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COR 3

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

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 System (ISMS) and ISAMs / HSAMs are not detailed in this document[1].

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

2.1 Message Codes

2.1.1 Message Code Format

Message codes shall be a two byte value. The most significant byte shall have special significance as follows:

Table 1 - Message Code Format

Bits 7-4	Bit 3	Bit 2	Bit 1	Bit 0	Hex [2]	Type of message	Message Group
0000	0	0	0	0	00	Transaction Record data	ITSO shell, IPE Administration, Card issuer messages
0000	0	0	0	1	01	Transaction Record data	Stored Travel Rights, CTA
0000	0	0	1	0	02	Transaction Record data	ITSO ID, loyalty, create or amend IPE, journey record, Actionlist acknowledge
0000	0	0	1	1	03	Transaction Record data	Cancellations and refunds, miscellaneous, list match event records
0000	0	1	0	0	04	Other Message Data	Exceptions and card transaction error messages (POST to HOPS)
0000	0	1	0	1	05	Other Message Data	POST to HOPS queries
0000	0	1	1	0	06	Other Message Data using a hash mac	HOPS to HOPS messages
0000	0	1	1	1	07	Other Message Data	AMS – ISMS messages, which are defined in ITSO TS 1000-8
0000	1	0	0	0	08	POST/HOPS to POST/HOPS messages	Miscellaneous messages, note that some message types may use a hash mac.
0000	1	0	0	1	09	HOPS to POST /HOPS messages	Message control
0000	1	0	1	0	0A	HOPS to POST /HOPS messages	Parameter tables
0000	1	0	1	1	0B	HOPS to POST /HOPS messages using a hash mac	Parameter tables

[2] The Hex column contains a hexadecimal representation of the code represented in binary in the previous 5 columns

Bits 7-4	Bit 3	Bit 2	Bit 1	Bit 0	Hex 2	Type of message	Message Group
0000	1	1	0	0	0C	HOPS to POST /HOPS messages	Inter-operability list, Capability list, Hotlist, Actionlist, Data Correction record
0000	1	1	0	1	0D	HOPS to POST /HOPS messages	HOPS Response to POST queries
0000	1	1	1	0	0E	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.[3]
0000	1	1	1	1	0F	User defined system specific messages using a hash mac	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.
Codes other than zero	Any	Any	Any	Any		RFU	RFU

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

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 Note on transmission of parameter tables and data lists:

The following rules shall apply to the transmission of parameter tables:

— Each row of a table shall be sent as a separate data block[4].

The following rules shall apply to the transmission of data lists:

— Each item in the list is sent as a separate data block.

[3] These messages may be used to return user defined audit registers.

[4] Refer to ITSO TS 1000-9 for a definition of data blocks.

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.
- Where the data element contains a numeric value (for example, HEX or BCD), then the element shall be set to a value of zero.
- 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.

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
	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)

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

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.

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

Table 6 - Negative acknowledgement to Class 2 message (NAK2)

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 shall be the following: DATA_FRAME_ERROR 01 (hex)

3.6 Envelop Frame, Code 0920

The data associated with this message code shall be an entire Data Frame including its seal[5].

[5] Refer to ITSO TS 1000-9 for an explanation of the use of Envelop Frames.

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 destinations[6]:

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.

2. Records of transactions which create 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 directory header, except that in the case of Compact Shells the messages shall be sent to the Product Owner, identified by the OID in the IPE directory entry.

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.

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 specification 1000-8.

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.

[6] 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.

4.3 Transaction Record Message Codes.

Table 7 - Transaction Record Message Codes

Transaction Group	Transaction Type	Hex Code	Sent To Owners Of:
ITSO shell	Create ITSO shell (inactive)	0001	Shell POST
	RFU	0002	RFU
	RFU	0003	RFU
	Delete ITSO shell	0004	Shell POST
IPE administration	Create IPE (sent to ITSO Shell owner)	0005	Shell
	Amend IPE (sent to ITSO Shell owner)	0006	Shell
	Delete IPE[7] (sent to ITSO Shell owner and IPE owner)	0007	Shell POST IPE
ITSO Shell owner records[8]	Stored Travel Rights first use	0008	Shell
	Enable/disable CTA	0009	Shell
ITSO ID	Create ITSO ID TYPs 14 & 16 (includes any deposit payment)	0200	POST IPE
	Amend ITSO ID TYPs 14 & 16	0201	POST IPE
Stored Travel Rights	Create Stored Travel Rights TYP 2	0120	POST IPE
	Amend Stored Travel Rights TYP 2	0121	POST IPE
	Stored Travel Rights usage (deduction from store) (funds transfer request)	0100	POST IPE
	Stored Travel Rights load (manual or Actionlist)	0101	POST IPE
	Stored Travel Rights load (Auto-Top-Up)	0102	POST IPE
	Stored Travel Rights load check record (created with each Stored Travel Rights usage transaction where a Value Record pertaining to the same add value event is present in the STR IPE Value Record Data Group)	0103	POST IPE

[7] Note that the LOG IPE shall not be deleted.

[8] Data records returned to the card or shell owner, identified by OID found in the directory header.

Transaction Group	Transaction Type	Hex Code	Sent To Owners Of:
	Enable or amend Auto-Top-Up	0104	POST IPE
	Disable Auto-Top-Up	0105	POST IPE
	First use of Stored Travel Rights (to IPE owner)	0106	POST IPE
	Stored Travel Rights transaction cancellation (restoration of Stored Travel Rights deducted during a transaction which has been cancelled)	0107	POST IPE
	Stored Travel Rights – refund of part/all Stored Travel Rights (which may, or may not, follow a loading transaction)	0108	POST IPE
	Refund all Stored Travel Rights, together with any deposit amount and disable the Stored Travel Rights IPE.	0109	POST IPE
Charge to account (CTA)	Create CTA IPE TYP 4	0122	POST IPE
	Amend CTA IPE TYP 4	0123	POST IPE
	Create CTA IPE TYP 5	0124	POST IPE
	Amend CTA IPE TYP 5	0125	POST IPE
	Enable CTA	010B	POST IPE
	Disable CTA	010C	POST IPE
	CTA Full / Partial Refund for a purchased ticket	010D	POST IPE
	CTA TYP 4 Usage	010E	POST IPE
	CTA TYP 4 Value Adjustment	010F	POST IPE
	CTA TYP 5 Full / Partial Refund for a purchased ticket	0110	POST IPE
	CTA TYP 5 Usage	0111	POST IPE
	CTA TYP 5 Value Adjustment	0112	POST IPE
Loyalty	Create Loyalty IPE	020B	POST IPE
	RFU	0202	
	Loyalty add points	0203	POST IPE
	Loyalty redemption	0204	POST IPE
	Loyalty amendment (transaction reversal)	0205	POST IPE

Transaction Group	Transaction Type	Hex Code	Sent To Owners Of:
	First use of scheme	0206	POST IPE
Transaction cancellation	(other than Stored Travel Rights, with rides refund to Customer Media if appropriate)	0300	POST IPE
Predefined ticket and predefined specific journey ticket transactions	Create IPE (sent to IPE owner)	0207	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	POST IPE
Refund	Full / Partial refund for a purchased ticket (IPE)	0301	POST IPE
Journey record	Journey / entry / exit record (IPE usage)	0209	POST IPE
	Journey / entry / exit record (Transient Ticket)	0210	POST IPE
Miscellaneous	Deposit received	0302	POST and IPE or Shell as appropriate
	Deposit refund	0303	POST and IPE or Shell as appropriate
	Enable / Amend Auto-Renew	0304	POST IPE
	Disable Auto-Renew	0305	POST IPE
	Supplementary Data message	0310	POST IPE
	Hotlist match event record	0311	POST & IPE & Shell owners if applicable to an IPE, or Shell owner as applicable to a Shell, see note below
	Actionlist match event record	0312	POST and IPE owner if applicable to an IPE, or Shell owner if applicable to a Shell
	Cyclic Log status change	0313	Shell
	Unblock Shell or Product	0314	Shell and, if appropriate, the Product
Exceptions	Transaction Failed	0400	Shell POST IPE (see note below)
	Transaction with Customer Media apparently successful, but the POST was unable to confirm this.	0410	Shell POST IPE

Message code 0311 **Hotlist match event record** shall be transmitted to the IPE or Shell owner using the contents of the Hotlist data group HotItemOriginator data element as a destination.

Message code 0312 Actionlist match event record shall be transmitted to the IPE or Shell owner using the contents of the Actionlist data group ActionListOriginator data element as a destination.

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.

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

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 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. For messages formatted according to this version of the specification this value shall be set to 2 (two).
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 directory header. A 4 bit number occupying bits 0-3, bits 4-7 shall be set to zero

Name	Source	Format	Size	Comment
KeyStrategyVersion	Shell	KSC	1	Format version information from the directory header
KeyVersion	Shell	KVC	1	Format version information from the directory header
IPEID	shell, dir	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. When a message is used to record an event relating to an ITSO Shell, then this IPEID element shall either: be set to zero to indicate that the message relates to a Shell, or as an optional alternative shall be made up of the Shell's IIN, the Shell owner's OID, IPE Type - which shall be set to a value of 32 (decimal), and a Shell owner defined PTYP value which shall be used to indicate the Shell version. If the IPE cannot be read and IINL = 1, set the IIN portion of this element to zero (0).
Shell_IterationNumber	Shell	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 – 255	RFU

4.4.2 Create an ITSO shell, code 0001.

This applies to creation of an ITSO shell.

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 zero. Where MCRN is available in the ITSO Shell it shall be included in this record
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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 zero. 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	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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 and if appropriate the IPE owner.

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

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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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.

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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

4.4.6 Stored Travel Rights travel, Product or service purchase, load (manual, Actionlist and Auto-Top-Up), load check record, transaction cancellation, 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), transaction cancellation, 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), transaction cancellation, 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 zero. 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 zero.

Name	Source	Format	Size	Comment
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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

4.4.6.2 Stored Travel Rights load check record code 0103.

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. 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 by ITSO, set to zero
RFU		RFU	1	RFU by ITSO, set to zero
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 zero.
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 zero.
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

Name	Source	Format	Size	Comment
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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CFD does not support ISRN this element shall be set to zero

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

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

Name	Source	Format	Size	Comment
StandardData			21	
BankName	POST	ASCII	40	
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
BankCardExpiryDate	POST	BCDN	4	Date shall be transmitted as 8 characters in the form ddmmyyyy without delimiters, for example, 21/04/00 shall be transmitted as 21042000
BankCardStartDate	POST	BCDN	4	Date shall be transmitted as 8 characters in the form ddmmyyyy without delimiters, for example, 21/04/00 shall be transmitted as 21042000
BankCardIssueNumber	POST	BCDN	2	Applies to credit or other bank card.
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 zero. 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

Name	Source	Format	Size	Comment
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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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.

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 zero. 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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

4.4.9 First Use Of Stored Travel Rights (Load), code 0106.

This record shall be accompanied by a standard load transaction record.

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 (Load), 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 zero. 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	
StartDateSTR	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 zero
DepositMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0

Name	Source	Format	Size	Comment
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 zero.
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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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 zero. 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 zero.
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

Name	Source	Format	Size	Comment
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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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 zero. 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 use to create the IPE. The IPE instance data from a value group shall not be used here.
IPE_SAMSequenceNumber	IPE	ISAM	3	Included for IPE instance identification

Name	Source	Format	Size	Comment
		S#		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.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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 zero. 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 zero
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

Name	Source	Format	Size	Comment
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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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

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 - Enable CTA, code 010B – RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
StandardData			21	
BankName	POST	ASCII	40	
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
BankCardExpiryDate	POST	BCDN	4	Date shall be transmitted as 8 characters in the form ddmmyyyy without delimiters, for example, 21/04/00 shall be transmitted as 21042000
BankCardStartDate	POST	BCDN	4	Date shall be transmitted as 8 characters in the form ddmmyyyy without delimiters, for example, 21/04/00 shall be transmitted as 21042000
BankCardIssueNumber	POST	BCDN	2	Applies to credit or other bank card.
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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.

Name	Source	Format	Size	Comment
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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 zero. 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 use to create the IPE. The IPE instance data from a value group shall not be used here.

Name	Source	Format	Size	Comment
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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

4.4.17 CTA 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 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 zero. 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 zero.
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

Name	Source	Format	Size	Comment
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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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 zero. 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 zero
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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.

Name	Source	Format	Size	Comment
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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.

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.

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	
StartDateSTR	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 zero
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 zero.

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 zero. 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 zero.
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 use to create the IPE. The IPE instance data from a value group shall not be used here.

Name	Source	Format	Size	Comment
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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberNonEncrypted	Shell	uISRN	16	Not encrypted. In a code 0121 message, this element shall be set to zero (0)
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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 zero
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 zero
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 zero.

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 zero. 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 use to create the IPE. The IPE instance data from a value group shall not be used here.

Name	Source	Format	Size	Comment
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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberNonEncrypted	Shell	uISRN	16	Not encrypted. In a code 0123 message, this element shall be set to zero (0)
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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 zero
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 zero
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

Name	Source	Format	Size	Comment
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 zero.
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 zero. 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 zero
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

Name	Source	Format	Size	Comment
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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberNonEncrypted	Shell	uISRN	16	Not encrypted. In a code 0125 message, this element shall be set to zero (0)
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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. 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.

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
HolderSurname	POST	ASCII	20	Where necessary, this element shall be padded with trailing spaces
HolderOtherNames	POST	ASCII	30	Where necessary, this element shall be padded with trailing spaces
HolderAddress1	POST	ASCII	30	Where necessary, this element shall be padded with trailing spaces
HolderAddress2	POST	ASCII	30	Where necessary, this element shall be padded with trailing spaces
HolderAddress3	POST	ASCII	30	Where necessary, this element shall be padded with trailing spaces
HolderAddress4	POST	ASCII	30	Where necessary, this element shall be padded with trailing spaces
HolderPostcode	POST	ASCII	10	Where necessary, this element shall be padded with trailing spaces
HolderPhoneDay	POST	ASCII	20	Where necessary, this element shall be padded with trailing spaces
HolderPhoneHome	POST	ASCII	20	Where necessary, this element shall be padded with trailing spaces
HolderPhoneMobile	POST	ASCII	20	Where necessary, this element shall be padded with trailing spaces
HolderEmail	POST	ASCII	40	Where necessary, this element shall be padded with trailing spaces
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.

Name	Source	Format	Size	Comment
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 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 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	
ConcessionaryPassIssuerCostCentre	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 zero.
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	
Language	IPE	HEX	1	
HolderID	IPE	HEX	4	
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 zero.
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 zero.
EntitlementExpiryDate	IPE	DATE	2.000	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 zero
DepositMethodOfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0

Name	Source	Format	Size	Comment
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 zero
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 zero
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	ISAMID	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	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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberNonEncrypted	Shell	uISRN	16	Not encrypted. In a code 0125 message, this element shall be set to zero (0)
				The code 0200, 0201 Optional Data Elements shall be incorporated into the record at this point if they are included in the record.

Name	Source	Format	Size	Comment
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

Table 31 - Create or Amend ITSO ID IPE or Entitlement IPE, code 0200, 0201, Optional Data Elements – RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
SecondaryHolderID	IPE	HEX	4	
ForenameLength	IPE	HEX	1.000	Length of Forename, in bytes Set to zero if no Forename stored
Forename	IPE	ASCII	39.000	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.
SurnameLength	IPE	HEX	1.000	Length of Surname, in bytes Set to zero if no Surname stored
Surname	IPE	ASCII	39.000	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.
HalfDayOfWeek	IPE	BMP	2	
ValidAtOrFrom	IPE	LOC1	Variable, maximum 17	Variable length element
ValidTo	IPE	LOC1	Variable, maximum 17	Variable length element

Note. The Optional Data Elements shall be included in the code 0200 and 0201 elements immediately prior to the ITSOShellReferenceNumberEncrypted data element, and not simply appended to the mandatory data elements.

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 amendment (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 amendment (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 zero. 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 zero
UserDefined	IPE	UD	2	Applies to loyalty type 1 (TYP 3 IPE) only for type 2 loyalty programs this value shall be set to zero
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

Name	Source	Format	Size	Comment
				the ISAM which was use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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.

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	
HolderName	POST	ASCII	50	
HolderAddress	POST	ASCII	100	
HolderPostcode	POST	ASCII	8	
HolderPhoneDay	POST	ASCII	20	
HolderPhoneHome	POST	ASCII	20	
HolderEmail	POST	ASCII	40	
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.

Name	Source	Format	Size	Comment
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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberNonEncrypted	Shell	uISRN	16	Not encrypted. In a code 0206 message, this element shall be set to zero (0)
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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 dependant 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.

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	

Name	Source	Format	Size	Comment
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. 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	

Name	Source	Format	Size	Comment
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 n 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 use 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 use 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 37 - 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	

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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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 zero
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 zero
AutoRenewQuantity1	IPE	BIN	1	
Class	IPE	UD	1	
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	

Name	Source	Format	Size	Comment
ConcessionaryPassIssuerCostCentre	IPE	UD	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 39B - 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 zero
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 zero
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 zero

Name	Source	Format	Size	Comment
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	
ConcessionaryPassIssuerCostCentre	IPE	UD	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 zero.
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 zero
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 zero
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 zero
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	
ConcessionaryPassIssuerCostCentre	IPE	UD	2	
TYP23Mode	IPE	BMP	1	
MaxTransfers	IPE	HEX	1	

Name	Source	Format	Size	Comment
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 41B - 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 zero
ValidityCode	IPE	UD	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to zero

Name	Source	Format	Size	Comment
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 zero
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	
ConcessionaryPassIssuerCostCentre	IPE	UD	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	1.000	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0
VGBitMap	IPE VG	BMP	1.000	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0
VGFormatRevision	IPE VG	HEX	1.000	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0
TransactionType	IPE VG	HEX	1.000	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0
TransactionSequenceNumber	IPE VG	TS#	2.000	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 zero.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
CountRemainingRidesJourneys	IPE VG	HEX	1.000	
CountTransfers	IPE VG	HEX	1.000	
TYP23ValueFlags	IPE VG	BMP	1	

4.4.26.6 IPE TYP 24.

Table 43 - TYP 24 Core data segment (always included) – RecordFormatRevision = 2

Name	Source	Format	Size	Comment
ProductRetailer	IPE	OID16	2.000	
TYP24Flags	IPE	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 zero.
Class	IPE	BIN	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 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
IssueDateTime	IPE	DTS	3	
IssueLocation	IPE	LOC2	7	
PartySizeAdult	IPE	HEX	1	
PartySizeChild	IPE	HEX	1	
AmountPaidMethodOfPayment	IPE	MOP	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	
AmountPaidVATSalesTax	IPE	VATM	2	
Origin2	IPE	LOC2	7	
Destination2	IPE	LOC2	7	
DepartureDate	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 zero
TicketNumber	IPE	UD	4	Operators Ticket number, when available, otherwise set to zero. An IPE element shorter than 6 bytes shall occupy the least significant bytes of this element.
ValidOnDayCode	IPE	DOW	1	
JourneyTypeCode	IPE	HEX	1	
RouteNumber	IPE	HEX	1	
ProfileCode	IPE	HEX	1	

Name	Source	Format	Size	Comment
WarrantNumber	IPE	HEX	3	
CustomerTransactionReference #	IPE	HEX	4	

Table 44 - TYP 24 Optional Data – RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
PhotocardNumber	IPE	UD	4	
TicketStatusCode	IPE	UD	2	
TypeOfTicketCode	IPE	UD	3	
RouteCode	IPE	UD	5	
ValidityCode	IPE	UD	2	

Table 45 - TYP 24 Extended Validity Segment (included only if ExtendedValidityPresent flag is set) – RecordFormatRevision = 2

Name	Source	Format	Size	Comment
PartySizeAdultConcession	IPE	HEX	1	
PartySizeChildConcession	IPE	HEX	1	
DepartureTime	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 zero
RestrictionCode	IPE	UD	6	
ArrivalBandStart	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 zero
ArrivalBandEnd	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 zero
DepartureBandStart	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 zero
DepartureBandEnd	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 zero
NotValidTime1	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 zero
NotValidTime2	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 zero
NotValidTime3	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 zero
ArrivalTime	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 zero
RestrictedCode	IPE	UD	2	
FirstUseTime	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 zero
ValidityTime	IPE	HEX	2	
IntermediatePoint	IPE	LOC2	7	

Name	Source	Format	Size	Comment
NotViaPoint	IPE	LOC2	7	
AssistanceType	IPE	HEX	1	

Table 46 - TYP 24 Reservation Segment type 1 (a number of reservation segments may be included, determined by the value of QuantityResBlocks) – RecordFormatRevision = 2

Name	Source	Format	Size	Comment
QuantityResBlocks	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. The QuantityResBlocks element shall only be sent once, at the start of the record.
ResBlock#	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
ResDepartureDTS	IPE	DTS	3	
Seat	IPE	HEX	1	
Coach	IPE	UD	4	
SeatType1	IPE	UD	1	
ServiceIdentifier	IPE	ASCII	8	
UserDefined	IPE	UD	3	
ResOrigin	IPE	LOC2	7	
ResDestination	IPE	LOC2	7	
BookingReferenceNumber	IPE	HEX	4	

Table 47 - TYP 24 Reservation Segment type 2 (a number of reservation segments may be included, determined by the value of QuantityResBlocks) – RecordFormatRevision = 2

Name	Source	Format	Size	Comment
QuantityResBlocks	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0. The QuantityResBlocks element shall only be sent once, at the start of the record.
ResBlock#	IPE	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0.
ResDepartureDTS	IPE	DTS	3	
Seat	IPE	HEX	1	
Coach	IPE	UD	4	
SeatPositionCode	IPE	HEX	1	
SeatType2	IPE	HEX	1	
RFU	IPE	RFU	1	
TravelServiceNumber	IPE	ASCII	2	
ResOrigin	IPE	LOC2	7	
ResDestination	IPE	LOC2	7	
BookingReferenceNumber	IPE	HEX	4	

Table 48 - TYP 24 Value Group – RecordFormatRevision = 2.

Name	Source	Format	Size	Comment
VGLength	IPE	HEX	1.000	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0
VGBitMap	IPE	BMP	1.000	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0
VGFormatRevision	IPE	HEX	1.000	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0
TransactionType	IPE	HEX	1.000	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0
TransactionSequenceNumber	IPE	TS#	2.000	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 zero.
DateTimeStamp	IPE	DTS	3	
ISAMIDModifier	IPE	HEX	4	
ActionSequenceNumber	IPE	HEX	1	
CountRemainingJourneys	IPE	HEX	1	
TicketUseFlags	IPE	UD	1	

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 zero
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 zero
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	1.000	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0
VGBitMap	IPE VG	BMP	1.000	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0
VGFormatRevision	IPE VG	HEX	1.000	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0
TransactionType	IPE VG	HEX	1.000	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0
TransactionSequenceNumber	IPE VG	TS#	2.000	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 zero.
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 zero
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	1.000	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0
VGBitMap	IPE VG	BMP	1.000	A 0.75 byte value, occupying bits 0 to 5, bits 6 to 7 shall be set to 0
VGFormatRevision	IPE VG	HEX	1.000	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0
TransactionType	IPE VG	HEX	1.000	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0
TransactionSequenceNumber	IPE VG	TS#	2.000	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 zero.
DateTimeStamp	IPE VG	DTS	3	
ISAMIDModifier	IPE VG	HEX	4	
ActionSequenceNumber	IPE VG	HEX	1	
CountRemainingRidesJourneys	IPE VG	HEX	1.000	
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 zero
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 zero.
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 zero.
PassbackTime	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to zero
AmountPaidMethod OfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to zero
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 zero
GeoValidity/AreaValidity	IPE	LOC4/ LOC3	13	The 4 most significant bits of this element shall be set to zero, with the data commencing from the 5 bit of the element. The least significant 4 bytes of this element shall be set to zero 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 zero
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 zero.
PassbackTime	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to zero
AmountPaidMethod OfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to zero
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 zero
AreaValidity	IPE	LOC3	9	The 4 most significant bits of this element shall be set to zero, 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 zero
ExpiryTick2	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to zero
ExpiryTick3	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to zero
ExpiryTick4	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to zero
ExpiryTick5	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to zero
ExpiryTick6	IPE	HEX	1	A 0.625 byte value, occupying bits 0-4 of the element. Bits 5-7 shall be set to zero
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 zero.
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 zero.
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 zero
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 zero.
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 zero.
ScalingFactor	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to zero
AmountPaidMethod OfPayment	IPE	MOP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to zero
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 zero
AreaValidity	IPE	LOC3	9	The 4 most significant bits of this element shall be set to zero, 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 zero
QtyRemaining	IPE	HEX	2	A 1.625 byte value, occupying bits 0-12 of the element. Bits 13-15 shall be set to zero
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 zero
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 zero.
PassbackTime	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to zero
MaxDailyJourneys	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to zero
MaxTransfers	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to zero
ScalingFactor	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to zero
TYP29PassFlags	IPE	BMP	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to zero
AreaValidity	IPE	LOC3	9	The 4 most significant bits of this element shall be set to zero, 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 zero
DailyJnyCounter	IPE	HEX	1	A 0.5 byte value, occupying bits 0-3 of the element. Bits 4-7 shall be set to zero
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, including those made when a Ticket IPE is used;, to record Journeys where a Transient Ticket record is created (in addition to a 0210 record); to record Closed System entry and exit transactions; to record use of a voucher or open system toll IPE; and to record a free concessionary journey 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 Operator.

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 zero. 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	OID	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 zero.
ProductRetailer	IPE	OID16	2	

Name	Source	Format	Size	Comment
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 zero. 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 zero.
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, 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 zero.
ConcessionaryPassIssuerCostCentre	IPE	UD	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 zero.
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 TransactionType code has been stored in an IPE or a transient Ticket relevant to the Journey Record, use an appropriate code according to EN1545 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 EventTypeCode list; that EventTypeCode value may be used here. 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

Name	Source	Format	Size	Comment
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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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 zero. 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	
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 zero.

Name	Source	Format	Size	Comment
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 zero.
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 zero.
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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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 zero indicating that no IPE is pointed to.

4.4.28.2 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 60a - 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 zero. 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 zero.
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 zero.

Name	Source	Format	Size	Comment
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 zero.
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 zero.
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 zero.
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 zero.
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 use to create the IPE. The IPE instance data from a value group shall not be used here.

Name	Source	Format	Size	Comment
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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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 zero indicating that no IPE is pointed to.

4.4.29 Transaction cancellation, 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 only be used with Ticket Product IPE types.

Table 61 - Transaction cancellation, 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 zero. 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 zero. 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

Name	Source	Format	Size	Comment
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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

Table 61a: StoredUses data element map.

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.

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.

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 zero. 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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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 OID value contained in the IPE-ID element of the standard data shall be that of the shell owner, i.e. it shall be taken from the directory header.

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

Table 63 - Deposit Received or Refunded, code 0302, 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	DepostAmount 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 4-7of the most significant byte shall be set to zero.
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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.

Name	Source	Format	Size	Comment
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

4.4.32 Enable or Amend Auto-Renew, code 0304

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.

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

Name	Source	Format	Size	Comment
StandardData			21	
BankName	POST	ASCII	40	
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.
ExpiryDate	POST	BCDN	4	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
StartDate	POST	BCDN	4	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
IssueNumber	POST	BCDN	2	Applies to credit or other bank card.
ProductRetailer	IPE	OID16	2	

Name	Source	Format	Size	Comment
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 zero. 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.
Auto-RenewThreshold	IPE	HEX	2	Revised value
Auto-RenewValue	IPE	VALI	2	Revised 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 use 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 use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

4.4.33 Supplementary Data Message, code 0310.

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 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	One or more elements encoded according to asn.1 using basic encoding rules. Allowable data elements and associated tag values are defined in ITSO Developer Guide DG0009.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8. Where a CMD does not support ISRN this element shall be set to zero

Table 66 0310 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	*Tag value*	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)	*Tag value*	Calculated – the length of the elements in this group, excluding the length of this tag and this length	There may be no, one or more than one ITSO defined sub-groups in the message

		element	
ITSO defined element (s)	*Tag value*	Calculated	There may be one or more than one ITSO defined elements in the sub-group
Private data group (s)	*Tag value*	Calculated – the length of the elements in this group, excluding the length of this tag and this length element	There may be no, one or more than one user defined sub-groups in the message
ITSO OID	*Tag value*	Calculated	The OID of the entity responsible for the message should be recorded here
User defined element (s)	*Tag value*	Calculated	User defined data, identified by the OID of the originator included in the user defined sub-group data

4.4.34 Hotlist match event, code 0311.

Table 67 - Hotlist match event, 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.
CreatingISAMID	IPE	HEX	4	Identifies any IPE blocked. 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.
CreatingISAMSeq#	IPE	HEX	3	Identifies any IPE blocked. 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.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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

Code	Action Taken
0	Not 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, code 0312.

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 70 - Actionlist match event, 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	
IPEID	IPE	IPEIDM	7	Identifies IPE acted upon
CreatingISAMID	IPE	HEX	4	Identifies IPE acted upon 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.
CreatingISAMSeq#	IPE	HEX	3	Identifies IPE acted upon 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_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	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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

Code	Action Taken
0	Not 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.
~~3~~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.

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 74. 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 zero. 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	IPE	ISAM S#	3	if data unavailable this element shall be set to zero 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.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

ExceptionType shall be a one byte code defined as follows:

Table 73 - Definition of ExceptionType – RecordFormatRevision = 2

Code	Meaning	Destination[9]		
		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	√	√	
6	ITSO directory certificate check failed (both copies where software anti-tear provided)	√	√	
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)	√		√

[9] The destinations in this column are the minimum required, messages may also be sent to additional destinations.

Code	Meaning	Destination[9]		
		POST	Shell	IPE
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	√		√
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 TYPs 4, 5 or 14, but there is no valid TYP 16 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	√		√
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 zero	√		√
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 zero, if the Transaction took place	√		√

Code	Meaning	Destination[9]		
		POST	Shell	IPE
42-127	RFU			
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 – 255	RFU			

Implementation of code 3 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.

4.4.37 Exception, Transaction with Customer Media apparently successful, but the POST was unable to confirm this Transaction, code 410.

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 records (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
IPE_ISAMID	IPE	ISAM ID	4	If no data is available this element shall be set to zero. 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	IPE	ISAM S#	3	if data unavailable this element shall be set to zero 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.
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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 zero only if unblock Transaction applied to an ITSO Shell
CreatingISAMID	IPE	HEX	4	Identifies IPE acted upon Set to zero only if unblock Transaction applied to an ITSO Shell
CreatingISAMSeq#	IPE	HEX	3	Identifies IPE acted upon Set to zero 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 zero only if unblock Transaction applied to an ITSO Shell
ITSOShellReferenceNumberEncrypted	Shell via ISAM	eISRN	16	Formatted according to ITSO TS 1000-8 if CMD does not support ISRN this element shall be set to zero

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.

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 optional 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 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
POST Configuration	RFU	0C00	--
	Multiple records of multiple types	--	0600
	RFU	0C01	0601
	Hotlist	0C02	0602
	Actionlist	0C03	0603
	Data Correction record	0C04	0604
	RFU	0C05-0CFF	0605-06FF

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

5.3 HOPS to POST Configuration message data.

5.3.1 Multi Record Transmission, multiple types (message code 0600)

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 zero.

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

This data set may 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. Alternatively, this data set may be transmitted as a class 3 message, in accordance with ITSO 1000-8, when the data is to be stored in and processed by an ISAM.

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)
- 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.

Table 79 - KeyType Definitions

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 be used when the CFD does not support an identifiable shell
2-255	RFU

Table 80 - KeyType 0, Header Definition

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 zero. ISAM search string element.
INS#	HEX	0.5	Shell iteration number ISAM search string element.
IIN_Index	HEX	1	See clause 6.5.10 (table 111) ISAM search string element.
ISRN_OID	OID16	2	OID extracted from ISRN ISAM search string element.
ISRN_ISSN	HEX	3.5	ISRN 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 81 - KeyType 1, Header Definition

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 82 - IPE ID Optional Additional Identification Group Definition.

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	OID16	2	The value FFFF hex shall indicate a Wildcard
IPE_TYP	TYP	1	The value FF hex shall indicate a Wildcard
IPE_PTYP	PTYP	1	The value FF hex shall indicate a Wildcard
IPE_ISAMID_Creator	ISAMID	4	The value FFFFFFFF hex shall indicate a Wildcard
IPE_ISAMS#_Creator	HEX	3	The value FFFFFF hex shall indicate a Wildcard

Table 83 - Bit Map Definition

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
9-15	RFU

Table 84 - RecordType Definition

RecordType code	Meaning
0	Not used
1	Hotlist
2	Actionlist
3-255	RFU

Table 85 - 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
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, 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.

Table 87 - 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.

Table 88 - 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 89 - Actionlist Data Group, Code 0C03

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, Code 0C03, 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, Code 0C03, 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, Code 0C03, 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, Code 0C03, Optional IPE Group

Name	Format	Size	Comment
ListLength	HEX	1	Length of the entire list, including ListLength
IPE_EmbodimentParameterList	HEX	Variable	The Target IPE Embodiment Parameter List as defined herein

Table 94 - Actionlist, Code 0C03, 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 zero.

Table 95 - Actionlist, Code 0C03, ActionToTake Definition

Code	Meaning
0	Not used
1	Create IPE
2	Update IPE: change expiry date
3	Update Shell
4	Disable STR Auto-Top-Up
5	Add STR Auto-Top-Up
6	Un-Hotlist shell
7	Un-Hotlist 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
15-255	RFU

Table 96 - Actionlist, Code 0C03, 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	Not used				
1	Create IPE	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		Threshold TopUpAmount	None	Threshold and TopUpAmount are set to zero.
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-Hot Shell		Shell blocked flag in DirBitMap	None	Clear shell blocked flag in DirBitMap, increment shell iteration number INS#
7	Un-Hot IPE		Data group blocked flag in ATPF Flags element	None	Clear data group blocked flag in ATPF Flags element, increment IPE iteration number INP#.
8	Disable Auto-Renew		AutoRenewQuantity1 or AutoRenewQuantity2	None	Set target element to zero
9	Enable Auto-Renew and set associated IPE parameters		For all IPE TYPs, confirm that an ITSO ID IPE is present and valid before proceeding. — TYP 22: — AutoRenewQuantity1 — TYP22ValueFlags/Auto-Renew (bit 0) [set this bit to	ActionQty	TYP 22: Value to add to NumberRemainingPasses TYP 23: zero TYP 24: zero TYP 25: Value to add to CountUsesAvailable TYP 26: Value to add 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)]		CountRemainingRidesJourneys
10	Update IPE	Add stored rides or journeys	TYP 22: NumberRemainingPasses 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

5.4 Data Correction Record, Code 0C04.

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.

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.)
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;

— Transaction type shall indicate data correction;

— IPE-ID shall be taken from the transaction record being amended;

— ProductRetailer shall be set to zero; and

— 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.

6. Interoperability List - POST Operating Parameters.

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.

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.

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 Interoperability list Transaction Record Format

Direction HOPS to POST

Table 98 - Interoperability List Transaction Record Format, HOPS to POST.

ITSO name	Format	Size (bytes)	Comment
InteroperabilityListIdentifier	HEX	2	Unique identity for this list created by the HOPS
ParameterTableRow	Byte	Variable	A row of a Parameter table as defined below

6.3 Interoperability List Response.

In response to successful receipt of all interoperability list's, 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
	RFU	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
	RFU	0A0E-0AFF	0B0E-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 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 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 zero.

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

6.7.1 Peak Times, Code 0A02.

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 0A02

ITSO name	Format	Size (bytes)	Comment
0A02_IIN	IIN	3	Defines IPE Embodiment (Product type) together with OID, TYP & PTYP
0A02_OID	OID16	2	Defines IPE Embodiment (Product type) together with IIN, TYP & PTYP
0A02_TYP	TYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & PTYP
0A02_PTYP	PTYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & TYP
0A02_DayType	HEX	1	Code indicating the type of day to which the record applies, defined below.
0A02_Start	BCDN	4	A time expressed in BCD, for example, 17:34 would be recorded as 1734.
0A02_End	BCDN	4	A time expressed in BCD, for example, 17:34 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.

Day type shall be a 1 byte HEX code defined as follows:

Table 101 - DayType Definition

HEX Code	Day type definition
0	Not 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.

Assigns a day type definition to specific dates.

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 0A03

ITSO name	Format	Size (bytes)	Comment
0A03_IIN	IIN	3	Defines IPE Embodiment (Product type) together with OID, TYP & PTYP
0A03_OID	OID16	2	Defines IPE Embodiment (Product type) together with IIN, TYP & PTYP
0A03_TYP	TYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & PTYP
0A03_PTYP	PTYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & TYP
0A03_Date	BCDN	4	Note that Date shall be transmitted as 8 characters in the form ddmmyyyy without delimiters, for example, 21/04/00 shall be transmitted as 21042000.
0A03_DayType	HEX	1	The defined day shall be treated as the day type identified by this element Codes are defined in table 101.

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.

6.7.3 Transfers, Code 0A04.

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 103Table 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 0A04.

ITSO name	Format	Size (bytes)	Comment
0A04_IIN	IIN	3	Defines IPE Embodiment (Product type) together with OID, TYP & PTYP
0A04_OID	OID16	2	Defines IPE Embodiment (Product type) together with IIN, TYP & PTYP
0A04_TYP	TYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & PTYP
0A04_PTYP	PTYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & TYP
0A04_MaxTransfers	HEX	1	Maximum quantity of transfers allowed
0A04_FareCap	VALI	2	Maximum fare
0A04_FareCapCurrencyCode	VALC	1	
0A04_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.

Table 104 - 'Valid same service' code definition

Code	Definition
0	RFU
1	No
2	Yes
3-FF	RFU

6.7.4 Rebates, code 0A05.

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 105Table 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 0A05

ITSO name	Format	Size (bytes)	Comment
0A05_IIN	IIN	3	Defines IPE Embodiment (Product type) together with OID, TYP & PTYP
0A05_OID	OID16	2	Defines IPE Embodiment (Product type) together with IIN, TYP & PTYP
0A05_TYP	TYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & PTYP
0A05_PTYP	PTYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & TYP
0A05_OID1	OID16	2	Participating operator 1
0A05_OID2	OID16	2	Participating operator 2
0A05_TimePeriod	HEX	1	Transfer time allowable from previous leg, in minutes
0A05_StartFare	VALI	2	Defines range of fares
0A05_EndFare	VALI	2	Defines range of fares
0A05_Rebate	VALI	2	Rebate amount
0A05_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.

6.7.5 Loyalty Rules, Code 0A06.

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 0A06.

ITSO name	Format	Size (bytes)	Comment
0A06_IIN	IIN	3	Defines IPE Embodiment (Product type) together with OID, TYP & PTYP
0A06_OID	OID16	2	Defines IPE Embodiment (Product type) together with IIN, TYP & PTYP
0A06_TYP	TYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & PTYP
0A06_PTYP	PTYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & TYP
0A06_PointsPerUnitCurrency	HEX	1	
0A06_CurrencyCode	VALC	1	
0A06_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, Code 0A07.

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 0A07

ITSO name	Format	Size (bytes)	Comment
0A07_FromCurrency	VALC	1	
0A07_ToCurrency	VALC	1	
0A07_EffectiveDate	BCDN	4	Date shall be transmitted as 8 characters in the form ddmmyyyy without delimiters, for example, 21/04/00 shall be transmitted as 21042000.
0A07_Factor	Signed floating point number	4	Single Precision Floating Point Notation

6.7.7 Zone Table Reference, Code 0A08.

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 0A08

ITSO name	Format	Size (bytes)	Comment
0A08_IIN	IIN	3	Defines IPE Embodiment (Product type) together with OID, TYP & PTYP
0A08_OID	OID16	2	Defines IPE Embodiment (Product type) together with IIN, TYP & PTYP
0A08_TYP	TYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & PTYP
0A08_PTYP	PTYP	1	Defines IPE Embodiment (Product type) together with IIN, OID, & TYP
0A08_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, Code 0A09.

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 0A09

ITSO name	Format	Size (bytes)	Comment
0A09_TableID	HEX	1	Table Identity
0A09_Bit	HEX	2	Encoded zone number, defined by the bit location in the bit mapped zone field according to LocDefType 204 or 205
0A09_Zone	HEX	2	Local zone code[10]

[10] zone code as printed on ticket and in fares information

6.7.9 Sale Price Table, Code 0A0A.

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 0A0A

ITSO name	Format	Size (bytes)	Comment
0A0A_IIN	IIN	3	
0A0A_OID	OID16	2	
0A0A_TYP	TYP	1	
0A0A_PTYP	PTYP	1	
0A0A_RFU	RFU	1	Reserved for future use by ITSO
0A0A_Class	HEX	1	
0A0A_PromotionCode	HEX	1	
0A0A_EntitlementCode	HEX	1	
0A0A_ConcessionaryClass	HEX	1	
0A0A_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.
0A0A_Price	VALI	2	
0A0A_PriceCurrencyCode	VALC	1	
0A0A_ValidityPeriodDays	HEX	2	Count of days
0A0A_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, Code 0A0B

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 0A0B

ITSO name	Format	Size (bytes)	Comment
0A0B_IIN_Index	HEX	1	
0A0B_IIN	IIN	3	

6.7.11 IPE Parameter Tables, Code 0A0C

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 0A0C.

Name	Format	Size	Comment
0A0C_Length	HEX	1	Length of the entire list, including ListLength
0A0C_IPE_EmbodimentParameterList	HEX	Variable	The Target IPE Embodiment Parameter List as defined herein

6.7.12 ISAM Management File Parameters

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.

Table 112a – ISAM Management File Parameters, Code 0A0D

Name	Format	Size	Comment
0A0D_Type	HEX	1	The File type (see ITSO TS1000 -8)
0A0D_IDentifier	HEX	2	The Identifier of the file as allocated or referenced by the AMS
0A0D_EF_Size	HEX	2	The number of data bytes in the file (see ITSO TS1000 -8)
0A0D_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 zero)
0A0D_File_Use	HEX	1	The file use as defined in table 112b
0A0D_VF_DATE	DATE	2	The date upon which this entry becomes active

Table 112b – 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 0A0D_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

7. POST to HOPS queries.

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	Offset	Format	Size	Comment
ITSOShell Reference Number	0	ISRN	9	
IPEID	9	IPEIDM	7	
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 use 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 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	Offset	Format	Size	Comment
ITSOShell Reference Number	0	ISRN	9	
IPEID	9	IPEIDM	7	
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 use 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 use 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	Offset	Format	Size	Comment
ITSOShell Reference Number	0	ISRN	9	
IPEID	9	IPEIDM	7	
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 use 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 use 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	Offset	Format	Size	Comment
ITSOShellReferenceNumber	0	ISRN	9	
IPEID	9	IPEIDM	7	
IPE_ISAMID	16	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	20	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.

7.2.5 Request Deposit Refund Rules, Code 0504.

Table 118 - Request Deposit Refund Rules, Code 0504

Name	Offset	Format	Size	Comment
ITSOShellReferenceNumber	0	ISRN	9	
IPEID	9	IPEIDM	7	
IPE_ISAMID	16	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	20	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.
0504_Flags	23		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.

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
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
HolderSurname	ASCII	20	Where necessary, this element shall be padded with trailing spaces
HolderOtherNames	ASCII	30	Where necessary, this element shall be padded with trailing spaces
HolderAddress1	ASCII	30	Where necessary, this element shall be padded with trailing spaces
HolderAddress2	ASCII	30	Where necessary, this element shall be padded with trailing spaces
HolderAddress3	ASCII	30	Where necessary, this element shall be padded with trailing spaces
HolderAddress4	ASCII	30	Where necessary, this element shall be padded with trailing spaces
HolderPostcode	ASCII	10	Where necessary, this element shall be padded with trailing spaces
HolderPhoneDay	ASCII	20	Where necessary, this element shall be padded with trailing spaces
HolderPhoneHome	ASCII	20	Where necessary, this element shall be padded with trailing spaces
HolderPhoneMobile	ASCII	20	Where necessary, this element shall be padded with trailing spaces
HolderEmail	ASCII	40	Where necessary, this element shall be padded with trailing spaces
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

Name	Format	Size	Comment
			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	
ConcessionaryPassIssuerCostCentre	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 zero.
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	
Language	HEX	1	
HolderID	HEX	4	
RoundingFlag	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to zero.
RoundingValueFlag	BMP	1	A 0.125 byte value, occupying bit 0 of the byte. Bits 1-7 of the byte shall be set to zero.
EntitlementExpiryDate	DATE	2.000	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 zero
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 zero
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

Name	Format	Size	Comment
			most significant byte. Bits 4-7 of the most significant byte shall be set to zero
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. 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.
ITSOShellReferenceNumberNonEncrypted	uISRN	16	Not encrypted. If CMD does not support ISRN then this element shall be set to zero.
SecondaryHolderID	HEX	4	
ForenameLength	HEX	1	Length of Forename, in bytes Set to zero if no Forename stored
Forename	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.
SurnameLength	HEX	1	Length of Surname, in bytes

Name	Format	Size	Comment
			Set to zero if no Surname stored
Surname	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.
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
ITSOShellReferenceNumber	ISRN	9	
IPEID	IPEIDM	7	
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 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
StartDateSTR	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
RecordFormatRevision	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 2 (two).
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	
HolderName	ASCII	50	
HolderAddress	ASCII	100	
HolderPostcode	ASCII	8	
HolderPhoneDay	ASCII	20	
HolderPhoneHome	ASCII	20	
HolderEmail	ASCII	40	
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. 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

Name	Format	Size	Comment
			which was use to create the IPE. The IPE instance data from a value group shall not be used here.
ITSOShellReferenceNumberNonEncrypted	uISRN	16	Not encrypted. If CMD does not support ISRN this element shall be set to zero.

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
ITSOShellReferenceNumber	ISRN	9	
IPEID	IPEIDM	7	
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	

ITSO Name	Format	Size bytes	Comment
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.

Table 127 - Deposit Refund Rules, Code 0D06

Name	Offset	Format	Size	Comment
ITSOShellReferenceNumber	0	ISRN	9	
IPEID	9	IPEIDM	7	
IPE_ISAMID	16	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	20	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.
0D06_Flags	23	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	24	HEX	1	Refer to Table 128.
OD06_RefundValue	25	VALI	2	Value to be refunded, subject to RefundRule. If no value specified then this element shall be set to zero (0).
0D06_RefundPercentage	27	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	Offset	Format	Size	Comment
Data Frame Sequence Number		HEX	3	Sequence number of the Data Frame in which the query message was received

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 ListDataListDataSize of zero.

Where the ListDataSize = zero and where only one rule code is implemented, then the element shall be omitted from the table.

Where more than one rule code is implemented but where only one has a ListDataSize = zero, then the element shall be omitted from the table if the selected rule code has a ListDataSize = zero.

Where there are multiple rule codes possible and more than one rule code that could be used has a ListDataSize = zero, the element record is sent with ListDataSize = zero 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.

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	0	HEX	1	The identity number of each parameter, obtained from the following definition tables
RuleCode	1	HEX	1	The rule code for each element, obtained from the following definition tables
ListDataSize	2	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 zero is permissible, in which case there shall not be a ListData element.
ListData	3	As required	variable	For those elements where a value is required, it shall be stored here.

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 IPE Format Version 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.

Table 131 - IPE TYP 2, Format Version 1

LD	Informa-tion only	Informa-tion only	Information only	Information only	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	determined upon IPE creation	1	0	-------
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-------
8	H	IPEBitMap	BMP	Always	determined upon IPE creation	1	0	-------
9	H	IPEFormat Revision	HEX	Always	set to value in embodiment spec	2	1	1
10	IPE	RemoveDa te	RDATE	Always	set to value in embodiment spec	2	1.00	value
11	IPE	ProductRet ailer	OID16	Always	determined upon IPE creation	1	0	-------
12	IPE	TYP2Flags	BMP	Always	set to value in embodiment spec	2	1.00	value

13	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
14	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
15	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
16	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
17	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
18	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
19	IPE	RFU	RFU	Always	set to zero (0)	4	0	-------
20	IPE	DepositMethodOfPayment	MOP	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	DepositCurrencyCode	VALC	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	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
23	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-------
24	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
25	INS	KID	HEX	Always	determined upon IPE creation	1	0	-------
26	INS	INP#	HEX	Always	set to zero (0)	4	0	-------
27	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-------
28	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-------
29	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-------
30	VH	VGLength	HEX	Always	determined upon IPE creation	1	0	-------
31	VH	VGBitMap	BMP	Always	determined upon IPE creation	1	0	-------
32	VH	VGFormat Revision	HEX	Always	set to value in embodiment spec	2	1	9
33	V	Transaction Type	HEX	Always	set to zero (0)	4	0	-------
34	V	TransactionSequenceNumber	TS#	Always	set to zero (0)	4	0	-------
35	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-------
36	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-------
37	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-------
38	V	Value	VALS	Always	set to zero (0)	4	0	-------

39	V	ValueCurrencyCode	VALC	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
40	V	CountJourneyLegs	HEX	Always	set to zero (0)	4	0	-------
41	V	Cumulative Fare	VALI	Always	set to zero (0)	4	0	-------
42	V	TYP2Value Flags	BMP	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1	null or value
43	V	Padding	PAD	If Required	set to zero (0)	4	0	-------
44	INS	KID	HEX	Always	determined upon IPE creation	1	0	-------
45	INS	INP#	HEX	Always	set to zero (0)	4	0	-------
46	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-------
47	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-------
48	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-------

Table 132 - IPE TYP 3, Format Version 1

LD	Informa-tion only	Informa-tion only	Information only	Information only	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	determined upon IPE creation	1	0	-------
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-------
8	H	IPEBitMap	BMP	Always	determined upon IPE creation	1	0	-------
9	H	IPEFormat Revision	HEX	Always	set to value in embodiment spec	2	1	1
10	IPE	RemoveDa te	RDATE	Always	set to value in embodiment spec	2	1.00	value
11	IPE	ProductRet ailer	OID16	Always	determined upon IPE creation	1	0	-------
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	determined upon IPE creation	1	0	-------
21	VH	VGFormat Revision	HEX	Always	set to value in embodiment spec	2	1	9
22	V	Transaction Type	HEX	Always	set to zero (0)	4	0	-------
23	V	TransactionSequenceNumber	TS#	Always	set to zero (0)	4	0	-------
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	VALI	Always	set to zero (0)	4	0	-------
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	Informa-tion only	Informa-tion only	Information only	Information only	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	determined upon IPE creation	1	0	-------
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-------
8	H	IPEBitMap	BMP	Always	determined upon IPE creation	1	0	-------
9	H	IPEFormat Revision	HEX	Always	set to value in embodiment spec	2	1	1
10	IPE	RemoveDa te	RDATE	Always	set to value in embodiment spec	2	1.00	value
11	IPE	ProductRet ailer	OID16	Always	determined upon IPE creation	1	0	-------
12	IPE	TYP4Flags	BMP	Always	set to value in embodiment spec	2	1.00	value

13	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
14	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
15	IPE	StartDateCTA	DATE	Always	determined upon IPE creation	1	0	-------
16	IPE	EndDate	DATE	Always	determined upon IPE creation	1	0	-------
17	IPE	DepositMethodOfPayment	MOP	Always	determined upon IPE creation	1	0	-------
18	IPE	DepositCurrencyCode	VALC	Always	determined upon IPE creation	1	0	-------
19	IPE	DepositVATSalesTax	VAT	Always	determined upon IPE creation	1	0	-------
20	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-------
21	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
22	INS	KID	HEX	Always	determined upon IPE creation	1	0	-------
23	INS	INP#	HEX	Always	set to zero (0)	4	0	-------
24	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-------
25	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-------
26	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-------
27	VH	VGLength	HEX	Always	determined upon IPE creation	1	0	-------
28	VH	VGBitMap	BMP	Always	determined upon IPE creation	1	0	-------
29	VH	VGFormatRevision	HEX	Always	set to value in embodiment spec	2	1	9

30	V	TransactionType	HEX	Always	set to zero (0)	4	0	-------
31	V	TransactionSequenceNumber	TS#	Always	set to zero (0)	4	0	-------
32	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-------
33	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-------
34	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-------
35	V	CumulativeAmount	VALI	Always	set to zero (0)	4	0	-------
36	V	ValueCurrencyCode	VALC	Always	determined upon IPE creation	1	0	-------
37	V	CountJourneyLegs	HEX	Always	set to zero (0)	4	0	-------
38	V	CumulativeFare	VALI	Always	set to zero (0)	4	0	-------
39	V	TYP4ValueFlags	BMP	Always	set to value in embodiment spec	2	1.00	value
40	V	Padding	PAD	If Required	set to zero (0)	4	0	-------
41	INS	KID	HEX	Always	determined upon IPE creation	1	0	-------
42	INS	INP#	HEX	Always	set to zero (0)	4	0	-------
43	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-------
44	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-------
45	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-------

Table 134 - IPE TYP 5, Format Version 1

LD	Informa-tion only	Informa-tion only	Information only	Information only	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	determined upon IPE creation	1	0	-------
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-------
8	H	IPEBitMap	BMP	Always	determined upon IPE creation	1	0	-------
9	H	IPEFormat Revision	HEX	Always	set to value in embodiment spec	2	1	1
10	IPE	RemoveDa te	RDATE	Always	set to value in embodiment spec	2	1.00	value
11	IPE	ProductRet ailer	OID16	Always	determined upon IPE creation	1	0	-------
12	IPE	TYP5Flags	BMP	Always	set to value in embodiment spec	2	1.00	value

13	IPE	WeeksPer Period	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	QuantityTra nsactions	HEX	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	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
16	IPE	DepositAm ount	VALI	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
17	IPE	StartDateC TA	DATE	Always	determined upon IPE creation	1	0	-------
18	IPE	EndDate	DATE	Always	determined upon IPE creation	1	0	-------
19	IPE	DepositMet hodOfPay ment	MOP	Always	determined upon IPE creation	1	0	-------
20	IPE	DepositCur rencyCode	VALC	Always	determined upon IPE creation	1	0	-------
21	IPE	DepositVA TSalesTax	VAT	Always	determined upon IPE creation	1	0	-------
22	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-------
23	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
24	INS	KID	HEX	Always	determined upon IPE creation	1	0	-------
25	INS	INP#	HEX	Always	set to zero (0)	4	0	-------
26	INS	ISAMIDCre ator	HEX	Always	determined upon IPE creation	1	0	-------
27	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-------

28	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-------
29	VH	VGLength	HEX	Always	determined upon IPE creation	1	0	-------
30	VH	VGBitMap	BMP	Always	determined upon IPE creation	1	0	-------
31	VH	VGFormat Revision	HEX	Always	set to value in embodiment spec	2	1	9
32	V	Transaction Type	HEX	Always	set to zero (0)	4	0	-------
33	V	Transaction SequenceN umber	TS#	Always	set to zero (0)	4	0	-------
34	V	DateTimeS tamp	DTS	Always	determined upon IPE creation	1	0	-------
35	V	ISAMIDMo difier	HEX	Always	determined upon IPE creation	1	0	-------
36	V	ActionSequ enceNumb er	HEX	Always	set to zero (0)	4	0	-------
37	V	CountOfTra nsactions	HEX	Always	set to zero (0)	4	0	-------
38	V	RFU	BIN	Always	set to zero (0)	4	0	-------
39	V	LastResetD ate	DATE	Always	set to current date and time	6	0	-------
40	V	ValueCurre ncyCode	VALC	Always	determined upon IPE creation	1	0	-------
41	V	TYP5Value Flags	BMP	Always	set to value in embodiment spec	2	1.00	value
42	V	RFU	RFU	Always	set to zero (0)	4	0	-------
43	V	CountJourn eyLegs	HEX	Always	set to zero (0)	4	0	-------
44	V	Padding	PAD	If Required	set to zero (0)	4	0	-------
45	INS	KID	HEX	Always	determined upon IPE creation	1	0	-------
46	INS	INP#	HEX	Always	set to zero (0)	4	0	-------
47	INS	ISAMIDCre ator	HEX	Always	determined upon IPE creation	1	0	-------

48	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-------
49	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-------

Table 135 – IPE TYP 14, Format Version 1

LD	Informa-tion only	Informa-tion only	Information only	Information only	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	determined upon IPE creation	1	0	-------
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-------
8	H	IPEBitMap	BMP	Always	determined upon IPE creation	1	0	-------
9	H	IPEFormat Revision	HEX	Always	set to value in embodiment spec	2	1	1
10	IPE	RemoveDa te	RDATE	Always	set to value in embodiment spec	2	1.00	value
11	IPE	ConcessionaryPassIssuerCostCentre	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 3	null or value
12	IPE	IDFlags	BMP	Always	set to value in embodiment spec	2	1.00	value

13	IPE	RoundingFlagsEnable	FLAG	Always	set to value in embodiment spec	2	1.00	value
14	IPE	RFU	RFU	Always	set to zero (0)	4	0.00	----
15	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1.00	value
16	IPE	HolderID	HEX	Always	determined upon IPE creation	1	0	-------
17	IPE	RoundingFlag	FLAG	Always	set to value in embodiment spec	2	1.00	value
18	IPE	RoundingValueFlag	FLAG	Always	set to value in embodiment spec	2	1.00	value
19	IPE	EntitlementExpiryDate	DATE	Always	Set to todays date plus the value in embodiment spec	5	2	Date offset value
20	IPE	RFU	RFU	Always	set to zero (0)	4	0	-------
21	IPE	DepositCurrencyCode	VALC	Always	determined upon IPE creation	1	0	-------
22	IPE	DepositMethodOfPayment	MOP	Always	determined upon IPE creation	1	0	-------
23	IPE	DepositVATSalesTax	VAT	Always	determined upon IPE creation	1	0	-------
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	EntitlementCode	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 4	null or value
26	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

27	IPE O	Secondary HolderID	HEX	according to bit map	determined upon IPE creation	1	0	-------
28	IPE O	HalfDayOf Week	BMP	according to bit map	determined upon IPE creation	1	0	-------
29	IPE O	ValidAtOrFrom	LOC1	according to bit map	determined upon IPE creation	1	0	-------
30	IPE O	ValidTo	LOC1	according to bit map	determined upon IPE creation	1	0	-------
31	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-------
32	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
33	INS	KID	HEX	Always	determined upon IPE creation	1	0	-------
34	INS	INP#	HEX	Always	set to zero (0)	4	0	-------
35	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-------
36	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-------
37	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-------

Table 136 - IPE TYP 16, Format Version 1

LD	Informa-tion only	Informa-tion only	Information only	Information only	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	determined upon IPE creation	1	0	-------
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-------
8	H	IPEBitMap	BMP	Always	determined upon IPE creation	1	0	-------
9	H	IPEFormat Revision	HEX	Always	set to value in embodiment spec	2	1	1
10	IPE	RemoveDa te	RDATE	Always	set to value in embodiment spec	2	1.00	value
11	IPE	ConcessionaryPassIssuerCostCentre	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 3	null or value
12	IPE	IDFlags	BMP	Always	set to value in embodiment spec	2	1.00	value

13	IPE	RoundingFlagsEnable	FLAG	Always	set to value in embodiment spec	2	1.00	value
14	IPE	RFU	RFU	Always	set to zero (0)	4	0	----
15	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1.00	value

16	IPE	DateOfBirth	DOB	Always	determined upon IPE creation	1	0	-------
17	IPE	Language	HEX	Always	determined upon IPE creation	1	0	-------
18	IPE	HolderID	HEX	Always	determined upon IPE creation	1	0	-------
19	IPE	RoundingFlag	FLAG	Always	set to value in embodiment spec	2	1.00	value
20	IPE	RoundingValueFlag	FLAG	Always	set to value in embodiment spec	2	1.00	value
21	IPE	EntitlementExpiryDate	DATE	Always	Set to todays date plus the value in embodiment spec	5	2	Date offset value
22	IPE	DepositMethodOfPayment	MOP	Always	determined upon IPE creation	1	0	-------
23	IPE	DepositVATSalesTax	VAT	Always	determined upon IPE creation	1	0	-------
24	IPE	ShellDepositMethodOfPayment	MOP	Always	determined upon IPE creation	1	0	-------
25	IPE	ShellDepositVATSalesTax	VAT	Always	determined upon IPE creation	1	0	-------
26	IPE	DepositCurrencyCode	VALC	Always	set to value in embodiment spec or set to value determined upon IPE creation[11]	1 or 2	0 or 1	Null or value
27	IPE	ShellDepositCurrencyCode	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

[11] (Note that the Rule Code used shall match the Rule Code used for the Deposit Value)

[12] (Note that the Rule Code used shall match the Rule Code used for the Shell Deposit Value)

28	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
29	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
30	IPE	Entitlement Code	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 4	null or value
31	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
32	IPE O	Secondary HolderID	HEX	according to bit map	determined upon IPE creation	1	0	-------
33	IPE O	ForenameLength	HEX	according to bit map	determined upon IPE creation	1	0	-------
34	IPE O	Forename	ASCII	according to bit map	determined upon IPE creation	1	0	-------
35	IPE O	SurnameLength	HEX	according to bit map	determined upon IPE creation	1	0	-------
36	IPE O	Surname	ASCII	according to bit map	determined upon IPE creation	1	0	-------
37	IPE O	HalfDayOf Week	BMP	according to bit map	determined upon IPE creation	1	0	-------
38	IPE O	ValidAtOrFrom	LOC1	according to bit map	determined upon IPE creation	1	0	-------
40	IPE O	ValidTo	LOC1	according to bit map	determined upon IPE creation	1	0	-------

40	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-------
41	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
42	INS	KID	HEX	Always	determined upon IPE creation	1	0	-------
43	INS	INP#	HEX	Always	set to zero (0)	4	0	-------
44	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-------
45	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-------
46	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-------

Table 137 - IPE TYP 17, Format Version 1

LD	Informa-tion only	Informa-tion only	Information only	Information only	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	determined upon IPE creation	1	0	-------
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-------
8	H	IPEBitMap	BMP	Always	determined upon IPE creation	1	0	-------
9	H	IPEFormat Revision	HEX	Always	set to value in embodiment spec	2	1	1
10	IPE	RemoveDa te	RDATE	Always	set to value in embodiment spec	2	1.00	value
11	IPE	ProductRet ailer	OID16	Always	determined upon IPE creation	1	0	-------
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	Informa-tion only	Informa-tion only	Information only	Information only	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	determined upon IPE creation	1	0	-------
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-------
8	H	IPEBitMap	BMP	Always	determined upon IPE creation	1	0	-------
9	H	IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	1
10	IPE	RemoveDate	RDATE	Always	set to value in embodiment spec	2	1.00	value
11	IPE	ProductRetailer	OID16	Always	determined upon IPE creation	1	0	-------
12	IPE	TYP22Flags	BMP	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2.00	null or value

13	IPE	RFU	RFU	Always	set to zero (0)	4	0	----
14	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1.00	value
15	IPE	IssueDate	DATE	Always	determined upon IPE creation	1	0	-------
16	IPE	ExpiryTime	TIME	Always	determined upon IPE creation	1	0	-------
17	IPE	RFU	RFU	Always	set to zero (0)	4	0	-------
18	IPE	AutoRenewQuantity1	BIN	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	Class	BIN	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	ValidityCode	UD	Always	set to value in embodiment specification or set t value determined upon creation	1 or 2	0 or 1	null or value
21	IPE	ValidityStartDTS	DTS	Always	determined upon IPE creation	1	0	-------
22	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
23	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
24	IPE	PartySizeAdult	HEX	according to bit map	determined upon IPE creation	1	0	-------
25	IPE	PartySizeChild	HEX	Always	determined upon IPE creation	1	0	-------
26	IPE	PartySizeConcession	HEX	Always	determined upon IPE creation	1	0	-------

27	IPE	RFU	RFU	Always	set to zero (0)	4	0	-------
28	IPE	AmountPaid CurrencyCode	VALC	Always	determined upon IPE creation	1	0	-------
29	IPE	AmountPaid	VALI	Always	determined upon IPE creation	1	0	-------
30	IPE	AmountPaid MethodOfPayment	MOP	Always	determined upon IPE creation	1	0	-------
31	IPE	AmountPaid VATSalesTax	VAT	Always	determined upon IPE creation	1	0	-------
32	IPE O	ConcessionaryPassIssuerCostCentre	HEX	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 3	null or value
33	IPE O	ValidAtOrFrom	LOC1	according to bit map	determined upon IPE creation	1	0	-------
34	IPE O	ValidTo	LOC1	according to bit map	determined upon IPE creation	1	0	-------
35	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
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	determined upon IPE creation	1	0	-------
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 zero (0)	4	0	-------
47	V	TransactionSequenceNumber	TS#	Always	set to zero (0)	4	0	-------
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	NumberRemainingPasses	BIN	Always	set to value in embodiment spec	2	1.00	value
52	V	TYP22ValueFlags	BMP	if value group present	set to value in embodiment spec	2	1.00	value
53	V	ExpiryDateSP	DATE	if value group present	Set to todays date plus the value in embodiment spec	5	2	Date offset value
54	V	ExpiryDateCurrent	DATE	Always	determined upon IPE creation	1	0	-------
55	V	RFU	RFU	Always	set to zero (0)	4	0	-------
56	V	Padding	PAD	If Required	set to zero (0)	4	0	-------
57	INS	KID	HEX	Always	determined upon IPE creation	1	0	-------
58	INS	INP#	HEX	Always	set to zero (0)	4	0	-------
59	INS	ISAMIDCreator	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	-------

Table 139 - IPE TYP 23, Format Version 1

LD	Informa-tion only	Informa-tion only	Information only	Information only	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	determined upon IPE creation	1	0	-------
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-------
8	H	IPEBitMap	BMP	Always	determined upon IPE creation	1	0	-------
9	H	IPEFormat Revision	HEX	Always	set to value in embodiment spec	2	1	1
10	IPE	RemoveDa te	RDATE	Always	set to value in embodiment spec	2	1.00	value
11	IPE	ProductRet ailer	OID16	Always	determined upon IPE creation	1	0	-------
12	IPE	TYP23Flag s	BMP	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1.00	null or value

13	IPE	RFU	RFU	Always	set to zero (0)	4	0	----
14	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1.00	value
15	IPE	RFU	RFU	Always	set to zero (0)	4	0	-------
16	IPE	IssueDate	DATE	Always	determined upon IPE creation	1	0	-------
17	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
18	IPE	ExpiryTime	TIME	Always	determined upon IPE creation	1	0	-------
19	IPE	RFU	RFU	Always	set to zero (0)	4	0	-------
20	IPE	Class	BIN	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	PartySizeAdult	HEX	according to bit map	determined upon IPE creation	1	0	-------
22	IPE	PartySizeChild	HEX	Always	determined upon IPE creation	1	0	-------
23	IPE	PartySizeConcession	HEX	Always	determined upon IPE creation	1	0	-------
24	IPE	RFU	RFU	Always	set to zero (0)	4	0	-------
25	IPE	AmountPaidCurrencyCode	VALC	Always	determined upon IPE creation	1	0	-------
26	IPE	AmountPaid	VALI	Always	determined upon IPE creation	1	0	-------
27	IPE	AmountPaidMethodOfPayment	MOP	Always	determined upon IPE creation	1	0	-------
28	IPE	AmountPaidVATSalesTax	VAT	Always	determined upon IPE creation	1	0	-------
29	IPE	Photocard Number	UD	Always	determined upon IPE creation	1	0	-------

30	IPE	Promotion Code	UD	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	ConcessionaryPassIssuerCostCentre	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 3	null or value
32	IPE O	RFU	RFU	according to bit map	set to zero (0)	4	0	-------
33	IPE O	TYP23Mode	HEX	according to bit map	set to value in embodiment spec	2	1.00	value
34	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
35	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 1.00	null or value
36	IPE O	ValueOfRideJourney	VALI	according to bit map	set to value in embodiment spec	2	2	value
37	IPE O	RFU	RFU	according to bit map	set to zero (0)	4	0	-------
38	IPE O	ValueOfRideJourneyCurrencyCode	VALC	according to bit map	set to value in embodiment spec	2	1	value
39	IPE O	Origin1	LOC1	according to bit map	determined upon IPE creation	1	0	-------
40	IPE O	Destination 1	LOC1	according to bit map	determined upon IPE creation	1	0	-------
41	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-------
42	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value

43	INS	KID	HEX	Always	determined upon IPE creation	1	0	-------
44	INS	INP#	HEX	Always	set to zero (0)	4	0	-------
45	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-------
46	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-------
47	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-------
48	VH	VGLength	HEX	if value group present	determined upon IPE creation	1	0	-------
49	VH	VGBitMap	BMP	if value group present	determined upon IPE creation	1	0	-------
50	VH	VGFormat Revision	HEX	if value group present	set to value in embodiment spec	2	1	9
51	V	Transaction Type	HEX	if value group present	set to zero (0)	4	0	-------
52	V	Transaction SequenceNumber	TS#	Always	set to zero (0)	4	0	-------
53	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-------
54	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-------
55	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-------
56	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
57	V	CountTransfers	HEX	if value group present	set to zero (0)	4	0	-------
58	V	TYP23ValueFlags	BMP	if value group present	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 1.00	null or value
59	V	RFU	RFU	Always	set to zero (0)	4	0	-------

60	V	Padding	PAD	If Required	set to zero (0)	4	0	-------
61	INS	KID	HEX	Always	determined upon IPE creation	1	0	-------
62	INS	INP#	HEX	Always	set to zero (0)	4	0	-------
63	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-------
64	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-------
65	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-------

Table 140 - IPE TYP 24, Format Version 1

LD	Inform a-tion only	Informa-tion only	Inform ation only	Informatio n only	Information only	LD	LD	LD
Elem ent Num ber	Target IPE Group	Target IPE ITSO Name	Targ et IPE Data Type	Included in target IPE?	Content generation rule	Rule Code	List Data Size	List Data
1	DIR	OID	EF + OID1 3	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	determined upon IPE creation	1	0	-------
6	DIR	EXP (Expiry Date)	DAT E	Dir Entry	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-------
8	H	IPEBitMap	BMP	Always	determined upon IPE creation	1	0	-------
9	H	IPEFormatRevi sion	HEX	Always	set to value in embodiment spec	2	1	1
10	IPE	RemoveDate	RDA TE	Always	set to value in embodiment spec	2	1.00	value
11	IPE	ProductRetailer	OID1 6	Always	determined upon IPE creation	1	0	-------
12	IPE	TYP24Flags	BMP	Always	set to value in embodiment spec	2	2.00	value
13	IPE	Class	BIN	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	RFU	RFU	Always	set to zero (0)	4	0	-------
15	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1.00	value
16	IPE	IssueDateTime	DTS	Always	determined upon IPE creation	1	0	-------
17	IPE	IssueLocation	LOC2	Always	determined upon IPE creation	1	0	-------
18	IPE	PartySizeAdult	HEX	according to bit map	determined upon IPE creation	1	0	-------
19	IPE	PartySizeChild	HEX	Always	determined upon IPE creation	1	0	-------
20	IPE	AmountPaidMethodOfPayment	MOP	Always	determined upon IPE creation	1	0	-------
21	IPE	AmountPaidCurrencyCode	VALC	Always	determined upon IPE creation	1	0	-------
22	IPE	AmountPaid	VALI	Always	determined upon IPE creation	1	0	-------
23	IPE	RFU	RFU	Always	set to zero (0)	4	0	-------
24	IPE	AmountPaidVATSalesTax	VAT	Always	determined upon IPE creation	1	0	-------
25	IPE	Origin2	LOC2	Always	determined upon IPE creation	1	0	-------
26	IPE	Destination2	LOC2	according to bit map	determined upon IPE creation	1	0	-------
27	IPE	RFU	RFU	Always	set to zero (0)	4	0	-------
28	IPE	DepartureDate	DATE	Always	determined upon IPE creation	1	0	-------
29	IPE	TicketNumber	UD	Always	determined upon IPE creation	1	0	-------
30	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
31	IPE	RFU	RFU	Always	set to zero (0)	4	0	-------
32	IPE	JourneyTypeCode	HEX	Always	determined upon IPE creation	1	0	-------
33	IPE	RouteNumber	HEX	Always	determined upon IPE creation	1	0	-------

34	IPE	ProfileCode	HEX	Always	determined upon IPE creation	1	0	-------
35	IPE	WarrantNumber	HEX	Always	determined upon IPE creation	1		-------
36	IPE	CustomerTransactionReference#	HEX	Always	determined upon IPE creation	1		-------
37	IPE O1	PhotocardNumber	UD	according to bit map	determined upon IPE creation	1	0	-------
38	IPE O1	TicketStatusCode	UD	according to bit map	determined upon IPE creation	1	0	-------
39	IPE O1	TypeOfTicketCode	UD	according to bit map	determined upon IPE creation	1	0	-------
40	IPE O1	RouteCode	UD	according to bit map	determined upon IPE creation	1	0	-------
41	IPE O1	ValidityCode	UD	according to bit map	determined upon IPE creation	1	0	-------
42	IPE EV	PartySizeAdultConcession	HEX	according to bit map	determined upon IPE creation	1	0	-------
43	IPE EV	PartySizeChildConcession	HEX	If Required	determined upon IPE creation	1	0	----
44	IPE EV	RFU	RFU	according to bit map	set to zero (0)	4	0	-------
45	IPE EV	DepartureTime	TIME	according to bit map	determined upon IPE creation	1	0	-------
46	IPE EV	RestrictionCode	UD	according to bit map	determined upon IPE creation	1	0	-------
47	IPE EV	RFU	RFU	according to bit map	set to zero (0)	4	0	-------
48	IPE EV	ArrivalBandStart	TIME	according to bit map	determined upon IPE creation	1	0	-------
49	IPE EV	RFU	RFU	according to bit map	set to zero (0)	4	0	-------
50	IPE EV	ArrivalBandEnd	TIME	according to bit map	determined upon IPE creation	1	0	-------
51	IPE EV	RFU	RFU	according to bit map	set to zero (0)	4	0	-------
52	IPE EV	DepartureBandStart	TIME	according to bit map	determined upon IPE creation	1	0	-------

53	IPE EV	RFU	RFU	according to bit map	set to zero (0)	4	0	-------
54	IPE EV	DepartureBand End	TIME	according to bit map	determined upon IPE creation	1	0	-------
55	IPE EV	RFU	RFU	according to bit map	set to zero (0)	4	0	-------
56	IPE EV	NotValidTime1	TIME	according to bit map	determined upon IPE creation	1	0	-------
57	IPE EV	RFU	RFU	according to bit map	set to zero (0)	4	0	-------
58	IPE EV	NotValidTime2	TIME	according to bit map	determined upon IPE creation	1	0	-------
59	IPE EV	RFU	RFU	according to bit map	set to zero (0)	4	0	-------
60	IPE EV	NotValidTime3	TIME	according to bit map	determined upon IPE creation	1	0	-------
61	IPE EV	RFU	RFU	according to bit map	set to zero (0)	4	0	-------
62	IPE EV	ArrivalTime	TIME	according to bit map	determined upon IPE creation	1	0	-------
63	IPE EV	RestrictedCode	UD	according to bit map	determined upon IPE creation	1	0	-------
64	IPE EV	RFU	RFU	according to bit map	set to zero (0)	4	0	-------
65	IPE EV	FirstUseTime	TIME	according to bit map	set to zero (0)	4	0	-------
66	IPE EV	ValidityTime	HEX	according to bit map	determined upon IPE creation	1	0	-------
67	IPE EV	IntermediatePoint	LOC2	according to bit map	determined upon IPE creation	1	0	-------
68	IPE EV	NotViaPoint	LOC2	according to bit map	determined upon IPE creation	1	0	-------
69	IPE EV	AssistanceType	HEX	according to bit map	determined upon IPE creation	0		-------
70	IPE R1	QuantityResBlocks	HEX	according to bit map	determined upon IPE creation	1	0	-------
71	IPE R1	ResBlock#	HEX	according to bit map	determined upon IPE creation	1	0	-------
72	IPE R1	ResDepartureDTS	DTS	according to bit map	determined upon IPE creation	1	0	-------

73	IPE R1	Seat	HEX	according to bit map	determined upon IPE creation	1	0	-------
74	IPE R1	Coach	UD	according to bit map	determined upon IPE creation	1	0	-------
75	IPE R1	SeatType1	UD	according to bit map	determined upon IPE creation	1	0	-------
76	IPE R1	ServiceIdentifier	ASCII	according to bit map	determined upon IPE creation	1	0	-------
77	IPE R1	UserDefined	UD	according to bit map	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 3	null or value
78	IPE R1	ResOrigin	LOC2	according to bit map	determined upon IPE creation	1	0	-------
79	IPE R1	ResDestination	LOC2	according to bit map	determined upon IPE creation	1	0	-------
80	IPE R1	BookingReferenceNumber	HEX	according to bit map	determined upon IPE creation	0		-------
81	IPE R2	QuantityResBlocks	HEX	according to bit map	determined upon IPE creation	1	0	-------
82	IPE R2	ResBlock#	HEX	according to bit map	determined upon IPE creation	1	0	-------
83	IPE R2	ResDepartureDTS	DTS	according to bit map	determined upon IPE creation	1	0	-------
84	IPE R2	Seat	HEX	according to bit map	determined upon IPE creation	1	0	-------
85	IPE R2	Coach	UD	according to bit map	determined upon IPE creation	1	0	-------
86	IPE R2	RFU	RFU	according to bit map	set to zero (0)	4	0	-------
87	IPE R2	SeatPositionCode	HEX	according to bit map	determined upon IPE creation	1	0	-------
88	IPE R2	SeatType2	HEX	according to bit map	determined upon IPE creation	1	0	-------
89	IPE R2	RFU	HEX	According to bit map	set to zero (0)	4	0	-------
90	IPE R2	TravelServiceNumber	ASCII	according to bit map	determined upon IPE creation	1	0	-------
91	IPE R2	ResOrigin	LOC2	according to bit map	determined upon IPE creation	1	0	-------

92	IPE R2	ResDestination	LOC2	according to bit map	determined upon IPE creation	1	0	-------
93	IPE R2	BookingReferenceNumber	HEX	according to bit map	determined upon IPE creation	1	0	-------
94	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-------
95	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
96	INS	KID	HEX	Always	determined upon IPE creation	1	0	-------
97	INS	INP#	HEX	Always	set to zero (0)	4	0	-------
98	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-------
99	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-------
100	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-------
101	VH	VGLength	HEX	if value group present	determined upon IPE creation	1	0	-------
102	VH	VGBitMap	BMP	if value group present	determined upon IPE creation	1	0	-------
103	VH	VGFormatRevision	HEX	if value group present	set to value in embodiment spec	2	1	8
104	V	TransactionType	HEX	if value group present	set to zero (0)	4	0	-------
105	V	TransactionSequenceNumber	TS#	Always	set to zero (0)	4	0	-------
106	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-------
107	V	ISAMIDModifier	HEX	Always	determined upon IPE creation	1	0	-------
108	V	ActionSequenceNumber	HEX	Always	set to zero (0)	4	0	-------
109	V	CountRemainingJourneys	HEX	if value group present	determined upon IPE creation	1	0	-------
110	V	TicketUseFlags	BMP	if value group present	set to zero (0)	4	0	-------

111	V	RFU	RFU	Always	set to zero (0)	4	0	-------
112	V	Padding	PAD	If Required	set to zero (0)	4	0	-------
113	INS	KID	HEX	Always	determined upon IPE creation	1	0	-------
114	INS	INP#	HEX	Always	set to zero (0)	4	0	-------
115	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-------
116	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-------
117	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-------

Table 141 - IPE TYP 25, Format Version 1

LD	Informa-tion only	Informa-tion only	Information only	Information only	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	determined upon IPE creation	1	0	-------
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-------
8	H	IPEBitMap	BMP	Always	determined upon IPE creation	1	0	-------
9	H	IPEFormat Revision	HEX	Always	set to value in embodiment spec	2	1	1
10	IPE	RemoveDa te	RDATE	Always	set to value in embodiment spec	2	1.00	value
11	IPE	ProductRet ailer	OID16	Always	determined upon IPE creation	1	0	-------
12	IPE	TYP25Flag s	BMP	Always	set to value in embodiment spec	2	1.00	value
13	IPE	RFU	RFU	Always	set to zero (0)	4	0	----

14	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1.00	value
15	IPE	RFU	RFU	Always	set to zero (0)	4	0	-------
16	IPE	IssueDate	DATE	Always	determined upon IPE creation	1	0	-------
17	IPE	ValidityStartDTS	DTS	Always	determined upon IPE creation	1	0	-------
18	IPE	RFU	RFU	Always	set to zero (0)	4	0	-------
19	IPE	ExpiryTime	TIME	Always	determined upon IPE creation	1	0	-------
20	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
21	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
22	IPE	MaxValueCurrencyCode	VALC	Always	determined upon IPE creation	1	0	-------
23	IPE	AmountPaidCurrencyCode	VALC	Always	determined upon IPE creation	1	0	-------
24	IPE	AmountPaid	VALI	Always	determined upon IPE creation	1	0	-------
25	IPE	AmountPaidMethodOfPayment	MOP	Always	determined upon IPE creation	1	0	-------
26	IPE	AmountPaidVATSalesTax	VAT	Always	determined upon IPE creation	1	0	-------
27	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
28	IPE O	AutoRenewQuantity2	HEX	according to bit map	set to value in embodiment spec	2	1.00	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	if value group present	determined upon IPE creation	1	0	-------
37	VH	VGBitMap	BMP	if value group present	determined upon IPE creation	1	0	-------
38	VH	VGFormat Revision	HEX	if value group present	set to value in embodiment spec	2	1	9
39	V	Transaction Type	HEX	if value group present	set to zero (0)	4	0	-------
40	V	TransactionSequenceNumber	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	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
45	V	TYP25ValueFlags	BMP	if value group present	set to value in embodiment spec	2	1.00	value
46	V	RFU	RFU	Always	set to zero (0)	4	0	-------

47	V	Padding	PAD	If Required	set to zero (0)	4	0	-------
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 142 - IPE TYP 26, Format Version 1

LD	Informa-tion only	Informa-tion only	Information only	Information only	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	26
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	determined upon IPE creation	1	0	-------
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
7	H	IPELength	HEX	Always	determined upon IPE creation	1	0	-------
8	H	IPEBitMap	BMP	Always	determined upon IPE creation	1	0	-------
9	H	IPEFormat Revision	HEX	Always	set to value in embodiment spec	2	1	1
10	IPE	RemoveDa te	RDATE	Always	set to value in embodiment spec	2	1.00	value
11	IPE	ProductRet ailer	OID16	Always	determined upon IPE creation	1	0	-------
12	IPE	RFU	RFU	Always	set to zero (0)	4	0	-------
13	IPE	PassbackTi me	HEX	Always	set to value in embodiment spec	2	1.00	value

14	IPE	TYP26Flags	BMP	Always	set to value in embodiment spec	2	1.00	value
15	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
16	IPE	RFU	RFU	Always	set to zero (0)	4	0	-------
17	IPE	IssueDate	DATE	Always	determined upon IPE creation	1	0	-------
18	IPE	ValidityStartDTS	DTS	Always	determined upon IPE creation	1	0	-------
19	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
20	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
21	IPE	Padding	PAD	If Required	set to zero (0)	4	0	-------
22	IPE O	IIN	IIN	If Required	set to value in embodiment spec	2	3	value
23	INS	KID	HEX	Always	determined upon IPE creation	1	0	-------
24	INS	INP#	HEX	Always	set to zero (0)	4	0	-------
25	INS	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-------
26	INS	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-------
27	INS	SEAL	BIN	Always	determined upon IPE creation	1	0	-------
28	VH	VGLength	HEX	if value group present	determined upon IPE creation	1	0	-------
29	VH	VGBitMap	BMP	if value group present	determined upon IPE creation	1	0	-------

30	VH	VGFormat Revision	HEX	if value group present	set to value in embodiment spec	2	1	9
31	V	Transaction Type	HEX	if value group present	set to zero (0)	4	0	-------
32	V	TransactionSequenceNumber	TS#	Always	set to zero (0)	4	0	-------
33	V	DateTimeStamp	DTS	Always	determined upon IPE creation	1	0	-------
34	V	ISAMIDModifier	HEX	if value group present	determined upon IPE creation	1	0	-------
35	V	ActionSequenceNumber	HEX	if value group present	set to zero (0)	4	0	-------
36	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
37	V	TYP26ValueFlags	BMP	if value group present	set to value in embodiment spec	2	1.00	value
38	V	RFU	RFU	if value group present	set to zero (0)	4	0	-------
39	V	Padding	PAD	If Required	set to zero (0)	4	0	-------
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 143 – IPE TYP 27, Format Version 1

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	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	determined upon IPE creation	1	0	-------
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
7	IPE	IPELength	HEX	Always	determined upon IPE creation	1	0	-------
8	IPE	IPEBitMap	HEX	Always	determined upon IPE creation	1	0	-------
9	IPE	IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	1
10	IPE	IssueDate	DATE	Always	determined upon IPE creation	1	0	-------
11	IPE	Sterling/Euro	FLAG	Always	determined upon IPE creation	1	0	-------
12	IPE	Child	FLAG	Always	determined upon IPE creation	1	0	-------
13	IPE	PassbackTime	HEX	Always	set to value in embodiment spec	2	1	value
14	IPE	AmountPaidMethodOfPayment	MOP	Always	determined upon IPE creation	1	0	-------
15	IPE	AmountPaid	VALI	Always	determined upon IPE creation	1	0	-------
16	IPE	TYP27PassFlags	BMP	Always	set to value in embodiment spec	2	1	value
17	IPE	GeoValidity/AreaValidity	LOC4/LOC3	Always	determined upon IPE creation	1	0	-------
18	IPE	Event1	HEX	Always	set to zero (0)	4	0	----
19	IPE	Event2	HEX	Always	set to zero (0)	4	0	-------
20	IPE	LastUseDTS	DTS	Always	set to current date and time	6	0	-------
21	IPE	PhotocardNumber	HEX	Always	determined upon IPE creation	1	0	----
22	IPE	TYP27ExpiryDate	HEX	Always	Determined upon IPE creation, or Set to todays date plus the value in embodiment spec	1 or 5	0 or 2	null or Date offset value
23	IPE	Seq#	HEX	Always	Set to zero (0)	4	0	-----
24	IPE	KID	HEX	Always	determined upon IPE creation	1	0	-------
25	IPE	INP#	HEX	Always	set to zero (0)	4	0	-------
26	IPE	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-------

27	IPE	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-------
28	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 check out code.

Table 144 – IPE TYP 28, Format Version 1

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	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	determined upon IPE creation	1	0	-------
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
7	IPE	IPELength	HEX	Always	determined upon IPE creation	1	0	-------
8	IPE	IPEBitMap	HEX	Always	determined upon IPE creation	1	0	-------
9	IPE	IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	1
10	IPE	IssueDate	DATE	Always	determined upon IPE creation	1	0	-------
11	IPE	Sterling/Euro	FLAG	Always	determined upon IPE creation	1	0	-------
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	AmountPaidMethodOfPayment	MOP	Always	determined upon IPE creation	1	0	-------
15	IPE	AmountPaid	VALI	Always	determined upon IPE creation	1	0	-------
16	IPE	TYP28PassFlags	BMP	Always	set to value in embodiment spec	2	1	value
17	IPE	AreaValidity	LOC3	Always	determined upon IPE creation	1	0	-------
18	IPE	RFU	HEX	Always	set to zero (0)	4	0	-------
19	IPE	LastUseDTS	DTS	Always	set to current date and time	6	0	-------
20	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

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**
21	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
22	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
23	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
24	IPE	ExpiryTick5	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	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
26	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
27	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
28	IPE	Seq#	HEX	Always	Set to zero (0)	4	0	-------
29	IPE	KID	HEX	Always	determined upon IPE creation	1	0	-------
30	IPE	INP#	HEX	Always	set to zero (0)	4	0	-------
31	IPE	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-------
32	IPE	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-------
33	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 #	**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

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**
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	determined upon IPE creation	1	0	-------
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
7	IPE	IPELength	HEX	Always	determined upon IPE creation	1	0	-------
8	IPE	IPEBitMap	HEX	Always	determined upon IPE creation	1	0	-------
9	IPE	IPEFormatRevision	HEX	Always	set to value in embodiment spec	2	1	1
10	IPE	IssueDate	DATE	Always	determined upon IPE creation	1	0	-------
11	IPE	Sterling/Euro	FLAG	Always	determined upon IPE creation	1	0	-------
12	IPE	Ticket/Coupon	FLAG	Always	determined upon IPE creation	1	0	-------
13	IPE	ScalingFactor	HEX	Always	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
14	IPE	AmountPaidMethodOfPayment	MOP	Always	determined upon IPE creation	1	0	-------
15	IPE	AmountPaid	VALI	Always	determined upon IPE creation	1	0	-------
16	IPE	TYP29PassFlags	BMP	Always	set to value in embodiment spec	2	1	value
17	IPE	AreaValidity	LOC3	Always	determined upon IPE creation	1	0	-------
18	IPE	RFU	HEX	Always	set to zero (0)	4	0	-------
19	IPE	TYP29UsageRecCode	HEX	Always	set to zero (0)	4	0	-------
20	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
21	IPE	UsageRec	HEX	Always	set to zero (0)	4	0	-------
22	IPE	ScaledQtyBackup	HEX	Always	determined upon IPE creation	1	0	-------
23	IPE	Seq#	HEX	Always	set to zero (0)	4	0	-------
24	IPE	KID	HEX	Always	determined upon IPE creation	1	0	-------
25	IPE	INP#	HEX	Always	set to zero (0)	4	0	-------
26	IPE	ISAMIDCreator	HEX	Always	determined upon IPE creation	1	0	-------

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
27	IPE	ISAMS#	HEX	Always	determined upon IPE creation	1	0	-------
28	IPE	SEAL	BIN	Always	determined upon IPE creation	1	0	-------

Table 145a – 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	determined upon IPE creation	1	0	-------
6	DIR	EXP (Expiry Date)	DATE	Dir Entry	set to value in embodiment spec or set to value determined upon creation	1 or 2	0 or 2	null or value
7	IPE	IPELength	HEX	Always	determined upon IPE creation	1	0	-------
8	IPE	IPEBitMap	HEX	Always	determined upon IPE creation	1	0	-------
9	IPE	IPEFormat Revision	HEX	Always	set to value in embodiment spec	2	1	2
10	IPE	IssueDate	DATE	Always	determined upon IPE creation	1	0	-------
11	IPE	Sterling/Euro	FLAG	Always	determined upon IPE creation	1	0	-------
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	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 2	null or value
17	IPE	RFU	HEX	Always	set to zero (0)	4	0	-------
18	IPE	TYP29PassFlags	BMP	Always	set to value in embodiment spec	2	1	value

19	IPE	AreaValidity	LOC3	Always	determined upon IPE creation	1	0	-------
20	IPE	JnyComDTS	DTS	Always	determined upon IPE creation	1	0	-------
21	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
22	IPE	TransferCounter	HEX	Always	set to zero (0)	4	0	-------
23	IPE	DailyJnyCounter	HEX	Always	set to zero (0)	4	0	-------
24	IPE	LastUseDTS	DTS	Always	set to zero (0)	4	0	-------
25	IPE	ScaledQtyBackup	HEX	Always	determined upon IPE creation	1	0	-------
26	IPE	Seq#	HEX	Always	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	-------

9. POST/HOPS to POST/HOPS messages, Miscellaneous Messages, Code 08xx.

9.1. Message Codes 08xx.

Table 146 - Miscellaneous Messages

Group	Table Type	HEX CODE	
Miscellaneous Messages	Embodiment Parameter Request Message	0800	
	Supplementary Data Message (Hash/Mac)	0801	
	CM or Shell unavailable advisory message	0802	
	RFU	0803 – 08FF	

9.2. Embodiment Parameter Request Message.

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.

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 ITSO Developers Guide DG0009.

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	*Tag value*	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-	*Tag value*	Calculated – the length of the elements in this	There may be no, one or more than one ITSO defined sub-groups in the

sub group (s)		group, excluding the length of this tag and this length element	message
ITSO defined element (s)	*Tag value*	Calculated	There may be one or more than one ITSO defined elements in the sub-group
Private data group (s)	*Tag value*	Calculated – the length of the elements in this group, excluding the length of this tag and this length element	There may be no, one or more than one user defined sub-groups in the message
ITSO OID	*Tag value*	Calculated	The OID of the entity responsible for the message should be recorded here
User defined element (s)	*Tag value*	Calculated	User defined data, identified by the OID of the originator included in the user defined sub-group data

9.4 CM or Shell unavailable advisory message, code 0802

It is strongly recommended that when a Shell Owner is aware that a CM or a Shell has been Hotlisted, blocked or is otherwise unavailable, this advisory message should be sent to all Product Owners who are recorded in the ISA as having current loaded products in the affected Shell.

When received by a HOPS, this message triggers a change in IPA Status to “Host Unavailable”.

Table 148 – CM or Shell unavailable advisory message, code 0802 – RecordFormatRevision = 1.

Name	Source	Format	Size	Comment
ITSOShellReferenceNumberNonEncrypted	HOPS	uISRN	16	Not encrypted.
UnavailabilityReasonCode	HOPS	HEX	1	Refer to table 149 below. May be set to zero (0) when reason codes are not sent.

Table 149– UnavailablityReasonCode code list

UnavailabilityReasonCode	Code value
Not used	0
CM destroyed	1
CM returned and faulty	2
CM blocked	3
Shell deleted from CM	4

Shell blocked	5
Other reason	6
RFU	7-255

---o0o---