

Issuing Authority:	Owner:	Project:
ITSO	Technology at ITSO	Technical
Document number	Part Number:	Sub-Part Number
ITSO TS 1000	6	
Issue number (stage):	Month:	Year
2.1.5	March	2025
Title:		
ITSO TS 1000-6 Interoperable public transport ticketing using contactless smart customer media – Part 6: Message Data		
Replaces Documents:		
ITSO TS 1000-6 2010-02 issue number 2.1.4		

Revision history of current edition

Date	ITSO Ref.	Editor ID	Nature of Change to this Document (or Part)
Nov 2002	DCI 100 / create 2.1	SLB/DBH	Incorporate revisions advised by author (PJ)
May 2003		PJ / JHC	Re- create as Part 6 and fit to template
Jun 2003		PJ / SLB	Finalise working document
Sep 2003		PJ / SLB	Revise and issue as CD
Nov 2003		PJ / SLB	Revise, implement global changes, fix up formatting/numbering and issue as 2 nd CD
Nov 2003		SLB	Editorial changes only. Issue 1 st committee draft.
Nov 2003		PRJ / SLB	Update and issue Consultation Draft (CD10)
Feb 2004		PRJ	Update according to consultation results etc.
Feb 2004		SLB	Clean up, consolidate changes and format as final draft (FD).
Mar 2004		SLB	Implement final changes and prepare for issue.
Oct 2006		MPJE / PRJ	Updated to include ISADs following approval by DfT
Apr 2007		PRJ	Updated to include ISADs following approval by DfT
Jun 2007		MPJE	Final Editing prior to publication
Apr 2008		PRJ	Updated to include ISADs following approval by DfT
Apr 2008		MPJE	Final Editing prior to publication
Jan 2010		PRJ	Updated to include ISADs following approval by DfT
Feb 2010		MPJE	Final Editing prior to publication
Apr 2015		MPJE	Updated to incorporate Corrigendum 9 to Version 2.1.4
May 2024		AM	Draft publication of Version 2.1.5
Mar 2025		AM	Updated to include ISADs following approval by DfT.
Mar 2025		AM	Final Editing prior to publication of Version 2.1.5

Document Reference: ITSO TS 1000-6

Date: 2025-03-31

Version: 2.1.5

Ownership: ITSO

Secretariat: Technology at ITSO

ITSO Technical Specification 1000-6 – Interoperable Public Transport Ticketing using contactless smart customer media – Part 6: Message data

ISBN: 978-1-3999-8707-3

Although this information was commissioned by the Department for Transport (DfT), the specifications are those of the authors and do not necessarily represent the views of the DfT. The information or guidance in this document (including third party information, products and services) is provided by DfT on an 'as is' basis, without any representation or endorsement made and without warranty of any kind whether express or implied.

OGL

© King's Printer and Controller of His Majesty's Stationery Office (HMSO), 2025, except where otherwise stated.

Copyright in the typographical arrangement rests with the Crown.

You may re-use this information (not including logos or third-party material) free of charge in any format or medium, under the terms of the Open Government Licence v3.0. To view this licence visit <http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3> or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or e-mail: psi@nationalarchives.gsi.gov.uk.

Foreword

This document is a part of ITSO TS 1000, a Specification published and maintained by ITSO, a membership company limited by guarantee without shareholders. The membership of ITSO comprises transport organisations, equipment and system suppliers, local and national government. For the current list of members see the ITSO web site www.itso.org.uk

ITSO TS 1000 is the result of extensive consultation between transport providers, sponsors, system suppliers and manufacturers. The Department for Transport (DfT) has also contributed funding and expertise to the process.

Its purpose is to provide a platform and tool-box for the implementation of interoperable contactless smart customer media public transport ticketing and related services in the UK in a manner which offers end to end loss-less data transmission and security. It has been kept as open as possible within the constraints of evolving national, European and International standards in order to maximise competition in the supply of systems and components to the commercial benefit of the industry as a whole. In general, it promotes open standards but it does not disallow proprietary solutions where they are offered on reasonable, non-discriminatory, terms and contribute towards the ultimate objective of interoperability.

ITSO has been established to maintain the Technical Specification and Business Rules required to facilitate interoperability. It also accredits participants and interoperable equipment. ITSO is a facilitator of interoperability at the minimum level of involvement necessary. It will not involve itself in any commercial decisions or arrangements for particular ticketing schemes; neither will it set them up nor run them. It will however “register” them in order to provide the necessary interoperability services (e.g. issue and control of unique scheme identifiers, certification and accreditation, security oversight).

Consequently, adoption of this Specification for particular ticket schemes will be a matter for the commercial judgement of the sponsors/participants, as will the detailed Business Rules and precise partnership arrangements.

Contents

Revision history of current edition	2
Foreword	4
Contents	5
1. Scope	11
1.1 Scope of Part 6	11
2. Message Data	12
2.1 Message Codes	12
2.1.1 Message Code Format	12
2.2 Data Destinations	13
2.3 Data Format	13
2.3.1 Not Used	13
2.3.2 Note on actions to take when there is no data available for a specific message data element:	13
2.3.3 Note on actions to take when a Transaction with an older format IPE is reported using later format messages	13
2.4 Notation	13
3. Message control messages	14
3.1 Message Codes	14
3.2 Acknowledgement to Class 1 message (ACK1)	14
3.3 Acknowledgement to Class 2 message (ACK2)	14
3.4 Negative acknowledgement to Class 1 message (NAK1)	15
3.5 Negative acknowledgement to Class 2 message (NAK2)	15
3.6 Envelop Frame, Code 0920	17
3.7 Class 1 Data Frame collection, Code 0605	17
3.8 Data Frame Not Received Advisory Message, Message Code 0913	17
4. Transaction Record Data Messages	19
4.1 Introductory Note	19
4.2 Record creation rules	19
4.2.1 Determining Message Destinations	19
4.2.2 General Data Creation Rules	19
4.3 Transaction Record Message Codes	20
4.4 Transaction Record Data Content – RecordFormatRevision = 2	23
4.4.1 Standard Elements	23
4.4.2 Create an ITSO shell, code 0001	24
4.4.3 Delete ITSO Shell, code 0004	25
4.4.4 Create or Amend IPE, code 0005, 0006	26
4.4.5 Delete IPE, Stored Travel Rights first use, Enable/disable CTA, code 0007, 0008, 0009	27
4.4.6 Stored Travel Rights travel, Product or service purchase, load (manual, Actionlist and Auto-Top-Up), load check record, TransactionReversal, codes 0100, 0101, 0102, 0103, 0107	27
4.4.7 Enable or amend Auto-Top-Up, code 0104	30

4.4.8 Disable Auto-Top-Up, Auto-Renew or CTA, code 0105, 0305, 010C.	32
4.4.9 First Use of Stored Travel Rights, code 0106.	33
4.4.10 Full / partial refund of Stored Travel Rights, code 0108.	35
4.4.11 Refund all Stored Travel Rights, together with any deposit amount and disable the Stored Travel Rights IPE, code 0109.	36
4.4.12 CTA TYP 5 Full / Partial Refund for a purchased ticket code 0110.	37
4.4.13 CTA TYP 5 Usage, Code 0111.	37
4.4.14 Deleted.	39
4.4.15 Bank Account Details, code 010B.	39
4.4.16 Full / partial refund of CTA cumulative amount, code 010D.	40
4.4.17 CTA TYP 4 usage (travel, Product or service purchase), code 010E.	41
4.4.18 CTA TYP 4, TYP 5, Value Adjustment, Code, 010F, 0112.	43
4.4.19 Create or Amend Stored Travel Rights, codes 0120, 0121.	44
4.4.20 Create or Amend CTA IPE TYP 4, codes 0122, 0123.	46
4.4.21 Create or Amend CTA IPE TYP 5, Code 0124, 0125.	48
4.4.22 Create or Amend ITSO ID IPE or Entitlement IPE, code 0200, 0201.	50
4.4.23 Code 0202, RFU.	55
4.4.24 Loyalty add points, Loyalty redemption, Loyalty transaction reversal, codes 0203, 0204, 0205.	55
4.4.25 Create Loyalty IPE, First Use of loyalty scheme, code 020B, 0206.	57
4.4.26 Create or Amend Ticket IPE, code 0207, 0208.	59
4.4.27 Journey Record, code 0209.	72
4.4.28 Journey Record, code 0210.	75
4.4.29 TransactionReversal, code 0300.	77
4.4.30 Full / Partial refund for a purchased ticket (IPE), code 0301.	79
4.4.31 Deposit Received or Refunded, code 0302, 0303.	80
4.4.32 Enable or Amend Auto-Renew, code 0304 - RecordFormatRevision = 2.	82
4.4.33 Not used.	85
4.4.34 Hotlist match event, code 0311 - RecordFormatRevision = 2.	85
4.4.35 Actionlist match event record, code 0312 - RecordFormatRevision = 2.	86
4.4.36 Exception, Transaction Failed, code 0400.	88
4.4.37 Exception, Transaction with Customer Media apparently successful, but the POST was unable to confirm that this Transaction was successful, code 0410.	92
4.4.38 Cyclic Log Status Change, code 0313.	93
4.4.39 Unblock Shell or Product, code 0314.	94
4.4.40 Shell or IPE blocking event not arising as an outcome of a Hotlist match event, code 0315 – RecordFormatRevision = 2.	95
4.5 Transaction Record Data Content – RecordFormatRevision = 3.	96
4.5.1 Standard Elements – RecordFormatRevision = 3.	96
4.5.2 Create an ITSO shell, code 0001 – RecordFormatRevision = 3.	98

4.5.6 Stored Travel Rights travel, Product or service purchase, load (manual, Actionlist and Auto-Top-Up), load check record, TransactionReversal, codes 0100, 0101, 0102, 0103, 0107, RecordFormatRevision = 3.	99
4.5.10 Full / partial refund of Stored Travel Rights, code 0108, RecordFormatRevision = 3	108
4.5.11 Refund all Stored Travel Rights, together with any deposit amount and disable the Stored Travel Rights IPE, code 0109, RecordFormatRevision = 3	111
4.5.12 CTA TYP 5 Full / Partial Refund for a purchased ticket code 0110, RecordFormatRevision = 3	115
4.5.13 CTA TYP 5 Usage, Code 0111, RecordFormatRevision = 3	115
4.5.16 Full / partial refund of CTA cumulative amount, code 010D – RecordFormatRevision = 3	119
4.5.17 CTA usage (travel, Product or service purchase), code 010E, RecordFormatRevision = 3	122
4.5.19 Create or Amend Stored Travel Rights, codes 0120, 0121, RecordFormatRevision = 3	126
4.5.20 Create or Amend CTA IPE TYP 4, codes 0122, 0123, RecordFormatRevision = 3	131
4.5.21 Create or Amend CTA IPE TYP 5, Code 0124, 0125, RecordFormatRevision = 3	135
4.5.22 Create or Amend ITSO ID IPE or Entitlement IPE, code 0200, 0201 - RecordFormatRevision = 3	140
4.5.26 Create or Amend Ticket IPE, code 0207, 0208 – RecordFormatRevision = 3	145
4.5.27 Journey Record, code 0209 – RecordFormatRevision = 3	158
4.5.28 Journey Record, code 0210 – RecordFormatRevision = 3	162
4.5.29 TransactionReversal, code 0300 – RecordFormatRevision = 3	164
4.5.30 Full / Partial refund for a purchased ticket (IPE), code 0301 – RecordFormatRevision = 3	165
4.5.31 Deposit Received or Refunded, code 0302, 0303 - RecordFormatRevision = 3	166
4.5.33 Supplementary Data Message, code 0310 – RecordFormatRevision = 3	168
4.5.34 Hotlist match event, code 0311 - RecordFormatRevision = 3	169
4.5.35 Actionlist match event record, code 0312 - RecordFormatRevision = 3	170
4.6 Transaction Record Data Content – RecordFormatRevision = 4	172
4.6.1 Standard Elements – RecordFormatRevision = 4	172
4.6.26 Create or Amend Ticket IPE, code 0207, 0208 – RecordFormatRevision = 4	173
4.6.27 Journey Record, code 0209 – RecordFormatRevision = 4	187
4.6.28 Journey Record, code 0210 – RecordFormatRevision = 4	191
4.6.34 Hotlist match event record, code 0311 - RecordFormatRevision = 4	193
4.6.35 Actionlist match event record, code 0312 - RecordFormatRevision = 4	194
4.7 Transaction Record Data Content – RecordFormatRevision = 5	196
4.7.1 Standard Elements – RecordFormatRevision = 5	196
4.7.26 Create or Amend Ticket IPE, code 0207, 0208 – RecordFormatRevision = 5	198
4.7.28 Journey Record, code 0210 – RecordFormatRevision = 5	212
5. HOPS – HOPS and HOPS – POST Data List Transmission Mechanism.	216
5.1 Message Format	216
5.2 Message Codes	216
5.3 HOPS to POST Configuration message data	217
5.3.1 Multi Record Transmission, multiple types (message code 0600)	217
5.3.2 Multi Record Transmission (message codes 0601 to 06FF)	217
5.3.3 Hotlist and Actionlist item records, code 0C02, 0C03	218

5.4 Data Correction Record, Code 0C04.	242
6. ITSO POST Configuration Data.	244
6.1 Message format.	244
6.2 ITSO POST Configuration Data Record Format.	244
6.3 ITSO POST Configuration Data Message Response.	245
6.4 ParameterTable Message Codes.	245
6.5 Multi Record Transmission, multiple types (message code 0B00)	245
6.6 Multi Record Transmission (message codes 0B01 to 0BFF).....	246
6.7 Parameter table definitions, ListFormatRevision = 1.....	246
6.7.1 Peak Times, Code 0A02.	247
6.7.2 Day type assignment, code 0A03, 0B03.....	250
6.7.3 Transfers, Codes 0A04, 0B04.	251
6.7.4 Rebates, codes 0A05, 0B05.	252
6.7.5 Loyalty Rules, Codes 0A06, 0B06.	253
6.7.6 Currency, Codes 0A07, 0B07.	254
6.7.7 Zone Table Reference, Codes 0A08, 0B08.....	254
6.7.8 Zone Table Bitmap, Codes 0A09, 0B09.	255
6.7.9 Sale Price Table, Codes 0A0A, 0B0A.	256
6.7.10 IIN Table, Codes 0A0B, 0B0B	257
6.7.11 IPE Parameter Tables, Codes 0A0C, 0B0C.....	257
6.7.12 ISAM Management File Parameters, Codes 0A0D, 0B0D	258
6.7.13 Term Dates, Codes 0A01, 0B01	259
6.7.14 Passback times, Codes 0A0E, 0B0E.....	260
6.8 Parameter table definitions, ListFormatRevision = 2.....	261
6.8.1 Peak Times, Code 0A02, ListFormatRevision = 2.....	261
6.8.2 Day type assignment, code 0A03, 0B03, ListFormatRevision = 2.	264
6.8.3 Transfers, Codes 0A04, 0B04, ListFormatRevision = 2.	265
6.8.4 Rebates, codes 0A05, 0B05, ListFormatRevision = 2.....	267
6.8.5 Loyalty Rules, Codes 0A06, 0B06, ListFormatRevision = 2.....	268
6.8.6 Currency, Codes 0A07, 0B07, ListFormatRevision = 2.....	269
6.8.7 Zone Table Reference, Codes 0A08, 0B08, ListFormatRevision = 2.....	270
6.8.8 Zone Table Bitmap, Codes 0A09, 0B09, ListFormatRevision = 2.	270
6.8.9 Sale Price Table, Codes 0A0A, 0B0A, ListFormatRevision = 2.	271
6.8.10 IIN Table, Codes 0A0B, 0B0B, ListFormatRevision = 2.....	272
6.8.11 IPE Parameter Tables, Codes 0A0C, 0B0C, ListFormatRevision = 2.....	273
6.8.12 ISAM Management File Parameters, Codes 0A0D, 0B0D, ListFormatRevision = 2.....	274
6.8.13 Term Dates, Codes 0A01, 0B01, ListFormatRevision = 2.....	275
6.8.14 Passback times, Codes 0A0E, 0B0E, ListFormatRevision = 2.....	276
6.9 Manifest Message	277
6.9.1 Manifest Message code.....	277

6.9.2 Manifest message Data	277
6.9.3 Data Elements comprising the Manifest Header	278
6.9.4 Data Elements comprising the Table Data structures	279
6.9.5 Manifest Trailer Data Element	280
7. POST to HOPS queries.	281
7.1 Message Codes.....	281
7.2 Request Messages.....	281
7.2.1 Customer Media holder ID information Code 0500	282
7.2.2. Stored Travel Rights details Code 0501	282
7.2.3 Loyalty details, code 0502	283
7.2.4 CTA details, code 0503.....	283
7.2.5 Request Deposit Refund Rules, Code 0504.....	284
7.3 Response Messages.	284
7.3.1 Customer Media holder ID information, Code 0D00.....	284
7.3.2 Stored Travel Rights details, Code 0D01.	289
7.3.3 Loyalty details type 1, Code 0D02 and type 2, Code 0D03.....	291
7.3.5 CTA details, Code 0D04, 0D05.	292
7.3.6 Deposit Refund Rules, Code 0D06.....	295
7.3.7 Response: No data available, Code 0DFF.	296
8. IPE Embodiment Parameters.....	298
8.1 Introduction	298
8.2 File Structure	298
8.2.1 List Creation Rules.....	299
8.3 List Format Revision 1, IPE Format Revision 1.....	300
8.3.1 IPE Format Revision 1	345
8.3.2 IPE Format Revision 2	345
8.3.3 IPE Format Revision 3	345
8.4 List Format Revision 1, IPE Format Revision 2.....	352
8.5 List Format Revision 2, IPE Format Revision 1.....	373
8.6 List Format Revision 2, IPE Format Revision 2.....	390
8.7 List Format Revision 3, IPE Format Revision 1.....	407
9. HOPS to POST, POST to HOPS and HOPS to HOPS messages, Miscellaneous Messages, Code 08xx.	424
9.1. Message Codes 08xx.	424
9.2. Embodiment Parameter Request Message, code 0800.	424
9.3. Supplementary Data Message (Hash/Mac), code 0801	425
9.4 CM or Shell status advisory message, code 0802	426
9.5 POST Information Notification, code 0803	427
9.6 Customer Media Holder Details request, code 0804	430
9.7 Customer Media Holder Details response, Code 0805	434
9.8 IPE Fulfilment Action Notification, code 0806	437

9.9 Additional Shell Data, code 0807	437
9.10 Embodiment Parameter Request Message, code 0808 - RecordFormatRevision = 2	438
9.11 POST SET Notification Message, code 0809	439
9.12 ISAM Parameter Table Request Message, code 080A - RecordFormatRevision = 1	440
9.13 ISAM Parameter Table Response Message (Hash/Mac), code 080B – RecordFormatRevision = 1	441
9.14 Product Status Advisory Message, code 080C	442
9.15 Hotlist Removal Request, code 080D	443
9.16 Actionlist Removal Request, code 080E	443
9.17 Response to a Data Frame Not Received Advisory Message (Hash/Mac), code 080F	444
9.18 Transaction with Customer Media apparently successful but the POST was unable to confirm this, code 0810	445
Annex A - ITSO BER_LTV Data Objects (Normative)	447
A.1 Introduction	447
A.1.1 BER-LTV data objects	447
A.1.2 BER-TLV tag fields	448
A.1.3 BER-TLV length fields	448
A.2 Tag allocation	449
A.2.1 General details	449
A.2.2 CDOs in Numeric order	449
A.2.3 CDOs in Alphabetic order	450
A.2.4 PDOs in Numeric order	451
A.2.5 PDOs in Alphabetic order	453
A.3 Tag definitions only found in this Annex	456
Annex B - Examples of the use of the 080A and 080B ISAM Parameter Table Request and Response Messages in Native Format (Informative)	459
B.1 Request Example	459
B.2 Response Example	459

1. Scope

ITSO TS 1000 defines the key technical items and interfaces that are required to deliver interoperability. To this end, the end-to-end security system and shell layout are defined in detail; while other elements (e.g. terminals, 'back-office' databases) are described only in terms of their interfaces. The business rules that supplement the technical requirements are defined elsewhere.

1.1 Scope of Part 6

This Part of ITSO TS 1000 defines the ITSO message data elements and structures, excepting that messages between the ITSO Security Management Service (ISMS) and ISAMs / HSAMs are not detailed in this document¹.

The section of the specification uses terms, definitions and data types which are defined in ITSO TS 1000-1.

¹ ISMS - ISAM/HSAM messages are defined in ITSO TS 1000-8

2. Message Data

Use of message codes 05xx and 0Dxx is deprecated in this version of the Specification and references to these message codes shall be removed from the next version of the Specification.

2.1 Message Codes

2.1.1 Message Code Format

Message codes shall be a two byte value (x = any value).

Table 1 - Message Code Format

Code (HEX)	Hashed Message?	Type of message	Message Group	Reference to individual Message Definitions in this document
00xx	No	Transaction Record data	ITSO shell, IPE Administration, Card issuer messages	Table 7
01xx	No	Transaction Record data	Stored Travel Rights, CTA	Table 7
02xx	No	Transaction Record data	ITSO ID, loyalty, create or amend IPE, journey record, Actionlist acknowledge	Table 7
03xx	No	Transaction Record data	Reversals and refunds, miscellaneous, list match event records	Table 7
04xx	No	Other Message Data	Exceptions and card transaction error messages (POST to HOPS)	Table 7
05xx	No	Other Message Data	POST to HOPS queries	Table 113
06xx	Yes	Other Message Data	HOPS to HOPS and HOPS to POST messages	Table 78
07xx	RFU	RFU	RFU	---
08xx	As Required	HOPS to POST, POST to HOPS and HOPS to HOPS messages	Miscellaneous messages	Table 146
09 xx	No	HOPS to POST /HOPS messages	Message control	Table 2
0Axx	No	HOPS to POST /HOPS messages	Parameter tables	Table 99
0Bxx	Yes	HOPS to POST /HOPS messages	Parameter tables	Table 99
0Cxx	As Required	HOPS to POST /HOPS messages	Inter-operability list, Capability list, Hotlist, Actionlist, Data Correction record.	Table 78
0Dxx	No	HOPS to POST /HOPS messages	HOPS Response to POST queries	Table 113
0Exx	No	User defined system specific messages	Messages are user defined, and it is the responsibility of the sender to ensure that the addressee can interpret the message. Both data format and content are user defined, excepting that the messaging system shall assume that "the native format data is of another data type", as defined in ITSO 1000-9 annex A, clause A.3.3. ¹	----
0Fxx	Yes	User defined system specific messages	Messages are user defined, and it is the responsibility of the sender to ensure that the addressee can interpret the message. Both data format and content are user defined. For the formatting and processing of long messages refer to ITSO TS 1000-9, excepting that the messaging	----

			system shall assume that "the native format data is of another data type", as defined in ITSO 1000-9 annex A, clause A.3.3.	
>1000	RFU	RFU	RFU	----

Note that any message codes not defined herein are reserved for future use.

¹ These messages may be used to return user defined audit registers.

2.2 Data Destinations

Data records sent from POST to HOPS may be sent to one or more destinations, as defined in the destination(s) and count of destinations elements. Where so required by the ITSO Operating Licence, messages shall also be addressed to a destination mandated within the Operating Licence, for the purposes of centralised monitoring for fraudulent activity (Governance).

2.3 Data Format.

Data shall be formatted for transmission according to the provisions of ITSO TS 1000-9.

Messages transmitted from HOPS to POST and vice versa shall be in accordance with the stated Transmission Methods and Data Formats defined in ITSO TS 1000-3.

2.3.1 Not Used

2.3.2 Note on actions to take when there is no data available for a specific message data element:

When there is no data available for a specific data element, then the following action shall be taken, depending upon the type of data element involved:

The data element shall always be included in the message, and the content set to a null value as follows.

Where the data element contains a numeric value of data type BCDN, DEC, HEX, BIN, FLAG, VALI, VALS, VAT or VATM, then the element shall be set to a value of zero.

Where the data element contains a numeric value of data type BCDS, then the element may be set either to a value of zero, or set every 4 bit subfield to 0xF.

Where the data element contains an ASCII value, then the element shall contain all spaces, that is, each byte of the element shall contain the hex value 20h.

2.3.3 Note on actions to take when a Transaction with an older format IPE is reported using later format messages

The general rule for the case where a data element has been added to a later version IPE, but older version IPEs are being used with later version messages is that if a message data element is mandatory and is not included in an earlier version of the IPE data, the element should be included in the message and populated with zero or ASCII spaces according to data type.

2.4 Notation

Data element sizes detailed in this part of ITSO TS 1000 are defined as a count of bytes.

3. Message control messages

3.1 Message Codes

Table 2 - Message Codes

Message Group	Data Frame Type	Message Code (hex)
Message Control	Acknowledgement to Class 1 message (ACK1)	0901
	Acknowledgement to Class 2 message (ACK2)	0902
	Negative Acknowledgement to Class 1 message (NAK1)	0911
	Negative Acknowledgement to Class 2 message (NAK2)	0912
	Data Frame Not Received Advisory message	0913
	Envelop Frame	0920

All other Message Codes with a high-order byte value of 09 (hex) are RFU.

3.2 Acknowledgement to Class 1 message (ACK1)

A Data Frame with this Message Code shall be issued by a HOPS (to a POST) to acknowledge correct and full receipt of a set of Class 1 Application Messages that form a Transaction Session Batch.

The format of the Data Block is defined in Table 3:

Table 3 - Acknowledgement to Class 1 message (ACK1)

Data Element	Format	Size (bytes)	Comment
IBatch Header sequence number	HEX	3	Generated by ISAM in the HOPS
IBatch Header delete parameters	HEX	8	Generated by ISAM in the HOPS

3.3 Acknowledgement to Class 2 message (ACK2)

A Data Frame with this Message Code shall be issued by a POST or HOPS to acknowledge correct receipt of a Data Frame within a Class 2 Application Message.

The format of the Data Block is defined in Table 4:

Table 4 - Acknowledgement to Class 2 message (ACK2) - Record Format Revision 1

This version of the ACK2 message is deprecated and will be removed from the next version of the Specification.

Data Element	Format	Size (bytes)	Comment
Data Frame Sequence Number	HEX	3	Sequence Number of the Data Frame being ACKed.

Table 4.2 - Acknowledgement to Class 2 message (ACK2) - Record Format Revision 2

Data Element	Format	Size (bytes)	Comments
RecordFormatRevision	HEX	1	This data element shall be set to a value of two (2)
Data Frame Sequence Number	HEX	3	Sequence Number of the Data Frame being ACKed.
Timestamp	DTS	3	Timestamp of the Data Frame being ACKed.

HOPS shall use the message versions as follows: Record Format Revision 1 of this message shall be used where it is known that the originator or recipient of the message does not support version 2. Record Format Revision 2 shall be used where it is known that the originator or recipient of the message does support version 2.

POSTs compliant to this version of the Specification shall not use Record Format Revision 1.

3.4 Negative acknowledgement to Class 1 message (NAK1)

A Data Frame with this Message Code shall be issued by a HOPS (to a POST) to indicate an error in the reception of one or more Class 1 Application Messages that form a Transaction Session Batch.

The format of the Data Block is defined in Table 5:

Table 5 - Negative acknowledgement to Class 1 message (NAK1)

Data Element	Format	Size (bytes)	Comment
IBatch Header sequence number	HEX	3	Generated by ISAM in the HOPS
NAK reason code	HEX	1	The value Reason code shall be a bitmapped field, encoded as follows: DATA_FRAME_ERROR : bit 0 shall be set to one (1) MISSING_DATA_FRAME : bit 1 shall be set to one (1) IBATCH_HEADER_ERROR : bit 2 shall be set to one (1) RFU : bits 3-7.

3.5 Negative acknowledgement to Class 2 message (NAK2)

A Data Frame with this Message Code shall be issued to indicate an error in the reception of a Data Frame within a Class 2 Application Message.

It is not mandatory for any node receiving a NAK2 to respond. It is, however, acceptable for a node to reconstitute the original message, having corrected any errors and send a different message.

The format of the Data Block is defined in Table 6:

Table 6 - Negative acknowledgement to Class 2 message (NAK2) - Record Format Revision 1

This version of the NAK2 message is deprecated and will be removed from the next version of the Specification.

Data Element	Format	Size (bytes)	Comment
Data Frame Sequence Number	HEX	3	Sequence Number of the Data Frame being NAKed.
NAK reason code	HEX	1	The value and significance of NAK2 reason codes are defined in Table 6a

Table 6a - NAK2 reason codes

NAK2 reason code value	Significance
0x01	DATA_FRAME_SEAL_ERROR
0x02	DATA_FRAME_ERROR
0x03	FUNCTION_NOT_SUPPORTED
0x04	FUNCTION_NOT_AUTHORISED
0x05	FUNCTION_LEVEL_NOT_SUPPORTED
0x06	PARAMETER_REJECTED
0x07	BAD_DATA
0x08	UNABLE_TO_PROCESS_080A
0x09	Hotlist or Actionlist processing error, occurring when a POST or a HOPS cannot successfully process a received list because the RecordType code does not correspond with the condition of the List Identifiers (HotListIdentifier or ActionListIdentifier as appropriate) in the new and current lists.
0x0A	Hotlist, Actionlist or POST Configuration Data list processing error, occurring when a POST or a HOPS cannot successfully process a received list, for any reason other than the reasons defined for reason code 0x09
0x0B – 0xFF	RFU

For backwards compatibility, any Node not supporting NAK2 reason codes 0x02 to 0x0A shall interpret the receipt of any of these codes as if it were coded 0x01.

Table 6b - Negative acknowledgement to Class 2 message (NAK2) - Record Format Revision 2

Data Element	Format	Size (bytes)	Comment
RecordFormatRevision	HEX	1	This data element shall be set to a value of two (2)
Data Frame Sequence Number	HEX	3	Sequence Number of the Data Frame being NAKed.
NAK reason code	HEX	1	The value and significance of NAK2 reason codes are defined in table 6a
Timestamp	DTS	3	Timestamp of the Data Frame being NAKed.

HOPS shall use these message versions as follows: Record Format Revision 1 of this message shall be used where it is known that the originator or recipient of the message does not support version 2. Record Format Revision 2 shall be used where it is known that the originator or recipient of the message does support version 2. POSTs compliant to this version of the Specification shall not use Record Format Revision 1.

3.6 Envelop Frame, Code 0920

The data associated with this message code shall be an entire Data Frame including its seal².

3.7 Class 1 Data Frame collection, Code 0605

The data associated with this message code shall be a collection of Class 1 message Data Frames covered by a HASH MAC and sent to a single destination. This message may be used as an alternative to the 0920 envelope message. The existing 0920 envelope message shall still be supported.

The Class 2 0605 message shall only be used for HOPS to HOPS forwarding of Class 1 Data Frames and shall NOT be used for POST to HOPS messaging.

The content of the 0605 message shall be a concatenated list of complete Class 1 Data Frames where each Data Frame is considered as single list item record within a list of multiple Class 1 Data Frames. This collection of Data Frames becomes the Data Block of the 0605 message that also includes a Hash of all the data in the block which is then sealed by the 0605 message originator. It remains the responsibility of the first line HOPS to manage the acknowledgment of Class 1 Data Frames and batch deletion in the POST.

3.8 Data Frame Not Received Advisory Message, Message Code 0913

This message shall be used as defined in ITSO TS1000-4, Clause 6.2.2.8 "Processing of Sequence Numbers in Messages Received From Other HOPS".

Where a range of missing Data Frames is specified, the range shall be a contiguous range of missing Data Frame Seq# values.

When the request message is incorrectly formatted, or cannot be validated, the recipient shall respond with a NAK using an appropriate code as defined in Table 6a.

² Refer to ITSO TS 1000-9 for an explanation of the use of Envelop Frames

Table 6c – Data Frame Not Received Advisory Message

Data Element	Format	Size (bytes)	Comment
RecordFormatRevision	HEX	1	This data element shall be set to a value of one (1)
FirstDataFrameSeq#	HEX	3	The sequence number of the first missing Data Frame
LastDataFrameSeq#	HEX	3	The sequence number of the last missing Data Frame. If there is only one missing Data Frame, then this element shall contain the same value as used in FirstDataFrameSeq#.

4. Transaction Record Data Messages

4.1 Introductory Note

The following Data messages shall be generated by POSTs as and when appropriate for each Customer Media transaction and transmitted to the HOPS. There are a large variety of data flow types, depending upon the transaction type and the IPE type(s) used in the transaction.

4.2 Record creation rules

4.2.1 Determining Message Destinations

Messages shall be addressed to the following destinations³:

1.	All records of transactions involving an IPE shall be addressed to the owner of the IPE, identified by OID in the relevant IPE directory entry. Note that when a check in transaction takes place in a check in / check out environment the IPE which will be used for the exit transaction cannot always be determined at check in. Under these circumstances a 0210 message need not be sent to an IPE owner.
2.	Records of transactions which create, amend or delete an ITSO shell, or which change the directory contents shall be sent to the owner of the ITSO shell, identified by the OID in the Shell Environment Data Group, except that in the case of Compact Shells messages with message codes 0001 to 0007 (inclusive) shall not be created or sent. In the case of Compact Shells all other messages which would normally be sent to the Shell Owner shall be sent to the Product Owner.
3.	All records of transactions shall be addressed to the owner of the ISAM installed in the terminal where the transaction took place, identified by OID within the POST's ISAM ID, where this differs from the IPE owner ID, excepting that this is not mandatory for messages with message codes 0005, 0006, 0008, 0009, 0313, and 0314.
4.	Journey Records created upon exit from a check in / check out environment shall also be addressed to the entry service operator where this can be identified as different from the owner of the ISAM who performed the checkout transaction.

Note: that in some circumstances, one record type shall be sent to the Shell Owner, and a different record type sent to the IPE and POST owners.

For the avoidance of doubt, the above destinations shall be automatically procured from either the customer media or the ISAM, as appropriate.

4.2.2 General Data Creation Rules

1.	Where no data is available for a given element, then an element of the specified size shall still be included in the record, with its contents set to zero if the element is of a numeric type and to 20h (space) if the element is of an ASCII type.
2.	Note that for reasons of ensuring Customer Media holder privacy the ISRN shall be encrypted according to ITSO TS 1000-8. Licensed Members are to ensure that, where the ISRN is stored unencrypted, they comply with their responsibilities under the General Data Protection Regulation (GDPR).

³ Where a message is intended for more than one destination, a POST shall transmit a single message with multiple destinations as defined in ITSO TS 1000-9

3.	Where a data element to be recorded does not consist of a multiple of 8 bits, then that data shall be stored in the appropriate element of the message such that the least significant bit of the data to be stored shall be stored in the least significant bit of the message element, and so on for the remaining bits of the element.
4.	The "Source" column in the following definitions indicates the original source of the data. However, it is not mandatory to read this source to obtain the data if a POST can reliably determine the data value by other means.

4.3 Transaction Record Message Codes.

Table 7 - Transaction Record Message Codes

Transaction Group	Transaction Type	Hex Code	Ver ⁴	Sent To Owners Of:
ITSO shell	Create ITSO shell (inactive)	0001	2, 3	Shell POST
	Amend ITSO shell	0002	3	Shell POST
	RFU	0003		RFU
	Delete ITSO shell	0004	2	Shell POST
IPE administration	Create IPE (sent to ITSO Shell owner)	0005	2	Shell
	Amend IPE (sent to ITSO Shell owner)	0006	2	Shell
	Delete IPE ⁵ (sent to ITSO Shell owner and IPE owner)	0007	2	Shell POST IPE
ITSO Shell owner records ⁶	Stored Travel Rights first use	0008	2	Shell
	Enable/disable CTA	0009	2	Shell
ITSO ID	Create ITSO ID TYPs 14 & 16 (includes any deposit payment)	0200	2, 3	POST IPE
	Amend ITSO ID TYPs 14 & 16	0201	2, 3	POST IPE
Stored Travel Rights	Create Stored Travel Rights TYP 2	0120	2, 3	POST IPE
	Amend Stored Travel Rights TYP 2	0121	2, 3	POST IPE
	Stored Travel Rights usage (deduction from store) (funds transfer request)	0100	2, 3	POST IPE
	Stored Travel Rights load (manual or Actionlist)	0101	2, 3	POST IPE
	Stored Travel Rights load (Auto-Top-Up)	0102	2, 3	POST IPE

⁴ This column indicates the currently valid RecordFormatRevision for this message data

⁵ Note that the LOG IPE shall not be deleted

⁶ Data records returned to the card or shell owner, identified by OID found in the Shell Environment Data Group

	Stored Travel Rights load check record	0103	2, 3	POST IPE
	Enable or amend Auto-Top-Up	0104	2	POST IPE
	Disable Auto-Top-Up	0105	2	POST IPE
	First use of Stored Travel Rights (to IPE owner)	0106	2	POST IPE
	Stored Travel Rights TransactionReversal (restoration of Stored Travel Rights deducted during a Transaction which has been cancelled)	0107	2, 3	POST IPE
	Stored Travel Rights – refund of part/all Stored Travel Rights (which may, or may not, follow a loading transaction)	0108	2, 3	POST IPE
	Refund all Stored Travel Rights, together with any deposit amount and disable the Stored Travel Rights IPE.	0109	2, 3	POST IPE
Charge to account (CTA)	Create CTA IPE TYP 4	0122	2, 3	POST IPE
	Amend CTA IPE TYP 4	0123	2, 3	POST IPE
	Create CTA IPE TYP 5	0124	2, 3	POST IPE
	Amend CTA IPE TYP 5	0125	2, 3	POST IPE
	Bank Account Details	010B	2	POST IPE
	Disable CTA	010C	2	POST IPE
	CTA Full / Partial Refund for a purchased ticket	010D	2, 3	POST IPE
	CTA TYP 4 Usage	010E	2, 3	POST IPE
	CTA TYP 4 Value Adjustment	010F	2	POST IPE
	CTA TYP 5 Full / Partial Refund for a purchased ticket	0110	2, 3	POST IPE
	CTA TYP 5 Usage	0111	2, 3	POST IPE
	CTA TYP 5 Value Adjustment	0112	2	POST IPE
Loyalty	Create Loyalty IPE	020B	2	POST IPE
	RFU	0202		
	Loyalty add points	0203	2	POST IPE
	Loyalty redemption	0204	2	POST IPE
	Loyalty transaction reversal	0205	2	POST IPE
	First use of scheme	0206	2	POST IPE
TransactionReversal	(other than Stored Travel Rights, with rides refund to Customer Media if appropriate)	0300	2, 3	POST IPE

Predefined ticket and predefined specific journey ticket transactions	Create IPE (sent to IPE owner)	0207	2, 3, 4, 5	POST IPE
	Amend IPE (sent to IPE owner). A record code 0208 is generated for every change to the IPE, including a stored rides use.	0208	2, 3, 4, 5	POST IPE
Refund	Full / Partial refund for a purchased ticket (IPE)	0301	2, 3	POST IPE
Journey record	Journey / entry / exit record (IPE usage)	0209	2, 3, 4	POST IPE
	Journey / entry / exit record (Transient Ticket)	0210	2, 3, 4, 5	POST IPE
Miscellaneous	Deposit received	0302	2	POST and IPE or Shell as appropriate
	Deposit refund	0303	2, 3	POST and IPE or Shell as appropriate
	Enable / Amend Auto-Renew	0304	2	POST IPE
	Disable Auto-Renew	0305	2	POST IPE
	Supplementary Data message	0310	3	POST
	Hotlist match event record	0311	2, 3, 4	See note below
	Actionlist match event record	0312	2, 3, 4	See note below
	Cyclic Log status change	0313	2	Shell
	Unblock Shell or Product	0314	2	Shell and, if appropriate, the Product
	Shell or IPE blocking event not arising as an outcome of a Hotlist match event	0315	2	POST always, and either Shell or IPE owner as appropriate
Exceptions	Transaction Failed	0400	2	Shell POST IPE (see note below)
	Transaction with Customer Media apparently successful, but the POST was unable to confirm this.	0410	2	Shell POST IPE (see note below)

Note regarding Message code 0311 Hotlist match event record and Message code 0312 **Actionlist match event record**. These messages shall always be sent to the POST owner

0311 messages shall also be sent to the IPE and Shell owners if applicable to an IPE, or sent to the Shell owner if applicable to a Shell. When transmitted to the IPE or Shell owner, the contents of the Hotlist data group HotItemOriginator data element shall be used as one of the destinations.

0312 messages shall also be sent to the IPE owner if applicable to an IPE, or sent to the Shell owner if applicable to a Shell. When transmitted to the IPE or Shell owner, the contents of the Actionlist data group ActionListOriginator data element shall be used as one of the destinations.

Codes within the range 0000 to 04FF not explicitly specified in the above table are reserved for future use by ITSO (RFU).

Note that there is no prohibition on sending messages to additional destinations, other than those mandated in Table 7.

In this context, POST owner is defined as the owner of the ISAM installed in the terminal where the transaction took place.

Note regarding Message Code 0410 - Use of messages using code 0410 Transaction with Customer Media apparently successful but the POST was unable to confirm this - is deprecated in this version of the Specification and references to this message code will be removed from the next version of the Specification.

4.4 Transaction Record Data Content – RecordFormatRevision = 2

The data elements shall comprise standard data always returned for each Customer Media transaction, together with transaction type specific data.

4.4.1 Standard Elements.

The following elements shall always be returned as the leading data elements (StandardData) in every transaction record for all types of transaction.

Table 8 - Standard Elements - RecordFormatRevision = 2

Name	Source	Format	Size	Comment
RecordFormatRevision	POST	HEX code	1	Defines format revision of this message.
TransactionDateTime	POST	DTS	3	Date & time at which the transaction took place, which shall be identical to any DTS recorded in the shell, IPEs or Transient Ticket store
TransactionInformation	POST	UD	1	User defined element.
StaffID	POST	HEX	4	Identifies the operators member of staff (if any) conducting the transaction. If none then zero shall be recorded in this element.
SupplementalInformation	POST	HEX	1	Additional information code
FormatVersionCode	Shell	FVC	1	Format version information from the Shell Environment Data Group.
KeyStrategyVersion	Shell	KSC	1	Format version information from the Shell Environment Data Group
KeyVersion	Shell	KVC	1	Format version information from the Shell Environment Data Group
IPEID	Shell, Dir	IPEIDM	7	Identifies the IPE involved in the transaction, taken from the ITSO Shell's directory entry. It is a concatenation of IIN, OID, TYP and PTYP in that order. When a message is used to record an event relating to an ITSO Shell, then this IPEID element shall either: be made up of the Shell's IIN, the Shell owner's OID,

				<p>IPE TYP - which shall be set to a value of 32 (decimal), and IPE PTYP which shall be set to either a Shell owner defined value to indicate the Shell version, or to a value of zero,</p> <p>or</p> <p>be set to zero to indicate that the message relates to a Shell. (This option shall not be used in new or amended implementations. Note that this option will be removed in a future version of the ITSO Specification.)</p> <p>If no IPE or Shell ID information is available, then the contents of this Data Element shall be set to 0.</p> <p>If the IPE cannot be read and IINL = 1, set the IIN portion of this element to zero (0).</p>
Shell_IterationNumber	Dir	INS#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.

Table 9 - Supplemental information element codes - RecordFormatRevision = 2

Code	Meaning
00	No supplemental information stored
01	Test/Maintenance/training transaction
02	Incomplete transaction
03	Commercial In (required for 0209 Journey Records only)
04	Commercial Out (required for 0209 Journey Records only)
05	Minimum Subsidy In (required for 0209 Journey Records only)
06	Minimum Subsidy Out (required for 0209 Journey Records only)
07	Minimum Cost In (required for 0209 Journey Records only)
08	Minimum Cost Out (required for 0209 Journey Records only)
09 – 255	RFU

4.4.2 Create an ITSO shell, code 0001.

This applies to creation of an ITSO shell.

The use of RecordFormatRevision = 3 is mandated in this version of the Specification in order to provide additional data required for the creation of Detached IPEs.

In this version of the Specification, Format Revision 2 is deprecated and will be removed from the next version of the Specification.

Note: Unlike other messages relating to the IPE_Fulfilment_Action and Customer Media Holder Not Present this message does NOT use ASN.1 for any elements in this message.

Table 10 - Create an ITSO shell, code 0001 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
DepositAmount	POST	VALI	2	
DepositCurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositMethodOfPayment	POST	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositVATSalesTax	POST	VATM	2	
EXP	Shell	DATE	2	Shell Expiry Date
CardReferenceNumber	Shell	MCRN	10	Identity number of a host multi-application Customer Media. Note that this element is optional, and where not included in the Customer Media this message element shall be set to 0. Where MCRN is available in the ITSO Shell it shall be included in this record. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.3 Delete ITSO Shell, code 0004.**Table 11 - Delete ITSO Shell, code 0004 - RecordFormatRevision = 2.**

Name	Source	Format	Size	Comment
StandardData			21	
CardReferenceNumber	Shell	MCRN	10	Identity number of a host multi-application Customer Media. Note that this element is optional, and where not included in the Customer Media this element shall be set to 0. Where MCRN is available to shall be included in this record
DepositRefundAmount	IPE	VALI	2	
DepositCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.4 Create or Amend IPE, code 0005, 0006.

Note, this record shall be sent to the ITSO Shell owner. An IPE specific creation record shall also be created and sent to the IPE owner.

A 0006 message shall only be generated when an IPE Data Group is modified. This message shall not be generated when an IPE Value Group data is modified.

These messages shall not be sent when an IPE of TYP 27, 28, or 29, is created or amended on CMD 4 Media.

Table 12 - Create or Amend IPE, code 0005, 0006 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
DirectoryEntryNumber	DIR	En	1	A copy of the directory entry number for this IPE. This and the DIM elements may be used for recovery purposes.
DirectoryImageLength	POST	HEX	1	Length of DirectoryImage in bytes
DirectoryImage	DIR	HEX	Variable	A copy of the Directory Data Group Dataset (ITSO TS 1000-2,) after the transaction is performed.
IPEFormatRevision	IPE	HEX	1	
RemoveDate	IPE	RDATE	1	
ProductRetailer	IPE	OID16	2	
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.5 Delete IPE, Stored Travel Rights first use, Enable/disable CTA, code 0007, 0008, 0009.

This record shall be used for all IPE deletion transactions.

This record shall be created and addressed to the ITSO shell owner when the Stored Travel Rights IPE is first used, and when CTA is either enabled or disabled.

A 0007 message shall not be sent to the Shell owner when an IPE of TYP 27, 28, or 29, is deleted from a CMD 4, 5 or 6 Media.

Table 13 - Delete IPE, Stored Travel Rights first use, Enable/disable CTA, code 0007, 0008, 0009 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
ProductRetailer	IPE	OID16	2	
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.6 Stored Travel Rights travel, Product or service purchase, load (manual, Actionlist and Auto-Top-Up), load check record, TransactionReversal, codes 0100, 0101, 0102, 0103, 0107.

4.4.6.1 Stored Travel Rights travel, Product or service purchase, load (manual, Actionlist and auto-top up), TransactionReversal, codes 0100, 0101, 0102, 0107.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Table 14 - Stored Travel Rights travel, Product or service purchase, load (manual, Actionlist and Auto-Top-Up), TransactionReversal, codes 0100, 0101, 0102, 0107 - RecordFormatRevision = 2

Name	Source	Format	Size	Comment
StandardData			21	
ProductRetailer	IPE	OID16	2	
POSTAmount	POST	VALI	2	Value of transaction in the POST native currency, defined by POSTAmountCurrencyCode
POSTAmountCurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
DateTimeStamp	IPE VG	DTS	3	
SAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
Value	IPE VG	VALS	2	
ValueCurrencyCode	IPE VG	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CountJourneyLegs	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CumulativeFare	IPE VG	VALI	2	A 1.625 byte value occupying bits 0-7 of the least significant byte and bits 0-4 of the most significant byte. Bits 5-7 of the most significant byte shall be set to 0.
TYP2ValueFlags	IPE VG	BMP	1	A 0.375 byte value, occupying bits 0 to 2, bits 3 to 7 shall be set to 0.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.

IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.6.2 Stored Travel Rights load check record code 0103.

A Stored Travel Rights load check record message shall be created with each Stored Travel Rights Transaction where the STR IPE value record data group contains a record of an add value Transaction. If there is no record of an add value Transaction in the value record data group then the message is not sent. Data from the most recently written IPE Value Record recording addition of Stored Travel Rights shall be recorded in the appropriate elements of this transaction record, noting that if the current Transaction is an add value Transaction then the data relating to the most recent previous add value Transaction shall be recorded, not that from the current Transaction. Only one set of elements shall be recorded in the record, relevant to most recent load Transaction, even where more than one Value Group exists.

Table 14a - Stored Travel Rights load check record code 0103 - RecordFormatRevision = 2

Name	Source	Format	Size	Comment
StandardData			21	
ProductRetailer	IPE	OID16	2	
RFU		RFU	2	RFU
RFU		RFU	1	RFU
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DateTimeStamp	IPE VG	DTS	3	
SAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
Value	IPE VG	VALS	2	
ValueCurrencyCode	IPE VG	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.

CountJourneyLegs	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CumulativeFare	IPE VG	VALI	2	A 1.625 byte value occupying bits 0-7 of the least significant byte and bits 0-4 of the most significant byte. Bits 5-7 of the most significant byte shall be set to 0.
TYP2ValueFlags	IPE VG	BMP	1	A 0.375 byte value, occupying bits 0 to 2, bits 3 to 7 shall be set to 0.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.7 Enable or amend Auto-Top-Up, code 0104.

Some data elements in the 0104 message are intended to hold personal data and, if populating these elements, Product Owners, POST owners and HOPS providers must make relevant provisions to ensure that storage of such data complies with the General Data Protection Regulation (GDPR). These elements are: BankName; BankACNumber; BankCardExpiryDate; BankCardStartDate; and BankCardIssueNumber.

When the Transaction which triggered creation of a Transaction Record of this type occurred as a result of implementing an Actionlist item, then the following elements shall be set to a null value in accordance with clause 2.3.2 of this part: BankName; BankACNumber; BankCardExpiryDate; BankCardStartDate; and BankCardIssueNumber.

Table 15 - Enable or amend Auto-Top-Up, code 0104 - RecordFormatRevision = 2

Name	Source	Format	Size	Comment
StandardData			21	
BankName	POST	ASCII	40	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
BankACNumber	POST	BCDS	16	<p>Element used to transmit either bank a/c number or credit card number</p> <p>Bank A/C number format:</p> <ul style="list-style-type: none"> - Byte 15 (MSB) = 01 - Bytes 14 - 11 = sort code in BCD format - Bytes 10 - 0 = account number in BCD format <p>Credit card number format:</p> <ul style="list-style-type: none"> - Byte 15 (MSB) = 02 - Bytes 14 - 0 = account number in BCD format <p>Null entry:</p> <ul style="list-style-type: none"> - Byte 15 (MSB) = 00 - no bank account details sent in this message instance <p>Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).</p>
BankCardExpiryDate	POST	BCDN	4	<p>Date shall be transmitted as 8 characters in the form ddmmyyyy without delimiters, for example, shall be transmitted as 21042000</p> <p>Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).</p>
BankCardStartDate	POST	BCDN	4	<p>Date shall be transmitted as 8 characters in the form ddmmyyyy without delimiters, for example, shall be transmitted as 21042000</p> <p>Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).</p>
BankCardIssueNumber	POST	BCDN	2	<p>Applies to credit or other bank card.</p> <p>Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).</p>
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the

				most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
ActionSequenceNumber	IPE VG	HEX	1	
ProductRetailer	IPE	OID	2	
ValueCurrencyCode	IPE VG	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TopUpAmount	IPE	VALI	2	The updated value
Threshold	IPE	VALI	2	The updated value
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.8 Disable Auto-Top-Up, Auto-Renew or CTA, code 0105, 0305, 010C.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists. The message type 0305 shall only be used with Ticket Product IPE types which support Auto-Renew of the Ticket.

For the purposes of simplifying HOPS processing, and enabling messages related to the same Transaction to be identified by the receiving HOPS, it is recommended that:

- If the disable Transaction took place as a result of an Actionlist match:
 - The Actionlist match event message should be transmitted first, immediately followed by the 0105 or 0305 message with the next message number in the sequence
- If the IPE EXP data element was modified, then:
 - The Delete IPE message should be transmitted after the 0105 or 0305 message, and
 - The Create IPE message should be transmitted last in the sequence

- All using sequential message numbers

Table 16 - Disable Auto-Top-Up, Auto-Renew or CTA, code 0105, 0305, 010C - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
TransactionSequenceNumber	IPE	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
ActionSequenceNumber	IPE	HEX	1	
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.9 First Use of Stored Travel Rights, code 0106.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Table 17 - First Use of Stored Travel Rights, code 0106 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ProductRetailer	IPE	OID16	2	
Threshold	IPE	VALI	2	
TopUpAmount	IPE	VALI	2	
MaxValue2	IPE	VALI	2	
MaxNegativeAmount	IPE	VALI	2	
DepositAmount	IPE	VALI	2	
StartDateAutoTopUp	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
DepositMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositVATSalesTax	IPE	VAT	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and

				identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.10 Full / partial refund of Stored Travel Rights, code 0108

This message records the amount by which Stored Travel Rights changes as a result of a refund.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Table 18 - Full / partial refund of Stored Travel Rights, code 0108 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
ProductRetailer	IPE	OID16	2	
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
Value	IPE VG	VALS	2	
ValueCurrencyCode	IPE VG	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CountJourneyLegs	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CumulativeFare	IPE VG	VALI	2	A 1.625 byte value occupying bits 0-7 of the least significant byte and bits 0-4 of the most significant byte. Bits 5-7 of the most significant byte shall be set to 0.
TYP2ValueFlags	IPE VG	BMP	1	A 0.375 byte value, occupying bits 0 to 2, bits 3 to 7 shall be set to 0.

IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	elSRN	16	

4.4.11 Refund all Stored Travel Rights, together with any deposit amount and disable the Stored Travel Rights IPE, code 0109.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Table 19 - Refund all Stored Travel Rights, together with any deposit amount and disable the Stored Travel Rights IPE, code 0109 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
ProductRetailer	IPE	OID16	2	
IPEAmount	POST	VALI	2	Value of Stored Travel Rights refund in IPE native currency defined by ValueCurrencyCode
POSTAmount	POST	VALI	2	Value of the Stored Travel Rights refund in POST native currency defined by POSTAmountCurrencyCode
POSTAmountCurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction

				completion, where TS# is stored in the IPE.
DepositAmount	IPE	VALI	2	
DepositCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
Value	IPE	VALS	2	Stored Travel Rights – after transaction, in IPE native currency defined by ValueCurrencyCode
ValueCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.12 CTA TYP 5 Full / Partial Refund for a purchased ticket code 0110

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

The data set used for this message shall be the data set defined in table 21 for a message code 0111.

4.4.13 CTA TYP 5 Usage, Code 0111.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Table 21 - CTA TYP 5 Usage, Code 0111 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
IPEAmount	POST	VALI	2	Value of transaction in the IPE native currency, defined by ValueCurrencyCode
POSTAmount	POST	VALI	2	Value of transaction in the POST native currency, defined by POSTAmountCurrencyCode
POSTAmountCurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
ProductRetailer	IPE	OID16	2	
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
ActionSequenceNumber	IPE VG	HEX	1	
LastResetDate	IPE VG	Date	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ValueCurrencyCode	IPE VG	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TYP5ValueFlags	IPE VG	BMP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CountOfTransactions	IPE VG	HEX	1	
CountOfJourneyLegs	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the

				IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.14 Deleted

Clause 4.4.14 is deleted but the Clause sub section has been left in to retain the sequencing.

4.4.15 Bank Account Details, code 010B

Some data elements in the 010B message are intended to hold personal data and, if populating these elements, Product Owners, POST owners and HOPS providers must make relevant provisions to ensure that storage of such data complies with the General Data Protection Regulation (GDPR). These elements are: BankName; BankACNumber; BankCardExpiryDate; BankCardStartDate; and BankCardIssueNumber.

This message should be used with caution, because the data is not encrypted except within the VPN. It is provided only for completeness, and it is recommended that it is only used in the absence of other methods.

Table 23 - Bank Account Details, code 010B - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
BankName	POST	ASCII	40	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
BankACNumber	POST	BCDS	16	Element used to transmit either bank a/c number or credit card number Bank A/C number format: - Byte 15 (MSB) = 01 - Bytes 14 - 11 = sort code in BCD format - Bytes 10 - 0 = account number in BCD format Credit card number format: - Byte 15 (MSB) = 02 - Bytes 14 - 0 = account number in BCD format Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
BankCardExpiryDate	POST	BCDN	4	Date shall be transmitted as 8 characters in the form ddmmyyyy without delimiters, for example, shall be transmitted as 21042000 Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
BankCardStartDate	POST	BCDN	4	Date shall be transmitted as 8 characters

				in the form ddmmyyyy without delimiters, for example, shall be transmitted as 21042000 Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
BankCardIssueNumber	POST	BCDN	2	Applies to credit or other bank card. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
ProductRetailer	IPE	OID	2	
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.16 Full / partial refund of CTA cumulative amount, code 010D.

This message records the amount by which a CTA cumulative amount changes as a result of a refund.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Table 24 - Full / partial refund of CTA cumulative amount, code 010D - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
IPEAmount	POST	VALI	2	Value of refund in IPE native currency defined by IPECurrencyCode
POSTAmount	POST	VALI	2	Value of the Stored Travel Rights refund in POST native currency defined by POSTAmountCurrencyCode
POSTAmountCurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.

ProductRetailer	IPE	OID16	2	
TransactionSequenceNumber	IPE	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
CumulativeAmount	IPE	VALIS	2	value after transaction
ValueCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.17 CTA TYP 4 usage (travel, Product or service purchase), code 010E

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Table 25 - CTA TYP 4 usage (travel, Product or service purchase), code 010E - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
IPEAmount	POST	VALI	2	Value of transaction in the IPE native currency, defined by ValueCurrencyCode
POSTAmount	POST	VALI	2	Value of transaction in the POST native currency, defined by POSTAmountCurrencyCode
POSTAmountCurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.

ProductRetailer	IPE	OID16	2	
TransactionType	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
ActionSequenceNumber	IPE	HEX	1	
CumulativeAmount	IPE	VALI	2	Value following transaction
ValueCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CountJourneyLegs	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CumulativeFare	IPE	VALI	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
TYP4ValueFlags	IPE	BMP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.18 CTA TYP 4, TYP 5, Value Adjustment, Code, 010F, 0112

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Table 26 - TYP 4, TYP 5, Value Adjustment, Code, 010F, 0112 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
IPEAmount	POST	VALI	2	Value of transaction in the IPE native currency, defined by ValueCurrencyCode
POSTAmount	POST	VALI	2	Value of transaction in the POST native currency, defined by POSTAmountCurrencyCode
POSTAmountCurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
ProductRetailer	IPE	OID16	2	
TransactionType	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
ActionSequenceNumber	IPE	HEX	1	
CumulativeAmount	IPE	VALI	2	Value following transaction applies to TYP 4 only, for TYP 5, this value shall be set to 0.
IPE_ IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_ SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data

				from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.19 Create or Amend Stored Travel Rights, codes 0120, 0121.

Note that if any value is loaded when the IPE is created then this shall be recorded using an additional Stored Travel Rights load message.

It is not mandatory to send a 0121 message in parallel with a specific change message, if the 0121 message does not convey any additional information (i.e. the contents of the additional data items sent in the 0121 message are unchanged), and if both messages would have been sent to the same destination(s). However, optionally 0121 messages can be sent under these conditions.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Table 27 - Create or Amend Stored Travel Rights, codes 0120, 0121 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
IPEExpiryDate	Shell	DATE	2	A copy of the relevant EXP directory data element relevant to this IPE.
IPELength	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEBitMap	IPE	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEFormatRevision	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
RemoveDate	IPE	RDATE	1	
ProductRetailer	IPE	OID16	2	
TYP2Flags	IPE	BMP	1	
Threshold	IPE	VALI	2	
TopUpAmount	IPE	VALI	2	
MaxValue2	IPE	VALI	2	
MaximumNegativeAmount	IPE	VALI	2	
DepositAmount	IPE	VALI	2	
StartDateAutoTopUp	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most

				significant byte shall be set to 0.
DepositMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositVATSalesTax	IPE	VAT	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
VGLength	IPE VG	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	IPE VG	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGFormatRevision	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
Value	IPE VG	VALS	2	
ValueCurrencyCode	IPE VG	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CountJourneyLegs	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CumulativeFare	IPE VG	VALI	2	A 1.625 byte value occupying bits 0-7 of the least significant byte and bits 0-4 of the most significant byte. Bits 5-7 of the most significant byte shall be set to 0.
TYP2ValueFlags	IPE VG	BMP	1	A 0.375 byte value, occupying bits 0 to 2, bits 3 to 7 shall be set to 0.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance

				identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberNonEncrypted	Shell	uISRN	16	Not encrypted. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR). In a code 0121 message, this element shall be set to zero (0)
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.20 Create or Amend CTA IPE TYP 4, codes 0122, 0123

Note that this message shall only be used for amendments not covered by other transaction type specific messages defined elsewhere herein.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Table 28 - Create or Amend CTA IPE TYP 4, codes 0122, 0123 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
IPEExpiryDate	Shell	DATE	2	A copy of the relevant EXP directory data element relevant to this IPE.
IPELength	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEBitMap	IPE	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEFormatRevision	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
RemoveDate	IPE	RDATE	1	
ProductRetailer	IPE	OID	2	
TYP4Flags	IPE	BMP	1	
MaxValue4	IPE	VALI	2	

DepositAmount	IPE	VALI	2	
StartDateCTA	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
EndDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
DepositMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositVATSalesTax	IPE	VAT	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
VGLength	IPE VG	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	IPE VG	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGFormatRevision	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
CumulativeAmount	IPE VG	VALI	2	
ValueCurrencyCode	IPE VG	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CountJourneyLegs	IPE VG	HEX	1	
CumulativeFare	IPE VG	VALI	2	
TYP4ValueFlags	IPE VG	BMP	1	
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE

				instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberNonEncrypted	Shell	uISRN	16	Not encrypted. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR). In a code 0123 message, this element shall be set to zero (0)
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.21 Create or Amend CTA IPE TYP 5, Code 0124, 0125.

Note that this message shall only be used for amendments not covered by other Transaction type specific messages defined elsewhere herein.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Table 29 - Create or Amend CTA IPE TYP 5, Code 0124, 0125 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
IPEExpiryDate	Shell	DATE	2	A copy of the relevant EXP directory data element relevant to this IPE
IPELength	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEBitMap	IPE	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEFormatRevision	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
RemoveDate	IPE	RDATE	1	
ProductRetailer	IPE	OID16	2	
TYP5Flags	IPE	BMP	1	
WeeksPerPeriod	IPE	HEX	1	
QuantityTransactions	IPE	HEX	1	

MaxValue5	IPE	VALI	2	
DepositAmount	IPE	VALI	2	
StartDateCTA	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
EndDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
DepositMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositVATSalesTax	IPE	VAT	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
VGLength	IPE VG	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	IPE VG	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGFormatRevision	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
CountOfTransactions	IPE VG	HEX	1	
LastResetDate	IPE VG	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte

				shall be set to 0.
ValueCurrencyCode	IPE VG	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TYP5ValueFlags	IPE VG	BMP	1	
CountJourneyLegs	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_ SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberNonEncrypted	Shell	uISRN	16	Not encrypted. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR). In a code 0125 message, this element shall be set to zero (0)
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.22 Create or Amend ITSO ID IPE or Entitlement IPE, code 0200, 0201

This record shall be used for both ID TYP 16 and Entitlement TYP 14. All data elements shall be included. Where no data is available for a specific message element then that element shall contain zero, excepting that any message element of format LOC1, LOC2, LOC3 or LOC4 shall not be set to zero, but shall contain a NULL location definition in the form of LocDefType 255, and with the minimum permissible structure length.

For a creation transaction, all elements appropriate to the IPE type shall be completed. For an amendment, only those elements for which data is available need be completed, other elements shall contain zero if the element is of a numeric type, or 20h (space) if the element is an of ASCII type.

Some data elements in the 0200 and 0201 are intended to hold personal data and, if populating these elements, Product Owners, POST owners and HOPS providers must make relevant provisions to ensure that storage of such data complies with the General Data Protection Regulation (GDPR). For the purposes of data protection Product Owners may choose not to populate these elements, in which case they shall be handled according to clause 2.3.2. In these circumstances, the Product Owner must make their own arrangements to recover the affected data (if it is required to be sent to the back office). The affected elements are as follows: HolderTitle; HolderSurname;

HolderOtherNames; HolderAddress1; HolderAddress2; HolderAddress3; HolderAddress4; HolderPostcode; HolderPhoneDay; HolderPhoneHome; HolderPhoneMobile; HolderEmail; DateOfBirth; Forename; Surname.

It is not mandatory to send a 0201 message in parallel with a specific change message (e.g. a 0303 deposit refund message), if the 0201 message does not convey any additional information (i.e. the contents of the additional data items sent in the 0201 message are unchanged), and if both messages would have been sent to the same destination(s).

However, optionally 0201 messages can be sent under these conditions.

The use of RecordFormatRevision = 3 is mandated and in this version of the Specification. Format Revision 2 is deprecated and will be removed from the next version of the Specification.

Table 30 - Create or Amend ITSO ID IPE or Entitlement IPE, code 0200, 0201 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
Amount	POST	VALI	2	Amount of any remittance by the Customer Media holder, excluding a deposit.
AmountCurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
HolderTitle	POST	ASCII	4	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderSurname	POST	ASCII	20	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderOtherNames	POST	ASCII	30	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderAddress1	POST	ASCII	30	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderAddress2	POST	ASCII	30	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).

HolderAddress3	POST	ASCII	30	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderAddress4	POST	ASCII	30	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderPostcode	POST	ASCII	10	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderPhoneDay	POST	ASCII	20	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderPhoneHome	POST	ASCII	20	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderPhoneMobile	POST	ASCII	20	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderEmail	POST	ASCII	40	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
IPE-TYP	POST	TYP	1	This element shall indicate the TYP of IPE to which a message instance refers, and also indicates the type of optional data which may be found within a message instance. In this instance it shall be used to identify whether the IPE is of TYP 14 or TYP 16.

IPEExpiryDate	Shell	DATE	2	A copy of the relevant EXP directory data element relevant to this IPE.
IPELength	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEBitMap	IPE	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEFormatRevision	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
RemoveDate	IPE	RDATE	1	
CPICC	IPE	HEX	2	
IDFlags	IPE	BMP	1	
RoundingFlagsEnable	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
PassbackTime	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
DateOfBirth	IPE	DOB	4	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
Language	IPE	HEX	1	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderID	IPE	HEX	4	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
RoundingFlag	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
RoundingValueFlag	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
EntitlementExpiryDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
DepositMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.

DepositVATSalesTax	IPE	VAT	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
ShellDepositMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
ShellDepositVATSalesTax	IPE	VAT	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DepositCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
ShellDepositCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositAmount	IPE	VALI	2	
ShellDeposit	IPE	VALI	2	
EntitlementCode	IPE	HEX	1	
ConcessionaryClass	IPE	HEX	1	
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberNonEncrypted	Shell	uISRN	16	Not encrypted. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR). In a code 0201 message, this element shall be set to zero (0)
SecondaryHolderID	IPE	HEX	4	Users of this data element shall

				take note of the requirements of the General Data Protection Regulation (GDPR).
ForenameLength	IPE	HEX	1	Length of Forename, in bytes Set to 0. if no Forename stored
Forename	IPE	ASCII	39	A variable length element, actual length is determined by ForenameLength. Length may exceed 39, but combined length of Forename plus Surname shall not exceed 78 bytes. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
SurnameLength	IPE	HEX	1	Length of Surname, in bytes Set to 0. if no Surname stored
Surname	IPE	ASCII	39	A variable length element, actual length is determined by SurnameLength. Length may exceed 39, but combined length of Forename plus Surname shall not exceed 78 bytes. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HalfDayOfWeek	IPE	BMP	2	
ValidAtOrFrom	IPE	LOC1	Variable, maximum 17	Variable length element
ValidTo	IPE	LOC1	Variable, maximum 17	Variable length element
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

IDFlag definitions

These shall be as defined for the ITSO ID IPE, TYP = 16 and entitlement IPE TYP 14.

4.4.23 Code 0202, RFU.

This message code is RFU.

4.4.24 Loyalty add points, Loyalty redemption, Loyalty transaction reversal, codes 0203, 0204, 0205.

This record covers both types of loyalty, as defined in specification ITSO TS 1000-4.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Table 33 - Loyalty add points, Loyalty redemption, Loyalty transaction reversal, codes 0203, 0204, 0205 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
IPE-TYP	POST	TYP	1	This element shall indicate the TYP of IPE to which a message instance refers, and also indicates the type of optional data which may be found within a message instance. In this instance it shall be used to identify whether the IPE is of TYP 3 or TYP 17.
POSTDefinedData	POST	UD	4	User defined element (note that this does not relate to any IPE element)
TransactionAmountOfPoints	POST	HEX	2	Points added, redeemed, or restored as appropriate to the transaction type
ProductRetailer	IPE	OID16	2	
TransactionSequenceNumber	IPE	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
TransactionType	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
LoyaltyPoints	IPE	HEX	3	Value after transaction Applies to loyalty type 1 (TYP 3 IPE) only for type 2 loyalty programs this value shall be set to 0.
UserDefined	IPE	UD	2	Applies to loyalty type 1 (TYP 3 IPE) only for type 2 loyalty programs this value shall be set to 0.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to

				create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.25 Create Loyalty IPE, First Use of loyalty scheme, code 020B, 0206

This record covers both types of loyalty, as defined in specification ITSO TS 1000-4.

When a 0206 message is created, use of the HolderTitle; HolderName; HolderAddress; HolderPostcode; HolderPhoneDay; HolderPhoneHome; and HolderEmail elements is optional. When not used they shall be populated with ASCII spaces in accordance with clause 2.3.2.

Table 34 - Create Loyalty IPE, First Use of loyalty scheme, code 020B, 0206 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
HolderTitle	POST	ASCII	4	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR)
HolderName	POST	ASCII	50	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR)
HolderAddress	POST	ASCII	100	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR)
HolderPostcode	POST	ASCII	8	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR)
HolderPhoneDay	POST	ASCII	20	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR)
HolderPhoneHome	POST	ASCII	20	Users of this data element shall take note of the requirements of the General Data Protection

				Regulation (GDPR)
HolderEmail	POST	ASCII	40	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR)
IPE-TYP	POST	TYP	1	This element shall indicate the TYP of IPE to which a message instance refers, and also indicates the type of optional data which may be found within a message instance. In this instance it will be used to identify whether the IPE is of TYP 3 or TYP 17.
IPEExpiryDate	Shell	DATE	2	A copy of the relevant EXP directory data element relevant to this IPE.
IPELength	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEBitMap	IPE	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEFormatRevision	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
RemoveDate	IPE	RDATE	1	
ProductRetailer	IPE	OID16	2	
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberNonEncrypted	Shell	uISRN	16	Not encrypted. Users of this data element shall take note of the requirements of the General Data

				Protection Regulation (GDPR). In a code 0206 message, this element shall be set to zero (0)
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.26 Create or Amend Ticket IPE, code 0207, 0208

This records the creation or amendment of a ticket IPE. If a simultaneous journey is made a journey record shall also be transmitted.

The actual Data is dependent upon the type of IPE being created or amended. For efficiency, the record is split into common data (common to all IPEs), IPE TYP specific data and a footer.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

It is not mandatory to send a 0208 message in parallel with a specific change message (e.g. a 0303 deposit refund message), if the 0208 message does not convey any additional information (i.e. the contents of the additional data items sent in the 0208 message are unchanged), and if both messages would have been sent to the same destination(s).

However, optionally 0208 messages can be sent under these conditions.

4.4.26.1 Record Structure.

The record shall always be structured in the following manner, in the sequence shown.

Table 35 - Create or Amend Ticket IPE, code 0207, 0208, Record Structure - RecordFormatRevision = 2.

Data Group	Comment
Common data	Always required
Optional data	Present according to IPE type involved, as defined by TYP and the IPEBitMap. These optional data groups shall be included in the record in the same order as they occur in this specification.
Footer	Always required

4.4.26.2 Common Data.

Table 36 - Common Data - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
IPE-TYP	POST	TYP	1	This element shall indicate the TYP of IPE to which a message instance refers, and also indicates the type of optional data which may be found within a message instance.
NormalPrice	POST	VALI	2	Full price for ticket (if any), currency is defined by CurrencyCode

CurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
MachineNumber	POST	HEX	4	Serial number of the terminal conducting the transaction
TransactionFlags	POST	HEX	1	
MessageBitMap	DIR & POST	BMP	1	Bit 0 shall be a copy of the Value Group Present flag from the directory. This indicates whether a value group is present in an IPE instance, and therefore also present in a message instance. Bit 1 shall be set to one (1) when the ID_IPEID, ID_ISAMID and ID_ISAMSeq# data elements are included in the record. Bits 2 – 7 are RFU.
ITSOShellReferenceNumberNonEncrypted	Shell	uISRN	16	Not encrypted. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR). In a code 0208 message, this element shall be set to zero (0)
IPEExpiryDate	Shell	DATE	2	A copy of the relevant EXP directory data element relevant to this IPE.
IPELength	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEBitMap	IPE	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0. For TYP 27, 28, 29 IPEs the contents of this element shall have no effect on the contents of a Transaction Record instance, i.e. all elements shall be included in the Transaction Record. For TYP 22-26 IPEs this element shall be used to determine which optional data elements are included in a Transaction Record instance, i.e. optional elements are only included in the Transaction Record if they are also included in the IPE instance. Refer to ITSO TS 1000-5 for the definition of IPEBitMap and optional elements.
IPEFormatRevision	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
RemoveDate	IPE	RDATE	1	
ProductRetailer	IPE	OID16	2	
ID_IPEID	IPE	IPEIDM	7	Identifies an identity IPE.

				Include this element only if MessageBitMap bit 1 is set to one (1). IPE instance identity details for an ID IPE contained in the same ITSO Shell as the IPE that is the subject of this message. May be sent for the purpose of enabling identification of the card holder in circumstances where the ISRN is not known due to its being encrypted.
ID_ISAMID	IPE	HEX	4	Identifies an identity IPE. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here. Include this element only if MessageBitMap bit 1 is set to one (1)
ID_ISAMSeq#	IPE	HEX	3	Identifies an identity IPE. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here. Include this element only if MessageBitMap bit 1 is set to one (1)

Figure 1: Table37 - TransactionFlags Definition - RecordFormatRevision = 2.

A combination of flags shall be set where appropriate so to do. Note that an attended POST is one where the POST is operated by a member of staff, whilst an unattended POST is one where the POST is essentially operated by the card holder.

Flag ID	Flag name	Flag purpose
0	AutoTransaction	Set to one (1) when the relevant transaction took place automatically due to auto-renew, otherwise set to zero (0). Note that the use of flags 0, 1 and 2 is mutually exclusive. Only one of flags 0, 1 and 2 shall be set for every transaction.
1	ActionListTransaction	Set to one (1) when the relevant transaction took place due to an Actionlist item, otherwise set to zero (0). Note that the use of flags 0, 1 and 2 is mutually exclusive. Only one of flags 0, 1 and 2 shall be set for every transaction.
2	StoredTicketActivation	Set to one (1) when the relevant transaction took place due to Stored Ticket activation, otherwise set to zero (0). Note that the use of flags 0, 1 and 2 is mutually exclusive. Only one of flags 0, 1 and 2 shall be set for every transaction.

3	ManualPostTransaction	Set to one (1) when the relevant transaction took place at an attended POST, e.g. a ticket office machine or bus ticket machine, otherwise set to zero (0). Note that the use of flags 3, 4 and 5 is mutually exclusive. Only one of flags 3, 4 and 5 shall be set for every transaction.
4	UnattendedPostTransaction	Set to one (1) when the relevant transaction took place at an unattended POST, e.g. a ticket vending machine, otherwise set to zero (0). Note that the use of flags 3, 4 and 5 is mutually exclusive. Only one of flags 3, 4 and 5 shall be set for every transaction.
5	RemotePostTransaction	Set to one (1) when the relevant transaction took place with a remote POST, e.g. CM holder not present, otherwise set to zero (0). Note that the use of flags 3, 4 and 5 is mutually exclusive. Only one of flags 3, 4 and 5 shall be set for every transaction.
6	RFU	
7	RFU	

Note:

In instances where the relevant transaction has taken place and it is deemed appropriate to set the bit value to one (1), the values for bits 0, 1 and 2 shall be mutually exclusive. However, there may be instances where setting the bit

value of 0, 1 or 2 to one (1) is not appropriate (i.e. for a direct fulfilment) and in such instances it may be deemed appropriate to set bits 0, 1 and 2 all to a value of zero (0).

4.4.26.3 Footer.**Table 38 - Footer - RecordFormatRevision = 2.**

Name	Source	Format	Size	Comment
IIN	IPE	IIN	3	IIN shall always be included in the Transaction Record, where necessary it contents shall be deduced from the ITSO Shell Owner Identity.
KID	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification. This value shall be taken from the IPE

				data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.26.4 IPE TYP 22.

Table 39 - IPE TYP 22 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
ProductRetailer	IPE	OID	2	
TYP22Flags	IPE	BMP	2	
PassBackTime	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ExpiryTime	IPE	TIME	2	A 1.375 byte value, occupying bits 0-7 of the least significant byte, and bits 0-2 of the most significant byte. Bits 3-7 of the most significant byte shall be set to 0.
AutoRenewQuantity1	IPE	BIN	1	
Class	IPE	UD	1	
ValidityStartDTS	IPE	DTS	3	
PromotionCode	IPE	HEX	1	
ValidOnDayCode	IPE	DOW	1	
PartySizeAdult	IPE	HEX	1	
PartySizeChild	IPE	HEX	1	
PartySizeConcession	IPE	HEX	1	
AmountPaidCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaid	IPE	VALI	2	
AmountPaidMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaidVATSalesTax	IPE	VATM	2	

CPICC	IPE	HEX	2	
ValidAtOrFrom	IPE	LOC1	Variable, maximum 17	
ValidTo	IPE	LOC1	Variable, maximum 17	
PassDuration	IPE	HEX	1	

Flag definitions are as defined for the relevant IPEs.

Table 40 - IPE TYP 22, Value Group - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
VGLength	IPE VG	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	IPE VG	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGFormatRevision	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
NumberRemainingPasses	IPE VG	BIN	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
TYP22ValueFlags	IPE VG	BMP	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0.
ExpiryDateSP	IPE VG	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ExpiryDateCurrent	IPE VG	DATE	2	

4.4.26.5 IPE TYP 23.**Table 41 - IPE TYP 23 - RecordFormatRevision = 2.**

Name	Source	Format	Size	Comment
ProductRetailer	IPE	OID	2	
TYP23Flags	IPE	BMP	1	
PassBackTime	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ExpiryTime	IPE	TIME	2	A 1.375 byte value, occupying bits 0-7 of the least significant byte, and bits 0-2 of the most significant byte. Bits 3-7 of the most significant byte shall be set to 0.
Class	IPE	UD	1	
PartySizeAdult	IPE	HEX	1	
PartySizeChild	IPE	HEX	1	
PartySizeConcession	IPE	HEX	1	
AmountPaidCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaid	IPE	VALI	2	
AmountPaidMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaidVATSalesTax	IPE	VATM	2	
PhotocardNumber	IPE	UD	4	
PromotionCode	IPE	HEX	1	
CPICC	IPE	HEX	2	
TYP23Mode	IPE	BMP	1	
MaxTransfers	IPE	HEX	1	
TimeLimit	IPE	HEX	1	
ValueOfRideJourney	IPE	VALI	2	
ValueOfRideJourneyCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.

Origin1	IPE	LOC1	Variable, maximum 17	
Destination1	IPE	LOC1	Variable, maximum 17	

Flag definitions are as defined for the relevant IPEs.

Table 42 - IPE TYP 23 Value Group - RecordFormatRevision = 2

Name	Source	Format	Size	Comment
VGLength	IPE VG	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	IPE VG	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGFormatRevision	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
CountRemainingRidesJourneys	IPE VG	HEX	1	
CountTransfers	IPE VG	HEX	1	
TYP23ValueFlags	IPE VG	BMP	1	

4.4.26.6 IPE TYP 24

In this version of the specification, transmission of 0207 and 0208 messages relating to TYP 24 IPEs is not permitted at Record Format Revision 2.

4.4.26.7 IPE TYP 25**Table 49 - IPE TYP 25 - RecordFormatRevision = 2.**

Name	Source	Format	Size	Comment
ProductRetailer	IPE	OID16	2	
TYP25Flags	IPE	BMP	1	
PassBackTime	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ValidityStartDTS	IPE	DTS	3	
ExpiryTime	IPE	TIME	2	A 1.375 byte value, occupying bits 0-7 of the least significant byte, and bits 0-2 of the most significant byte. Bits 3-7 of the most significant byte shall be set to 0.
ServiceID	IPE	UD	1	
MaxValue25	IPE	VALI	2	
MaxValueCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaidCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaid	IPE	VALI	2	
AmountPaidMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaidVATSalesTax	IPE	VATM	2	
UserDefined	IPE	UD	1	
AutoRenewQuantity2	IPE	HEX	1	

Table 50 - IPE TYP 25 Value Group - RecordFormatRevision = 2

Name	Source	Format	Size	Comment
VGLength	IPE VG	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	IPE VG	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGFormatRevision	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.

TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
CountUsesAvailable	IPE VG	HEX	1	
TYP25ValueFlags	IPE VG	BMP	1	

4.4.26.8 IPE TYP 26

Table 51 - IPE TYP 26 - RecordFormatRevision = 2

Name	Source	Format	Size	Comment
ProductRetailer	IPE	OID16	2	
PassBackTime	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
TYP26Flags	IPE	BMP	1	
TYP26Class	IPE	UD	1	
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ValidityStartDTS	IPE	DTS	3	
UserDefined	IPE	UD	7	
AutoRenewQuantity3	IPE	HEX	1	

Table 52 - IPE TYP 26 Value Group - RecordFormatRevision = 2

Name	Source	Format	Size	Comment
VGLength	IPE VG	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	IPE VG	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGFormatRevision	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.

TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
CountRemainingRidesJourneys	IPE VG	HEX	1	
TYP26ValueFlags	IPE VG	BMP	1	

4.4.26.9 IPE TYP 27, 28, 29

Table 53 - IPE TYP 27, IPEFormatRevision = 1, - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
Sterling/Euro	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
Child	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
PassbackTime	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AmountPaidMethod OfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AmountPaid	IPE	VALI	2	
TYP27PassFlags	IPE	BMP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
GeoValidity/AreaValidity	IPE	LOC4/ LOC3	13	The 4 most significant bits of this element shall be set to 0, with the data commencing from the 5 bit of the element. The least significant 4 bytes of this element shall be set to 0 when it contains AreaValidity
Event1	IPE	HEX	1	
Event2	IPE	HEX	1	
LastUseDTS	IPE	DTS	3	

PhotocardNumber	IPE	HEX	3	
TYP27ExpiryDate	IPE	HEX	1	
Seq#	IPE	HEX	1	Set to all 0's if this element is not present in the IPE

[Editor's Note Table 54 deleted]

Table 55 - IPE TYP 28, IPEFormatRevision = 1, - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
Sterling/Euro	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
PassbackTime	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AmountPaidMethod OfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AmountPaid	IPE	VALI	2	
TYP28PassFlags	IPE	BMP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AreaValidity	IPE	LOC3	9	The 4 most significant bits of this element shall be set to 0, with the data commencing from the 5 bit of the element.
LastUseDTS	IPE	DTS	3	
ExpiryTick1	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
ExpiryTick2	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
ExpiryTick3	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
ExpiryTick4	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
ExpiryTick5	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
ExpiryTick6	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
NDoIE	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
NDoEE	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
Seq#	IPE	HEX	1	Set to all 0's if this element is not present in the IPE.

[Editor's Note Table 56 deleted]

Table 57 - IPE TYP 29, IPEFormatRevision = 1, - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
Sterling/Euro	IPE	FLAG	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
Ticket/Coupon	IPE	FLAG	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
ScalingFactor	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AmountPaidMethod OfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AmountPaid	IPE	VALI	2	
TYP29PassFlags	IPE	BMP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AreaValidity	IPE	LOC3	9	The 4 most significant bits of this element shall be set to 0, with the data commencing from the 5 bit of the element.
TYP29UsageRecCode	IPE	HEX	1	A 0.375 byte value, occupying bits 0-2 of the element. Bits 3-7 shall be set to 0.
QtyRemaining	IPE	HEX	2	A 1.625 byte value, occupying bits 0-12 of the element. Bits 13-15 shall be set to 0.
UsageRecord	IPE	HEX	4	
ScaledQtyBackup	IPE	BMP	4	
Seq#	IPE	HEX	1	Set to all 0's if this element is not present in the IPE.

Table 58 - IPE TYP 29, IPEFormatRevision = 2, - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
Sterling/Euro	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
PassbackTime	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.

MaxDailyJourneys	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
MaxTransfers	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
ScalingFactor	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
TYP29PassFlags	IPE	BMP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AreaValidity	IPE	LOC3	9	The 4 most significant bits of this element shall be set to 0, with the data commencing from the 5 bit of the element.
JnyComDTS	IPE	DTS	3	
QtyRemaining	IPE	HEX	1	
TransferCounter	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
DailyJnyCounter	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
LastUseDTS	IPE	DTS	3	
ScaledQtyBackup	IPE	BMP	4	
Seq#	IPE	HEX	1	Set to all 0's if this element is not present in the IPE

4.4.27 Journey Record, code 0209.

This record shall be used to record all Journeys made using an ITSO Customer Media. For the avoidance of doubt this includes (but is not necessarily limited to):

- Journeys when a Ticket IPE is used
- Journeys when a Transient Ticket record is created (in addition to a 0210 record)
- Where more than one Transient Ticket is created in the course of a Journey it is only mandatory to create one 0209 message for that Journey
 - Closed System entry and exit transactions
 - The 0209 message shall be sent for either the entry or the exit transaction so as to record the Journey, and optionally may be sent for both transactions
 - Usage of STR or CTA to purchase a ticket
 - Usage of a voucher or open system toll IPE and
 - Free concessionary Journeys authorised solely by the ITSO ID/Entitlement IPEs, TYPs 14 and 16

This record may also be used to record other types of Transaction, at the discretion of the relevant Licensed Member.

The 0209 message should refer to the primary authorisation for that journey, which could be:

- a Ticket IPE used to authorise a Journey; or
- a concessionary entitlement used to authorise a free or discounted Journey; or

- a STR or CTA IPE, BUT ONLY if STR (or CTA) was used to pay for the Journey AND an IPE was neither used to authorise the Journey nor was an IPE created.

Data from this primary IPE shall be used in the 0209 message where the source is indicated to be "IPE".

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Where the primary IPE does not include a value group then the Transaction sequence number shall be set to 0. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Table 59 - Journey Record, code 0209 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
AmountPaid	POST	VALI	2	Actual fare/price paid for journey (if any). Do not insert any value here if an amount value is entered in a simultaneous ticket creation or amendment record. Currency is defined by CurrencyCode.
NormalPrice	POST	VALI	2	Full fare/price for journey. Do not insert any value here if an amount value is entered in a simultaneous ticket creation or amendment record. Currency is defined by CurrencyCode.
CurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
Location	POST	LOC2	7	Location at which the journey commenced or location at which the event recorded herein occurred.
Destination	POST	LOC2	7	Destination or proposed destination where known.
ConcessionaryAuthority	POST	HEX	2	Identity of the concessionary authority within whose area the journey commenced, obtained from the POST configuration data where this information may be stored for this purpose. Where no concessionary authority ID data is stored in this data element then it shall be set to 0. This is a number that is unique to a given Travel Concession Authority. These numbers are allocated by the appropriate National Concessionary Travel Authority for the country in which the boarding point is located. The maximum value is 65535. This value might be an OID.
ProductRetailer	IPE	OID16	2	

TransactionSequenceNumber	IPE	TS#	2	<p>A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.</p> <p>The current value of TS# after transaction completion, where TS# is stored in the IPE.</p> <p>Where the IPE does not include a value group then set this element to a value of 0.</p>
RemainingUses	IPE	HEX	1	<p>If a multi-use IPE (i.e. multi-ride, journey ticket or multi-use voucher) then record the remaining number of uses after the transaction.</p> <p>This data will be extracted from the TYP 22 NumberRemainingPasses, TYP 23 or TYP 26 CountRemainingRidesJourneys, TYP 24 CountRemainingJourneys, or TYP 25 CountUsesAvailable, or TYP 29 QtyRemaining, IPE element, depending on the IPE used for the transaction.</p> <p>If the IPE element is smaller than 1 byte, then it shall occupy the least significant bits of this element.</p> <p>If the IPE does not include this data, then set this element to a value of 0.</p> <p>If the value of the data element in the IPE is greater than or equal to 255, then set this element to 255, or if the IPE value is less than 255 then set this element to that value.</p>
CPICC	IPE	HEX	2	<p>A copy of the IPE data element of the same name.</p> <p>If the IPE does not include this data, then set this element to a value of 0.</p>
TransactionType	IPE POST	HEX	1	<p>If a TransactionType code has been recorded in either the transient ticket log or in the IPE value record, then that value shall be recorded here.</p> <p>Otherwise, where no TransactionType code has been stored in an IPE or a transient Ticket relevant to the Journey Record, use an appropriate code according to [EN1545-1] EventTypeCode. As 8 bit codes can be stored here [whereas only 4 bit codes are permissible in IPEs] then if a more appropriate code, greater than 15, is available in the [EN1545-1] EventTypeCode list; that EventTypeCode value may be used here.</p>

				Further guidance may be found in ITSO DG0007.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAMS#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.28 Journey Record, code 0210.

This record shall be used to record journeys made, entry and exit transactions, where a transient ticket record is recorded.

4.4.28.1 Journey Record, code 0210 – RecordFormatRevision = 2

This version of the Journey record is used to record Transient Ticket records created according to TTFormatRevision 1.

Table 60 - Journey Record, code 0210 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
TTLength	TTR	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
TTBitMap1	TTR	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
TTFormatRevision	TTR	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TTBitMap2	TTR	BMP	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set

				to 0. This element shall be used to determine which optional data elements are included in a Transaction Record instance. Refer to ITSO TS 1000-5 for the definition of TTRBitMap2 and optional elements.
TTRTransactionType	TTR	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DateTimeStamp	TTR	DTS	3	
AmountPaidMethodOfPayment	TTR	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaidCurrencyCode	TTR	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaid	TTR	VALI	2	
NoFareCharged	TTR	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
AmountPaidVATSalesTax	TTR	VATM	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DestinationTT	TTR	LOC2	7	
IPEPointer	TTR	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
OriginLocation	TTR	LOC2	7	
RoutingCode	TTR	LOC2	7	
IIN	TTR	IIN	3	
UserDefinedSize	POST	HEX	1	The size of the UserDefined element in bytes.
UserDefined	TTR	UD	Variable	
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. See note below. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification See note below. This value shall be taken from the IPE data group instance information, and

				identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

Note: When a ticket has been recorded in the Transient Ticket Record then the IPE_ISAMID and IPE_SAMSequenceNumber elements shall contain a pointer to any entitlement IPE used in the Tickets creation. Where this does not apply then the element may be used to record the identity of any IPE relevant to the transaction, or set to 0 indicating that no IPE is pointed to.

4.4.29 TransactionReversal, code 0300

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

This message type shall be used whenever any of the following Transaction types is reversed:

- Creation or amendment of a Ticket IPE where a 0207 or 0208 message was generated;
- A Transaction which resulted in a 0209 Journey Record message being generated;
- A Transaction where either a IPE TYP 14 or an IPE TYP 16 was used to authorise a Journey; or
- A Transaction where a Transient Ticket was created and stored in the holders CM, and a 0210 message generated.

Note that there is overlap between these various conditions, this is intentional for the avoidance of doubt.

This message type shall not be used in other circumstances (noting that there are additional message types defined for the reversal of other Transaction types).

Table 61 - TransactionReversal, code 0300 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
AmountPaid	POST	VALI	2	Actual fare/price refund amount for ticket (if any), currency is defined by CurrencyCode
NormalPrice	POST	VALI	2	Full fare/price for ticket (if any), currency is defined by CurrencyCode
CurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
StoredUsesRefunded	POST	HEX	1	Number of stored uses of the ticket refunded (if any) Refer to table 61a.
ProductRetailer	IPE	OID16	2	
StoredUses	IPE	HEX	1	Number of stored uses after transaction (if any) Refer to table 61a.

TicketNumber	IPE or POST	UD	6	Operators Ticket number, when available, otherwise set to 0. Shall be obtained from the IPE if IPE is of TYP 24, otherwise obtained from the POST. An IPE element shorter than 6 bytes shall occupy the least significant bytes of this element.
TransactionSequenceNumber	IPE	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

The following table maps the element StoredUses to the appropriate IPE data element. Note that the element StoredUsesRefunded maps indirectly to the same IPE data element as does StoredUses.

Table 61a - StoredUses data element map

IPE TYP	IPE Data element to which StoredUses maps
22	NumberRemainingPasses
23	CountRemainingRidesJourneys
24	CountRemainingJourneys
25	CountUsesAvailable
26	CountRemainingRidesJourneys

4.4.30 Full / Partial refund for a purchased ticket (IPE), code 0301

This message type shall only be used with Ticket Product IPE types. This message is sent in addition to a 0007 message when an IPE is deleted and a refund given.

Table 62 - Full / Partial refund for a purchased ticket (IPE), code 0301 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
ProductRetailer	IPE	OID16	2	
Amount	POST	VALI	2	Amount refunded
AmountCurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TicketNumber	IPE or POST	UD	6	Operators Ticket number, when available, otherwise set to 0. Shall be obtained from the IPE if IPE is of TYP 24, otherwise obtained from the POST. An IPE element shorter than 6 bytes shall occupy the least significant bytes of this element.
ReasonCode	POST	UD	1	
VATSalesTax	POST	VATM	2	
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.

IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	elSRN	16	

4.4.31 Deposit Received or Refunded, code 0302, 0303

This record relates to a deposit received or refunded for an ITSO Shell or an IPE.

When the deposit is for an ITSO Shell, the IPE-ID element of the standard data shall identify the Shell in accordance with the alternate rules for identifying a Shell as defined in table 8 such that IIN and OID are those of the Shell owner, TYP shall be set to 32, and PTYP shall be set to indicate the shell version. It is also permissible, but not preferred, that in these circumstances the IIN and OID are those of the Shell owner, TYP shall be set to 16, and PTYP shall be set to the PTYP of the TYP 16 IPE wherein the deposit amount is stored. Note that in these circumstances this method of identification of the Shell is not optional as it is with other message types. Note also that in these circumstances the IPE_IterationNumber, ProductRetailer, IPE_ISAMID and IPE_SAMSequenceNumber may be set to zero (0).

When the deposit is for an IPE, the standard data shall identify the IPE.

Table 63 - Deposit Received, code 0302 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
DepositType	POST	HEX	1	A value of zero (0) shall not be used. A value of one (1) indicates that the deposit applies to a Shell. A value of two (2) indicates that the deposit applies to an IPE. Values between three (3) and 255 inclusive are RFU.
ProductRetailer	IPE	OID16	2	This data element shall contain a value identifying the product retailer.
DepositAmount	IPE	VALI	2	DepositAmount shall be encoded according to DepositCurrencyCode. This data element shall contain a value relevant to the deposit charged.
DepositCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 4, bits 5 to 7 shall be set to 0. This data element shall contain a value relevant to the deposit charged and recorded in the IPE.

DepositMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This data element shall contain a value relevant to the deposit charged and recorded in the IPE.
DepositVATSalesTax	IPE	VAT	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. This data element shall contain a value relevant to the deposit charged and recorded in the IPE.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

RecordFormatRevision 2 of the 0303 message shall not be used by POSTs, which shall use the RecordFormatRevision 3 of this message. HOPS however shall be capable of processing received 0303 messages to RecordFormatRevision 2.

Table 63a - Deposit Refunded, code 0303 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
DepositType	POST	HEX	1	A value of zero (0) shall not be used. A value of one (1) indicates that the deposit applies to a Shell. A value of two (2) indicates that the deposit applies to an IPE. Values between three (3) and 255 inclusive are RFU.
ProductRetailer	IPE	OID16	2	

DepositAmount	IPE	VALI	2	DepositAmount shall be encoded according to DepositCurrencyCode
DepositCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 4, bits 5 to 7 shall be set to 0.
DepositMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositVATSalesTax	IPE	VAT	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.32 Enable or Amend Auto-Renew, code 0304 - RecordFormatRevision = 2.

This record shall be used when an IPE is created with, or amended to include, Auto-Renew. The message type 0304 shall only be used with Ticket Product IPE types which support Auto-Renew of the Ticket.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Some data elements in the 0304 message are intended to hold personal data and, if populating these elements, Product Owners, POST owners and HOPS providers must make relevant provisions to ensure that storage of such data complies with the General Data Protection Regulation (GDPR). These elements are: BankName; BankACNumber; BankCardExpiryDate; BankCardStartDate; and BankCardIssueNumber.

When the Transaction which triggered creation of a Transaction Record of this type occurred as a result of implementing an Actionlist item, then the following elements shall be set to a null value in accordance with clause 2.3.2 of this part: BankName; BankACNumber; BankCardExpiryDate; BankCardStartDate; and BankCardIssueNumber.

Table 64 - Enable or Amend Auto-Renew, code 0304 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
BankName	POST	ASCII	40	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
BankACNumber	POST	BCDS	16	<p>Element used to transmit either bank a/c number or credit card number</p> <p>Bank A/C number format:</p> <ul style="list-style-type: none"> - Byte 15 (MSB) = 01. - Bytes 14 - 11= sort code in BCD format. - Bytes 10 - 0 = account number in BCD format. <p>Credit card number format:</p> <ul style="list-style-type: none"> - Byte 15 (MSB) = 02. - Bytes 14 - 0 = account number in BCD format. <p>Null entry:</p> <ul style="list-style-type: none"> - byte 15 (MSB) = 00. - no bank account details sent in this message instance. <p>Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).</p>
BankCardExpiryDate	POST	BCDN	4	<p>Applies to credit or other bank card. Date shall be transmitted as 8 characters in the form ddmmyyyy without delimiters, for example, 21/04/00 shall be transmitted as 21042000.</p> <p>Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).</p>
BankCardStartDate	POST	BCDN	4	<p>Applies to credit or other bank card. Date shall be transmitted as 8 characters in the form ddmmyyyy without delimiters, for example, 21/04/00 shall be transmitted as 21042000.</p> <p>Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).</p>
BankCardIssueNumber	POST	BCDN	2	<p>Applies to credit or other bank card.</p> <p>Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).</p>

ProductRetailer	IPE	OID16	2	
TransactionSequenceNumber	IPE	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
Auto-RenewAmount	IPE	HEX	2	Revised value, taken from the TYP 22 AutoRenewQuantity1 element, the TYP 25 AutoRenewQuantity2 element, or the TYP 26 AutoRenewQuantity3 element, as appropriate. This data element is not used in a TYP 23 IPE, and when the message relates to a TYP 23 IPE, this element shall be set to 0.
Auto-RenewThreshold	IPE	HEX	2	Revised value.
Auto-RenewValue	POST	VALI	2	The Monetary value of the Auto-Renew Transaction, where known.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.33 Not used**4.4.34 Hotlist match event, code 0311 - RecordFormatRevision = 2.****4.4.34 Hotlist match event record, code 0311 - RecordFormatRevision = 2**

This message shall be used for reporting Hotlist match events.

When the Hotlist item is related to a Shell, then the IPEID element in the StandardData shall be formatted in accordance with Part 6, Table 8.

All new implementations shall use version 4, or a subsequent version, and this old version (2) should only be used for the purposes of backwards compatibility.

Table 67 - Hotlist match event record, code 0311 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
HotListIdentifier	List	HEX	2	
HotType	List	HEX	1	
HotListOriginator	List	OID16	2	
OriginalHotListIdentifier	List	HEX	2	
0311ActionTaken	POST	HEX	1	
0311CustomerMediaDisposition	POST	HEX	1	
IPEID	IPE	IPEIDM	7	Identifies any IPE blocked. If record relates to a Shell set this element to 0.
CreatingISAMID	IPE	HEX	4	Identifies any IPE blocked. If record relates to a Shell set this element to 0. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
CreatingISAMSeq#	IPE	HEX	3	Identifies any IPE blocked. If record relates to a Shell set this element to 0. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

Table 68 - 0311ActionTaken Code List - RecordFormatRevision = 2.

Code	Action Taken
0	This Code value shall not be used
1	Action successful
2	Action unsuccessful
3-255	RFU

Table 69 - 0311Customer Media Disposition Code List - RecordFormatRevision = 2.

Code	Meaning
0	Unknown
1	Customer Media left with Customer Media holder
2	Customer Media left with Customer Media holder, and name and address recorded
3	Customer Media confiscated
4-255	RFU

4.4.35 Actionlist match event record, code 0312 - RecordFormatRevision = 2

This message shall be used for reporting Actionlist match events.

When the Actionlist item is related to an IPE with a Value Group, then the data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

When the Actionlist item is related to a Shell, then the IPEID element in the StandardData shall be formatted in accordance with Part 6, Table 8.

All new implementations shall use version 4, or a subsequent version, and this old version (2) should only be used for the purposes of backwards compatibility.

Table 70 - Actionlist match event record, code 0312 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
ActionListIdentifier	List	HEX	2	
ActionListOriginator	List	OID16	2	
OriginalActionListIdentifier	List	HEX	2	

0312ActionTaken	POST	HEX	1	
ActionSequenceNumber	IPE	HEX	1	If there is no ActionSequenceNumber to store, because ActionSequenceNumber was not relevant to this match event, then this value shall be set to 0. (See note after Table 71 regarding action unsuccessful cases)
IPEID	IPE	IPEIDM	7	Identifies IPE acted upon. If record relates to a Shell set this element to 0.
CreatingISAMID	IPE	HEX	4	Identifies IPE acted upon. If record relates to a Shell set this element to 0. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
CreatingISAMSeq#	IPE	HEX	3	Identifies IPE acted upon. If record relates to a Shell set this element to 0. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3. Bits 4 to 7 shall be set to zero (0).
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

Table 71 - 0312ActionTaken Code List - RecordFormatRevision = 2.

Code	Action Taken
0	This code value shall not be used
1	Action successful
2	Action unsuccessful - unspecified event match problem
3	Action unsuccessful – POST could not write to the CM
4	Action unsuccessful – POST attempted to write to the CM but could not confirm that the write was successful
5	Action unsuccessful – POST does not have the necessary ISAM permissions
6	Action unsuccessful – Actionlist Sequence Number mismatch, where the Action Sequence Number held in the Actionlist item is greater than the Action Sequence Number held in the IPE.
7-255	RFU

Note that in all cases where the action was unsuccessful, it will be assumed that the copy of action sequence number held in the IPE (in the CM) has not been changed. The value of action sequence number returned in the match event record shall be identical to that contained in the list item. In these circumstances where the action was unsuccessful the HOPS shall not update its copy of ActionSequenceNumber to match the value of that element contained in the match event message.

4.4.36 Exception, Transaction Failed, code 0400.

Record of transactions which fail to complete.

These messages shall also be used to indicate POST health status, as specified in ITSO TS 1000-3.

Table 72 - Exception, code 0400 - RecordFormatRevision = 2

Name	Source	Format	Size	Comment
StandardData			21	
ExceptionType	POST	HEX	1	Exception code defined in Table 73. The most appropriate exception code shall be used to reflect the condition triggering the sending of an 0400 message.
POSTType	POST	UD	2	Code defining terminal type, allows different result codes for different terminal types, depending upon the terminals capabilities
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	If no data is available this element shall be set to 0. Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	if data unavailable this element shall be set to 0 Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

The destinations defined in Table 73 shall be interpreted as the owners of POSTs, Shells and IPEs, and are the minimum required, messages may also be sent to additional destinations. However, code 0400 messages shall only be sent to Shell and IPE owners when to do so would be appropriate and possible, i.e. when the identities of the Shell and IPE owners can be determined and when the content of the message is appropriate to be sent to the

relevant owner. It is recommended that 0400 messages with exception code 21 are only sent to the Shell owner if the ISRN Luhn check digit is correct.

ExceptionType shall be a one byte code defined as follows:

Table 73 - Definition of ExceptionType – RecordFormatRevision = 2

The codes defined in Table 73 may be used in 0311, 0312 and 0400 messages.

Code	Meaning	Destination		
		POST	Shell	IPE
0	This code shall not be used			
1	Customer Media read failure	√		
2	ITSO Shell invalid – shell expired (VUT date)	√	√	
3	ITSO Shell invalid – FVC not supported	√	√	
4	ITSO Shell invalid – KSC not supported	√	√	
5	ITSO Shell invalid – ITSO Directory invalid (both copies where software anti-tear provided)	√	√	
6	ITSO Directory Seal check failed	√	√	
7	Requested transaction failed – POST not permitted	√		
8	Requested IPE creation failed – insufficient ITSO Shell memory space or no free directory entries available	√	√	√
9	Requested IPE creation failed – POST not permitted	√		√
10	No valid IPE	√		
11	IPE requested for transaction unusable and there is no usable alternative IPE	√		√
12	IPE requested for transaction not found	√		√
13	IPE requested for transaction certificate check failed	√		√
14	IPE requested for transaction not acceptable at this POST	√		√
15	IPE requested for transaction invalid – here (geographic check)	√		√
16	IPE requested for transaction invalid – today (for example, date, day type, day of week, including expiry date) check	√		√
17	IPE requested for transaction invalid – at this time (for example, time band, AM/PM check)	√		√
18	IPE requested for transaction invalid – on this service (for example, bus or rail service)	√		√
19	IPE requested for transaction invalid – insufficient funds (Stored Travel Rights)	√		√
20	IPE requested for transaction invalid – no rides/journeys/uses left (for example, stored rides, multiple use IPEs)	√		√
21	Shell CRC (SECRC) is incorrect	√	√	
22	Invalid ISRN found (Luhn check does not match)	√	√	
23	Invalid ISRN found (IIN not accepted)	√	√	
24	Invalid ISRN found (other non-specified ISRN error)	√	√	
25	Unable to determine CMD	√		
26	CM serial number found to be in error (refer to ITSO 1000-10)	√	√	

27	Customer Media does not accept write commands	√	√	
28	Shell format error	√	√	
29	Shell format revision not supported	√	√	
30	IPE format revision not supported	√		√
31	MCRN check digit contains incorrect value	√	√	
32	STR Value exceeds MaxValue2, or TYP 4 CumulativeAmount exceeds MaxValue4, or TYP 5 Transaction value exceeds MaxValue5, or TYP 5 CountOfTransactions exceeds QuantityTransactions prior to the Transaction	√		√
33	Transaction type requires use of STR but there is no valid STR Product present or there are insufficient STR funds available	√		√
34	IPE invalid – all Value Group Seals invalid	√		√
35	No Transaction conducted because the IPE requested for the Transaction was still in its passback period. See note below.	√		√
36	Attempt to create or use an IPE of TYP14 IFR1, but there is no valid TYP 16 IFR1 present in the ITSO shell	√		√
37	Attempt to enable TYP 2 Auto-Top-Up, but there is no valid TYP 16 present in the ITSO shell	√		√
38	Transaction aborted because TYP 2 STR Value would exceed MaxValue2, or TYP 4 CumulativeAmount would exceed MaxValue4, or TYP 5 Transaction value would exceed MaxValue5, or TYP 5 CountOfTransactions would exceed QuantityTransactions if the Transaction were conducted	√		√
39	IPE parameter essential to the Transaction does not contain a valid value	√		√
40	Transaction aborted because TYP 3 LoyaltyPoints would exceed maximum permissible, or would be reduced to a value less than 0	√		√
41	Transaction aborted because TYP 2 Value would be less than MaximumNegativeAmount, or TYP 4 CumulativeAmount or TYP 5 CountOfTransactions would be reduced to less than 0, if the Transaction took place	√		√
42	IPE delete failed, POST not permitted	√		√
43	Attempt to refund deposit failed because refund not allowed	√		√
44	Attempt to enable Auto-Renew failed because there was no valid TYP 16 IPE in the Shell	√		√
45	Transaction aborted because the value of TYP22 NumberRemainingPasses, TYP23 CountRemainingRidesJourneys, TYP24 CountRemainingJourneys, TYP25 CountUsesAvailable, TYP26 CountRemainingRidesJourneys would exceed the maximum permissible (when adding pass/rides/journeys/uses)	√		√
46	Transaction aborted because the proposed transaction value (with a TYP25 IPE) exceeds MaxValue25	√		√
47	Transaction aborted because either: - the remaining IPE life defined by IPE expiry date (EXP) is shorter than the product validity which would be created by the Auto-Renew action; or - an Auto-Top-Up action is triggered within a short time (determined by a POST configuration parameter) of IPE expiry (EXP).	√		√
48	Actionlist triggered Transaction not conducted because either: - the remaining IPE life defined by IPE expiry date (EXP) is shorter than the product validity which would be created by the Actionlist action; or - the POST determines that some other critical problem will arise if the Actionlist item is processed.	√		√
128	Persistent poor Customer Media reading/writing performance detected.	√		

129	Customer Media reader/writer not in service	√		
130	Ticket or Receipt printer not in service	√		
131	Customer Media holder interface (display, traffic light indicators or audible device) not in service	√		
132	Other Unspecified POST problem	√		
133	IPE found in Hotlist and blocked	√		√
134	ITSO shell found in Hotlist and blocked	√	√	
135	Blocked IPE found	√		√
136	Blocked ITSO shell found	√	√	
137	Blocked Customer Media found	√	√	
138	ISAM error	√		
139	ITSO shell found in Hotlist and both Shell and CM blocked	√	√	
140	Hotlist, Actionlist or POST Configuration Data list, processing error, occurring when a POST or a HOPS cannot successfully process a received list (for whatever reason)(see note below)			
141	Match Event Transaction successful. (This code value shall be used only with the 0311 and 0312 messages)	√	√	√
142	The circumstances under which a 0410 or 0810 message is generated apply, and a separate 0410 or 0810 or message has been sent. (This code value shall be used only with the 0311 and 0312 messages)	√	√	√
143	Hotlist or Actionlist match event unsuccessful - unspecified event match problem (which is not covered by one of codes 144 – 147 inclusive)	√	√	√
144	Hotlist or Actionlist match event unsuccessful – POST could not write to the CM	√	√	√
145	Hotlist or Actionlist match event unsuccessful – POST attempted to write to the CM but could not confirm that the write was successful	√	√	√
146	Hotlist or Actionlist match event unsuccessful – POST does not have the necessary ISAM permissions	√	√	√
147	Hotlist or Actionlist match event unsuccessful – Actionlist Sequence Number mismatch, where the Action Sequence Number held in the Actionlist item is greater than the Action Sequence Number held in the IPE.	√	√	√
148	Hotlist or Actionlist processing unsuccessful – HotListIdentifier or ActionListIdentifier and RecordType value mismatch.	√		
149	Remote fulfilment on the ISAM has commenced. Message batch has been created.	√		
150	REMI# has reached MAXI_WARN on IPE creation. Should be created in a new ISAM batch to trigger acknowledgement of the batch created for code 149.	√		
151	Creation limit has been met. Decrementing REMI# would result in a REMI# less than 0. Should be created in a new ISAM batch to trigger acknowledgement of the batch created for code 149. N.B. This creates a failsafe in the process and guards against MAXI_WARN being incorrectly set.	√		
152 – 255	RFU			

Implementation of code 35 in POSTs is optional. When code 35 is implemented, it is recommended that generation of 0400 messages in response to a passback violation be controlled by a configurable parameter stored in the POST. It is further recommended that such messages shall only be generated in response to passback violations

with specific predetermined IPE embodiments, where the list of such IPE embodiments is stored as a configurable parameter table.

Note regarding the use of error code 140:

- The 0400 message with error code 140 shall only be used when the first line HOPS is certified to version 2.1.4 (or earlier) and therefore does not support the use of the new NAK2 codes introduced in this version of the Specification. This error code is only retained for backwards compatibility purposes;
- 0400 error code 140 is deprecated in this version of the Specification and shall be removed from the next version of the Specification.
- 0400 messages containing error code 140 shall be addressed to the originator of the Hotlist, Actionlist or Post Configuration Data List which could not be successfully processed;
- The following data elements shall be set to a value of zero: the IPE ID data elements within the StandardData; IPE_IterationNumber; IPE_ISAMID; and IPE_SAMSequenceNumber.

Note regarding error code 142:

- All new implementations shall use the 0810 message. The 0410 message is deprecated in this version of the Specification and will be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

Note regarding 0400 messages reporting circumstances which do not involve an ITSO Shell, or circumstances where the ITSO Shell Reference Number is not known:

In these circumstances the ITSOShellReferenceNumberEncrypted data element shall be calculated by setting the ISRN parameter in the ISAM IMAC command to a value of zero.

Note regarding error codes 37 & 44:

- These exception type codes will be removed from the version after next of the Specification but references to these exception type codes will be retained for backwards compatibility in the next version of the Specification. Users developing systems to Version 2.1.5 or earlier are recommended to take note of this.

4.4.37 Exception, Transaction with Customer Media apparently successful, but the POST was unable to confirm that this Transaction was successful, code 0410.

This message shall be sent when a Transaction was conducted which involved writing to the CM, but the success of that write could not be verified.

This message is deprecated in this version of the Specification and will be removed from the next version of the Specification. A new message code 0810 replaces this message code – see clauses 9.1.

Table 74 - Exception, code 0410 - RecordFormatRevision = 2

Name	Source	Format	Size	Comment
StandardData			21	
POSTType	POST	UD	2	Code defining terminal type, allows different result codes for different terminal types, depending upon the terminals capabilities
ShellImage	POST	HEX	as req'd	An image of such data as has been read by the POST, from the media, for purposes of the transaction process to which this message relates. The data will be loaded in the following order: Shell environment Data Group Directory (2 copies where present) IPE and value record data groups (as many as were read) Logs (as many as were read)
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. If no data is available this element shall be set to 0. Used to identify the last IPE (if any) which was being written to during the Transaction.
IPE_ISAMID	IPE	ISAM ID	4	If no data is available this element shall be set to 0. Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here. Used to identify the last IPE (if any) which was being written to during the Transaction.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	If data unavailable this element shall be set to 0. Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here. Used to identify the last IPE (if any) which was being written to during the Transaction.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.4.38 Cyclic Log Status Change, code 0313

This message is used to record a change in the status of a cyclic log.

Table 75 - Cyclic Log Status Change, code 0313 - RecordFormatRevision = 2

Name	Source	Format	Size	Comment
StandardData			21	In this instance the IPEID data element shall point to the Shell as defined in clause 4.4.1 Standard Elements.
CyclicLogStatusCode	POST	HEX	1	Refer to Table 76
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

The CyclicLogStatusCode Data Element shall be coded (Table 76) as two nibbles:

- The most significant nibble containing the value of the code
- The least significant nibble containing the value in the interpretation of code column as required

Table 76 - Cyclic Log Status Code List - RecordFormatRevision = 2

Code MS nibble	Code LS nibble	Applies to Log type:	Interpretation of code
1	0	Normal	Log could not be created no room in directory
2	0	Normal	Log could not be created no room on CM
3	n	Normal	Log created with n records
4	n	Normal	Log of n records deleted
5	m	Normal	Log extended and is now m records
6	p	Normal	Log reduced and is now p records
7	0	Normal	Log full with messages marked for retention
8	0	Normal	Log full and could not be extended or used
9	0	Basic	Log could not be created no room in directory
A	0	Basic	Log deleted
B-F	0-F	RFU	

4.4.39 Unblock Shell or Product, code 0314

This message is used to record the unblocking of an ITSO Shell or Product at an attended terminal, e.g. a ticket office machine.

Table 77 - Unblock Shell or Product, code 0314 - RecordFormatRevision = 2

Name	Source	Format	Size	Comment
StandardData			21	
IPEID	IPE	IPEIDM	7	Identifies IPE acted upon Set to 0 only if unblock Transaction applied to an ITSO Shell
CreatingISAMID	IPE	HEX	4	Identifies IPE acted upon Set to 0 only if unblock Transaction applied to an ITSO Shell
CreatingISAMSeq#	IPE	HEX	3	Identifies IPE acted upon Set to 0 only if unblock Transaction applied to an ITSO Shell
IPE_ItterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. Set to 0 only if unblock Transaction applied to an ITSO Shell
ITSOShellReferenceNumberEncrypted	Shell via ISAM	elSRN	16	

4.4.40 Shell or IPE blocking event not arising as an outcome of a Hotlist match event, code 0315 – RecordFormatRevision = 2

Implementation of this message is optional in HOPS and POSTs.

When implemented, this message shall be created and transmitted when a POST blocks a Shell or an IPE, not as an outcome of a Hotlist match event, but as an outcome of a business rule implemented in the POST. Note that the TYP value recorded in the StandardData / IPE ID indicates whether a Shell or an IPE was blocked.

Table 77a - Shell or IPE blocking event not arising as an outcome of a Hotlist match event, code 0315 - RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
0315CustomerMediaDisposition	POST	HEX	1	
0315ReasonCode	POST	UD	1	An optional user defined code defining the reason for the blocking event
CreatingISAMID	IPE	HEX	4	Identifies any IPE blocked. If record relates to a Shell set this element to 0. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used

				here.
CreatingISAMSeq#	IPE	HEX	3	Identifies any IPE blocked. If record relates to a Shell set this element to 0. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

Table 77b – 0315 Customer Media Disposition Code List - RecordFormatRevision = 2.

Code	Meaning
0	Unknown
1	Customer Media left with Customer Media holder
2	Customer Media left with Customer Media holder, and name and address recorded
3	Customer Media confiscated
4-255	RFU

4.5 Transaction Record Data Content – RecordFormatRevision = 3

The data elements shall comprise standard data always returned for each Customer Media transaction, together with transaction type specific data.

Note that in this section:

- clause numbers are chosen to match those in clause 4.4; and
- table numbers are chosen to match those in clause 4.4 and prefixed with the RecordFormatRevision number and a stop;
- therefore neither clause nor table numbers are contiguous.

4.5.1 Standard Elements – RecordFormatRevision = 3.

The following elements shall always be returned as the leading data elements (StandardData) in every transaction record for all types of transaction.

Table 3.8 - Standard Elements - RecordFormatRevision = 3

Name	Source	Format	Size	Comment
RecordFormatRevision	POST	HEX code	1	Defines format revision of this message.
TransactionDateTime	POST	DTS	3	Date & time at which the transaction took place, which shall be identical to any DTS recorded in the shell, IPEs or Transient Ticket store
TransactionInformation	POST	UD	1	User defined element.
StaffID	POST	HEX	4	Identifies the operators member of staff (if any) conducting the transaction. If none then 0 shall be recorded in this element.
SupplementalInformation	POST	HEX	1	Additional information code
FormatVersionCode	Shell	FVC	1	Format version information from the Shell Environment Data Group.
KeyStrategyVersion	Shell	KSC	1	Format version information from the Shell Environment Data Group
KeyVersion	Shell	KVC	1	Format version information from the Shell Environment Data Group
IPEID	Shell, Dir	IPEIDM	7	<p>Identifies the IPE involved in the transaction, taken from the ITSO Shell's directory entry. It is a concatenation of IIN, OID, TYP and PTYP in that order.</p> <p>When a message is used to record an event relating to an ITSO Shell, then this IPEID element shall either:</p> <ul style="list-style-type: none"> be made up of the Shell's IIN, the Shell owner's OID, IPE TYP - which shall be set to a value of 32 (decimal), and IPE PTYP which shall be set to either a Shell owner defined value to indicate the Shell version, or to a value of 0, or be set to 0 to indicate that the message relates to a Shell. <p>(This option shall not be used in new or amended implementations. Note that this option will be removed in a future version of the ITSO Specification.)</p> <p>If no IPE or Shell ID information is available, then the contents of this Data Element shall be set to 0.</p> <p>If the IPE cannot be read and IINL = 1, set the IIN portion of this element to zero (0).</p>
Shell_IterationNumber	Dir	INS#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.

Table 3.9 - Supplemental information element codes - RecordFormatRevision = 3

Code	Meaning
00	No supplemental information stored
01	Test/Maintenance/training transaction
02	Incomplete transaction
03	Commercial In (required for 0209 Journey Records only)
04	Commercial Out (required for 0209 Journey Records only)
05	Minimum Subsidy In (required for 0209 Journey Records only)
06	Minimum Subsidy Out (required for 0209 Journey Records only)
07	Minimum Cost In (required for 0209 Journey Records only)
08	Minimum Cost Out (required for 0209 Journey Records only)
09 – 255	RFU

4.5.2 Create an ITSO shell, code 0001 – RecordFormatRevision = 3

All implementations compliant to this version of the Specification shall use this Format Revision, and the old version (RecordFormatRevision 2) should only be used for the purpose of backwards compatibility.

Table 3.10 - Create or amend an ITSO shell, code 0001, 0002 – RecordFormatRevision = 3

Name	Source	Format	Size	Comment
StandardData			21	
DepositAmount	POST	VALI	2	
DepositCurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositMethodOfPayment	POST	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositVATSalesTax	POST	VATM	2	
MID	Shell	HEX	8	The MID relating to this Shell Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
LEN_Shell_Data_Group	Shell	HEX	1	The number of bytes in the following Shell Environment Data Group

ITSO_Shell_Environment_Data_Group	Shell	HEX	Var	The entire contents of this Shell's ITSO Shell Environment Data Group Dataset or Compact ITSO Shell Environment Dataset. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
LEN_DIR_Data_Group	Shell	HEX	1	The number of bytes in the following Directory Data Group
Directory_Data_Group	Shell	HEX	Var	The entire contents of this Shell's ITSO Directory Data Group.
Media_Reference_Number	Shell	MCRN	10	The Identity number of a host Customer Media (MCRN) relating to the Shell_Reference. Note: This Data Element is not required and shall be set to all 0's if there is no host CM or this number is already present in the ITSO Shell Environment Data Group Dataset.
Anti_Tear_Type	Shell	HEX	1	A single byte coded as follows: 0x01 Software anti-tear is used 0x02 Hardware anti-tear is used 0x03 No anti-tear, OTP areas may be used All other values RFU
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.5.6 Stored Travel Rights travel, Product or service purchase, load (manual, Actionlist and Auto-Top-Up), load check record, TransactionReversal, codes 0100, 0101, 0102, 0103, 0107, RecordFormatRevision = 3.

4.5.6.1 Stored Travel Rights travel, Product or service purchase, load (manual, Actionlist and auto-top up), TransactionReversal, codes 0100, 0101, 0102, 0107.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Implementation of this format revision of this message is optional in both POSTs and HOPS.

Table 3.14 - Stored Travel Rights travel, Product or service purchase, load (manual, Actionlist and Auto-Top-Up), TransactionReversal, codes 0100, 0101, 0102, 0107 - RecordFormatRevision = 3

Name	Source	Format	Size	Comment
StandardData			21	
MessageBitMap	POST	BMP	1	Bit 0 shall be set to one (1) when complex capping data is stored in a value group extension, those data elements being included in the message. Bits 1 – 7 RFU.

ProductRetailer	IPE	OID16	2	
POSTAmount	POST	VALI	2	Value of transaction in the POST native currency, defined by POSTAmountCurrencyCode.
POSTAmountCurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
DateTimeStamp	IPE VG	DTS	3	
SAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
Value	IPE VG	VALS	2	
ValueCurrencyCode	IPE VG	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CountJourneyLegs	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CumulativeFare	IPE VG	VALI	2	A 1.625 byte value occupying bits 0-7 of the least significant byte and bits 0-4 of the most significant byte. Bits 5-7 of the most significant byte shall be set to 0.
TYP2ValueFlags	IPE VG	BMP	1	A 0.375 byte value, occupying bits 0 to 2, bits 3 to 7 shall be set to 0.
VGXLength	IPE-VGX	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1
VGXRef (Bit9; Bit8)	IPE-VGX	BMP	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
VGXRef (Bit7 – Bit0)	IPE-VGX	HEX	1	This element shall be included in the message only if MessageBitMap/0 = 1.
CapStrategyCode	IPE-VGX	HEX	2	This element shall be included in the

				message only if MessageBitMap/0 = 1.
CapAccumulator1Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid1	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid1TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap1DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator2Rule	IPE-VGX	HEX	13	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid2	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid2TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator2	IPE-VGX	VALI	2	This element shall be included in the

				message only if MessageBitMap/0 = 1.
Cap2DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator3Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid3	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid3TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap3DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator4Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid4	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid4TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator4	IPE-VGX	VALI	2	This element shall be included in the

				message only if MessageBitMap/0 = 1.
MultidayCapAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap4DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Location	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
Location1	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp1	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location2	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp2	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location3	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp3	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location4	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp4	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification.

				This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.5.6.2 Stored Travel Rights load check record code 0103.

A Stored Travel Rights load check record message shall be created with each Stored Travel Rights Transaction where the STR IPE value record data group contains a record of an add value Transaction. If there is no record of an add value Transaction in the value record data group then the message is not sent. Data from the most recently written IPE Value Record recording addition of Stored Travel Rights shall be recorded in the appropriate elements of this transaction record, noting that if the current Transaction is an add value Transaction then the data relating to the most recent previous add value Transaction shall be recorded, not that from the current Transaction. Only one set of elements shall be recorded in the record, relevant to most recent load Transaction, even where more than one Value Group exists.

Implementation of this format revision of this message is optional in both POSTs and HOPS.

Table 3.14A - Stored Travel Rights load check record code 0103 – RecordFormatRevision = 3

Name	Source	Format	Size	Comment
StandardData			21	
MessageBitMap	POST	BMP	1	Bit 0 shall be set to one (1) when complex capping data is stored in a value group extension, those data elements being included in the message. Bits 1 - 7 RFU.
ProductRetailer	IPE	OID16	2	
RFU		RFU	2	RFU
RFU		RFU	1	RFU
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DateTimeStamp	IPE VG	DTS	3	
SAMIDModifier	IPE VG	HEX	4	

ActionSequenceNumber	IPE VG	HEX	1	
Value	IPE VG	VALS	2	
ValueCurrencyCode	IPE VG	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CountJourneyLegs	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CumulativeFare	IPE VG	VALI	2	A 1.625 byte value occupying bits 0-7 of the least significant byte and bits 0-4 of the most significant byte. Bits 5-7 of the most significant byte shall be set to 0.
TYP2ValueFlags	IPE VG	BMP	1	A 0.375 byte value, occupying bits 0 to 2, bits 3 to 7 shall be set to 0.
VGXLength	IPE-VGX	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
VGXRef (Bit9; Bit8)	IPE-VGX	BMP	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
VGXRef (Bit7 – Bit0)	IPE-VGX	HEX	1	This element shall be included in the message only if MessageBitMap/0 = 1.
CapStrategyCode	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator1Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid1	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid1TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0 This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap1DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.

CapAccumulator2Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid2	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid2TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap2DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator3Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid3	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid3TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap3DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator4Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid4	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid4TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.

UncappedAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap4DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Location	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
Location1	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp1	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location2	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp2	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location3	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp3	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location4	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp4	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used

				here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.5.10 Full / partial refund of Stored Travel Rights, code 0108, RecordFormatRevision = 3

This message records the amount by which Stored Travel Rights changes as a result of a refund.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Implementation of this format revision of this message is optional in both POSTs and HOPS.

Table 3.18 - Full / partial refund of Stored Travel Rights, code 0108 – RecordFormatRevision = 3.

Name	Source	Format	Size	Comment
StandardData			21	
MessageBitMap	POST	BMP	1	Bit 0 shall be set to one (1) when complex capping data is stored in a value group extension, those data elements being included in the message. Bits 1 - 7 RFU.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
ProductRetailer	IPE	OID16	2	
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
Value	IPE VG	VALS	2	
ValueCurrencyCode	IPE VG	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.

CountJourneyLegs	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CumulativeFare	IPE VG	VALI	2	A 1.625 byte value occupying bits 0-7 of the least significant byte and bits 0-4 of the most significant byte. Bits 5-7 of the most significant byte shall be set to 0.
TYP2ValueFlags	IPE VG	BMP	1	A 0.375 byte value, occupying bits 0 to 2, bits 3 to 7 shall be set to 0.
VGXLength	IPE-VGX	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
VGXRef (Bit9; Bit8)	IPE-VGX	BMP	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
VGXRef (Bit7 – Bit0)	IPE-VGX	HEX	1	This element shall be included in the message only if MessageBitMap/0 = 1.
CapStrategyCode	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator1Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid1	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid1TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap1DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator2Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid2	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1
LastFarePaid2TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0 This element shall be included in the message only if MessageBitMap/0 = 1

UncappedAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap2DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator3Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid3	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid3TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap3DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator4Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid4	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid4TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap4DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.

Location	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
Location1	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp1	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location2	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp2	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location3	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp3	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location4	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp4	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_ISAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.5.11 Refund all Stored Travel Rights, together with any deposit amount and disable the Stored Travel Rights IPE, code 0109, RecordFormatRevision = 3.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Implementation of this format revision of this message is optional in both POSTs and HOPS.

Table 3.19 - Refund all Stored Travel Rights, together with any deposit amount and disable the Stored Travel Rights IPE, code 0109 – RecordFormatRevision = 3.

Name	Source	Format	Size	Comment
StandardData			21	
MessageBitMap	POST	BMP	1	Bit 0 shall be set to one (1) when complex capping data is stored in a value group extension, those data elements being included in the message. Bits 1 - 7 RFU.
ProductRetailer	IPE	OID16	2	
IPEAmount	POST	VALI	2	Value of Stored Travel Rights refund in IPE native currency defined by ValueCurrencyCode.
POSTAmount	POST	VALI	2	Value of the Stored Travel Rights refund in POST native currency defined by POSTAmountCurrencyCode.
POSTAmountCurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
DepositAmount	IPE	VALI	2	
DepositCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
Value	IPE	VALS	2	Stored Travel Rights – after transaction, in IPE native currency defined by ValueCurrencyCode.
ValueCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
VGXLength	IPE-VGX	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
VGXRef (Bit9; Bit8)	IPE-VGX	BMP	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.

VGXRef (Bit7 – Bit0)	IPE-VGX	HEX	1	This element shall be included in the message only if MessageBitMap/0 = 1.
CapStrategyCode	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator1Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid1	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid1TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap1DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator2Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid2	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid2TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap2DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator3Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid3	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.

LastFarePaid3TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap3DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator4Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid4	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid4TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap4DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Location	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
Location1	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp1	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location2	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp2	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location3	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.

DateTimeStamp3	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location4	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp4	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.5.12 CTA TYP 5 Full / Partial Refund for a purchased ticket code 0110, RecordFormatRevision = 3

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

The data set used for this message shall be the data set defined in table 3.21 for a message code 0111.

Implementation of this format revision of this message is optional in both POSTs and HOPS.

4.5.13 CTA TYP 5 Usage, Code 0111, RecordFormatRevision = 3.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Implementation of this format revision of this message is optional in both POSTs and HOPS.

Table 3.21 - CTA TYP 5 Usage, Code 0111 - RecordFormatRevision = 3.

Name	Source	Format	Size	Comment
StandardData			21	
MessageBitMap	POST	BMP	1	Bit 0 shall be set to one (1) when complex capping data is stored in a value group extension, those data elements being included in the message. Bits1 – 7 RFU.
IPEAmount	POST	VALI	2	Value of transaction in the IPE native currency, defined by ValueCurrencyCode.
POSTAmount	POST	VALI	2	Value of transaction in the POST native currency, defined by POSTAmountCurrencyCode.
POSTAmountCurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
ProductRetailer	IPE	OID16	2	
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
ActionSequenceNumber	IPE VG	HEX	1	
LastResetDate	IPE VG	Date	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ValueCurrencyCode	IPE VG	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TYP5ValueFlags	IPE VG	BMP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CountOfTransactions	IPE VG	HEX	1	
CountOfJourneyLegs	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
VGXLength	IPE-VGX	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
VGXRef (Bit9; Bit8)	IPE-VGX	BMP	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.

VGXRef (Bit7 – Bit0)	IPE-VGX	HEX	1	This element shall be included in the message only if MessageBitMap/0 = 1.
CapStrategyCode	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator1Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid1	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid1TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap1DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator2Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid2	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid2TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap2DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator3Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid3	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.

LastFarePaid3TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap3DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator4Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid4	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid4TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap4DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Location	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
Location1	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp1	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location2	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp2	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location3	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp3	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.

Location4	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp4	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.5.16 Full / partial refund of CTA cumulative amount, code 010D – RecordFormatRevision = 3.

This message records the amount by which a CTA cumulative amount changes as a result of a refund.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Implementation of this format revision of this message is optional in both POSTs and HOPS.

Table 3.24 - Full / partial refund of CTA cumulative amount, code 010D - RecordFormatRevision = 3.

Name	Source	Format	Size	Comment
StandardData			21	
MessageBitMap	POST	BMP	1	Bit 0 shall be set to one (1) when complex capping data is stored in a value group extension, those data elements being included in the message. Bits 1 – 7 RFU.
IPEAmount	POST	VALI	2	Value of refund in IPE native currency defined by IPECurrencyCode.
POSTAmount	POST	VALI	2	Value of the Stored Travel Rights refund in POST native currency defined by POSTAmountCurrencyCode.
POSTAmountCurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.

ProductRetailer	IPE	OID16	2	
TransactionSequenceNumber	IPE	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
CumulativeAmount	IPE	VALIS	2	value after transaction.
ValueCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
VGXLength	IPE-VGX	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
VGXRef (Bit9; Bit8)	IPE-VGX	BMP	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
VGXRef (Bit7 – Bit0)	IPE-VGX	HEX	1	This element shall be included in the message only if MessageBitMap/0 = 1.
CapStrategyCode	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator1Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid1	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid1TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap1DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator2Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid2	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.

LastFarePaid2TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap2DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator3Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid3	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid3TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap3DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator4Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid4	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid4TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap4DayCount	IPE-VGX	HEX	2	This element shall be included in the message

				only if MessageBitMap/0 = 1.
Location	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
Location1	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp1	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location2	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp2	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location3	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp3	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location4	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp4	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.5.17 CTA usage (travel, Product or service purchase), code 010E, RecordFormatRevision = 3

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Implementation of this format revision of this message is optional in both POSTs and HOPS.

Table 3.25 - CTA usage (travel, Product or service purchase), code 010E – RecordFormatRevision = 3

Name	Source	Format	Size	Comment
------	--------	--------	------	---------

StandardData			21	
MessageBitMap	POST	BMP	1	Bit 0 shall be set to one (1) when complex capping data is stored in a value group extension, those data elements being included in the message. Bits 1 - 7 RFU.
IPEAmount	POST	VALI	2	Value of transaction in the IPE native currency, defined by ValueCurrencyCode
POSTAmount	POST	VALI	2	Value of transaction in the POST native currency, defined by POSTAmountCurrencyCode
POSTAmountCurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
ProductRetailer	IPE	OID16	2	
TransactionType	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
ActionSequenceNumber	IPE	HEX	1	
CumulativeAmount	IPE	VALI	2	Value following transaction
ValueCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CountJourneyLegs	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CumulativeFare	IPE	VALI	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
TYP4ValueFlags	IPE	BMP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
VGXLength	IPE-VGX	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
VGXRef (Bit9; Bit8)	IPE-VGX	BMP	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
VGXRef (Bit7 – Bit0)	IPE-VGX	HEX	1	This element shall be included in the message only if MessageBitMap/0 = 1.

CapStrategyCode	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator1Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid1	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid1TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap1DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator2Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid2	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid2TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0, This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap2DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator3Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid3	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.

LastFarePaid3TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap3DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator4Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid4	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid4TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap4DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Location	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
Location1	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp1	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location2	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp2	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location3	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.

DateTimeStamp3	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location4	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp4	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.5.19 Create or Amend Stored Travel Rights, codes 0120, 0121, RecordFormatRevision = 3.

Note that if any value is loaded when the IPE is created then this shall be recorded using an additional Stored Travel Rights load message.

Note that this message shall only be used for amendments not covered by other messages defined elsewhere herein.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Implementation of this format revision of this message is optional in both POSTs and HOPS.

Table 3.27 - Create or Amend Stored Travel Rights, codes 0120, 0121 – RecordFormatRevision = 3

Name	Source	Format	Size	Comment
StandardData			21	
MessageBitMap	POST	BMP	1	Bit 0 shall be set to one (1) when complex capping data is stored in a value group extension, those data elements being included in the message. Bits 1 - 7 RFU.
IPEExpiryDate	Shell	DATE	2	A copy of the relevant EXP directory data element relevant to this IPE.
IPELength	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEBitMap	IPE	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEFormatRevision	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
RemoveDate	IPE	RDATE	1	
ProductRetailer	IPE	OID16	2	
TYP2Flags	IPE	BMP	1	
Threshold	IPE	VALI	2	
TopUpAmount	IPE	VALI	2	
MaxValue2	IPE	VALI	2	
MaximumNegativeAmount	IPE	VALI	2	
DepositAmount	IPE	VALI	2	
StartDateAutoTopUp	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
DepositMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositVATSalesTax	IPE	VAT	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
VGLength	IPE VG	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	IPE VG	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.

VGFormatRevision	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
Value	IPE VG	VALS	2	
ValueCurrencyCode	IPE VG	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CountJourneyLegs	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CumulativeFare	IPE VG	VALI	2	A 1.625 byte value occupying bits 0-7 of the least significant byte and bits 0-4 of the most significant byte. Bits 5-7 of the most significant byte shall be set to 0.
TYP2ValueFlags	IPE VG	BMP	1	A 0.375 byte value, occupying bits 0 to 2, bits 3 to 7 shall be set to 0
VGXLength	IPE-VGX	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
VGXRef (Bit9; Bit8)	IPE-VGX	BMP	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0 This element shall be included in the message only if MessageBitMap/0 = 1.
VGXRef (Bit7 – Bit0)	IPE-VGX	HEX	1	This element shall be included in the message only if MessageBitMap/0 = 1.
CapStrategyCode	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator1Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid1	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid1TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.

UncappedAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap1DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator2Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid2	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid2TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap2DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator3Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid3	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid3TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap3DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.

CapAccumulator4Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid4	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid4TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap4DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Location	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
Location1	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp1	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location2	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp2	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location3	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp3	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location4	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp4	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.

IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberNonEncrypted	Shell	uISRN	16	Not encrypted. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR). In a code 0121 message, this element shall be set to zero (0)
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.5.20 Create or Amend CTA IPE TYP 4, codes 0122, 0123, RecordFormatRevision = 3

Note that this message shall only be used for amendments not covered by other transaction type specific messages defined elsewhere herein.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Implementation of this format revision of this message is optional in both POSTs and HOPS.

Table 3.28 - Create or Amend CTA IPE TYP 4, codes 0122, 0123 - RecordFormatRevision = 3.

Name	Source	Format	Size	Comment
StandardData			21	
MessageBitMap	POST	BMP	1	Bit 0 shall be set to one (1) when complex capping data is stored in a value group extension, those data elements being included in the message. Bits 1 – 7 RFU.
IPEExpiryDate	Shell	DATE	2	A copy of the relevant EXP directory data element relevant to this IPE.
IPELength	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEBitMap	IPE	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEFormatRevision	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
RemoveDate	IPE	RDATE	1	
ProductRetailer	IPE	OID	2	
TYP4Flags	IPE	BMP	1	

MaxValue4	IPE	VALI	2	
DepositAmount	IPE	VALI	2	
StartDateCTA	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
EndDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
DepositMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositVATSalesTax	IPE	VAT	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
VGLength	IPE VG	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	IPE VG	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGFormatRevision	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
CumulativeAmount	IPE VG	VALI	2	
ValueCurrencyCode	IPE VG	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
CountJourneyLegs	IPE VG	HEX	1	
CumulativeFare	IPE VG	VALI	2	
TYP4ValueFlags	IPE VG	BMP	1	

VGXLength	IPE-VGX	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
VGXRef (Bit9; Bit8)	IPE-VGX	BMP	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
VGXRef (Bit7 – Bit0)	IPE-VGX	HEX	1	This element shall be included in the message only if MessageBitMap/0 = 1.
CapStrategyCode	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator1Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid1	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid1TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap1DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator2Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid2	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid2TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.

Cap2DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator3Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid3	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid3TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap3DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator4Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid4	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid4TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap4DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Location	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
Location1	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp1	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.

Location2	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp2	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location3	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp3	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location4	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp4	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberNonEncrypted	Shell	uISRN	16	Not encrypted. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR). In a code 0123 message, this element shall be set to 0.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.5.21 Create or Amend CTA IPE TYP 5, Code 0124, 0125, RecordFormatRevision = 3.

Note that this message shall only be used for amendments not covered by other Transaction type specific messages defined elsewhere herein.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Implementation of this format revision of this message is optional in both POSTs and HOPS.

Table 3.29 - Create or Amend CTA IPE TYP 5, Code 0124, 0125 – RecordFormatRevision = 3

Name	Source	Format	Size	Comment
StandardData			21	
MessageBitMap	POST	BMP	1	Bit 0 shall be set to one (1) when complex capping data is stored in a value group extension, those data elements being included in the message. Bits 1 - 7 RFU.
IPEExpiryDate	Shell	DATE	2	A copy of the relevant EXP directory data element relevant to this IPE.
IPELength	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEBitMap	IPE	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEFormatRevision	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
RemoveDate	IPE	RDATE	1	
ProductRetailer	IPE	OID16	2	
TYP5Flags	IPE	BMP	1	
WeeksPerPeriod	IPE	HEX	1	
QuantityTransactions	IPE	HEX	1	
MaxValue5	IPE	VALI	2	
DepositAmount	IPE	VALI	2	
StartDateCTA	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
EndDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
DepositMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositVATSalesTax	IPE	VAT	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
VGLength	IPE VG	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	IPE VG	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6

				to 7 shall be set to 0.
VGFormatRevision	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
CountOfTransactions	IPE VG	HEX	1	
LastResetDate	IPE VG	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ValueCurrencyCode	IPE VG	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TYP5ValueFlags	IPE VG	BMP	1	
CountJourneyLegs	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
VGXLength	IPE-VGX	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
VGXRef (Bit9; Bit8)	IPE-VGX	BMP	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
VGXRef (Bit7 – Bit0)	IPE-VGX	HEX	1	This element shall be included in the message only if MessageBitMap/0 = 1.
CapStrategyCode	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator1Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid1	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid1TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.

UncappedAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator1	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap1DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator2Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid2	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid2TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator2	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap2DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
CapAccumulator3Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid3	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid3TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator3	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap3DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.

CapAccumulator4Rule	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid4	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
LastFarePaid4TransactionType	IPE-VGX	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
UncappedAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
DayCapAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
MultidayCapAccumulator4	IPE-VGX	VALI	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Cap4DayCount	IPE-VGX	HEX	2	This element shall be included in the message only if MessageBitMap/0 = 1.
Location	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
Location1	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp1	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location2	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp2	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location3	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp3	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
Location4	IPE-VGX	LOC1	Variable, maximum 17	This element shall be included in the message only if MessageBitMap/0 = 1.
DateTimeStamp4	IPE-VGX	DTS	3	This element shall be included in the message only if MessageBitMap/0 = 1.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.

IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberNonEncrypted	Shell	uISRN	16	Not encrypted. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR). In a code 0125 message, this element shall be set to zero (0)
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.5.22 Create or Amend ITSO ID IPE or Entitlement IPE, code 0200, 0201 - RecordFormatRevision = 3

This record shall be used for both ID TYP 16 and Entitlement TYP 14. All data elements shall be included. Where no data is available for a specific message element then that element shall contain zero, excepting that any message element of format LOC1, LOC2, LOC3 or LOC4 shall not be set to zero, but shall contain a NULL location definition in the form of LocDefType 255, and with the minimum permissible structure length.

For a creation transaction, all elements appropriate to the IPE type shall be completed. For an amendment, only those elements for which data is available need be completed, other elements shall contain zero if the element is of a numeric type, or 20h (space) if the element is an of ASCII type.

Some data elements in the 0200 and 0201 are intended to hold personal data and, if populating these elements, Product Owners, POST owners and HOPS providers must make relevant provisions to ensure that storage of such data complies with the General Data Protection Regulation (GDPR). For the purposes of data protection Product Owners may choose not to populate these elements, in which case they shall be handled according to clause 2.3.2. In these circumstances, the Product Owner must make their own arrangements to recover the affected data (if it is required to be sent to the back office). The affected elements are as follows: HolderTitle; HolderSurname; HolderOtherNames; HolderAddress1; HolderAddress2; HolderAddress3; HolderAddress4; HolderPostcode; HolderPhoneDay; HolderPhoneHome; HolderPhoneMobile; HolderEmail; DateOfBirth; Forename; Surname.

It is not mandatory to send a 0201 message in parallel with a specific change message (e.g. a 0303 deposit refund message), if the 0201 message does not convey any additional information (i.e. the contents of the additional data items sent in the 0201 message are unchanged), and if both messages would have been sent to the same destination(s).

However, optionally 0201 messages can be sent under these conditions.

All implementations compliant to this version of the Specification shall use this Format Revision, and the old version (RecordFormatRevision = 2) should only be used for the purpose of backwards compatibility.

Table 3.30 -Create or Amend ITSO ID IPE or Entitlement IPE, code 0200, 0201 - RecordFormatRevision = 3

Name	Source	Format	Size	Comment
StandardData			21	
Amount	POST	VALI	2	Amount of any remittance by the Customer Media holder, excluding a deposit.
AmountCurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
HolderTitle	POST	ASCII	4	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderSurname	POST	ASCII	20	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderOtherNames	POST	ASCII	30	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderAddress1	POST	ASCII	30	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderAddress2	POST	ASCII	30	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderAddress3	POST	ASCII	30	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderAddress4	POST	ASCII	30	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderPostcode	POST	ASCII	10	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).

HolderPhoneDay	POST	ASCII	20	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderPhoneHome	POST	ASCII	20	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderPhoneMobile	POST	ASCII	20	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderEmail	POST	ASCII	40	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
IPE-TYP	POST	TYP	1	This element shall indicate the TYP of IPE to which a message instance refers, and also indicates the type of optional data which may be found within a message instance. In this instance it shall be used to identify whether the IPE is of TYP 14 or TYP 16.
IPEExpiryDate	Shell	DATE	2	A copy of the relevant EXP directory data element relevant to this IPE.
IPELength	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEBitMap	IPE	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEFormatRevision	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
RemoveDate	IPE	RDATE	1	
CPICC	IPE	HEX	2	
IDFlags	IPE	BMP	1	
RoundingFlagsEnable	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
PassbackTime	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
DateOfBirth	IPE	DOB	4	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
Language	IPE	HEX	1	Users of this data element shall take note

				of the requirements of the General Data Protection Regulation (GDPR).
HolderID	IPE	HEX	4	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
RoundingFlag	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
RoundingValueFlag	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
EntitlementStartDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
EntitlementExpiryDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
DepositMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositVATSalesTax	IPE	VAT	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
ShellDepositMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
ShellDepositVATSalesTax	IPE	VAT	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DepositCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
ShellDepositCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositAmount	IPE	VALI	2	
ShellDeposit	IPE	VALI	2	
EntitlementCode	IPE	HEX	1	
ConcessionaryClass	IPE	HEX	1	
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data

				from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberNonEncrypted	Shell	uISRN	16	Not encrypted. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR). In a code 0201 message, this element shall be set to zero (0)
SecondaryHolderID	IPE	HEX	4	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
ForenameLength	IPE	HEX	1	Length of Forename, in bytes Set to 0. if no Forename stored
Forename	IPE	ASCII	39	A variable length element, actual length is determined by ForenameLength. Length may exceed 39, but combined length of Forename plus Surname shall not exceed 78 bytes. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
SurnameLength	IPE	HEX	1	Length of Surname, in bytes Set to 0. if no Surname stored
Surname	IPE	ASCII	39	A variable length element, actual length is determined by SurnameLength. Length may exceed 39, but combined length of Forename plus Surname shall not exceed 78 bytes. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HalfDayOfWeek	IPE	BMP	2	
ValidAtOrFrom	IPE	LOC1	Variable, maximum 17	Variable length element
ValidTo	IPE	LOC1	Variable, maximum 17	Variable length element
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

IDFlag definitions

These shall be as defined for the ITSO ID IPE, TYP = 16 and Entitlement IPE TYP =14.

4.5.26 Create or Amend Ticket IPE, code 0207, 0208 – RecordFormatRevision = 3.

This records the creation or amendment of a ticket IPE. If a simultaneous journey is made a journey record shall also be transmitted.

The actual Data is dependent upon the type of IPE being created or amended. For efficiency, the record is split into common data (common to all IPEs), IPE TYP specific data and a footer.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

It is not mandatory to send a 0208 message in parallel with a specific change message (e.g. a 0303 deposit refund message), if the 0208 message does not convey any additional information (i.e. the contents of the additional data items sent in the 0208 message are unchanged), and if both messages would have been sent to the same destination(s).

However, optionally 0208 messages can be sent under these conditions.

4.5.26.1 Record Structure

The record shall always be structured in the following manner, in the sequence shown.

Table 3.35 - Create or Amend Ticket IPE, code 0207, 0208, Record Structure - RecordFormatRevision = 3.

Data Group	Comment
Common data	Always required
Optional data	Present according to IPE type involved, as defined by TYP and the IPEBitMap. These optional data groups shall be included in the record in the same order as they occur in this specification.
Footer	Always required

4.5.26.2 Common Data

Table 3.36 - Common Data - RecordFormatRevision = 3.

Name	Source	Format	Size	Comment
StandardData			21	
IPE-TYP	POST	TYP	1	This element shall indicate the TYP of IPE to which a message instance refers, and also indicates the type of optional data which may be found within a message instance.
NormalPrice	POST	VALI	2	Full price for ticket (if any), currency is defined by CurrencyCode
CurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
MachineNumber	POST	HEX	4	Serial number of the terminal conducting the transaction

TransactionFlags	POST	HEX	1	
MessageBitMap	DIR & POST	BMP	1	<p>Bit 0 shall be a copy of the Value Group Present flag from the directory. This indicates whether a value group is present in an IPE instance, and therefore also present in a message instance.</p> <p>Bit 1 shall be set to one (1) when the ID_IPEID, ID_ISAMID and ID_ISAMSeq# data elements are included in the record.</p> <p>Bits 2 – 7 are RFU.</p>
ITSOShellReferenceNumberNonEncrypted	Shell	uISRN	16	<p>Not encrypted. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).</p> <p>In a code 0208 message, this element shall be set to zero (0).</p>
IPEExpiryDate	Shell	DATE	2	A copy of the relevant EXP directory data element relevant to this IPE.
IPELength	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEBitMap	IPE	BMP	1	<p>A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.</p> <p>For TYP 27, 28, 29 IPEs the contents of this element shall have no effect on the contents of a Transaction Record instance, i.e. all elements shall be included in the Transaction Record.</p> <p>For TYP 22-26 IPEs this element shall be used to determine which optional data elements are included in a Transaction Record instance, i.e. optional elements are only included in the Transaction Record if they are also included in the IPE instance.</p> <p>Refer to ITSO TS 1000-5 for the definition of IPEBitMap and optional elements.</p>
IPEFormatRevision	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
RemoveDate	IPE	RDATE	1	
ProductRetailer	IPE	OID16	2	
ID_IPEID	IPE	IPEIDM	7	<p>Identifies an identity IPE.</p> <p>IPE instance identity details for an ID IPE contained in the same ITSO Shell as the IPE that is the subject of this message. May be sent for the purpose of enabling identification of the card holder in circumstances where the</p>

				ISRN is not known due to its being encrypted. Include this element only if MessageBitMap bit 1 is set to one (1).
ID_ISAMID	IPE	HEX	4	Identifies an identity IPE. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here. Include this element only if MessageBitMap bit 1 is set to one (1)
ID_ISAMSeq#	IPE	HEX	3	Identifies an identity IPE. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here. Include this element only if MessageBitMap bit 1 is set to one (1)

A combination of flags shall be set where appropriate to do so. Note that an attended POST is one where the POST is operated by a member of staff, whilst an unattended POST is one where the POST is essentially operated by the card holder.

Table 3.37 - TransactionFlags Definition – RecordFormatRevision = 3.

Flag ID	Flag name	Flag purpose
0	AutoTransaction	Set to one (1) when the relevant transaction took place automatically due to auto-renew, otherwise set to zero (0). See note below.
1	ActionListTransaction	Set to one (1) when the relevant transaction took place due to an Actionlist item, otherwise set to zero (0). See note below.
2	StoredTicketActivation	Set to one (1) when the relevant transaction took place due to Stored Ticket activation, otherwise set to zero (0). See note below.
3	ManualPostTransaction	Set to one (1) when the relevant transaction took place at an attended POST, e.g. a ticket office machine or bus ticket machine, otherwise set to zero (0). Note that the use of flags 3, 4 and 5 is mutually exclusive. Only one of flags 3, 4 and 5 shall be set for every transaction.
4	UnattendedPostTransaction	Set to one (1) when the relevant transaction took place at an unattended POST, e.g. a ticket vending machine, otherwise set to zero (0). Note that the use of flags 3, 4 and 5 is mutually exclusive. Only one of flags 3, 4 and 5 shall be set for every transaction.

5	RemotePostTransaction	Set to one (1) when the relevant transaction took place with a remote POST, e.g. CM holder not present, otherwise set to zero (0). Note that the use of flags 3, 4 and 5 is mutually exclusive. Only one of flags 3, 4 and 5 shall be set for every transaction.
6	RFU	
7	RFU	

Note:

In instances where the relevant transaction has taken place and it is deemed appropriate to set the bit value to one (1), the values for bits 0, 1 and 2 shall be mutually exclusive. However, there may be instances where setting the bit value of 0, 1 or 2 to one (1) is not appropriate (i.e, for a direct fulfilment)

4.5.26.3 Footer.

Table 3.38 - Footer - RecordFormatRevision = 3.

Name	Source	Format	Size	Comment
IIN	IPE	IIN	3	IIN shall always be included in the Transaction Record, where necessary it contents shall be deduced from the ITSO Shell Owner Identity.
KID	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.5.26.4 IPE TYP 22.

Table 3.39 - IPE TYP 22 - RecordFormatRevision = 3.

Name	Source	Format	Size	Comment
ProductRetailer	IPE	OID	2	
TYP22Flags	IPE	BMP	2	
PassBackTime	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ExpiryTime	IPE	TIME	2	A 1.375 byte value, occupying bits 0-7 of the least significant byte, and bits 0-2 of the most significant byte. Bits 3-7 of the most significant byte shall be set to 0.
AutoRenewQuantity1	IPE	BIN	1	
Class	IPE	UD	1	
ValidityCode	IPE	UD	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
ValidityStartDTS	IPE	DTS	3	
PromotionCode	IPE	HEX	1	
ValidOnDaytypeCode	IPE	DOW	1	
PartySizeAdult	IPE	HEX	1	
PartySizeChild	IPE	HEX	1	
PartySizeConcession	IPE	HEX	1	
AmountPaidCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaid	IPE	VALI	2	
AmountPaidMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaidVATSalesTax	IPE	VATM	2	
CPICC	IPE	HEX	2	
ValidAtOrFrom	IPE	LOC1	Variable, maximum 17	
ValidTo	IPE	LOC1	Variable, maximum 17	
PassDuration	IPE	HEX	1	

Flag definitions are as defined for the relevant IPEs.

Table 3.40 - IPE TYP 22, Value Group - RecordFormatRevision = 3.

Name	Source	Format	Size	Comment
VGLength	IPE VG	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	IPE VG	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGFormatRevision	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
NumberRemainingPasses	IPE VG	BIN	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
TYP22ValueFlags	IPE VG	BMP	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0.
ExpiryDateSP	IPE VG	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ExpiryDateCurrent	IPE VG	DATE	2	

4.5.26.5 IPE TYP 23**Table 3.41 - IPE TYP 23 - RecordFormatRevision = 3.**

Name	Source	Format	Size	Comment
ProductRetailer	IPE	OID	2	
TYP23Flags	IPE	BMP	1	
PassBackTime	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.

IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ValidityCode	IPE	UD	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
ExpiryTime	IPE	TIME	2	A 1.375 byte value, occupying bits 0-7 of the least significant byte, and bits 0-2 of the most significant byte. Bits 3-7 of the most significant byte shall be set to 0.
Class	IPE	UD	1	
PartySizeAdult	IPE	HEX	1	
PartySizeChild	IPE	HEX	1	
PartySizeConcession	IPE	HEX	1	
AmountPaidCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaid	IPE	VALI	2	
AmountPaidMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaidVATSalesTax	IPE	VATM	2	
PhotocardNumber	IPE	UD	4	
PromotionCode	IPE	HEX	1	
CPICC	IPE	HEX	2	
TYP23Mode	IPE	BMP	1	
MaxTransfers	IPE	HEX	1	
TimeLimit	IPE	HEX	1	
ValueOfRideJourney	IPE	VALI	2	
ValueOfRideJourneyCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
Origin1	IPE	LOC1	Variable, maximum 17	
Destination1	IPE	LOC1	Variable, maximum 17	

Flag definitions are as defined for the relevant IPEs.

Table 3.42 - IPE TYP 23 Value Group - RecordFormatRevision = 3

Name	Source	Format	Size	Comment
VGLength	IPE VG	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	IPE VG	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGFormatRevision	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
CountRemainingRidesJourneys	IPE VG	HEX	1	
CountTransfers	IPE VG	HEX	1	
TYP23ValueFlags	IPE VG	BMP	1	

4.5.26.6 IPE TYP 24

In this version of the specification, transmission of 0207 and 0208 messages relating to TYP 24 IPEs is not permitted at Record Format Revision 3.

4.5.26.7 IPE TYP 25**Table 3.49 - IPE TYP 25 - RecordFormatRevision = 3**

Name	Source	Format	Size	Comment
ProductRetailer	IPE	OID16	2	
TYP25Flags	IPE	BMP	1	
PassBackTime	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ValidityStartDTS	IPE	DTS	3	

ExpiryTime	IPE	TIME	2	A 1.375 byte value, occupying bits 0-7 of the least significant byte, and bits 0-2 of the most significant byte. Bits 3-7 of the most significant byte shall be set to 0.
ServiceID	IPE	UD	1	
MaxValue25	IPE	VALI	2	
MaxValueCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaidCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaid	IPE	VALI	2	
AmountPaidMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaidVATSalesTax	IPE	VATM	2	
UserDefined	IPE	UD	1	
AutoRenewQuantity2	IPE	HEX	1	

Table 3.50 - IPE TYP 25 Value Group - RecordFormatRevision = 3

Name	Source	Format	Size	Comment
VGLength	IPE VG	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	IPE VG	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGFormatRevision	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
CountUsesAvailable	IPE VG	HEX	1	
TYP25ValueFlags	IPE VG	BMP	1	

4.5.26.8 IPE TYP 26**Table 3.51 - IPE TYP 26 - RecordFormatRevision = 3**

Name	Source	Format	Size	Comment
ProductRetailer	IPE	OID16	2	
PassBackTime	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
TYP26Flags	IPE	BMP	1	
TYP26Class	IPE	UD	1	
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ValidityStartDTS	IPE	DTS	3	
UserDefined	IPE	UD	7	
AutoRenewQuantity3	IPE	HEX	1	

Table 3.52 - IPE TYP 26 Value Group - RecordFormatRevision = 3

Name	Source	Format	Size	Comment
VGLength	IPE VG	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	IPE VG	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGFormatRevision	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
CountRemainingRidesJourneys	IPE VG	HEX	1	
TYP26ValueFlags	IPE VG	BMP	1	

4.5.26.9 IPE TYP 27, 28, 29**Table 3.53 IPE TYP 27, IPEFormatRevision = 1, - RecordFormatRevision = 3**

Name	Source	Format	Size	Comment
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
Sterling/Euro	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
Child	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
PassbackTime	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AmountPaidMethod OfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AmountPaid	IPE	VALI	2	
TYP27PassFlags	IPE	BMP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
GeoValidity/AreaValidity	IPE	LOC4/ LOC3	13	The 4 most significant bits of this element shall be set to 0, with the data commencing from the 5 bit of the element. The least significant 4 bytes of this element shall be set to 0 when it contains AreaValidity
Event1	IPE	HEX	1	
Event2	IPE	HEX	1	
LastUseDTS	IPE	DTS	3	
PhotocardNumber	IPE	HEX	3	
TYP27ExpiryDate	IPE	HEX	1	
Seq#	IPE	HEX	1	Set to all 0's if this element is not present in the IPE

Table 3.55 IPE TYP 28, IPEFormatRevision = 1, - RecordFormatRevision = 3

Name	Source	Format	Size	Comment
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
Sterling/Euro	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.

PassbackTime	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AmountPaidMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AmountPaid	IPE	VALI	2	
TYP28PassFlags	IPE	BMP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AreaValidity	IPE	LOC3	9	The 4 most significant bits of this element shall be set to 0, with the data commencing from the 5 bit of the element.
LastUseDTS	IPE	DTS	3	
ExpiryTick1	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
ExpiryTick2	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
ExpiryTick3	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
ExpiryTick4	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
ExpiryTick5	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
ExpiryTick6	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
NDoIE	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
NDoEE	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
Seq#	IPE	HEX	1	Set to all 0's if this element is not present in the IPE

Table 3.57 IPE TYP 29, IPEFormatRevision = 1, – RecordFormatRevision = 3

Name	Source	Format	Size	Comment
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
Sterling/Euro	IPE	FLAG	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
Ticket/Coupon	IPE	FLAG	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
ScalingFactor	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.

AmountPaidMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AmountPaid	IPE	VALI	2	
TYP29PassFlags	IPE	BMP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AreaValidity	IPE	LOC3	9	The 4 most significant bits of this element shall be set to 0, with the data commencing from the 5 bit of the element.
TYP29UsageRecCode	IPE	HEX	1	A 0.375 byte value, occupying bits 0-2 of the element. Bits 3-7 shall be set to 0.
QtyRemaining	IPE	HEX	2	A 1.625 byte value, occupying bits 0-12 of the element. Bits 13-15 shall be set to 0.
UsageRecord	IPE	HEX	4	
ScaledQtyBackup	IPE	BMP	4	
Seq#	IPE	HEX	1	Set to all 0's if this element is not present in the IPE

Table 3.58 IPE TYP 29, IPEFormatRevision = 2, - RecordFormatRevision = 3

Name	Source	Format	Size	Comment
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
Sterling/Euro	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
PassbackTime	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
MaxDailyJourneys	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
MaxTransfers	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
ScalingFactor	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
TYP29PassFlags	IPE	BMP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AreaValidity	IPE	LOC3	9	The 4 most significant bits of this element shall be set to 0, with the data commencing from the 5 bit of the element.
JnyComDTS	IPE	DTS	3	
QtyRemaining	IPE	HEX	1	

TransferCounter	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
DailyJnyCounter	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
LastUseDTS	IPE	DTS	3	
ScaledQtyBackup	IPE	BMP	4	
Seq#	IPE	HEX	1	Set to all 0's if this element is not present in the IPE

4.5.27 Journey Record, code 0209 – RecordFormatRevision = 3.

From version 2.1.4 of the specification, format revision 3 is deprecated. Equipment operating to version 2.1.4 of the specification shall support format revision 3 but no new implementations should implement functionality dependent on the use of format revision 3. Format revision 3 will be removed from the next version of the specification.

This record shall be used to record all Journeys made using an ITSO Customer Media. For the avoidance of doubt this includes (but is not necessarily limited to):

- Journeys when a Ticket IPE is used
- Journeys when a Transient Ticket record is created (in addition to a 0210 record)
 - Where more than one Transient Ticket is created in the course of a Journey it is only mandatory to create one 0209 message for that Journey
- Closed System entry and exit transactions
 - The 0209 message shall be sent for either the entry or the exit transaction so as to record the Journey, and optionally may be sent for both transactions
- Usage of STR or CTA to purchase a ticket
- Usage of a voucher or open system toll IPE; and
- Free concessionary Journeys authorised solely by the ITSO ID/Entitlement IPEs, TYPs 14 and 16

This record may also be used to record other types of Transaction, at the discretion of the relevant Licensed Member.

The 0209 message should refer to the primary authorisation for that journey, which could be:

- a Ticket IPE used to authorise a Journey; or
- a concessionary entitlement used to authorise a free or discounted Journey; or
- a STR or CTA IPE, BUT ONLY if STR (or CTA) was used to pay for the Journey AND an IPE was neither used to authorise the Journey nor was an IPE created.

Data from this primary IPE shall be used in the 0209 message where the source is indicated to be "IPE".

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Where the primary IPE does not include a value group then the Transaction sequence number shall be set to 0. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Implementation of this version of the 0209 message is optional in POSTs. POSTs may either use RecordFormatVersion = 2 or this version, and may be capable of creating both versions according to need.

Table 3.59 - Journey Record, code 0209 – RecordFormatRevision = 3

Name	Source	Format	Size	Comment
StandardData			21	
AmountPaid	POST	VALI	4	Actual fare/price paid for journey (if any). Do not insert any value here if an amount value is entered in a simultaneous ticket creation or amendment record. Currency is defined by CurrencyCode.
NormalPrice	POST	VALI	4	Full fare/price for journey. Do not insert any value here if an amount value is entered in a simultaneous ticket creation or amendment record. Currency is defined by CurrencyCode.
CurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
Location	POST	LOC1	Variable, maximum 17	Location at which the journey commenced or location at which the event recorded herein occurred
Destination	POST	LOC1	Variable, maximum 17	Destination or proposed destination where known
ConcessionaryAuthority	POST	HEX	2	Identity of the concessionary authority within whose area the journey commenced, obtained from the POST configuration data where this information may be stored for this purpose. Where no concessionary authority ID data is stored in this data element then it shall be set to 0. This is a number that is unique to a given Travel Concession Authority. These numbers are allocated by the appropriate National Concessionary Travel Authority for the country in which the boarding point is located. This value might be an OID
ProductRetailer	IPE	OID16	2	
TransactionSequenceNumber	IPE	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE. Where the IPE does not include a value group then set this element to a

				value of 0.
RemainingUses	IPE	HEX	1	<p>If a multi-use IPE (i.e. multi-ride, journey ticket or multi-use voucher) then record the remaining number of uses after the transaction.</p> <p>This data will be extracted from the TYP 22 NumberRemainingPasses, TYP 23 or TYP 26 CountRemainingRidesJourneys, TYP 24 CountRemainingJourneys, or TYP 25 CountUsesAvailable, or TYP 29 QtyRemaining, IPE element, depending on the IPE used for the transaction.</p> <p>If the IPE element is smaller than 1 byte, then it shall occupy the least significant bits of this element.</p> <p>If the IPE does not include this data, then set this element to a value of 0.</p> <p>If the value of the data element in the IPE is greater than or equal to 255, then set this element to 255, or if the IPE value is less than 255 then set this element to that value.</p>
CPICC	IPE	HEX	2	<p>A copy of the IPE data element of the same name.</p> <p>If the IPE does not include this data, then set this element to a value of 0.</p>
TransactionType	IPE POST	HEX	1	<p>If a TransactionType code has been recorded in either the transient ticket log or in the IPE value record, then that value shall be recorded here.</p> <p>Otherwise, where no TransactionType code has been stored in an IPE or a transient Ticket relevant to the Journey Record, use an appropriate code according to [EN1545-1] EventTypeCode. As 8 bit codes can be stored here [whereas only 4 bit codes are permissible in IPEs] then if a more appropriate code, greater than 15, is available in the [EN1545-1] EventTypeCode list; that EventTypeCode value may be used here.</p> <p>Further guidance may be found in ITSO DG0007.</p>

ServiceOperatorID	POST	UD	2	This could be an OID, or could be a user defined value, defined either by the Service Operator or by the owner of the Product used in the Transaction
ServiceNumber	POST	UD	10	An identifier for the route or service relevant to the Transaction. If there is no relevant identifier available set to a null value (0 or ASCII spaces).
TripNumberOrTrainNumber	POST	UD	10	An identifier for the bus trip number or train number relevant to the Transaction. If there is no relevant identifier available set to a null value (0 or ASCII spaces).
ReimbursementDataFlags	POST	BMP	1	Refer to Table 3.59a below
SupplementaryData	POST	Variable	Variable, maximum 255	One or more elements encoded according to asn.1 using basic encoding rules. Allowable data elements and associated tag values are defined in Annex A.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAMS#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

Table 3.59a - ReimbursementDataFlags Definition

Bit	Meaning
0	Concessionary Minimum Cost Contract if set to 1
1	Concessionary Minimum Subsidy Contract if set to 1
2	Direction (OUT or Clockwise, set to 0, IN or Anticlockwise, set to 1)
3	RFU
4	RFU
5	RFU
6	RFU
7	RFU

Note that the SupplementalInformation data element shall not also be set with reimbursement data when ReimbursementDataFlags are set.

4.5.28 Journey Record, code 0210 – RecordFormatRevision = 3

This version of the Journey record is used to record Transient Ticket records created according to TTFormatRevision 2.

Table 3.60 - Journey Record, code 0210 - RecordFormatRevision = 3

Name	Source	Format	Size	Comment
StandardData			21	
TTLength	TTR	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
TTBitMap1	TTR	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
TTFormatRevision	TTR	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TTBitMap2	TTR	BMP	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. This element shall be used to determine which optional data elements are included in a Transaction Record instance. Refer to ITSO TS 1000-5 for the

				definition of TTBitMap2 and optional elements.
TTTransactionType	TTR	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DateTimeStamp	TTR	DTS	3	
AmountPaidMethodOfPayment	TTR	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaidCurrencyCode	TTR	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaid	TTR	VALI	2	
CompanionTravelled	TTR	FLAG	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
ReturnTicket	TTR	FLAG	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
RFU	TTR	FLAG	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
NoFareCharged	TTR	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
AmountPaidVATSalesTax	TTR	VATM	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DestinationTT	TTR	LOC2	7	
IPEPointer	TTR	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
OriginLocation	TTR	LOC2	7	
RoutingCode	TTR	LOC2	7	
IIN	TTR	IIN	3	
UserDefinedSize	POST	HEX	1	The size of the UserDefined element in bytes
UserDefined	TTR	UD	Variable	
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. See note below. This value shall be taken from the IPE data group instance

				information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification. See note below. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

Note: When a ticket has been recorded in the Transient Ticket Record then the IPE_ISAMID and IPE_SAMSequenceNumber elements shall contain a pointer to any entitlement IPE used in the Tickets creation. Where this does not apply then the element may be used to record the identity of any IPE relevant to the transaction, or set to 0 indicating that no IPE is pointed to.

4.5.29 TransactionReversal, code 0300 – RecordFormatRevision = 3

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists. This message type shall only be used with Ticket Product IPE types.

This message type shall be used whenever any of the following Transaction types is reversed:

- Creation or amendment of a Ticket IPE where a 0207 or 0208 message was generated;
- A Transaction which resulted in a 0209 Journey Record message being generated;
- A Transaction where either a IPE TYP 14 or an IPE TYP 16 was used to authorise a Journey; or
- A Transaction where a Transient Ticket was created and stored in the holders CM, and a 0210 message generated.

Note that there is overlap between these various conditions, this is intentional for the avoidance of doubt.

This message type shall not be used in other circumstances (noting that there are additional message types defined for the reversal of other Transaction types).

Table 3.61 - Transaction Reversal , code 0300 – RecordFormatRevision = 3

Name	Source	Format	Size	Comment
StandardData			21	
AmountPaid	POST	VALI	4	Actual fare/price refund amount for ticket (if any), currency is defined by CurrencyCode
NormalPrice	POST	VALI	4	Full fare/price for ticket (if any), currency is defined by CurrencyCode
CurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.

StoredUsesRefunded	POST	HEX	1	Number of stored uses of the ticket refunded (if any) Refer to table 61a.
ProductRetailer	IPE	OID16	2	
StoredUses	IPE	HEX	1	Number of stored uses after transaction (if any) Refer to table 61a.
TicketNumber	IPE or POST	UD	6	Operators Ticket number, when available, otherwise set to 0. Shall be obtained from the IPE if IPE is of TYP 24, otherwise obtained from the POST. An IPE element shorter than 6 bytes shall occupy the least significant bytes of this element.
TransactionSequenceNumber	IPE	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAMS#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.5.30 Full / Partial refund for a purchased ticket (IPE), code 0301 – RecordFormatRevision = 3

This message type shall only be used with Ticket Product IPE types. This message is sent in addition to a 0007 message when an IPE is deleted and a refund given.

Table 3.62 - Full / Partial refund for a purchased ticket (IPE), code 0301 – RecordFormatRevision = 3

Name	Source	Format	Size	Comment
StandardData			21	
ProductRetailer	IPE	OID16	2	
Amount	POST	VALI	4	Amount refunded
AmountCurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TicketNumber	IPE or POST	UD	6	Operators Ticket number, when available, otherwise set to 0. Shall be obtained from the IPE if IPE is of

				TYP 24, otherwise obtained from the POST. An IPE element shorter than 6 bytes shall occupy the least significant bytes of this element.
ReasonCode	POST	UD	1	
VATSalesTax	POST	VATM	2	
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAMS#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.5.31 Deposit Received or Refunded, code 0302, 0303 - RecordFormatRevision = 3

This record relates to a deposit received or refunded for an ITSO Shell or an IPE.

When the deposit is for an ITSO Shell, the IPE-ID element of the standard data shall identify the Shell in accordance with the alternate rules for identifying a Shell as defined in table 8 such that IIN and OID are those of the Shell owner, TYP shall be set to 32, and PTYP shall be set to indicate the shell version. It is also permissible, but not preferred, that in these circumstances the IIN and OID are those of the Shell owner, TYP shall be set to 16, and PTYP shall be set to the PTYP of the TYP 16 IPE wherein the deposit amount is stored. Note that in these circumstances this method of identification of the Shell is not optional as it is with other message types. Note also that in these circumstances the IPE_IterationNumber, ProductRetailer, IPE_ISAMID and IPE_SAMSequenceNumber may be set to zero (0).

When the deposit is for an IPE, the standard data shall identify the IPE.

Note that in this version of the specification, only an 0303 message is defined at this RecordFormatRevision 3.

Note that the entire value of a deposit may be refunded, or a partial refund given, according to rules defined by the Product Owner. If the IPE remains valid after the transaction, then the remaining value of any deposit retained by the Product Owner shall be recorded in the IPE, or the DepositAmount set to zero if the entire deposit is refunded, by deleting and rewriting the IPE.

Table 3.63a - Deposit Refunded, code 0303 - RecordFormatRevision = 3

Name	Source	Format	Size	Comment
StandardData			21	
DepositType	POST	HEX	1	A value of zero (0) shall not be used. A value of one (1) indicates that the deposit applies to a Shell.

				A value of two (2) indicates that the deposit applies to an IPE. Values between three (3) and 255 inclusive are RFU.
ProductRetailer	POST	OID16	2	This data element shall contain a value identifying the Licensed Member at whose POST the deposit was refunded
DepositAmount	POST	VALI	2	DepositAmount shall be encoded according to DepositCurrencyCode This data element shall contain the value of the refunded deposit
DepositCurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 4, bits 5 to 7 shall be set to 0. This data element shall contain a value relevant to the refunded deposit
DepositMethodOfPayment	POST	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. This data element shall contain a value relevant to the refunded deposit
DepositVATSalesTax	POST	VAT	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. This data element shall contain a value relevant to the value of the refunded deposit
IPE_ IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_ SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.5.33 Supplementary Data Message, code 0310 – RecordFormatRevision = 3.

Implementation of the 0310 message is optional in POSTs.

Supplementary data messages are always subservient to another class 1 message, known as the primary message. This primary message is identified by including the message code, signing ISAM ID and signing ISAM sequence number appropriate to the primary message within the supplementary data message.

Table 3.65 - Supplementary Data Message, code 0310 - RecordFormatRevision = 3

Name	Source	Format	Size	Comment
PrimaryMessageMessageCode	POST	HEX	2	Used to match this message to the relevant primary message
PrimaryMessageSealerID	POST	HEX	7	Used to match this message to the relevant primary message (the value is found in the DF trailer)
PrimaryMessageISAMS#	POST	HEX	3	Used to match this message to the relevant primary message (the value is found in the DF trailer)
DataArea	POST	Variable	Variable, maximum 255	One or more elements encoded according to asn.1 using basic encoding rules. Allowable data elements and associated tag values are defined in Annex A.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

Table 3.66 - Supplementary Data Message, 0310 message DataArea structure Elements shall be included in the DataArea in the order shown in Table 3.66.

All characters are an ASCII representation of hexadecimal values. Note that when ASCII characters are stored, then the hexadecimal value of each ASCII code shall be stored. For example, the string "A123" shall be stored as 41 31 32 33 (HEX).

Table 3.66 - Supplementary Data Message, 0310 message DataArea structure

Tag name	Tag value	Length	Description
ITSO root	0xE0	Calculated – the length of the DataArea, excluding the length of the ITSO root tag and this length element	
ITSO data group	<i>Tag value</i>	Calculated – the length of the elements in this group, excluding the length of this tag and this length element	There may be none or one ITSO defined data groups in the message
ITSO defined-sub group (s)	<i>Tag value</i>	Calculated – the length of the elements in this group, excluding the length of this tag	There may be none, one or more than one ITSO defined sub-groups in the message

		and this length element	
ITSO defined element (s)	<i>Tag value</i>	Calculated	There may be one or more than one ITSO defined elements in the sub-group
Private data group (s)	<i>Tag value</i>	Calculated – the length of the elements in this group, excluding the length of this tag and this length element	There may be none, one or more than one user defined sub-groups in the message
ITSO OID	<i>Tag value</i>	Calculated	Where a Private Data Group(s) is included the OID of the entity responsible for the message shall be recorded here
User defined element (s)	<i>Tag value</i>	Calculated	Where a Private Data Group(s) is included the user defined data, identified by the OID of the originator included in the user defined sub-group data shall be recorded here

4.5.34 Hotlist match event, code 0311 - RecordFormatRevision = 3.

4.5.34 Hotlist match event record, code 0311 - RecordFormatRevision = 3

This message shall be used for reporting Hotlist match events.

When the Hotlist item is related to a Shell, then the IPEID element in the StandardData shall be formatted in accordance with Part 6, Table 8.

All new implementations shall use version 4, or a subsequent version, and this old version 3 should only be used for the purposes of backwards compatibility.

Table 3.67 - Hotlist match event record, code 0311 - RecordFormatRevision = 3

Name	Source	Format	Size	Comment
StandardData			21	
HotListIdentifier	List	HEX	2	
HotType	List	HEX	1	
HotListOriginator	List	OID16	2	
OriginalHotListIdentifier	List	HEX	2	
0311ActionTaken	POST	HEX	1	
0311CustomerMediaDisposition	POST	HEX	1	
IPEID	IPE	IPEIDM	7	Identifies any IPE blocked. If record relates to a Shell set this element to 0.

CreatingISAMID	IPE	HEX	4	Identifies any IPE blocked. If record relates to a Shell set this element to 0. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
CreatingISAMSeq#	IPE	HEX	3	Identifies any IPE blocked. If record relates to a Shell set this element to 0. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

Table 3.69 - 0311Customer Media Disposition Code List - RecordFormatRevision = 3

Code	Meaning
0	Unknown
1	Customer Media left with Customer Media holder
2	Customer Media left with Customer Media holder, and name and address recorded
3	Customer Media confiscated
4-255	RFU

An 0400 exception message is not required when a Hotlist match event occurs, and an error prevented the Transaction from being successfully conducted.

The 0311ActionTaken data element shall be populated with a success or exception code as defined in table 73.

Note that in circumstances where sending of an 0410 or 0810 message is required, then that message shall be sent in addition to this 0311 message, and code 142 used in the 0311ActionTaken data element. In these circumstances, for the purposes of linking the two messages in the back office:

- the 0311 message shall be sent first; and
- the 0410 or 0810 message shall be sent immediately after, such that it's message sequence number is next in the sequence after the 0311 message sequence number.

4.5.35 Actionlist match event record, code 0312 - RecordFormatRevision = 3

This message shall be used for reporting Actionlist match events.

When the Actionlist item is related to an IPE with a Value Group, then the data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this Transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

When the Actionlist item is related to a Shell, then the IPEID element in the StandardData shall be formatted in accordance with Part 6, Table 8.

All new implementations shall use version 4, or a subsequent version, and this old version 3 should only be used for the purposes of backwards compatibility.

Table 3.70 - Actionlist match event record, code 0312 - RecordFormatRevision = 3

Name	Source	Format	Size	Comment
StandardData			21	
ActionListIdentifier	List	HEX	2	
ActionListOriginator	List	OID16	2	
OriginalActionListIdentifier	List	HEX	2	
0312ActionTaken	POST	HEX	1	
ActionSequenceNumber	IPE	HEX	1	If ActionSequenceNumber was not used, set this value to 0.
IPEID	IPE	IPEIDM	7	Identifies IPE acted upon. If record relates to a Shell set this element to 0.
CreatingISAMID	IPE	HEX	4	Identifies IPE acted upon. If record relates to a Shell set this element to 0. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
CreatingISAMSeq#	IPE	HEX	3	Identifies IPE acted upon. If record relates to a Shell set this element to 0. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3. Bits 4 to 7 shall be set to zero (0).
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

Note that in all cases where the action was unsuccessful, it will be assumed that the copy of action sequence number held in the IPE (in the CM) has not been changed. The value of action sequence number returned in the match event record shall be identical to that contained in the list item.

An 0400 exception message is not required when an Actionlist match event occurs, and an error prevented the action being successfully conducted.

The 0312ActionTaken data element shall be populated with a success or exception code as defined in table 73.

In circumstances where sending of an 0410 or 0810 message is required, then that message shall be sent in addition to this 0312 message, and code 142 used in the 0312ActionTaken data element. In these circumstances, for the purposes of linking the two in the back office:

- the 0312 message shall be sent first; and
- the 0410 or 0810 message shall be sent immediately after, such that it's message sequence number is next in the sequence after the 0312 message sequence number.

4.6 Transaction Record Data Content – RecordFormatRevision = 4

The data elements shall comprise standard data always returned for each Customer Media transaction, together with transaction type specific data.

Note that in this section:

- clause numbers are chosen to match those in clause 4.4; and
- table numbers are chosen to match those in clause 4.4 and prefixed with the RecordFormatRevision number and a stop;
- therefore neither clause nor table numbers are contiguous.

4.6.1 Standard Elements – RecordFormatRevision = 4.

The following elements shall always be returned as the leading data elements (StandardData) in every transaction record for all types of transaction.

Table 4.8 - Standard Elements - RecordFormatRevision = 4

Name	Source	Format	Size	Comment
RecordFormatRevision	POST	HEX code	1	Defines format revision of this message
TransactionDateTime	POST	DTS	3	Date & time at which the transaction took place, which shall be identical to any DTS recorded in the shell, IPEs or Transient Ticket store
TransactionInformation	POST	UD	1	User defined element
StaffID	POST	HEX	4	Identifies the operators member of staff (if any) conducting the transaction. If none then 0 shall be recorded in this element.
SupplementalInformation	POST	HEX	1	Additional information code
FormatVersionCode	Shell	FVC	1	Format version information from the Shell Environment Data Group.
KeyStrategyVersion	Shell	KSC	1	Format version information from the Shell Environment Data Group
KeyVersion	Shell	KVC	1	Format version information from the Shell Environment Data Group
IPEID	Shell, Dir	IPEIDM	7	Identifies the IPE involved in the transaction, taken from the ITSO Shell's directory entry. It is a concatenation of IIN, OID, TYP and PTYP in that order. When a message is used to record an event relating to an

				<p>ITSO Shell, then this IPEID element shall either:</p> <ul style="list-style-type: none"> be made up of the Shell's IIN, the Shell owner's OID, IPE TYP - which shall be set to a value of 32 (decimal), and IPE PTYP which shall be set to either a Shell owner defined value to indicate the Shell version, or to a value of 0, or be set to 0 to indicate that the message relates to a Shell. (This option shall not be used in new or amended implementations. Note that this option will be removed in a future version of the ITSO Specification.) <p>If no IPE or Shell ID information is available, then the contents of this Data Element shall be set to 0.</p> <p>If the IPE cannot be read and IINL = 1, set the IIN portion of this element to zero (0).</p>
Shell_IterationNumber	Dir	INS#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.

Table 4.9- Supplemental information element codes - RecordFormatRevision = 4

Code	Meaning
00	No supplemental information stored
01	Test/Maintenance/training transaction
02	Incomplete transaction
03	Commercial In (required for 0209 Journey Records only)
04	Commercial Out (required for 0209 Journey Records only)
05	Minimum Subsidy In (required for 0209 Journey Records only)
06	Minimum Subsidy Out (required for 0209 Journey Records only)
07	Minimum Cost In (required for 0209 Journey Records only)
08	Minimum Cost Out (required for 0209 Journey Records only)
09 – 255	RFU

4.6.26 Create or Amend Ticket IPE, code 0207, 0208 – RecordFormatRevision = 4

This records the creation or amendment of a ticket IPE. If a simultaneous journey is made a journey record shall also be transmitted.

The actual Data is dependent upon the type of IPE being created or amended. For efficiency, the record is split into common data (common to all IPEs), IPE TYP specific data and a footer.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

It is not mandatory to send a 0208 message in parallel with a specific change message (e.g. a 0303 deposit refund message), if the 0208 message does not convey any additional information (i.e. the contents of the additional data

items sent in the 0208 message are unchanged), and if both messages would have been sent to the same destination(s).

However, optionally 0208 messages can be sent under these conditions.

4.6.26.1 Record Structure.

The record shall always be structured in the following manner, in the sequence shown.

Table 4.35 - Create or Amend Ticket IPE, code 0207, 0208, Record Structure - RecordFormatRevision = 4

Data Group	Comment
Common data	Always required
Optional data	Present according to IPE type involved, as defined by TYP and the IPEBitMap. These optional data groups shall be included in the record in the same order as they occur in this specification.
Footer	Always required

4.6.26.2 Common Data.

Table 4.36 - Common Data - RecordFormatRevision = 4

Name	Source	Format	Size	Comment
StandardData			21	
IPE-TYP	POST	TYP	1	This element shall indicate the TYP of IPE to which a message instance refers, and also indicates the type of optional data which may be found within a message instance.
NormalPrice	POST	VALI	4	Full price for ticket (if any), currency is defined by CurrencyCode
CurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
MachineNumber	POST	HEX	4	Serial number of the terminal conducting the transaction
TransactionFlags	POST	HEX	1	
MessageBitMap	DIR & POST	BMP	1	Bit 0 shall be a copy of the Value Group Present flag from the directory. This indicates whether a value group is present in an IPE instance, and therefore also present in a message instance. Bit 1 shall be set to one (1) when the ID_IPEID, ID_ISAMID and ID_ISAMSeq# data elements are included in the record. Bits 2 – 7 are RFU.
ITSOShellReferenceNumberNonE	Shell	uISRN	16	Not encrypted. Users of this data element shall

ncrypted				take note of the requirements of the General Data Protection Regulation (GDPR). In a code 0208 message, this element shall be set to zero (0)
IPEExpiryDate	Shell	DATE	2	A copy of the relevant EXP directory data element relevant to this IPE.
IPELength	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEBitMap	IPE	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0. For TYP 27, 28, 29 IPEs the contents of this element shall have no effect on the contents of a Transaction Record instance, i.e. all elements shall be included in the Transaction Record. For TYP 22-26 IPEs this element shall be used to determine which optional data elements are included in a Transaction Record instance, i.e. optional elements are only included in the Transaction Record if they are also included in the IPE instance. Refer to ITSO TS 1000-5 for the definition of IPEBitMap and optional elements.
IPEFormatRevision	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
RemoveDate	IPE	RDATE	1	
ProductRetailer	IPE	OID16	2	
ID_IPEID	IPE	IPEIDM	7	Identifies an identity IPE. Include this element only if MessageBitMap bit 1 is set to one (1). IPE instance identity details for an ID IPE contained in the same ITSO Shell as the IPE that is the subject of this message. May be sent for the purpose of enabling identification of the card holder in circumstances where the ISRN is not known due to its being encrypted.
ID_ISAMID	IPE	HEX	4	Identifies an identity IPE. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here. Include this element only if MessageBitMap bit 1 is set to one (1)
ID_ISAMSeq#	IPE	HEX	3	Identifies an identity IPE. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here. Include this element only if MessageBitMap bit 1 is set to one (1)

Table 4.37 - TransactionFlags Definition - RecordFormatRevision = 4

A combination of flags shall be set where appropriate so to do. Note that an attended POST is one where the POST is operated by a member of staff, whilst an unattended POST is one where the POST is essentially operated by the card holder.

Flag ID	Flag name	Flag purpose
0	AutoTransaction	Set to one (1) when the relevant transaction took place automatically due to auto-renew, otherwise set to zero (0). See note below.
1	ActionListTransaction	Set to one (1) when the relevant transaction took place due to an Actionlist item, otherwise set to zero (0). See note below.
2	StoredTicketActivation	Set to one (1) when the relevant transaction took place due to Stored Ticket activation, otherwise set to zero (0). See note below.
3	ManualPostTransaction	Set to one (1) when the relevant transaction took place at an attended POST, e.g. a ticket office machine or bus ticket machine, otherwise set to zero (0). Note that the use of flags 3, 4 and 5 is mutually exclusive. Only one of flags 3, 4 and 5 shall be set for every transaction.
4	UnattendedPostTransaction	Set to one (1) when the relevant transaction took place at an unattended POST, e.g. a ticket vending machine, otherwise set to zero (0). Note that the use of flags 3, 4 and 5 is mutually exclusive. Only one of flags 3, 4 and 5 shall be set for every transaction.
5	RemotePostTransaction	Set to one (1) when the relevant transaction took place with a remote POST, e.g. CM holder not present, otherwise set to zero (0). Note that the use of flags 3, 4 and 5 is mutually exclusive. Only one of flags 3, 4 and 5 shall be set for every transaction.
6	RFU	
7	RFU	

Note:

In instances where the relevant transaction has taken place and it is deemed appropriate to set the bit value to one (1), the values for bits 0, 1 and 2 shall be mutually exclusive. However, there may be instances where setting the bit value of 0, 1 or 2 to one (1) is not appropriate (i.e. for a direct fulfilment) and in such instances it may be deemed appropriate to set bits 0, 1 and 2 all to a value of zero (0).

4.6.26.3 Footer.**Table 4.38 - Footer - RecordFormatRevision = 4**

Name	Source	Format	Size	Comment
IIN	IPE	IIN	3	IIN shall always be included in the Transaction Record, where necessary it contents shall be deduced from the ITSO Shell Owner Identity.
KID	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.6.26.4 IPE TYP 22.**Table 4.39 - IPE TYP 22 - RecordFormatRevision = 4**

Name	Source	Format	Size	Comment
ProductRetailer	IPE	OID	2	
TYP22Flags	IPE	BMP	2	
PassBackTime	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ExpiryTime	IPE	TIME	2	A 1.375 byte value, occupying bits 0-7 of the least significant byte, and bits 0-2 of the most significant byte. Bits 3-7

				of the most significant byte shall be set to 0.
AutoRenewQuantity1	IPE	BIN	1	
Class	IPE	UD	1	
ValidityCode	IPE	UD	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
ValidityStartDTS	IPE	DTS	3	
PromotionCode	IPE	HEX	1	
ValidOnDaytypeCode	IPE	DOW	1	
PartySizeAdult	IPE	HEX	1	
PartySizeChild	IPE	HEX	1	
PartySizeConcession	IPE	HEX	1	
AmountPaidCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaid	IPE	VALI	4	
AmountPaidMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaidVATSalesTax	IPE	VATM	2	
CPICC	IPE	HEX	2	
ValidAtOrFrom	IPE	LOC1	Variable, maximum 17	
ValidTo	IPE	LOC1	Variable, maximum 17	
PassDuration	IPE	HEX	1	
RouteCode	IPE	UD	5	

Flag definitions are as defined for the relevant IPEs.

Table 4.40 - IPE TYP 22, Value Group - RecordFormatRevision = 4

Name	Source	Format	Size	Comment
VGLength	IPE VG	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	IPE VG	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.

VGFormatRevision	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
NumberRemainingPasses	IPE VG	BIN	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
TYP22ValueFlags	IPE VG	BMP	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0.
ExpiryDateSP	IPE VG	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ExpiryDateCurrent	IPE VG	DATE	2	

4.6.26.5 IPE TYP 23

Table 4.41 - IPE TYP 23 - RecordFormatRevision = 4

Name	Source	Format	Size	Comment
ProductRetailer	IPE	OID	2	
TYP23Flags	IPE	BMP	1	
PassBackTime	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ValidityCode	IPE	UD	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
ExpiryTime	IPE	TIME	2	A 1.375 byte value, occupying bits 0-7 of the least significant byte, and bits 0-2 of the most significant byte. Bits 3-7

				of the most significant byte shall be set to 0.
Class	IPE	UD	1	
PartySizeAdult	IPE	HEX	1	
PartySizeChild	IPE	HEX	1	
PartySizeConcession	IPE	HEX	1	
AmountPaidCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaid	IPE	VALI	4	
AmountPaidMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaidVATSalesTax	IPE	VATM	2	
PhotocardNumber	IPE	UD	4	
PromotionCode	IPE	HEX	1	
CPICC	IPE	HEX	2	
TYP23Mode	IPE	BMP	1	
MaxTransfers	IPE	HEX	1	
TimeLimit	IPE	HEX	1	
ValueOfRideJourney	IPE	VALI	2	
ValueOfRideJourneyCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
Origin1	IPE	LOC1	Variable, maximum 17	
Destination1	IPE	LOC1	Variable, maximum 17	
RouteCode	IPE	UD	5	

Flag definitions are as defined for the relevant IPEs.

Table 4.42 - IPE TYP 23 Value Group - RecordFormatRevision = 4

Name	Source	Format	Size	Comment
VGLength	IPE VG	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	IPE VG	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGFormatRevision	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
CountRemainingRidesJourneys	IPE VG	HEX	1	
CountTransfers	IPE VG	HEX	1	
TYP23ValueFlags	IPE VG	BMP	1	

4.6.26.6 IPE TYP 24

In this version of the specification, transmission of 0207 and 0208 messages relating to TYP 24 IPEs is not permitted at Record Format Revision 4.

4.6.26.7 IPE TYP 25**Table 4.49 - IPE TYP 25 - RecordFormatRevision = 4**

Name	Source	Format	Size	Comment
ProductRetailer	IPE	OID16	2	
TYP25Flags	IPE	BMP	1	
PassBackTime	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.

ValidityStartDTS	IPE	DTS	3	
ExpiryTime	IPE	TIME	2	A 1.375 byte value, occupying bits 0-7 of the least significant byte, and bits 0-2 of the most significant byte. Bits 3-7 of the most significant byte shall be set to 0.
ServiceID	IPE	UD	1	
MaxValue25	IPE	VALI	2	
MaxValueCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaidCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaid	IPE	VALI	2	
AmountPaidMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaidVATSalesTax	IPE	VATM	2	
UserDefined	IPE	UD	1	
AutoRenewQuantity2	IPE	HEX	1	

Table 4.50 - IPE TYP 25 Value Group - RecordFormatRevision = 4

Name	Source	Format	Size	Comment
VGLength	IPE VG	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	IPE VG	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGFormatRevision	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
CountUsesAvailable	IPE VG	HEX	1	
TYP25ValueFlags	IPE VG	BMP	1	

4.6.26.8 IPE TYP 26**Table 4.51 - IPE TYP 26 - RecordFormatRevision = 4**

Name	Source	Format	Size	Comment
ProductRetailer	IPE	OID16	2	
PassBackTime	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
TYP26Flags	IPE	BMP	1	
TYP26Class	IPE	UD	1	
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ValidityStartDTS	IPE	DTS	3	
UserDefined	IPE	UD	7	
AutoRenewQuantity3	IPE	HEX	1	

Table 4.52 - IPE TYP 26 Value Group - RecordFormatRevision = 4

Name	Source	Format	Size	Comment
VGLength	IPE VG	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	IPE VG	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGFormatRevision	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
CountRemainingRidesJourneys	IPE VG	HEX	1	
TYP26ValueFlags	IPE VG	BMP	1	

4.6.26.9 IPE TYP 27, 28, 29

Name	Source	Format	Size	Comment
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
Sterling/Euro	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
Child	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
PassbackTime	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AmountPaidMethod OfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AmountPaid	IPE	VALI	2	
TYP27PassFlags	IPE	BMP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
GeoValidity/AreaValidity	IPE	LOC4/ LOC3	13	The 4 most significant bits of this element shall be set to 0, with the data commencing from the 5 bit of the element. The least significant 4 bytes of this element shall be set to 0 when it contains AreaValidity
Event1	IPE	HEX	1	
Event2	IPE	HEX	1	
LastUseDTS	IPE	DTS	3	
PhotocardNumber	IPE	HEX	3	
TYP27ExpiryDate	IPE	HEX	1	
Seq#	IPE	HEX	1	Set to all 0's if this element is not present in the IPE

Table 4.55 - IPE TYP 28, IPEFormatRevision = 1, - RecordFormatRevision = 4

Name	Source	Format	Size	Comment
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
Sterling/Euro	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.

PassbackTime	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AmountPaidMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AmountPaid	IPE	VALI	2	
TYP28PassFlags	IPE	BMP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AreaValidity	IPE	LOC3	9	The 4 most significant bits of this element shall be set to 0, with the data commencing from the 5 bit of the element.
LastUseDTS	IPE	DTS	3	
ExpiryTick1	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
ExpiryTick2	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
ExpiryTick3	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
ExpiryTick4	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
ExpiryTick5	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
ExpiryTick6	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
NDoIE	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
NDoEE	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
Seq#	IPE	HEX	1	Set to all 0's if this element is not present in the IPE

Table 4.57 - IPE TYP 29, IPEFormatRevision = 1, – RecordFormatRevision = 4.

Name	Source	Format	Size	Comment
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
Sterling/Euro	IPE	FLAG	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
Ticket/Coupon	IPE	FLAG	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
ScalingFactor	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element.

				Bits 4-7 shall be set to 0.
AmountPaidMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AmountPaid	IPE	VALI	2	
TYP29PassFlags	IPE	BMP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AreaValidity	IPE	LOC3	9	The 4 most significant bits of this element shall be set to 0., with the data commencing from the 5 bit of the element.
TYP29UsageRecCode	IPE	HEX	1	A 0.375 byte value, occupying bits 0-2 of the element. Bits 3-7 shall be set to 0.
QtyRemaining	IPE	HEX	2	A 1.625 byte value, occupying bits 0-12 of the element. Bits 13-15 shall be set to 0.
UsageRecord	IPE	HEX	4	
ScaledQtyBackup	IPE	BMP	4	
Seq#	IPE	HEX	1	Set to all 0's if this element is not present in the IPE

Table 4.58 - IPE TYP 29, IPEFormatRevision = 2, - RecordFormatRevision = 4

Name	Source	Format	Size	Comment
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
Sterling/Euro	IPE	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
PassbackTime	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
MaxDailyJourneys	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
MaxTransfers	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
ScalingFactor	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
TYP29PassFlags	IPE	BMP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
AreaValidity	IPE	LOC3	9	The 4 most significant bits of this element shall be set to 0, with the data commencing from the 5 bit of the element.
JnyComDTS	IPE	DTS	3	

QtyRemaining	IPE	HEX	1	
TransferCounter	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
DailyJnyCounter	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
LastUseDTS	IPE	DTS	3	
ScaledQtyBackup	IPE	BMP	4	
Seq#	IPE	HEX	1	Set to all 0's if this element is not present in the IPE

4.6.27 Journey Record, code 0209 – RecordFormatRevision = 4

Implementation of this version of the 0209 message is mandatory in POSTs that will operate in closed system environments where product selection is performed on exit from the system. Implementation is optional in POSTs that are not designed to run in such an environment. POSTs not requiring this functionality may either use RecordFormatVersion = 2, RecordFormatVersion = 3 or this version, and may be capable of creating all versions according to need.

This record shall be used to record all Journeys made using an ITSO Customer Media. For the avoidance of doubt this includes (but is not necessarily limited to):

- Journeys when a Ticket IPE is used
- Journeys when a Transient Ticket record is created (in addition to a 0210 record)
 - Where more than one Transient Ticket is created in the course of a Journey it is only mandatory to create one 0209 message for that Journey
 - Closed System entry and exit transactions
 - The 0209 message shall be sent for either the entry or the exit transaction so as to record the Journey, and optionally may be sent for both transactions
- Usage of STR or CTA to purchase a ticket
- Usage of a voucher or open system toll IPE; and
- Free concessionary Journeys authorised solely by the ITSO ID/Entitlement IPEs, TYPs 14 and 16

This record may also be used to record other types of Transaction, at the discretion of the relevant Licensed Member.

Where the POST is operating in a check in/check out closed system environment then no 0209 record is required on entry into the system if the actual product is selected on exit from the system. In the case where no 0209 record is created a corresponding 0210 record shall still be created to record the creation of a transient ticket for entry.

The 0209 message should refer to the primary authorisation for that journey, which could be:

- a Ticket IPE used to authorise a Journey; or
- a concessionary entitlement used to authorise a free or discounted Journey; or
- a STR or CTA IPE, BUT ONLY if STR (or CTA) was used to pay for the Journey AND an IPE was neither used to authorise the Journey nor was an IPE created.

Data from this primary IPE shall be used in the 0209 message where the source is indicated to be "IPE". Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Where the primary IPE does not include a value group then the Transaction sequence number shall be set to 0. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

Table 4.59 - Journey Record, code 0209 - RecordFormatRevision = 4

Name	Source	Format	Size	Comment
StandardData			21	
AmountPaid	POST	VALI	4	Actual fare/price paid for journey (if any). Do not insert any value here if an amount value is entered in a simultaneous ticket creation or amendment record. Currency is defined by CurrencyCode.
NormalPrice	POST	VALI	4	Full fare/price for journey. Do not insert any value here if an amount value is entered in a simultaneous ticket creation or amendment record. Currency is defined by CurrencyCode.
CurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
Location	POST	LOC1	Variable, maximum 17	Location at which the journey commenced or location at which the event recorded herein occurred
Destination	POST	LOC1	Variable, maximum 17	Destination or proposed destination where known
ConcessionaryAuthority	POST	HEX	2	Identity of the concessionary authority within whose area the journey commenced, obtained from the POST configuration data where this information may be stored for this purpose. Where no concessionary authority ID data is stored in this data element then it shall be set to 0. This is a number that is unique to a given Travel Concession Authority. These numbers are allocated by the appropriate National Concessionary Travel Authority for the country in which the boarding point is located. This value might be an OID
ProductRetailer	IPE	OID16	2	
TransactionSequenceNumber	IPE	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. The current value of TS# after transaction completion, where TS# is stored in the IPE. Where the IPE does not include a value group then set this element to a value of 0.
RemainingUses	IPE	HEX	1	If a multi-use IPE (i.e. multi-ride, journey ticket or multi-use voucher) then record the remaining number of uses after the transaction. This data will be extracted from the TYP 22 NumberRemainingPasses, TYP 23 or TYP 26 CountRemainingRidesJourneys, TYP 24 CountRemainingJourneys, or TYP 25

				CountUsesAvailable, or TYP 29 QtyRemaining, IPE element, depending on the IPE used for the transaction. If the IPE element is smaller than 1 byte, then it shall occupy the least significant bits of this element. If the IPE does not include this data, then set this element to a value of 0. If the value of the data element in the IPE is greater than or equal to 255, then set this element to 255, or if the IPE value is less than 255 then set this element to that value.
CPICC	IPE	HEX	2	A copy of the IPE data element of the same name. If the IPE does not include this data, then set this element to a value of 0.
TransactionType	IPE POST	HEX	1	If a TransactionType code has been recorded in either the transient ticket log or in the IPE value record, then that value shall be recorded here. Otherwise, where no TransactionTypecode has been stored in an IPE or a transient Ticket relevant to the Journey Record, use an appropriate code according to [EN1545-1] EventTypeCode. As 8 bit codes can be stored here [whereas only 4 bit codes are permissible in IPEs] then if a more appropriate code, greater than 15, is available in the [EN1545-1] EventTypeCode list; that EventTypeCode value may be used here. Further guidance may be found in ITSO DG0007.
ServiceOperatorID	POST	UD	2	This could be an OID, or could be a user defined value, defined either by the Service Operator or by the owner of the Product used in the Transaction
ServiceNumber	POST	UD	10	An identifier for the route or service relevant to the Transaction. If there is no relevant identifier available set to a null value (0 or ASCII spaces).
TripNumberOrTrainNumber	POST	UD	10	An identifier for the bus trip number or train number relevant to the Transaction. If there is no relevant identifier available set to a null value (0 or ASCII spaces).
ReimbursementDataFlags	POST	BMP	1	Refer to Table 4.59a below
SupplementaryData	POST	Variable	Variable, maximum 255	One or more elements encoded according to asn.1 using basic encoding rules. Allowable data elements and associated tag values are defined in Annex A.
ENTRY_TT_IPE_ISAMID	TTR	ISAMID	4	Identifier of the Transient Ticket (IPE) instance of the original TTR created for check in to a closed system. This value shall be taken from the TTR TT_Entry group instance If no TTR exists or the corresponding elements are not present in a TTR to then this

				should be set to 0.
ENTRY_TT_IPE_SAMSequenceNumber	TTR	IPE ISAMS#	3	Identifier of the Transient Ticket (IPE) instance of the original TTR created for check in to a closed system. This value shall be taken from the TTR TT_Entry group instance. If no TTR exists or the corresponding elements are not present in a TTR to then this should be set to 0.
ENTRY_DateTimeStamp	TTR	DTS	3	The DateTime where the customer media checked in to the closed system. This value shall be taken from the TTR TT_Entry group instance. If no TTR exists or the corresponding elements are not present in a TTR to then this should be set to 0.
ENTRY_OID	TTR	OID16	2	The service operator OID where the customer media entered (check in) to the closed system. This value shall be taken from the TTR TT_Entry_OID group instance. If no TTR exists or the corresponding elements are not present in a TTR to then this should be set to 0.
ENTRY_IIN_Index	TTR	IINIndex	1	The IIN Index for the service operator where the customer media entered (checked in) to the closed system
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAMS#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

Table 4.59a - ReimbursementDataFlags Definition

Bit	Meaning
0	Concessionary Minimum Cost Contract if set to 1
1	Concessionary Minimum Subsidy Contract if set to 1
2	Direction (OUT or Clockwise, set to 0, IN or Anticlockwise, set to 1)
3	RFU
4	RFU
5	RFU
6	RFU
7	RFU

Note that the SupplementalInformation data element shall not also be set with reimbursement data when ReimbursementDataFlags are set.

4.6.28 Journey Record, code 0210 – RecordFormatRevision = 4

This version of the Journey record is used to record Transient Ticket records created according to TTFormatRevision 3.

Table 4.60 - Journey Record, code 0210 – RecordFormatRevision = 4

Name	Source	Format	Size	Comment
StandardData			21	
TTLength	TTR	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
TTBitMap1	TTR	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
TTFormatRevision	TTR	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TTBitMap2	TTR	BMP	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. This element shall be used to determine which optional data elements are included in a Transaction Record instance. Refer to ITSO TS 1000-5 for the definition of TTBitMap2 and optional elements.
TTTransactionType	TTR	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DateTimeStamp	TTR	DTS	3	

AmountPaidMethodOfPayment	TTR	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaidCurrencyCode	TTR	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaid	TTR	VALI	2	
CompanionTravelled	TTR	FLAG	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
ReturnTicket	TTR	FLAG	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
RFU	TTR	FLAG	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
NoFareCharged	TTR	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
AmountPaidVATSalesTax	TTR	VATM	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DestinationTT	TTR	LOC2	7	
IPEPointer	TTR	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
OriginLocation	TTR	LOC2	7	
RoutingCode	TTR	LOC2	7	
IIN	TTR	IIN	3	
IPEID1	TTR	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
IPEID2	TTR	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
IPEID3	TTR	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
IPEID4	TTR	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.
CIPEFlags	TTR	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
UserDefinedSize	POST	HEX	1	The size of the UserDefined element in bytes
UserDefined	TTR	UD	Variable	
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. See note below. This value shall be taken from the IPE data group instance information used for travel, and identifies the ISAM which was used to create the IPE. The

				IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification. See note below. This value shall be taken from the IPE data group instance information used for travel, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.6.34 Hotlist match event record, code 0311 - RecordFormatRevision = 4

This message shall be used for reporting Hotlist match events.

When the Hotlist item is related to a Shell, then the IPEID element in the StandardData shall be formatted in accordance with Part 6, Table 8.

All new implementations shall use this new version, or a subsequent version, and the old versions (RecordFormatRevisions 2 and 3) should only be used for the purposes of backwards compatibility.

Table 4.67 - Hotlist match event record, code 0311 – RecordFormatRevision = 4.

Name	Source	Format	Size	Comment
StandardData			21	
HotListIdentifier	List	HEX	2	
HotType	List	HEX	1	
HotListOriginator	List	OID16	2	
OriginalHotListIdentifier	List	HEX	2	
0311ActionTaken	POST	HEX	1	
0311CustomerMediaDisposition	POST	HEX	1	
IPEID	IPE	IPEIDM	7	Identifies any IPE blocked. If record relates to a Shell set this element to 0.
CreatingISAMID	IPE	HEX	4	Identifies any IPE blocked. If record relates to a Shell set this element to 0. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.

CreatingISAMSeq#	IPE	HEX	3	Identifies any IPE blocked. If record relates to a Shell set this element to 0. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberNonEncrypted	Shell	uISRN	16	Not encrypted. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

Table 3.69 - 0311Customer Media Disposition Code List - RecordFormatRevision = 3

Code	Meaning
0	Unknown
1	Customer Media left with Customer Media holder
2	Customer Media left with Customer Media holder, and name and address recorded
3	Customer Media confiscated
4-255	RFU

An 0400 exception message is not required when a Hotlist match event occurs, and an error prevented the Transaction from being successfully conducted.

The 0311ActionTaken data element shall be populated with a success or exception code as defined in table 73.

Note that in circumstances where sending of an 0410 message is required, then that message shall be sent in addition to this 0311 message, and code 142 used in the 0311ActionTaken data element. In these circumstances, for the purposes of linking the two messages in the back office:

- the 0311 message shall be sent first; and
- the 0410 message shall be sent immediately after, such that it's message sequence number is next in the sequence after the 0311 message sequence number.

4.6.35 Actionlist match event record, code 0312 - RecordFormatRevision = 4

This message shall be used for reporting Actionlist match events.

When the Actionlist item is related to an IPE with a Value Group, then the data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this Transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

When the Actionlist item is related to a Shell, then the IPEID element in the StandardData shall be formatted in accordance with Part 6, Table 8.

All new implementations shall use this new version, or a subsequent version, and the old version (RecordFormatRevision 2 and 3) should only be used for the purposes of backwards compatibility.

Table 4.70 - Actionlist match event record, code 0312 - RecordFormatRevision = 4

Name	Source	Format	Size	Comment
StandardData			21	
ActionListIdentifier	List	HEX	2	
ActionListOriginator	List	OID16	2	
OriginalActionListIdentifier	List	HEX	2	
ActionItemSerialNumber	List	HEX	3	
Source_Reference:ISAMID	List	ISAMID	4	Only available with ActionToTake code 15. When another ActionToTake type has been used set this value to zero (0)
Source_Reference:Ref#	List	HEX	4	Only available with ActionToTake code 15. When another ActionToTake type has been used set this value to zero (0)
0312ActionTaken	POST	HEX	1	
ActionSequenceNumber	POST	HEX	1	If ActionSequenceNumber was not used, set this value to 0.
IPEID	IPE	IPEIDM	7	Identifies IPE acted upon. If record relates to a Shell set this element to 0, except in circumstances where an IPE was created as an outcome of the match event, in which case the IPE details shall be recorded here.
CreatingISAMID	IPE	HEX	4	Identifies IPE acted upon. If record relates to a Shell set this element to 0, except in circumstances where an IPE was created as an outcome of the match event, in which case the IPE details shall be recorded here. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
CreatingISAMSeq#	IPE	HEX	3	Identifies IPE acted upon. If record relates to a Shell set this element to 0, except in circumstances where an IPE was created as an outcome of the match event, in which case the IPE details shall be recorded here. This value shall be taken from the IPE data group instance

				information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3. Bits 4 to 7 shall be set to zero (0).
ITSOShellReferenceNumberNonEncrypted	Shell via ISAM	uISRN	16	Not encrypted. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

Note that in all cases where the action was unsuccessful, it will be assumed that the copy of action sequence number held in the IPE (in the CM) has not been changed. The value of action sequence number returned in the match event record shall be identical to that contained in the list item.

An 0400 exception message is not required when an Actionlist match event occurs, and an error prevented the action being successfully conducted.

The 0312ActionTaken data element shall be populated with a success or exception code as defined in table 73.

In circumstances where sending of an 0410 message is required, then that message shall be sent in addition to this 0312 message, and code 142 used in the 0312ActionTaken data element. In these circumstances, for the purposes of linking the two in the back office:

- the 0312 message shall be sent first; and
- the 0410 message shall be sent immediately after, such that it's message sequence number is next in the sequence after the 0312 message sequence number.

4.7 Transaction Record Data Content – RecordFormatRevision = 5

The data elements shall comprise standard data always returned for each Customer Media transaction, together with transaction type specific data.

Note that in this section:

- clause numbers are chosen to match those in clause 4.4; and
- table numbers are chosen to match those in clause 4.4 and prefixed with the RecordFormatRevision number and a stop
- therefore neither clause nor table numbers are contiguous

4.7.1 Standard Elements – RecordFormatRevision = 5.

The following elements shall always be returned as the leading data elements (StandardData) in every transaction record for all types of transaction.

Table 5.8 - Standard Elements & RecordFormatRevision = 5

Name	Source	Format	Size	Comment
RecordFormatRevision	POST	HEX code	1	Defines format revision of this message. For messages formatted according to this version of the specification this value shall be set to 5 (five).
TransactionDateTime	POST	DTS	3	Date & time at which the transaction took place, which shall be identical to any DTS recorded in the shell, IPEs or Transient Ticket store
TransactionInformation	POST	UD	1	User defined element.
StaffID	POST	HEX	4	Identifies the operators member of staff (if any) conducting the transaction. If none then zero (0) shall be recorded in this element.
SupplementalInformation	POST	HEX	1	Additional information code
FormatVersionCode	Shell	FVC	1	Format version information from the Shell Environment Data Group.
KeyStrategyVersion	Shell	KSC	1	Format version information from the Shell Environment Data Group
KeyVersion	Shell	KVC	1	Format version information from the Shell Environment Data Group
IPEID	Shell, Dir	IPEIDM	7	Identifies the IPE involved in the transaction, taken from the ITSO Shell's directory entry. It is a concatenation of IIN, OID, TYP and PTYP in that order. When a message is used to record an event relating to an ITSO Shell, then this IPEID element shall either: be made up of the Shell's IIN, the Shell owner's OID, IPE TYP - which shall be set to a value of 32 (decimal), and IPE PTYP which shall be set to either a Shell owner defined value to indicate the Shell version, or to a value of zero, or be set to zero to indicate that the message relates to a Shell. (This option shall not be used in new or amended implementations. Note that this option will be removed in a future version of the ITSO Specification.) If no IPE or Shell ID information is available, then the contents of this Data Element shall be set to zero (0). If the IPE cannot be read and IINL = 1, set the IIN portion of this element to zero (0).
Shell_IterationNumber	Dir	INS#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.

Table 5.9 - Supplemental information element codes - RecordFormatRevision = 5

Code	Meaning
00	No supplemental information stored
01	Test/Maintenance/training transaction
02	Incomplete transaction
03	Commercial In (required for 0209 Journey Records only)
04	Commercial Out (required for 0209 Journey Records only)
05	Minimum Subsidy In (required for 0209 Journey Records only)
06	Minimum Subsidy Out (required for 0209 Journey Records only)
07	Minimum Cost In (required for 0209 Journey Records only)
08	Minimum Cost Out (required for 0209 Journey Records only)
09 – 255	RFU

4.7.26 Create or Amend Ticket IPE, code 0207, 0208 – RecordFormatRevision = 5

This records the creation or amendment of a ticket IPE. If a simultaneous journey is made a journey record shall also be transmitted.

The actual Data is dependent upon the type of IPE being created or amended. For efficiency, the record is split into common data (common to all IPEs), IPE TYP specific data and a footer.

Data from the most recently written IPE Value Group only shall be recorded in the appropriate elements of this transaction record. Only one set of elements shall be recorded in the record, even where more than one Value Group exists.

It is not mandatory to send a 0208 message in parallel with a specific change message (e.g. a 0303 deposit refund message), if the 0208 message does not convey any additional information (i.e. the contents of the additional data items sent in the 0208 message are unchanged), and if both messages would have been sent to the same destination(s).

However, optionally 0208 messages can be sent under these conditions.

4.7.26.1 Record Structure.

The record shall always be structured in the following manner, in the sequence shown.

Table 5.35 - Create or Amend Ticket IPE, code 0207, 0208, Record Structure - RecordFormatRevision = 5

Data Group	Comment
Common data	Always required
Optional data	Present according to IPE type involved, as defined by TYP and the IPEBitMap. These optional data groups shall be included in the record in the same order as they occur in this specification.
Footer	Always required

4.7.26.2 Common Data.**Table 5.36 - Common Data - RecordFormatRevision = 5**

Name	Source	Format	Size	Comment
StandardData			21	
IPE-TYP	POST	TYP	1	This element shall indicate the TYP of IPE to which a message instance refers, and also indicates the type of optional data which may be found within a message instance.
NormalPrice	POST	VALI	4	Full price for ticket (if any), currency is defined by CurrencyCode
CurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
MachineNumber	POST	HEX	4	Serial number of the terminal conducting the transaction
TransactionFlags	POST	HEX	1	
MessageBitMap	DIR & POST	BMP	1	Bit 0 shall be a copy of the Value Group Present flag from the directory. This indicates whether a value group is present in an IPE instance, and therefore also present in a message instance. Bit 1 shall be set to one (1) when the ID_IPEID, ID_ISAMID and ID_ISASeq# data elements are included in the record. Bits 2 – 7 are RFU.
ITSOShellReferenceNumberNonEncrypted	Shell	uISRN	16	Not encrypted. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR). In a code 0208 message, this element shall be set to zero (0)
IPEExpiryDate	Shell	DATE	2	A copy of the relevant EXP directory data element relevant to this IPE.

IPELength	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEBitMap	IPE	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0. For TYP 27, 28, 29 IPEs the contents of this element shall have no effect on the contents of a Transaction Record instance, i.e. all elements shall be included in the Transaction Record. For TYP 22-26 IPEs this element shall be used to determine which optional data elements are included in a Transaction Record instance, i.e. optional elements are only included in the Transaction Record if they are also included in the IPE instance. Refer to ITSO TS 1000-5 for the definition of IPEBitMap and optional elements.
IPEFormatRevision	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
RemoveDate	IPE	RDATE	1	
ProductRetailer	IPE	OID16	2	
ID_IPEID	IPE	IPEIDM	7	Identifies an identity IPE. Include this element only if MessageBitMap bit 1 is set to one (1). IPE instance identity details for an ID IPE contained in the same ITSO Shell as the IPE that is the subject of this message. May be sent for the purpose of enabling identification of the card holder in circumstances where the ISRN is not known due to its being encrypted.
ID_ISAMID	IPE	HEX	4	Identifies an identity IPE. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here. Include this element only if MessageBitMap bit 1 is set to one (1)
ID_ISAMSeq#	IPE	HEX	3	Identifies an identity IPE. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used

				here. Include this element only if MessageBitMap bit 1 is set to one (1)
--	--	--	--	---

Table 5.37 - TransactionFlags Definition - RecordFormatRevision = 5

A combination of flags shall be set where appropriate to do so. Note that an attended POST is one where the POST is operated by a member of staff, whilst an unattended POST is one where the POST is essentially operated by the card holder.

Flag ID	Flag name	Flag purpose
0	AutoTransaction	Set to one (1) when the relevant transaction took place automatically due to auto-renew, otherwise set to zero (0). See note below.
1	ActionListTransaction	Set to one (1) when the relevant transaction took place due to an Actionlist item, otherwise set to zero (0). See note below.
2	StoredTicketActivation	Set to one (1) when the relevant transaction took place due to Stored Ticket activation, otherwise set to zero (0). See note below.
3	ManualPostTransaction	Set to one (1) when the relevant transaction took place at an attended POST, e.g. a ticket office machine or bus ticket machine, otherwise set to zero (0). Note that the use of flags 3, 4 and 5 is mutually exclusive. Only one of flags 3, 4 and 5 shall be set for every transaction.
4	UnattendedPostTransaction	Set to one (1) when the relevant transaction took place at an unattended POST, e.g. a ticket vending machine, otherwise set to zero (0). Note that the use of flags 3, 4 and 5 is mutually exclusive. Only one of flags 3, 4 and 5 shall be set for every transaction.
5	RemotePostTransaction	Set to one (1) when the relevant transaction took place with a remote POST, e.g. CM holder not present, otherwise set to zero (0). Note that the use of flags 3, 4 and 5 is mutually exclusive. Only one of flags 3, 4 and 5 shall be set for every transaction.
6	RFU	
7	RFU	

Note:

In instances where the relevant transaction has taken place and it is deemed appropriate to set the bit value to one (1), the values for bits 0, 1 and 2 shall be mutually exclusive. However, there may be instances where setting the bit value of 0, 1 or 2 to one (1) is not appropriate (i.e. for a direct fulfilment) and in such instances it may be deemed appropriate to set bits 0, 1 and 2 all to a value of zero (0).

4.7.26.3 Footer.

Table 5.38 - Footer - RecordFormatRevision = 5

Name	Source	Format	Size	Comment
IIN	IPE	IIN	3	IIN shall always be included in the Transaction Record, where necessary its contents shall be deduced from the ITSO Shell Owner Identity.
KID	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

4.7.26.4 IPE TYP 22 - IPE Format Revision 3, RecordFormatRevision = 5**Table 5.39 - IPE TYP 22 - RecordFormatRevision = 5**

Name	Source	Format	Size	Comment
ProductRetailer	IPE	OID	2	
TYP22Flags	IPE	BMP	2	
PassBackTime	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ExpiryTime	IPE	TIME	2	A 1.375 byte value, occupying bits 0-7 of the least significant byte, and bits 0-2 of the most significant byte. Bits 3-7 of the most significant byte shall be set to 0.
AutoRenewQuantity1	IPE	BIN	1	
Class	IPE	UD	1	
ValidityCode	IPE	UD	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.

ValidityStartDate	IPE	Date	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ValidityStartTime	IPE	Time	2	A 1.375 byte value, occupying bits 0-7 of the least significant byte, and bits 0-2 of the most significant byte. Bits 3-7 of the most significant byte shall be set to 0.
PromotionCode	IPE	HEX	1	
ValidOnDaytypeCode	IPE	DOW	1	
PartySizeAdult	IPE	HEX	1	
PartySizeChild	IPE	HEX	1	
PartySizeConcession	IPE	HEX	1	
AmountPaidCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaid	IPE	VALI	4	
AmountPaidMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaidVATSalesTax	IPE	VATM	2	
CPICC	IPE	HEX	2	
PassDurationCode	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
PassDuration	IPE	HEX	2	A 1.5 byte value, occupying bits 0 to 11, bits 12 to 15 shall be set to 0.
ExpiryDateSPDuration	IPE	HEX	2	
RouteCode	IPE	UD	5	
ValidAtOrFrom	IPE	LOC1	Variable, maximum 17	
ValidTo	IPE	LOC1	Variable, maximum 17	
IdentityDocumentIDType	IPE	HEX	1	A 0.375 byte value, occupying bits 0-2 of the element. Bits 3-7 shall be set to 0. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
IdentityDocumentIDLength	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
IdentityDocumentID	IPE	HEX	Variable, maximum 31	Length is determined by IdentityDocumentIDLength. See comment below regarding data type. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).

Flag definitions are as defined for the relevant IPEs.

Note: IdentityDocumentID data type, as stored in IPEs, is variable. It may be of type ASCII, or of type HEX. However, this causes difficulties with conversion from Native Format to Transmission format (See ITSO TS1000-9 Appendix A). Therefore, this data element shall always be treated as of data type HEX when in a Native Format message. For example, if IdentityDocumentID contained the Native Format ASCII string "ITSO", this would be considered to be the HEX string 0x4954534F and converted to the ASCII Transmission Format string "4954534F"

Table 5.40 - IPE TYP 22, Value Group - RecordFormatRevision = 5

Name	Source	Format	Size	Comment
VGLength	IPE VG	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	IPE VG	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGFormatRevision	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
NumberRemainingPasses	IPE VG	BIN	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
TYP22ValueFlags	IPE VG	BMP	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0.
ExpiryDateSP	IPE VG	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ExpiryDateCurrent	IPE VG	DATE	2	

4.7.26.5 IPE TYP 23 - IPE Format Revision 3, RecordFormatRevision = 5**Table 5.41 - IPE TYP 23 - RecordFormatRevision = 5**

Name	Source	Format	Size	Comment
ProductRetailer	IPE	OID	2	
TYP23Flags	IPE	BMP	1	
PassBackTime	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IssueDate	IPE	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
ValidityStartDTS	IPE	DTS	3	
ValidityCode	IPE	UD	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to 0.

ExpiryTime	IPE	TIME	2	A 1.375 byte value, occupying bits 0-7 of the least significant byte, and bits 0-2 of the most significant byte. Bits 3-7 of the most significant byte shall be set to 0.
Class	IPE	UD	1	
PartySizeAdult	IPE	HEX	1	
PartySizeChild	IPE	HEX	1	
PartySizeConcession	IPE	HEX	1	
AmountPaidCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaid	IPE	VALI	4	
AmountPaidMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaidVATSalesTax	IPE	VATM	2	
PhotocardNumber	IPE	UD	4	
PromotionCode	IPE	HEX	1	
CPICC	IPE	HEX	2	
AutoRenewQuantity	IPE	HEX	1	
TYP23Mode	IPE	BMP	1	
MaxTransfers	IPE	HEX	1	
TimeLimit	IPE	HEX	1	
ValueOfRideJourney	IPE	VALI	4	
ValueOfRideJourneyCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
Origin1	IPE	LOC1	Variable, maximum 17	
Destination1	IPE	LOC1	Variable, maximum 17	
RouteCode	IPE	UD	5	

Flag definitions are as defined for the relevant IPEs.

Table 5.42 - IPE TYP 23 Value Group - RecordFormatRevision = 5

Name	Source	Format	Size	Comment
VGLength	IPE VG	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	IPE VG	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGFormatRevision	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	IPE VG	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.

TransactionSequenceNumber	IPE VG	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
CountRemainingRidesJourneys	IPE VG	HEX	1	
CountTransfers	IPE VG	HEX	1	
TYP23ValueFlags	IPE VG	BMP	1	
ExpiryDateSRJ	IPE VG	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.

4.7.26.6 IPE TYP 24

Table 5.43 - TYP 24 Core data segment (always included) – RecordFormatRevision = 5

Name	Source	Format	Size	Comment
ProductRetailer	IPE	OID16	2	
TYP24Flags	IPE	BMP	2	A 1.5 byte value, occupying bits 0 to 11, bits 12 to 15 shall be set to 0.
ProductTypeEncoding	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TicketNumber	IPE	UD	4	
NumberOfAssociatedIPEs	IPE	HEX	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0.
NumberOfDiscounts	IPE	HEX	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0.
NumberOfSupplements	IPE	HEX	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0.
NumberOfTransferTypes	IPE	HEX	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0.
NumberOfInterchanges	IPE	HEX	1	A 0.375 byte value, occupying bits 0 to 2, bits 3 to 7 shall be set to 0.
NumberOfRestrictionTimeBands	IPE	HEX	1	A 0.375 byte value, occupying bits 0 to 2, bits 3 to 7 shall be set to 0.
NumberOfVehicleSpecificRestrictions	IPE	HEX	1	A 0.375 byte value, occupying bits 0 to 2, bits 3 to 7 shall be set to 0.
NumberOfRoutingPoints	IPE	HEX	1	A 0.375 byte value, occupying bits 0 to 2, bits 3 to 7 shall be set to 0.

Class	IPE	HEX	1	A 0.375 byte value, occupying bits 0 to 2, bits 3 to 7 shall be set to 0.
AutoRenewTimeAfterExpiry	IPE	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
NumberOfJourneysSold	IPE	HEX	2	A 1.125 byte value, occupying bits 0 to 8, bits 9 to 15 shall be set to 0.
OutPortionPeriodOfValidity	IPE	HEX	2	A 1.125 byte value, occupying bits 0 to 8, bits 9 to 15 shall be set to 0.
RtnPortionPeriodOfValidity	IPE	HEX	2	A 1.125 byte value, occupying bits 0 to 8, bits 9 to 15 shall be set to 0.
OperatorSpecificity	IPE	UD	2	
FaresTypeOfTicket	IPE	UD	3	
PartySizeAdult	IPE	HEX	1	
PartySizeChild	IPE	HEX	1	
PartySizeConcession	IPE	HEX	1	
IdDocumentReference	IPE	UD	4	
Origin	IPE	LOC1	Variable Maximum 17	
Destination	IPE	LOC1	Variable Maximum 17	
AlternativeOrigin	IPE	LOC1	Variable Maximum 17	
AlternativeDestination	IPE	LOC1	Variable Maximum 17	
Route	IPE	UD	5	
OutPortionValidFrom	IPE	DTS	3	
RtnPortionValidFrom	IPE	DTS	3	
RestrictionCode	IPE	UD	2	
DaysTravelPermitted	IPE	DOW	1	
DaysRestrictionApplies	IPE	DOW	1	
AmountPaidCurrencyCode	IPE	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaidMOP	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4

				to 7 shall be set to 0.
AmountPaid	IPE	VALI	4	
VendorLoc	IPE	LOC1	Variable Maximum 17	

Table 5.44 - TYP 24 AssociatedIPE Segment (included n times only if the value (n) of NumberOfAssociatedIPEs is not equal to 0) – RecordFormatRevision = 5

Name	Source	Format	Size	Comment
IPEInstanceID	AssociatedIPE	HEX	1	

Table 5.45 - TYP 24 Discounts Segment (included n times only if the value (n) of NumberOfDiscounts is not equal to 0) – RecordFormatRevision = 5

Name	Source	Format	Size	Comment
DiscountCode	Discounts	UD	5	
DiscountAmount	Discounts	VALI	4	
DiscountPercentage	Discounts	HEX	2	A 1.25 byte value, occupying bits 0 to 9, bits 10 to 15 shall be set to 0.
DiscountCodeType	Discounts	UD	1	A 0.625 byte value, occupying bits 0 to 4, bits 5 to 7 shall be set to 0.
RFU	Discounts	RFU	1	

Table 5.46 - TYP 24 Supplement Segment (included n times only if the value (n) of NumberOfSupplements is not equal to 0) – RecordFormatRevision = 5

Name	Source	Format	Size	Comment
AssociatedSupplementCode	Supplement	ASCII	3	

Table 5.47 - TYP 24 Interchange Segment (included n times only if the value (n) of NumberOfInterchanges is not equal to 0) – RecordFormatRevision = 5

Name	Source	Format	Size	Comment
OutOfLocationInterchangeExit	Interchange	LOC1	Variable Maximum	

			17	
OutOfLocationInterchangeEntry	Interchange	LOC1	Variable Maximum 17	
PermittedInterchangeTime	Interchange	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
RFU	Interchange	RFU	1	

Table 5.48 - TYP 24 Transfers Segment (included n times only if the value (n) of NumbersOfTransferTypes is not equal to 0) – RecordFormatRevision = 5

Name	Source	Format	Size	Comment
TransferEntitlementType	Transfers	HEX	1	
NumberOfTransfers	Transfers	HEX	2	A 1.125 byte value, occupying bits 0 to 8, bits 9 to 15 shall be set to 0.
RFU	Transfers	RFU	2	
ExtendedValidityPeriod	Transfers	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.

Table 5.48a - TYP 24 Restriction1 Segment (included n times only if the value (n) of NumberOfRestrictionTimeBands is not equal to 0) – RecordFormatRevision = 5

Name	Source	Format	Size	Comment
OperatorApplicability	Restriction1	UD	2	
SpecificLocationApplicability	Restriction1	LOC1	Variable Maximum 17	
TimeBandOnOutOrReturn	Restriction1	BMP	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0.
TimeBandStart	Restriction1	TIME	2	A 1.375 byte value, occupying bits 0 to 10, bits 11 to 15 shall be set to 0.
TimeBandEnd	Restriction1	TIME	2	A 1.375 byte value, occupying bits 0 to 10, bits 11 to 15 shall be set to 0.
TimeBandOnArriveOrDepart	Restriction1	FLAG	1	A 0.125 byte value, occupying bits 0, bits 1 to 7 shall be set to 0.
TimeBandIncludeExcludeFlag	Restriction1	FLAG	1	A 0.125 byte value, occupying bits 0, bits 1 to 7 shall be set to 0.
RFU	Restriction1	RFU	1	

Table 5.48b - TYP 24 Restriction2 Segment (included n times only if the value (n) of NumberOfVehicleSpecificRestrictions is not equal to 0) – RecordFormatRevision = 5

Name	Source	Format	Size	Comment
SpecificVehicleDepartureLocation	Restriction2	LOC1	Variable Maximum 17	
SpecificServiceId	Restriction2	UD	6	
SpecificVehicleDepartureTime	Restriction2	TIME	2	A 1.375 byte value, occupying bits 0 to 10, bits 11 to 15 shall be set to 0.
RestrictionOrEasementFlag	Restriction2	FLAG	1	A 0.125 byte value, occupying bits 0, bits 1 to 7 shall be set to 0.

Table 5.48c - TYP 24 Route Segment (included n times only if the value (n) of NumberOfRoutingPoints is not equal to 0) – RecordFormatRevision = 5

Name	Source	Format	Size	Comment
RoutingLocation	Route	LOC1	Variable Maximum 17	
ViaNotVia	Route	UD	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0.
RFU	Route	RFU	1	

Table 5.48d - TYP 24 PaxDetail Segment (included only if bit 1 of IPEBitMap is set.) – RecordFormatRevision = 5

Name	Source	Format	Size	Comment
Name	PaxDetail	ASCII	20	
Gender	PaxDetail	BMP	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0.
RFU	PaxDetail	RFU	1	

Table 5.48e - TYP 24 Value Group – RecordFormatRevision = 5

Name	Source	Format	Size	Comment
VGLength	V	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGBitMap	V	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGFormatRevision	V	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionType	V	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TransactionSequenceNumber	V	TS#	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DateTimeStamp	V	DTS	3	
ISAMIDModifier	V	HEX	4	
ActionSequenceNumber	V	HEX	1	
JourneysRemaining	V	HEX	1	
TransfersRemaining	V	BMP	2	A 1.375 byte value, occupying bits 0 to 10, bits 11 to 15 shall be set to 0.
JourneyPartUsedFlag	V	FLAG	1	A 0.125 byte value, occupying bits 0, bits 1 to 7 shall be set to 0.
NumberOfReservations	V	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
RFU	V	RFU	2	

Table 5.48f - TYP24 Value Group Extension – RecordFormatRevision = 5

Name	Source	Format	Size	Comment
VGXLength	VX	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
VGXRef (Bit9; Bit8)	VX	BMP	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0. This element shall be included in the message only if MessageBitMap/0 = 1.
VGXRef (Bit7 – Bit0)	VX	HEX	1	This element shall be included in the message only if MessageBitMap/0 = 1.

DTSOfLastValidation	VX	DTS	3	
LocationOfLastValidation	VX	LOC1	Variable Maximum 17	
BookingReference	VX	ASCII	8	

Table 5.48g - TYP 24Value Group VO Segment (included n times only if the value (n) of NumberOfReservations is not equal to 0) – RecordFormatRevision = 5

Name	Source	Format	Size	Comment
LegDepartureDateTime	VXO	DTS	3	
LegServiceId	VXO	ASCII	6	
LegOrigin	VXO	LOC1	Variable Maximum 17	
LegDestination	VXO	LOC1	Variable Maximum 17	
Coach	VXO	ASCII	2	
SeatNumber	VXO	ASCII	3	
AccommodationAttribute	VXO	ASCII	4	
SeatDirection	VXO	BMP	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0.
BerthUpperLower	VXO	BMP	1	A 0.25 byte value, occupying bits 0 to 1, bits 2 to 7 shall be set to 0.
ReservationType	VXO	UD	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TogetherFlag	VXO	FLAG	1	A 0.125 byte value, occupying bits 0, bits 1 to 7 shall be set to 0.
RFU	VXO	RFU	1	

4.7.28 Journey Record, code 0210 – RecordFormatRevision = 5

This version of the Journey record is used to record Transient Ticket records created according to TTFormatRevision 4.

Table 5.60 - Journey Record, code 0210 – RecordFormatRevision = 5

Name	Source	Format	Size	Comment
StandardData			21	
TTLLength	TTR	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
TTBitMap1	TTR	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
TTFormatRevision	TTR	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
TTBitMap2	TTR	BMP	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0. This element shall be used to determine which optional data elements are included in a Transaction Record instance. Refer to ITSO TS 1000-5 for the definition of TTBitMap2 and optional elements.
TTTransactionType	TTR	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DateTimeStamp	TTR	DTS	3	
AmountPaidMethodOfPayment	TTR	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaidCurrencyCode	TTR	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
AmountPaid	TTR	VALI	2	
CompanionTravelled	TTR	FLAG	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
ReturnTicket	TTR	FLAG	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
RFU	TTR	FLAG	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
NoFareCharged	TTR	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
AmountPaidVATSalesTax	TTR	VATM	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DestinationTT	TTR	LOC2	7	
IPEPointer	TTR	HEX	1	A 0.625 byte value, occupying bits 0-4

				of the element. Bits 5-7 shall be set to 0.
OriginLocation	TTR	LOC2	7	
RoutingCode	TTR	LOC2	7	
IIN	TTR	IIN	3	
CIPE1_ISAMID	IPE	ISAM ID	4	Identifies IPE instance of the first candidate IPE. This value shall be taken from the IPE data group instance.
CIPE1_SAMSequenceNumber	IPE	ISAM S#	3	Identifies IPE instance of the first candidate IPE. This value shall be taken from the IPE data group instance.
CIPE2_ISAMID	IPE	ISAM ID	4	Identifies IPE instance of the second candidate IPE. This value shall be taken from the IPE data group instance.
CIPE2_SAMSequenceNumber	IPE	ISAM S#	3	Identifies IPE instance of the second candidate IPE. This value shall be taken from the IPE data group instance.
CIPE3_ISAMID	IPE	ISAM ID	4	Identifies IPE instance of the third candidate IPE. This value shall be taken from the IPE data group instance.
CIPE3_SAMSequenceNumber	IPE	ISAM S#	3	Identifies IPE instance of the third candidate IPE. This value shall be taken from the IPE data group instance.
CIPE4_ISAMID	IPE	ISAM ID	4	Identifies IPE instance of the fourth candidate IPE. This value shall be taken from the IPE data group instance.
CIPE4_SAMSequenceNumber	IPE	ISAM S#	3	Identifies IPE instance of the fourth candidate IPE. This value shall be taken from the IPE data group instance.
CIPEFlags	TTR	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to 0.
ENTRY_IPE_ISAMID	TTR	ISAM ID	4	Identifies the TTR (IPE) instance of the original TTR created for check in to a closed system. This value shall be taken from the (TTR)IPE data group instance.
ENTRY_IPE_SAMSequenceNumber	TTR	IPE ISAM S#	3	Identifies the TTR (IPE) instance of the original TTR created for check in to a closed system. This value shall be taken from the (TTR)IPE data group instance.
ENTRY_DateTimeStamp	TTR	DTS	3	The DateTime where the customer media checked in to the closed system. This value shall be taken from the (TTR) DateTimeStamp field.
ENTRY_OID	TTR	OID	2	The service operator OID where the

				customer media entered (checked in) to the closed system
ENTRY_IIN_Index	TTR	IINIndex	1	The IIN Index for the service operator where the customer media entered (checked in) to the closed system
UserDefinedSize	POST	HEX	1	The size of the UserDefined element in bytes
UserDefined	TTR	UD	Variable	
IPE_ISAMID	IPE	ISAM ID	4	Included for IPE instance identification. See note below. This value shall be taken from the IPE data group instance information used for travel, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM S#	3	Included for IPE instance identification. See note below. This value shall be taken from the IPE data group instance information used for travel, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	

5. HOPS – HOPS and HOPS – POST Data List Transmission Mechanism.

This clause defines:

- Message data content relating to messages between HOPS and POST
- Response message data content between POST and HOPS, where the response is not a record of a Customer Media transaction
- Message data content sent between HOPS and HOPS

5.1 Message Format.

Messages shall be formatted in accordance with ITSO TS 1000-9.

Use of messages using codes 0600 (combined Hotlists and Actionlists), 0604 (combined Data Correction Record), 0C02 (Hotlists), 0C03 (Actionlists) and 0C04 (Data Correction Record) is deprecated in this version of the Specification and references to these message codes shall be removed from the next version of the Specification.

When messages are sent according to message codes 0C00 to 0CFF, then each item in a list shall be transmitted as a single Data Block as defined in ITSO TS 1000-9.

Messages sent according to message codes 0601 to 06FF support the transmission of multiple list items (of the same type) in a single Data Block as defined in ITSO TS 1000-9. Implementation of this type of message is mandatory in both HOPS and POST.

Messages sent according to message code 0600 allows multiple records of multiple types to be included within a single data block as defined in ITSO TS 1000-9. Implementation of this type of message is optional and retained for backwards compatibility in both HOPS and POST.

5.2 Message Codes.

Table 78 - Data List Transmission, Message codes

Group	Transaction Type	HEX CODE single record per Data Block	HEX CODE multiple records per Data Block (i.e. using a hash)
POST Configuration	RFU	0C00	--
	Multiple records of multiple types	--	0600
	RFU	0C01	0601
	Hotlist	0C02	0602
	Actionlist	0C03	0603
	Data Correction record	0C04	0604
	Class 1 Data Frame Collection	N/A	0605
	RFU	0C06- 0CFF	0606- 06FF

Note that POST event match messages (codes 310-312) shall be sent by the POST to the HOPS in response to receipt and actioning of the matching POST configuration message.

Where the size of an Actionlist item would exceed the maximum size permitted for a normal message using the 0C03 message type, for example when an IPE_Fulfilment_Action or a TYP24_Reservation_Group is sent, then the 0603 message type which uses a hash shall be employed.

5.3 HOPS to POST Configuration message data.

5.3.1 Multi Record Transmission, multiple types (message code 0600)

Use of message code 0600 is deprecated in this version of the Specification and will be removed from the next version of the Specification.

A message according to the 0600 code can be utilised to send multiple list items records, of multiple types, within a single Data Block. Records according to message codes 0A01 to 0AFF and 0C01 to 0CFF can be included in a 0600 message. These messages also use the hash sealing method defined in ITSO 1000-9 to further improve the efficiency of transmitting large numbers of lists item records.

A multi record message shall always consist of the following data groups, in the order shown

- A header, which defines the message contents; and
- A number of item records, included in the same order as each type of item is identified in the header.

Table 78a - Multi Record (Multi Type) Header Definition

Name	Format	Size	Description
QtyHeaderItems	HEX	3	The number of HeaderItem records within this header.
HeaderItem	HEX	6	Defined in table 78b. As many HeaderItems may be included as necessary.

Table 78b - HeaderItem Definition

Name	Format	Size	Description
RecordType	HEX	2	A Message code in the range 0A00 to 0AFF or 0C00 to 0CFF
QtyRecords	HEX	2	The quantity of records of this type included in the list
Offset	HEX	2	The offset, in bytes, of the first byte in the first record. For the first HeaderItem in the header, this value shall be set to 0.

It is recommended that all records of a single type be grouped together in the message.

5.3.2 Multi Record Transmission (message codes 0601 to 06FF)

Messages according to codes 0601 to 06FF can be utilised to send multiple records (of the same type) within a single Data Block. These messages also uses the hash sealing method defined in ITSO 1000-9 to further improve the efficiency of transmitting large numbers of records.

A multi record message shall always consist of the following data groups, in the order shown

- A header; and

- A number of item records

Table 78c - Multi Record (single type) Header Definition

Name	Format	Size	Description
Number of List Item Records	HEX	3	The number of list item records within this data block.

5.3.3 Hotlist and Actionlist item records, code 0C02, 0C03

This data set shall be transmitted as a class 2 message, using the message codes defined in table 78, when the data will be stored in and processed by a POST.

Hotlist and Actionlist items are made up from a number of groups of data elements

A record shall always consist of the following data groups, in the order shown

- A header (either KeyType 0 or KeyType 1)
- A record version number record
- An optional record defining an IPE, used together with a KeyType 0 header, in circumstances where a search first looks for a shell instance, and second looks for an IPE instance contained within that shell.
- A Hotlist or Actionlist data group
- Optional Actionlist data elements and groups, which if more than one is included, shall be included in the same order as defined herein

The header shall contain a bit map element, which defines which data groups follow in the record

The initial 8 bytes of Hotlist and Actionlist records have special significance; they are intended to form the primary search string when searching the lists. Multiple formats for these 8 bytes are possible, identified by KeyType.

A further optional data group allows further identification of IPEs.

5.3.3.1 Hotlist and Actionlist Search Strings

5.3.3.1.1 Hotlist and Actionlist Search Strings Version 0

Clause contents deleted, numbering retained

5.3.3.1.2 Hotlist and Actionlist Search Strings Version 1

This version 1 is deprecated in this version of the Specification. References to this version will be removed from the next version of the Specification.

Note that this version 1 is included only to enable Actionlist processing to function in the case where either the HOPS or the POST only support a previous version of this Specification (i.e. Version 2.1.4 or earlier).

Table 179 - KeyType Definitions - Version 1

KeyType	Interpretation
0	Item applies to a search for an ITSO Shell.
1	List applies to a search for an IPE instance. This search shall only be used when the CMD does not support an identifiable Shell or the Shell ISRN is unknown.
2-255	RFU

Table 180 - KeyType 0, Header Definition - Version 1

Note that data elements from KeyType to ISRN_CHD (the initial 8 bytes) shall be used as the ISAM search string.

Name	Format	Size	Description
Keytype	HEX	0.5	For lists of the type defined in this table, the value of this element shall be set to 0. ISAM search string element.
INS#	HEX	0.5	Shell iteration number ISAM search string element.
IIN_Index	HEX	1	See clause 6.7.10 (table 111) ISAM search string element.
ISRN_OID	HEX	2	OID extracted from ISRN ISAM search string element.
ISRN_ISSN	HEX	3.5	ISSN extracted from ISRN ISAM search string element.
ISRN_CHD	HEX	0.5	ISRN check digit ISAM search string element.
RecordLength	HEX	2	Defines the length, in native format, of the data set commencing with and including the RecordType element, and all the subsequent elements in the record, but excluding all preceding data.
RecordType	HEX	1	Defines the type of record which follows
Bitmap	BMP	2	

Table 181 - KeyType 1, Header Definition - Version 1

Note that data elements from KeyType to ISAM seq# (the initial 8 bytes) shall be used as the ISAM search string.

Name	Format	Size	Description
Keytype	HEX	0.5	For lists of the type defined in this table, the value of this element shall be set to one. ISAM search string element.

INP#	HEX	0.5	IPE iteration number ISAM search string element.
ISAM ID	HEX	4	ISAM identity ISAM search string element.
ISAM seq#	HEX	3	ISAM sequence number ISAM search string element.
RecordLength	HEX	2	Defines the length, in native format, of the data set commencing with and including the RecordType element, and all the subsequent elements in the record, but excluding all preceding data.
RecordType	HEX	1	Defines the type of record which follows
Bitmap	BMP	2	

Table 182a - Record Version Number Record Definition - Version 1

Name	Format	Size	Description
RecordVersionNumber	HEX	1	A number indicating the version of the following data. For records according to this version of the specification, this element shall be set to a value of one (1).

Table 182 - IPE ID Optional Additional Identification Group Definition - Version 1

This data group shall be included when the primary search is for a Shell, and a secondary search for an IPE instance within that shell.

Name	Format	Size	Description
IPE_IIN	IIN	3	
IPE_OID	HEX	2	OID16: The value FFFF hex shall indicate a Wildcard
IPE_TYP	HEX	1	TYP: The value FF hex shall indicate a Wildcard
IPE_PTyp	HEX	1	PTYP: The value FF hex shall indicate a Wildcard
IPE_INP#	HEX	1	IPE iteration number: A 4 bit number, stored in the least significant bits of this element. The most significant bits of this element shall be set to zero (0). The value FF hex shall indicate a Wildcard
IPE_ISAMID_Creator	HEX	4	ISAMID: The value FFFFFFFF hex shall indicate a Wildcard
IPE_ISAMS#_Creator	HEX	3	The value FFFFFFF hex shall indicate a Wildcard

Great care should be taken when using Wildcards. When the target is a specific IPE then Wildcards shall not be used.

Table 183 - Bit Map Definition - Version 1

Bit#	Data group present if bit is set
0	IPEID
1	Hotlist
2	Actionlist
3	Action Date element
4	Action Quantity element
5	Action Amount element
6	Second Action Amount element
7	Action IPE element
8	Action new iteration number element
9	RecordVersionNumber element
10	IPE_Fulfilment_Action present
11	TYP 24 Transfers Element
12	TYP 24 Reservation Group
13-14	RFU
15	Secondary Bitmap Element

5.3.3.1.3 Hotlist and Actionlist Search Strings Version 2

Where both HOPS and POST support this version of this specification, then this Version 2 of the Hotlist and Actionlist Search Strings shall be used.

Table 200 - KeyType Definitions - Version 2

KeyType	Interpretation
0	Item applies to a search for an ITSO Shell
1	List applies to a search for an IPE instance. This search shall only be used when the CMD does not support an identifiable Shell or the ISRN is unknown.
2-255	RFU

Table 201 - KeyType 0, Header Definition - Version 2

Note that data elements from KeyType to ISRN_CHD (the initial 8 bytes) shall be used as the ISAM search string.

Name	Format	Size	Description
Keytype	HEX	0.5	For lists of the type defined in this table, the value of this element shall be set to 0. ISAM search string element.
INS#	HEX	0.5	Shell iteration number ISAM search string element. In circumstances where the Hotlist or Actionlist is searching for a Shell which is not owned by the list originator, and where the value of INS# is unknown, a wildcard value of 0xF hex may be used. Where this value is used, the POST shall match any value of INS#. The INS# wildcard may only be used when Hotlisting an IPE. It shall not be used, and the true value of INS# shall be used, whenever a shell is Hotlisted.
IIN_Index	HEX	1	See clause 6.7.10 (table 111) ISAM search string element.
ISRN_OID	HEX	2	OID extracted from ISRN ISAM search string element.
ISRN_ISSN	HEX	3.5	ISSN extracted from ISRN ISAM search string element.
ISRN_CHD	HEX	0.5	ISRN check digit ISAM search string element.
RecordLength	HEX	2	Defines the length, in native format, of the data set commencing with and including the RecordType element, and all the subsequent elements in the record, but excluding all preceding data.
RecordType	HEX	1	Defines the type of record which follows, see table 206
Bitmap	BMP	2	See table 205

Table 202 - KeyType 1, Header Definition - Version 2

Note that data elements from KeyType to ISAM seq# (the initial 8 bytes) shall be used as the ISAM search string.

Name	Format	Size	Description
Keytype	HEX	0.5	For lists of the type defined in this table, the value of this element shall be set to one. ISAM search string element.
INP#	HEX	0.5	IPE iteration number ISAM search string element.
ISAM ID	HEX	4	ISAM identity ISAM search string element.
ISAM seq#	HEX	3	ISAM sequence number ISAM search string element.
RecordLength	HEX	2	Defines the length, in native format, of the data set commencing with and including the RecordType element, and all the subsequent elements in the record, but excluding all preceding

			data.
RecordType	HEX	1	Defines the type of record which follows, see table 206
Bitmap	BMP	2	See table 205

Table 203 - Record Version Number Record Definition - Version 2

Name	Format	Size	Description
RecordVersionNumber	HEX	1	A number indicating the version of the following data. For records according to this version of the specification, this element shall be set to a value of two (2).

Table 204 - IPE ID Optional Additional Identification Group Definition - Version 2

This data group shall be included when the primary search is for a Shell, and a secondary search for an IPE instance within that shell.

Name	Format	Size	Description
IPE_IIN	IIN	3	
IPE_OID	HEX	2	OID16: The value FFFF hex shall indicate a Wildcard
IPE_TYP	HEX	1	TYP: The value FF hex shall indicate a Wildcard
IPE_PTyp	HEX	1	PTYP: The value FF hex shall indicate a Wildcard
IPE_INP#	HEX	1	IPE iteration number: A 4 bit number, stored in the least significant bits of this element. The most significant bits of this element shall be set to zero (0). The value FF hex shall indicate a Wildcard
IPE_ISAMID_Creator	HEX	4	ISAMID: The value FFFFFFFF hex shall indicate a Wildcard
IPE_ISAMS#_Creator	HEX	3	The value FFFFFFF hex shall indicate a Wildcard

Great care should be taken when using Wildcards. When the target is a specific IPE then Wildcards shall not be used.

Table 205 - Bit Map Definition - Version 2

Bit#	Data group present if bit is set
0	IPEID, see table 204 IPE ID Optional Additional Identification Group Definition
1	Hotlist, see table 207 Hotlist Data Group, Code 0C02
2	Actionlist, see table 211 Actionlist Data Group
3	Action Date element, see table 212 Actionlist Optional Date Element
4	Action Quantity element, see table 213 Actionlist Optional Action Quantity Element
5	Action Amount element, see table 214 Actionlist Optional Action Amount Group
6	Second Action Amount element, see table 214 Actionlist Optional Action Amount Group
7	Action IPE element, see table 215 Actionlist Optional Action IPE Group
8	New Iteration Number, see table 220 Actionlist Optional NewIterationNumber
9	RecordVersionNumber element, see table 203 Record Version Number Record Definition
10	IPE_Fulfilment_Action present, see table 216 Actionlist Optional Action IPE_Fulfilment_Action
11	TYP 24 Transfers Element, see table 217 Actionlist Optional TYP 24 Transfers Element
12	TYP 24 Reservation Group, see table 218 Actionlist, Code Optional TYP 24 Reservation Group
13-14	RFU
15	Secondary Bitmap Element, see table 219 Actionlist Optional Secondary Bitmap Element

5.3.3.2 Hotlist and Actionlist Data Elements

5.3.3.2.1 Hotlist and Actionlist Data Elements Versions 0 and 1.

Note that these versions (0 and 1), are included only to enable Actionlist processing to function in the case where either the HOPS or the POST only support a previous version of this Specification (i.e. Version 2.1.4 or earlier). These versions (0 and 1) are deprecated in this version of the Specification and will be removed in the next version.

Note that Tables 84-96, which were associated with the previous version of the Specification, have been deprecated in the current version. These tables are retained solely for backward compatibility. For the most up-to-date information, refer to the tables in Clause 5.3.3.2.2.

Table 84 - RecordType Definition

RecordType code	Meaning
0	This code value shall not be used
1	Hotlist
2	Actionlist
3-255	RFU

Table 85 - Hotlist Data Group

Name	Format	Size	Description
HotListIdentifier	HEX	2	A unique identifier generated by the list creating HOPS
HotType	HEX	1	Defines the scope of Hotlist record
HotAction	HEX	1	Defines what action should be taken when a match occurs
CustomerMediaDisposition	HEX	1	Defines what should be done with the Customer Media when a match occurs (attended equipment, or capable unattended equipment, only)
HotItemOriginator	OID16	2	Used to identify item originator
OriginalHotListIdentifier	HEX	2	Used to identify the original list when a list is consolidated

Table 86 - Hotlist HotType Definition

Code	Meaning
0	This code value shall not be used
1	Hot item applies to an ITSO shell
2	Hot item applies to an IPE
3	Hot item applies to Customer Media
4-255	RFU

Codes 1 and 3 shall only be used by the Shell owner. Code 2 shall only be used by the IPE owner.

Table 87 - Hotlist HotAction Definition

Code	Meaning
0	This code value shall not be used
1	IPE to be blocked
2	ITSO shell to be blocked
3	ITSO shell to be blocked and, if possible, the Customer Media to be blocked
4	Customer Media to be blocked if possible
5-255	RFU

Codes 2, 3 and 4 shall only be used by the Shell owner. Code 1 shall only be used by the IPE owner.

Table 88 - Hotlist Customer Media Disposition Definition

Code	Meaning
0	This code value shall not be used
1	Customer Media to be left with Customer Media holder, name and address to be recorded if possible
2	Customer Media to be confiscated
3	Customer Media to be left with Customer Media holder
4	Customer Media Disposition is not specified
5-255	RFU

Note that CM confiscation is impractical at unattended POSTs.

Attended POST types shall display a suitable message to the Licensed Member's staff operating the POST based on the meaning defined in Table 88. When code 4 is used, the POST shall display a message simply indicating that the Shell or IPE (as appropriate) is Hotlisted.

Table 89 - Actionlist Data Group

Name	Format	Size	Description
ActionListIdentifier	HEX	2	A unique identifier generated by the list creating OID
ActionToTake	HEX	1	Defines what action should be taken when a match occurs
ActionSequenceNumber	HEX	1	
ActionListOriginator	OID16	2	Used to identify item originator when a list is consolidated
OriginalActionListIdentifier	HEX	2	Used to identify the original list when a list is consolidated

Table 90 - Actionlist Optional Date Element

Name	Format	Size	Description
ActionDate	DATE	2	For use when a Date is to be written or changed by the action item.

Table 91 - Actionlist Optional Quantity Element

Name	Format	Size	Description
ActionQty	HEX	1	For use when a quantity is to be written or changed by the action item

Table 92 - Actionlist Optional Amount Group

Name	Format	Size	Description
ActionAmount	VALI	2	For use when a currency value is to be written or changed by the action item
ActionAmountCurrencyCode		1	

Table 93 - Actionlist Optional IPE Group

Name	Format	Size	Comment
ListLength	HEX	1	Length of the entire list, including ListLength
IPE_EmbodimentParameterList	EmbodimentList	Variable	The Target IPE Embodiment Parameter List as defined herein

Note that the ListLength size of 1 byte limits IPE_EmbodimentParameterList to a maximum length of 255 bytes, which is insufficient for the size of embodiment parameter list required to create larger IPEs. Therefore this IPE creation method is not suitable for creation of an IPE containing optional data elements where the embodiment PCD data exceeds 255 (0xFF) bytes in size.

Table 94 - Actionlist Optional NewIterationNumber

Name	Format	Size	Description
NewIterationNumber	HEX	1	The new iteration number (INS# or INP# as appropriate) shall occupy the least significant bits of this byte; all other bits shall be set to 0.

Table 94a - Actionlist Optional IPE_Fulfilment_Action

Name	Format	Size	Description
Length	HEX	2	The length of the entire IPE_Fulfilment_Action including the Length data element
IPE_Fulfilment_Action	HEX	Var	A collection of ASN.1 Objects comprising an entire IPE Fulfilment Action (as defined in clause 5.3.3.4)

Table 94b - Actionlist Optional TYP 24 Transfers Element

Name	Format	Size	Description
TransferQty	BMP	2	For use when a quantity is to be written or changed by the action item

Table 94c - Actionlist Optional TYP 24 Reservation Group

Name	Format	Size	Description
ReservationQty	HEX	1	For use when a quantity is to be written or changed by the action item A value of zero means; all existing journey leg reservation groups shall be removed and no groups will be appended to this element
JourneyLegReservationGroup			This is a repeating group of the following data elements Number of such groups defined by ReservationQty
DepartureDateTime	DTS	3	
ServiceID	ASCII	6	
Origin	LOC1	Variable Maximum 17	If no data specified shall contain a NULL location definition in the form of LocDefType 255
Destination	LOC1	Variable Maximum 17	If no data specified shall contain a NULL location definition in the form of LocDefType 255
Coach	ASCII	2	
Seat	ASCII	3	

AccommodationAttribute	ASCII	4	
SeatDirection	BMP	1	
BerthUpperorLower	BMP	1	
ReservationType	HEX	1	
TogetherFlag	FLAG	1	

Note: In table 94c the ReservationQty relates to the data elements NumberofReservations within the TYP 24 Value Group. The remaining data elements in the above table match to the TYP 24 Value Group VO Segment.

Table 94d - Actionlist Optional Secondary Bitmap Element

Name	Format	Size	Description
Additional Actionlist Bitmap	BMP	2	RFU for optional data elements as yet to be defined

Table 95 - Actionlist ActionToTake Definition

Code	Meaning
0	This code value shall not be used
1	Create IPE - Deprecated, see note below
2	Update IPE: change expiry date
3	Update Shell
4	Disable STR Auto-Top-Up
5	Add STR Auto-Top-Up
6	Un-Block Shell
7	Un-Block IPE
8	Disable Auto-Renew
9	Enable Auto-Renew and set associated IPE parameters.
10	Update IPE: Add Stored Rides or Journeys
11	Update IPE: Add Stored Rides or Journeys, and amend expiry date
12	Update IPE: Add STR
13	Update IPE: CTA value adjustment (TYP 4 IPE only)
14	Update IPE: Amend IPE iteration number
15	Update Shell contents: IPE_Fulfilment_Action
16	Update IPE (TYP 24): Amend one or more value group count and reservation elements

17-255	RFU
--------	-----

Action to Take code 1 is deprecated in this version of the Specification and will be removed from the next version of the Specification.

Table 96 - Actionlist Actions Which May Be Taken

This table defines those actions which may be instigated by an Actionlist item.

Where the IPE element acted upon is not included in an anti-tear group, care shall be taken when performing the action to ensure that Customer Media corruption does not occur, or will always be corrected if it does occur.

Code	Action to Take	Specific Action	Shell or IPE data elements acted upon	Optional Actionlist data elements used	Contents of optional Actionlist data elements
0	This code value shall not be used				
1	Create IPE (see note below tables 95 and 221)	Create IPE	All	Optional IPE Group	IPE Embodiment parameter table
2	Update IPE	Change Expiry Date	ExpiryDate	ActionDate	The new expiry date
3	Update Shell	Amend shell iteration number	INS#	NewIterationNumber	New iteration number
4	Disable STR Auto-Top-Up		TYP2ValueFlags - AutoTopUp Threshold TopUpAmount	None	Reset TYP2ValueFlags - AutoTopUp flag to zero. For reasons of backwards compatibility the Threshold and TopUpAmount may also or alternatively set to 0.
5	Add STR Auto-Top-Up		Threshold TopUpAmount	ActionAmount ActionAmount ActionAmountCurrencyCode	Two amounts are sent: - the first contains a new Threshold value - the second contains a new TopUpAmount value the two copies of ActionAmountCurrencyCode shall be set to the same value
6	Un-Block Shell		Shell blocked flag in DirBitMap	None	Clear shell blocked flag in DirBitMap, increment shell iteration number INS#
7	Un-Block IPE		Data group blocked by SCT setting	None	Clear data group blocked SCT setting, increment IPE iteration number INP#.
8	Disable Auto-Renew		TYP22ValueFlags - Auto-Renew or TYP23ValueFlags -	None	Reset the TYP22ValueFlags – Auto-Renew flag or the TYP23ValueFlags - Auto-Renew flag, as appropriate, to zero. For reasons of backwards

			Auto-Renew and/or AutoRenewQuantity1 or AutoRenewQuantity2		compatibility the AutoRenewQuantity1 or AutoRenewQuantity2 data elements, as appropriate, may also or alternatively be set to zero.
9	Enable Auto-Renew and set associated IPE parameters		TYP 22: AutoRenewQuantity1 TYP22ValueFlags/Auto-Renew (bit 0) [set this bit to one (1)] TYP 23: TYP23ValueFlags/Auto-Renew (bit 0) [set this bit to one (1)] TYP 24: TicketUseFlags/Auto-Renew (bit 7) [set this bit to one (1)] TYP 25: AutoRenewQuantity2 TYP25ValueFlags/Auto-Renew (bit 0) [set this bit to one (1)] TYP 26: AutoRenewQuantity3 TYP26ValueFlags/Auto-Renew (bit 0) [set this bit to one (1)]	ActionQty	TYP 22: Value to add to NumberRemainingPasses TYP 23: 0 TYP 24: 0 TYP 25: Value to add to CountUsesAvailable TYP 26: Value to add to CountRemainingRidesJourneys
10	Update IPE	Add stored rides or journeys	TYP 22: NumberRemainingPasses (See Notes) TYP 23: CountRemainingRidesJourneys TYP 24: CountRemainingJourneys TYP 25: CountUsesAvailable TYP 26: CountRemainingRidesJourneys	ActionQty	The quantity to be added to the relevant IPE data element
11	Update IPE	Add stored rides or journeys, and amend ExpiryDate	TYP 22: NumberRemainingPasses ExpiryDateSP	ActionDate ActionQty	The new expiry date The quantity to be added to the relevant IPE data element
12	Update IPE	Add STR	TYP 2: Value	ActionAmount ActionAmountCurrencyCode	The amount to be added to Value.
13	Update IPE	CTA Value Adjustment (TYP 4 IPE only)	TYP 4: CumulativeAmount	ActionAmount ActionAmountCurrencyCode	The amount to be subtracted from CumulativeAmount
14	Update IPE	Amend IPE iteration number	INP#	NewIterationNumber	New iteration number
15	Update Shell contents	IPE Fulfillment	All	IPE Group or Groups	IPEs added, deleted or both (see clause 5.3.3.4)

		Action			
16	Update IPE (TYP 24)	Amend one or more value group count and reservation elements	TYP 24: JourneysRemaining TransfersRemaining	ActionQty TransferQty	Quantity to be added to the relevant IPE Value Group data element
			NumberOfReservations LegDepartureDateTime LegServiceId LegOrigin LegDestination Coach SeatNumber AccommodationAttribute SeatDirection BerthUpperLower ReservationType TogetherFlag	Optional TYP 24 Reservation Group	The new Value Group VXO segment replacing the existing segment (if present)

Note regarding use of Action To Take code 10 with TYP 22 IPEs. It is strongly recommended that when adding stored passes to a TYP 22 IPE which is in stored passes mode (TYP22ValueFlags bit 1 is set to one (1)), Action To Take code 11 should be used because this also allows ExpiryDateSP to be modified.

5.3.3.2.2 Hotlist and Actionlist Data Elements Version 2

Note that where both HOPS and POST support this version of the Specification, then this Version 2 of the Hotlist and Actionlist Data Elements shall be used.

Table 206 - RecordType Definition

RecordType	Meaning
0	This code shall not be used
1	Hotlist
2	Actionlist
3	Hotlist (Replacement)
4	Actionlist (Replacement)
5	Hotlist (Append to current list)
6	Actionlist (Append to current list)
7-255	RFU

Notes:

When using new Hotlist Append (code 5) and Hotlist Replacement (code 3), old codes must not be used.

When using new Hotlist Append (code 5) and Hotlist Replacement (code 3), old codes must not be used.

Support for RecordType 1 & 2 with support for replacement and append lists shall be maintained.

Table 207 - Hotlist Data Group, Code 0C02

Name	Format	Size	Description
HotListIdentifier	HEX	2	A unique identifier generated by the list creating HOPS
HotType	HEX	1	Defines the scope of Hotlist record, see table 208
HotAction	HEX	1	Defines what action should be taken when a match occurs, see table 209
CustomerMediaDisposition	HEX	1	Defines what should be done with the Customer Media when a match occurs (attended equipment, or capable unattended equipment, only) , see table 210
HotItemOriginator	OID16	2	Used to identify item originator
OriginalHotListIdentifier	HEX	2	Used to identify the original list when a list is consolidated

Table 208 - Hotlist, Code 0C02, HotType Definition

Code	Meaning
0	Not used
1	Hot item applies to an ITSO shell
2	Hot item applies to an IPE
3	Hot item applies to Customer Media
4-255	RFU

Codes 1 and 3 shall only be used by the Shell owner.

Code 2 shall only be used by the IPE owner.

Table 209 - Hotlist, Code 0C02, HotAction Definition

Code	Meaning
0	Not used
1	IPE to be blocked
2	ITSO shell to be blocked
3	ITSO shell to be blocked and, if possible, the Customer Media to be blocked
4	Customer Media to be blocked if possible
5-255	RFU

Codes 2, 3 and 4 shall only be used by the Shell owner. Code 1 shall only be used by the IPE owner.

Table 210 - Hotlist, Code 0C02, Customer Media Disposition Definition

Code	Meaning
0	Not used
1	Customer Media to be left with Customer Media holder, name and address to be recorded if possible
2	Customer Media to be confiscated
3-255	RFU

Table 211 - Actionlist Data Group

Name	Format	Size	Description
ActionListIdentifier	HEX	2	A unique identifier generated by the list creating OID
ActionToTake	HEX	1	Defines what action should be taken when a match occurs, see Table 221 - Actionlist ActionToTake Definition
ActionSequenceNumber	HEX	1	
ActionItemOriginator	OID16	2	Used to identify item originator when a list is consolidated
OriginalActionListIdentifier	HEX	2	Used to identify the original list when a list is consolidated

Table 212 - Actionlist Optional Date Element

Name	Format	Size	Description
ActionDate	DATE	2	For use when a Date is to be written or changed by the action item.

Table 213 - Actionlist Optional Action Quantity Element

Name	Format	Size	Description
ActionQty	HEX	1	For use when a quantity is to be written or changed by the action item

Table 214 - Actionlist Optional Action Amount Group

Name	Format	Size	Description
ActionAmount	VALI	2	For use when a currency value is to be written or changed by the action item
ActionAmountCurrency Code		1	

Table 215 - Actionlist Optional Action IPE Group

Name	Format	Size	Comment
ListLength	HEX	1	Length of the entire list, including ListLength
IPE_EmbodimentParameterList	EmbodimentList	Variable	The Target IPE Embodiment Parameter List as defined herein

Note that the ListLength size of 1 byte limits IPE_EmbodimentParameterList to a maximum length of 255 bytes, which is insufficient for the size of embodiment parameter list required to create larger IPEs. Therefore this IPE creation method is not suitable for creation of an IPE containing optional data elements where the embodiment PCD data exceeds 255 bytes in size.

Table 216 - Actionlist Optional Action IPE_Fulfilment_Action

Name	Format	Size	Description
Length	HEX	2	The length of the entire IPE_Fulfilment_Action including the Length data element
IPE_Fulfilment_Action	HEX	Var	A collection of ASN.1 Objects comprising an entire IPE Fulfilment Action (as defined in clause 5.3.3.4)

Table 217 - Actionlist Optional TYP 24 Transfers Element

Name	Format	Size	Description
TransferQty	BMP	2	For use when a quantity is to be written or changed by the action item

Table 218 - Actionlist, Code Optional TYP 24 Reservation Group

Name	Format	Size	Description
ReservationQty	HEX	1	For use when a quantity is to be written or changed by the action item A value of zero means; all existing journey leg reservation groups shall be removed and no groups will be appended to this element
JourneyLegReservationGroup			This is a repeating group of the following data elements Number of such groups defined by ReservationQty
DepartureDateTime	DTS	3	
ServiceID	ASCII	6	
Origin	LOC1	Variable Maximum 17	If no data specified shall contain a NULL location definition in the form of LocDefType 255
Destination	LOC1	Variable Maximum 17	If no data specified shall contain a NULL location definition in the form of LocDefType 255
Coach	ASCII	2	
Seat	ASCII	3	
AccommodationAttribute	ASCII	4	
SeatDirection	BMP	1	
BerthUpperorLower	BMP	1	
ReservationType	HEX	1	
TogetherFlag	FLAG	1	

Note: In Table 2.194c the ReservationQty relates to the data elements NumberofReservations within the TYP 24 Value Group. The remaining data elements in the above table match to the TYP 24 Value Group Extension Segment.

Table 219 - Actionlist Optional Secondary Bitmap Element

Name	Format	Size	Description
Additional Actionlist Bitmap	BMP	2	RFU for optional data elements as yet to be defined

Table 220 - Actionlist Optional NewIterationNumber

Name	Format	Size	Description
NewIterationNumber	HEX	1	The new iteration number (INS# or INP# as appropriate) shall occupy the least significant bits of this byte; all other bits shall be set to 0.

Table 221 - Actionlist ActionToTake Definition

Code	Meaning
0	This code shall not be used
1	Create IPE- Deprecated, see note 1 below
2	RFU
3	Update Shell, see notes 2 and 3 below
4	Disable STR Auto-Top-Up, see note 2 below,
5	Enable STR Auto-Top-Up, see note 2 below,
6	Un-Block shell
7	Un-Block IPE, see note 2 below,
8	Disable Auto-Renew, see note 2 below.
9	Enable Auto-Renew and set associated IPE parameters. If IPE fixed data will be modified, the provisions of Note 2 below apply.
10	Update IPE: Add Stored Rides or Journeys
11	Update IPE: Add Stored Rides or Journeys, and amend expiry date
12	Update IPE: Add STR
13	Update IPE: CTA value adjustment (TYP 4 IPE only)
14	Update IPE: Amend IPE iteration number, see note 2 below.
15	Update Shell contents: IPE_Fulfilment_Action
16	Update IPE (TYP 24): Amend one or more value group count and reservation elements
17	Amend TYP 22 Period Pass validity period by amending ExpiryDateCurrent
18-255	RFU

Note 1: Action to Take Code 1 is deprecated in this version of the Specification and will be removed from the next version of the Specification.

Note 2: Safe Operation of Actionlists

Some Actionlist activities change Directory and/or IPE “fixed data”.

Problems will arise if the media is removed from the reader before the Actionlist update activity is complete.

Therefore, these ActionToTakeCodes shall only be used in the following circumstances:

- Where the media is physically restrained on or within the reader so that it cannot be removed before the transaction is complete. For safety this restraint should be a mechanical feature of the reader, manually holding the media on the reader is not considered safe. Note that system operators may take the risk of updating fixed data without physical restraint of the media if they so choose, at their own risk.
- Where some customer media types (CMD) are used. Where the media uses “Backup files” which are protected against tearing throughout, then the anti-tear protection provided by the media hardware will prevent tearing and data corruption. This is indicated by the HOPS Shell Account Anti_Tear_Type data element containing a value of 0x02 indicating that Hardware anti-tear is used. These CMD types are summarised as follows:

- CMD types where anti-tear functionality is not provided: CMD2; CMD7 according to v2.1.4 and earlier versions of the specification;
- CMD types where anti-tear (backup) functionality is provided: CMD7 according to v2.1.5 of the specification; CMD11 ; and CMD12.

Table 222 - Actionlist Actions Which May Be Taken

This table defines those actions which may be instigated by an Actionlist item.

Code	Action to Take	Specific Action	Shell or IPE data elements acted upon	Optional Actionlist data elements used	Contents of optional Actionlist data elements
0	This code shall not be used				
1	Create IPE	Create IPE	All	Optional IPE Group	IPE Embodiment parameter table
2	This code shall not be used				
3	Update Shell	Amend shell iteration number	INS#	NewIterationNumber	New iteration number
4	Disable STR Auto-Top-Up	AutoTopUp is set to 0.	TYP2ValueFlags – AutoTopUp	None	
5	Enable STR Auto-Top-Up	AutoTopUp is set to 1, Apply the new values.	AutoTopUp (flag) Threshold TopUpAmount	ActionAmount ActionAmount ActionAmountCurrencyCode ActionAmountCurrencyCode	Two amounts are sent: - the first contains a new Threshold value - the second contains a new TopUpAmount value the two copies of ActionAmountCurrencyCode shall be set to the same value
6	Un-Block Shell	Clear shell blocked flag in DirBitMap, increment shell iteration number INS#	Shell blocked flag in DirBitMap INS#	None	
7	Un-Block IPE	Clear data group blocked SCT setting, increment IPE iteration number INP#.	Data group blocked by SCT setting	None	

8	Disable Auto-Renew	Set target element to 0	<p>TYP 22: TYP22ValueFlags-Auto-Renew</p> <p>TYP 23: TYP23ValueFlags-Auto-Renew.</p> <p>TYP 24: AutoRenew flag. TYP 25: TYP25ValueFlags/Auto-Renew (bit 0)</p> <p>TYP 26: TYP26ValueFlags/Auto-Renew (bit 0).</p>	None	
9	Enable Auto-Renew	Set target flag to one [1], Apply the new values.	<p>TYP 22: TYP22ValueFlags/Auto-Renew (bit 0) AutoRenewQuantity1</p> <p>TYP 23: TYP23ValueFlags/Auto-Renew (bit 0)</p> <p>TYP 24: TicketUseFlags/Auto-Renew (bit 7) TYP 25: AutoRenewQuantity2 TYP25ValueFlags/Auto-Renew (bit 0)</p> <p>TYP 26: TYP26ValueFlags/Auto-Renew (bit 0) AutoRenewQuantity3</p>	<p>AutoRenewQuantity1 AutoRenewQuantity2 AutoRenewQuantity3</p>	The appropriate Auto Renew quantity
10	Update IPE	Add stored rides or journeys	<p>TYP 22: NumberRemainingPasses</p> <p>TYP 23: CountRemainingRidesJourneys</p> <p>TYP 24:</p>	ActionQty	The quantity to be added to the relevant IPE data element

			CountRemainingJourneys TYP 25: CountUsesAvailable TYP 26: CountRemainingRidesJourneys		
11	Update IPE	Add stored rides or journeys, and amend ExpiryDate	TYP 22: NumberRemainingPasses ExpiryDateSP	ActionDate ActionQty	The new expiry date The quantity to be added to the relevant IPE data element
12	Update IPE	Add STR	TYP 2: Value	ActionAmount ActionAmountCurrencyCode	The amount to be added to Value.
13	Update IPE	CTA Value Adjustment (TYP 4 IPE only)	TYP 4: CumulativeAmount	ActionAmount ActionAmountCurrencyCode	The amount to be subtracted from CumulativeAmount
14	Update IPE	Amend IPE iteration number	INP#	NewIterationNumber	New iteration number
15	Update Shell contents	IPE Fulfilment Action	All	IPE Group or Groups	IPEs added, deleted or both (see clause 5.3.3.4)
16	Update IPE (TYP 24)	Amend one or more value group count and reservation elements	TYP 24: JourneysRemaining TransfersRemaining	ActionQty TransferQty	Quantity to be added to the relevant IPE Value Group data element
			NumberOfReservations LegDepartureDateTime LegServiceId LegOrigin LegDestination Coach SeatNumber AccommodationAttribute SeatDirection BerthUpperLower ReservationType TogetherFlag	Optional TYP 24 Reservation Group	The new Value Group VXO segment replacing the existing segment (if present)
17	Amend TYP 22 Period Pass validity period	ExpiryDate Current Value amendment	TYP 22 ExpiryDateCurrent	ActionDate	New value of ExpiryDateCurrent

5.3.3.3 Not Used

Intentionally left blank, clause retained for numbering.

5.3.3.4 IPE Fulfilment Action

This clause defines the structure and content of the ActionList IPE_Fulfilment_Action Data Group that is required for use by POSTs. Implementation is mandatory in POSTs and HOPS.

The Data Group contains within it a set of ASN.1 objects that, when read and acted upon in sequence by the POST application, applies a complete fulfilment update to the Shell within the CM. The IPE_Fulfilment_Action data group provides details of:

- A unique reference created by the source of the IPE_Fulfilment_Action
- The fulfilment window
- The net number of Sectors occupied by the fulfilment
- Details of IPEs that shall not be present as a precondition to the completion of the fulfilment
- Details of IPEs that shall be present as a precondition to the completion of the fulfilment
- Details of IPEs that shall be deleted as a precondition to the completion of the fulfilment
- Details of the Detached IPEs that are to be conditionally added to the target Shell

The IPE_Fulfilment_Action Data Group is defined in Table 96a and is made up of Constructed and Primitive Data Objects (CDOs and PDOs) in accordance with ASN.1 the tags and syntax for which are defined in Annex A.

Table 96a shows:

- Primitive Data Objects in plain text
- Constructed Data Objects in bold
- Objects that are optional as shaded
- Objects that may occur more than once in italics
- The *'s prefixing the DO names indicate the nesting level of the DO

Note: A mandatory Primitive Data Object will not be present if it is contained in an optional Constructed Data Object that is not present.

Table 223 - Actionlist, Optional IPE_Fulfilment_Action

ASN.1 Constructed DO names ASN.1 Primitive DO names	DATA TYPE	Description
ITSO_Root_Group		
*ITSO_Data_Group		
**Shell_Reference	ISRN	A single Mandatory PDO containing the reference of the ITSO Shell (ISRN) targeted by this IPE_Fulfilment_Action
**IPE_Fulfilment_Action		<i>One or more mandatory CDOs containing a complete IPE fulfilment action</i>
***Source_Reference		A single mandatory CDO forming a unique reference for this IPE_Fulfilment_Action
****ISAMID	HEX	A single mandatory PDO containing the ISAMID of the ISAM of the retail POST function used in the creation of this IPE_Fulfilment_Action
****Ref#	HEX	A single mandatory PDO containing a 4 Byte binary integer. Added by the source to uniquely identify this IPE_Fulfilment_Action. This shall be

		incremented by 1 for every different IPE_Fulfilment_Action generated. Rollover is not permitted for the same value of ISAMID
***Fulfilment_Window		A single mandatory CDO forming the period demarcated by the primitive DOs present in this constructed DO during which this fulfilment action is valid
****Start_DTS	DTS	A single mandatory PDO containing the DTS from which this fulfilment action shall be possible
****End_DTS	DTS	A single mandatory PDO containing the DTS after which this fulfilment action shall not take place
***Fulfilment_#Sectors	HEX	A single optional PDO containing the net number of Sectors occupied by this fulfilment action (after taking into account any deletions) A single byte binary integer in the range 1-255
***Not_Present		<i>One or more optional CDOs containing an IPE instance that shall not be present in this Shell before proceeding with this IPE_Fulfilment_Action</i>
****Label	HEX	A single optional PDO containing the IPE label (i.e. DIR entry)
****IIN_Index	HEX	A single mandatory PDO containing the reference to the IPE IIN
****IPE_InstanceID ⁷	HEX	A single mandatory PDO containing the IPE instanceID
***Present		<i>One or more optional CDOs containing an IPE instance that shall be present in this Shell before proceeding with this IPE_Fulfilment_Action</i>
****Label	HEX	A single optional PDO containing the IPE label (i.e. DIR entry)
****IIN_Index	HEX	A single mandatory PDO containing a reference to the IPE IIN
****IPE_InstanceID	HEX	A single mandatory PDO containing the IPE instanceID
***Delete		<i>One or more optional CDOs containing an IPE instance that shall be deleted from this Shell before proceeding with this IPE_Fulfilment_Action</i>
****Label	HEX	A single optional PDO containing the IPE label (i.e. DIR entry)
****IIN_Index	HEX	A single mandatory PDO containing a reference to the IPE IIN
****IPE_InstanceID	HEX	A single mandatory PDO containing the IPE instanceID
***Add		<i>One or more optional CDOs containing IPE Data Groups that shall normally be added to this Shell, unless, if present, the content of the IPE_Delivery_Date prohibits this, before proceeding with this IPE_Fulfilment_Action</i>
****IPE_Delivery_Date_Range	DATE	A single optional CDO which if present and If the current date is not in the range IPE_Delivery_Date_Start to IPE_Delivery_Date_End inclusive, then the following Data Group(s) shall not be added to this Shell. Where no IPE_Delivery_Date_End is present then the IPE_Delivery_Date_Range is a single day
*****IPE_Delivery_Date_Start	DATE	A single mandatory PDO Indicating the start date of the IPE_Delivery_Date_Range (within the Fulfilment_Window)

⁷ The actual value of the KID Data Element within the IPE_InstanceID may not be known to the HOPS sending this PDO however the remaining data in the IPE instance is sufficient to uniquely identify the IPE without using the value of KID. Thus the value of KID shall be ignored by the POST application when matching this PDO to the IPE_InstanceID read from the CM. Any HOPS that does not know the true value shall set KID to 0xF

****IPE_Delivery_Date_End	DATE	A single optional PDO Indicating the end date of the IPE_Delivery_Date_Range (within the Fulfilment_Window)
****IPE_Data_Group	HEX	A single mandatory PDO containing an entire IPE Data Group
****IPE_Value_Record_Data_GroupA	HEX	A single optional PDO containing an entire Value Record Data Group copy A
****IPE_Value_Record_Data_GroupB	HEX	A single optional PDO containing An entire Value Record Data Group copy B

5.4 Data Correction Record, Code 0C04.

Use of message codes 0604 and 0C04 is deprecated in this version of the Specification and will be removed from the next version of the Specification.

Note that this record type is only used between HOPS, not for transmission to POSTs. It is used when a correction to a transaction data record is required. This message would be sent by a Licensed Member (for example a service provider whose POST created the original message in question) to another Licensed Member (such as a Product Owner whose product was used in the Transaction the record of which is being changed).

Table 97 - Data Correction Record, Code 0C04

Name	Format	Size	Comment
StandardData		21	Standard data returned with all transaction records
InitialRecordLength	HEX	2	Length of the InitialRecord structure in bytes (where the count excludes the comma between the InitialRecordLength and InitialRecord data elements, includes commas within the InitialRecord Structure, and excludes the comma between the InitialRecord and AmendedRecordLength data elements. The length shall be calculated of the message in transmission format.)
InitialRecord		Variable	A structure containing a copy or clone of the initial data record before correction, (comprising the whole ITSO transaction data frame including Sequence number, timestamp, data including message code and destinations, and the Seal) as originally transmitted.
AmendedRecordLength	HEX	2	Length of the AmendedRecord structure in bytes (where the count excludes the comma between the AmendedRecordLength and AmendedRecord data elements, and includes commas within the AmendedRecord Structure. The length shall be calculated of the message in transmission format.)
AmendedRecord		Variable	A structure containing the amended record after correction comprising the whole ITSO transaction data frame (including Sequence number, timestamp, data including message code and destinations, and with the original sealer ID (ISAM ID and ISAM sequence number) and Seal.

In this context the standard data shall be written as follows:

- Transaction date and time shall record the date and time of creating the correction message
- IPE-ID shall be taken from the transaction record being amended
- StaffID shall identify the member of staff responsible for creating the correction message

The InitialRecord and AmendedRecord shall contain an entire ITSO message data frame. When transmitted the individual data elements within these data frames shall be separated by commas. These structures shall not be converted to transmission format twice.

The InitialRecord shall contain the complete original message Data Frame including:

- Header
- Standard data
- Data
- Footer & original Seal

It is sent so that the receiving HOPS can identify the original data.

The AmendedRecord shall contain the complete amended message Data Frame including:

- Original Header
- Original or Amended Standard data
- Original or Amended Data
- Original Footer & original Seal

For the AmendedRecord the same structure as a class 1 message shall be used, which may simplify the processing required in the receiving HOPS. The Seal will of course be invalid for this data set, and the outcome of the seal check should be ignored

6. ITSO POST Configuration Data.

This clause defines POST operating parameter tables required for inter-operability. These are generated by back office ticketing configuration systems and distributed to POSTs as required.

POSTs are not required to implement ITSO POST Configuration parameter tables if it can be demonstrated that suitable alternative arrangements exist for the integration of Operator Specific configuration data provided from or available in a HOPS for the purposes of achieving interoperability, and furthermore that these alternative arrangements are acceptable to Licensed Members.

6.1 Message format.

The tables defined in this clause may be transmitted from HOPS to POST in accordance with the stated Transmission Methods and Data Formats defined in ITSO TS 1000-3.

For HOPS to HOPS messages then the files shall be formatted as defined in ITSO TS 1000-9. This file structure may optionally be used for HOPS to POST messages.

When messages are sent according to message codes 0A00 to 0AFF, then each item in a list shall be transmitted as a single Data Block as defined in ITSO TS 1000-9.

Use of messages using codes 0A00 to 0AFF are deprecated in this version of the Specification. References to these message codes shall be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

Messages sent according to message codes 0B01 to 0BFF support the transmission of multiple list items (of the same type) in a single Data Block as defined in ITSO TS 1000-9. Implementation of this type of message is optional in both HOPS and POST.

Messages sent according to message code 0B00 allows multiple records of multiple types to be included within a single data block as defined in ITSO TS 1000-9. Implementation of this type of message is optional in both HOPS and POST.

6.2 ITSO POST Configuration Data Record Format

Direction HOPS to POST

Table 98 - ITSO POST Configuration Data Record Format, HOPS to POST

ITSO name	Format	Size (bytes)	Comment
ParameterTableIdentifier	HEX	2	Unique identity for this list created by the HOPS
ParameterTableRow	Byte	Variable	A row of a Parameter table as defined below

Note that ParameterTableIdentifier shall be prefixed to every row in the table.

6.3 ITSO POST Configuration Data Message Response.

In response to successful receipt of all ITSO POST configuration data messages, the POST shall respond with the standard ACK2 (acknowledgement to class 2 message) command.

6.4 ParameterTable Message Codes.

Table 99 - ParameterTable Message Codes

Group	Table Type	HEX CODE single record per Data Block	HEX CODE multiple records per data block
Parameter table	RFU	0A00	--
	Multiple records of multiple types	--	0B00
	Term Dates	0A01	0B01
	Peak Times	0A02	0B02
	Day type assignment	0A03	0B03
	Transfers	0A04	0B04
	Rebates	0A05	0B05
	Loyalty Rules	0A06	0B06
	Currency	0A07	0B07
	Zone Table Reference	0A08	0B08
	Zone Table Bitmap	0A09	0B09
	Sale Price Table	0A0A	0B0A
	IIN Table	0A0B	0B0B
	IPE Parameter Tables	0A0C	0B0C
	ISAM Management File Parameters	0A0D	0B0D
	Passback Times	0A0E	0B0E
	RFU	0A0F- 0AFE	0B0F- 0BFE
Manifest Message	N/A	0AFF	0BFF

6.5 Multi Record Transmission, multiple types (message code 0B00)

A message according to the 0B00 code can be utilised to send multiple list items records, of multiple types, within a single Data Block. Records according to message codes 0A01 to 0AFF and 0C01 to 0CFF can be included in a 0B00 message. These messages also use the hash sealing method defined in ITSO 1000-9 to further improve the efficiency of transmitting large numbers of lists item records.

Use of messages using codes 0A00 to 0AFF are deprecated in this version of the Specification. References to these message codes shall be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

A multi record message shall always consist of the following data groups, in the order shown

- A header, which defines the message contents; and
- A number of item records, included in the same order as each type of item is identified in the header.

Table 99a - Multi Record (Multi Type) Header Definition

Name	Format	Size	Description
QtyHeaderItems	HEX	3	The number of HeaderItem records within this header.
HeaderItem	HEX	6	Defined in table 99b. As many HeaderItems may be included as necessary.

Table 99b - HeaderItem Definition

Name	Format	Size	Description
RecordType	HEX	2	A Message code in the range 0A00 to 0AFF or 0C00 to 0CFF
QtyRecords	HEX	2	The quantity of records of this type included in the list
Offset	HEX	2	The offset, in bytes, of the first byte in the first record. For the first HeaderItem in the header, this value shall be set to 0.

It is recommended that all records of a single type be grouped together in the message.

6.6 Multi Record Transmission (message codes 0B01 to 0BFF)

Messages according to codes 0B01 to 0BFF can be utilised to send multiple records (of the same type) within a single Data Block. These messages also uses hash sealing method defined in ITSO 1000-9 to further improve the efficiency of transmitting large numbers of records.

A multi record message shall always consist of the following data groups, in the order shown

- A header; and
- A number of item records.

Table 99c - Multi Record (single type) Header Definition

Name	Format	Size	Description
Number of List Item Records	HEX	3	The number of list item records within this data block.

6.7 Parameter table definitions, ListFormatRevision = 1

Note: ListFormatRevision 1 is provided for backwards compatibility only; new implementations shall not use it. POSTs implemented to this Version of the Specification shall use ListFormatRevision = 2.

6.7.1 Peak Times, Code 0A02.

Use of message code 0A02 is deprecated in this version of the Specification. References to this message code shall be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

The table defines inclusive Peak Times for the IPE Embodiment identified in the record. It may be used in conjunction with the peak/off-peak flag.

Table 100 - Peak Times, Code 0B02

ITSO name	Format	Size (bytes)	Comment
0B02_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of one (1) shall be assigned to this element
0B02_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B02_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B02_IIN	IIN	3	Defines IPE Embodiment (Product type) together with OID, TYP & PTYP
0B02_OID	OID16	2	Defines IPE Embodiment (Product type) together with IIN, TYP & PTYP
0B02_TYP	TYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & PTYP
0B02_PTYP	PTYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & TYP
0B02_QualiferCodeRef	HEX	1	A reference to the IPE data element which should be matched against 0A02_QualifierCode, see table 100a, 100b, 100c, 100d, 100e & 100f.
0B02_QualifierCode	UD	4	A qualifier code defined by the Product Owner. This element may be matched to an IPE data element as defined by 0A02_QualiferCodeRef.
0B02_DayType	HEX	1	Code indicating the type of day to which the record applies, defined below in table 101.
0B02_Start	BCDN	2	A time expressed in BCD, for example, would be recorded as 1734.
0B02_End	BCDN	2	A time expressed in BCD, for example, would be recorded as 1734.

Where more than one peak time band is required for a given IPE, then multiple rows shall be created in the table, one row per IPE / peak time band combination.

A value of FF hex in any of the TYP or PTYP elements, or a value of FFFF hex in the OID element, shall denote a wildcard.

Table 100a - QualiferCodeRef definition

QualiferCodeRef value	TYP 2 data element	TYP 3 data element	TYP 4 data element	TYP 5 data element	TYP 17 data element
0	No matching IPE data element	No matching IPE data element	No matching IPE data element	No matching IPE data element	No matching IPE data element
1-255	RFU	RFU	RFU	RFU	RFU

Table 100b - QualiferCodeRef definition

QualiferCodeRef value	TYP 14 data element	TYP 16 data element
0	No matching IPE data element	No matching IPE data element
1	CPICC	CPICC
2	EntitlementCode	EntitlementCode
3	ConcessionaryClass	ConcessionaryClass
4	RFU	DateOfBirth
5-255	RFU	RFU

Table 100c - QualiferCodeRef definition

QualiferCodeRef value	TYP 22 data element	TYP 23 data element
0	No matching IPE data element	No matching IPE data element
1	Class	Class
2	PromotionCode	PromotionCode
3	CPICC	CPICC
4	ValidityCode	ValidityCode
5-255	RFU	RFU

Table 100d - QualiferCodeRef definition

QualiferCodeRef value	TYP 24 data element	TYP 25 data element
0	No matching IPE data element	No matching IPE data element
1	Class	ServiceID
2	JourneyTypeCode	UserDefined

3	ProfileCode	RFU
4	TicketStatusCode	RFU
5	TypeOfTicketCode	RFU
6	ValidityCode	RFU
7	RestrictionCode	RFU
8	RestrictedCode	RFU
9	UserDefined (from the relevant reservation block)	RFU
10	ServiceIdentifier	RFU
11	TravelServiceNumber	RFU
12	AssistanceType	RFU
13-255	RFU	RFU

Table 100e - QualiferCodeRef definition

QualiferCodeRef value	TYP 26 data element	TYP 27 data element
0	No matching IPE data element	No matching IPE data element
1	Typ26Class	RFU
2	UserDefined (least significant 2 bytes only)	RFU
3-255	RFU	RFU

Table 100f - QualiferCodeRef definition

QualiferCodeRef value	TYP 28 data element	TYP 29 data element
0	No matching IPE data element	No matching IPE data element
1-255	RFU	RFU

Day type shall be a 1 byte HEX code defined as follows:

Table 101 - DayType Definition

HEX Code	Day type definition
0	This code value shall not be used
1	Monday to Friday inclusive
2	Saturday
3	Sunday
4	Saturday+Sunday
5	Bank Holiday
6	Routine abnormal day, Market day for example (A 'special day')
7 - FF	Reserved for future use.

6.7.2 Day type assignment, code 0A03, 0B03.

Use of message code 0A03 is deprecated in this version of the Specification. References to this message code shall be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

Defines the day types upon which an IPE Embodiment (Product type) is valid.

Table 102 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message.

Table 102 - Day type assignment, code 0B03

ITSO name	Format	Size (bytes)	Comment
0B03_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of one (1) shall be assigned to this element
0B03_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B03_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B03_IIN	IIN	3	Defines IPE Embodiment (Product type) together with OID, TYP & PTYP
0B03_OID	OID16	2	Defines IPE Embodiment (Product type) together with IIN, TYP & PTYP
0B03_TYP	TYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & PTYP
0B03_PTYP	PTYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & TYP
0B03_DayType	BMP	1	Day types upon which this IPE Embodiment is valid, depicted as a bit map which is defined in table 102a.

A value of FF hex in any of the TYP or PTYP elements, or a value of FFFF hex in the OID element, shall denote a wildcard.

Table 102a - DayType Bit Map Definition

Bit	Day type definition
0 (LSB)	When set, indicates that the IPE is valid on Mondays to Fridays inclusive.
1	When set, indicates that the IPE is valid on Saturdays.
2	When set, indicates that the IPE is valid on Sundays.
3	When set, indicates that the IPE is valid on Special Days, Bank Holidays and Public Holidays.
4	Reserved for future use.
5	Reserved for future use.
6	Reserved for future use.
7 (MSB)	Reserved for future use.

6.7.3 Transfers, Codes 0A04, 0B04.

Use of message code 0A04 is deprecated in this version of the Specification. References to this message code shall be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

Facilities for defining transfer limit treated as part of overall through journey for fares calculation purposes, together with any fares cap associated with purse payments.

Table 103 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message.

Table 103 - Transfers, Code 0B04

ITSO name	Format	Size (bytes)	Comment
0B04_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of one (1) shall be assigned to this element
0B04_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B04_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B04_IIN	IIN	3	Defines IPE Embodiment (Product type) together with OID, TYP & PTYP
0B04_OID	OID16	2	Defines IPE Embodiment (Product type) together with IIN, TYP & PTYP
0B04_TYP	TYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & PTYP
0B04_PTYP	PTYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & TYP
0B04_MaxTransfers	HEX	1	Maximum quantity of transfers allowed

0B04_FareCap	VALI	2	Maximum fare which may be charged for a qualifying journey
0B04_FareCapCurrencyCode	VALC	1	
0B04_ValidSameService?	HEX	1	See code list below

A value of FF hex in any of the TYP or PTP elements, or a value of FFFF hex in the OID element, shall denote a wildcard.

Note that this message is used to transmit parameters needed by the POST to implement multi-leg Journeys. In this context a “qualifying Journey” is any multi-leg Journey which satisfies the rules defining a qualifying Journey, as defined by the IPE owner and/or the Service Operator(s) concerned.

Table 104 - Valid same service code definition

Code	Definition
0	RFU
1	No
2	Yes
3-FF	RFU

6.7.4 Rebates, codes 0A05, 0B05.

Use of message code 0A05 is deprecated in this version of the Specification. References to this message code shall be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

Fares definition table for allowable fare reduction when transfer criteria for rebates are met. These criteria include use of the IPE Embodiment identified, meeting the transfer ticket rules including making the transfer within the time limit, and transfer from an operator defined by OID1, to an operator defined by OID2, or vice versa.

Table 105 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message.

Table 105 - Rebates, code 0B05

ITSO name	Format	Size (bytes)	Comment
0B05_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of one (1) shall be assigned to this element
0B05_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B05_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B05_IIN	IIN	3	Defines IPE Embodiment (Product type) together with OID, TYP & PTP
0B05_OID	OID16	2	Defines IPE Embodiment (Product type) together with IIN, TYP & PTP

0B05_TYP	TYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & PTYP
0B05_PTyp	PTYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & TYP
0B05_OID1	OID16	2	Participating operator 1
0B05_OID2	OID16	2	Participating operator 2
0B05_TimePeriod	HEX	1	Transfer time allowable from previous leg, in minutes
0B05_StartFare	VALI	2	Defines range of fares
0B05_EndFare	VALI	2	Defines range of fares
0B05_Rebate	VALI	2	Rebate amount
0B05_FareCurrencyCode	VALC	1	Currency code applicable to rebate amount and fares

A value of FF hex in any of the TYP or PTYP elements, or a value of FFFF hex in the OID element, shall denote a wildcard.

The data elements 0B05_StartFare and 0B05_EndFare define a range of fares which could be applied when calculating the fare for the new journey leg. i.e. to get the rebate the fare for the new (second) journey leg must fall within the defined range.

6.7.5 Loyalty Rules, Codes 0A06, 0B06.

Use of message code 0A06 is deprecated in this version of the Specification. References to this message code shall be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

Table 106 defines the loyalty rules for points accumulation.

Table 106 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message.

Table 106 - Loyalty Rules, Code 0B06

ITSO name	Format	Size (bytes)	Comment
0B06_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of one (1) shall be assigned to this element
0B06_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B06_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B06_IIN	IIN	3	Defines Loyalty IPE Embodiment (Product type) together with OID, TYP & PTYP
0B06_OID	OID16	2	Defines Loyalty IPE Embodiment (Product type) together with IIN, TYP & PTYP
0B06_TYP	TYP	1	Defines Loyalty IPE Embodiment (Product type) together with IIN, OID, & PTYP

0B06_PTyp	PTYP	1	Defines Loyalty IPE Embodiment (Product type) together with IIN, OID, & TYP
0B06_PointsPerUnitCurrency	HEX	1	Defines the quantity of loyalty points which should be awarded per unit of currency.
0B06_CurrencyCode	VALC	1	
0B06_Rounding	ASCII	1	Coded as 'U' indicating round up, 'D' indicating round down. Codes are 'upper case'. All other codes RFU.

A value of FF hex in any of the TYP or PTyp elements, or a value of FFFF hex in the OID element, shall denote a wildcard.

6.7.6 Currency, Codes 0A07, 0B07.

Use of message code 0A07 is deprecated in this version of the Specification. References to this message code shall be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

This table defines the currency exchange rate for conversions.

Table 107 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message.

Table 107 - Currency, Code 0B07

ITSO name	Format	Size (bytes)	Comment
0B07_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of one (1) shall be assigned to this element
0B07_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B07_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B07_FromCurrency	VALC	1	
0B07_ToCurrency	VALC	1	
0B07_EffectiveDate	BCDN	4	Date shall be transmitted as 8 characters in the form ddmmyyyy without delimiters, for example, shall be transmitted as 21042000.
0B07_Factor	Signed floating point number	4	Single Precision Floating Point Notation Defines the ratio which should be multiplied by a FromCurrency amount to determine the equivalent amount in ToCurrency.

6.7.7 Zone Table Reference, Codes 0A08, 0B08.

Use of message code 0A08 is deprecated in this version of the Specification. References to this message code shall be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

This table defines the zone table associated with an IPE embodiment.

Table 108 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message.

Table 108 - Zone Table Reference, Code 0B08

ITSO name	Format	Size (bytes)	Comment
0B08_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of one (1) shall be assigned to this element
0B08_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B08_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B08_IIN	IIN	3	Defines IPE Embodiment (Product type) together with OID, TYP & PTYP
0B08_OID	OID16	2	Defines IPE Embodiment (Product type) together with IIN, TYP & PTYP
0B08_TYP	TYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & PTYP
0B08_PTYP	PTYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & TYP
0B08_TableID	HEX	1	Pointer to Zone Table Bitmap, code 0A09

A value of FF hex in any of the TYP or PTYP elements, or a value of FFFF hex in the OID element, shall denote a wildcard.

6.7.8 Zone Table Bitmap, Codes 0A09, 0B09.

Use of message code 0A09 is deprecated in this version of the Specification. References to this message code shall be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

This table maps local zone identities to the encoded zone number

Table 109 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message.

Table 109 - Zone Table Bitmap, Code 0B09

ITSO name	Format	Size (bytes)	Comment
0B09_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of one (1) shall be assigned to this element
0B09_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B09_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII

0B09_TableID	HEX	1	Table Identity
0B09_Bit	HEX	2	Zone number, encoded as a HEX value , identifying the bit location in bit mapped zone data elements contained within IPEs defined according to LocDefType 204 or 205.
0B09_Zone	HEX	2	Local zone code ⁸

6.7.9 Sale Price Table, Codes 0A0A, 0B0A.

Use of message code 0A0A is deprecated in this version of the Specification. References to this message code shall be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

Sales parameters where required for interoperability of applications.

Table 110 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message.

Table 110 - Sale Price Table, Code 0B0A

ITSO name	Format	Size (bytes)	Comment
0B0A_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of one (1) shall be assigned to this element
0B0A_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B0A_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B0A_IIN	IIN	3	
0B0A_OID	OID16	2	
0B0A_TYP	TYP	1	
0B0A_PTyp	PTYP	1	
0B0A_RFU	RFU	1	Reserved for future use by ITSO
0B0A_Class	HEX	1	
0B0A_PromotionCode	HEX	1	
0B0A_EntitlementCode	HEX	1	
0B0A_ConcessionaryClass	HEX	1	
0B0A_DiscountPercentage	HEX	2	Percentage by which fare is discounted, expressed to 2 decimal places. This element may be used when EntitlementCode contains code 3, proportional fare. Values in the range 0 to 9999 (decimal, equivalent to 0x270F

⁸ zone code as printed on ticket and in fares information

			hexadecimal) shall be stored as a HEX number, and interpreted such that a value of 1 shall be interpreted to mean 0.01% and a value of 9999 (decimal) shall be interpreted to mean 99.99%.
0B0A_Price	VALI	2	
0B0A_PriceCurrencyCode	VALC	1	
0B0A_ValidityPeriodDays	HEX	2	Count of days.
0B0A_ParameterList	UD	Variable	

A value of FF hex in any of the TYP or PTYP elements, or a value of FFFF hex in the OID element, shall denote a wildcard.

6.7.10 IIN Table, Codes 0A0B, 0B0B

Use of message code 0A0B is deprecated in this version of the Specification. References to this message code shall be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

Table used to cross reference IIN_Index used in Hotlist and Actionlists, to actual IIN values.

Table 111 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message.

Table 111 - IIN Table, Code 0B0B

ITSO name	Format	Size (bytes)	Comment
0B0B_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of one (1) shall be assigned to this element
0B0B_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B0B_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B0B_IIN_Index	HEX	1	
0B0B_IIN	IIN	3	

6.7.11 IPE Parameter Tables, Codes 0A0C, 0B0C

Use of message code 0A0C is deprecated in this version of the Specification. References to this message code shall be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

A table containing IPE owner defined parameters according to the IPE embodiment specification. Used for creating IPEs at POSTs.

Table 112 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message.

Table 112 - IPE Parameter Tables, Code 0B0C

Name	Format	Size	Comment
0B0C_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of one (1) shall be assigned to this element
0B0C_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B0C_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B0C_Length	HEX	1	Combined Length of the 0A0C_IPE_EmbodimentParameterList and 0A0C_Length elements
0B0C_IPE_EmbodimentParameterList	EmbodimentList	Variable	The Target IPE Embodiment Parameter List as defined herein

6.7.12 ISAM Management File Parameters, Codes 0A0D, 0B0D

Use of message code 0A0D is deprecated in this version of the Specification. References to this message code shall be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

A table generated by an AMS that contains ISAM control and status parameters.

Table 112a defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message. Each row in the table defines an ISAM data file.

Table 112a – ISAM Management File Parameters, Code 0B0D

Name	Format	Size	Comment
0B0D_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of one (1) shall be assigned to this element
0B0D_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B0D_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B0D_Type	HEX	1	The File type (see ITSO TS1000 -8)
0B0D_IDentifier	HEX	2	The Identifier of the file as allocated or referenced by the AMS
0B0D_EF_Size	HEX	2	The number of data bytes in the file (see ITSO TS1000 -8)
0B0D_Record_length	HEX	1	The number of Bytes in a record (not relevant if the file type is not record based – in this case set to 0)
0B0D_File_Use	HEX	1	The file use as defined in table 112a1

0B0D_VF_DATE	DATE	2	The date upon which this entry becomes active
--------------	------	---	---

Table 112a1 – ISAM Management File Parameters File Use Codes

Code	File Use
0	Combined Hotlist and Actionlist file allocation
1	Hotlist file allocation
2	Actionlist file allocation
3	Statistics of the ISAM file referenced by the 0B0D_Identifier Data Element. The use of this code is OPTIONAL where an AMS HOPS wishes to inform the POST of the sizes of ISAM Acceptance and Capability tables
4-255	RFU

6.7.13 Term Dates, Codes 0A01, 0B01

Use of message code 0A01 is deprecated in this version of the Specification. References to this message code shall be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

Table 112b - Term Dates, code 0B01

ITSO name	Format	Size (bytes)	Comment
0B01_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of one (1) shall be assigned to this element
0B01_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B01_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B01_IIN	IIN	3	Defines IPE Embodiment (Product type) together with OID, TYP & PTYP
0B01_OID	OID16	2	Defines IPE Embodiment (Product type) together with IIN, TYP & PTYP
0B01_TYP	TYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & PTYP
0B01_PTYP	PTYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & TYP
0B01_EstablishmentCode	ASCII	4	Match to CPICC (see note 2). This data element shall be coded as an ASCII representation of a hexadecimal value, padded with leading spaces where appropriate.
0B01_TermDateStart1	Date	2	2 bit padding + DateStamp

			The Product shall be valid upon this date and upon subsequent dates until Term End Date
0B01_TermDateEnd1	Date	2	2 bit padding + DateStamp The Product shall be valid upon this date but not valid thereafter, excepting where a second term is defined by TermDateStart2 & TermDateEnd2
0B01_TermDateStart2	Date	2	2 bit padding + DateStamp The Product shall be valid upon this date and upon subsequent dates until Term End Date (see note 3)
0B01_TermDateEnd2	Date	2	2 bit padding + DateStamp The Product shall be valid upon this date but not valid thereafter

Note 1: That there may be more than one table entry for each Product Type ID / Establishment Code combination.

Note 2: It is assumed, as this table defines term dates, that it is used for scholars' passes; in which case the establishment code (i.e. the school or college ID code) will always be stored in CPICC. This works for IPE TYPs 14, 16, 22, & 23.

Note 3: Including two term ranges in the table has logistical advantages for scheme operators – at half terms and inset days there is very little time between the end of one term and the start of another during which all POSTs can be loaded with the new configuration table. Having two ranges in the table avoids this problem, and significantly reduces the chances of finding two rows in the table for the same product.

6.7.14 Passback times, Codes 0A0E, 0B0E

Use of message code 0A0E is deprecated in this version of the Specification. References to this message code shall be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

Table 112c - Passback Times, code 0B0E

ITSO name	Format	Size (bytes)	Comment
0B0E_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of one (1) shall be assigned to this element
0B0E_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B0E_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B0E_IIN	IIN	3	Defines IPE Embodiment (Product type) together with OID, TYP & PTYP
0B0E_OID	OID16	2	Defines IPE Embodiment (Product type) together with IIN, TYP & PTYP
0B0E_TYP	TYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & PTYP
0B0E_PTYP	PTYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & TYP

0B0E_ConcessionaryClass	HEX	1	Match against the ConcessionaryClass data element found within the Product – if no such element within the Product then assume a match ⁹
0B0E_PassbackTime	HEX	1	Time in minutes

6.8 Parameter table definitions, ListFormatRevision = 2

6.8.1 Peak Times, Code 0A02, ListFormatRevision = 2.

Use of message code 0A02, ListFormatRevision = 2 is deprecated in this version of the Specification. References to this message code will be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

The table defines inclusive Peak Times for the IPE Embodiment identified in the record. It may be used in conjunction with the peak/off-peak flag.

Table 100-2 - Peak Times, Code 0B02

ITSO name	Format	Size (bytes)	Comment
0B02_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of two (2) shall be assigned to this element
0B02_IndexNumber	HEX	2	The IndexNumber shall be assigned by the First Line HOPS that collates the PCD. This number shall be unique in every row of a particular Parameter table but not necessarily contiguous or sequential within that table.
0B02_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B02_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B02_IIN	IIN	3	Defines IPE Embodiment (Product type) together with OID, TYP & PTYP
0B02_OID	OID16	2	Defines IPE Embodiment (Product type) together with IIN, TYP & PTYP
0B02_TYP	TYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & PTYP
0B02_PTYP	PTYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & TYP
0B02_QualiferCodeRef	HEX	1	A reference to the IPE data element which should be matched against 0A02_QualifierCode, see table 100a, 100b, 100c, 100d, 100e & 100f.

⁹ This test is included to further differentiate between products

0B02_QualifierCode	UD	4	A qualifier code defined by the Product Owner. This element may be matched to an IPE data element as defined by 0A02_QualifierCodeRef.
0B02_DayType	HEX	1	Code indicating the type of day to which the record applies, defined below in table 101.
0B02_Start	BCDN	2	A time expressed in BCD, for example, would be recorded as 1734.
0B02_End	BCDN	2	A time expressed in BCD, for example, would be recorded as 1734.

Where more than one peak time band is required for a given IPE, then multiple rows shall be created in the table, one row per IPE / peak time band combination.

A value of FF hex in any of the TYP or PTYP elements, or a value of FFFF hex in the OID element, shall denote a wildcard.

Table 100a-2 - QualifierCodeRef definition

QualifierCodeRef value	TYP 2 data element	TYP 3 data element	TYP 4 data element	TYP 5 data element	TYP 17 data element
0	No matching IPE data element	No matching IPE data element	No matching IPE data element	No matching IPE data element	No matching IPE data element
1-255	RFU	RFU	RFU	RFU	RFU

Table 100b-2 - QualifierCodeRef definition

QualifierCodeRef value	TYP 14 data element	TYP 16 data element
0	No matching IPE data element	No matching IPE data element
1	CPICC	CPICC
2	EntitlementCode	EntitlementCode
3	ConcessionaryClass	ConcessionaryClass
4	RFU	DateOfBirth
5-255	RFU	RFU

Table 100c-2 - QualifierCodeRef definition

QualifierCodeRef value	TYP 22 data element	TYP 23 data element
0	No matching IPE data element	No matching IPE data element
1	Class	Class

2	PromotionCode	PromotionCode
3	CPICC	CPICC
4	ValidityCode	ValidityCode
5-255	RFU	RFU

Table 100d-2 - QualiferCodeRef definition

QualiferCodeRef value	TYP 24 data element	TYP 25 data element
0	No matching IPE data element	No matching IPE data element
1	Class	ServiceID
2	JourneyTypeCode	UserDefined
3	ProfileCode	RFU
4	TicketStatusCode	RFU
5	TypeOfTicketCode	RFU
6	ValidityCode	RFU
7	RestrictionCode	RFU
8	RestrictedCode	RFU
9	UserDefined (from the relevant reservation block)	RFU
10	ServiceIdentifier	RFU
11	TravelServiceNumber	RFU
12	AssistanceType	RFU
13-255	RFU	RFU

Table 100e-2 - QualiferCodeRef definition

QualiferCodeRef value	TYP 26 data element	TYP 27 data element
0	No matching IPE data element	No matching IPE data element
1	Typ26Class	RFU
2	UserDefined (least significant 2 bytes only)	RFU
3-255	RFU	RFU

Table 100f-2 - QualiferCodeRef definition

QualiferCodeRef value	TYP 28 data element	TYP 29 data element
0	No matching IPE data element	No matching IPE data element
1-255	RFU	RFU

Day type shall be a 1 byte HEX code defined as follows:

Table 101-2 - DayType Definition

HEX Code	Day type definition
0	This code value shall not be used
1	Monday to Friday inclusive
2	Saturday
3	Sunday
4	Saturday+Sunday
5	Bank Holiday
6	Routine abnormal day, Market day for example (A 'special day')
7	All day types, i.e. Monday to Sunday inclusive, and bank holidays and routine abnormal days.
8 – FF	Reserved for future use.

6.8.2 Day type assignment, code 0A03, 0B03, ListFormatRevision = 2.

Use of message code 0A03, ListFormatRevision = 2 is deprecated in this version of the Specification. References to this message code will be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

Defines the day types upon which an IPE Embodiment (Product type) is valid.

Table 102 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message.

Table 102-2 - Day type assignment, code 0B03

ITSO name	Format	Size (bytes)	Comment
0B03_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of two (2) shall be assigned to this element
0B03_IndexNumber	HEX	2	The IndexNumber shall be assigned by the First Line HOPS that collates the PCD. This number shall be unique in every row of a

			particular Parameter table but not necessarily contiguous or sequential within that table.
0B03_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B03_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B03_IIN	IIN	3	Defines IPE Embodiment (Product type) together with OID, TYP & PTYP
0B03_OID	OID16	2	Defines IPE Embodiment (Product type) together with IIN, TYP & PTYP
0B03_TYP	TYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & PTYP
0B03_PTYP	PTYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & TYP
0B03_DayType	BMP	1	Day types upon which this IPE Embodiment is valid, depicted as a bit map which is defined in table 102a.

A value of FF hex in any of the TYP or PTYP elements, or a value of FFFF hex in the OID element, shall denote a wildcard.

Table 102a-2 - DayType Bit Map Definition

Bit	Day type definition
0 (LSB)	When set, indicates that the IPE is valid on Mondays to Fridays inclusive.
1	When set, indicates that the IPE is valid on Saturdays.
2	When set, indicates that the IPE is valid on Sundays.
3	When set, indicates that the IPE is valid on Special Days, Bank Holidays and Public Holidays.
4	Reserved for future use.
5	Reserved for future use.
6	Reserved for future use.
7 (MSB)	Reserved for future use.

6.8.3 Transfers, Codes 0A04, 0B04, ListFormatRevision = 2.

Use of message code 0A04, ListFormatRevision = 2 is deprecated in this version of the Specification. References to this message code will be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

Facilities for defining transfer limit treated as part of overall through journey for fares calculation purposes, together with any fares cap associated with purse payments.

Table 103 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message.

Table 103-2 - Transfers, Code 0B04

ITSO name	Format	Size (bytes)	Comment
0B04_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of two (2) shall be assigned to this element
0B04_IndexNumber	HEX	2	The IndexNumber shall be assigned by the First Line HOPS that collates the PCD. This number shall be unique in every row of a particular Parameter table but not necessarily contiguous or sequential within that table.
0B04_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B04_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B04_IIN	IIN	3	Defines IPE Embodiment (Product type) together with OID, TYP & PTYP
0B04_OID	OID16	2	Defines IPE Embodiment (Product type) together with IIN, TYP & PTYP
0B04_TYP	TYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & PTYP
0B04_PTYP	PTYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & TYP
0B04_MaxTransfers	HEX	1	Maximum quantity of transfers allowed
0B04_FareCap	VALI	2	Maximum fare which may be charged for a qualifying journey
0B04_FareCapCurrencyCode	VALC	1	
0B04_ValidSameService?	HEX	1	See code list below

A value of FF hex in any of the TYP or PTYP elements, or a value of FFFF hex in the OID element, shall denote a wildcard.

Note that this message is used to transmit parameters needed by the POST to implement multi-leg Journeys. In this context a “qualifying Journey” is any multi-leg Journey which satisfies the rules defining a qualifying Journey, as defined by the IPE owner and/or the Service Operator(s) concerned.

Table 104-2 - ‘Valid same service’ code definition

Code	Definition
0	RFU
1	No

2	Yes
3-FF	RFU

6.8.4 Rebates, codes 0A05, 0B05, ListFormatRevision = 2.

Use of message code 0A05, ListFormatRevision = 2 is deprecated in this version of the Specification. References to this message code will be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

Fares definition table for allowable fare reduction when transfer criteria for rebates are met. These criteria include use of the IPE Embodiment identified, meeting the transfer ticket rules including making the transfer within the time limit, and transfer from an operator defined by OID1, to an operator defined by OID2, or vice versa.

Table 105 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message.

Table 105-2 - Rebates, code 0B05

ITSO name	Format	Size (bytes)	Comment
0B05_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of two (2) shall be assigned to this element
0B05_IndexNumber	HEX	2	The IndexNumber shall be assigned by the First Line HOPS that collates the PCD. This number shall be unique in every row of a particular Parameter table but not necessarily contiguous or sequential within that table.
0B05_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B05_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B05_IIN	IIN	3	Defines IPE Embodiment (Product type) together with OID, TYP & PTYP
0B05_OID	OID16	2	Defines IPE Embodiment (Product type) together with IIN, TYP & PTYP
0B05_TYP	TYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & PTYP
0B05_PTYP	PTYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & TYP
0B05_OID1	OID16	2	Participating operator 1
0B05_OID2	OID16	2	Participating operator 2
0B05_TimePeriod	HEX	1	Transfer time allowable from previous leg, in minutes
0B05_StartFare	VALI	2	Defines range of fares

0B05_EndFare	VALI	2	Defines range of fares
0B05_Rebate	VALI	2	Rebate amount
0B05_FareCurrencyCode	VALC	1	Currency code applicable to rebate amount and fares

A value of FF hex in any of the TYP or PTYP elements, or a value of FFFF hex in the OID element, shall denote a wildcard.

The data elements 0B05_StartFare and 0B05_EndFare define a range of fares which could be applied when calculating the fare for the new journey leg. i.e. to get the rebate the fare for the new (second) journey leg must fall within the defined range.

6.8.5 Loyalty Rules, Codes 0A06, 0B06, ListFormatRevision = 2.

Use of message code 0A06, ListFormatRevision = 2 is deprecated in this version of the Specification. References to this message code will be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

Table 106 defines the loyalty rules for points accumulation.

Table 106 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message.

Table 106-2 - Loyalty Rules, Code 0B06

ITSO name	Format	Size (bytes)	Comment
0B06_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of two (2) shall be assigned to this element
0B06_IndexNumber	HEX	2	The IndexNumber shall be assigned by the First Line HOPS that collates the PCD. This number shall be unique in every row of a particular Parameter table but not necessarily contiguous or sequential within that table.
0B06_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B06_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B06_IIN	IIN	3	Defines Loyalty IPE Embodiment (Product type) together with OID, TYP & PTYP
0B06_OID	OID16	2	Defines Loyalty IPE Embodiment (Product type) together with IIN, TYP & PTYP
0B06_TYP	TYP	1	Defines Loyalty IPE Embodiment (Product type) together with IIN, OID, & PTYP
0B06_PTYP	PTYP	1	Defines Loyalty IPE Embodiment (Product type) together with IIN, OID, & TYP

0B06_PointsPerUnitCurrency	HEX	1	Defines the quantity of loyalty points which should be awarded per unit of currency.
0B06_CurrencyCode	VALC	1	
0B06_Rounding	ASCII	1	Coded as 'U' indicating round up, 'D' indicating round down. Codes are 'upper case'. All other codes RFU.

A value of FF hex in any of the TYP or PTYP elements, or a value of FFFF hex in the OID element, shall denote a wildcard.

6.8.6 Currency, Codes 0A07, 0B07, ListFormatRevision = 2.

Use of message code 0A07, ListFormatRevision = 2 is deprecated in this version of the Specification. References to this message code will be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

This table defines the currency exchange rate for conversions.

Table 107 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message.

Table 107-2 - Currency, Code 0B07

ITSO name	Format	Size (bytes)	Comment
0B07_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of two (2) shall be assigned to this element
0B08_IndexNumber	HEX	2	The IndexNumber shall be assigned by the First Line HOPS that collates the PCD. This number shall be unique in every row of a particular Parameter table but not necessarily contiguous or sequential within that table.
0B07_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B07_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B07_FromCurrency	VALC	1	
0B07_ToCurrency	VALC	1	
0B07_EffectiveDate	BCDN	4	Date shall be transmitted as 8 characters in the form ddmmyyyy without delimiters, for example, shall be transmitted as 21042000.
0B07_Factor	Signed floating point number	4	Single Precision Floating Point Notation Defines the ratio which should be multiplied by a FromCurrency amount to determine the equivalent amount in ToCurrency.

6.8.7 Zone Table Reference, Codes 0A08, 0B08, ListFormatRevision = 2.

Use of message code 0A08, ListFormatRevision = 2 is deprecated in this version of the Specification. References to this message code will be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

This table defines the zone table associated with an IPE embodiment.

Table 108 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message.

Table 108-2 - Zone Table Reference, Code 0B08

ITSO name	Format	Size (bytes)	Comment
0B08_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of two (2) shall be assigned to this element
0B08_IndexNumber	HEX	2	The IndexNumber shall be assigned by the First Line HOPS that collates the PCD. This number shall be unique in every row of a particular Parameter table but not necessarily contiguous or sequential within that table.
0B08_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B08_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B08_IIN	IIN	3	Defines IPE Embodiment (Product type) together with OID, TYP & PTYP
0B08_OID	OID16	2	Defines IPE Embodiment (Product type) together with IIN, TYP & PTYP
0B08_TYP	TYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & PTYP
0B08_PTYP	PTYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & TYP
0B08_TableID	HEX	1	Pointer to Zone Table Bitmap, code 0B09

A value of FF hex in any of the TYP or PTYP elements, or a value of FFFF hex in the OID element, shall denote a wildcard.

6.8.8 Zone Table Bitmap, Codes 0A09, 0B09, ListFormatRevision = 2.

Use of message code 0A09, ListFormatRevision = 2 is deprecated in this version of the Specification. References to this message code will be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

This table maps local zone identities to the encoded zone number

Table 109 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message.

Table 109-2 - Zone Table Bitmap, Code 0B09

ITSO name	Format	Size (bytes)	Comment
0B09_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of two (2) shall be assigned to this element
0B09_IndexNumber	HEX	2	The IndexNumber shall be assigned by the First Line HOPS that collates the PCD. This number shall be unique in every row of a particular Parameter table but not necessarily contiguous or sequential within that table.
0B09_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B09_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B09_TableID	HEX	1	Table Identity
0B09_Bit	HEX	2	Zone number, encoded as a HEX value , identifying the bit location in bit mapped zone data elements contained within IPEs defined according to LocDefType 204 or 205.
0B09_Zone	HEX	2	Local zone code ¹⁰

6.8.9 Sale Price Table, Codes 0A0A, 0B0A, ListFormatRevision = 2.

Use of message code 0A0A, ListFormatRevision = 2 is deprecated in this version of the Specification. References to this message code will be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

Sales parameters where required for interoperability of applications.

Table 110 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message.

Table 110-2 - Sale Price Table, Code 0B0A

ITSO name	Format	Size (bytes)	Comment
0B0A_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of two (2) shall be assigned to this element
0B0A_IndexNumber	HEX	2	The IndexNumber shall be assigned by the First Line HOPS that collates the PCD. This number shall be unique in every row of a particular Parameter table but not necessarily contiguous or sequential within that table.
0B0A_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B0A_EndDateTime	BCDN	6	The date and time upon which the validity of this list item

¹⁰ zone code as printed on ticket and in fares information

			ceases, formatted as YYYYMMDDHHII
0B0A_IIN	IIN	3	
0B0A_OID	OID16	2	
0B0A_TYP	TYP	1	
0B0A_PTyp	PTYP	1	
0B0A_RFU	RFU	1	Reserved for future use by ITSO
0B0A_Class	HEX	1	
0B0A_PromotionCode	HEX	1	
0B0A_EntitlementCode	HEX	1	
0B0A_ConcessionaryClass	HEX	1	
0B0A_DiscountPercentage	HEX	2	Percentage by which fare is discounted, expressed to 2 decimal places. This element may be used when EntitlementCode contains code 3, proportional fare. Values in the range 0 to 9999 (decimal, equivalent to 0x270F hexadecimal) shall be stored as a HEX number, and interpreted such that a value of 1 shall be interpreted to mean 0.01% and a value of 9999 (decimal) shall be interpreted to mean 99.99%.
0B0A_Price	VALI	2	
0B0A_PriceCurrencyCode	VALC	1	
0B0A_ValidityPeriodDays	HEX	2	Count of days defining the period for which the data in this message is valid. This data element shall be set to a value of 0xFFFF. It is recommended that POSTs interpret this value as indicating that the message data is valid until EndDateTime.
0B0A_ParameterList	UD	Variable	

A value of FF hex in any of the TYP or PTyp elements, or a value of FFFF hex in the OID element, shall denote a wildcard.

6.8.10 IIN Table, Codes 0A0B, 0B0B, ListFormatRevision = 2

Use of message code 0A0B, ListFormatRevision = 2 is deprecated in this version of the Specification. References to this message code will be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

Table used to cross reference IIN_Index used in Hotlist and Actionlists, to actual IIN values.

Table 111 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message.

Table 111-2 - IIN Table, Code 0B0B

ITSO name	Format	Size (bytes)	Comment
-----------	--------	--------------	---------

0B0B_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of two (2) shall be assigned to this element
0B0B_IndexNumber	HEX	2	The IndexNumber shall be assigned by the First Line HOPS that collates the PCD. This number shall be unique in every row of a particular Parameter table but not necessarily contiguous or sequential within that table.
0B0B_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B0B_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B0B_IIN_Index	HEX	1	
0B0B_IIN	IIN	3	

6.8.11 IPE Parameter Tables, Codes 0A0C, 0B0C, ListFormatRevision = 2

Use of message code 0A0C, ListFormatRevision = 2 is deprecated in this version of the Specification. References to this message code will be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

A table containing IPE owner defined parameters according to the IPE embodiment specification. Used for creating IPEs at POSTs.

Table 112-2 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message.

Table 112-2 - IPE Parameter Tables, Code 0B0C, ListFormatRevision = 2

Name	Format	Size	Comment
0B0C_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of two (2) shall be assigned to this element.
0B0C_IndexNumber	HEX	2	The IndexNumber shall be assigned by the First Line HOPS that collates the PCD. This number shall be unique in every row of a particular Parameter table but not necessarily contiguous or sequential within that table.
0B0C_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII.
0B0C_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII.
0B0C_Length	HEX	2	Combined Length of the 0A0C_IPE_EmbodimentParameterList and 0A0C_Length elements.

0B0C_IPE_EmbodimentParameterList	EmbodimentList	Variable	The Target IPE Embodiment Parameter List as defined herein.
----------------------------------	----------------	----------	---

6.8.12 ISAM Management File Parameters, Codes 0A0D, 0B0D, ListFormatRevision = 2

Use of message code 0A0D, ListFormatRevision = 2 is deprecated in this version of the Specification. References to this message code will be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

A table generated by an AMS that contains ISAM control and status parameters.

Table 112a-2 defines one entry in a table of entries, where each entry shall be transmitted to the POST as a discrete message. Each row in the table defines an ISAM data file.

Table 112a -2 - ISAM Management File Parameters, Code 0B0D

Name	Format	Size	Comment
0B0D_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of two (2) shall be assigned to this element.
0B0D_IndexNumber	HEX	2	The IndexNumber shall be assigned by the First Line HOPS that collates the PCD. This number shall be unique in every row of a particular Parameter table but not necessarily contiguous or sequential within that table.
0B0D_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII.
0B0D_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII.
0B0D_Type	HEX	1	The File type (see ITSO TS1000 -8).
0B0D_IDentifier	HEX	2	The Identifier of the file as allocated or referenced by the AMS.
0B0D_EF_Size	HEX	2	The number of data bytes in the file (see ITSO TS1000 -8).
0B0D_Record_length	HEX	1	The number of Bytes in a record (not relevant if the file type is not record based – in this case set to 0).
0B0D_File_Use	HEX	1	The file use as defined in table 112a1-2.
0B0D_VF_DATE	DATE	2	The date upon which this entry becomes active.

Table 112a1 - 2 - ISAM Management File Parameters File Use Codes

Code	File Use
0	RFU
1	RFU
2	RFU
3	Statistics of the ISAM file referenced by the 0B0D_Identifier Data Element. The use of this code is OPTIONAL where an AMS HOPS wishes to inform the POST of the sizes of ISAM Acceptance and Capability tables
4-255	RFU

6.8.13 Term Dates, Codes 0A01, 0B01, ListFormatRevision = 2

Use of message code 0A01, ListFormatRevision = 2 is deprecated in this version of the Specification. References to this message code will be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

Table 112b-2 - Term Dates, code 0B01

ITSO name	Format	Size (bytes)	Comment
0B01_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of two (2) shall be assigned to this element.
0B01_IndexNumber	HEX	2	The IndexNumber shall be assigned by the First Line HOPS that collates the PCD. This number shall be unique in every row of a particular Parameter table but not necessarily contiguous or sequential within that table.
0B01_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII.
0B01_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII.
0B01_IIN	IIN	3	Defines IPE Embodiment (Product type) together with OID, TYP & PTYP.
0B01_OID	OID16	2	Defines IPE Embodiment (Product type) together with IIN, TYP & PTYP.
0B01_TYP	TYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & PTYP.
0B01_PTYP	PTYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & TYP.
0B01_EstablishmentCode	ASCII	4	Match to CPICC (see note 2). This data element shall be coded as an ASCII representation of a hexadecimal value, padded with leading spaces where appropriate.
0B01_TermDateStart1	Date	2	2 bit padding + DateStamp

			The Product shall be valid upon this date and upon subsequent dates until Term End Date.
0B01_TermDateEnd1	Date	2	2 bit padding + DateStamp The Product shall be valid upon this date but not valid thereafter, excepting where a second term is defined by TermDateStart2 & TermDateEnd2.
0B01_TermDateStart2	Date	2	2 bit padding + DateStamp The Product shall be valid upon this date and upon subsequent dates until Term End Date (see note 3).
0B01_TermDateEnd2	Date	2	2 bit padding + DateStamp The Product shall be valid upon this date but not valid thereafter.

Note 1: That there may be more than one table entry for each Product Type ID / Establishment Code combination.

Note 2: It is assumed, as this table defines term dates, that it is used for scholars' passes; in which case the establishment code (i.e. the school or college ID code) will always be stored in CPICC. This works for IPE TYPs 14, 16, 22, & 23.

Note 3: Including two term ranges in the table has logistical advantages for scheme operators – at half terms and inset days there is very little time between the end of one term and the start of another during which all POSTs can be loaded with the new configuration table. Having two ranges in the table avoids this problem, and significantly reduces the chances of finding two rows in the table for the same product.

6.8.14 Passback times, Codes 0A0E, 0B0E, ListFormatRevision = 2

Use of message code 0A0E, ListFormatRevision = 2 is deprecated in this version of the Specification. References to this message code will be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

Table 112c -2 - Passback Times, code 0B0E

ITSO name	Format	Size (bytes)	Comment
0B0E_ListFormatRevision	HEX	1	For list items formatted according to this definition a value of two (2) shall be assigned to this element
0B0E_IndexNumber	HEX	2	The IndexNumber shall be assigned by the First Line HOPS that collates the PCD. This number shall be unique in every row of a particular Parameter table but not necessarily contiguous or sequential within that table.
0B0E_StartDateTime	BCDN	6	The date and time upon which the validity of this list item commences, formatted as YYYYMMDDHHII
0B0E_EndDateTime	BCDN	6	The date and time upon which the validity of this list item ceases, formatted as YYYYMMDDHHII
0B0E_IIN	IIN	3	Defines IPE Embodiment (Product type) together with OID, TYP & PTYP
0B0E_OID	OID16	2	Defines IPE Embodiment (Product type) together with IIN, TYP & PTYP
0B0E_TYP	TYP	1	Defines IPE Embodiment (Product type) together with IIN,

			OID, & PTYP
0B0E_PTyp	PTYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & TYP
0B0E_ConcessionaryClass	HEX	1	Match against the ConcessionaryClass data element found within the Product – if no such element within the Product then assume a match ¹¹
0B0E_PassbackTime	HEX	1	Time in minutes

6.9 Manifest Message

The new Manifest message shall be made up of a Header Data Structure plus one Table Data Structure for each of the Parameter Tables present in the complete PCD intended for the recipient POST or SET of POSTS followed by a Trailer Data Structure.

The Header shall contain information on the manifest structure, validity and the number of tables present.

This shall be followed by any number of Table Data Structures that contain information about the contents of all the constituent tables in the Post Configuration Data including a Hash value of the contents of each table present.

This shall be followed by a Trailer Data Element containing the hash value computed for the manifest.

6.9.1 Manifest Message code

Use of message code 0AFF is deprecated in this version of the Specification. References to this message code will be removed from the next version of the Specification and is retained only for purposes of backwards compatibility.

The message code 0x0AFF (0x0BFF) shall be used for the manifest message. If PCD is used it shall be mandatory for all POSTs to accept the manifest (where present) within an 0600 message.

Note: This allows the manifest message to be transmitted as any one of the following:

- A single data frame
- On its own within an 0600 message using the HASH sealing method
- Within an 0600 message together with all PCD parameter tables
- Within an 0600 mixed with other lists and or PCD parameter tables

PCD updates shall consist of a complete business rule update covered by a single manifest and be sent from a HOPS in accordance with TS1000-4 clause 8.5.15.2 then actioned by a POST in accordance with TS1000-3 clause 6.4.3.

6.9.2 Manifest message Data

The Data Structures and Elements that make up the Data content of a Manifest message are tabulated below and defined in the remainder of this clause.

Data Structure / Element	ITSO name	Format	Offset	Size (bytes)	Comment
--------------------------	-----------	--------	--------	--------------	---------

¹¹ This test is included to further differentiate between products

Header	FormatRevision	HEX	0	1	The version of the structure and content of the Data Elements in the entire Manifest message
	Manifest_Description	ASCII	1	20	Free text description of this manifest
	Manifest_DTS	DTS	21	3	The date of creation of this manifest
	StartDateTime	DTS	24	3	The indicative date and time upon which this Manifest commences.
	EndDateTime	DTS	27	3	The indicative date and time after which this Manifest ceases.
	NumTables	HEX	30	2	Total number of Table Data Structures present in this Manifest message
Table	Table_Message_Code	HEX	32	2	As defined in TS1000-6 using the 0x0Axx notation
	ParameterTableIdentifier	HEX	34	2	Unique identity for the table identified by the Table_Message_Code
	Table_FormatRevision	HEX	36	1	The version of the structure and content of the table identified by the Table_Message_Code
	TableNumRows	HEX	37	3	Total number of rows present in the table identified by the Table_Message_Code
	TableHash	HEX	40	20	The SHA1 Hash of all the contents of the table identified by the Table_Message_Code
Table	Other instances of the Table Data Structure above as determined by NumTables				
Trailer	ManifestHash	HEX	VAR	20	The SHA1 Hash of the contents of the Manifest

6.9.3 Data Elements comprising the Manifest Header

This shall be the first Data Structure of the manifest message and shall be comprised of the Data Elements defined in this clause.

6.9.3.1 FormatRevision

This Data Element indicates the version of the structure and content of the data following this element in the Manifest.

This Data Element shall be formatted as a single byte binary integer in the range 1-255.

All the subsequent Data Elements and structures in this clause (6.9.3) and all Data Elements in clause 6.9.4 and 6.9.5 are defined for FormatRevision = 1 of the Manifest.

6.9.3.2 Manifest_Description

A text string assigned by the HOPS to identify the PCD currently applicable to the target equipment. This Data Element shall be formatted as up to 20 ASCII characters left justified and padded with spaces if necessary.

Note: This Data Element is also included in Format Revision 2 of the 0803 message as a new Data Element (0803_Manifest_Description)

6.9.3.3 Manifest_DTS

A DTS generated by the HOPS used to identify the date of creation of the PCD described in the Manifest_Description.

This Data Element shall be formatted as Data Type DTS (see TS1000-1).

It shall be used by the POST to determine if this Manifest supersedes any the POST is currently using.

Note: This Data Element is also included in Format Revision 2 of the 0803 message as a new Data Element (0803_Manifest_DTS)

6.9.3.4 StartDateTime

The date and time upon which this Manifest becomes valid.

This Data Element shall be formatted as Data Type DTS (see TS1000-1) and may be used as defined by the POST application.

6.9.3.5 EndDateTime

The date and time after which this Manifest becomes invalid.

This Data Element shall be formatted as Data Type DTS (see TS1000-1) and may be used as defined by the POST application.

6.9.3.6 NumTables

The total number of Manifest Table Data Structures that are present in this Manifest message.

This Data Element shall be formatted as a 2 byte binary integer in the range 1- 65535.

6.9.4 Data Elements comprising the Table Data structures

One or more instances of the Table Data Structure shall follow the Manifest Header Data Structure. The Table Data Structure shall be comprised of the Data Elements defined in this clause.

Each Table Data Structure shall be associated with a table present in the PCD. Thus if there are 5 tables in the PCD there will be 5 Table Data structures in the Manifest message.

6.9.4.1 Table_Message_Code

This Data Element contains the Parameter Table Message Code using the 0AXX format of the message code as defined for one of the tables in TS1000-6 that is present in the PCD.

6.9.4.2 ParameterTableIdentifier

This Data Element is a copy of the value of the ParameterTableIdentifier that is defined in TS1000-6 and found in the Parameter Table pointed to by the Table_Message_Code in this Data Structure.

6.9.4.3 Table_FormatRevision

This Data Element is a copy of the 0AXX_FormatRevision that is defined in TS1000-6 and found in the Parameter Table pointed to by the Table_Message_Code in this Data Structure.

6.9.4.4 TableNumRows

The total number of rows present in the Parameter Table pointed to by the Table_Message_Code in this Data Structure.

This Data Element shall be formatted as a 2 byte binary integer in the range 1- 65535.

6.9.4.5 TableHash

This Data Element shall be a Hash value derived from the contents of every element in all rows of the Parameter Table pointed to by the Table_Message_Code in this Table Data Structure of the manifest.

The Hash value shall be calculated over the native format version of the Data Elements as defined in clause 6.8 of TS1000-6 for every row of the Parameter Table concatenated in ascending row order.

This Data Element shall be formatted as a 20 byte binary string and shall be generated using the SHA1 algorithm.

6.9.5 Manifest Trailer Data Element

This is single data element following the last Table Data Structure in the Manifest message.

6.9.5.1 ManifestHash

This Data Element shall be a Hash value derived from the contents of every other Data Element in the message in the order received but not including the ManifestHash Data Element itself. The Hash value shall be calculated over the native format version of all the preceding content in the Data Element of the message.

This Data Element shall be formatted as a 20 byte binary string and shall be generated using the SHA1 algorithm.

Note: The ManifestHash Data Element is purely related to the Manifest message and should not be confused with the HASH Data Element used when generating the Seal in a Data Frame Trailer of long messages.

7. POST to HOPS queries.

Use of message codes 0500, 0501, 0502, 0503, 0504, 0505-05FF (POST to HOPS queries) and 0D00, 0D01, 0D02, 0D03, 0D04, 0D05, 0D06, 0D07-0DFE, 0DFF (POST to HOPS query responses) is deprecated in this version of the Specification and will be removed from the next version of the Specification.

This group of messages constitutes a query generated by a POST followed by a response from the HOPS.

7.1 Message Codes.

Table 113 - POST to HOPS queries, Message Codes

Group	Transaction Type	HEX CODE
POST to HOPS queries	Customer Media holder ID information	0500
	Stored Travel Rights details	0501
	Loyalty details	0502
	CTA details	0503
	Request deposit refund rules	0504
	RFU	0505-05FF
POST to HOPS query responses	Customer Media holder ID information	0D00
	Stored Travel Rights details	0D01
	Loyalty details type 1	0D02
	Loyalty details type 2	0D03
	CTA details (TYP 4)	0D04
	CTA details (TYP 5)	0D05
	Deposit refund rules	0D06
	RFU	0D07-0DFE
	Response: No data available	0DFF

7.2 Request Messages.

All the data elements in request messages shall be used in the HOPS search of Shell and Product Accounts.

7.2.1 Customer Media holder ID information Code 0500**Table 114 - Customer Media holder ID information Code 0500**

Name	Format	Size	Comment
MessageFormatRevisionNumber	HEX	1	For messages formatted according to this version of the specification, this element shall be set to one (1)
ITSOShell Reference Number	ISRN	9	
IPEID	IPEIDM	7	
IPE_ISAMID	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was use to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was use to create the IPE. The IPE instance data from a value group shall not be used here.

7.2.2. Stored Travel Rights details Code 0501**Table 115 - Stored Travel Rights details Code 0501**

Name	Format	Size	Comment
MessageFormatRevisionNumber	HE3X	1	For messages formatted according to this version of the specification, this element shall be set to one (1)
ITSOShell Reference Number	ISRN	9	
IPEID	IPEIDM	7	
IPE_ISAMID	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.

7.2.3 Loyalty details, code 0502**Table 116 - Loyalty details, code 0502**

Name	Format	Size	Comment
MessageFormatRevisionNumber	HEX	1	For messages formatted according to this version of the specification, this element shall be set to one (1)
ITSOShell Reference Number	ISRN	9	
IPEID	IPEIDM	7	
IPE_ISAMID	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.

7.2.4 CTA details, code 0503.**Table 117 - CTA details, code 0503**

Name	Format	Size	Comment
MessageFormatRevisionNumber	HEX	1	For messages formatted according to this version of the specification, this element shall be set to one (1)
ITSOShellReferenceNumber	ISRN	9	
IPEID	IPEIDM	7	
IPE_ISAMID	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.

7.2.5 Request Deposit Refund Rules, Code 0504.

When the deposit is for an ITSO Shell, then the IPE-ID element in this message shall identify the Shell so that IIN and OID are those of the Shell owner, TYP shall be set to 32, and PTYP shall be set to indicate the shell version. In these circumstances the IPE_ISAMID and IPE_SAMSequenceNumber may be set to zero (0).

Table 118 - Request Deposit Refund Rules, Code 0504

Name	Format	Size	Comment
MessageFormatRevisionNumber	HEX	1	For messages formatted according to this version of the specification, this element shall be set to one (1)
ITSOShellReferenceNumber	ISRN	9	
IPEID	IPEIDM	7	
IPE_ISAMID	ISAM ID	4	Included for IPE instance identification. This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	ISAM S#	3	Included for IPE instance identification This value shall be taken from the IPE data group instance information, and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.
0504_Flags		1	Bit 0 when set to zero (0) shall signify that the request applies to a deposit for the ITSO ID Bit 0 when set to one (1) shall signify that the request applies to a deposit for the ITSO Shell Bits 1-7 RFU

7.3 Response Messages.

Transmission of Response messages may be restricted according to any security policy instituted by the data owner.

7.3.1 Customer Media holder ID information, Code 0D00.

All data elements shall be included. Where no data is available for a specific message element then that element shall be handled according to clause 2.3.2, excepting that any message element of format LOC1, LOC2, LOC3 or LOC4 shall not be set to zero, but shall contain a NULL location definition in the form of LocDefType 255, and with the minimum permissible structure length.

Table 119 - Customer Media holder ID information, Code 0D00

The entire table as shown shall be included in a message. Where an optional IPE data element is not included in an IPE instance then the element shall be handled according to clause 2.3.2.

Name	Format	Size	Comment
MessageFormatRevisionNumber	HEX	1	For messages formatted according to this version of the specification, this element shall be set to one (1)
IPEID	IPEIDM	7	Identifies the IPE involved in the transaction, taken from the ITSO Shells directory entry. It is a concatenation of IIN, OID, TYP and PTYP in that order.
Shell_IterationNumber	INS#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
Amount	VALI	2	Amount of any remittance by the Customer Media holder, excluding a deposit.
AmountCurrencyCode	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
HolderTitle	ASCII	4	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderSurname	ASCII	20	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderOtherNames	ASCII	30	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderAddress1	ASCII	30	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderAddress2	ASCII	30	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderAddress3	ASCII	30	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).

HolderAddress4	ASCII	30	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderPostcode	ASCII	10	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderPhoneDay	ASCII	20	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderPhoneHome	ASCII	20	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderPhoneMobile	ASCII	20	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderEmail	ASCII	40	Where necessary, this element shall be padded with trailing spaces. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
IPE-TYP	TYP	1	This element indicates the TYP of IPE to which a message instance refers, and also indicates the type of optional data which may be found within a message instance in this instance it will be used to identify whether the IPE is of TYP 14 or TYP 16.
IPELength	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
IPEBitMap	BMP	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0. In this message instance bitmap defines what optional data is included in the IPE.
IPEFormatRevision	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
RemoveDate	RDATE	1	
CPICC	HEX	2	
IDFlags	BMP	1	

RoundingFlagsEnable	FLAG	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
PassbackTime	HEX	1	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0.
DateOfBirth	DOB	4	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
Language	HEX	1	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderID	HEX	4	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
RoundingFlag	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
RoundingValueFlag	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to 0.
EntitlementExpiryDate	DATE	2	A 1.75 byte value, occupying bits 0-7 of the least significant byte, and bits 0-5 of the most significant byte. Bits 6-7 of the most significant byte shall be set to 0.
DepositMethodOfPayment	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositVATSalesTax	VAT	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
ShellDepositMethodOfPayment	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
ShellDepositVATSalesTax	VAT	2	A 1.5 byte value occupying bits 0-7 of the least significant byte and bits 0-3 of the most significant byte. Bits 4-7 of the most significant byte shall be set to 0.
DepositCurrencyCode	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
ShellDepositCurrencyCode	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
DepositAmount	VALI	2	
ShellDeposit	VALI	2	
ConcessionaryClass	HEX	1	
EntitlementCode	HEX	1	

IPE_IterationNumber	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	ISAM ID	4	Included for IPE instance identification. A copy of the data element of the same name contained within the original query which can be used to aid matching of responses and queries in the POST.
IPE_SAMSequenceNumber	ISAM S#	3	Included for IPE instance identification. A copy of the data element of the same name contained within the original query which can be used to aid matching of responses and queries in the POST.
QuerySealerID	ISAM ID	4	Copy of the ISAM ID of the ISAM sealing the original query, included for query identification.
QueryDFSeq#	HEX	3	Copy of the data frame sequence number contained in the data frame trailer of the original query, included for query identification. Note that for class 2 messages this data is generated by the POST, and it is therefore up to query originating POSTs to ensure uniqueness.
ITSOShellReferenceNumberNonEncrypted	uISRN	16	Not encrypted. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
SecondaryHolderID	HEX	4	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
ForenameLength	HEX	1	Length of Forename, in bytes Set to zero if no Forename stored. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
Forename	ASCII	Variable, maximum 78	A variable length element, actual length is determined by ForenameLength. Length may exceed 39, but combined length of Forename plus Surname shall not exceed 78 bytes. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
SurnameLength	HEX	1	Length of Surname, in bytes Set to zero if no Surname stored. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
Surname	ASCII	Variable, maximum 78	A variable length element, actual length is determined by SurnameLength. Length may exceed 39, but combined length of Forename plus Surname shall not exceed

			78 bytes. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HalfDayOfWeek	BMP	2	
ValidAtOrFrom	LOC1	Variable, maximum 17	
ValidTo	LOC1	Variable, maximum 17	

IDFlags are as defined for the ITSO ID IPE.

7.3.2 Stored Travel Rights details, Code 0D01.

The data returned shall consist of details of the last load, and all subsequent payment transactions, which are available at the time of processing the request. The data sent shall be organised as follows:

Table 120 - Stored Travel Rights details, Code 0D01, Structure

Header data
Number of records following (including the last load)
Last load details
Payment transaction details, in transaction time order, most recent transaction first.

Table 121 - Stored Travel Rights details, Code 0D01, Header

ITSO Name	Format	Size bytes	Comment
MessageFormatRevisionNumber	HEX	1	For messages formatted according to this version of the specification, this element shall be set to one (1)
ITSOShellReferenceNumber	ISRN	9	
IPEID	IPEIDM	7	
IPE_ISAMID	ISAM ID	4	Included for IPE instance identification. A copy of the data element of the same name contained within the original query which can be used to aid matching of responses and queries in the POST.
IPE_SAMSequenceNumber	ISAM S#	3	Included for IPE instance identification. A copy of the data element of the same name contained within the original query which can be used to aid matching of responses and queries in the POST.
QuerySealerID	ISAM ID	4	Copy of the ISAM ID of the ISAM sealing the original query, included for query identification.

QueryDFSeq#	HEX	3	Copy of the data frame sequence number contained in the data frame trailer of the original query, included for query identification. Note that for class 2 messages this data is generated by the POST, and it is therefore up to query originating POSTs to ensure uniqueness.
DepositAmount	HEX	2	Original Deposit
DepositAmountCurrencyCode	VALC	1	
DepositAmountMethodOfPayment	MOP	1	
DepositAmountVATSalesTax	VATM	2	
NumberOfRecords	HEX	1	Count of number of transaction details records sent, including the last load transaction record

Table 122 - Stored Travel Rights details, Code 0D01, Transaction details record

Used for the last load and payment transaction records. Where there is no record of a value load, because the account is new, then the appropriate record shall be included and the Amount element and other transaction details elements shall be handled according to clause 2.3.2. Where there have been no transactions since the last value load, or since the account was opened in the case of a new account, then the NumberOfRecords element shall be set to zero, and no transaction data records appended to the message.

ITSO Name	Format	Size bytes
TransactionSequenceNumber	TS#	2
TransactionDateTimeStamp	DTS	3
ISAMIdModifier	HEX	4
TransactionType	HEX	1
Value	VALI	2
ValueCurrencyCode	VALC	1
ActionSequenceNumber	HEX	1
IPEFormatRevision	HEX	1
RemoveDate	RDATE	1
ProductRetailer	OID	2
TYP2Flags	BMP	1
TYP2ValueFlags	BMP	1
Threshold	HEX	2
TopUpAmount	HEX	2
MaxValue2	HEX	2

StartDateAutoTopUp	DATE	2
--------------------	------	---

Parameter flag definitions are as defined for Stored Travel Rights IPEs.

Transaction type codes are as defined for Stored Travel Rights IPEs.

7.3.3 Loyalty details type 1, Code 0D02 and type 2, Code 0D03.

Table 123 - Loyalty details type 1, Code 0D02 and type 2, Code 0D03

Name	Format	Size	Comment
MessageFormatRevisionNumber	HEX	1	For messages formatted according to this version of the specification, this element shall be set to three (3)
IPEID	IPEIDM	7	Identifies the IPE involved in the transaction, taken from the ITSO Shells directory entry. It is a concatenation of IIN, OID, TYP and PTYP in that order.
Shell_IterationNumber	INS#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
HolderTitle	ASCII	4	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderName	ASCII	50	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderAddress	ASCII	100	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderPostcode	ASCII	8	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderPhoneDay	ASCII	20	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderPhoneHome	ASCII	20	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
HolderEmail	ASCII	40	Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
IPE-TYP	TYP	1	This element indicates the TYP of IPE to which a message instance refers, and also indicates the type of optional data which may be found within a message instance in this instance it will be used to identify

			whether the IPE is of TYP 3 or TYP 17.
ProductRetailer	OID16	2	
IPE_IterationNumber	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
IPE_ISAMID	ISAM ID	4	Included for IPE instance identification. A copy of the data element of the same name contained within the original query which can be used to aid matching of responses and queries in the POST.
IPE_SAMSequenceNumber	ISAM S#	3	Included for IPE instance identification. A copy of the data element of the same name contained within the original query which can be used to aid matching of responses and queries in the POST.
QuerySealerID	ISAM ID	4	Copy of the ISAM ID of the ISAM sealing the original query, included for query identification.
QueryDFSeq#	HEX	3	Copy of the data frame sequence number contained in the data frame trailer of the original query, included for query identification. Note that for class 2 messages this data is generated by the POST, and it is therefore up to query originating POSTs to ensure uniqueness.
ITSOShellReferenceNumberNonEncrypted	uISRN	16	Not encrypted. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).

7.3.5 CTA details, Code 0D04, 0D05.

The data returned shall consist of details of the last payment into the account (settlement), and all subsequent payment transactions, which are available at the time of processing the request. The data sent shall be organised as follows:

Table 124 - CTA details, Code 0D04, 0D05, Structure

Header data
Number of records following (including the last load)
Details of last payment into account
Payment transaction details, in transaction time order, most recent transaction first.

Table 125 - CTA details, Code 0D04, 0D05, Header

ITSO Name	Format	Size bytes	Comment
MessageFormatRevisionNumber	HEX	1	For messages formatted according to this version of the specification, this element shall be set to one (1)
ITSOShellReferenceNumber	ISRN	9	
IPEID	IPEIDM	7	
IPE_ISAMID	ISAM ID	4	Included for IPE instance identification. A copy of the data element of the same name contained within the original query which can be used to aid matching of responses and queries in the POST.
IPE_SAMSequenceNumber	ISAM S#	3	Included for IPE instance identification. A copy of the data element of the same name contained within the original query which can be used to aid matching of responses and queries in the POST.
QuerySealerID	ISAM ID	4	Copy of the ISAM ID of the ISAM sealing the original query, included for query identification.
QueryDFSeq#	HEX	3	Copy of the data frame sequence number contained in the data frame trailer of the original query, included for query identification. Note that for class 2 messages this data is generated by the POST, and it is therefore up to query originating POSTs to ensure uniqueness.
DepositAmount	HEX	2	Original Deposit
DepositAmountCurrencyCode	VALC	1	
DepositAmountMethodOfPayment	MOP	1	
DepositAmountVATSalesTax	VATM	2	
NumberOfRecords	HEX	1	Count of number of transaction details records sent, including the last load transaction record

Table 126 - CTA details, Code 0D04, 0D05, Transaction details record

Used for the last payment into account and payment transaction records. Where there was no previous payment into the account, because the account is new, then the appropriate record shall be included and the Amount element and other transaction details elements shall be handled according to clause 2.3.2. Where there are have been no transactions since the last payment into the account, or since the account was opened in the case of a new account, then the NumberOfRecords element shall be set to zero, and no transaction data records appended to the message.

ITSO Name	Format	Size bytes	Comment
TransactionSequenceNumber	TS#	2	
TransactionDateTimeStamp	DTS	3	
ISAMIDModifier	HEX	4	ISAMID (of the Terminal which last changed this record)
TransactionType	HEX	1	
CumulativeAmount	VALI	2	Set to zero (0) for a 0D05 message
ActionSequenceNumber	HEX	1	
IPEFormatRevision	HEX	1	
RemoveDate	RDATE	1	
ProductRetailer	OID	2	
TYP4Flags	BMP	1	Set to zero (0) for a 0D05 message
TYP4ValueFlags	BMP	1	Set to zero (0) for a 0D05 message
TYP5Flags	BMP	1	Set to zero (0) for a 0D04 message
TYP5ValueFlags	BMP	1	Set to zero (0) for a 0D04 message
CountOfTransactions	HEX	1	Set to zero (0) for a 0D04 message
LastResetDate	DATE	2	Set to zero (0) for a 0D04 message
WeeksPerPeriod	HEX	1	Set to zero (0) for a 0D04 message
QuantityTransactions	HEX	1	Set to zero (0) for a 0D04 message
MaxValue	VALI	2	Insert MaxValue4 contents in a 0D04 message Insert MaxValue5 contents in a 0D05 message
StartDateCTA	DATE	2	
EndDate	DATE	2	
CurrencyCode	VALC	1	
Amount	VAL	2	Amount paid into the account in settlement, or value of the transaction, as appropriate.

7.3.6 Deposit Refund Rules, Code 0D06.

When the deposit is for an ITSO Shell, then the IPE-ID element in this message shall identify the Shell so that IIN and OID are those of the Shell owner, TYP shall be set to 32, and PTYP shall be set to indicate the shell version. In these circumstances the IPE_ISAMID and IPE_SAMSequenceNumber shall be set to the values contained in element of the same name within the matching 0504 message.

Table 127 - Deposit Refund Rules, Code 0D06

Name	Format	Size	Comment
MessageFormatRevisionNumber	HEX	1	For messages formatted according to this version of the specification, this element shall be set to one (1)
ITSOShellReferenceNumber	ISRN	9	
IPEID	IPEIDM	7	
IPE_ISAMID	ISAM ID	4	Included for IPE instance identification. A copy of the data element of the same name contained within the original query which can be used to aid matching of responses and queries in the POST.
IPE_SAMSequenceNumber	ISAM S#	3	Included for IPE instance identification. A copy of the data element of the same name contained within the original query which can be used to aid matching of responses and queries in the POST.
QuerySealerID	ISAM ID	4	Copy of the ISAM ID of the ISAM sealing the original query, included for query identification.
QueryDFSeq#	HEX	3	Copy of the data frame sequence number contained in the data frame trailer of the original query, included for query identification. Note that for class 2 messages this data is generated by the POST, and it is therefore up to query originating POSTs to ensure uniqueness.
0D06_Flags	BMP	1	Bit 0 when set to zero (0) shall signify that the rules apply to a deposit for the ITSO ID Bit 0 when set to one (1) shall signify that the rules apply to a deposit for the ITSO shell Bits 1-7 RFU
0D06_RefundRule	HEX	1	Refer to Table 128
0D06_RefundValue	VALI	2	Value to be refunded, subject to RefundRule. If no value specified then this element shall be set to zero (0).
0D06_RefundPercentage	HEX	1	Percentage of deposit to be refunded, subject to RefundRule. If no value specified then this element shall be set to zero (0).

Table 128 – Deposit Refund Rules, 0D06_RefundRule, Definition

Code	Refund Rule
0	RFU
1	Refund not permitted
2	Refund full deposit amount stored in IPE
3	Refund part of deposit amount stored in IPE, where the amount refunded is determined by the RefundPercent element in this response
4	Refund value returned in this response (RefundValue)
5	Cancel Product, refund will be made in due course by back office
6	Refund determined according to rules stored in the POST. (POSTs which do not contain these rules shall not cancel the relevant Product or refund the deposit)
7 – 255	RFU

7.3.7 Response: No data available, Code 0DFF.

This response shall be used when there is no data available to answer a query.

Table 128a – Response: No data available, Code 0DFF

Name	Format	Size	Comment
MessageFormatRevisionNumber	HEX	1	For messages formatted according to this version of the specification, this element shall be set to one (1)
IPE_ISAMID	ISAM ID	4	Included for IPE instance identification. A copy of the data element of the same name contained within the original query which can be used to aid matching of responses and queries in the POST.
IPE_SAMSequenceNumber	ISAM S#	3	Included for IPE instance identification. A copy of the data element of the same name contained within the original query which can be used to aid matching of responses and queries in the POST.
QuerySealerID	ISAM ID	4	Copy of the ISAM ID of the ISAM sealing the original query, included for query identification.
QueryDFSeq#	HEX	3	Copy of the data frame sequence number contained in the data frame trailer of the original query, included for query identification. Note that for class 2 messages this data is generated by the POST, and it is therefore up to query originating POSTs to ensure uniqueness.
DenialCode	HEX	1	Refer to table 128b

Table 128b - DenialCode listing

DenialCode value	DenialCode meaning
0	This code shall not be used
1	No data available
2	Data withheld because transmission would result in violation of the Data owner's security policy
3-255	RFU

8. IPE Embodiment Parameters.

8.1 Introduction

For an IPE instance to be created, various parameters must be defined by the IPE owner. These definitions will vary from one IPE embodiment to another, and therefore a specification of these parameters is required for each embodiment. The nature of these specifications will also vary by IPE TYP.

The following tables define the Embodiment parameters for each IPE TYP, in a form which may be transmitted electronically. Embodiment parameters determine the rules for creating values for loading into IPE instances, and may also constrain POST operation.

For the majority of Elements, actual values included in list instances shall be determined by the target IPE owner. For the remaining elements, actual values are determined in the following clauses.

Note that for certain IPE elements there is no data to send. Affected elements are indicated within the tables, by a ListDataSize of 0.

Where the ListDataSize = 0 and where only one rule code is defined, then the element shall be omitted from the embodiment list.

Where more than one rule code is defined but where only one has a ListDataSize = 0, then the element shall be omitted from the embodiment list if the selected rule code has a ListDataSize = 0.

Where an IPE contains optional data, and where the presence or absence of that data is indicated by a bit map included within the IPE, then the optional data elements:

- shall be included in the Embodiment list when they are required to be included in the target IPE, i.e. when the relevant bit map bit(s) is(are) set
- shall be omitted from the Embodiment list when they are not required to be included in the target IPE, i.e. when the relevant bit map bit(s) is(are) not set

Where there are multiple rule codes possible and more than one rule code that could be used has a ListDataSize = 0, the element record is sent with ListDataSize = 0 and ListData is empty [null].

Where an element is not included in the Embodiment parameter list for this reason, the POST shall be programmed to populate the matching IPE instance element with the correct data.

IPE Embodiment Parameter lists may be transmitted to POSTs as parameter tables, or in Actionlists.

Note that in this section 8, all numeric values included in tables are normally in decimal notation unless otherwise indicated. In some specific instances hexadecimal notation is used and this is indicated by recording the value in the form 0xnn where nn is the hexadecimal value.

8.2 File Structure

All IPE Embodiment Parameters files shall comprise the requisite number of records, where a single record is structured as follows:

Table 129 – Embodiment Parameter List Record Structure

ITSO Name	Offset	Format	Size bytes	Comment
ElementNumber	0x0	HEX	1	The identity number of each parameter, obtained from the following definition tables
RuleCode	0x1	HEX	1	The rule code for each element, obtained from the following definition tables
ListDataSize	0x2	HEX	1	The data size for each element, obtained from the following definition tables. This is the size of the element stored in the list. A size of 0 is permissible, in which case there shall not be a ListData element.
ListData	0x3	HEX	variable	For those elements where a value is required, it shall be stored here. ListData shall be treated as HEX for the purposes of conversion to Transmission Format, irrespective of the data type defined for each individual element in the embodiment lists.

The first three records in each list shall have special meaning, and together with IIN shall be used to identify the IPE Embodiment. This information shall be used both to identify the target IPE embodiment, and to create the directory entry for IPE instances created.

The ListData element format will vary, and will follow the format of the target IPE element.

8.2.1 List Creation Rules

Each Embodiment parameter list shall be based upon the entire table as defined below and shall be created as a single list containing the requisite number of records as defined above, and transmitted as a single message according to ITSO TS 1000-9.

All data elements in the Embodiment parameter list shall occupy a whole number of bytes. Where a target data element does not occupy a whole number of bytes, then the data shall be arranged in the list element such that bit 0 contains the data that shall be loaded to bit 0 of the target element, bit 1 contains the data that shall be loaded to bit 1 of the target element, and so on.

Elements shall be included in the list in the order shown in the following tables.

Whilst OID is shown here as a single element for the convenience of Embodiment Parameter List creators, POST implementers should note that it is stored in more complex form in the directory, please refer to ITSO TS 1000-2.

Lists contain for each element a Content Generation Rule Code which defines the action a POST shall take when creating an IPE according to the list. RuleCodes are defined in Table 130.

Table 130 – Embodiment parameter list RuleCode definition

RuleCode	Content Generation Rule
1	IPE element value determined upon IPE creation
2	IPE element value set to the value contained within the Embodiment parameter list
3	IPE element value set to one (1)
4	IPE element value set to zero (0)
5	IPE element value set to today's date plus the value contained within the Embodiment parameter list
6	IPE element value set to current date and time

8.3 List Format Revision 1, IPE Format Revision 1.

Definition of IPE Embodiment Parameters for IPEs formatted according to format version code 1.

Note that in the following tables, extra columns are included for the information of users. Only those columns marked LD shall be included in transmitted Embodiment parameter lists.

Note that, for guidance, values for elements where the rule is marked with a * would normally be determined at the issuing POST except in circumstances where the embodiment specification is included in an Actionlist.

Note that in element 9, the most significant 4 bits shall contain ListFormatRevision, and the least significant 4 bits shall contain IPEFormatRevision. Only IPEFormatRevision shall be programmed into IPE instances.

Elements 1 to 9 of each list shall retain their current sizes for future format versions.

Table 131 - IPE TYP 2, Format Version 1

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	2
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to one (1)	3	0	-----
5	DIR	IINL	FLAG	Dir Entry	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or	1 or 2 or 5	0 or 2	null or value

					set to today's date plus the value in embodiment spec			
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x11
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	value
11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
12	IPE	TYP2Flags - 0	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
13	IPE	TYP2Flags – 1	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
14	IPE	TYP2Flags – 2	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
15	IPE	TYP2Flags – 3	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
16	IPE	TYP2Flags – 4	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	TYP2Flags – PrintTicket	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
18	IPE	TYP2Flags - PrintReceipt	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	TYP2Flags - 7	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value

20	IPE	Threshold	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
21	IPE	TopUpAmount	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
22	IPE	MaxValue2	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
23	IPE	MaximumNegativeAmount	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
24	IPE	DepositAmount	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
25	IPE	StartDateAutoTopUp	DATE	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
26	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
27	IPE	DepositMethodOfPayment	MOP	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
28	IPE	DepositCurrencyCode	VALC	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
29	IPE	DepositVATSalesTax	VAT	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
30	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
31	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
32	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
33	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
34	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
35	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
36	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
37	VH	VGLength	HEX	Always	determined upon IPE creation	1	0	-----
38	VH	VGBitMap	BMP	Always	Set to value in embodiment spec or determined upon IPE creation	1 or 2	0 or 1	Null or value
39	VH	VGFormatRevision	HEX	Always	set to value in embodiment	2	1	9

					spec			
40	V	TransactionType	HEX	Always	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 1	Null or value
41	V	TransactionSequence Number	TS#	Always	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 2	Null or value
42	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-----
43	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-----
44	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-----
45	V	Value	VALS	Always	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 2	Null or value
46	V	ValueCurrencyCode	VALC	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
47	V	CountJourneyLegs	HEX	Always	set to zero (0)	4	0	-----
48	V	CumulativeFare	VALI	Always	set to zero (0)	4	0	-----
49	V	TYP2ValueFlags - AutoTopUp	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
50	V	TYP2ValueFlags - IPEPriorityOverride	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
51	V	TYP2ValueFlags - AutoTopUpInternal	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
52	V	Padding	PAD	If Required	set to zero (0)	4	0	-----
53	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
54	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
55	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
56	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
57	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Table 132 - IPE TYP 3, Format Version 1

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	3
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to one (1)	3	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x11
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	Value
11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
12	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
13	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	Value
14	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
15	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
16	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
17	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----

18	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
19	VH	VGLength	HEX	Always	determined upon IPE creation	1	0	-----
20	VH	VGBitMap	BMP	Always	Set to value in embodiment spec or determined upon IPE creation	1 or 2	0 or 1	Null or value
21	VH	VGFormatRevision	HEX	Always	set to value in embodiment spec	2	1	9
22	V	TransactionType	HEX	Always	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 1	Null or Value
23	V	TransactionSequenceNumber	TS#	Always	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 2	Null or Value
24	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-----
25	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-----
26	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-----
27	V	LoyaltyPoints	HEX	Always	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 2	Null or Value
28	V	UserDefined	UD	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
29	V	Padding	PAD	If Required	set to zero (0)	4	0	-----
30	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
31	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
32	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
33	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
34	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Table 133 - IPE TYP 4, Format Version 1

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	Value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	4
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	Value
4	DIR	VGP	FLAG	Dir Entry	set to one (1)	3	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x11
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	value
11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
12	IPE	TYP4Flags - 0	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
13	IPE	TYP4Flags – 1	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value

14	IPE	TYP4Flags – 2	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
15	IPE	TYP4Flags – 3	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
16	IPE	TYP4Flags – 4	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	TYP4Flags – PrintTicket	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
18	IPE	TYP4Flags - PrintReceipt	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	TYP4Flags - 7	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
20	IPE	MaxValue4	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
21	IPE	DepositAmount	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
22	IPE	StartDateCTA	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
23	IPE	EndDate	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value

24	IPE	DepositMethodOfPayment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
25	IPE	DepositCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
26	IPE	DepositVATSalesTax	VAT	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
27	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
28	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
29	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
30	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
31	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
32	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
33	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
34	VH	VGLength	HEX	Always	determined upon IPE creation	1	0	-----
35	VH	VGBitMap	BMP	Always	Set to value in embodiment spec or determined upon IPE creation	1 or 2	0 or 1	Null or value
36	VH	VGFormatRevision	HEX	Always	set to value in embodiment spec	2	1	9
37	V	TransactionType	HEX	Always	set to zero (0)	4	0	-----
38	V	TransactionSequence Number	TS#	Always	set to zero (0)	4	0	-----
39	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-----
40	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-----
41	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-----
42	V	CumulativeAmount	VALI	Always	set to zero (0)	4	0	-----
43	V	ValueCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value

44	V	CountJourneyLegs	HEX	Always	set to zero (0)	4	0	-----
45	V	CumulativeFare	VALI	Always	set to zero (0)	4	0	-----
46	V	TYP4ValueFlags - 0	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
47	V	TYP4ValueFlags - IPEPriorityOverride	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
48	V	TYP4ValueFlags – 2	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
49	V	TYP4ValueFlags - 3	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
50	V	Padding	PAD	If Required	set to zero (0)	4	0	-----
51	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
52	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
53	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
54	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
55	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Table 134 - IPE TYP 5, Format Version 1

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	5
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to one (1)	3	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value

6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x11
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	Value
11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
12	IPE	TYP5Flags - 0	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
13	IPE	TYP5Flags – 1	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
14	IPE	TYP5Flags – 2	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
15	IPE	TYP5Flags – 3	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
16	IPE	TYP5Flags – 4	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	TYP5Flags – PrintTicket	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
18	IPE	TYP5Flags - PrintReceipt	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	TYP5Flags - 7	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
20	IPE	WeeksPerPeriod	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
21	IPE	QuantityTransactions	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value

22	IPE	MaxValue5	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
23	IPE	DepositAmount	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
24	IPE	StartDateCTA	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
25	IPE	EndDate	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
26	IPE	DepositMethodOfPayment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
27	IPE	DepositCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
28	IPE	DepositVATSalesTax	VAT	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
29	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
30	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	Value
31	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
32	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
33	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
34	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
35	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
36	VH	VGLength	HEX	Always	determined upon IPE creation	1	0	-----
37	VH	VGBitMap	BMP	Always	Set to value in embodiment spec or determined upon IPE creation	1 or 2	0 or 1	Null or value
38	VH	VGFormatRevision	HEX	Always	set to value in embodiment spec	2	1	9
39	V	TransactionType	HEX	Always	set to zero (0)	4	0	-----
40	V	TransactionSequence Number	TS#	Always	set to zero (0)	4	0	-----
41	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-----

42	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-----
43	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-----
44	V	CountOfTransactions	HEX	Always	set to zero (0)	4	0	-----
45	V	RFU	RFU	Always	set to zero (0)	4	0	-----
46	V	LastResetDate	DATE	Always	set to current date and time	6	0	-----
47	V	ValueCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
48	V	TYP5ValueFlags - 0	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
49	V	TYP5ValueFlags - IPEPriorityOverride	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
50	V	TYP5ValueFlags - 2	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
51	V	TYP5ValueFlags - 3	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
52	V	RFU	RFU	Always	set to zero (0)	4	0	-----
53	V	CountJourneyLegs	HEX	Always	set to zero (0)	4	0	-----
54	V	Padding	PAD	If Required	set to zero (0)	4	0	-----
55	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
56	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
57	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
58	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
59	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Table 135 – IPE TYP 14, Format Version 1

The use of IPE Embodiment Parameters for this IPE formatted according to format version code 1 is deprecated in this version of the Specification and will be removed from the next version of the Specification.

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in	2	1	14

					embodiment spec			
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to zero (0)	4	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x11
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	Value
11	IPE	CPICC	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
12	IPE	IDFlags - Personalised	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
13	IPE	IDFlags – Gender	BMP	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
14	IPE	IDFlags – URI	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
15	IPE	IDFlags – CompanionAllowed	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
16	IPE	IDFlags – PrintTicket	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	IDFlags – DepositRefundable?	Flag	Always	set to value in embodiment spec or set to value determined upon	1 or 2	0 or 1	null or value

					creation			
18	IPE	IDFlags – ShellDepositRefundable?	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	RoundingFlagsEnable	FLAG	Always	set to value in embodiment spec	2	1	Value
20	IPE	RFU	RFU	Always	set to zero (0)	4	0	----
21	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1	Value
22	IPE	HolderID	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	null or value
23	IPE	RoundingFlag	FLAG	Always	set to value in embodiment spec	2	1	Value
24	IPE	RoundingValueFlag	FLAG	Always	set to value in embodiment spec	2	1	value
25	IPE	EntitlementExpiryDate	DATE	Always	Set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	Null or date value or date offset value
26	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
27	IPE	DepositCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
28	IPE	DepositMethodOfPayment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
29	IPE	DepositVATSalesTax	VAT	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
30	IPE	DepositAmount	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
31	IPE	EntitlementCode	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
32	IPE	ConcessionaryClass	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
33	IPE O	SecondaryHolderID	HEX	according to	*set to value in embodiment spec or set	1 or 2	0 or 4	null or

				bit map	to value determined upon IPE creation			value
34	IPE O	HalfDayOfWeek	BMP	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
35	IPE O	ValidAtOrFrom	LOC1	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 17	null or value
36	IPE O	ValidTo	LOC1	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 17	null or value
37	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
38	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
39	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
40	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
41	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
42	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
43	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Table 136 - IPE TYP 16, Format Version 1

The use of IPE Embodiment Parameters for this IPE formatted according to format version code 1 is deprecated in this version of the Specification and will be removed from the next version of the Specification.

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	16
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to zero (0)	4	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined	1 or 2	0 or 1	null or value

					upon IPE creation			
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x11
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	Value
11	IPE	CPICC	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
12	IPE	IDFlags - Personalised	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
13	IPE	IDFlags – Gender	BMP	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
14	IPE	IDFlags – URI	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
15	IPE	IDFlags – CompanionAllowed	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
16	IPE	IDFlags – PrintTicket	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	IDFlags – DepositRefundable?	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
18	IPE	IDFlags – ShellDepositRefundable?	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	RoundingFlagsEnable	FLAG	Always	set to value in embodiment spec	2	1	Value

20	IPE	RFU	RFU	Always	set to zero (0)	4	0	----
21	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1	Value
22	IPE	DateOfBirth	DOB	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	null or value
23	IPE	Language	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
24	IPE	HolderID	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	null or value
25	IPE	RoundingFlag	FLAG	Always	set to value in embodiment spec	2	1	value
26	IPE	RoundingValueFlag	FLAG	Always	set to value in embodiment spec	2	1	value
27	IPE	EntitlementExpiryDate	DATE	Always	Set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	Null or date value or date offset value
28	IPE	DepositMethodOfPayment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
29	IPE	DepositVATSalesTax	VAT	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
30	IPE	ShellDepositMethodOfPayment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
31	IPE	ShellDepositVATSalesTax	VAT	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
32	IPE	DepositCurrencyCode	VALC	Always	set to value in embodiment spec or set to value determined upon IPE creation ¹²	1 or 2	0 or 1	Null or value

¹² Note that the Rule Code used shall match the Rule Code used for the Deposit Value

33	IPE	ShellDepositCurrencyCode	VALC	Always	set to value in embodiment spec or set to value determined upon IPE creation ¹³	1 or 2	0 or 1	Null or value
34	IPE	DepositAmount	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
35	IPE	ShellDeposit	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
36	IPE	EntitlementCode	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
37	IPE	ConcessionaryClass	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
38	IPE O	SecondaryHolderID	HEX	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	null or value
39	IPE O	ForenameLength	HEX	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
40	IPE O	Forename	ASCII	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 39	null or value
41	IPE O	SurnameLength	HEX	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value

¹³ Note that the Rule Code used shall match the Rule Code used for the Shell Deposit Value

42	IPE O	Surname	ASCII	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 39	null or value
43	IPE O	HalfDayOfWeek	BMP	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
44	IPE O	ValidAtOrFrom	LOC1	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 17	null or value
45	IPE O	ValidTo	LOC1	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 17	null or value
46	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
47	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
48	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
49	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
50	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
51	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
52	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Table 137 - IPE TYP 17, Format Version 1

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	17
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to zero (0)	4	0	-----

5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x11
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	Value
11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
12	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
13	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	Value
14	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
15	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
16	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
17	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
18	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Table 138 – IPE TYP 22, Format Version 1

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	22

3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to one (1) or set to zero (0) or determined upon IPE creation	3 or 4 or 1	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x11
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	Value
11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
12	IPE	TYP22Flags - Transferable	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
13	IPE	TYP22Flags - 1	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
14	IPE	TYP22Flags - 2	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value

15	IPE	TYP22Flags - 3	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
16	IPE	TYP22Flags - 4	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	TYP22Flags – PrintTicket	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
18	IPE	TYP22Flags – PrintReceipt	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	TYP22Flags - 7	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
20	IPE	TYP22Flags - OffPeakOnly	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
21	IPE	TYP22Flags - ValidAMWeekdays	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
22	IPE	TYP22Flags - ValidPMWeekdays	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
23	IPE	TYP22Flags - ValidAMSaturdays	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
24	IPE	TYP22Flags - ValidPMSaturdays	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
25	IPE	TYP22Flags - ValidAMSundays	Flag	Always	set to value in embodiment spec or set to value determined upon	1 or 2	0 or 1	null or value

					creation			
26	IPE	TYP22Flags - ValidPMSundays	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
27	IPE	TYP22Flags - ValidPublicHoliday	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
28	IPE	RFU	RFU	Always	set to zero (0)	4	0	----
29	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1	Value
30	IPE	IssueDate	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
31	IPE	ExpiryTime	TIME	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
32	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
33	IPE	AutoRenewQuantity1	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
34	IPE	Class	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
35	IPE	ValidityCode	UD	Always	set to value in embodiment specification or set to value determined upon creation	1 or 2	0 or 1	Null or value
36	IPE	ValidityStartDTS	DTS	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 3	null or value
37	IPE	PromotionCode	UD	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
38	IPE	ValidOnDayCode	DOW	Always	set to value in embodiment spec or set to value determined upon	1 or 2	0 or 1	null or value

					creation			
39	IPE	PartySizeAdult	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
40	IPE	PartySizeChild	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
41	IPE	PartySizeConcession	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
42	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
43	IPE	AmountPaidCurrency Code	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
44	IPE	AmountPaid	VALI	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
45	IPE	AmountPaidMethodOf Payment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
46	IPE	AmountPaidVATSale sTax	VAT	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
47	IPE O	CPICC	HEX	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
48	IPE O	ValidAtOrFrom	LOC1	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 17	null or value
49	IPE O	ValidTo	LOC1	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 17	null or value
50	IPE O	PassDuration	HEX	according to bit map	set to value in embodiment spec or set to value	1 or 2	0 or 1	null or value

					determined upon creation			
51	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
52	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
53	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
54	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
55	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
56	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
57	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
58	VH	VGLength	HEX	if value group present	determined upon IPE creation	1	0	-----
59	VH	VGBitMap	BMP	if value group present	Set to value in embodiment spec or determined upon IPE creation	1 or 2	0 or 1	Null or value
60	VH	VGFormatRevision	HEX	if value group present	set to value in embodiment spec	2	1	9
61	V	TransactionType	HEX	if value group present	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 1	Null or value
62	V	TransactionSequence Number	TS#	Always	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 2	Null or value
63	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-----
64	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-----
65	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-----
66	V	NumberRemainingPasses	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
67	V	TYP22ValueFlags - Auto-Renew	Flag	Always	set to value in embodiment spec or set to value	1 or 2	0 or 1	null or value

					determined upon creation			
68	V	TYP22ValueFlags - Stored Tickets	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
69	V	TYP22ValueFlags – 2	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
70	V	TYP22ValueFlags – 3	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
71	V	TYP22ValueFlags – 4	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
72	V	TYP22ValueFlags – 5	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
73	V	ExpiryDateSP	DATE	if value group present	Set to today's date plus the value in embodiment spec	5	2	Date offset value
74	V	ExpiryDateCurrent	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
75	V	RFU	RFU	Always	set to zero (0)	4	0	-----
76	V	Padding	PAD	If Required	set to zero (0)	4	0	-----
77	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
78	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
79	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
80	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
81	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Table 139 - IPE TYP 23, Format Version 1

LD	Information only	LD	LD	LD
-----------	-------------------------	-----------	-----------	-----------

Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	23
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to one (1) or set to zero (0) or determined upon IPE creation	3 or 4 or 1	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x11
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	Value
11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
12	IPE	TYP23Flags - RFU	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
13	IPE	TYP23Flags - UsedChecked	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
14	IPE	TYP23Flags - RFU	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value

15	IPE	TYP23Flags - RFU	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
16	IPE	TYP23Flags - RFU	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	TYP23Flags - PrintTicket	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
18	IPE	TYP23Flags - PrintReceipt	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	TYP23Flags - RFU	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
20	IPE	RFU	RFU	Always	set to zero (0)	4	0	----
21	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1	Value
22	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
23	IPE	IssueDate	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
24	IPE	ValidityCode	UD	Always	Set to value in embodiment specification or set to value determined upon creation	1 or 2	0 or 1	Null or value
25	IPE	ExpiryTime	TIME	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
26	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
27	IPE	Class	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
28	IPE	PartySizeAdult	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
29	IPE	PartySizeChild	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
30	IPE	PartySizeConcession	HEX	Always	*set to value in	1 or 2	0 or 1	null or

					embodiment spec or set to value determined upon IPE creation			value
31	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
32	IPE	AmountPaidCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
33	IPE	AmountPaid	VALI	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
34	IPE	AmountPaidMethodOfPayment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
35	IPE	AmountPaidVATSalesTax	VAT	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
36	IPE	PhotocardNumber	UD	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	null or value
37	IPE	PromotionCode	UD	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
38	IPE	CPICC	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 23	null or value
39	IPE O	RFU	RFU	according to bit map	set to zero (0)	4	0	-----
40	IPE O	TYP23Mode	HEX	according to bit map	set to value in embodiment spec	2	1	value
41	IPE O	MaxTransfers	HEX	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
42	IPE O	TimeLimit	HEX	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
43	IPE O	ValueOfRideJourney	VALI	according to bit map	set to value in embodiment spec	2	2	value
44	IPE O	RFU	RFU	according to bit map	set to zero (0)	4	0	-----
45	IPE O	ValueOfRideJourneyCurrencyCode	VALC	according to bit map	set to value in embodiment spec	2	1	value
46	IPE O	Origin1	LOC1	according to	*set to value in	1 or 2	0 or	null or

				bit map	embodiment spec or set to value determined upon IPE creation		variable, maximum 17	value
47	IPE O	Destination1	LOC1	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 17	null or value
48	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
49	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
50	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
51	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
52	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
53	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
54	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
55	VH	VGLength	HEX	if value group present	determined upon IPE creation	1	0	-----
56	VH	VGBitMap	BMP	if value group present	Set to value in embodiment spec or determined upon IPE creation	1 or 2	0 or 1	Null or value
57	VH	VGFormatRevision	HEX	if value group present	set to value in embodiment spec	2	1	9
58	V	TransactionType	HEX	if value group present	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 1	Null or value
59	V	TransactionSequence Number	TS#	Always	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 2	Null or value
60	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-----
61	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-----
62	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-----
63	V	CountRemainingRides Journeys	HEX	if value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value

64	V	CountTransfers	HEX	if value group present	set to zero (0)	4	0	-----
65	V	TYP23ValueFlags – Auto-Renew	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
66	V	TYP23ValueFlags – UsedChecked	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
67	V	TYP23ValueFlags - RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
68	V	TYP23ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
69	V	TYP23ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
70	V	TYP23ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
71	V	TYP23ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
72	V	TYP23ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
73	V	RFU	RFU	Always	set to zero (0)	4	0	-----
74	V	Padding	PAD	If Required	set to zero (0)	4	0	-----
75	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
76	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
77	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
78	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
79	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Editors note, there is no table 140.

Table 141 - IPE TYP 25, Format Version 1

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	25
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to one (1) or set to zero (0) or determined upon IPE creation	3 or 4 or 1	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x11
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	Value
11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
12	IPE	TYP25Flags- RFU	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
13	IPE	TYP25Flags- RFU	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
14	IPE	TYP25Flags- RFU	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value

15	IPE	TYP25Flags- RFU	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
16	IPE	TYP25Flags- RFU	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	TYP25Flags – PrintTicket	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
18	IPE	TYP25Flags - PrintReceipt	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	TYP25Flags - RFU	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
20	IPE	RFU	RFU	Always	set to zero (0)	4	0	----
21	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1	value
22	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
23	IPE	IssueDate	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
24	IPE	ValidityStartDTS	DTS	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 3	null or value
25	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
26	IPE	ExpiryTime	TIME	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
27	IPE	ServiceID	UD	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
28	IPE	MaxValue25	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
29	IPE	MaxValueCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
30	IPE	AmountPaidCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
31	IPE	AmountPaid	VALI	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value

32	IPE	AmountPaidMethodOfPayment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
33	IPE	AmountPaidVATSalesTax	VAT	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
34	IPE	UserDefined	UD	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
35	IPE O	AutoRenewQuantity2	HEX	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
36	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
37	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
38	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
39	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
40	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
41	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
42	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
43	VH	VGLength	HEX	if value group present	determined upon IPE creation	1	0	-----
44	VH	VGBitMap	BMP	if value group present	Set to value in embodiment spec or determined upon IPE creation	1 or 2	0 or 1	Null or value
45	VH	VGFormatRevision	HEX	if value group present	set to value in embodiment spec	2	1	9
46	V	TransactionType	HEX	if value group present	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 1	Null or value
47	V	TransactionSequenceNumber	TS#	Always	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 2	Null or value
48	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-----
49	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-----

50	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-----
51	V	CountUsesAvailable	HEX	if value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
52	V	TYP25ValueFlags – Auto-Renew	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
53	V	TYP25ValueFlags - RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
54	V	TYP25ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
55	V	TYP25ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
56	V	TYP25ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
57	V	TYP25ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
58	V	TYP25ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
59	V	TYP25ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
60	V	RFU	RFU	Always	set to zero (0)	4	0	-----
61	V	Padding	PAD	If Required	set to zero (0)	4	0	-----
62	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
63	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
64	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
65	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
66	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Table 142 - IPE TYP 26, Format Version 1

LD	Information only					LD	LD	LD
Element	Target IPE Group	Target IPE ITSO Name	Target IPE	Included in target IPE?	Content generation rule	Rule Code	List Data	List Data

Numb er			Data Type				Size	
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	26
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to one (1) or set to zero (0) or determined upon IPE creation	1 or 3 or 4	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x11
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	Value
11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
12	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
13	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1	Value
14	IPE	TYP26Flags - RFU	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
15	IPE	TYP26Flags – RFU	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
16	IPE	TYP26Flags – RFU	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	TYP26Flags – RFU	FLAG	Always	set to value in embodiment spec or set to value	1 or 2	0 or 1	null or value

					determined upon creation			
18	IPE	TYP26Flags – RFU	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	TYP26Flags – PrintTicket	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
20	IPE	TYP26Flags - PrintReceipt	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
21	IPE	TYP26Flags - RFU	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
22	IPE	TYP26Class	UD	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
23	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
24	IPE	IssueDate	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
25	IPE	ValidityStartDTS	DTS	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 3	null or value
26	IPE	UserDefined	UD	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 7	null or value
27	IPE O	AutoRenewQuantity3	HEX	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
28	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
29	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
30	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
31	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
32	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
33	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
34	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
35	VH	VGLength	HEX	if value group present	determined upon IPE creation	1	0	-----
36	VH	VGBitMap	BMP	if value group	Set to value in embodiment spec or determined upon	1 or 2	0 or 1	Null or value

				present	IPE creation			
37	VH	VGFormatRevision	HEX	if value group present	set to value in embodiment spec	2	1	9
38	V	TransactionType	HEX	if value group present	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 1	Null or value
39	V	TransactionSequenceNumber	TS#	Always	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 2	Null or value
40	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-----
41	V	ISAMIDModifier	HEX	if value group present	determined upon IPE creation	1	0	-----
42	V	ActionSequenceNumber	HEX	if value group present	set to zero (0)	4	0	-----
43	V	CountRemainingRidesJourneys	HEX	if value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
44	V	TYP26ValueFlags – Auto-Renew	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
45	V	TYP26ValueFlags - RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
46	V	TYP26ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
47	V	TYP26ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
48	V	TYP26ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
49	V	TYP26ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
50	V	TYP26ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
51	V	TYP26ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
52	V	RFU	RFU	if value group present	set to zero (0)	4	0	-----

53	V	Padding	PAD	If Required	set to zero (0)	4	0	-----
54	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
55	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
56	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
57	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
58	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Table 143 – IPE TYP 27, Format Version 1

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	27
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to zero (0)	4	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	IPE	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	IPE	IPEBitMap	HEX	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	IPE	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x11
10	IPE	IssueDate	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
11	IPE	Sterling/Euro	FLAG	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value

12	IPE	Child	FLAG	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
13	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1	Value
14	IPE	AmountPaidMethodOfPayment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
15	IPE	AmountPaid	VALI	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
16	IPE	TYP27PassFlags - OffPeakOnly	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	TYP27PassFlags - WeekdayOnly	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
18	IPE	TYP27PassFlags - Class	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	TYP27PassFlags - ExpiryTimeFlag	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
20	IPE	GeoValidity / AreaValidity	LOC4/LOC3	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 13	null or value
21	IPE	Event1	HEX	Always	set to zero (0)	4	0	----
22	IPE	Event2	HEX	Always	set to zero (0)	4	0	-----
23	IPE	LastUseDTS	DTS	Always	set to zero (0)	4	0	-----
24	IPE	PhotocardNumber	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	null or value
25	IPE	TYP27ExpiryDate	HEX	Always	Determined upon IPE creation, or Set to today's date plus the value in embodiment spec	1 or 5	0 or 2	null or Date offset value
26	IPE	Seq#	HEX	according to bit map	Set to zero (0)	4	0	----
27	IPE	KID	HEX	Always	determined upon IPE creation	1	0	-----
28	IPE	INP#	HEX	Always	set to zero (0)	4	0	-----
29	IPE	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
30	IPE	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
31	IPE	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Note: Where Event1 and Event2 are used to store entry and exit information Event1 shall store the check in code and Event2 the checkout code.

Table 144 – IPE TYP 28, Format Version 1

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	28
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to zero (0)	4	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	IPE	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	IPE	IPEBitMap	HEX	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	IPE	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x11
10	IPE	IssueDate	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
11	IPE	Sterling/Euro	FLAG	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
12	IPE	RFU	FLAG	Always	set to zero (0)	4	0	-----
13	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1	value
14	IPE	AmountPaidMet	MOP	Always	*set to value in	1 or 2	0 or 1	null or

		hodOfPayment			embodiment spec or set to value determined upon IPE creation			value
15	IPE	AmountPaid	VALI	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
16	IPE	TYP28PassFlags - OffPeakOnly	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	TYP28PassFlags - WeekdayOnly	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
18	IPE	TYP28PassFlags - Class	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	TYP28PassFlags - ExpiryTimeFlag	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
20	IPE	AreaValidity	LOC3	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 9	null or value
21	IPE	RFU	HEX	Always	set to zero (0)	4	0	-----
22	IPE	LastUseDTS	DTS	Always	set to zero (0)	4	0	-----
23	IPE	ExpiryTick1	HEX	Always	Determined upon IPE creation, or Set to today's date plus the value in embodiment spec	1 or 5	0 or 2	null or Date offset value
24	IPE	ExpiryTick2	HEX	Always	Determined upon IPE creation, or Set to today's date plus the value in embodiment spec	1 or 5	0 or 2	null or Date offset value
25	IPE	ExpiryTick3	HEX	Always	Determined upon IPE creation, or Set to today's date plus the value in embodiment spec	1 or 5	0 or 2	null or Date offset value
26	IPE	ExpiryTick4	HEX	Always	Determined upon IPE creation, or Set to today's date plus the value in embodiment spec	1 or 5	0 or 2	null or Date offset value
27	IPE	ExpiryTick5	HEX	Always	Determined upon IPE creation, or Set to	1 or 5	0 or 2	null or Date

					today's date plus the value in embodiment spec			offset value
28	IPE	ExpiryTick6	HEX	Always	Determined upon IPE creation, or Set to today's date plus the value in embodiment spec	1 or 5	0 or 2	null or Date offset value
29	IPE	NDoIE	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
30	IPE	NDoEE	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
31	IPE	Seq#	HEX	according to bit map	Set to zero (0)	4	0	-----
32	IPE	KID	HEX	Always	determined upon IPE creation	1	0	-----
33	IPE	INP#	HEX	Always	set to zero (0)	4	0	-----
34	IPE	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
35	IPE	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
36	IPE	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Table 145 – IPE TYP 29, Format Version 1

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	29
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to zero (0)	4	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or	1 or 2 or 5	0 or 2	null or value

					set to today's date plus the value in embodiment spec			
7	IPE	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	IPE	IPEBitMap	HEX	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	IPE	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x11
10	IPE	IssueDate	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
11	IPE	Sterling/Euro	FLAG	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
12	IPE	Ticket/Coupon	FLAG	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
13	IPE	ScalingFactor	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
14	IPE	AmountPaidMethodOfPayment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
15	IPE	AmountPaid	VALI	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
16	IPE	TYP29PassFlags - OffPeakOnly	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	TYP29PassFlags - WeekdayOnly	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
18	IPE	TYP29PassFlags - Class	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	TYP29PassFlags - ExpiryTimeFlag	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
20	IPE	AreaValidity	LOC3	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 9	null or value
21	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
22	IPE	TYP29UsageRecCode	HEX	Always	set to zero (0)	4	0	-----
23	IPE	QtyRemaining	HEX	Always	set to value in embodiment spec or set to value determined upon creation Note: the POST computes the #of bits that may need to be set in the ScaledQtyBackup BitMap depending the target platform and the IPEBitMap	1 or 2	0 or 2	null or value

					setting			
24	IPE	UsageRec	LOCE	Always	set to zero (0)	4	0	-----
25	IPE	ScaledQtyBackup	HEX	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	null or value
26	IPE	Seq#	HEX	according to bit map	set to zero (0)	4	0	-----
27	IPE	KID	HEX	Always	determined upon IPE creation	1	0	-----
28	IPE	INP#	HEX	Always	set to zero (0)	4	0	-----
29	IPE	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
30	IPE	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
31	IPE	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

8.3.1 IPE Format Revision 1

Clause retained for numbering

8.3.2 IPE Format Revision 2

Clause retained for numbering

8.3.3 IPE Format Revision 3

Definition of IPE Embodiment Parameters for IPEs formatted according to format version code 3.

Note that in the following tables extra columns are included for the information of users. Only those columns marked LD shall be included in transmitted Embodiment parameter lists.

Note that values for elements where the rule is marked with a * would normally be determined at the issuing POST except in circumstances where the embodiment specification is included in an Actionlist.

Note that in element 9, the most significant 4 bits shall contain ListFormatRevision and the least significant 4 bits shall contain IPEFormatRevision. Only IPEFormatRevision shall be programmed into IPE instances.

Elements 1 to 9 of each list shall retain their current meanings for future format versions.

Table 3.138 - IPE TYP 22, Format Version 3

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Group	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	22
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to one (1) or set to zero (0) or determined by upon IPE creation	3 or 4 or 1	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value

6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in the embodiment spec	1 or 2 or 5	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBit Map	BMP	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x13
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	value
11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
12	IPE	TYP22 Flags - Transferable	FLAG	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
13	IPE	TYP22 Flags - 1	FLAG	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
14	IPE	TYP22 Flags - 2	FLAG	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
15	IPE	TYP22 Flags - 3	FLAG	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
16	IPE	TYP22 Flags - 4	FLAG	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
17	IPE	TYP22 Flags - PrintTicket	FLAG	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
18	IPE	TYP22 Flags - PrintReceipt	FLAG	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
19	IPE	TYP22 Flags - TreatmentOf ExpiredSP	FLAG	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
20	IPE	TYP22 Flags - OffPeakOnly	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
21	IPE	TYP22 Flags - ValidAMWeekdays	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
22	IPE	TYP22 Flags - ValidPMWeekdays	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
23	IPE	TYP22 Flags - ValidAMSaturdays	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
24	IPE	TYP22 Flags - ValidPMSaturdays	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
25	IPE	TYP22 Flags - ValidAMSundays	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
26	IPE	TYP22 Flags - ValidPMSundays	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value

		ays						
27	IPE	TYP22 Flags - ValidPublicHoliday	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
28	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
29	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1	value
30	IPE	IssueDate	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
31	IPE	ExpiryTime	TIME	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
32	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
33	IPE	AutoRenewQuantity1	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
34	IPE	Class	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
35	IPE	ValidityCode	UD	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
36	IPE	ValidityStartDate	DATE	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
37	IPE	ValidityStartTime	TIME	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
38	IPE	PromotionCode	UD	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
39	IPE	ValidOnDayCode	DOW	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
40	IPE	PartySizeAdult	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
41	IPE	PartySizeChild	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
42	IPE	PartySizeConcession	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
43	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
44	IPE	AmountPaidCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
45	IPE	AmountPaid	VALI	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	null or value
46	IPE	AmountPaidMethodOfPayment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
47	IPE	AmountPaidVATSaleTax	VAT	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
48	IPE O	CPICC	HEX	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
49	IPE O	PassDurationCode	HEX	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
50	IPE O	PassDuration	HEX	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
51	IPE O	ExpiryDateSPDuration	HEX	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
52	IPE O	RouteCode	UD	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 5	null or value
53	IPE O	ValidAtOrFrom	LOC1	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or variable,	null or value

							maximum 17	
54	IPE O	ValidTo	LOC1	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or variable, maximum 17	null or value
55	IPE	Padding	PAD	If required	set to zero (0)	4	0	-----
56	IPE O	IIN	IIN	If required	set to value in embodiment spec	2	3	value
57	INS	KID	HEX	Always	set to zero (0)	1	0	-----
58	INS	INP#	HEX	Always	set to zero (0)	1	0	-----
59	INS	ISAMIDCreate	HEX	Always	determined upon IPE creation	1	0	-----
60	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
61	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
62	VH	VGLength	HEX	if value group present	determined upon IPE creation	1	0	-----
63	VH	VGBitMap	BMP	if value group present	set to value in embodiment spec or determined upon IPE creation	1 or 2	0 or 1	null or value
64	VH	VGFormatRevision	HEX	if value group present	set to value in embodiment spec	2	1	0x0B
65	V	TransactionType	HEX	if value group present	set to value in embodiment spec or set to value determined upon IPE creation or set to zero (0)	1 or 2 or 4	0 or 1	null or value
66	V	TransactionSequenceNumber	TS#	Always	set to value in embodiment spec or set to value determined upon IPE creation or set to zero (0)	1 or 2 or 4	0 or 2	null or value
67	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-----
68	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-----
69	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-----
70	V	NumberRemainingPasses	HEX	Always	set to value in embodiment spec or determined upon IPE creation	1 or 2	0 or 1	null or value
71	V	TYP22ValueFlags - Auto-renew	FLAG	Always	set to value in embodiment spec or determined upon creation	1 or 2	0 or 1	null or value
72	V	TYP22ValueFlags - Stored Tickets	FLAG	Always	set to value in embodiment spec or determined upon creation	1 or 2	0 or 1	null or value
73	V	TYP22ValueFlags - 2	FLAG	Always	set to value in embodiment spec or determined upon creation	1 or 2	0 or 1	null or value
74	V	TYP22ValueFlags - 3	FLAG	Always	set to value in embodiment spec or determined upon creation	1 or 2	0 or 1	null or value
75	V	TYP22ValueFlags - 4	FLAG	Always	set to value in embodiment spec or determined upon creation	1 or 2	0 or 1	null or value
76	V	TYP22ValueFlags - 5	FLAG	Always	set to value in embodiment spec or determined upon creation	1 or 2	0 or 1	null or value
77	V	ExpiryDateSP	DATE	if value group present	set to today's date plus the value in embodiment spec	5	2	date offset value
78	V	ExpiryDateCu	DATE	Always	*set to value in embodiment spec or set	1 or 2	0 or 2	null or

		rrent			to value determined upon IPE creation			value
79	V	RFU	RFU	Always	set to zero (0)	4	0	-----
80	V	Padding	PAD	If required	set to zero (0)	4	0	-----
81	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
82	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
83	INS	ISAMIDCreat or	HEX	Always	determined upon IPE creation	1	0	-----
84	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
85	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Table 3.139 - IPE TYP 23, Format Version 3

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Group	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	23
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to one (1) or set to zero (0) or determined by upon IPE creation	3 or 4 or 1	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 0r 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in the embodiment spec	1 or 2 or 5	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBit Map	BMP	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	H	ListFormat Revision + IPEFormat Revision	HEX	Always	set to value in embodiment spec	2	1	0x13
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	value
11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
12	IPE	TYP23 Flags - RFU	FLAG	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
13	IPE	TYP23 Flags - RFU	FLAG	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
14	IPE	TYP23 Flags - RFU	FLAG	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
15	IPE	TYP23 Flags - RFU	FLAG	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
16	IPE	TYP23 Flags - RFU	FLAG	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
17	IPE	TYP23 Flags - PrintTicket	FLAG	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value

18	IPE	TYP23 Flags - PrintReceipt	FLAG	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
19	IPE	TYP23 Flags - RFU	FLAG	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
20	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
21	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1	value
22	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
23	IPE	IssueDate	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
24	IPE	ValidityStart DTS	DTS	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 3	null or value
25	IPE	ValidityCode	UD	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
26	IPE	ExpiryTime	TIME	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
27	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
28	IPE	Class	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
29	IPE	PartySizeAdult	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
30	IPE	PartySizeChild	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
31	IPE	PartySizeConcession	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
32	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
33	IPE	AmountPaidCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
34	IPE	AmountPaid	VALI	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	null or value
35	IPE	AmountPaidMethodOf Payment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
36	IPE	AmountPaidVATSaleTax	VAT	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
37	IPE	PhotoCard Number	UD	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	null or value
38	IPE	PromotionCode	UD	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
39	IPE	CPICC	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
40	IPE	AutoRenew Quantity	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
41	IPE O	RFU	RFU	Always	set to zero (0)	4	0	-----
42	IPE O	TYP23 Mode	HEX	according to bit map	set to value in embodiment spec	2	1	value
43	IPE O	MaxTransfers	HEX	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value

44	IPE O	TimeLimit	HEX	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
45	IPE O	ValueOfRideJourney	VALI	according to bit map	set to value in embodiment spec	2	4	value
46	IPE O	RFU	RFU	according to bit map	set to zero (0)	4	0	-----
47	IPE O	ValueOfRideJourneyCurrencyCode	VALC	according to bit map	set to value in embodiment spec	2	1	value
48	IPE O	RouteCode	UD	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 5	null or value
49	IPE O	Origin1	LOC1	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 17	null or value
50	IPE O	Destination1	LOC1	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 17	null or value
51	IPE	Padding	PAD	If required	set to zero (0)	4	0	-----
52	IPE O	IIN	IIN	If required	set to value in embodiment spec	2	3	value
53	INS	KID	HEX	Always	set to zero (0)	1	0	-----
54	INS	INP#	HEX	Always	set to zero (0)	1	0	-----
55	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
56	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
57	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
58	VH	VGLength	HEX	if value group present	determined upon IPE creation	1	0	-----
59	VH	VGBitMap	BMP	if value group present	set to value in embodiment spec or determined upon IPE creation	1 or 2	0 or 1	null or value
60	VH	VGFormatRevision	HEX	if value group present	set to value in embodiment spec	2	1	0x0B
61	V	TransactionType	HEX	if value group present	set to value in embodiment spec or set to value determined upon IPE creation or set to zero (0)	1 or 2 or 4	0 or 1	null or value
62	V	TransactionSequenceNumber	TS#	Always	set to value in embodiment spec or set to value determined upon IPE creation or set to zero (0)	1 or 2 or 4	0 or 2	null or value
63	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-----
64	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-----
65	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-----
66	V	CountRemainingRidesJourneys	HEX	if value group present	set to value in embodiment spec or determined upon creation	1 or 2	0 or 1	null or value
67	V	CountTransfers	HEX	if value group	set to zero (0)	4	0	-----

				present				
68	V	TYP23ValueFlags - Auto-renew	FLAG	if value group present	set to value in embodiment spec or determined upon creation	1 or 2	0 or 1	null or value
69	V	TYP23ValueFlags - UsedChecked	FLAG	if value group present	set to value in embodiment spec or determined upon creation	1 or 2	0 or 1	null or value
70	V	TYP23ValueFlags - RFU	FLAG	if value group present	set to value in embodiment spec or determined upon creation	1 or 2	0 or 1	null or value
71	V	TYP23ValueFlags - RFU	FLAG	if value group present	set to value in embodiment spec or determined upon creation	1 or 2	0 or 1	null or value
72	V	TYP23ValueFlags - RFU	FLAG	if value group present	set to value in embodiment spec or determined upon creation	1 or 2	0 or 1	null or value
73	V	TYP23ValueFlags - RFU	FLAG	if value group present	set to value in embodiment spec or determined upon creation	1 or 2	0 or 1	null or value
74	V	TYP23ValueFlags - RFU	FLAG	if value group present	set to value in embodiment spec or determined upon creation	1 or 2	0 or 1	null or value
75	V	TYP23ValueFlags - RFU	FLAG	if value group present	set to value in embodiment spec or determined upon creation	1 or 2	0 or 1	null or value
76	V	RFU	RFU	Always	set to zero (0)	4	0	-----
77	V	ExpiryDateSRJ	DATE	if value group present	set to value in embodiment spec or determined upon creation	1 or 2	0 or 2	null or value
78	V	Padding	PAD	If required	set to zero (0)	4	0	-----
79	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
80	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
81	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
82	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
83	INS	SEAL	HEX	Always	determined upon IPE creation	1	0	-----

8.4 List Format Revision 1, IPE Format Revision 2.

Definition of IPE Embodiment Parameters for IPEs formatted according to format version code 2.

Note that in the following tables, extra columns are included for the information of users. Only those columns marked LD shall be included in transmitted Embodiment parameter lists.

Note that values for elements where the rule is marked with a * would normally be determined at the issuing POST except in circumstances where the embodiment specification is included in an Actionlist.

Note that in element 9, the most significant 4 bits shall contain ListFormatRevision, and the least significant 4 bits shall contain IPEFormatRevision. Only IPEFormatRevision shall be programmed into IPE instances.

Elements 1 to 9 of each list shall retain their current meanings for future format versions.

Table 2.138 – IPE TYP 22, Format Version 2

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	22
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to one (1) or set to zero (0) or determined upon IPE creation	3 or 4 or 1	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x12
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	Value
11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
12	IPE	TYP22Flags - Transferable	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
13	IPE	TYP22Flags - 1	Flag	Always	set to value in embodiment spec or set to value	1 or 2	0 or 1	null or value

					determined upon creation			
14	IPE	TYP22Flags - 2	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
15	IPE	TYP22Flags - 3	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
16	IPE	TYP22Flags - 4	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	TYP22Flags – PrintTicket	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
18	IPE	TYP22Flags – PrintReceipt	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	TYP22Flags - 7	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
20	IPE	TYP22Flags - OffPeakOnly	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
21	IPE	TYP22Flags - ValidAMWeekdays	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
22	IPE	TYP22Flags - ValidPMWeekdays	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
23	IPE	TYP22Flags - ValidAMSaturdays	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
24	IPE	TYP22Flags - ValidPMSaturdays	Flag	Always	set to value in embodiment spec or set to value determined upon	1 or 2	0 or 1	null or value

					creation			
25	IPE	TYP22Flags - ValidAMSundays	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
26	IPE	TYP22Flags - ValidPMSundays	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
27	IPE	TYP22Flags - ValidPublicHoliday	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
28	IPE	RFU	RFU	Always	set to zero (0)	4	0	----
29	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1	Value
30	IPE	IssueDate	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
31	IPE	ExpiryTime	TIME	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
32	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
33	IPE	AutoRenewQuantity1	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
34	IPE	Class	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
35	IPE	ValidityCode	UD	Always	set to value in embodiment specification or set to value determined upon creation	1 or 2	0 or 1	Null or value
36	IPE	ValidityStartDTS	DTS	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 3	null or value
37	IPE	PromotionCode	UD	Always	set to value in embodiment spec or set to value determined upon	1 or 2	0 or 1	null or value

					creation			
38	IPE	ValidOnDayCode	DOW	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
39	IPE	PartySizeAdult	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
40	IPE	PartySizeChild	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
41	IPE	PartySizeConcession	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
42	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
43	IPE	AmountPaidCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
44	IPE	AmountPaid	VALI	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	null or value
45	IPE	AmountPaidMethodOfPayment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
46	IPE	AmountPaidVATSalesTax	VAT	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
47	IPE O	CPICC	HEX	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
48	IPE O	PassDuration	HEX	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
49	IPE O	RouteCode	UD	according to bit map	set to value in embodiment spec or set to value	1 or 2	0 or 5	null or value

					determined upon creation			
50	IPE O	ValidAtOrFrom	LOC1	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 17	null or value
51	IPE O	ValidTo	LOC1	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 17	null or value
52	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
53	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
54	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
55	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
56	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
57	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
58	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
59	VH	VGLength	HEX	if value group present	determined upon IPE creation	1	0	-----
60	VH	VGBitMap	BMP	if value group present	Set to value in embodiment spec or determined upon IPE creation	1 or 2	0 or 1	Null or value
61	VH	VGFormatRevision	HEX	if value group present	set to value in embodiment spec	2	1	0x0A
62	V	TransactionType	HEX	if value group present	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 1	Null or value
63	V	TransactionSequenceNumber	TS#	Always	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 2	Null or value
64	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-----
65	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-----
66	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-----
67	V	NumberRemaining	HEX	Always	set to value in	1 or 2	0 or 1	null or

		Passes			embodiment spec or set to value determined upon IPE creation			value
68	V	TYP22ValueFlags - Auto-Renew	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
69	V	TYP22ValueFlags - Stored Tickets	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
70	V	TYP22ValueFlags – 2	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
71	V	TYP22ValueFlags – 3	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
72	V	TYP22ValueFlags – 4	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
73	V	TYP22ValueFlags – 5	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
74	V	ExpiryDateSP	DATE	if value group present	Set to today's date plus the value in embodiment spec	5	2	Date offset value
75	V	ExpiryDateCurrent	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
76	V	RFU	RFU	Always	set to zero (0)	4	0	-----
77	V	Padding	PAD	If Required	set to zero (0)	4	0	-----
78	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
79	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
80	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
81	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
82	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Table 2.139 - IPE TYP 23, Format Version 2

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	23
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to one (1) or set to zero (0) or determined upon IPE creation	3 or 4 or 1	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x12
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	Value
11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
12	IPE	TYP23Flags - RFU	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
13	IPE	TYP23Flags - UsedChecked	Flag	Always	set to value in embodiment spec or set to value	1 or 2	0 or 1	null or value

					determined upon creation			
14	IPE	TYP23Flags - RFU	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
15	IPE	TYP23Flags - RFU	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
16	IPE	TYP23Flags - RFU	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	TYP23Flags - PrintTicket	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
18	IPE	TYP23Flags - PrintReceipt	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	TYP23Flags - RFU	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
20	IPE	RFU	RFU	Always	set to zero (0)	4	0	----
21	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1	Value
22	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
23	IPE	IssueDate	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
24	IPE	ValidityCode	UD	Always	Set to value in embodiment specification or set to value determined upon creation	1 or 2	0 or 1	Null or value
25	IPE	ExpiryTime	TIME	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
26	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
27	IPE	Class	HEX	Always	set to value in embodiment spec or set to value	1 or 2	0 or 1	null or value

					determined upon creation			
28	IPE	PartySizeAdult	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
29	IPE	PartySizeChild	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
30	IPE	PartySizeConcession	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
31	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
32	IPE	AmountPaidCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
33	IPE	AmountPaid	VALI	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	null or value
34	IPE	AmountPaidMethodOfPayment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
35	IPE	AmountPaidVATSaleSTax	VAT	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
36	IPE	PhotocardNumber	UD	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	null or value
37	IPE	PromotionCode	UD	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
38	IPE	CPICC	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
39	IPE O	RFU	RFU	according to bit map	set to zero (0)	4	0	-----

40	IPE O	TYP23Mode	HEX	according to bit map	set to value in embodiment spec	2	1	value
41	IPE O	MaxTransfers	HEX	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
42	IPE O	TimeLimit	HEX	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
43	IPE O	ValueOfRideJourney	VALI	according to bit map	set to value in embodiment spec	2	2	value
44	IPE O	RFU	RFU	according to bit map	set to zero (0)	4	0	-----
45	IPE O	ValueOfRideJourney CurrencyCode	VALC	according to bit map	set to value in embodiment spec	2	1	value
46	IPE O	RouteCode	UD	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 5	null or value
47	IPE O	Origin1	LOC1	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 17	null or value
48	IPE O	Destination1	LOC1	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 17	null or value
49	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
50	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
51	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
52	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
53	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
54	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
55	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
56	VH	VGLength	HEX	if value group present	determined upon IPE creation	1	0	-----
57	VH	VGBitMap	BMP	if value group present	Set to value in embodiment spec or determined upon IPE creation	1 or 2	0 or 1	Null or value
58	VH	VGFormatRevision	HEX	if value group present	set to value in embodiment spec	2	1	0x0A

59	V	TransactionType	HEX	if value group present	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 1	Null or value
60	V	TransactionSequenceNumber	TS#	Always	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 2	Null or value
61	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-----
62	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-----
63	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-----
64	V	CountRemainingRidesJourneys	HEX	if value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
65	V	CountTransfers	HEX	if value group present	set to zero (0)	4	0	-----
66	V	TYP23ValueFlags – Auto-Renew	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
67	V	TYP23ValueFlags – UsedChecked	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
68	V	TYP23ValueFlags - RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
69	V	TYP23ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
70	V	TYP23ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
71	V	TYP23ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value

72	V	TYP23ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
73	V	TYP23ValueFlags – RFU	FLAG	If value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
74	V	RFU	RFU	Always	set to zero (0)	4	0	-----
75	V	Padding	PAD	If Required	set to zero (0)	4	0	-----
76	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
77	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
78	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
79	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
80	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Table 2.140 - IPE TYP 24, Format Version 2

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	Value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	24
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	Value
4	DIR	VGP	FLAG	Dir Entry	set to one (1) or set to zero (0) or determined upon IPE creation	3 or 4 or 1	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	Null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE	1 or 2	0 or 1	Null or value

					creation			
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x12
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	Value
11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or value
12	IPE	TYP24Flags	BMP	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
13	IPE	ProductTypeEncoding	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
14	IPE	TicketNumber	UD	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	Null or Value
15	IPE	NumberOfAssociatedIPEs	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
16	IPE	NumberOfDiscounts	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
17	IPE	NumberOfSupplements	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
18	IPE	NumberOfTransferTypes	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
19	IPE	NumberOfInterchanges	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
20	IPE	NumberOfRestrictionTime Bands	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
21	IPE	NumberOfVehicleSpecific Restrictions	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
22	IPE	NumberOfRoutingPoints	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
23	IPE	Class	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
24	IPE	AutoRenewTimeAfterExpiry	HEX	Always	set to value in embodiment spec or set to value	1 or 2	0 or 1	Null or Value

					determined upon IPE creation			
25	IPE	NumberOfJourneysSold	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
26	IPE	OutPortionPeriodOfValidity	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
27	IPE	RtnPortionPeriodOfValidity	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
28	IPE	OperatorSpecificity	UD	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
29	IPE	FaresTypeOfTicket	UD	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 3	Null or Value
30	IPE	PartySizeAdult	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
31	IPE	PartySizeChild	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
32	IPE	PartySizeConcession	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
33	IPE	IdDocumentReference	UD	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	Null or Value
34	IPE	Origin	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
35	IPE	Destination	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
36	IPE	AlternativeOrigin	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
37	IPE	AlternativeDestination	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
38	IPE	Route	UD	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 5	Null or Value
39	IPE	OutPortionValidFrom	DTS	Always	set to value in embodiment spec or set to value	1 or 2	0 or 3	Null or Value

					determined upon IPE creation			
40	IPE	RtnPortionValidFrom	DTS	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 3	Null or Value
41	IPE	RestrictionCode	UD	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
42	IPE	DaysTravelPermitted	DOW	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
43	IPE	DaysRestrictionApplies	DOW	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
44	IPE	AmountPaidCurrencyCode	VALC	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
45	IPE	AmountPaidMOP	MOP	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
46	IPE	AmountPaid	VALI	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	Null or Value
47	IPE	VendorLoc	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
48	Associated-IPE	IPEInstanceID	HEX	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
49	Discounts	DiscountCode	UD	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 5	Null or Value
50	Discounts	DiscountAmount	VALI	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	Null or Value
51	Discounts	DiscountPercentage	HEX	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
52	Discounts	DiscountCodeType	UD	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
53	Discounts	RFU	RFU	according to bit map	Set to zero (0)	4	0	-----
54	Supplement	AssociatedSupplementCode	ASCII	according to bit map	set to value in embodiment spec or set to value determined upon IPE	1 or 2	0 or 3	Null or Value

					creation			
55	Interchange	OutOfLocationInterchange Exit	LOC1	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
56	Interchange	OutOfLocationInterchange Entry	LOC1	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
57	Interchange	PermittedInterchangeTime	HEX	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
58	Interchange	RFU	RFU	according to bit map	Set to zero (0)	4	0	-----
59	Transfers	TransferEntitlementType	HEX	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
60	Transfers	NumberOfTransfers	HEX	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
61	Transfers	RFU	RFU	according to bit map	Set to zero (0)	4	0	-----
62	Transfers	ExtendedValidityPeriod	HEX	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
63	Restriction1	OperatorApplicability	UD	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
64	Restriction1	SpecificLocationApplicability	LOC1	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
65	Restriction1	TimeBandOnOutOrReturn	BMP	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
66	Restriction1	TimeBandStart	TIME	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
67	Restriction1	TimeBandEnd	TIME	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
68	Restriction1	TimeBandOnArriveOrDepart	FLAG	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
69	Restriction1	TimeBandIncludeExclude Flag	FLAG	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
70	Restriction1	RFU	RFU	according to bit map	Set to zero (0)	4	0	-----

71	Restriction2	SpecificVehicleDeparture Location	LOC1	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
72	Restriction2	SpecificServiceId	UD	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 6	Null or Value
73	Restriction2	SpecificVehicleDeparture Time	TIME	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
74	Restriction2	RestrictionOrEasementFlag	FLAG	According to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
75	Restriction2	RFU	RFU	According to bit map	Set to zero (0)	4	0	-----
76	Route	RoutingLocation	LOC1	According to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
77	Route	ViaNotVia	UD	According to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
78	Route	RFU	RFU	According to bit map	Set to zero (0)	4	0	-----
79	PaxDetail	Name	ASCII	According to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 20	Null or Value
80	PaxDetail	Gender	BMP	According to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
81	PaxDetail	RFU	RFU	According to bit map	set to zero (0)	4	0	-----
82	IPE	Padding	PAD	if required	set to zero (0)	4	0	-----
83	IPE	IIN	IIN	if required	set to value in embodiment spec	2	3	Value
84	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
85	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
86	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
87	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
88	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
89	VH	VGLength	HEX	Always	determined upon IPE creation	1	0	-----
90	VH	VGBitMap	BMP	Always	Set to value in embodiment spec or determined upon IPE creation	1 or 2	0 or 1	Null or value
91	VH	VGFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x0A
92	V	TransactionType	HEX	Always	Set to value in embodiment	1 or 2 or 4	0 or 1	Null or

					spec, or set to value determined upon IPE creation, or set to zero (0)			value
93	V	TransactionSequence Number	TS#	Always	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 2	Null or value
94	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-----
95	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-----
96	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-----
97	V	JourneysRemaining	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
98	V	TransfersRemaining	BMP	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
99	V	JourneyPartUsedFlag	FLAG	Always	set to zero (0)	4	0	-----
100	V	NumberOfReservations	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
101	V	RFU	RFU	Always	Set to zero (0)	4	0	-----
102	VXH	VGXLength	HEX	Always	determined upon IPE creation	1	0	-----
103	VXH	VGXRef (Bit9; Bit8)	BMP	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Value
104	VXH	VGXRef (Bit7 – Bit0)	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Value
105	VX	DTSOfLastValidation	DTS	Always	Set to zero (0)	4	0	-----
106	VX	LocationOfLastValidation	LOC1	Always	set to zero (0)	4	0	-----
107	VX	BookingReference	ASCII	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 8	Null or Value
108	VXO	LegDepartureDateTime	DTS	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 3	Null or Value
109	VXO	LegServiceId	ASCII	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 6	Null or Value
110	VXO	LegOrigin	LOC1	according to bit map	set to value in embodiment spec or set to value determined upon IPE	1 or 2	0 or variable 17 max	Null or Value

					creation			
111	VXO	LegDestination	LOC1	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
112	VXO	Coach	ASCII	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
113	VXO	SeatNumber	ASCII	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 3	Null or Value
114	VXO	AccommodationAttribute	ASCII	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	Null or Value
115	VXO	SeatDirection	BMP	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
116	VXO	BerthUpperLower	BMP	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
117	VXO	ReservationType	UD	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
118	VXO	TogetherFlag	FLAG	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
119	VXO	RFU	RFU	according to bit map	set to zero (0)	4	0	-----
120	VX	VGX_Padding	PAD	If Required	set to zero (0)	4	0	-----
121	V	Padding	PAD	If Required	set to zero (0)	4	0	-----
122	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
123	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
124	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
125	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
126	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Table 2.145 – IPE TYP 29, Format Version 2

LD	Information only					LD	LD	LD
Element #	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value

2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	29
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to zero (0)	4	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	IPE	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	IPE	IPEBitMap	HEX	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	IPE	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x12
10	IPE	IssueDate	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
11	IPE	Sterling/Euro	FLAG	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
12	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
13	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1	value
14	IPE	MaxDailyJourneys	HEX	Always	set to value in embodiment spec	2	1	value
15	IPE	MaxTransfers	HEX	Always	set to value in embodiment spec	2	1	value
16	IPE	ScalingFactor	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
18	IPE	TYP29PassFlags - OffPeakOnly	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	TYP29PassFlags - WeekdayOnly	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value

20	IPE	TYP29PassFlags - Class	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
21	IPE	TYP29PassFlags - ExpiryTimeFlag	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
22	IPE	AreaValidity	LOC3	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 9	null or value
23	IPE	JnyComDTS	DTS	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 3	null or value
24	IPE	QtyRemaining	HEX	Always	set to value in embodiment spec or set to value determined upon creation Note: the POST computes the #of bits that may need to be set in the ScaledQtyBackup BitMap depending the target platform and the IPEBitMap setting	1 or 2	0 or 2	null or value
25	IPE	TransferCounter	HEX	Always	set to zero (0)	4	0	-----
26	IPE	DailyJnyCounter	HEX	Always	set to zero (0)	4	0	-----
27	IPE	LastUseDTS	DTS	Always	set to zero (0)	4	0	-----
28	IPE	ScaledQtyBackup	HEX	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	null or value
29	IPE	Seq#	HEX	according to bit map	set to zero (0)	4	0	-----
30	IPE	KID	HEX	Always	determined upon IPE creation	1	0	-----
31	IPE	INP#	HEX	Always	set to zero (0)	4	0	-----
32	IPE	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
33	IPE	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
34	IPE	SEAL	BIN	Always	Determined upon IPE creation	1	0	-----

8.5 List Format Revision 2, IPE Format Revision 1.

Definition of IPE Embodiment Parameters for IPEs formatted according to format version code 1.

Note that in the following tables, extra columns are included for the information of users. Only those columns marked LD shall be included in transmitted Embodiment parameter lists.

Note that, for guidance, values for elements where the rule is marked with a * would normally be determined at the issuing POST except in circumstances where the embodiment specification is included in an Actionlist.

Note that in element 9, the most significant 4 bits shall contain ListFormatRevision, and the least significant 4 bits shall contain IPEFormatRevision. Only IPEFormatRevision shall be programmed into IPE instances.

Elements 1 to 9 of each list shall retain their current sizes for future format versions.

Table 3.131 – List Format Revision 2, IPE TYP 2, Format Revision 1

Implementation of this version is optional in both HOPS and POSTs.

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	Value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	2
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	Value
4	DIR	VGP	FLAG	Dir Entry	set to one (1)	3	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x21
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	Value
11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
12	IPE	TYP2Flags - 0	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value

13	IPE	TYP2Flags – 1	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
14	IPE	TYP2Flags – 2	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
15	IPE	TYP2Flags – 3	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
16	IPE	TYP2Flags – 4	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	TYP2Flags – PrintTicket	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
18	IPE	TYP2Flags - PrintReceipt	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	TYP2Flags - 7	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
20	IPE	Threshold	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
21	IPE	TopUpAmount	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
22	IPE	MaxValue2	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
23	IPE	MaximumNegativeAmount	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
24	IPE	DepositAmount	VALI	Always	set to value in embodiment spec or	1 or 2	0 or 2	null or value

					set to value determined upon creation			
25	IPE	StartDateAutoTopUp	DATE	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
26	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
27	IPE	DepositMethodOfPayment	MOP	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
28	IPE	DepositCurrencyCode	VALC	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
29	IPE	DepositVATSalesTax	VAT	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
30	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
31	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	Value
32	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
33	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
34	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
35	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
36	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
37	VH	VGLength	HEX	Always	determined upon IPE creation	1	0	-----
38	VH	VGBitMap	BMP	Always	Set to value in embodiment spec or determined upon IPE creation	1 or 2	0 or 1	Null or value
39	VH	VGFormatRevision	HEX	Always	set to value in embodiment spec	2	1	9
40	V	TransactionType	HEX	Always	Set to value in embodiment spec or set to value determined upon creation or set to zero (0)	1 or 2 or 4	0 or 1	Null or value
41	V	TransactionSequence Number	TS#	Always	Set to value in embodiment spec or set to value determined upon creation or set to zero (0)	1 or 2 or 4	0 or 2	Null or value
42	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-----
43	V	ISAMIDModifier	HEX	Always	determined upon IPE	1	0	-----

					creation			
44	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-----
45	V	Value	VALS	Always	Set to value in embodiment spec or set to value determined upon creation or set to zero (0)	1 or 2 or 4	0 or 2	Null or value
46	V	ValueCurrencyCode	VALC	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
47	V	CountJourneyLegs	HEX	Always	set to zero (0)	4	0	-----
48	V	CumulativeFare	VALI	Always	set to zero (0)	4	0	-----
49	V	TYP2ValueFlags - AutoTopUp	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
50	V	TYP2ValueFlags - IPEPriorityOverride	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
51	V	TYP2ValueFlags - AutoTopUpInternal	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
52	VXH	VGXLength	HEX	Always	determined upon IPE creation	1	0	-----
53	VXH	VGXRef (Bit9; Bit8)	BMP	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	Value
54	VXH	VGXRef (Bit7 – Bit0)	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	Value
55	VX	CapStrategyCode	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	Value
56	VX	CapAccumulator1Rule	HEX	Always	set to zero (0)	4	0	-----
57	VX	LastFarePaid1	HEX	Always	set to zero (0)	4	0	-----
58	VX	LastFarePaid1TransactionType	HEX	Always	set to zero (0)	4	0	-----
59	VX	UncappedAccumulator1	VALI	Always	set to zero (0)	4	0	-----
60	VX	DayCapAccumulator1	VALI	Always	set to zero (0)	4	0	-----
61	VX	MultidayCapAccumulator1	VALI	Always	set to zero (0)	4	0	-----

62	VX	Cap1DayCount	HEX	Always	set to zero (0)	4	0	-----
63	VX	CapAccumulator2Rule	HEX	Always	set to zero (0)	4	0	-----
64	VX	LastFarePaid2	HEX	Always	set to zero (0)	4	0	-----
65	VX	LastFarePaid2TransactionType	HEX	Always	set to zero (0)	4	0	-----
66	VX	UncappedAccumulator2	VALI	Always	set to zero (0)	4	0	-----
67	VX	DayCapAccumulator2	VALI	Always	set to zero (0)	4	0	-----
68	VX	MultidayCapAccumulator2	VALI	Always	set to zero (0)	4	0	-----
69	VX	Cap2DayCount	HEX	Always	set to zero (0)	4	0	-----
70	VX	CapAccumulator3Rule	HEX	Always	set to zero (0)	4	0	-----
71	VX	LastFarePaid3	HEX	Always	set to zero (0)	4	0	-----
72	VX	LastFarePaid3TransactionType	HEX	Always	set to zero (0)	4	0	-----
73	VX	UncappedAccumulator3	VALI	Always	set to zero (0)	4	0	-----
74	VX	DayCapAccumulator3	VALI	Always	set to zero (0)	4	0	-----
75	VX	MultidayCapAccumulator3	VALI	Always	set to zero (0)	4	0	-----
76	VX	Cap3DayCount	HEX	Always	set to zero (0)	4	0	-----
77	VX	CapAccumulator4Rule	HEX	Always	set to zero (0)	4	0	-----
78	VX	LastFarePaid4	HEX	Always	set to zero (0)	4	0	-----
79	VX	LastFarePaid4TransactionType	HEX	Always	set to zero (0)	4	0	-----
80	VX	UncappedAccumulator4	VALI	Always	set to zero (0)	4	0	-----
81	VX	DayCapAccumulator4	VALI	Always	set to zero (0)	4	0	-----
82	VX	MultidayCapAccumulator4	VALI	Always	set to zero (0)	4	0	-----
83	VX	Cap4DayCount	HEX	Always	set to zero (0)	4	0	-----
84	VX	Location	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or value
85	VX	Location1	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or value
86	VX	DateTimeStamp1	DTS	Always	set to zero (0)	4	0	-----
87	VX	Location2	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or value
88	VX	DateTimeStamp2	DTS	Always	set to zero (0)	4	0	-----
89	VX	Location3	LOC1	Always	set to value in embodiment spec or set to value	1 or 2	0 or variable 17	Null or value

					determined upon IPE creation		max	
90	VX	DateTimeStamp3	DTS	Always	set to zero (0)	4	0	-----
91	VX	Location4	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or value
92	VX	DateTimeStamp4	DTS	Always	set to zero (0)	4	0	-----
93	VX	VGX_Padding	PAD	If Required	set to zero (0)	4	0	-----
94	V	Padding	PAD	If Required	set to zero (0)	4	0	-----
95	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
96	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
97	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
98	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
99	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Table 3.133 - List Format Revision 2, IPE TYP 4, Format Version Revision 1

Implementation of this version is optional in both HOPS and POSTs

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	Value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	4
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	Value
4	DIR	VGP	FLAG	Dir Entry	set to one (1)	3	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE	1 or 2	0 or 1	Null or value

					creation			
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x21
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	value
11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
12	IPE	TYP4Flags - 0	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
13	IPE	TYP4Flags – 1	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
14	IPE	TYP4Flags – 2	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
15	IPE	TYP4Flags – 3	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
16	IPE	TYP4Flags – 4	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	TYP4Flags – PrintTicket	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
18	IPE	TYP4Flags - PrintReceipt	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	TYP4Flags - 7	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
20	IPE	MaxValue4	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
21	IPE	DepositAmount	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value

22	IPE	StartDateCTA	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
23	IPE	EndDate	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
24	IPE	DepositMethodOfPayment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
25	IPE	DepositCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
26	IPE	DepositVATSalesTax	VAT	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
27	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
28	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
29	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
30	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
31	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
32	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
33	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
34	VH	VGLength	HEX	Always	determined upon IPE creation	1	0	-----
35	VH	VGBitMap	BMP	Always	Set to value in embodiment spec or determined upon IPE creation	1 or 2	0 or 1	Null or value
36	VH	VGFormatRevision	HEX	Always	set to value in embodiment spec	2	1	9
37	V	TransactionType	HEX	Always	Set to value in embodiment spec or set to value determined upon creation or set to zero (0)	1 or 2 or 4	0 or 1	Null or value
38	V	TransactionSequence Number	TS#	Always	Set to value in embodiment spec or set to value determined upon creation or set to zero (0)	1 or 2 or 4	0 or 2	Null or value

39	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-----
40	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-----
41	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-----
42	V	CumulativeAmount	VALI	Always	Set to value in embodiment spec or set to value determined upon creation or set to zero (0)	1 or 2 or 4	0 or 2	Null or value
43	V	ValueCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
44	V	CountJourneyLegs	HEX	Always	set to zero (0)	4	0	-----
45	V	CumulativeFare	VALI	Always	set to zero (0)	4	0	-----
46	V	TYP4ValueFlags - 0	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
47	V	TYP4ValueFlags - IPEPriorityOverride	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
48	V	TYP4ValueFlags – 2	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
49	V	TYP4ValueFlags - 3	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
50	VXH	VGXLength	HEX	Always	determined upon IPE creation	1	0	----
51	VXH	VGXRef (Bit9; Bit8)	BMP	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	Value
52	VXH	VGXRef (Bit7 – Bit0)	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	Value
53	VX	CapStrategyCode	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	Value
54	VX	CapAccumulator1Rule	HEX	Always	set to zero (0)	4	0	-----
55	VX	LastFarePaid1	HEX	Always	set to zero (0)	4	0	-----
56	VX	LastFarePaid1Transact	HEX	Always	set to zero (0)	4	0	-----

		ionType						
57	VX	UncappedAccumulator1	VALI	Always	set to zero (0)	4	0	-----
58	VX	DayCapAccumulator1	VALI	Always	set to zero (0)	4	0	-----
59	VX	MultidayCapAccumulator1	VALI	Always	set to zero (0)	4	0	-----
60	VX	Cap1DayCount	HEX	Always	set to zero (0)	4	0	-----
61	VX	CapAccumulator2Rule	HEX	Always	set to zero (0)	4	0	-----
62	VX	LastFarePaid2	HEX	Always	set to zero (0)	4	0	-----
63	VX	LastFarePaid2TransactionType	HEX	Always	set to zero (0)	4	0	-----
64	VX	UncappedAccumulator2	VALI	Always	set to zero (0)	4	0	-----
65	VX	DayCapAccumulator2	VALI	Always	set to zero (0)	4	0	-----
66	VX	MultidayCapAccumulator2	VALI	Always	set to zero (0)	4	0	-----
67	VX	Cap2DayCount	HEX	Always	set to zero (0)	4	0	-----
68	VX	CapAccumulator3Rule	HEX	Always	set to zero (0)	4	0	-----
69	VX	LastFarePaid3	HEX	Always	set to zero (0)	4	0	-----
70	VX	LastFarePaid3TransactionType	HEX	Always	set to zero (0)	4	0	-----
71	VX	UncappedAccumulator3	VALI	Always	set to zero (0)	4	0	-----
72	VX	DayCapAccumulator3	VALI	Always	set to zero (0)	4	0	-----
73	VX	MultidayCapAccumulator3	VALI	Always	set to zero (0)	4	0	-----
74	VX	Cap3DayCount	HEX	Always	set to zero (0)	4	0	-----
75	VX	CapAccumulator4Rule	HEX	Always	set to zero (0)	4	0	-----
76	VX	LastFarePaid4	HEX	Always	set to zero (0)	4	0	-----
77	VX	LastFarePaid4TransactionType	HEX	Always	set to zero (0)	4	0	-----
78	VX	UncappedAccumulator4	VALI	Always	set to zero (0)	4	0	-----
79	VX	DayCapAccumulator4	VALI	Always	set to zero (0)	4	0	-----
80	VX	MultidayCapAccumulator4	VALI	Always	set to zero (0)	4	0	-----
81	VX	Cap4DayCount	HEX	Always	set to zero (0)	4	0	-----
82	VX	Location	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or value
83	VX	Location1	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or value
84	VX	DateTimeStamp1	DTS	Always	set to zero (0)	4	0	-----
85	VX	Location2	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or value
86	VX	DateTimeStamp2	DTS	Always	set to zero (0)	4	0	-----

87	VX	Location3	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or value
88	VX	DateTimeStamp3	DTS	Always	set to zero (0)	4	0	-----
89	VX	Location4	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or value
90	VX	DateTimeStamp4	DTS	Always	set to zero (0)	4	0	-----
91	VX	VGX_Padding	PAD	If Required	set to zero (0)	4	0	-----
92	V	Padding	PAD	If Required	set to zero (0)	4	0	-----
93	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
94	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
95	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
96	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
97	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Table 3.134 - List Format Revision 2, IPE TYP 5, Format Version Revision 1

Implementation of this version is optional in both HOPS and POSTs

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	5
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to one (1)	3	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value

6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x21
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	Value
11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
12	IPE	TYP5Flags - 0	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
13	IPE	TYP5Flags – 1	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
14	IPE	TYP5Flags – 2	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
15	IPE	TYP5Flags – 3	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
16	IPE	TYP5Flags – 4	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	TYP5Flags – PrintTicket	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
18	IPE	TYP5Flags - PrintReceipt	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value

19	IPE	TYP5Flags - 7	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
20	IPE	WeeksPerPeriod	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
21	IPE	QuantityTransactions	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
22	IPE	MaxValue5	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
23	IPE	DepositAmount	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
24	IPE	StartDateCTA	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
25	IPE	EndDate	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
26	IPE	DepositMethodOfPayment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
27	IPE	DepositCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
28	IPE	DepositVATSalesTax	VAT	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
29	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
30	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	Value
31	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----

32	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
33	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
34	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
35	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
36	VH	VGLength	HEX	Always	determined upon IPE creation	1	0	-----
37	VH	VGBitMap	BMP	Always	Set to value in embodiment spec or determined upon IPE creation	1 or 2	0 or 1	Null or value
38	VH	VGFormatRevision	HEX	Always	set to value in embodiment spec	2	1	9
39	V	TransactionType	HEX	Always	Set to value in embodiment spec or set to value determined upon creation or set to zero (0)	1 or 2 or 4	0 or 1	Null or value
40	V	TransactionSequenceNumber	TS#	Always	Set to value in embodiment spec or set to value determined upon creation or set to zero (0)	1 or 2 or 4	0 or 2	Null or value
41	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-----
42	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-----
43	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-----
44	V	CountOfTransactions	HEX	Always	Set to value in embodiment spec or set to value determined upon creation or set to zero (0)	1 or 2 or 4	0 or 1	Null or value
45	V	RFU	RFU	Always	set to zero (0)	4	0	-----
46	V	LastResetDate	DATE	Always	set to current date and time	6	0	-----
47	V	ValueCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
48	V	TYP5ValueFlags - 0	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
49	V	TYP5ValueFlags - IPEPriorityOverride	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
50	V	TYP5ValueFlags - 2	FLAG	Always	set to value in embodiment spec or	1 or 2	0 or 1	null or value

					set to value determined upon creation			
51	V	TYP5ValueFlags - 3	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
52	V	RFU	RFU	Always	set to zero (0)	4	0	-----
53	V	CountJourneyLegs	HEX	Always	set to zero (0)	4	0	-----
54	VXH	VGXLength	HEX	Always	determined upon IPE creation	1	0	----
55	VXH	VGXRef (Bit9; Bit8)	BMP	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	Value
56	VXH	VGXRef (Bit7 – Bit0)	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	Value
57	VX	CapStrategyCode	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	Value
58	VX	CapAccumulator1Rule	HEX	Always	set to zero (0)	4	0	-----
59	VX	LastFarePaid1	HEX	Always	set to zero (0)	4	0	-----
60	VX	LastFarePaid1TransactionType	HEX	Always	set to zero (0)	4	0	-----
61	VX	UncappedAccumulator1	VALI	Always	set to zero (0)	4	0	-----
62	VX	DayCapAccumulator1	VALI	Always	set to zero (0)	4	0	-----
63	VX	MultidayCapAccumulator1	VALI	Always	set to zero (0)	4	0	-----
64	VX	Cap1DayCount	HEX	Always	set to zero (0)	4	0	-----
65	VX	CapAccumulator2Rule	HEX	Always	set to zero (0)	4	0	-----
66	VX	LastFarePaid2	HEX	Always	set to zero (0)	4	0	-----
67	VX	LastFarePaid2TransactionType	HEX	Always	set to zero (0)	4	0	-----
68	VX	UncappedAccumulator2	VALI	Always	set to zero (0)	4	0	-----
69	VX	DayCapAccumulator2	VALI	Always	set to zero (0)	4	0	-----
70	VX	MultidayCapAccumulator2	VALI	Always	set to zero (0)	4	0	-----
71	VX	Cap2DayCount	HEX	Always	set to zero (0)	4	0	-----
72	VX	CapAccumulator3Rule	HEX	Always	set to zero (0)	4	0	-----
73	VX	LastFarePaid3	HEX	Always	set to zero (0)	4	0	-----
74	VX	LastFarePaid3TransactionType	HEX	Always	set to zero (0)	4	0	-----

75	VX	UncappedAccumulator3	VALI	Always	set to zero (0)	4	0	-----
76	VX	DayCapAccumulator3	VALI	Always	set to zero (0)	4	0	-----
77	VX	MultidayCapAccumulator3	VALI	Always	set to zero (0)	4	0	-----
78	VX	Cap3DayCount	HEX	Always	set to zero (0)	4	0	-----
79	VX	CapAccumulator4Rule	HEX	Always	set to zero (0)	4	0	-----
80	VX	LastFarePaid4	HEX	Always	set to zero (0)	4	0	-----
81	VX	LastFarePaid4TransactionType	HEX	Always	set to zero (0)	4	0	-----
82	VX	UncappedAccumulator4	VALI	Always	set to zero (0)	4	0	-----
83	VX	DayCapAccumulator4	VALI	Always	set to zero (0)	4	0	-----
84	VX	MultidayCapAccumulator4	VALI	Always	set to zero (0)	4	0	-----
85	VX	Cap4DayCount	HEX	Always	set to zero (0)	4	0	-----
86	VX	Location	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or value
87	VX	Location1	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or value
88	VX	DateTimeStamp1	DTS	Always	set to zero (0)	4	0	-----
89	VX	Location2	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or value
90	VX	DateTimeStamp2	DTS	Always	set to zero (0)	4	0	-----
91	VX	Location3	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or value
92	VX	DateTimeStamp3	DTS	Always	set to zero (0)	4	0	-----
93	VX	Location4	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or value
94	VX	DateTimeStamp4	DTS	Always	set to zero (0)	4	0	-----
95	VX	VGX_Padding	PAD	If Required	set to zero (0)	4	0	-----
96	V	Padding	PAD	If Required	set to zero (0)	4	0	-----
97	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----

98	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
99	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
100	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
101	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

8.6 List Format Revision 2, IPE Format Revision 2.

Definition of IPE Embodiment Parameters for IPEs formatted according to format version code 2.

Note that in the following tables, extra columns are included for the information of users. Only those columns marked LD shall be included in transmitted Embodiment parameter lists.

Note that values for elements where the rule is marked with a * would normally be determined at the issuing POST except in circumstances where the embodiment specification is included in an Actionlist.

Note that in element 9, the most significant 4 bits shall contain ListFormatRevision, and the least significant 4 bits shall contain IPEFormatRevision. Only IPEFormatRevision shall be programmed into IPE instances.

Elements 1 to 9 of each list shall retain their current meanings for future format versions.

Messages formatted according to this clause shall not be sent to POSTs certified to version 2.1.3 of ITSO TS1000.

Table 4.135 – IPE TYP 14, Format Version2

The use of IPE Embodiment Parameters for this IPE formatted according to format version code 1 is deprecated in this version of the Specification and will be removed from the next version of the Specification.

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	14
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to zero (0)	4	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value	1 or 2 or 5	0 or 2	null or value

					determined upon creation or set to today's date plus the value in embodiment spec			
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x12
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	Value
11	IPE	CPICC	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
12	IPE	IDFlags - Personalised	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
13	IPE	IDFlags – Gender	BMP	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
14	IPE	IDFlags – URI	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
15	IPE	IDFlags – CompanionAllowed	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
16	IPE	IDFlags – PrintTicket	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	IDFlags – DepositRefundable	Flag	Always	set to value in embodiment spec or	1 or 2	0 or 1	null or value

		e?			set to value determined upon creation			
18	IPE	IDFlags – ShellDepositRefundable?	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	RoundingFlagsEnabled	FLAG	Always	set to value in embodiment spec	2	1	Value
20	IPE	RFU	RFU	Always	set to zero (0)	4	0	----
21	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1	Value
22	IPE	HolderID	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	null or value
23	IPE	RoundingFlag	FLAG	Always	set to value in embodiment spec	2	1	Value
24	IPE	RoundingValueFlag	FLAG	Always	set to value in embodiment spec	2	1	value
25	IPE	EntitlementStartDate	DATE	Always	set to value in embodiment spec	1 or 2 or 5	0 or 2	Null or date value or date offset value
26	IPE	EntitlementExpiryDate	DATE	Always	Set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	Null or date value or date offset value
27	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
28	IPE	DepositCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
29	IPE	DepositMethodOfPayment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
30	IPE	DepositVATSalesTax	VAT	Always	*set to value in embodiment spec or	1 or 2	0 or 2	null or value

					set to value determined upon IPE creation			
31	IPE	DepositAmount	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
32	IPE	EntitlementCode	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
33	IPE	ConcessionaryClass	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
34	IPE O	SecondaryHolderID	HEX	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	null or value
35	IPE O	HalfDayOfWeek	BMP	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
36	IPE O	ValidAtOrFrom	LOC1	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 17	null or value
37	IPE O	ValidTo	LOC1	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 17	null or value
38	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
39	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
40	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
41	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
42	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
43	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----

44	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
----	-----	------	-----	--------	------------------------------	---	---	-------

Table 4.136 - IPE TYP 16, Format Version 2

he use of IPE Embodiment Parameters for this IPE formatted according to format version code 1 is deprecated in this version of the Specification and will be removed from the next version of the Specification.

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	16
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to zero (0)	4	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x12
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	Value
11	IPE	CPICC	HEX	Always	set to value in embodiment spec or	1 or 2	0 or 2	null or

					set to value determined upon creation			value
12	IPE	IDFlags - Personalised	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
13	IPE	IDFlags – Gender	BMP	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
14	IPE	IDFlags – URI	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
15	IPE	IDFlags – CompanionAllowed	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
16	IPE	IDFlags – PrintTicket	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	IDFlags – DepositRefundable?	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
18	IPE	IDFlags – ShellDepositRefundable?	Flag	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	RoundingFlagsEnable	FLAG	Always	set to value in embodiment spec	2	1	Value
20	IPE	RFU	RFU	Always	set to zero (0)	4	0	----
21	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1	Value
22	IPE	DateOfBirth	DOB	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	null or value

23	IPE	Language	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
24	IPE	HolderID	HEX	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	null or value
25	IPE	RoundingFlag	FLAG	Always	set to value in embodiment spec	2	1	value
26	IPE	RoundingValueFlag	FLAG	Always	set to value in embodiment spec	2	1	value
27	IPE	EntitlementStartDate	DATE	Always	set to value in embodiment spec	1 or 2 or 5	0 or 2	Null or date value or date offset value
28	IPE	EntitlementExpiryDate	DATE	Always	Set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	Null or date value or date offset value
29	IPE	RFU	RFU	Always	set to zero (0)	4	0	----
30	IPE	DepositMethodOfPayment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
31	IPE	DepositVATSalesTax	VAT	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
32	IPE	ShellDepositMethodOfPayment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
33	IPE	ShellDepositVATSalesTax	VAT	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
34	IPE	DepositCurrencyCod	VALC	Always	set to value in	1 or 2	0 or 1	Null or

		e			embodiment spec or set to value determined upon IPE creation ¹⁴			value
35	IPE	ShellDepositCurrencyCode	VALC	Always	set to value in embodiment spec or set to value determined upon IPE creation ¹⁵	1 or 2	0 or 1	Null or value
36	IPE	DepositAmount	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
37	IPE	ShellDeposit	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
38	IPE	EntitlementCode	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
39	IPE	ConcessionaryClass	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
40	IPE O	SecondaryHolderID	HEX	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	null or value
41	IPE O	ForenameLength	HEX	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
42	IPE O	Forename	ASCII	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 39	null or value

¹⁴ Note that the Rule Code used shall match the Rule Code used for the Deposit Value

¹⁵ Note that the Rule Code used shall match the Rule Code used for the Shell Deposit Value

43	IPE O	SurnameLength	HEX	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
44	IPE O	Surname	ASCII	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 39	null or value
45	IPE O	HalfDayOfWeek	BMP	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
46	IPE O	ValidAtOrFrom	LOC1	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 17	null or value
47	IPE O	ValidTo	LOC1	according to bit map	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable, maximum 17	null or value
48	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
49	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
50	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
51	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
52	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
53	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
54	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Table 4.140 - IPE TYP 24, Format Version 2

LD	Information only				LD		LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	Value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	24
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	Value
4	DIR	VGP	FLAG	Dir Entry	set to one (1) or set to zero (0) or determined upon IPE creation	3 or 4 or 1	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	Null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x22
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	Value
11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or value
12	IPE	TYP24Flags	BMP	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
13	IPE	ProductTypeEncoding	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
14	IPE	TicketNumber	UD	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	Null or Value

15	IPE	NumberOfAssociatedIP Es	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
16	IPE	NumberOfDiscounts	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
17	IPE	NumberOfSupplements	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
18	IPE	NumberOfTransferType s	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
19	IPE	NumberOfInterchanges	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
20	IPE	NumberOfRestrictionTi me Bands	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
21	IPE	NumberOfVehicleSpeci fic Restrictions	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
22	IPE	NumberOfRoutingPoint s	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
23	IPE	Class	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
24	IPE	AutoRenewTimeAfterE xpiry	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
25	IPE	NumberOfJourneysSol d	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
26	IPE	OutPortionPeriodOfVali dity	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
27	IPE	RtnPortionPeriodOfVali dity	HEX	Always	set to value in embodiment spec	1 or 2	0 or 2	Null or Value

					or set to value determined upon IPE creation			
28	IPE	OperatorSpecificity	UD	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
29	IPE	FaresTypeOfTicket	UD	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 3	Null or Value
30	IPE	PartySizeAdult	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
31	IPE	PartySizeChild	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
32	IPE	PartySizeConcession	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
33	IPE	IdDocumentReference	UD	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	Null or Value
34	IPE	Origin	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
35	IPE	Destination	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
36	IPE	AlternativeOrigin	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
37	IPE	AlternativeDestination	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
38	IPE	Route	UD	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 5	Null or Value
39	IPE	OutPortionValidFrom	DTS	Always	set to value in embodiment spec or set to value determined upon	1 or 2	0 or 3	Null or Value

					IPE creation			
40	IPE	RtnPortionValidFrom	DTS	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 3	Null or Value
41	IPE	RestrictionCode	UD	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
42	IPE	DaysTravelPermitted	DOW	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
43	IPE	DaysRestrictionApplies	DOW	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
44	IPE	AmountPaidCurrencyCode	VALC	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
45	IPE	AmountPaidMOP	MOP	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
46	IPE	AmountPaid	VALI	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	Null or Value
47	IPE	VendorLoc	LOC1	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
48	Associated-IPE	IPEInstanceID	HEX	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
49	Discounts	DiscountCodes	UD	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 5	Null or Value
50	Discounts	DiscountAmounts	VALI	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	Null or Value
51	Discounts	DiscountPercentage	HEX	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value

52	Discounts	DiscountCodeType	UD	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
53	Discounts	RFU	RFU	according to bit map	Set to zero (0)	4	0	-----
54	Supplement	AssociatedSupplementCode	ASCII	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 3	Null or Value
55	Interchange	OutOfLocationInterchangeExit	LOC1	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
56	Interchange	OutOfLocationInterchangeEntry	LOC1	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
57	Interchange	PermittedInterchangeTime	HEX	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
58	Interchange	RFU	RFU	according to bit map	Set to zero (0)	4	0	-----
59	Transfers	TransferEntitlementType	HEX	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
60	Transfers	NumberOfTransfers	HEX	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
61	Transfers	RFU	RFU	according to bit map	Set to zero (0)	4	0	-----
62	Transfers	ExtendedValidityPeriod	HEX	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
63	Restriction1	OperatorApplicability	UD	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
64	Restriction1	SpecificLocationApplicability	LOC1	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
65	Restriction1	TimeBandOnOutOrReturn	BMP	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value

66	Restriction1	TimeBandStart	TIME	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
67	Restriction1	TimeBandEnd	TIME	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
68	Restriction1	TimeBandOnArriveOrDepart	FLAG	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
69	Restriction1	TimeBandIncludeExclude Flag	FLAG	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
70	Restriction1	RFU	RFU	according to bit map	Set to zero (0)	4	0	-----
71	Restriction2	SpecificVehicleDeparture Location	LOC1	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
72	Restriction2	SpecificServiceId	UD	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 6	Null or Value
73	Restriction2	SpecificVehicleDeparture Time	TIME	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
74	Restriction2	RestrictionOrEasement Flag	FLAG	According to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
75	Restriction2	RFU	RFU	According to bit map	Set to zero (0)	4	0	-----
76	Route	RoutingLocation	LOC1	According to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
77	Route	ViaNotVia	UD	According to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
78	Route	RFU	RFU	According to bit map	Set to zero (0)	4	0	-----
79	PaxDetail	Name	ASCII	According to bit map	set to value in embodiment spec or set to value determined upon	1 or 2	0 or 20	Null or Value

					IPE creation			
80	PaxDetail	Gender	BMP	According to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
81	PaxDetail	RFU	RFU	According to bit map	set to zero (0)	4	0	-----
82	IPE	Padding	PAD	if required	set to zero (0)	4	0	-----
83	IPE	IIN	IIN	if required	set to value in embodiment spec	2	3	Value
84	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
85	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
86	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
87	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
88	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
89	VH	VGLength	HEX	Always	determined upon IPE creation	1	0	-----
90	VH	VGBitMap	BMP	Always	Set to value in embodiment spec or determined upon IPE creation	1 or 2	0 or 1	Null or value
91	VH	VGFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x0A
92	V	TransactionType	HEX	Always	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 1	Null or value
93	V	TransactionSequence Number	TS#	Always	Set to value in embodiment spec, or set to value determined upon IPE creation, or set to zero (0)	1 or 2 or 4	0 or 2	Null or value
94	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-----
95	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-----
96	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-----
97	V	JourneysRemaining	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
98	V	TransfersRemaining	BMP	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
99	V	JourneyPartUsedFlag	FLAG	Always	set to zero (0)	4	0	-----
100	V	NumberOfReservations	HEX	Always	set to value in	1 or 2	0 or 1	Null or

					embodiment spec or set to value determined upon IPE creation			Value
101	V	RFU	RFU	Always	Set to zero (0)	4	0	-----
102	VXH	VGXLength	HEX	Always	determined upon IPE creation	1	0	-----
103	VXH	VGXRef (Bit9; Bit8)	BMP	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Value
104	VXH	VGXRef (Bit7 – Bit0)	HEX	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Value
105	VX	DTSOfLastValidation	DTS	Always	Set to zero (0)	4	0	-----
106	VX	LocationOfLastValidation	LOC1	Always	set to value in embodiment spec	2	Variable max 17	See note below
107	VX	BookingReference	ASCII	Always	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 8	Null or Value
108	VXO	LegDepartureDateTime	DTS	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 3	Null or Value
109	VXO	LegServiceId	ASCII	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 6	Null or Value
110	VXO	LegOrigin	LOC1	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
111	VXO	LegDestination	LOC1	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or variable 17 max	Null or Value
112	VXO	Coach	ASCII	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	Null or Value
113	VXO	SeatNumber	ASCII	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 3	Null or Value
114	VXO	AccommodationAttribute	ASCII	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 4	Null or Value

115	VXO	SeatDirection	BMP	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
116	VXO	BerthUpperLower	BMP	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
117	VXO	ReservationType	UD	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
118	VXO	TogetherFlag	FLAG	according to bit map	set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or Value
119	VXO	RFU	RFU	according to bit map	set to zero (0)	4	0	-----
120	VX	VGX_Padding	PAD	If Required	set to zero (0)	4	0	-----
121	V	Padding	PAD	If Required	set to zero (0)	4	0	-----
122	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
123	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
124	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
125	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
126	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Because the size of VGX data groups may be difficult to increase after creation of the data group, it is recommended that the IPE be created with the Location, Location1, Location2, Location3 and Location4 elements of such a size as to be sufficient for any location information which may subsequently be stored in those elements. At creation, the NULL location code should be stored, LocDefType 255. If for example, 8 data bytes should be reserved for these elements, then the list data would be encoded as 0xFF080000000000000000.

8.7 List Format Revision 3, IPE Format Revision 1.

Definition of IPE Embodiment Parameters for IPEs formatted according to format version code 1.

Note that in the following tables, extra columns are included for the information of users. Only those columns marked LD shall be included in transmitted Embodiment parameter lists.

Note that, for guidance, values for elements where the rule is marked with a * would normally be determined at the issuing POST except in circumstances where the embodiment specification is included in an Actionlist.

Note that in element 9, the most significant 4 bits shall contain ListFormatRevision, and the least significant 4 bits shall contain IPEFormatRevision. Only IPEFormatRevision shall be programmed into IPE instances.

Elements 1 to 9 of each list shall retain their current sizes for future format versions.

Table 5.131 – List Format Revision 3, IPE TYP 2, Format Revision 1

Implementation of this version is optional in both HOPS and POSTs.

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	Value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	2
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	Value
4	DIR	VGP	FLAG	Dir Entry	set to one (1)	3	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x21
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	Value
11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
12	IPE	TYP2Flags - 0	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
13	IPE	TYP2Flags – 1	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value

14	IPE	TYP2Flags – 2	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
15	IPE	TYP2Flags – 3	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
16	IPE	TYP2Flags – 4	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	TYP2Flags – PrintTicket	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
18	IPE	TYP2Flags - PrintReceipt	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	TYP2Flags - 7	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
20	IPE	Threshold	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
21	IPE	TopUpAmount	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
22	IPE	MaxValue2	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
23	IPE	MaximumNegativeAmount	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
24	IPE	DepositAmount	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
25	IPE	StartDateAutoTopUp	DATE	Always	set to value in embodiment spec or	1 or 2	0 or 2	null or value

					set to value determined upon creation			
26	IPE	RFU	RFU	Always	set to zero (0)	4	0	-----
27	IPE	DepositMethodOfPayment	MOP	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
28	IPE	DepositCurrencyCode	VALC	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
29	IPE	DepositVATSalesTax	VAT	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
30	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
31	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	Value
32	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
33	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
34	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
35	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
36	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
37	VH	VGLength	HEX	Always	determined upon IPE creation	1	0	-----
38	VH	VGBitMap	BMP	Always	Set to value in embodiment spec or determined upon IPE creation	1 or 2	0 or 1	Null or value
39	VH	VGFormatRevision	HEX	Always	set to value in embodiment spec	2	1	9
40	V	TransactionType	HEX	Always	Set to value in embodiment spec or set to value determined upon creation or set to zero (0)	1 or 2 or 4	0 or 1	Null or value
41	V	TransactionSequence Number	TS#	Always	Set to value in embodiment spec or set to value determined upon creation or set to zero (0)	1 or 2 or 4	0 or 2	Null or value
42	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-----
43	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-----
44	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-----
45	V	Value	VALS	Always	Set to value in	1 or 2 or	0 or 2	Null or

					embodiment spec or set to value determined upon creation or set to zero (0)	4		value
46	V	ValueCurrencyCode	VALC	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
47	V	CountJourneyLegs	HEX	Always	set to zero (0)	4	0	-----
48	V	CumulativeFare	VALI	Always	set to zero (0)	4	0	-----
49	V	TYP2ValueFlags - AutoTopUp	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
50	V	TYP2ValueFlags - IPEPriorityOverride	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
51	V	TYP2ValueFlags - AutoTopUpInternal	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
52	VXH	VGXLength	HEX	Always	determined upon IPE creation	1	0	-----
53	VXH	VGXRef (Bit9; Bit8)	BMP	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	Value
54	VXH	VGXRef (Bit7 – Bit0)	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	Value
55	VX	CapStrategyCode	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	Value
56	VX	CapAccumulator1Rule	HEX	Always	set to zero (0)	4	0	-----
57	VX	LastFarePaid1	HEX	Always	set to zero (0)	4	0	-----
58	VX	LastFarePaid1TransactionType	HEX	Always	set to zero (0)	4	0	-----
59	VX	UncappedAccumulator1	VALI	Always	set to zero (0)	4	0	-----
60	VX	DayCapAccumulator1	VALI	Always	set to zero (0)	4	0	-----
61	VX	MultidayCapAccumulator1	VALI	Always	set to zero (0)	4	0	-----
62	VX	Cap1DayCount	HEX	Always	set to zero (0)	4	0	-----
63	VX	CapAccumulator2Rule	HEX	Always	set to zero (0)	4	0	-----
64	VX	LastFarePaid2	HEX	Always	set to zero (0)	4	0	-----

65	VX	LastFarePaid2TransactionType	HEX	Always	set to zero (0)	4	0	-----
66	VX	UncappedAccumulator2	VALI	Always	set to zero (0)	4	0	-----
67	VX	DayCapAccumulator2	VALI	Always	set to zero (0)	4	0	-----
68	VX	MultidayCapAccumulator2	VALI	Always	set to zero (0)	4	0	-----
69	VX	Cap2DayCount	HEX	Always	set to zero (0)	4	0	-----
70	VX	CapAccumulator3Rule	HEX	Always	set to zero (0)	4	0	-----
71	VX	LastFarePaid3	HEX	Always	set to zero (0)	4	0	-----
72	VX	LastFarePaid3TransactionType	HEX	Always	set to zero (0)	4	0	-----
73	VX	UncappedAccumulator3	VALI	Always	set to zero (0)	4	0	-----
74	VX	DayCapAccumulator3	VALI	Always	set to zero (0)	4	0	-----
75	VX	MultidayCapAccumulator3	VALI	Always	set to zero (0)	4	0	-----
76	VX	Cap3DayCount	HEX	Always	set to zero (0)	4	0	-----
77	VX	CapAccumulator4Rule	HEX	Always	set to zero (0)	4	0	-----
78	VX	LastFarePaid4	HEX	Always	set to zero (0)	4	0	-----
79	VX	LastFarePaid4TransactionType	HEX	Always	set to zero (0)	4	0	-----
80	VX	UncappedAccumulator4	VALI	Always	set to zero (0)	4	0	-----
81	VX	DayCapAccumulator4	VALI	Always	set to zero (0)	4	0	-----
82	VX	MultidayCapAccumulator4	VALI	Always	set to zero (0)	4	0	-----
83	VX	Cap4DayCount	HEX	Always	set to zero (0)	4	0	-----
84	VX	Location	LOC1	Always	set to value in embodiment spec	2	Variable 17 max	See note below
85	VX	Location1	LOC1	Always	set to value in embodiment spec	2	Variable 17 max	See note below
86	VX	DateTimeStamp1	DTS	Always	set to zero (0)	4	0	-----
87	VX	Location2	LOC1	Always	set to value in embodiment spec	2	Variable 17 max	See note below
88	VX	DateTimeStamp2	DTS	Always	set to zero (0)	4	0	-----
89	VX	Location3	LOC1	Always	set to value in embodiment spec	2	0	See note below
90	VX	DateTimeStamp3	DTS	Always	set to zero (0)	4	0	-----
91	VX	Location4	LOC1	Always	set to value in embodiment spec	2	Variable 17 max	See note below
92	VX	DateTimeStamp4	DTS	Always	set to zero (0)	4	0	-----
93	VX	VGX_Padding	PAD	If Required	set to zero (0)	4	0	-----
94	V	Padding	PAD	If Required	set to zero (0)	4	0	-----

95	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
96	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
97	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
98	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
99	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Because the size of VGX data groups may be difficult to increase after creation of the data group, it is recommended that the IPE be created with the Location, Location1, Location2, Location3 and Location4 elements of such a size as to be sufficient for any location information which may subsequently be stored in those elements. At creation, the NULL location code should be stored, LocDefType 255. If for example, 8 data bytes should be reserved for these elements, then the list data would be encoded as 0xFF080000000000000000.

Table 5.133 - List Format Revision 3, IPE TYP 4, Format Version Revision 1

Implementation of this version is optional in both HOPS and POSTs

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	Value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	4
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	Value
4	DIR	VGP	FLAG	Dir Entry	set to one (1)	3	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment spec	1 or 2 or 5	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x31
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	value

11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
12	IPE	TYP4Flags - 0	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
13	IPE	TYP4Flags – 1	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
14	IPE	TYP4Flags – 2	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
15	IPE	TYP4Flags – 3	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
16	IPE	TYP4Flags – 4	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	TYP4Flags – PrintTicket	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
18	IPE	TYP4Flags - PrintReceipt	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	TYP4Flags - 7	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
20	IPE	MaxValue4	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
21	IPE	DepositAmount	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
22	IPE	StartDateCTA	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value

23	IPE	EndDate	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
24	IPE	DepositMethodOfPayment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
25	IPE	DepositCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
26	IPE	DepositVATSalesTax	VAT	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
27	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
28	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
29	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
30	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
31	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
32	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
33	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
34	VH	VGLength	HEX	Always	determined upon IPE creation	1	0	-----
35	VH	VGBitMap	BMP	Always	Set to value in embodiment spec or determined upon IPE creation	1 or 2	0 or 1	Null or value
36	VH	VGFormatRevision	HEX	Always	set to value in embodiment spec	2	1	9
37	V	TransactionType	HEX	Always	Set to value in embodiment spec or set to value determined upon creation or set to zero (0)	1 or 2 or 4	0 or 1	Null or value
38	V	TransactionSequence Number	TS#	Always	Set to value in embodiment spec or set to value determined upon creation or set to zero (0)	1 or 2 or 4	0 or 2	Null or value
39	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-----
40	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-----
41	V	ActionSequenceNumb	HEX	Always	set to zero (0)	4	0	-----

		er						
42	V	CumulativeAmount	VALI	Always	Set to value in embodiment spec or set to value determined upon creation or set to zero (0)	1 or 2 or 4	0 or 2	Null or value
43	V	ValueCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
44	V	CountJourneyLegs	HEX	Always	set to zero (0)	4	0	-----
45	V	CumulativeFare	VALI	Always	set to zero (0)	4	0	-----
46	V	TYP4ValueFlags - 0	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
47	V	TYP4ValueFlags - IPEPriorityOverride	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
48	V	TYP4ValueFlags – 2	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
49	V	TYP4ValueFlags - 3	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
50	VXH	VGXLength	HEX	Always	determined upon IPE creation	1	0	----
51	VXH	VGXRef (Bit9; Bit8)	BMP	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	Value
52	VXH	VGXRef (Bit7 – Bit0)	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	Value
53	VX	CapStrategyCode	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	Value
54	VX	CapAccumulator1Rule	HEX	Always	set to zero (0)	4	0	-----
55	VX	LastFarePaid1	HEX	Always	set to zero (0)	4	0	-----
56	VX	LastFarePaid1TransactionType	HEX	Always	set to zero (0)	4	0	-----
57	VX	UncappedAccumulator1	VALI	Always	set to zero (0)	4	0	-----
58	VX	DayCapAccumulator1	VALI	Always	set to zero (0)	4	0	-----

59	VX	MultidayCapAccumulator1	VALI	Always	set to zero (0)	4	0	-----
60	VX	Cap1DayCount	HEX	Always	set to zero (0)	4	0	-----
61	VX	CapAccumulator2Rule	HEX	Always	set to zero (0)	4	0	-----
62	VX	LastFarePaid2	HEX	Always	set to zero (0)	4	0	-----
63	VX	LastFarePaid2TransactionType	HEX	Always	set to zero (0)	4	0	-----
64	VX	UncappedAccumulator2	VALI	Always	set to zero (0)	4	0	-----
65	VX	DayCapAccumulator2	VALI	Always	set to zero (0)	4	0	-----
66	VX	MultidayCapAccumulator2	VALI	Always	set to zero (0)	4	0	-----
67	VX	Cap2DayCount	HEX	Always	set to zero (0)	4	0	-----
68	VX	CapAccumulator3Rule	HEX	Always	set to zero (0)	4	0	-----
69	VX	LastFarePaid3	HEX	Always	set to zero (0)	4	0	-----
70	VX	LastFarePaid3TransactionType	HEX	Always	set to zero (0)	4	0	-----
71	VX	UncappedAccumulator3	VALI	Always	set to zero (0)	4	0	-----
72	VX	DayCapAccumulator3	VALI	Always	set to zero (0)	4	0	-----
73	VX	MultidayCapAccumulator3	VALI	Always	set to zero (0)	4	0	-----
74	VX	Cap3DayCount	HEX	Always	set to zero (0)	4	0	-----
75	VX	CapAccumulator4Rule	HEX	Always	set to zero (0)	4	0	-----
76	VX	LastFarePaid4	HEX	Always	set to zero (0)	4	0	-----
77	VX	LastFarePaid4TransactionType	HEX	Always	set to zero (0)	4	0	-----
78	VX	UncappedAccumulator4	VALI	Always	set to zero (0)	4	0	-----
79	VX	DayCapAccumulator4	VALI	Always	set to zero (0)	4	0	-----
80	VX	MultidayCapAccumulator4	VALI	Always	set to zero (0)	4	0	-----
81	VX	Cap4DayCount	HEX	Always	set to zero (0)	4	0	-----
82	VX	Location	LOC1	Always	set to value in embodiment spec	2	Variable 17 max	See note below
83	VX	Location1	LOC1	Always	set to value in embodiment spec	2	Variable 17 max	See note below
84	VX	DateTimeStamp1	DTS	Always	set to zero (0)	4	0	-----
85	VX	Location2	LOC1	Always	set to value in embodiment spec	2	Variable 17 max	See note below
86	VX	DateTimeStamp2	DTS	Always	set to zero (0)	4	0	-----
87	VX	Location3	LOC1	Always	set to value in embodiment spec	2	Variable 17 max	See note below
88	VX	DateTimeStamp3	DTS	Always	set to zero (0)	4	0	-----
89	VX	Location4	LOC1	Always	set to value in embodiment spec	2	Variable 17 max	See note below
90	VX	DateTimeStamp4	DTS	Always	set to zero (0)	4	0	-----

91	VX	VGX_Padding	PAD	If Required	set to zero (0)	4	0	-----
92	V	Padding	PAD	If Required	set to zero (0)	4	0	-----
93	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
94	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
95	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
96	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
97	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Because the size of VGX data groups may be difficult to increase after creation of the data group, it is recommended that the IPE be created with the Location, Location1, Location2, Location3 and Location4 elements of such a size as to be sufficient for any location information which may subsequently be stored in those elements. At creation, the NULL location code should be stored, LocDefType 255. If for example, 8 data bytes should be reserved for these elements, then the list data would be encoded as 0xFF080000000000000000.

Table 5.134 - List Format Revision 3, IPE TYP 5, Format Version Revision 1

Implementation of this version is optional in both HOPS and POSTs

LD	Information only					LD	LD	LD
Element Number	Target IPE Group	Target IPE ITSO Name	Target IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID13	Dir Entry	set to value in embodiment spec	2	2	value
2	DIR	TYP	TYP	Dir Entry	set to value in embodiment spec	2	1	5
3	DIR	PTYP	PTYP	Dir Entry	set to value in embodiment spec	2	1	value
4	DIR	VGP	FLAG	Dir Entry	set to one (1)	3	0	-----
5	DIR	IINL	FLAG	Dir Entry	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation or set to today's date plus the value in embodiment	1 or 2 or 5	0 or 2	null or value

					spec			
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-----
8	H	IPEBitMap	BMP	Always	Set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	Null or value
9	H	ListFormatRevision + IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	0x31
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1	Value
11	IPE	ProductRetailer	OID16	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
12	IPE	TYP5Flags - 0	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
13	IPE	TYP5Flags – 1	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
14	IPE	TYP5Flags – 2	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
15	IPE	TYP5Flags – 3	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
16	IPE	TYP5Flags – 4	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
17	IPE	TYP5Flags – PrintTicket	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
18	IPE	TYP5Flags - PrintReceipt	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
19	IPE	TYP5Flags - 7	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
20	IPE	WeeksPerPeriod	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
21	IPE	QuantityTransactions	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
22	IPE	MaxValue5	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
23	IPE	DepositAmount	VALI	Always	set to value in	1 or 2	0 or 2	null or

					embodiment spec or set to value determined upon creation			value
24	IPE	StartDateCTA	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
25	IPE	EndDate	DATE	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
26	IPE	DepositMethodOfPayment	MOP	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
27	IPE	DepositCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
28	IPE	DepositVATSalesTax	VAT	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 2	null or value
29	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-----
30	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	Value
31	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----
32	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
33	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
34	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
35	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----
36	VH	VGLength	HEX	Always	determined upon IPE creation	1	0	-----
37	VH	VGBitMap	BMP	Always	Set to value in embodiment spec or determined upon IPE creation	1 or 2	0 or 1	Null or value
38	VH	VGFormatRevision	HEX	Always	set to value in embodiment spec	2	1	9
39	V	TransactionType	HEX	Always	Set to value in embodiment spec or set to value determined upon creation or set to zero (0)	1 or 2 or 4	0 or 1	Null or value
40	V	TransactionSequence Number	TS#	Always	Set to value in embodiment spec or set to value determined upon creation or set to zero (0)	1 or 2 or 4	0 or 2	Null or value
41	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-----
42	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-----

43	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-----
44	V	CountOfTransactions	HEX	Always	Set to value in embodiment spec or set to value determined upon creation or set to zero (0)	1 or 2 or 4	0 or 1	Null or value
45	V	RFU	RFU	Always	set to zero (0)	4	0	-----
46	V	LastResetDate	DATE	Always	set to current date and time	6	0	-----
47	V	ValueCurrencyCode	VALC	Always	*set to value in embodiment spec or set to value determined upon IPE creation	1 or 2	0 or 1	null or value
48	V	TYP5ValueFlags - 0	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
49	V	TYP5ValueFlags - IPEPriorityOverride	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
50	V	TYP5ValueFlags - 2	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
51	V	TYP5ValueFlags - 3	FLAG	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
52	V	RFU	RFU	Always	set to zero (0)	4	0	-----
53	V	CountJourneyLegs	HEX	Always	set to zero (0)	4	0	-----
54	VXH	VGXLength	HEX	Always	determined upon IPE creation	1	0	-----
55	VXH	VGXRef (Bit9; Bit8)	BMP	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	Value
56	VXH	VGXRef (Bit7 – Bit0)	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	Value
57	VX	CapStrategyCode	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	Value
58	VX	CapAccumulator1Rule	HEX	Always	set to zero (0)	4	0	-----
59	VX	LastFarePaid1	HEX	Always	set to zero (0)	4	0	-----
60	VX	LastFarePaid1TransactionType	HEX	Always	set to zero (0)	4	0	-----
61	VX	UncappedAccumulator1	VALI	Always	set to zero (0)	4	0	-----
62	VX	DayCapAccumulator1	VALI	Always	set to zero (0)	4	0	-----
63	VX	MultidayCapAccumulator1	VALI	Always	set to zero (0)	4	0	-----
64	VX	Cap1DayCount	HEX	Always	set to zero (0)	4	0	-----

65	VX	CapAccumulator2Rule	HEX	Always	set to zero (0)	4	0	-----
66	VX	LastFarePaid2	HEX	Always	set to zero (0)	4	0	-----
67	VX	LastFarePaid2TransactionType	HEX	Always	set to zero (0)	4	0	-----
68	VX	UncappedAccumulator2	VALI	Always	set to zero (0)	4	0	-----
69	VX	DayCapAccumulator2	VALI	Always	set to zero (0)	4	0	-----
70	VX	MultidayCapAccumulator2	VALI	Always	set to zero (0)	4	0	-----
71	VX	Cap2DayCount	HEX	Always	set to zero (0)	4	0	-----
72	VX	CapAccumulator3Rule	HEX	Always	set to zero (0)	4	0	-----
73	VX	LastFarePaid3	HEX	Always	set to zero (0)	4	0	-----
74	VX	LastFarePaid3TransactionType	HEX	Always	set to zero (0)	4	0	-----
75	VX	UncappedAccumulator3	VALI	Always	set to zero (0)	4	0	-----
76	VX	DayCapAccumulator3	VALI	Always	set to zero (0)	4	0	-----
77	VX	MultidayCapAccumulator3	VALI	Always	set to zero (0)	4	0	-----
78	VX	Cap3DayCount	HEX	Always	set to zero (0)	4	0	-----
79	VX	CapAccumulator4Rule	HEX	Always	set to zero (0)	4	0	-----
80	VX	LastFarePaid4	HEX	Always	set to zero (0)	4	0	-----
81	VX	LastFarePaid4TransactionType	HEX	Always	set to zero (0)	4	0	-----
82	VX	UncappedAccumulator4	VALI	Always	set to zero (0)	4	0	-----
83	VX	DayCapAccumulator4	VALI	Always	set to zero (0)	4	0	-----
84	VX	MultidayCapAccumulator4	VALI	Always	set to zero (0)	4	0	-----
85	VX	Cap4DayCount	HEX	Always	set to zero (0)	4	0	-----
86	VX	Location	LOC1	Always	set to value in embodiment spec	2	Variable 17 max	See note below
87	VX	Location1	LOC1	Always	set to value in embodiment spec	2	Variable 17 max	See note below
88	VX	DateTimeStamp1	DTS	Always	set to zero (0)	4	0	-----
89	VX	Location2	LOC1	Always	set to value in embodiment spec	2	Variable 17 max	See note below
90	VX	DateTimeStamp2	DTS	Always	set to zero (0)	4	0	-----
91	VX	Location3	LOC1	Always	set to value in embodiment spec	2	Variable 17 max	See note below
92	VX	DateTimeStamp3	DTS	Always	set to zero (0)	4	0	-----
93	VX	Location4	LOC1	Always	set to value in embodiment spec	2	Variable 17 max	See note below
94	VX	DateTimeStamp4	DTS	Always	set to zero (0)	4	0	-----
95	VX	VGX_Padding	PAD	If Required	set to zero (0)	4	0	-----
96	V	Padding	PAD	If Required	set to zero (0)	4	0	-----
97	INS	KID	HEX	Always	determined upon IPE creation	1	0	-----

98	INS	INP#	HEX	Always	set to zero (0)	4	0	-----
99	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-----
100	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-----
101	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-----

Because the size of VGX data groups may be difficult to increase after creation of the data group, it is recommended that the IPE be created with the Location, Location1, Location2, Location3 and Location4 elements of such a size as to be sufficient for any location information which may subsequently be stored in those elements. At creation, the NULL location code should be stored, LocDefType 255. If for example, 8 data bytes should be reserved for these elements, then the list data would be encoded as 0xFF080000000000000000.

9. HOPS to POST, POST to HOPS and HOPS to HOPS messages, Miscellaneous Messages, Code 08xx.

9.1. Message Codes 08xx.

Table 146 - Miscellaneous Messages

Group	Table Type	HEX CODE	Hashed Message?
Miscellaneous Messages	Embodiment Parameter Request Message	0800	No
	Supplementary Data Message (Hash/Mac)	0801	Yes
	CM or Shell status advisory message	0802	No
	POST Information Notification	0803	No
	Customer Media Holder Details request	0804	Yes
	Customer Media Holder Details response	0805	Yes
	IPE Fulfilment Action notification	0806	Yes
	Additional Shell Data	0807	No
	Embodiment Parameter Request Message	0808	No
	POST SET notification message	0809	No
	ISAM Parameter Table Request Message	080A	No
	ISAM Parameter Table Response Message (Hash/Mac)	080B	Yes
	Product Status Advisory Message	080C	No
	Hotlist Removal Request	080D	No
	Actionlist Removal Request	080E	No
	Response to a Data Frame Not Received Advisory Message	080F	Yes
	Transaction with Customer Media apparently successful but the POST was unable to confirm this	0810	Yes
	RFU	0811 – 08FF	----

Note 1: Data in messages shown shaded in Table 146 are coded using ASN.1 notation.

9.2. Embodiment Parameter Request Message, code 0800.

The message is sent from one HOPS to another HOPS when the first wishes to create IPEs owned by the second. For example, the first HOPS would typically be a Product Retailer and the second a Product Owner. The Embodiment Parameter Message is returned and passed on the POSTs.

Note that the IPE creating POST must also have access to the relevant keys and ISAM configuration data, methods for acquiring these are defined in ITSO TS 1000-4, ITSO TS 1000-7 and ITSO TS 1000-8.

The values in the request message shall identify the owner and IPE Embodiment that the requesting HOPS owner wishes to create instances of.

A HOPS may also send other POST Configuration Data messages in addition to the Embodiment Parameters, where the Product Owner wishes to do this, for the purposes of fully configuring POSTs to create IPE Instances. This message is provided for backwards compatibility only, new implementations shall not use it.

Table 147 - Embodiment Parameter Request Message, code 0800

Name	Format	Size	Comment
0800_IPEOwnerIIN	IIN	3	IIN Pertinent to the Owner of the target IPE
0800_IPEOwnerOID	OID	2	Target IPE Owner Identity
0800_TYP	TYP	1	Target IPE TYP
0800_PTYP	PTYP	1	Target IPE PTYP

9.3. Supplementary Data Message (Hash/Mac), code 0801

Implementation of the 0801 message is optional in POSTs.

Supplementary data messages are created by a POST and transmitted to a HOPS.

Supplementary data messages are always subservient to another message, known as the primary message. This primary message is identified by including the message code, signing ISAM ID and signing ISAM sequence number appropriate to the primary message within the supplementary data message.

Table 148 – Supplementary Data Message, code 0801 – RecordFormatRevision = 1.

Name	Source	Format	Size	Comment
PrimaryMessageMessageCode	POST	HEX	2	Used to match this message to the relevant primary message
PrimaryMessageSealerID	POST	HEX	7	Used to match this message to the relevant primary message (the value is found in the DF Trailer)
PrimaryMessageSeq#	POST	HEX	3	Used to match this message to the relevant primary message (the value is found in the DF Trailer)
DataArea	POST	Variable	Variable	One or more elements encoded according to asn.1 using basic encoding rules. Allowable data elements and associated tag values are defined in Annex A.

Table 149 - 0801 message DataArea structure

Elements shall be included in the DataArea in the order shown in this table.

All characters are an ASCII representation of hexadecimal values. Note that when ASCII characters are stored, then the hexadecimal value of each ASCII code shall be stored. For example, the string “A123” shall be stored as 41 31 32 33 (HEX).

Tag name	Tag value	Length	Description
ITSO root	0xE0	Calculated – the length of the DataArea, excluding the length of the ITSO root tag and this length element	
ITSO data group	<i>Tag value</i>	Calculated – the length of the elements in this group, excluding the length of this tag and this length element	There may be none or one ITSO defined data groups in the message
ITSO defined-sub group (s)	<i>Tag value</i>	Calculated – the length of the elements in this group, excluding the length of this tag and this length element	There may be none, one or more than one ITSO defined sub-groups in the message
ITSO defined element (s)	<i>Tag value</i>	Calculated	There may be one or more than one ITSO defined elements in the sub-group
Private data group (s)	<i>Tag value</i>	Calculated – the length of the elements in this group, excluding the length of this tag and this length element	There may be none, one or more than one user defined sub-groups in the message
ITSO OID	<i>Tag value</i>	Calculated	Where a Private Data Group(s) is included the OID of the entity responsible for the message shall be recorded here
User defined element (s)	<i>Tag value</i>	Calculated	Where a Private Data Group(s) is included the user defined data, identified by the OID of the originator included in the user defined sub-group data shall be recorded here

9.4 CM or Shell status advisory message, code 0802

When a Shell Owner is aware that a CM or a Shell has been blocked, destroyed or is otherwise unavailable, this advisory message shall be sent to all Product Owners who are recorded in the ISA as having current loaded products in the affected Shell.

When this message is received by a HOPS, the HOPS shall change the relevant IPA Status to “Host Unavailable”.

Table 150 – CM or Shell status advisory message, code 0802 – RecordFormatRevision = 1.

Name	Source	Format	Size	Comment
ITSOShellReferenceNumberNonEncrypted	HOPS	uISRN	16	Not encrypted. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
0802ReasonCode	HOPS	HEX	1	Refer to table 151 below. May be set to zero (0) when reason codes are not sent.

Table 151 - 0802ReasonCode code list

Code value	0802ReasonCode	
0	This code value shall not be used	
1	CM destroyed (i.e. physically destroyed and cannot be resurrected)	
2	CM returned and faulty	
3	CM blocked	
4	Shell deleted from CM	
5	Shell blocked	
6	Other reason	
7	Shell has been placed on a Hotlist	
8 - 255	RFU	

9.5 POST Information Notification, code 0803

Implementation of the code 0803 message is mandatory in POSTs and HOPS. The message shall be created by a POST and transmitted to a HOPS.

The current Format Revision 1 is now superseded by Format Revision 2 of this message which shall be used in all new and updated POST designs. To maintain interoperability HOPS shall support all Format Revisions until earlier versions are no longer in use by POSTs.

Tables 152 and 153 define the structure and content of the versions of this message.

Table 152 - POST Information Notification, code 0803 (RecordFormatRevision = 1)

Format Revision 1 is deprecated and shall be removed from the next version of the Specification

Name	Format	Size (bytes)	Comment
0803_RecordFormatRevision	Hex	1	Defines the format revision of this message. For messages formatted according to this version of the specification this value shall be set to 1 (one).
0803_POSTIdentifier	ASCII	MS 6	The POST Manufacturer ID shall be a unique reference Issued by the ITSO Registrar
	ASCII	LS 6	POST Manufacturer hardware identifier / serial number (guaranteed unique by the POST manufacturer)
0803_ServiceOperatorOID	OID16	2	Service operator OID
0803_ServiceOperator	UD	4	User defined service operator identifier
0803_TypeofPOST	UD	30	User defined description of the type of POST
0803_FixtureIdentifier	UD	16	User defined The identification code of the fixture to which the POST is currently attached, shall be set to all 0's where no FixtureIdentifier is available
0803_PreviousISAMIRN	BCD	9	IRN of the ISAM that was previously installed in the POST device, shall be set to all 0's if no ISAM previously installed
0803_NewISAMIRN	BCD	9	IRN of the ISAM that has just been or currently is installed in the POST device.
0803_TimeZone	ASCII	5	The current time zone of the POST device in the format: <sign><offset from UTC> i.e. "-1000"; "+0000", "+1230" Where the offset consists of two digits for the number of hours and two digits for the number of minutes (HHMM). NB: This is not necessarily the time zone the POST is currently being used in and does not necessarily enable transaction versus time zone reconciliation
0803_ListStorageSpace	HEX	3	The combined amount of storage space available for Hotlist, Actionlist and PCD items.
0803_HotlistStorage	HEX	3	The amount of space (in Kbytes) available on the POST device to store Hotlist items. Set to all zeros if no separate area is defined.
0803_ActionlistStorage	HEX	3	The amount of space (in Kbytes) available on the POST device to store Actionlist items. Set to all zeros if no separate area is defined.
0803_PCDListStorage	HEX	3	The amount of space (in Kbytes) available on the POST device to store POST Configuration Data items. Set to all zeros if no separate area is defined
0803_MaximumITSOMessageSize	HEX	3	Maximum size of ITSO messages (in native format) that this POST can accommodate (in Kbytes).
0803_InfoFlags	BMP	1	Shall be a bitmapped field, encoded as follows: Bit 0 shall be set to one if the POST acts as a server for POST/HOPS messaging if not then set to 0. Bit 1 shall be set to one if the POST uses the full XML tag set if it uses the reduced tag set then set to 0.

			Bit 2 shall be set to one if the POST uses the ISAM for list storage Bits 3-7 shall be RFU
--	--	--	---

Table 153 - POST Information Notification, code 0803 - RecordFormatRevision = 2

Name	Format	Size (bytes)	Comment
0803_RecordFormatRevision	Hex	1	Defines the format revision of this message. For messages formatted according to this version of the specification this value shall be set to 2.
0803_POSTIdentifier	ASCII	MS 6	The POST Manufacturer ID shall be a unique reference Issued by the ITSO Registrar
	ASCII	LS 6	POST Manufacturer hardware identifier / serial number (guaranteed unique by the POST manufacturer)
0803_ServiceOperatorOID	OID16	2	Service operator OID
0803_ServiceOperator	UD	4	User defined service operator identifier
0803_TypeofPOST	UD	30	User defined description of the type of POST
0803_FixtureIdentifier	UD	16	User defined The identification code of the fixture to which the POST is currently attached, shall be set to all 0's where no FixtureIdentifier is available
0803_PreviousISAMIRN	BCD	9	IRN of the ISAM that was previously installed in the POST device, shall be set to all 0's if no ISAM previously installed
0803_NewISAMIRN	BCD	9	IRN of the ISAM that has just been or currently is installed in the POST device
0803_TimeZone	ASCII	5	The current time zone of the POST device in the format: <sign><offset from UTC> i.e. "-1000"; "+0000", "+1230" Where the offset consists of two digits for the number of hours and two digits for the number of minutes (HHMM). NB: This is not necessarily the time zone the POST is currently being used in and does not necessarily enable transaction versus time zone reconciliation
0803_ListStorageSpace	HEX	3	The combined amount of storage space available for Hotlist, Actionlist and PCD items, set to all zeros (0) when separate storage areas for these items are defined.
0803_HotlistStorage	HEX	3	The amount of space (in Kbytes) available on the POST device to store Hotlist items. Set to all zeros if no separate storage area for Hotlists is defined.
0803_ActionlistStorage	HEX	3	The amount of space (in Kbytes) available on the POST device to store Actionlist items. Set to all zeros if no separate storage area for Actionlists is defined.
0803_PCDListStorage	HEX	3	The amount of space (in Kbytes) available on the POST device to store post configuration data items. Set to all zeros if no separate storage area for PCD lists is defined.
0803_HotlistSetID	SETID	7	POST-SET Identifier the POST is currently allocated to for Hotlist purposes. Set to zeros if the POST is not part of a POST-SET.
0803_ActionlistSetID	SETID	7	POST-SET Identifier the POST is currently allocated to for Actionlist purposes. Set to zeros if the POST is not part of a POST-SET.
0803_PCDSetID	SETID	7	POST-SET Identifier the POST is currently allocated to for Post Configuration Data purposes. Set to zeros if the POST is not

			part of a POST-SET.
0803_Manifest_Description	ASCII	20	A text string assigned by the HOPS to identify the PCD currently installed in this POST. This Data Element shall be formatted as up to 20 ASCII characters left justified and padded with spaces if necessary. If the 0803_Manifest_description is not known then the POST shall return all nulls for this Data Element.
0803_Manifest_DTS	DTS	3	A DTS assigned by the HOPS used to identify the date of creation of the PCD described in the 0803_Manifest_Description. If the 0803_Manifest_DTS is not known then the POST shall return all Zeros for this Data Element.
0803_MaximumITSOMessageSize	HEX	3	Maximum size of an ITSO Transaction message (in native format) that this POST can accommodate (in Kbytes). Artificially limiting the size of messages will affect operation, and this limit shall be set as high as reasonably possible. If there is no limit then set the size to 0FFFFFFF.
0803_InfoFlags	BMP	1	Shall be a bitmapped field, encoded as follows: Bit 0 shall be set to one if the POST acts as a server for POST/HOPS messaging if not then set to 0. Bit 1 shall be set to one if the POST uses the full XML tagset if it uses the reduced tagset then set to 0. Bit 2 shall be set to one if the POST uses the ISAM for storage Bit 3 shall be set to 1 if the POST does not support the sending of standalone messaging. Bit 4 shall be set to 1 to indicate that the POST shall ignore any DOCTYPE element in a received message and use its own stored version of the relevant DTD. Bits 5-7 shall be RFU by ITSO and shall be set to 0.

Note 1: Normally the POST would set the destination of the code 0803 message to that of the AMS HOPS for the ISAM in question. However if this information is unavailable at the particular POST the ISAM is placed in it shall set the destination of the code 0803 message to the OID of its own physical ISAMID (i.e. the ISAM's owner).

Note 2: SETID found in table 153 is as defined as the concatenation of IIN, OID and SET as found for Recipient_Type = 0x02 in Table 3a of TS1000-9.

Note 3: The shaded area in tables 152 and 153 denote the POST's memory utilisation for list storage. It is recognised that POSTs may have a fixed allocation for each type of list or dynamically allocate available memory among all or some lists as appropriate to usage.

The ListStorageSpace element is known to the POST and shall always be specified.

The proportion of the ListStorageSpace allocated for each type of list may also be fixed and if so shall be specified.

The proportion of space allocated for any of the list types specified may also be determined by the first line HOPS, in this case its associated amount of space indication shall be set to 0FFFFFFF.

Note 4: Bit 2 of the 0803_Info_Flags Data Element shall be used to indicate to a HOPS that the POST is storing POST application data in the ISAM as follows:

For any given POST the flag shall be set to zero (0) indicating that the POST application does not use the ISAM for any form of Data storage. Zero (0) is the recommended default setting for this flag. The flag shall be set to one (1) when the ISAM is used for POST application data storage in a file created by agreement with the AMS HOPS managing that POST.

9.6 Customer Media Holder Details request, code 0804

Implementation of this message is required where a HOPS supports a Virtual Store and provides, verification of certain customer details where possible and the ability to create Detached IPEs (see also the associated response returned to the requesting HOPS in clause 9.7).

This request shall be used to enable the Requesting HOPS to verify the customer details when first registering a customer.

The same request shall also be used to elicit additional data required when continuing to support the customer.

Each Customer Media Holder Details request in the message is targeted at single instance of a Customer Media.

Normally this request would be made to a Shell owner HOPS. The request is formed in such a way that the requestor supplies as many details given to it or already known and expects responses that confirm or otherwise the efficacy of the details revealed.

The CustomerMediaHolder_Details_Req is defined in Table 154. The message is made up of constructed and primitive Data Objects (CDOs and PDOs) in accordance with ASN.1 the tags and syntax, for which are defined in Annex A.

Table 154 shows:

- Primitive Data Objects in plain text
- Constructed Data Objects in bold
- Objects that are optional as shaded
- Objects that may be repeated more than once in italics
- The *'s prefixing the DO names indicate the nesting level of the DO

Note: A mandatory Primitive Data Object will not be present if it is contained in an optional Constructed Data Object that is not present.

Table 154 - Customer Media Holder Details request, Code 0804

ASN.1 Constructed DO names ASN.1 Primitive DO names	Data Type	Description
ITSO_Root_Group		
*ITSO_Data_Group		
**CustomerMediaHolder_Details_Req		<i>One or more CDOs containing a complete Customer Media Holder Details request</i>
***Source_Reference		A single mandatory CDO forming a unique reference for this CustomerMediaHolder_Details_Req
****ISAMID	HEX	A single mandatory PDO containing the ISAMID of the H/ISAM used in the creation of this CustomerMediaHolder_Details_Req
****Ref#	HEX	A single mandatory PDO containing a 4 Byte binary integer. Added by the source to uniquely identify this CustomerMediaHolder_Details_Req. This shall be incremented by 1 for every different CustomerMediaHolder_Details_Req generated. Rollover is not permitted for the same value of H/ISAMID
***Request_Purpose	HEX	A single mandatory PDO containing the description of the purpose of this request. A single byte binary integer coded in accordance with Table 155
***Media_Number	ASCII	A single optional PDO containing the media reference number given by the customer or by the HOPS on behalf of the customer. NB: it is recommended that any IIN and Luhn check digits present are verified before this value is populated The media reference number represented as a text string in ASCII MS Character first. Users of this data element shall take note of the requirements of the

		General Data Protection Regulation (GDPR).
***Shell_Reference	ISRN	A single optional PDO containing the reference of the ITSO Shell (ISRN) given by the customer or by the HOPS on behalf of the customer NB: it is recommended that the IIN, embedded OID and Lühn check digit of this number are verified before this value is populated. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
***DOB	DOB	A single optional PDO containing the date of birth given by the Customer coded according to [EN1545-1] BirthDate. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
***Expiry_Date	BCDN	A single optional PDO containing the (media) expiry date given by the Customer.
***CustomerMediaHolder_Information		An optional CDO containing details of the Customer Media Holder given by the Customer using as many primitive DOs as required selected from those following and as defined elsewhere in this part of TS1000.
****HolderTitle	ASCII	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderSurname	ASCII	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderOtherNames	ASCII	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderPhoneDay	ASCII	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderPhoneHome	ASCII	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderPhoneMobile	ASCII	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderAddress1	ASCII	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderAddress2	ASCII	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderAddress3	ASCII	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderAddress4	ASCII	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderPostCode	ASCII	A single optional PDO

		Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderEmail	ASCII	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****BankName	ASCII	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****BankACNumber	BCDS	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****BankCardExpiryDate	BCDN	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****BankCardStartDate	BCDN	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****BankCardIssueNumber	BCDN	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****Product_Information		A single optional CDO given by the Customer (i.e. CTA, ENCTS.....) and or as requested by the Source of this message containing as many TYP_PTyp Constructed DOs needed for requesting information on a collection of IPEs
***** TYP_PTyp		<i>One or more mandatory CDOs containing TYP and optionally OID, PTyp information. This CDO shall only be used when relating to IPEs of TYP = 2,3,4,5,14, 16 and 17</i>
*****TYP	TYP	A single mandatory PDO containing the TYP code (padded right)
*****IIN_Index	HEX	A single optional PDO containing a reference to the IPE IIN
*****OID	OID16	A single optional PDO containing the OID of the TYP owner
*****PTYP	PTYP	A single optional PDO containing the PTyp code (left padded).
*****IPEFormatRevision	HEX	A single optional PDO containing the IPEFormatRevision code (left padded).

Table 155 - Coding of Request_Purpose PDO

Value	Description
0x01	The request is for initial customer media holder registration
0x02	The request is for additional data
0x03 – 0xFF	All other values RFU

9.7 Customer Media Holder Details response, Code 0805

Implementation of this message is required where a HOPS or a POST responds to the code 0804 Customer Media Holder Details request.

The CustomerMediaholder_Details_Response is defined in Table 156. The message is made up of constructed and primitive Data Objects (CDOs and PDOs) in accordance with ASN.1 the tags and syntax, for which are defined in Annex A.

Table 156 shows:

- Primitive Data Objects in plain text
- Constructed Data Objects in bold
- Objects that are optional as shaded
- Objects that may be repeated more than once in italics

The *'s prefixing the DO names indicate the nesting level of the DO

Table 156 - Customer Media Holder Details response, Code 0805

ASN.1 Constructed DO names Primitive DO names	Data Type	Description
ITSO_Root_Group		
*ITSO_Data_Group		
**CustomerMediaHolder_Details_Response		<i>One or more CDOs containing the complete Customer Media Holder details response</i>
***Source_Reference		A single mandatory CDO containing a copy of the Source_Reference from the CustomerMediaHolder_Details_Req
****ISAMID	HEX	A single mandatory PDO Copied from the CustomerMediaHolder_Details_Req
****Ref#	HEX	A single mandatory PDO Copied from the CustomerMediaHolder_Details_Req
***Conditions	HEX	One or more mandatory PDOs containing the conditions applicable to this response. A single byte binary integer coded in accordance with Table 155
***Shell_Reference_Reply	HEX	A single optional PDO containing the entire contents of the ITSO Shell Environment Data Group Dataset relating to the Shell reference present in the request. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
***MID	HEX	A single optional PDO containing the MID relating to the CM carrying the Shell reference present in the request. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
***Directory_Data_Group	HEX	A single optional PDO containing the entire contents of the ITSO Directory Data Group Dataset relating to the Shell reference present in the request. All Data Elements indicating the OID of the IPE owner shall be set to null (all zeros).
***Estimated_Space	HEX	A single optional CDO only present where the responder is aware of one or more outstanding IPE Fulfilment Actions that have not yet been executed on this Shell and thus not covered by the contents of the

		Directory_Data_Group PDO.
****Num_Sectors	HEX	A single mandatory PDO containing the estimated number of vacant sectors remaining empty in the Shell assuming all outstanding IPE Fulfilment Actions have taken place. Coded as a single byte binary integer
****Num_DIR_Entries	HEX	A single mandatory PDO containing the estimated number of vacant Directory Entries remaining unused in the Shell assuming all outstanding IPE Fulfilment Actions have taken place. Coded as a single byte binary integer
***DOB_Reply	HEX	A single optional PDO containing confirmation of the DOB present in the request. A single byte binary integer coded as follows: Value 0x01 = request confirmed accurate Value 0x02 = request not accurate All other values RFU Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
***Expiry_Date_Reply	HEX	A single optional PDO containing the confirmation of the expiry date present in the request. A single byte binary integer coded as follows: Value 0x01 = request confirmed accurate Value 0x02 = request not accurate All other values RFU
*** CustomerMediaHolder_Information_Reply		A single optional CDO which is a list of single byte responses to each element present in the CustomerMediaHolder_Information CDO found in the CustomerMediaHolder_Details_Req All PDOs in this CDO are a single byte binary integer coded as follows: Value 0x01 = Element content confirmed accurate Value 0x02 = Element content not accurate Value 0x03 = Response denied Value 0x04 = Content cannot be confirmed All other values RFU
****HolderTitleReply	HEX	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderSurnameReply	HEX	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderOtherNamesReply	HEX	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderPhoneDayReply	HEX	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderPhoneHomeReply	HEX	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderPhoneMobileReply	HEX	A single optional PDO Users of this data element shall take note of the requirements of the

		General Data Protection Regulation (GDPR).
****HolderAddress1Reply	HEX	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderAddress2Reply	HEX	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderAddress3Reply	HEX	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderAddress4Reply	HEX	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderPostCodeReply	HEX	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****HolderEmailReply	HEX	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****BankNameReply	HEX	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****BankACNumberReply	HEX	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****BankCardExpiryDateReply	HEX	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****BankCardStartDateReply	HEX	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
****BankCardIssueNumberReply	HEX	A single optional PDO Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
*** Product_Information_reply		<i>One or more CDOs responding with details of any prequalification IPEs present in the CustomerMediaHolder_Information_Req</i>
****Label	HEX	A single mandatory PDO containing the IPE label (i.e. DIR entry)
****IIN_Index	HEX	A single mandatory PDO containing the cross reference to the IPE IIN
****IPE_InstanceID	HEX	A single mandatory PDO containing the IPE instanceID

Table 157 - Coding of Conditions PDO

Value	Description
0x00	Processed successfully
0x01	No Media reference identified
0x02	No Shell reference indentified
0x03	This CM is expired
0x04	This Shell is expired
0x05	This CM is blocked
0x06	This Shell is blocked
0x07	This CM is hotlisted
0x08	This Shell is hotlisted
0x09	Response denied
0x0A	No Media or Shell references present in the request
0x0B	Media and Shell references conflict
0x0C	Media reference no longer valid
0x0D	Shell reference no longer valid
0x0E – 0xFF	All other values RFU

9.8 IPE Fulfilment Action Notification, code 0806

This notification shall be sent from the HOPS sourcing an IPE_Fulfilment_Action to the HOPS of any Shell owners and Product owners that will be affected by the successful execution of an IPE_Fulfilment_Action.

The Data Content of the Code 0806 message shall be identical to that defined for the IPE_Fulfilment_Action (see Table 96a).

This message shall be sent concurrently with the sending of the Code 0C03, Optional IPE_Fulfilment_Action.

9.9 Additional Shell Data, code 0807

This notification may optionally, by arrangement with a retailing HOPS and as a precursor to offering remote fulfilment, be sent by a POST to that HOPS. The message contains only data that may be freely determined by any CM reader but has, in this case, been captured from CM presented at a POST.

The Additional_Shell_Data is defined in Table 158. The message is made up of constructed and primitive Data Objects (CDOs and PDOs) in accordance with ASN.1 the tags and syntax, for which are defined in Annex A.

Table 158 shows:

- Primitive Data Objects in plain text
- Constructed Data Objects in bold
- Objects that are optional as shaded
- Objects that may be repeated more than once in italics
- The *'s prefixing the DO names indicate the nesting level of the DO

Table 158 - Additional Shell Data, Code 0807

ASN.1 Constructed DO names ASN.1 Primitive DO names	Data Type	Description
ITSO_Root_Group		
*ITSO_Data_Group		
** <i>Additional_Shell_Data</i>		<i>One or more CDOs containing the additional Shell data required for Detached IPE creation.</i>
***Shell_Reference_Reply	HEX	A mandatory PDO containing the entire contents of the ITSO Shell Environment Data Group Dataset or Compact ITSO Shell Environment Dataset read from the presented ITSO Shell. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
***MID	HEX	A mandatory PDO containing the MID relating to the Shell_Reference_Reply Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
***Media_Reference_Number	MCRN	An optional PDO containing the Identity number of a host Customer Media (MCRN) relating to the Shell_Reference_Reply. Note: This DO is only not required if there is no host CM or this number is present in the ITSO Shell Environment Data Group Dataset. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).
***Directory_Data_Group	HEX	A mandatory PDO containing the entire contents of the ITSO Directory Data Group relating to the Shell_Reference_Reply.
***Anti_Tear_Type	HEX	A mandatory PDO indicating the type of anti-tear protection used. A single byte binary integer coded as follows: 0x01 Software anti-tear is used 0x02 Hardware anti-tear is used 0x03 No anti-tear, OTP areas may be used All other values RFU

9.10 Embodiment Parameter Request Message, code 0808 - RecordFormatRevision = 2

This message is sent from one HOPS to another HOPS when the Licensee operating the first HOPS wishes to create IPEs of a type owned by the Licensee operating the second HOPS. For example, the first HOPS would typically be a Product Retailer and the second a Product Owner. The Embodiment Parameter Message is returned and passed on to the POSTs.

Note that the IPE creating POST must also have access to the relevant keys and ISAM configuration data. Methods for acquiring these are defined in ITSO TS 1000-4, ITSO TS 1000-7 and ITSO TS 1000-8.

The values in the request message shall identify the owner and IPE Embodiment that the requesting HOPS owner wishes to create instances of.

A HOPS may also send other POST Configuration Data messages in addition to the Embodiment Parameters, where the Product Owner wishes to do this, for the purposes of fully configuring POSTs to create IPE Instances.

Table 159 - Embodiment Parameter Request Message, code 0808 - RecordFormatRevision = 2

Name	Format	Size	Comment
0808_FormatRevision	HEX	1	Defines format revision of this message. For messages formatted according to this version of the specification this value shall be set to 2 (two).
0808_IPEOwnerIIN	IIN	3	IIN Pertinent to the Owner of the target IPE
0808_IPEOwnerOID	OID	2	Target IPE Owner Identity
0808_TYP	TYP	1	Target IPE TYP
0808_PTYP	PTYP	1	Target IPE PTYP
0808_IPEFormatRevision	HEX	1	Target IPE format revision where values between 0 and 0x0F indicate that a specific format revision requested, a value of 0xFF indicates that the latest available revision is requested, and values between 0x10 and 0xFE are RFU.

9.11 POST SET Notification Message, code 0809

Where a HOPS controls the POST SET to which a POST is allocated, the following message may be utilised to tell the POST the identity of the POST SET and the dates between which the POST SET is in effect.

This message shall be addressed to the ISAMID of individual POSTs.

The implementation of this message is optional in both HOPS and POST.

Table 160 - POST SET notification, Code 0809 - RecordFormatRevision = 1

Name	Format	Size (bytes)	Comment
RecordFormatRevision	Hex	1	Defines the format revision of this message. For messages formatted according to this version of the specification this value shall be set to 1 (one).
StartDateTime	DTS	3	The date / time after which the POST SET becomes applicable.
EndDateTime	DTS	3	The date / time after which the POST SET ceases to apply.
DateTimeStamp	DTS	3	The date / time of creation of this notification message.
SetTypeFlags	BMP	1	Shall be a bitmapped field, encoded as follows: Bit 0 shall be set to 1 if this POST SET is defined for Post Configuration Data messages by the HOPS Bit 1 shall be set to 1 if this POST SET is defined for Hotlist messages by the HOPS Bit 2 shall be set to 1 if this POST SET is defined for Actionlist messages by the HOPS Bits 3-7 shall be RFU by ITSO and shall be set to 0.
SetID	SETID	7	POST SET Identifier allocated by the HOPS. A value of zero indicates that the POST is not allocated to any POST SET for the uses indicated by the SetTypeFlags.

Note: SETID in Table 160 is the concatenation of IIN, OID and SET (as defined for Recipient_Type = 0x02 in TS1000-9).

9.12 ISAM Parameter Table Request Message, code 080A - RecordFormatRevision = 1

This message is sent by a First Line HOPS to a POST, to request that the POST read and return to the HOPS (using a 080B message), one or more ISAM parameter files.

The POST response (080B) is defined in Table 162.

The message is made up of constructed and primitive Data Objects (CDOs and PDOs) in accordance with ASN.1 the tags and syntax, which are defined in Annex A.

Table 161 shows:

- Primitive Data Objects in plain text
- Constructed Data Objects in bold
- Objects that are optional as shaded
- Objects that may be repeated more than once in italics.

The *'s prefixing the DO names indicate the nesting level of the DO.

Table 161 ISAM Parameter Table Request Message, code 080A – RecordFormatRevision = 1

Name	Format	Size (bytes)	Comment
080A_RecordFormatRevision	HEX	1	Defines the format revision of this message. For messages formatted according to this version of the specification this value shall be set to 1.
ASN.1 Constructed DO names ASN.1 Primitive DO names	DATA TYPE	Tag	Description
ITSO_Root_Group	HEX	E0	
*ITSO_Data_Group	HEX	E1	
**Request_Reference	HEX	DF64	A single mandatory PDO containing a unique 12 byte HEX reference (to be left padded with zeroes as required). The Response Message shall include this reference.
** Read_File_Request	HEX	FC	One or more mandatory CDOs containing the files to be read. Each CDO shall contain a single type of ISAM file.
***File_DF	HEX	DF58	An optional PDO or a number of optional PDOs containing the DF path to the file to be read. Note that the ISAM Master File (0x3F00) does not need to be included in the request because all ISAM Files reside under this file.
***Short_File_ID	HEX	DF59	An optional PDO containing the Short File ID. Note that at least one instance of this PDO, the Record_File_ID PDO or the Transparent_File_ID PDO shall always be included in the message.
***Record_File_ID	HEX	DF60	An optional PDO containing the EF ID of the Record File to be read. For Files under a DF, the parent DF file ID should be specified using the File_DF tag. Note that at least one instance of this PDO, the Short_File_ID PDO or the Transparent_File_ID PDO shall always be included in the message.
***Transparent_File_ID	HEX	DF61	An optional PDO containing the EF File ID of the transparent file to be read. For Files under a DF, the parent DF file ID

			<i>should be specified using the File_DF tag. Note that at least one instance of this PDO, the Short_File_ID PDO or the Record_File_ID PDO shall always be included in the message.</i>
--	--	--	---

9.13 ISAM Parameter Table Response Message (Hash/Mac), code 080B – RecordFormatRevision = 1

This message is used by a POST to return one or more requested ISAM Parameter Tables, as files, to a First Line HOPS.

The request message (080A) is defined in Table 161.

The message is made up of constructed and primitive Data Objects (CDOs and PDOs) in accordance with ASN.1 the tags and syntax, which are defined in Annex A.

Table 162 shows:

- Primitive Data Objects in plain text;
- Constructed Data Objects in bold;
- Objects that are optional as shaded;
- Objects that may be repeated more than once in italics.

The *'s prefixing the DO names indicate the nesting level of the DO.

Table 162 - ISAM Parameter Table Response Message, code 080B, RecordFormatRevision = 1

Name	Format	Size (bytes)	Comment
080B_RecordFormatRevision	HEX	1	Defines the format revision of this message. For messages formatted according to this version of the specification this value shall be set to 1.
ASN.1 Constructed DO names	DATA TYPE	Tag	Description
ASN.1 Primitive DO names			
ITSO_Root_Group		E0	
*ITSO_Data_Group		E1	
**Request_Reference	HEX	DF64	A single mandatory PDO containing the same unique 12 byte HEX reference included in the associated Request message.
**Read_File_Response		FD	One or more mandatory CDOs containing the file data. Each CDO shall contain a single type of ISAM file.
***File_DF	HEX	DF58	An optional PDO or a number of optional PDOs containing the DF path to the file.
***Short_File_ID	HEX	DF59	An optional PDO containing the Short File ID. Note that at least one instance of this PDO, the Record_File_ID PDO or the Transparent_File_ID PDO shall

			<i>always be included in the message.</i>
***Record_File_ID	HEX	DF60	<i>An optional PDO containing the EF ID of the Record File. Note that at least one instance of this PDO, the Short_File_ID PDO or the Transparent_File_ID PDO shall always be included in the message.</i>
***Transparent_File_ID	HEX	DF61	<i>An optional PDO containing the EF File ID of the transparent file. Note that at least one instance of this PDO, the Short_File_ID PDO or the Record_File_ID PDO shall always be included in the message.</i>
***File_Data	HEX	DF63	<i>Nil or more optional PDOs containing the file or record data. This shall always be present in the response if the requested file contains any data.</i>
***Status	HEX	DF62	A single mandatory PDO containing a status code, see note below.

Note: Status codes used in this message shall be the ISAM response codes received when attempting to read the content of an ISAM file. The status code shall be sent once for every Read_File_Response CDO. In the case where the ISO Read Binary command is being used, and where the data block returned is less than 256 bytes, meaning that the end of the data has been reached, the POST shall return the status code 0x6A83 indicating that there is no more data.

9.14 Product Status Advisory Message, code 080C

When a Product Owner is aware that an IPE, encoded into a different Licensed Member's Shell has been Hotlisted, removed from the Hotlist or Unblocked, this advisory message shall be sent to the relevant Shell Owner (when the Shell Owner's identity is known). This action will enable the Shell Owner to make informed responses to CM Holder queries.

When received by a HOPS, this message triggers a change in ISA Status for the relevant IPE as appropriate.

Table 163 – Product status advisory message, code 080C – RecordFormatRevision = 1.

Name	Format	Size	Comment
080C_FormatRevision	HEX	1	Defines format revision of this message. For messages formatted according to this version of the specification this value shall be set to one (1)
080C_ITSOShellReferenceNumberNonEncrypted	uISRN	16	Not encrypted.
080C_IPE_ISAMID	ISAM ID	4	

080C_IPE_ISAMSequenceNumber	ISAM S#	3	
080C_IPE_INP#	HEX	1	IPE iteration number: A 4 bit number, stored in the least significant bits of this element. The most significant bits of this element shall be set to zero (0).
080C_ReasonCode	HEX	1	Refer to Table 164 below.

Table 164 - 080C ReasonCode code list

Code value	Reason
0	This code value shall not be used
1	IPE is Hotlisted
2	IPE removed from the Hotlist
3 - 255	RFU

9.15 Hotlist Removal Request, code 080D

The following message shall be employed when the transmitting HOPS has old Hotlists which can be removed from the recipient's Active Hotlist, but does not have a new Hotlist to send to the recipients HOPS1. The Receiving HOPS shall remove the Hotlist identified by OID and HotListIdentifier.

Table 165 – Hotlist removal Request, code 080D – RecordFormatRevision = 1.

Name	Format	Size	Comment
080D_FormatRevision	HEX	1	Defines format revision of this message. For messages formatted according to this version of the specification this value shall be set to one (1)
080D_OID	OID16	2	OID whose Hotlist items shall be removed from the Recipients Active Hotlist.
HotListIdentifier	HEX	2	The identifier value included within the list which shall be removed.

9.16 Actionlist Removal Request, code 080E

The following message shall be employed when the transmitting HOPS has old Actionlists which can be removed from the recipient's Active Actionlist, but does not have a new Actionlist to send to the recipients HOPS2. The Receiving HOPS shall remove the Actionlist identified by OID and ActionListIdentifier.

Table 166 - Actionlist Removal Request, code 080E – RecordFormatRevision = 1

Name	Format	Size	Comment
080E_FormatRevision	HEX	1	Defines format revision of this message. For messages formatted according to this version of the specification this value shall be set to one (1)
080E_OID	OID16	2	OID whose Actionlist items shall be removed from the Recipients Active Actionlist.
ActionListIdentifier	HEX	2	The identifier value included within the list which shall be removed.

9.17 Response to a Data Frame Not Received Advisory Message (Hash/Mac), code 080F

This message shall be used as defined in ITSO TS1000-4 Clause 6.2.2.9, “Action taken upon receipt of a Data Frame Not Received Advisory (0913) Message”.

Note that the Data Frame Seq# may have rolled, meaning that there may be more than one Data Frame with the same Seq#. In these circumstances the most recent Data Frame, having the specified Seq# value, shall be retransmitted.

When a range of Data Frames is being sent, the new Data Frames shall be sent in the same order as the list of missing Data Frames received from the other HOPS, i.e. the first new Data Frame shall correspond to the first missing Data Frame in the list, the second to the second, and so on.

When the response message is incorrectly formatted, or cannot be validated, the recipient shall respond with a NAK using an appropriate code as defined in Table 6a.

Table 167 – Response to a Data Frame Not Received Advisory Message

Data Element	Format	Size (bytes)	Comment
RecordFormatRevision	HEX	1	This data element shall be set to a value of one (1)
RequestDataFrameSeq#	HEX	3	The Data Frame sequence number of the request message, included to assist matching of requests and responses in the HOPS.
FirstDataFrameSeq#	HEX	3	Sequence number of the first missing Data Frame. This range shall be contiguous.
LastDataFrameSeq#	HEX	3	Sequence number of the last missing Data Frame. If this message relates to only one Data Frame then this element shall contain the same value as used in FirstDataFrameSeq#
ResponseCodeList	HEX	Variable, Quantity determined by the range of Data Frame sequence numbers defined in this message, Minimum 1	A list of one byte response codes, one per Data Frame, in the same order as the Data Frames in the defined range. The code values defined in Table 168 shall be used:

Table 168 - Response to a Data Frame Not Received Message – Response Code List

Code Value	Meaning
0	This value shall not be used
1	Data Frame resent
2	Original Class 2 message superseded and no longer relevant. This code shall only be used where the missing Data Frame relates to POST Configuration Data, Hotlists or Actionlists.
3	Cannot send a new Data Frame
4	Data Frame already ACKed or NAKed by the recipient.
5 - 256	RFU

9.18 Transaction with Customer Media apparently successful but the POST was unable to confirm this, code 0810

This message shall be sent when a Transaction was conducted which involved writing to the CM, but the success of that write could not be verified. This message shall always be sent to the POST, Shell and IPE owners.

Note: This message code 0810 replaces the existing Exception, Class 1 code 0410 message. The 0410 message code is deprecated in this version of the Specification and will be removed from the next version of the Specification.

Table 169 - Transaction with Customer Media apparently successful but the POST was unable to confirm this, Message Code 0810

Name	Source	Format	Size	Comment
RecordFormatRevision	POST	HEX	1	Defines format revision of this message
TransactionDateTime	POST	DTS	3	Date & time at which the transaction took place, which shall be identical to any DTS recorded in the Shell, IPEs or Transient Ticket store
TransactionInformation	POST	UD	1	User defined element
POSTType	POST	UD	2	Code defining terminal type, allows different result codes for different terminal types, depending upon the terminal's capabilities
ShellImage	POST	HEX	Variable	An image of such data as has been read by the POST, from the media, for purposes of the transaction process to which this message relates. The data will be loaded in the following order: Shell environment Data Group Directory (2 copies where present) IPE and value record data groups (as many as were read) Logs (as many as were read)
IPE_IterationNumber	IPE	INP#	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. If no data is available this element shall be set to 0. Used to identify the last IPE (if any) which was being written to during the Transaction.
IPE_ISAMID	IPE	ISAMID	4	If no data is available this element shall be set to 0. Included for IPE instance identification.

				<p>This value shall be taken from the IPE data group instance information and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.</p> <p>Used to identify the last IPE (if any) which was being written to during the Transaction.</p>
IPE_SAMSequenceNumber	IPE	ISAMS#	3	<p>If data is unavailable, this element shall be set to 0. Included for IPE instance identification</p> <p>This value shall be taken from the IPE data group instance information and identifies the ISAM which was used to create the IPE. The IPE instance data from a value group shall not be used here.</p> <p>Used to identify the last IPE (if any) which was being written to during the Transaction.</p>
ITSOShellReferenceNumberNo nEncrypted	Shell	uISRN	16	<p>Not encrypted. Users of this data element shall take note of the requirements of the General Data Protection Regulation (GDPR).</p>

Annex A - ITSO BER_LTV Data Objects (Normative)

A.1 Introduction

This Annex enumerates the ITSO library of Data Objects encoded in accordance with the Basic Encoding Rules (BER) of ASN.1 (ISO/IEC 8825-1 refers). The Data Objects are a Data Structure consisting of a Tag, a Length and a Value (TLV).

BER - TLV Data Objects may be used in various forms of ITSO messaging as defined in the relevant parts of TS1000 or, where required, in clause A.6 of this document.

A Data Object may be:

- A Primitive Data Object (PDO)
- A Constructed Data Object (CDO)

A CDO may be constructed of a hierarchy of PDOs and CDOs

All ITSO Data Objects are subservient to the ITSO_Data_Group CDO which is in turn subservient to the ITSO_Root_Group CDO.

Figure 1 illustrates an example of the nesting of CDOs and PDOs in this case 4 levels below the ITSO Root Group.

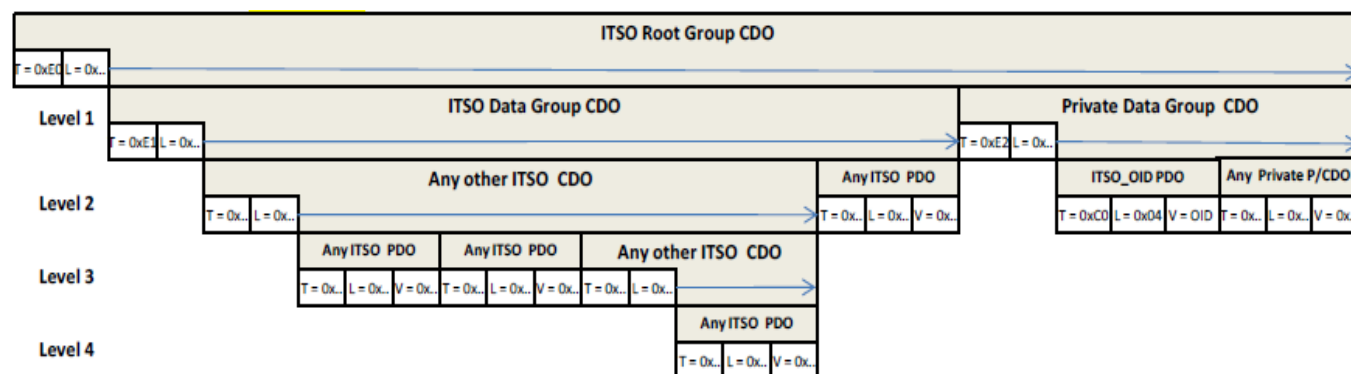


Figure 1 - Example relationship of CDOs and PDOs in a message

The example also shows that a Private Data Group of user defined data may also be present in a message where required by mutual agreement between originator and recipient.

Note: The PDO ITSO_OID shall always be included as the first element in a Private Data Group, for the purpose of identifying the message originator and thereby determining the data format of the Data Group.

A.1.1 BER-LTV data objects

Each BER-TLV data object consists of two or three consecutive fields (see the basic encoding rules of ASN.1 in ISO/IEC 8825-1): a mandatory tag field, a mandatory length field and a conditional value field.

The tag field consists of one or more consecutive bytes.

It indicates a class and an encoding, and it encodes a tag number. The value '00' is invalid for the first byte of tag fields (see ISO/IEC 8825-1).

The length field consists of one or more consecutive bytes. It encodes a length, i.e., a number denoted N.

If N is zero, there is no value field, i.e., the data object is empty. Otherwise (N > 0), the value field consists of N consecutive bytes.

Note: Any optional CDO that is not available would not be included in the Data sent. However, since BER TLV encoding rules allows tags to be specified as Null if they have zero length, it would be good design practice if a recipient ignored any optional DO present having a length of 0x00 in an otherwise correctly formed message.

A.1.2 BER-TLV tag fields

ITSO TS1000 supports tag fields of one, two and three bytes; longer tag fields are reserved for future use.

Bits 8 and 7 of the first byte of the tag field indicate a class.

- The value 00 indicates a data object of the universal class
- The value 01 indicates a data object of the application class
- The value 10 indicates a data object of the context-specific class
- The value 11 indicates a data object of the private class.

ITSO Tag definitions are all members of the private class

Bit 6 of the first byte of the tag field indicates an encoding.

- The value 0 indicates a primitive data object, i.e., the value field is not encoded in BER-TLV
- The value 1 indicates a constructed data object, i.e., the value field is encoded in BER-TLV

If bits 5 to 1 of the first byte of the tag field are not all set to 1, then they encode a tag number from zero to thirty and the tag field consists of a single byte.

Otherwise (bits 5 to 1 all set to 1), the tag field continues on one or more subsequent bytes

- Bit 8 of each subsequent byte shall be set to 1, unless it is the last subsequent byte
- Bits 7 to 1 of the first subsequent byte shall not be all set to 0
- Bits 7 to 1 of the first subsequent byte, followed by bits 7 to 1 of each further subsequent byte, up to and including bits 7 to 1 of the last subsequent byte encode a tag number.

DO Type	TAG_DEC	BER encoding Binary in byte blocks	TAG_HEX
PDO	0	11000000	0xC0
CDO	0	11100000	0xE0
PDO	48	11011111_00110000	0xDF30
CDO	48	11111111_00110000	0xFF30
PDO	128	11011111_10000001_00000000	0xDF8100
CDO	128	11111111_10000001_00000000	0xFF8100

Figure 2: Table x - Examples of Decimal to Hex Tag conversions for CDOs and PDOs

A.1.3 BER-TLV length fields

In short form, the length field consists of a single byte where bit 8 is set to 0 and bits 7 to 1 encode the number of bytes in the value field. One byte can thus encode any number from zero to 127.

In long form, the length field consists of two or more bytes. Bit 8 of the first byte is set to 1 and bits 7 to 1 are not all equal, thus encoding the number of subsequent bytes in the length field. Those subsequent bytes encode the number of bytes in the value field.

TS1000 does not use the “indefinite length” specified by the basic encoding rules of ASN.1.

TS1000 supports length fields of from one to five bytes maximum

	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Length
1 Byte	0x00 to 0x7F					0 to 127
2 Bytes	0x81	0x00 to 0xff				0 to 255
3 Bytes	0x82	0x0000 to 0xFFFF				0 to 65,535
4 Bytes	0x83	0x000000 to 0xFFFFFFFF				0 to 16,777,215
5 Bytes	0x84	0x00000000 to 0xFFFFFFFF				0 to 4,294,967,295

A.2 Tag allocation

A.2.1 General details

This section tabulates the Tags defined by ITSO both in numerical order of the decimal tag value and in alphabetic order of the DO Label used in the Specification.

Tag numbering is given in both decimal and the Hex notation used in BER_TLV objects.

The length of the Value data structure is shown as variable (VAR) where unknown or in Hex where fixed.

The spec ref column shows where, in TS1000 (by Specification part number) or herein (A.3), the Tag and its relationship to any CDOs are defined.

DO Labels suffixed with (*) indicate that the element could contain personal data. Licensed Members wishing to store such data are to ensure that they comply with their responsibilities under the General Data Protection Regulation (GDPR).

A.2.2 CDOs in Numeric order

DO Type	DO Label	TAG_DEC	TAG_HEX	Length	Data Type	Spec ref
CDO	ITSO_Root_Group	0	0xE0	VAR	N/A	Herein
CDO	ITSO_Data_Group	1	0xE1	VAR	N/A	Herein
CDO	Private_Data_Group	2	0xE2	VAR	N/A	Herein
CDO	IPEInstanceHolderInformation (*)	3	0xE3	VAR	N/A	Herein
CDO	BankACDetails (*)	4	0xE4	VAR	N/A	Herein
CDO	ActionListInformation	5	0xE5	VAR	N/A	Herein
CDO	NullData	6	0xE6	0x00	N/A	Herein
CDO	IPE_Fulfilment_Action	7	0xE7	VAR	N/A	P6
CDO	Source_Reference	8	0xE8	0x0C	N/A	P6
CDO	Fulfilment_Window	9	0xE9	VAR	N/A	P6
CDO	Not_Present	10	0xEA	VAR	N/A	P6
CDO	Present	11	0xEB	VAR	N/A	P6
CDO	Delete	12	0xEC	VAR	N/A	P6
CDO	Add	13	0xED	VAR	N/A	P6
CDO	IPE_Delivery_Date_Range	14	0xEE	0x08	N/A	P6
CDO	CustomerMediaHolder_Details_Req	15	0xEF	VAR	N/A	P6
CDO	CustomerMediaHolder_Information (*)	16	0xF0	VAR	N/A	P6
CDO	Product_Information	17	0xF1	VAR	N/A	P6
CDO	TYP_PTyp	18	0xF2	VAR	N/A	P6
CDO	CustomerMediaHolder_Details_Respo	19	0xF3	VAR	N/A	P6

	nse (*)					
CDO	Estimated_Space	20	0xF4	0x08	N/A	P6
CDO	CustomerMediaHolder_Information_Reply (*)	21	0xF5	VAR	N/A	P6
CDO	Product_Information_reply	22	0xF6	0x14	N/A	P6
CDO	Additional_Shell_Data	23	0xF7	VAR	N/A	P6
CDO	ReimbursementData	24	0xF8	VAR	N/A	Herein
CDO	TripData	25	0xF9	VAR	N/A	Herein
CDO	ContractRelatedData	26	0xFA	VAR	N/A	Herein
CDO	POSTTransactionID	27	0xFB	VAR	N/A	Herein
CDO	Read_File_Request	28	0xFC	VAR	N/A	P6 ¹⁶
CDO	Read_File_Response	29	0xFD	VAR	N/A	P6 ¹⁷

A.2.3 CDOs in Alphabetic order

DO Type	DO Label	TAG_DEC	TAG_HEX	Length	Data Type	Spec ref
CDO	ActionListInformation	5	0xE5	VAR	N/A	Herein
CDO	Add	13	0xED	VAR	N/A	P6
CDO	Additional_Shell_Data	23	0xF7	VAR	N/A	P6
CDO	BankACDetails (*)	4	0xE4	VAR	N/A	Herein
CDO	ContractRelatedData	26	0xFA	VAR	N/A	Herein
CDO	CustomerMediaHolder_Details_Req	15	0xEF	VAR	N/A	P6
CDO	CustomerMediaHolder_Details_Response (*)	19	0xF3	VAR	N/A	P6
CDO	CustomerMediaHolder_Information (*)	16	0xF0	VAR	N/A	P6
CDO	CustomerMediaHolder_Information_Reply (*)	21	0xF5	VAR	N/A	P6
CDO	Delete	12	0xEC	VAR	N/A	P6
CDO	Estimated_Space	20	0xF4	0x08	N/A	P6
CDO	Fulfilment_Window	9	0xE9	VAR	N/A	P6
CDO	IPE_Delivery_Date_Range	14	0xEE	0x08	N/A	P6
CDO	IPE_Fulfilment_Action	7	0xE7	VAR	N/A	P6
CDO	IPEInstanceHolderInformation (*)	3	0xE3	VAR	N/A	Herein
CDO	ITSO_Data_Group	1	0xE1	VAR	N/A	Herein
CDO	ITSO_Root_Group	0	0xE0	VAR	N/A	Herein
CDO	Not_Present	10	0xEA	VAR	N/A	P6
CDO	NullData	6	0xE6	0x00	N/A	Herein
CDO	POSTTransactionID	27	0xFB	VAR	N/A	Herein

¹⁶ Will be introduced to the next version of the ITSO Specification by TN0462

¹⁷ Will be introduced to the next version of the ITSO Specification by TN0462

CDO	Present	11	0xEB	VAR	N/A	P6
CDO	Private_Data_Group	2	0xE2	VAR	N/A	Herein
CDO	Product_Information	17	0xF1	VAR	N/A	P6
CDO	Product_Information_reply	22	0xF6	0x14	N/A	P6
CDO	Read_File_Request	28	0xFC	VAR	N/A	P6 ¹⁸
CDO	Read_File_Response	29	0xFD	VAR	N/A	P6 ¹⁹
CDO	ReimbursementData	24	0xF8	VAR	N/A	Herein
CDO	Source_Reference	8	0xE8	0x0C	N/A	P6
CDO	TripData	25	0xF9	VAR	N/A	Herein
CDO	TYP_PTyp	18	0xF2	VAR	N/A	P6

A.2.4 PDOs in Numeric order

DO Type	DO Label	TAG_DEC	TAG_HEX	Length	Data Type	Spec ref
PDO	ITSO_OID	0	0xC0	0x04	OID16	Herein
PDO	HolderTitle (*)	1	0xC1	0x04	ASCII	P6
PDO	HolderSurname (*)	2	0xC2	0x14	ASCII	P6
PDO	HolderOtherNames (*)	3	0xC3	0x1E	ASCII	P6
PDO	HolderPhoneDay (*)	4	0xC4	0x14	ASCII	P6
PDO	HolderPhoneHome (*)	5	0xC5	0x14	ASCII	P6
PDO	HolderPhoneMobile (*)	6	0xC6	0x14	ASCII	P6
PDO	HolderAddress1 (*)	7	0xC7	0x1E	ASCII	P6
PDO	HolderAddress2 (*)	8	0xC8	0x1E	ASCII	P6
PDO	HolderAddress3 (*)	9	0xC9	0x1E	ASCII	P6
PDO	HolderAddress4 (*)	10	0xCA	0x1E	ASCII	P6
PDO	HolderPostCode (*)	11	0xCB	0x0A	ASCII	P6
PDO	HolderEmail (*)	12	0xCC	0x28	ASCII	P6
PDO	BankName (*)	13	0xCD	0x28	ASCII	P6
PDO	BankACNumber (*)	14	0xCE	0x10	BCDS	P6
PDO	BankCardExpiryDate (*)	15	0xCF	0x04	BCDN	P6
PDO	BankCardStartDate (*)	16	0xD0	0x04	BCDN	P6
PDO	BankCardIssueNumber (*)	17	0xD1	0x02	BCDN	P6
PDO	ISAMID	18	0xD2	0x04	HEX	P2
PDO	Ref#	19	0xD3	0x04	HEX	P6
PDO	Start_DTS	20	0xD4	0x03	DTS	P6
PDO	End_DTS	21	0xD5	0x03	DTS	P6
PDO	Fulfilment_#Sectors	22	0xD6	0x01	HEX	P6
PDO	Label	23	0xD7	0x05	HEX	P2

¹⁸ Will be introduced to the next version of the ITSO Specification by TN0462

¹⁹ Will be introduced to the next version of the ITSO Specification by TN0462

PDO	IIN_Index	24	0xD8	0x01	HEX	P6
PDO	IPE_InstanceID	25	0xD9	0x08	HEX	P2
PDO	IPE_Delivery_Date_Start	26	0xDA	0x02	DATE	P6
PDO	IPE_Delivery_Date_End	27	0xDB	0x02	DATE	P6
PDO	IPE_Data_Group	28	0xDC	VAR	HEX	P2
PDO	IPE_Value_Record_Data_GroupA	29	0xDD	VAR	HEX	P2
PDO	IPE_Value_Record_Data_GroupB	30	0xDE	VAR	HEX	P2
PDO	Request_Purpose	31	0xDF1F	0x01	HEX	P6
PDO	Media_Number	32	0xDF20	VAR	ASCII	P6
PDO	Shell_Reference (*)	33	0xDF21	0x09	ISRN	P2
PDO	DOB (*)	34	0xDF22	0x04	DOB	P1
PDO	Expiry_Date	35	0xDF23	0x02	DATE	P1
PDO	TYP	36	0xDF24	0x01	TYP	P2
PDO	OID	37	0xDF25	0x02	OID16	P2
PDO	PTYP	38	0xDF26	0x01	PTYP	P2
PDO	IPEFormatRevision	39	0xDF27	0x01	HEX	P2
PDO	Conditions	40	0xDF28	0x01	HEX	P6
PDO	Shell_Reference_Reply (*)	41	0xDF29	VAR	HEX	P2
PDO	MID	42	0xDF2A	0x08	HEX	P2
PDO	Directory_Data_Group	43	0xDF2B	VAR	HEX	P2
PDO	Num_Sectors	44	0xDF2C	0x01	HEX	P6
PDO	Num_DIR_Entries	45	0xDF2D	0x01	HEX	P6
PDO	DOB_Reply (*)	46	0xDF2E	0x01	HEX	P6
PDO	Expiry_Date_Reply	47	0xDF2F	0x01	HEX	P6
PDO	HolderTitleReply (*)	48	0xDF30	0x01	HEX	P6
PDO	HolderSurnameReply (*)	49	0xDF31	0x01	HEX	P6
PDO	HolderOtherNamesReply (*)	50	0xDF32	0x01	HEX	P6
PDO	HolderPhoneDayReply (*)	51	0xDF33	0x01	HEX	P6
PDO	HolderPhoneHomeReply (*)	52	0xDF34	0x01	HEX	P6
PDO	HolderPhoneMobileReply (*)	53	0xDF35	0x01	HEX	P6
PDO	HolderAddress1Reply (*)	54	0xDF36	0x01	HEX	P6
PDO	HolderAddress2Reply (*)	55	0xDF37	0x01	HEX	P6
PDO	HolderAddress3Reply (*)	56	0xDF38	0x01	HEX	P6
PDO	HolderAddress4Reply (*)	57	0xDF39	0x01	HEX	P6
PDO	HolderPostCodeReply (*)	58	0xDF3A	0x01	HEX	P6
PDO	HolderEmailReply (*)	59	0xDF3B	0x01	HEX	P6
PDO	BankNameReply (*)	60	0xDF3C	0x01	HEX	P6
PDO	BankACNumberReply (*)	61	0xDF3D	0x01	HEX	P6
PDO	BankCardExpiryDateReply (*)	62	0xDF3E	0x01	HEX	P6
PDO	BankCardStartDateReply (*)	63	0xDF3F	0x01	HEX	P6
PDO	BankCardIssueNumberReply (*)	64	0xDF40	0x01	HEX	P6
PDO	Media_Reference_Number	65	0xDF41	0x0A	MCRN	P2
PDO	Anti_Tear_Type	66	0xDF42	0x01	HEX	P6

PDO	AverageAdultFare	67	0xDF43	VAR	VALI	Herein
PDO	AverageAdultFareServiceID	68	0xDF44	VAR	ASCII	Herein
PDO	ReturnTicketIndicator	69	0xDF45	0x01	HEX	Herein
PDO	MethodOfPayment	70	0xDF46	0x01	HEX	P
PDO	TripNumber	71	0xDF47	0x02	BCD	Herein
PDO	TripScheduledDepartureTime	72	0xDF48	0x02	BCD	Herein
PDO	TripScheduledDepartureDate	73	0xDF49	0x04	BCD	Herein
PDO	LocalServiceNumber	74	0xDF4A	VAR	ASCII	Herein
PDO	MasterReferenceServiceNumber	75	0xDF4B	VAR	ASCII	Herein
PDO	Direction	76	0xDF4C	0x01	ASCII	Herein
PDO	TripCountType	77	0xDF4D	0x01	HEX	Herein
PDO	ContractType	78	0xDF4E	0x01	HEX	Herein
PDO	ContractIdentifier	79	0xDF4F	VAR	ASCII	Herein
PDO	NormalRefreshLocation	80	0xDF50	VAR	LOC1	P
PDO	DayOfWeek	81	0xDF51	0x01	DOW	P
PDO	Date	82	0xDF52	0x04	BCD	Herein
PDO	Time	83	0xDF53	0x03	BCD	Herein
PDO	StageNumber	84	0xDF54	VAR	HEX	Herein
PDO	ZoneNumber	85	0xDF55	0x01	HEX	Herein
PDO	POSTID	86	0xDF56	VAR	ASCII	Herein
PDO	POSTTransactionSequenceNumber	87	0xDF57	VAR	HEX	Herein
PDO	File_DF	88	0xDF58	2	HEX	P6
PDO	Short_File_ID	89	0xDF59	1	HEX	P6
PDO	Record_File_ID	90	0xDF60	2	HEX	P6
PDO	Transparent_File_ID	91	0xDF61	2	HEX	P6
PDO	Status	92	0xDF62	2	HEX	P6
PDO	File_Data	93	0xDF63	VAR	HEX	P6
PDO	Request_Reference	94	0xDF64	VAR	HEX	Herein

A.2.5 PDOs in Alphabetic order

DO Type	DO Label	TAG_DEC	TAG_HEX	Length	Data Type	Spec ref
PDO	Anti_Tear_Type	66	0xDF42	0x01	HEX	P6
PDO	AverageAdultFare	67	0xDF43	VAR	VALI	Herein
PDO	AverageAdultFareServiceID	68	0xDF44	VAR	ASCII	Herein
PDO	BankACNumber (*)	14	0xCE	0x10	BCDS	P6
PDO	BankACNumberReply (*)	61	0xDF3D	0x01	HEX	P6
PDO	BankCardExpiryDate (*)	15	0xCF	0x04	BCDN	P6
PDO	BankCardExpiryDateReply (*)	62	0xDF3E	0x01	HEX	P6

PDO	BankCardIssueNumber (*)	17	0xD1	0x02	BCDN	P6
PDO	BankCardIssueNumberReply (*)	64	0xDF40	0x01	HEX	P6
PDO	BankCardStartDate (*)	16	0xD0	0x04	BCDN	P6
PDO	BankCardStartDateReply (*)	63	0xDF3F	0x01	HEX	P6
PDO	BankName	13	0xCD	0x28	ASCII	P6
PDO	BankNameReply	60	0xDF3C	0x01	HEX	P6
PDO	Conditions	40	0xDF28	0x01	HEX	P6
PDO	ContractIdentifier	79	0xDF4F	VAR	ASCII	Herein
PDO	ContractType	78	0xDF4E	0x01	HEX	Herein
PDO	Date	82	0xDF52	0x04	BCD	Herein
PDO	DayOfWeek	81	0xDF51	0x01	DOW	P1
PDO	Direction	76	0xDF4C	0x01	ASCII	Herein
PDO	Directory_Data_Group	43	0xDF2B	VAR	HEX	P2
PDO	DOB (*)	34	0xDF22	0x04	DOB	P1
PDO	DOB_Reply (*)	46	0xDF2E	0x01	HEX	P6
PDO	End_DTS	21	0xD5	0x03	DTS	P6
PDO	Expiry_Date	35	0xDF23	0x02	DATE	P1
PDO	Expiry_Date_Reply	47	0xDF2F	0x01	HEX	P6
PDO	File_Data	93	0xDF63	VAR	HEX	P6 1
PDO	File_DF	88	0xDF58	0x02	HEX	P6 1
PDO	Fulfilment_#Sectors	22	0xD6	0x01	HEX	P6
PDO	HolderAddress1 (*)	7	0xC7	0x1E	ASCII	P6
PDO	HolderAddress1Reply (*)	54	0xDF36	0x01	HEX	P6
PDO	HolderAddress2 (*)	8	0xC8	0x1E	ASCII	P6
PDO	HolderAddress2Reply (*)	55	0xDF37	0x01	HEX	P6
PDO	HolderAddress3 (*)	9	0xC9	0x1E	ASCII	P6
PDO	HolderAddress3Reply (*)	56	0xDF38	0x01	HEX	P6
PDO	HolderAddress4 (*)	10	0xCA	0x1E	ASCII	P6
PDO	HolderAddress4Reply (*)	57	0xDF39	0x01	HEX	P6
PDO	HolderEmail (*)	12	0xCC	0x28	ASCII	P6
PDO	HolderEmailReply (*)	59	0xDF3B	0x01	HEX	P6
PDO	HolderOtherNames (*)	3	0xC3	0x1E	ASCII	P6
PDO	HolderOtherNamesReply (*)	50	0xDF32	0x01	HEX	P6
PDO	HolderPhoneDay (*)	4	0xC4	0x14	ASCII	P6
PDO	HolderPhoneDayReply (*)	51	0xDF33	0x01	HEX	P6
PDO	HolderPhoneHome (*)	5	0xC5	0x14	ASCII	P6
PDO	HolderPhoneHomeReply (*)	52	0xDF34	0x01	HEX	P6
PDO	HolderPhoneMobile (*)	6	0xC6	0x14	ASCII	P6
PDO	HolderPhoneMobileReply (*)	53	0xDF35	0x01	HEX	P6
PDO	HolderPostCode (*)	11	0xCB	0x0A	ASCII	P6
PDO	HolderPostCodeReply (*)	58	0xDF3A	0x01	HEX	P6
PDO	HolderSurname (*)	2	0xC2	0x14	ASCII	P6
PDO	HolderSurnameReply (*)	49	0xDF31	0x01	HEX	P6

PDO	HolderTitle (*)	1	0xC1	0x04	ASCII	P6
PDO	HolderTitleReply (*)	48	0xDF30	0x01	HEX	P6
PDO	IIN_Index	24	0xD8	0x01	HEX	P6
PDO	IPE_Data_Group	28	0xDC	VAR	HEX	P2
PDO	IPE_Delivery_Date_End	27	0xDB	0x02	DATE	P6
PDO	IPE_Delivery_Date_Start	26	0xDA	0x02	DATE	P6
PDO	IPE_InstanceID	25	0xD9	0x08	HEX	P2
PDO	IPE_Value_Record_Data_GroupA	29	0xDD	VAR	HEX	P2
PDO	IPE_Value_Record_Data_GroupB	30	0xDE	VAR	HEX	P2
PDO	IPEFormatRevision	39	0xDF27	0x01	HEX	P2
PDO	ISAMID	18	0xD2	0x04	HEX	P2
PDO	ITSO_OID	0	0xC0	0x04	OID16	Herein
PDO	Label	23	0xD7	0x05	HEX	P2
PDO	LocalServiceNumber	74	0xDF4A	VAR	ASCII	Herein
PDO	MasterReferenceServiceNumber	75	0xDF4B	VAR	ASCII	Herein
PDO	Media_Number	32	0xDF20	VAR	ASCII	P6
PDO	Media_Reference_Number	65	0xDF41	0x0A	MCRN	P2
PDO	MethodOfPayment	70	0xDF46	0x01	HEX	P1
PDO	MID	42	0xDF2A	0x08	HEX	P2
PDO	NormalRefreshLocation	80	0xDF50	VAR	LOC1	P1
PDO	Num_DIR_Entries	45	0xDF2D	0x01	HEX	P6
PDO	Num_Sectors	44	0xDF2C	0x01	HEX	P6
PDO	OID	37	0xDF25	0x02	OID16	P2
PDO	POSTID	86	0xDF56	VAR	ASCII	Herein
PDO	POSTTransactionSequenceNumber	87	0xDF57	VAR	HEX	Herein
PDO	PTYP	38	0xDF26	0x01	PTYP	P2
PDO	Record_File_ID	90	0xDF60	0x02	HEX	P6 1
PDO	Ref#	19	0xD3	0x04	HEX	P6
PDO	Request_Purpose	31	0xDF1F	0x01	HEX	P6
PDO	Request_Reference	94	0xDF64	VAR	HEX	Herein
PDO	ReturnTicketIndicator	69	0xDF45	0x01	HEX	Herein
PDO	Shell_Reference (*)	33	0xDF21	0x09	ISRN	P2
PDO	Shell_Reference_Reply (*)	41	0xDF29	VAR	HEX	P2
PDO	Short_File_ID	89	0xDF59	0x01	HEX	P6 1
PDO	StageNumber	84	0xDF54	VAR	HEX	Herein
PDO	Start_DTS	20	0xD4	0x03	DTS	P6
PDO	Status	92	0xDF62	0x02	HEX	P6 1
PDO	Transparent_File_ID	91	0xDF61	0x02	HEX	P6 1
PDO	TripCountType	77	0xDF4D	0x01	HEX	Herein
PDO	TripNumber	71	0xDF47	0x02	BCD	Herein
PDO	TripScheduledDepartureDate	73	0xDF49	0x04	BCD	Herein
PDO	TripScheduledDepartureTime	72	0xDF48	0x02	BCD	Herein
PDO	Time	83	0xDF53	0x03	BCD	Herein

PDO	TYP	36	0xDF24	0x01	TYP	P2
PDO	ZoneNumber	85	0xDF55	0x01	HEX	Herein

A.3 Tag definitions only found in this Annex

This section defines the tags that are not found in the main parts of the Specification.

They fall into three classes namely:

- CDO Tags only used as higher level CDOs for DOs found in the Specification
- A PDO TAG for use as an ITSO identifier for the Private_Data_Group
- Data Objects (shown in *italics*) which may be included in the Data area of 0209, 0310 and 0801 messages

DO Labels suffixed with (*) indicate that the element contains personal data. Licensed Members wishing to store such data are to ensure that they comply with their responsibilities under the General Data Protection Regulation (GDPR).

DO Type	DO Label	TAG DEC	Length	Data Type	Description
CDO	ITSO_Root_Group	0	VAR	N/A	A CDO containing any other ITSO defined CDOs / PDOs
CDO	ITSO_Data_Group	1	VAR	N/A	A CDO forming the container for ITSO tagged Data Objects
CDO	Private_Data_Group	2	VAR	N/A	A CDO forming the container for User Data having user defined tags of any value that do no conflict with the ITSO_OID PDO (Tag 0 Dec) which shall be the first DO in the Private_Data_Group
PDO	ITSO_OID	0	0x04	OID16	A PDO containing the ITSO_OID of the message originator (NB: this is not an ISO registered OID)
CDO	<i>IPEInstanceHolderInformation (*)</i>	3	VAR	N/A	<i>A CDO forming the container for information relating to the CM holder of an IPE instance. May contain single instances of one or more optional PDOs with tag values in the range 1-12 (dec) inclusive.</i>
CDO	<i>BankACDetails (*)</i>	4	VAR	N/A	<i>A CDO forming the container for information relating to the CM holder's Bank Account. May contain single instances of one or more optional PDOs with tag values in the range 13-17 (dec) inclusive.</i>
CDO	<i>ActionListInformation</i>	5	VAR	N/A	<i>A CDO forming the container for location information relating to Actionlists: May contain one or more instances of tag value 80 (dec)</i>
CDO	<i>NullData</i>	6	0x00	N/A	<i>This CDO is used where there is no data to store in the supplementary data area of an 0209 message</i>
CDO	<i>ReimbursementData</i>	24	VAR	N/A	<i>A CDO forming the container for reimbursement data: May contain single instances of one or more optional PDOs with tag values in the range 68-70 (dec) inclusive</i>
CDO	<i>TripData</i>	25	VAR	N/A	<i>A CDO forming the container for trip data: May contain single instances of one or more optional PDOs with tag values in the range 71-77 (dec) inclusive</i>

CDO	ContractRelatedData	26	VAR	N/A	A CDO forming the container for contract related data: May contain single instances of one or more optional PDOs with tag values in the range 78-79 (dec) inclusive, and in the range 81-85 (dec) inclusive, and CDO 25.
CDO	POSTTransactionID	27	VAR	N/A	A CDO containing POSTID and POSTTransactionSequenceNumber
PDO	AverageAdultFare	67	VAR	VALI	A PDO containing the average fare for the last 100 non-discounted adult tickets issued for the Service Number indicated by 'AverageAdultFareServiceID'. This data is typically transmitted every 100th instance of the AdultAverageFare being updated. Note, however, that if the 100th qualifying fare is not related to an ITSO Product the POST will have to buffer the message and transmit it the next time that an ITSO Journey record is transmitted. This element shall use ITSO data type VALI
PDO	AverageAdultFareServiceID	68	VAR	ASCII	A PDO containing the Service Number associated with the 'AverageAdultFare'
PDO	ReturnTicketIndicator	69	0x01	HEX	A PDO containing a binary integer coded as follows: 0 = Paper ticket issued for return journey; 1 = Transient Ticket issued for return journey; 2 – 255 = RFU ITSO. Note that this data item is only transmitted for a concessionary return ticket. It is only needed if differential concession rates are applied to the two parts of the trip (out and return).
PDO	TripNumber	71	0x02	BCD	A PDO containing a value covering the range 0000 to 9999. This value may be manually entered by the driver at the start of the trip. If the ETM is configured to use Trip Numbers, the TripCountType element should be set to 1. Note that if the ETM is configured to use Scheduled Departure Time rather than Trip Numbers this field should be either omitted or set to 0000 and the TripCountType element should be set to 0.
PDO	TripScheduledDepartureTime	72	0x02	BCD	A PDO containing the time expressed as a BCD coded string, formatted HHMM. This value may be manually entered by the driver at the start of the trip. If the ETM is configured to use Scheduled Departure Time, the TripCountType element should be set to 0. Note that if the ETM is configured to use Trip Numbers rather than Scheduled Departure Time this element should be either omitted or set to 0000 and the TripCountType element should be set to 1
PDO	TripScheduledDepartureDate	73	0x04	BCD	A PDO containing the date expressed as a BCD coded string, formatted DDMMYYYY. The purpose of this data element is to ensure that transactions can be properly allocated to the correct traffic day, i.e. covering the case where a trip might start just after midnight.
PDO	LocalServiceNumber	74	VAR	ASCII	A PDO containing a Value that may be entered by the driver. The number (which may in fact be alphanumeric) is stored left justified and padded with spaces if necessary.

PDO	MasterReferenceServiceNumber	75	VAR	ASCII	A PDO containing a Master Service Number for use with NaPTAN stage numbers. This is provided by a look-up table where it is referenced from the 'LocalServiceNumber'. This look-up table is maintained at the depot back office. The number (which may in fact be alphanumeric) is stored left justified and padded with spaces if necessary.
PDO	Direction	76	0x01	ASCII	A PDO containing a Direction indicator coded as follows: O = out; I = in, A = circular anti clockwise; C = circular clockwise; All other characters RFU ITSO.
PDO	TripCountType	77	0x01	HEX	A PDO containing a binary integer coded as follows: 0 = ScheduledDepartureTime used; 1 = TripNumber used; All other values RFU ITSO.
PDO	ContractType	78	0x01	HEX	A PDO containing Contract Type information coded as follows: 0 = commercial contract; 1 = minimum cost contract; 2 = minimum subsidy contract; 3 – 255 RFU ITSO.
PDO	ContractIdentifier	79	VAR	ASCII	A PDO containing a reference number or name that identifies an out of scheme operators contract arrangements
PDO	Date	82	0x04	BCD	A PDO containing the date upon which a transaction took place expressed as a BCD coded string, formatted DDMMYYYY.
PDO	Time	83	0x03	BCD	A PDO containing the time at which a transaction took place expressed as a BCD coded string, formatted HHMMSS.
PDO	StageNumber	84	VAR	HEX	A PDO containing the identity of the bus fare stage at which a transaction took place.
PDO	ZoneNumber	85	0x01	HEX	A PDO containing the identity of the zone at which a transaction took place.
PDO	POSTID	86	VAR	ASCII	The POST's unique identity number
PDO	POSTTransactionSequenceNumber	87	VAR	HEX	A transaction sequence number generated by the POST
PDO	Request_Reference	94	VAR	HEX	A PDO containing a unique HEX reference. The Response Message shall include the reference from the Request in its response.

Annex B - Examples of the use of the 080A and 080B ISAM Parameter Table Request and Response Messages in Native Format (Informative)

B.1 Request Example

E0 2A E1 28DF64 0C 0102030405060708090A0B0C FC 0A DF58 02 AA11 DF60 02 1234 FC 04 DF59 01 01 FC 05 DF61 02 AA02

Tag Name	Tag Value	Length	PDO Value
ITSO_Root_Group	E0	2A	
*ITSO_Data_Group	E1	28	
**Request_Reference	DF64	0C	0102030405060708090A0B0C
**Read_File_Request	FC	0A	
***File_DF	DF58	02	AA11
***Record_File_ID	DF60	02	1234
**Read_File_Request	FC	04	
***Short_File_ID	DF59	01	01
**Read_File_Request	FC	05	
***Transparent_File_ID	DF61	02	AA02

B.2 Response Example

Note that the following example shows successful transmission of all the requested files. This may not always be the result; in which case the nature of the problems encountered by the POST will be indicated by the Status response.

E0 8185 E1 8182DF64 0C 0102030405060708090A0B0C FD 0F DF58 02 AA11 DF60 02 1234 DF62 02 6A83 FD 4B DF59 01 01 DF63 13 000100003FFF633597000810FF010100000000 DF63 13 010100003FFF633597000816FF020100000001 DF63 13 020100003FFF633597FFF8FFFF010100010002 DF62 02 6A83 FD 13 DF6102 AA02 DF63 06 00000A000012 DF62 02 6A83

Tag Name	TAG Value	Length	PDO Value
ITSO_Root_Group	E0	8185	
*ITSO_Data_Group	E1	8182	
**Request_Reference	E8	0C	0102030405060708090A0B0C
**Read_File_Response	FD	0F	
***File_DF	DF58	02	AA11
***Record_File_ID	DF60	02	1234
***Status	DF62	02	6A83
**Read_File_Response	FD	4B	
***Short_File_ID	DF59	01	01
***File_Data	DF63	13	000100003FFF6335970 00810FF010100000000
***File_Data	DF63	13	010100003FFF6335970 00816FF020100000001
***File_Data	DF63	13	020100003FFF633597F FF8FFFF010100010002
***Status	DF62	02	6A83
**Read_File_Response	FD	13	
***Transparent_File_ID	DF61	02	AA02
***File_Data	DF63	06	00000A000012
***Status	DF62	02	6A83

