

Host-to-Host Specifications



Secure Financial Transactions – Any Time, Any Place

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Document Control

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Chapter I: Online Participant Interface Specifications for Host-to-Host

Section I: Basic Transaction Support

This document defines the Host-to-Host Interface Specifications in detail. It provides clear understanding of the online and batch interfaces, certification information, protocols, and messages that enable evaluation and implementation of the Host-to-Host connection, and serves as a basic document for future enhancements. Unless indicated otherwise, this document addresses ISO-8583:1987 standard and standard Host-to-Host transaction set. This document also addresses underlying communication aspects. Host-to-Host Interface is capable of supporting both acquirers and issuers.

All terms defined in this section are valid in the context of this document:

Term	Description
Member	Bank or other institution connecting to the host via Host-to-Host connection
Host	Master connection that routes or processes transactions for participants.
Participant	One of the parties in a Host-to-Host connection (either host or the member).
Acquirer	Participant originating the message.
Issuer	Participant receiving the message.
Master Participant	Participant (in Host-to-Host connection) defining the business day and calculates settlement parameters.
Slave Participant	Participant (in Host-to-Host connection) that is not the Master Participant.

The following acronyms appear throughout this document:

Acronym	Meaning
ATM	Automated Teller Machine
AWK	Acquirer Working Key
BSC	Binary Synchronous Point-to-Point Communications Link Protocol
CVV	Card Verification Value
DE	Data Element
DKE	Dynamic Key Exchange
ISO-8583	International Standards Organization standards for messaging supported by the host. Unless specified otherwise, it refers to ISO-8583:1987 version.
IWK	Issuer Working Key

Acronym	Meaning
MAC	Message Authentication Code
MCC	Merchant Category Code
MTID	Message Type ID
OAR	List Account—Open Account Relationship
PAN	Primary Account Number
PIN	Personal Identification Number
POS	Point-of-Sale/Point-of-Service
PVV	PIN Verification Value
STAN	System Trace Audit Number
SVC	Switched Virtual Circuit
TLV	Tag-length-value
WK	Working Key
ZMK	Zone Master Key

System Definitions

Character Set

The Host-to-Host interface supports EBCDIC character set. An optional ASCII character set is available by request during project setup.

Master Participant, Cutover and Settlement Amounts

The Host-to-Host connection regards the participant who defines the business day (by sending a Cutover Message) and calculates the settlement amounts as the master participant. The Host-to-Host connection regards the participant who is not the master as the slave participant. Unless otherwise agreed, the master participant is the host and the slave participant is the member.

Message Authentication Code Usage

Message Authentication ensures the integrity of sensitive data elements within the message. The message originator generates the Message Authentication Code (MAC) based upon message elements defined in advance by the originator and recipient, and included into the message. The recipient verifies the MAC based on the same criteria set forth in generation. MACing occurs prior to normal processing of the message.

MACing is optional at the member's discretion and is not covered in this document.

Dynamic Key Exchange Support

Dynamic Key Exchange (DKE) allows the Host-to-Host connection to process key exchanges using an 0800 Network Management Message. DE-70 (bit 70) determines the type of key exchange performed. DE-48 (bit 48) transmits the key information.

DKE is optional at member's discretion.

File Update 03xx Messages Support

In certain system architectures (when the host performs a stand-in, a transaction pre-validation, etc. on behalf of issuer member) the host maintains a copy of member's card/account/balance database. File Update 03xx messages allow such a member to update certain information on the host side, in an online fashion. Examples are online change of card statuses and action codes (activation, blocking, de-blocking), balance synchronization etc.

File update messages are optional at member's discretion.

Transmission of Binary Data Elements

Depending on the character set, the Host-to-Host interface uses format specified in the following table for the data elements defined as binary in ISO-8583 standard:

Format Data Element	EBCDIC	ASCII
Bitmaps	16 EBCDIC char	16 ASCII char
PIN Block	16 EBCDIC char	16 ASCII char

Example:

PIN block with value 4ABF12C3D567980E

Transfer mode: 16 EBCDIC characters

F4 C1 C2 C6 F1 F2 C3 F3 C4 F5 F6 F7 F9 F8 F0 C5

Transfer mode: 16 ASCII characters

34 41 42 46 31 32 43 33 44 35 36 37 39 38 30 45

Differences to ISO-8583: 1987 Standard

Some of the data elements used in the Host-to-Host Interface Specification are defined differently than in ISO-8583:1987 standard. The following table lists changed data elements:

Data Element	Description	Difference
DE-11	STAN	Does not remain unchanged for all messages throughout transaction life cycle.
DE-41	Card Acceptor Terminal ID	No special characters allowed—an8 used instead of ans8.
DE-42	Card Acceptor ID	No special characters allowed—an15 used instead of ans15.
DE-43	Card Acceptor Location	No special characters allowed—an40 used instead of ans40.
DE-101	File Update code	No special characters allowed—an..17 used instead of ans..17.

Message Definitions

General Message Structure

The following table defines the message structure, based on ISO-8583 standard:

Message Element	Description
MTID	Message Type Identifier.
Bitmap	Primary bitmap.
Data	Concatenated data elements.

Example:

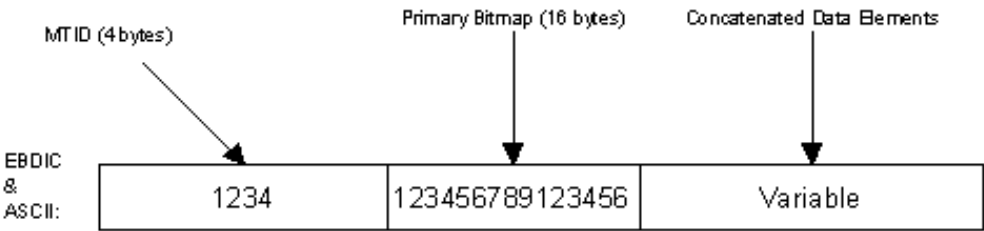


Figure 1 General Message Structure flowchart

Message Types

The Host-to-Host interface supports the following message types (a subset of ISO-8583 message set):

MTID	Significance
0100/0110	Authorization messages
0120/0121/0130	Authorization advice messages
0200/0210	Financial transaction messages
0220/0221/0230	Financial advice messages
0400/0410	Reversal messages
0420/0421/0430	Reversal messages
0800/0810	Network Management messages

Bitmap

The bitmap consists of 64 bits numbered from the left starting with 1. The value of each bit signifies presence (1) or absence (0) in the message of the data element associated with that particular bit.

The first bit within a bitmap, when set to 1, denotes the presence of an additional contiguous 64-bit bitmap.

Note: The bitmap always transfers as 16 characters.

Example:

Bitmap for Reversal Request message (bits 2, 3, 4, 5, 7, 9, 11, 12, 13, 15, 22, 32, 37, 38, 39, 41, 42, 43, 49, and 50 are used)

Binary value:

```
000000000111111111222222222333333333344444444455555555566666666
1234567890123456789012345678901234567890123456789012345678901234
```

```
0111101010111010000001000000000100001110111000001100000000000000
```

Hexadecimal value (8 bytes):

```
7A BA 04 01 0E E0 C0 00
```

Transferred as 16 EBCDIC characters (hexadecimal):

```
F7 C1 C2 C1 F0 F4 F0 F1 F0 C5 C5 F0 C3 F0 F0 F0
```

Transferred as 16 ASCII characters (hexadecimal):

```
37 41 42 41 30 34 30 31 30 45 45 30 43 30 30 30
```

Message Matching

Matching Response to Request

Use a combination of the following mandatory fields to match a response to the request message:

- Cardholder Number (DE-2)
- STAN (DE-11)
- Local transaction date (DE-12)
- Local transaction time (DE-13)

Match Follow-up Messages to the Original Message

A Follow-up Message is any request message sent after, and related to, the original request. For example, when the original request is an 0100 message, the follow-up message can be a Reversal (0420/0421) or a Financial Transaction (0200 and/or 0220/0221).

Generally, the issuer participant should perform a matching process of follow-up messages toward any previously received (related) messages. If a match occurs between the follow-up message and a previously received message, internal action can be required based on the type of message received.

Use a combination of the following mandatory fields to match follow-up messages to the original message:

- Cardholder Number (DE-2)
- Local transaction date (DE-12)
- Local transaction time (DE-13)
- Card Acceptor Terminal ID (DE-41)
- Retrieval Reference Number (DE-37)

As an alternative, use Original Data Elements (DE-90) if they are present in the message.

Issuer Processing

Issuer Message Processing

Issuer Message Processing consists of processing incoming requests and advices, generating responses as required, and generating and processing network management and file update requests and responses.

In summary, the issuer must implement:

- Receiving and processing of following messages:
 - 0800 Network Management request
 - 0100 Authorization request
 - 0120 Authorization advice
 - 0121 Authorization advice, repeated
 - 0200 Financial request
 - 0220 Financial advice
 - 0221 Financial advice, repeated
 - 0400 Reversal request
 - 0420 Reversal request
 - 0421 Reversal request, repeated
 - 0810 Network Management response
- Generating and sending of following messages:
 - 0810 Network Management response
 - 0110 Authorization response
 - 0130 Authorization advice response
 - 0210 Financial response
 - 0230 Financial advice response
 - 0410 Reversal response
 - 0430 Reversal response
 - 0800 Network Management request
- Taking necessary recovery actions

It is assumed that the issuer is capable of generating the appropriate Response Codes based on issuer criteria such as validation of PIN, CVV, PVV, expiration date, card/account existence and status, issuer limits, and account balances.

Acquirer Processing

Card Acceptance

The acquirer decides whether to accept certain card brands at a particular touch-point based on touch-point type and location, card brand, Primary Account Number (PAN), and service code.

Acquirer Message Processing

Acquirer Message Processing consists of sending requests and advices and processing the resulting responses, receiving network management requests and generating responses, and generating network management requests and receiving the resulting responses.

In summary, the acquirer must implement:

- Generating and sending of the following messages
 - 0800 Network Management request
 - 0100 Authorization request
 - 0120 Authorization advice
 - 0121 Authorization advice, repeated
 - 0200 Financial request
 - 0220 Financial advice
 - 0221 Financial advice, repeated
 - 0400 Reversal request
 - 0420 Reversal request
 - 0421 Reversal request, repeated
 - 0810 Network Management response
- Receiving and processing of following messages
 - 0810 Network Management response
 - 0110 Authorization response
 - 0130 Authorization Advice response
 - 0210 Financial response
 - 0230 Financial Advice response
 - 0410 Reversal response
 - 0430 Reversal response
 - 0420 Reversal advice response
 - 0800 Network Management request
- Taking necessary recovery actions

Message Flow

Network Management Messages

Logon (DE-70=1), Logoff (DE-70=2) and Echo (DE-70=301) network management messages can be originated by either party, at any time. The message can be initiated by the operator, the scheduled event, or as a part of recovery process.

The Cutover (DE-70=201) Network Management Message is initiated by the master participant once per business day.

Note: Dynamic Key Exchange Messages are optional.

Normal Completion—Logon, Logoff, and Echo Messages

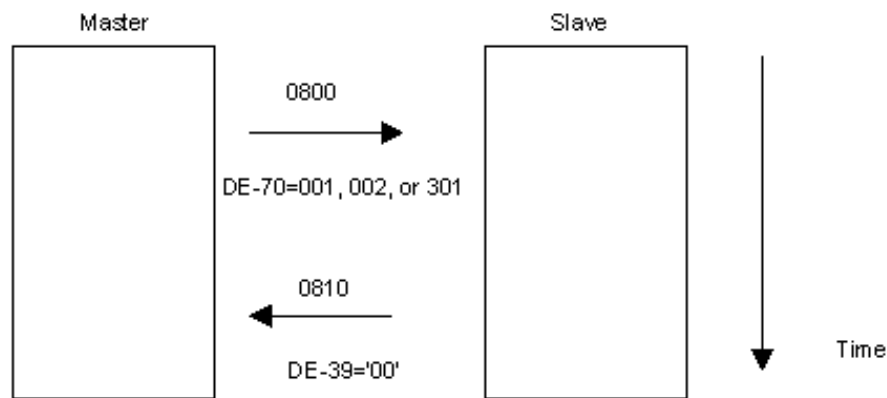


Figure 2 Normal Completion (Logon, Logoff, And Echo) flowchart

Response Code 00 indicates Normal Completion. Upon receipt, the session becomes active and other messages are available for exchange.

Normal Completion Cutover

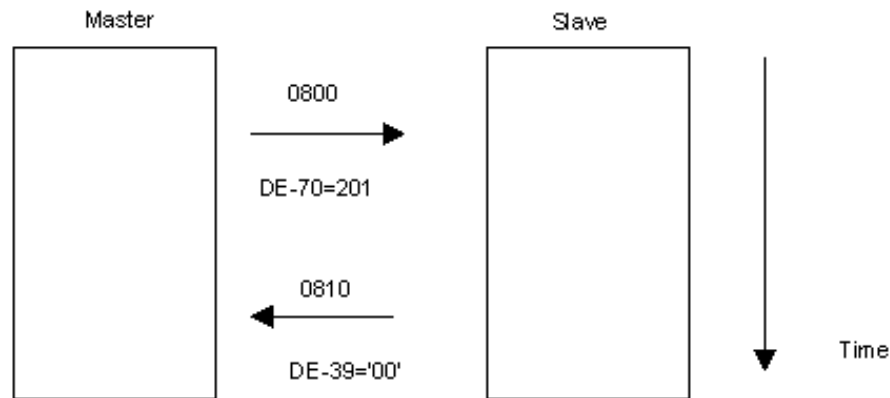


Figure 3 Normal Completion (Cutover) flowchart

Response Code 00 indicates Normal Completion. Upon receipt of cutover message, the slave participant should set its business date to the value received in DE-15 (new business date).

Exception Processing—No Response

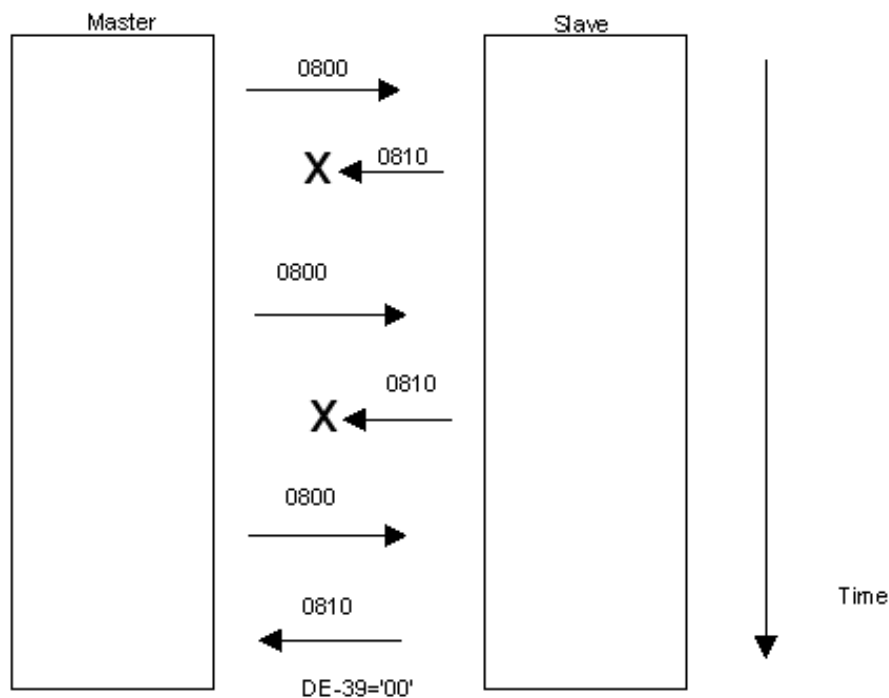


Figure 4 Exception Processing (No Response) flowchart

In case no response is received, the originator of the message repeats the request in regular intervals (no other messages can be exchanged) until normal completion occurs. Session status changes accordingly on the message originator's side.

Exception Processing—Message Declined

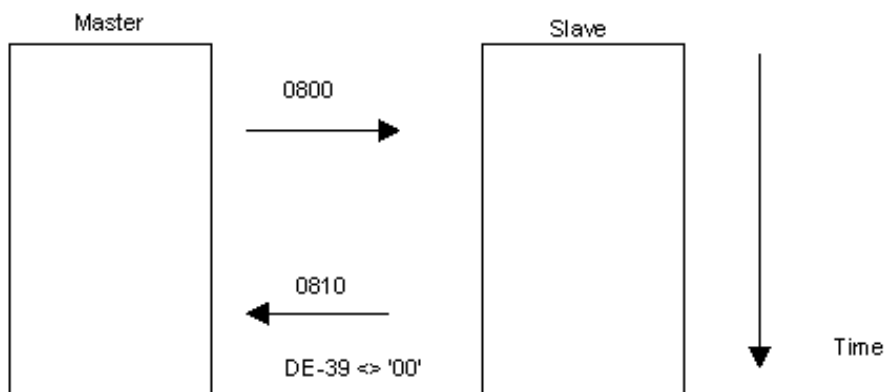


Figure 5 Exception Processing (Message Declined) flowchart

In case of declined network management message (DE-39 <> 00), the session terminates and the session status changes accordingly on both sides. No messages can be exchanged until next normal completion of logon message.

Authorization Messages

Either party can originate the Authorization Request (MTID = 0100) and corresponding follow-up requests (042x Reversal Request, 0200 or 0220 Financial Transaction, and 012x Authorization Advice Request). The originator is called the “acquirer.” Although in most of the cases the host is the request originator (acquirer), for some optional features, the member can also originate request messages.

Authorization Normal Completion

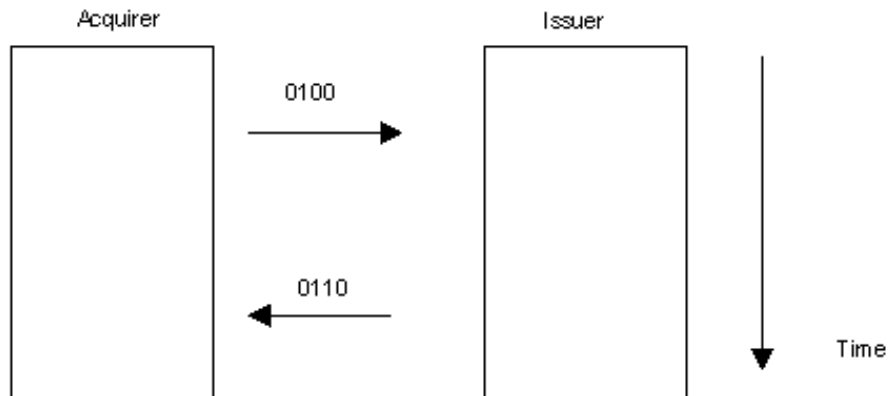


Figure 6 Authorization Normal Completion flowchart

Upon receipt of 0100 request, the issuer performs transaction validation and financial authorization, sets proper Response Code and approval number (where applicable), and sends a response back to the acquirer.

Upon receipt of the 0110 response, the acquirer performs action as specified by Response Code (DE-39).

Authorization Reversal Processing

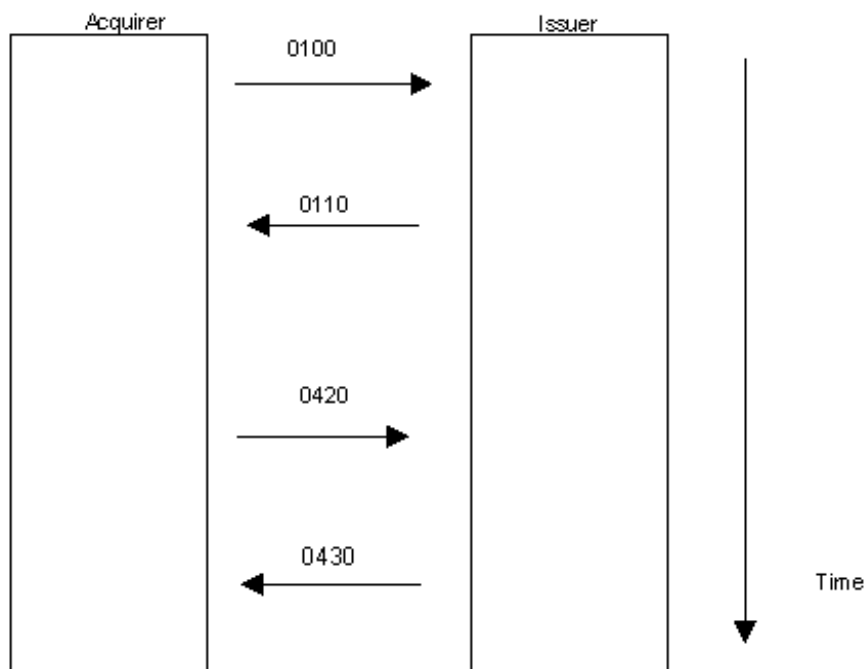


Figure 7 Authorization Reversal Processing flowchart

The acquirer initiates the Reversal Request (0420 Message).

Upon receipt of the Reversal Request, the issuer matches it to previous messages and, based on matching results, performs either a full or a partial reversal.

Authorization Reversal Timeout Processing

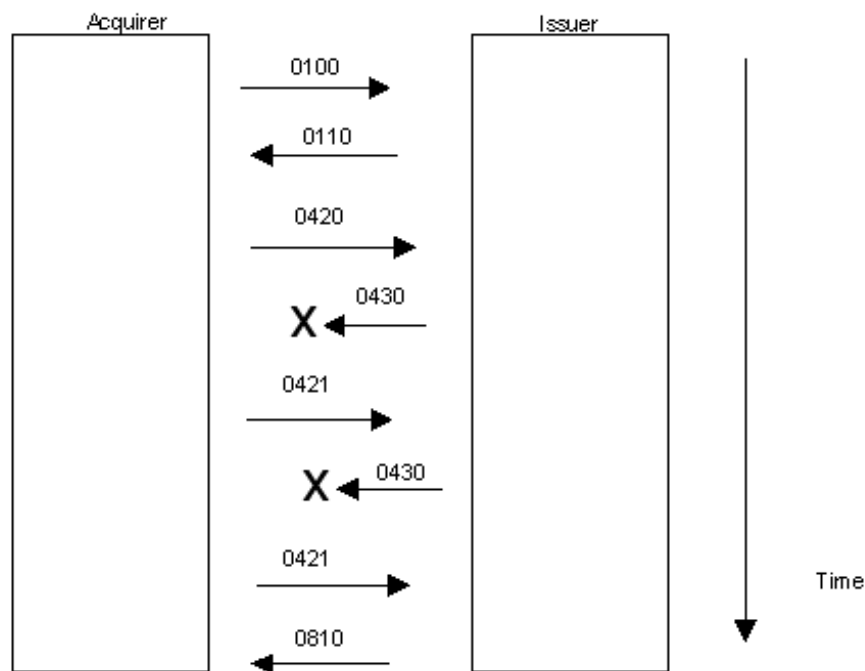


Figure 8 Authorization Reversal Timeout Processing flowchart

If a Reversal Timeout appears, the acquirer creates and repeats a 0421 Reversal Request in regular intervals until the number of repetitions reaches a predefined value* or until it receives the 0430 response.

Upon receipt of the 042x request, the issuer matches this message to possible previous messages and perform the appropriate action based on matching results.

Note: * Current number of repetitions is 5 (including first 0420).

Authorization Advice Normal Completion

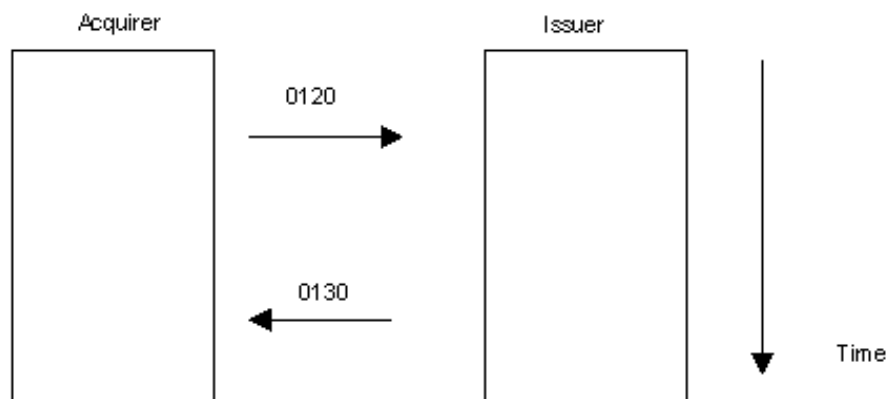


Figure 9 Authorization Advice Normal Completion flowchart

Upon receipt of the 0120 request, the issuer matches this message to possible previous messages and performs the appropriate action based on matching results and Response Code in the 0120 message

Authorization Advice Timeout Processing

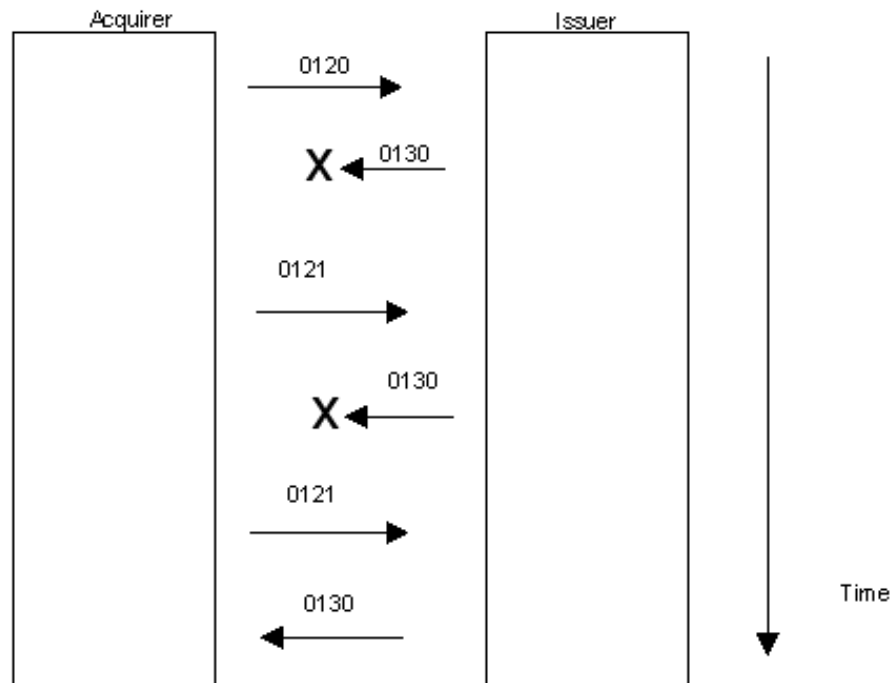


Figure 10 Authorization Advice Timeout Processing flowchart

If a timeout appears, the acquirer creates and repeats 0121 Authorization Advice Requests in regular intervals until the number of repetitions reaches a predefined value* or until it receives the 0130 Response.

Upon receipt of the 012x Request, the issuer matches this message to possible previous messages and performs the appropriate action based on matching results and the Response Code in 012x message.

Note: * Current number of repetitions is 5 (including first 0420).

Financial Transaction Messages

Either party can originate the Financial Transaction Request (MTID = 0200) and corresponding follow-up requests (042x Reversal Request, 0220 Financial Transaction). The originator is called the “acquirer.” Although in most cases the host is the originator (acquirer), for some optional features, the member can also originate request messages.

Financial Transaction Normal Completion

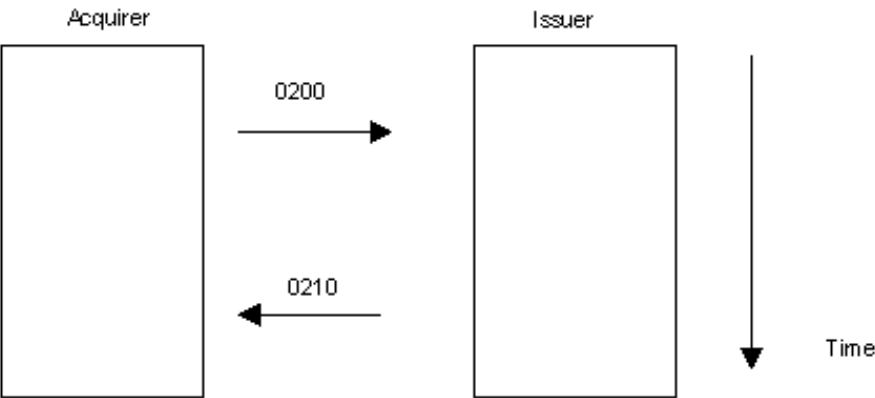


Figure 11 Financial Transaction Normal Completion flowchart

Upon receipt of a 0200 Request, the issuer tries to match it to possible previous messages, performs Transaction Validation and Financial Authorization, sets the proper Response Code and Approval Number (where applicable), and sends the response back to the acquirer.

Upon receipt of the 0210 Response, the acquirer performs the action as specified by Response Code (DE-39).

Note: Matching is necessary since it is possible to have authorization message sent before financial (usual in POS environment).

Financial Transaction Reversal Processing

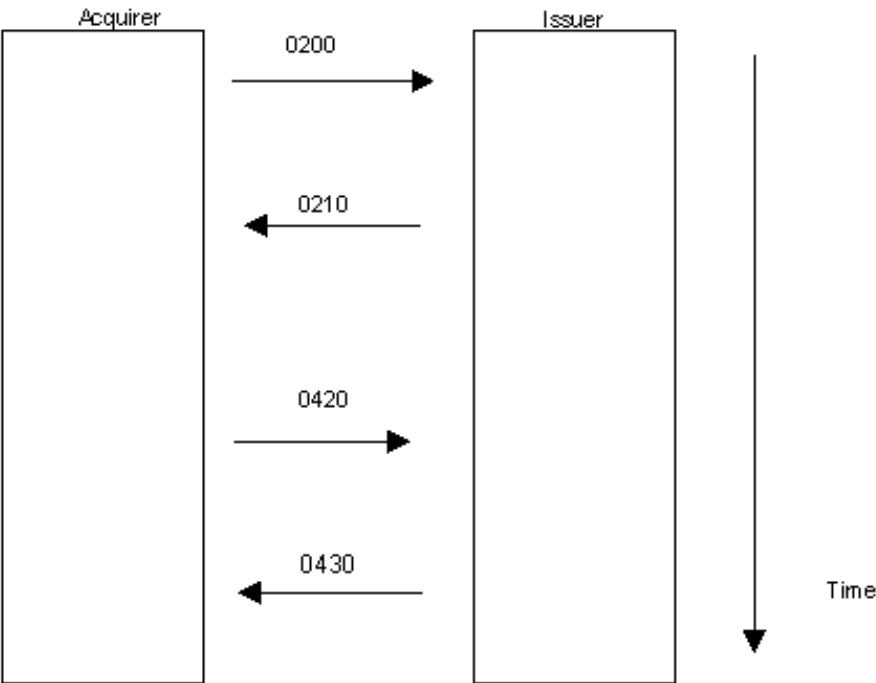


Figure 12 Financial Transaction Reversal Processing flowchart

The acquirer initiates the Reversal Request (0420) Message. It can be a full or a partial reversal.

Upon receipt of the Reversal Request, the issuer matches it to possible previous messages and, based on matching results, performs the appropriate action.

Financial Transaction Reversal Timeout Processing

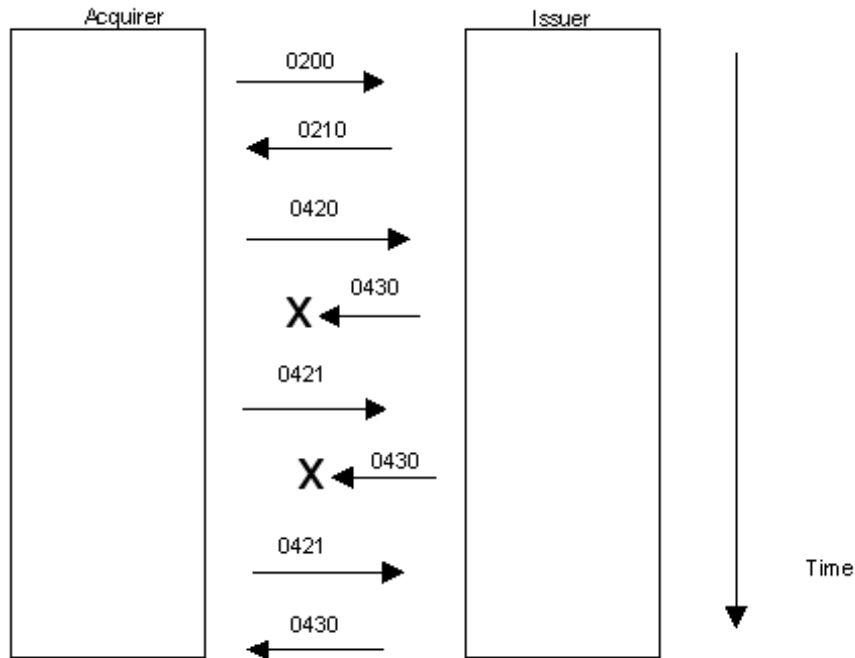


Figure 13 Financial Transaction Reversal Processing flowchart

If Reversal Timeout appears, the acquirer creates and repeats a 0421 Reversal Request in regular intervals until the number of repetitions reaches a predefined* value or until it receives the 0430 Response.

Upon receipt of the 042x Request, the issuer matches this message to possible previous messages and performs the appropriate action based on matching results.

Note: * Current number of repetitions is 5 (including first 0420).

Financial Transaction Advice Normal Completion

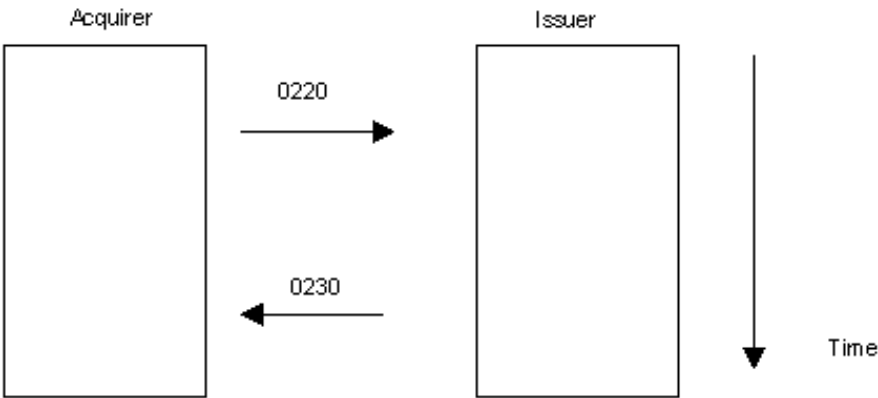


Figure 14 Financial Transaction Advice Normal Completion flowchart

Upon receipt of the 0220 Request, the issuer matches this message to possible previous messages and performs the appropriate action based on matching results and the Response Code in 0220 Message

Note: Matching is necessary since it is possible to have an Authorization and/or Reversal or Financial Message sent before Financial Advice (usual in POS environment).

Financial Transaction Advice Timeout Processing

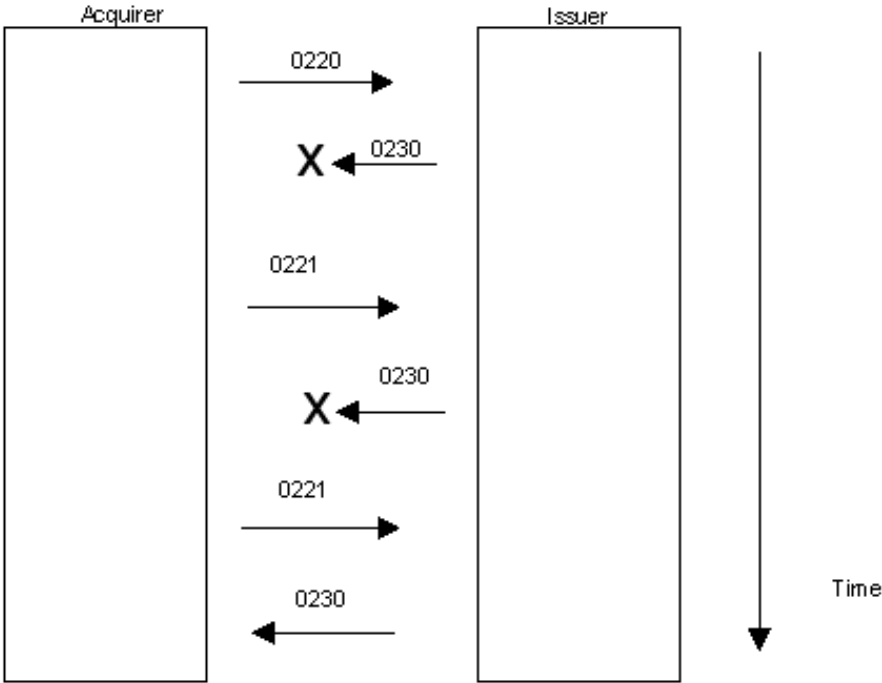


Figure 15 Financial Transaction Advice Timeout Processing flowchart

If a timeout appears, the acquirer creates and repeats a 0221 Authorization Advice Request in regular intervals until the number of repetitions reaches a predefined* value or until it receives the 0230 Response.

Upon receipt of the 022x Request, the issuer matches this message to possible previous messages and performs the appropriate action based on matching results and the Response Code in 022x Message

Note: * Current number of repetitions is 5 (including first 0420).

Reversal Messages

The Reversal Request (MTID = 042x) can be initiated by either party provided, that the party is the acquirer. Although in most cases the host is the originator (acquirer), for some optional features, the member can also originate request messages.

Reversal Normal Completion

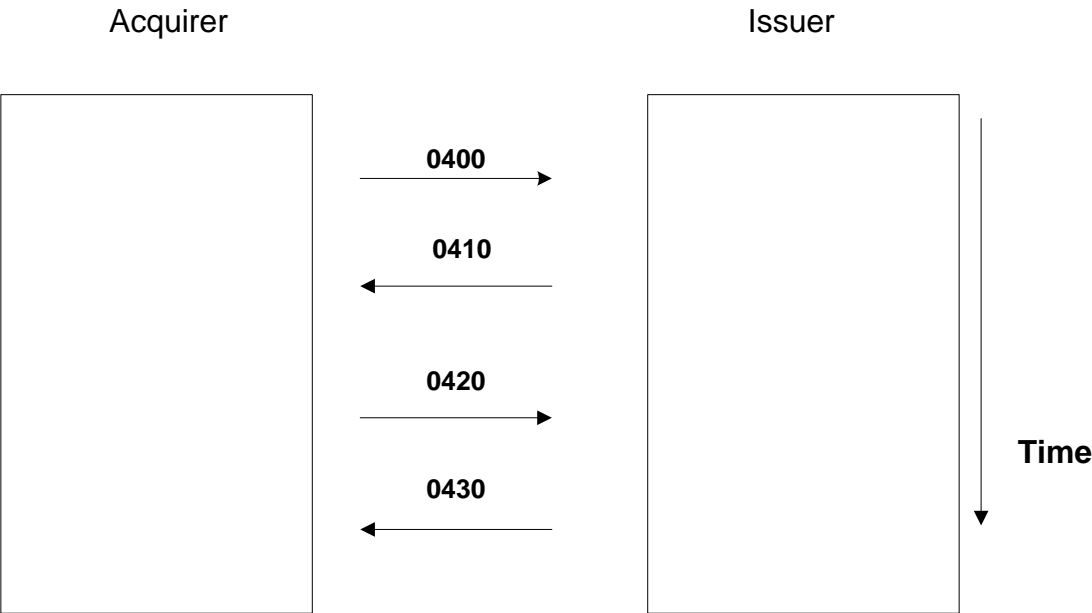


Figure 16 Reversal Normal Completion Flowchart

The acquirer always initiates the Reversal Request (0400 or 0420 Message). It can be a full or a partial request.

Upon receipt of the Reversal Request, the issuer matches it to previous messages and, based on matching results, performs the appropriate action.

Note: In case the original request (0100 or 0200) did not reach the issuer at all, a Stand Alone Reversal appears on the issuer side. Ignore the Stand Alone Reversal.

Reversal Timeout Processing

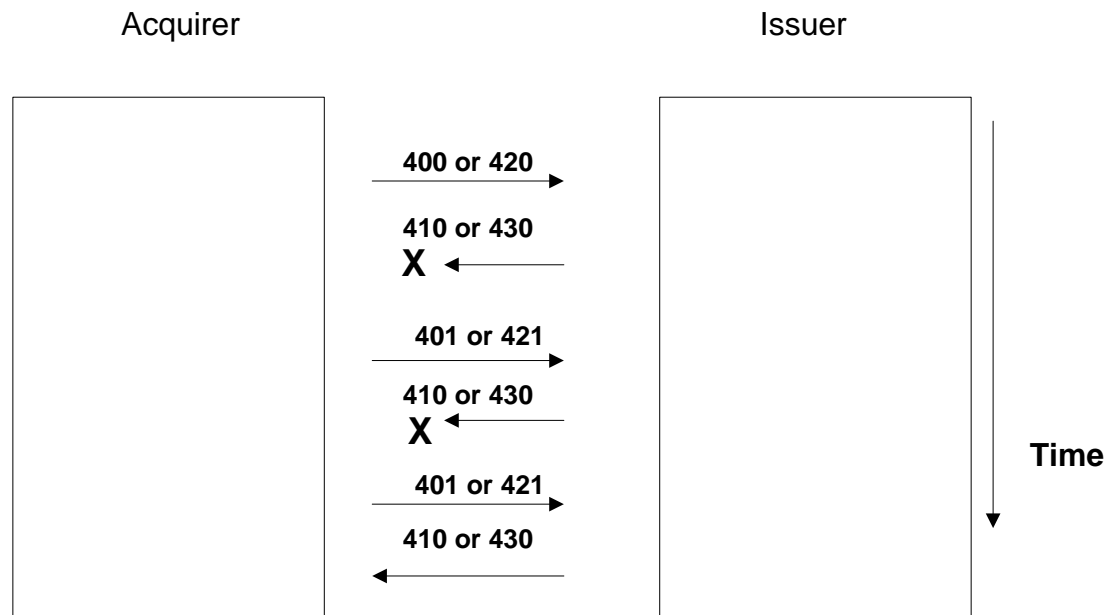


Figure 17 Reversal Timeout Processing flowchart

If a timeout appears, the acquirer creates and repeats a 0421 Reversal Request in regular intervals until the number of repetitions reaches a predefined value* or until it receives the 0410/0430 Response.

Upon receipt of the 04xx Request, the issuer matches this message to possible previous messages and performs the appropriate action based on matching results.

Note: * Current number of repetitions is 5 (including first 0420).

Message Format

All message format definition tables use the symbols defined in the following table:

Message Types and Corresponding Data Elements	
Symbol	Meaning
M	Mandatory.
M+	Mandatory, echoed from request.
C	Conditional.
C+	Conditional, echoed from request.
C*	Conditional, value can change.
O	Optional.
O+	Optional, echoed from request.
R	Reserved for future use.

Message Types and Corresponding Data Elements	
Symbol	Meaning
-	Not used.
n/a	Not applicable.

Network Management Messages			
Bit	Data Element MTID	0800	0810
1	Secondary bitmap	M	M
7	Transmission date/time	M	M
11	STAN	M	M
15	Date, settlement	C	C+
24	Network Identifier	O	O
32	Acquirer institution ID	O	O+
39	Response code	-	M
48	Key Data (Optional—Dynamic Key Exchange)	O	-
64	MAC Code (Optional—MACing)	R	R
70	NMIC	M	M
128	MAC Code 2 (Optional—MACing)	R	R

Authorization Messages					
Bit	Data Element MTID	0100	0110	0120	0130
1	Secondary Bitmap	C	C	-	C
2	Primary Account Number	C	C+	C	C+
3	Processing Code	M	M+	M	M+
4	Amount, transaction	M	M+	M	M+
5	Amount, settlement	C	M+	C	M+
7	Date/time, transmission	M	M	M	M
8	Fee, cardholder billing	R	R	R	R
9	Conversion rate, settlement	C	C+	C	C+
11	STAN	M	M+	M	M+
12	Time, local transaction	M	M+	M	M+
13	Date, local transaction	M	-	M	-
14	Date, expiration	C	-	C	-
15	Date, settlement	C	C+	C	C+
18	Merchant type	M	-	M	-
19	Acquirer Country Code	M	-	M	-

Authorization Messages					
Bit	Data Element MTID	0100	0110	0120	0130
22	POS entry mode	M	-	M	-
24	Network Identifier	O	O	O	O
25	POS condition code	M	-	M	-
26	POS PIN capture code	C	-	C	-
32	Acquirer institution ID	M	M+	M	M+
35	Track 2 data	C	-	C	-
37	Retrieval reference number	M	-	M	-
38	Authorization number	-	M	-	M
39	Response code	-	M	M	M
41	Card acceptor terminal ID	M	-	M	-
42	Card acceptor ID	M	-	M	-
43	Card acceptor name/location	M	-	M	-
49	Currency code, transaction	M	M+	M	M+
50	Currency code, settlement	C	C+	C	C+
52	PIN block	C	-	C	-
54	Additional amounts	-	C	-	C
60	Account 1 Qualifier	C	-	C	-
61	Account 2 Qualifier	C	-	C	-
64	MAC code	R	R	R	R
102	Account 1 identification	C	C	C	C
103	Account 2 identification	C	C	C	C
120-123	Extended Data	C	C*	C	C*
124	Additional transaction data	M	-	M	-
125-127	Private Use	C	C*	C*	C*
128	MAC code 2	R	R	R	R

Financial Messages					
Bit	Data Element MTID	0200	0210	0220	0230
1	Secondary bitmap	C-	C	C-	C
2	Primary Account Number	C	C+	C	C+
3	Processing code	M	M+	M	M+
4	Amount, transaction	M	M+	M	M+
5	Amount, settlement	C	C+	C	C+
7	Date/time, transmission	M	M	M	M
8	Fee, cardholder billing	R	R	R	R

Financial Messages					
Bit	Data Element MTID	0200	0210	0220	0230
9	Conversion rate, settlement	C	C+	C	C+
11	STAN	M	M+	M	M+
12	Time, local transaction	M	M+	M	M+
13	Date, local transaction	M	M+	M	M+
14	Date, expiration	C	-	C	-
15	Date, settlement	C	C+	C	C+
18	Merchant type	M	-	M	-
19	Acquirer Country Code	M	-	M	-
22	POS entry mode	M	-	M	-
24	Network Identifier	O	O	O	O
25	POS condition code	M	-	M	-
26	POS PIN capture code	C	-	C	-
32	Acquirer institution ID	M	M+	M	M+
35	Track 2 data	C	-	C	-
37	Retrieval reference number	M	M+	M	M+
38	Authorization number	-	C	C	C
39	Response code	-	M	M	M
41	Card acceptor terminal ID	M	-	M	-
42	Card acceptor ID	M	-	M	-
43	Card acceptor name/location	M	-	M	-
49	Currency code, transaction	M	M+	M	M+
50	Currency code, settlement	C	C+	C	C+
52	PIN Block	C	-	C	-
54	Additional amounts	-	C	-	C
55	ICC Related Data	C	C	C	-
60	Account 1 Qualifier	C	-	C	-
61	Account 2 Qualifier	C	-	C	-
64	MAC code	R	R	R	R
102	Account 1 identification	C	C	C	C
103	Account 2 identification	C	C	C	C
120-123	Extended Data	C	C*	C	C*
124	Additional transaction data	C	-	C	-
125-127	Private use	C	C*	C	C*
128	MAC Code 2	R	R	R	R

Reversal Messages					
Bit	Data Element MTID	0400	0410	0420	0430
1	Secondary bitmap	C	C	C	C
2	Primary Account Number	M	M+	M	M+
3	Processing code	M	M+	M	M+
4	Amount, transaction	M	M+	M	M+
5	Amount, settlement	C	C+	C	C+
7	Date/time, transmission	M	M	M	M
8	Fee, cardholder billing	R	R	R	R
9	Conversion rate, settlement	C	C+	C	C+
11	STAN	M	M+	M	M+
12	Time, local transaction	M	M+	M	M+
13	Date, local transaction	M	M+	M	M+
14	Date, expiration	C	-	C	-
15	Date, settlement	C	C+	C	C+
19	Acquirer Country Code	M	-	M	-
22	POS entry mode	M	-	M	-
24	Network Identifier	O	O	O	O
25	POS condition code	M	-	M	-
26	POS PIN capture code	C	-	C	-
32	Acquirer institution ID	M	M+	M	M+
35	Track 2 data	O	-	O	-
37	Retrieval reference number	M	M+	M	M+
38	Authorization number	C	C+	C	C+
39	Response code	M	M	M	M
41	Card acceptor terminal ID	M	-	M	-
42	Card acceptor ID	M	-	M	-
43	Card acceptor name/location	M	-	M	-
49	Currency code, transaction	M	M+	M	M+
50	Currency code, settlement	C	C+	C	C+
55	ICC Related Data	C	C	C	C
64	MAC code	R	R	R	R
90	Original data elements	O	O+	O	O+
95	Replacement amounts	C	-	C	-
102	Account I identification	C	C	C	C

Reversal Messages					
Bit	Data Element MTID	0400	0410	0420	0430
I03	Account 2 identification	C	C	C	C
I20-I23	Extended data	C	C*	C	C*
I28	MAC code 2	R	R	R	R

Data Element Definitions

Data element definitions use the following data elements types:

Data Element Types	
Type	Significance
A	Alphabetical, A-Z, a-z.
N	Numeric, 0-9
S	Special characters
An	Alphabetic and numeric
As	Alphabetic and special
Ns	Numeric and special
ans	Alphabetic, numeric, and special
YY	Year
MM	Month
DD	Day
Hh	Hour
mm	Minute
Ss	Second
LLVAR	Indicates variable format, length as two digits.
LLLVAR	Indicates variable format, length as three digits.
<n>	Fixed length of <number> characters.
.. <n>< td=""><td>Variable length up to maximum <number > characters. Must be preceded by type, for example ans..28.</td></n><>	Variable length up to maximum <number > characters. Must be preceded by type, for example ans..28.
X	<div><div>C</div>Credit</div> <div><div>D</div>Debit</div> <div>Must be associated to numeric amount element, for example x + n 6.</div>
B	Binary (bit) representation.
Z	Track data, as defined in ISO 7811 and ISO 7813.

Unless indicated otherwise, following rules and presumptions apply:

- All fixed length data elements of type n are right justified with leading 0s.
- All fixed length data elements of B type are left justified with trailing 0s.

- All other fixed length data elements are left justified with trailing *blanks*.
- All data elements are counted from left to right with leftmost position set as number 1.

Data Elements

Data elements are listed in ascending order as they appear in the bitmaps.

DE-1 Secondary Bitmap	
Format	
Type	b 64 transferred as 16 bytes (EBCDIC or ASCII characters).
Description	Bitmap consists of 64 bits numbered from the left starting with 1. The value of each bit signifies presence (1) or absence (0) in the message of the data element (DE-65 to DE-128) associated with that particular bit.
Field Edits	None.
Constraints	C: Element is present only if message contains any of data elements from range DE-65 to DE-128.

DE-2 Primary Account Number, PAN	
Format	LLVAR
Type	n..19
Description	A series of digits that identify customer account or relationship. It is mandatory for all 04xx messages.
Field Edits	If present, it should be echoed in response and all subsequent messages.
Constraints	This element is required when DE-35 (Track 2) is not present. This element may be present at any time if the Primary Account Number is available.

DE-3 Processing Code	
Format	
Type	n6

DE-3 Processing Code	
Description	<p>A series of digits that describes the type of transaction and the accounts affected by the transaction. It consists of three, two-digit subfields:</p> <p>Digit 1 and 2: Transaction Code:</p> <ul style="list-style-type: none"> 00 Purchase of goods/services 01 Cash withdrawal 09 Goods and services with cash disbursement 17 Cash advance 20 Credit, refund 21 Deposit 22 Credit adjustment 26 Original credit transaction 27 Prepaid load 31 Balance inquiry 40 Transfer 47 Prepaid load 48 Card activation 49 Card de-activation 85 Recurring Payment 89 POS DCC inquiry 90 Extended transaction type** 91 PIN try counter reset 92 PIN change <p>Digit 3 and 4: From Account Type*</p> <ul style="list-style-type: none"> 00 Unspecified/unknown 10 Savings 20 Checking 30 Credit card <p>Digit 5 and 6: To Account Number*</p> <ul style="list-style-type: none"> 00 Unspecified/unknown 10 Savings 20 Checking 30 Credit card <p>It is mandatory for all 01xx, 02xx, 04xx messages.</p> <p>Notes:</p> <p>* Other values can be used for optional features.</p> <p>**See the Optional Extended Transaction section for more information.</p>
Field Edits	When present, it should be echoed in response and all subsequent messages.
Constraints	

DE-4 Transaction Amount	
Format	
Type	n12

DE-4 Transaction Amount

Description	The amount of funds requested (for either debit or credit) in the currency of the source location of the transaction. Number of decimal places is implied by the Transaction Currency Code (DE-49). It is mandatory for 01xx, 02xx, and 04xx messages.
Field Edits	For balance inquiry, amount should be 0. When present it should be echoed in response and all subsequent messages.
Constraints	

DE-5 Settlement Amount

Format	
Type	n12
Description	The amount of funds expressed in the settlement currency (DE-50) by multiplying transaction amount (DE-4) with settlement currency conversion rate (DE-9).
Field Edits	When present, it should be echoed in response and all subsequent messages.
Constraints	C: The field is required when field DE-50 is present.

DE-7 Transmission Date and Time

Format	
Type	n10 (MMDDhhmmss)
Description	The time the message entered into the interchange system. It resets for each outgoing message and is expressed in GMT. It is mandatory for all message types.
Field Edits	
Constraints	

DE-8 Billing Fee Amount

Format	
Type	n8
Description	The amount of online fee. The fee rules are identified later.
Field Edits	
Constraints	R: Reserved for future use.

DE-9 Settlement Conversion Rate

Format	
Type	n8

DE-9 Settlement Conversion Rate

Description	The factor that converts transaction amount (DE-4) into settlement amount (DE-5). Transaction amount is multiplied by the settlement conversion rate to determine settlement amount. This field is in format ABBBBBBB where A denotes decimal position from the right and BB...B denotes conversion factor. For example, 40012345 denotes 1.2345.
Field Edits	When present it should be echoed in response and all subsequent messages.
Constraints	C: The field is required if DE-50 is present.

DE-11 Systems Trace Audit Number

Format	
Type	n6
Description	A unique number (within one business day) that matches response message to request message. It is not intended to remain the same throughout the life of a transaction (e.g. STANs in the reversal and/or store/forward messages differ mutually, and differ from the STAN of the original transaction). STAN is mandatory for all messages.
Field Edits	A message sender sets the STAN and it is echoed by the message receiver.
Constraints	

DE-12 Local Transaction Time

Format	
Type	n6 (hhmmss)
Description	The local time at which the transaction began at the card acceptor location. The data element is mandatory for 01xx and 02xx messages.
Field Edits	When present it should be echoed in response and all subsequent messages.
Constraints	

DE-13 Local Transaction Date

Format	
Type	n4 (MMDD)
Description	The local date that the transaction began at the card acceptor location. The data element is mandatory for 01xx and 02xx messages.
Field Edits	When present it should be echoed in response and all subsequent messages.
Constraints	

DE-14 Expiration Date

Format	
Type	n4 (yy mm)
Description	The year and month after which a card expires.

DE-14 Expiration Date

Field Edits	
Constraints	This element is required when DE-35 (Track 2) is not present. This element may be present at any time if the Expiration Date is available.

DE-15 Settlement Date

Format	
Type	n4 (MMDD)
Description	The month and the day on which the parties settle the transaction.
Field Edits	Field is mandatory if MTID is 0800 and DE-70=201 (cutover message). This field may be present messages at any time if available.
Constraints	C: Field is present if a) Field DE-50 is present or b) MTID is 0800 and DE-70=201 (cutover message).

Note: In case of cutover message, DE-15 represents new business date.

DE-18 Merchant Category Code (MCC)

Format	
Type	n4
Description	<p>MCC is four-digit code in accordance with the Visa/MasterCard MCC definitions. The data element is mandatory for 01xx and 02xx request messages. It is never present in response messages.</p> <p>Note: Most frequently used values are:</p> <p>6011 ATM Cash withdrawal.</p> <p>6010 Over the counter cash advance.</p> <p>4814 Airtime purchase.</p>
Field Edits	
Constraints	

DE-19 Acquirer Country Code

Format	
Type	n3
Description	ISO numeric code that identifies the country where the transaction was performed.
Field Edits	
Constraints	

DE-22 Point of Service Entry Mode

Format	
--------	--

DE-22 Point of Service Entry Mode	
Type	n3
Description	<p>The code describing the way to enter PAN (card number) and PIN at a touch-point.</p> <p>Data element consists of two sub-fields:</p> <p>PAN Entry Mode</p> <ul style="list-style-type: none"> 01 Manual. 02 Magnetic stripe read. 05 ICC, track data reliable 07 Contactless Chip 80 Fall-back 90 Full and unaltered magnetic stripe read (enables CVV validation). 91 Contactless Magstripe 95 ICC, track data unreliable <p>PIN Entry Mode</p> <ul style="list-style-type: none"> 0 Unspecified. 1 PIN entry capability. 2 No PIN entry capability. 6 PIN pad inoperative. <p>The data element is mandatory for 01xx, 02xx, and 04xx request messages. It can be present in response messages when the issuer changes the value. (e.g. issuer downgrade of the transaction that was originally acquired as chip.)</p>
Field Edits	None.
Constraints	

DE-23 Member Number	
Format	
Type	n..3
Description	DE-23 (Card Sequence Number) distinguishes among separate cards having the same PAN.
Field edits	None
Constraints	This field is right justified with leading zeros.

DE-24 Network Identifier	
Format	
Type	n..3
Description	
Field edits	
Constraints	Identifies a single international network or card issuer. Identifies a particular EFT interchange communications network of acquirers and card issuers sharing under a business agreement.

DE-25 Point of Service Condition Code

Format	
Type	n2
Description	<p>Two-digit code indicating conditions at touch-point:</p> <p>00 Normal.</p> <p>01 Customer not present.</p> <p>02 Unattended terminal (CAT, ADM).</p> <p>03 Merchant suspicious.</p> <p>05 Customer present, card not present.</p> <p>07 Telephone request.</p> <p>08 MO/TO request.</p> <p>52 mCommerce request.</p> <p>59 eCommerce request.</p> <p>The data element is mandatory for 01xx, 02xx, and 04xx request messages. It is never present in response messages.</p>
Field Edits	
Constraints	

DE-26 Point of Service PIN Capture Code

Format	
Type	n2
Description	<p>Two-digit code indicating the maximum number of PIN characters accepted by the acquiring touch-point that constructs the PIN data.</p> <p>Valid values:</p> <p>04-12</p>
Field Edits	
Constraints	C: For pass-through acquiring connection, data element is present in PIN based transaction requests i.e. whenever DE-52 is present. For issuer connection, data element is not used.

DE-32 Acquiring Institution Identification Code

Format	LLVAR
Type	n..11
Description	Identifies the acquiring institution for the transaction, or its agent. The host defines this value. The data element is mandatory for 01xx, 02xx, and 04xx request messages. It is optional for 08xx messages.
Field Edits	When present, it is set in request and echoed in response and all subsequent messages.
Constraints	O: Member can choose whether to use DE-32 in 08xx messages or not.

DE-35 Track 2 Data

Format	LLVAR
--------	-------

DE-35 Track 2 Data

Type	z..37
Description	The information encoded on Track 2 of the magnetic stripe of the plastic card (per ISO 7813) used for the transaction, excluding start and end sentinel and LRC characters.
Field Edits	
Constraints	C: Track 2 Data is present for all 01xx, 02xx requests, provided card was swiped at the touch-point i.e. when POS Entry Mode (DE-22 sub-field 1) = 90 or 02 and Track 2 is used. O: Track 2 Data is optional for 0420 Reversal Requests.

DE-37 Retrieval Reference Number

Format	
Type	an12
Description	The reference, assigned by the acquirer, to identify a transaction uniquely. It remains unchanged for all messages throughout the life of a transaction and matches the original message with reversal and/or store/forward messages. The data element is mandatory for 01xx, 02xx, and 04xx request messages.
Field Edits	It must be echoed in response message and all subsequent messages.
Constraints	

DE-38 Authorization Identification Response

Format	
Type	an6
Description	The unique (within business day) response identification value (also called approval or authorization code) assigned by the authorizing institution.
Constraints	C: For 0110 and 0210 response messages must be present only if transaction is approved. For 0220 and 0420 request messages, it is present if available.

DE-39 Response Code

Format	
Type	an2
Description	<p>This code indicates the disposition of a message as detailed tables below.</p> <p>Each code is associated with specific action code that is to be taken:</p> <ul style="list-style-type: none"> A Approve transaction. D Decline transaction. C Decline transaction and capture card. <p>Data element is mandatory in all response messages as well as in reversal and store/forward request messages.</p>

DE-39 Response Code	
Field Edits	In reversal and store/forward requests, value identifies the reason for reversal or store/forward message.
Constraints	

The following Response Codes are supported for authorization and financial transaction response (0110, 0210) messages as well as for store/forward request messages (0120/0121, 0220/0221):

0110, 0210, 0120/0121, 0220/0221 Response Codes		
Code	Description	Action
00	Approved or completed successfully.	A
03	Invalid merchant.	D
04	Pick-up.	C
05	Do not honor.	D
06	Error.	D
07	Pick-up card special condition.	C
08	Processor Down	D
09	Invalid Card Number	D
10	Module Processing Error	D
11	Approved (VIP).	A
12	Invalid transaction.	D
13	Invalid amount.	D
14	Invalid card number (no such number).	D
15	No such issuer.	D
17	Customer cancellation.	D
20	Invalid response.	D
21	No action taken.	D
22	Suspected malfunction.	D
30	Format error.	D
31	Bank not supported by switch.	D
32	Completed partially.	A
33	Expired card, capture.	C
34	Suspected fraud, capture.	C
35	Card acceptor contact acquirer, capture.	C
36	Restricted card, capture.	C
37	Card acceptor call acquirer security, capture.	C
38	Allowable PIN tries exceeded, capture.	C
39	No credit account.	D
40	Requested function not supported.	D

0110, 0210, 0120/0121, 0220/0221 Response Codes		
Code	Description	Action
41	Lost card, capture.	C
42	No universal account.	D
43	Stolen card, capture.	C
51	Not sufficient funds.	D
52	No checking account.	D
53	No savings account.	D
54	Expired card, decline.	D
55	Incorrect personal identification number.	D
56	No card record.	D
57	Transaction not permitted to cardholder.	D
58	Transaction not permitted to terminal.	D
59	Suspected fraud, decline.	D
60	Card acceptor contact acquirer, decline.	D
61	Exceeds withdrawal amount limit.	D
62	Restricted card, decline.	D
63	Security violation.	D
65	Exceeds withdrawal frequency limit.	D
66	Card acceptor call acquirer's security department.	D
67	Hard capture (requires card pick up at ATM).	C
75	Allowable number of PIN tries exceeded, decline.	D
84	Exceeds cash back limit.	D
90	Cutoff is in process.	D
91	Issuer or switch is inoperative.	D
92	No routing available.	D
93	Cannot complete transaction. Violation of law.	D
94	Duplicate transmission.	D
95	Reconcile error.	D
96	System malfunction.	D
NN	SECURITY ERROR DURING CVV	D
N0	INVALID CVV2	D
N1	CVCI & CVC2 NOT PRESENT	D
N2	CVCI GOOD/CVC2 NOT PRESENT	A
N3	CVCI BAD/CVC2 NOT PRESENT	D
N4	CVCI NOT PRESENT CVC2 GOOD	A
N5	CVCI NOT PRESENT CVC2 BAD	D

0110, 0210, 0120/0121, 0220/0221 Response Codes		
Code	Description	Action
N6	CVC1 GOOD/CVC2 GOOD	A
N7	CVC1 GOOD/CVC2 BAD	D
N8	CVC1 BAD/CVC2 GOOD	D
N9	CVC1 BAD/CVC2 BAD	D

The following Response Codes are supported for store/forward response messages (0130/0230):

0130/0230 Response Codes		
Code	Description	Action
00	Approved or completed successfully.	A
96	System malfunction.	D

The following Response Codes are supported for Reversal Request (042x) messages:

042x Response Codes		
Code	Description	Action
00	Approved or completed successfully.	A
17	Customer cancellation.	A
20	Invalid response.	A
21	No action taken.	A
22	Suspected malfunction.	A
32	Completed partially.	A
68	Response received too late.	A
91	Issuer or switch is inoperative.	D

The following Response Codes are supported for reversal response messages (0430):

0430 Response Codes		
Code	Description	Action
00	Approved or completed successfully.	A
96	System malfunction.	D

The following Response Codes are supported for network management response messages (0810):

0810 Response Codes		
Code	Description	Action
00	Approved or completed successfully.	A
Other	System malfunction, recovery action must be undertaken.	D

DE-41 Card Acceptor Terminal Identification

Format	
Type	
an8	
Description	A unique code identifying the terminal at the card acceptor location. Special characters (including national character support characters) are not allowed since some networks and/or back-office systems can have problems accepting these characters. The data element is mandatory for 01xx, 02xx, and 04xx request messages.
Field Edits	When present, it is echoed in response messages and all subsequent messages.
Constraints	

DE-42 Card Acceptor Identification Code

Format	
Type	
an15	
Description	Identifies the card acceptor in a transaction if the card acceptor is different from the acquiring institution. Special characters (including national character support characters) are not allowed since some networks or back-office systems can have problems accepting these characters. The data element is mandatory for 01xx, 02xx, and 04xx request messages.
Field Edits	When present, it is echoed in response messages and all subsequent messages.
Constraints	

DE-43 Card Acceptor Name/Location

Format	
Type	an40
Description	The name and location of the card acceptor, which defines the point of service in both local and interchange environments. Special characters (including national character support characters) are not allowed since some networks or back-office systems can have problems accepting these characters. Data element consists of the sub-fields detailed in the table below. The data element is mandatory for 01xx, 02xx, and 04xx request messages.
Field Edits	When present, it is echoed in response messages and all subsequent messages.
Constraints	

Structure of DE-43

Position	Length	Field Name	Description
01-23	23	Terminal owner	The name of the institution.

Structure of DE-43			
Position	Length	Field Name	Description
24-36	13	Terminal city	The city in which the transaction-originating terminal is located.
37-38	2	Terminal state	A code indicating the state or province in which the transaction-originating terminal is located.
39-40	2	Terminal country	A code indicating the country in which the transaction-originating terminal is located.

DE-48 Key Management Data Code	
Format	LLLVAR
Type	ann..256
Description	<p>Bit 48 transmits key information. Only one key is exchanged at a time. A single (16), double (32), or triple length (48) key can be sent. Therefore, the check digits can be located in positions 17-22, 33-38, or 49-54.</p> <p>This field is conditional for network management messages. It is required for key exchanges.</p>
Field Edits	
Constraints	C: Field is present if MTID is 0800 and DE-70 = Key Exchange information code. This field is required for Dynamic Key Exchange Messages.

Single Length Key		
Position	Length	Field Name
01-16	an 16	Key Value 1
17-22	an 06	Check Digits

Double Length Key		
Position	Length	Field Name
01-16	an 16	Key Value 1
17-32	an 16	Key Value 2
33-38	an 06	Check Digits

Triple Length Key		
Position	Length	Field Name
01-16	an 16	Key Value 1
17-32	an 16	Key Value 2
33-48	an 16	Key Value 3

Triple Length Key		
Position	Length	Field Name
49-54	an 06	Check Digits

DE-49 Transaction Currency Code	
Format	
Type	3
Description	The three-digit code (ISO 4217) that identifies the currency that applies to the Transaction Amount (DE-4). The data element is mandatory for 01xx, 02xx, and 04xx messages.
Field Edits	When present it should be echoed in response and all subsequent messages.
Constraints	

DE-50 Settlement Currency Code	
Format	
Type	3
Description	The three-digit code (ISO 4217) that identifies the currency that applies to the Settlement Amount (DE-5).
Field Edits	If present in request (sent by master party), should be echoed in response and all subsequent messages. If not present in request (sent by slave party), should be set in response (by master party) and echoed in all subsequent messages.
Constraints	C: This field is required in 01xx, 02xx, and 04xx messages sent by the master party.

DE-52 Personal Identification Number (PIN) Data	
Format	
Type	64 transferred as 16 bytes (EBCDIC or ASCII characters).
Description	The block of data containing encrypted PIN block.
Field Edits	
Constraints	C: Data element is present for PIN based 01xx, 02xx request messages i.e. when DE-22 sub-field 2 = 1.

DE-54 Additional Amounts	
Format	LLLVAR
Type	n..120
Description	The block of data carrying up to six balance sub-records with which the issuer system responds. Structure of the sub-record is detailed in the table below.
Field Edits	
Constraints	C: Present in 01xx, 02xx responses whenever balance information is needed.

Structure of DE-54		
Position	Length	Field Name
01-02	n2	Account Type 00 Unspecified 20 Checking/DDA 10 Savings 30 Credit Card 40 Other/Cashback
03-04	n2	Amount Type 01 Ledger Balance 02 Available Balance 03 Collected Balance 40 Cashback Amount
05-07	n3	Currency Code
08-20	x+n12	Amount Sign and Amount D Negative C Positive

DE-55 ICC Related Data															
Format	LLLVAR														
Type	binary, up to 999 bytes														
Description	<p>The ICC data consists of a series of sub-elements in the format of <tag-ID><tag-length><tag-value>.</p> <table><tr><td></td><td>Length</td><td>Description</td></tr><tr><td>tag-ID</td><td>1 or 2</td><td>Chip tag-ID as defined by EMV specification in the binary representation. The length can be one or two characters depending on the value of tag-ID</td></tr><tr><td>tag-length</td><td>1</td><td>The length of the chip tag value data in the binary representation</td></tr><tr><td>tag-value</td><td>variable</td><td>Chip tag variable length value. The length of the data is represented by tag-length. The value itself is in binary representation</td></tr></table> <p>The order of the TLV sub-structures is arbitrary. The data element is present in 01xx and 02xx requests only when DE-22 contains value 05 or 95. The data element is conditionally present in 01xx and 02xx responses – if issuer decides to send EMV data back to acquirer. The data element is supported in 04xx reversal requests and responses.</p>				Length	Description	tag-ID	1 or 2	Chip tag-ID as defined by EMV specification in the binary representation. The length can be one or two characters depending on the value of tag-ID	tag-length	1	The length of the chip tag value data in the binary representation	tag-value	variable	Chip tag variable length value. The length of the data is represented by tag-length. The value itself is in binary representation
	Length	Description													
tag-ID	1 or 2	Chip tag-ID as defined by EMV specification in the binary representation. The length can be one or two characters depending on the value of tag-ID													
tag-length	1	The length of the chip tag value data in the binary representation													
tag-value	variable	Chip tag variable length value. The length of the data is represented by tag-length. The value itself is in binary representation													
Field Edits	None. Tag data is transparently passed through.														
Constraints	Tags can be filled into DE-55, following the TLV sub-structure, up to the full length of the field.														

DE-60 Account 1 Qualifier	
Format	n2
Type	
Description	Identifies against which account the debit is posted. For example, "02" would mean that the transaction involves the cardholder's second account.
Field Edits	
Constraints	

DE-61 Account 2 Qualifier	
Format	n2
Type	
Description	Identifies against which account the credit is posted. For example, "02" would mean that the transaction involves the cardholder's second account.
Field Edits	
Constraints	

DE-70 Network Management Information Code	
Format	
Type	3
Description	A code identifying the purpose of a network management request message. The NMIC is mandatory for 0800 and 0810 Messages.
Field Edits	Should be echoed in responses.
Constraints	

The following table for a list of supported Network Management Informational Codes:

Network Management Informational Codes	
Code	Description
001	Logon
002	Logoff
201	Cutover
301	Echo-test

The following codes are only for Dynamic Key Management Messages:

Dynamic Key Management Message Codes	
Code	Description
160	Request new Acquirer key.
161	Request new Issuer key.

Dynamic Key Management Message Codes	
Code	Description
162	Request new Acquirer MAC key.
163	Request new Issuer MAC Key.
164	Request new PEK. Single key used for both acquirer and Issuer.
165	Request new MAC key. Single key used for both acquirer and Issuer.
166	Request all keys.
180	Acquirer key exchange.
181	Issuer key exchange.
182	MAC Acquirer key exchange.
183	MAC Issuer key exchange.
184	PEK key exchange.
185	MAC key exchange.

DE-90 Original Data Elements	
Format	
Type	42
Description	This data element contains parts of the original message being reversed or adjusted and matches reversal/adjustment to previous authorization or financial transaction message(s). The data element consists of the sub-elements detailed in table below:
Field Edits	
Constraints	O: Member can choose whether to use this data element.

Structure of DE-90			
Position	Length	Field Name	Description
01-04	4	Original MTID	MTID of the original transaction.
05-10	6	Original STAN	DE-11 of the original transaction.
11-14	4	Original Local Transaction Date	DE-12 of the original transaction, <i>MMDD</i> .
15-20	6	Original Local Transaction Time	DE-13 of the original transaction, <i>hhmmss</i> .
21-31	11	Original Acquiring Institution ID	DE-32 of the original transaction.
32-42	11	Original Forwarding Institution ID	All 0s (DE-33 not used).

DE-95 Replacement Amounts	
Format	
Type	an42

DE-95 Replacement Amounts

Description	New actual transaction amounts. This field consists of the elements detailed in the table below.
Field Edits	
Constraints	C: Present in partial reversal (0400 and 0420) and store/forward (0120 and 0220) messages, where actual transaction amount is not equal to originally authorized amount and not equal to 0.

Structure of DE-95

Position	Length	Sub-field Name	Description
01-12	12	Actual Transaction Amount	
13-24	12	Actual Settlement Amount	
25-25	1	Actual Transaction Fee Sign	C Credit D Debit
26-33	8	Actual Transaction Fee Amount	
34-34	1	Actual Settlement Fee Sign	C Credit D Debit
35-42	8	Actual Settlement Fee Amount	

DE-102 Account Identification 1

Format	LLVAR
Type	ans..28
Description	<p>A series of digits that identify a customer account. It denotes the “from” account number involved in the transaction (e.g. the debit account in a withdrawal or transfer transaction or the account being inquired upon in a balance inquiry transaction). The account number in the Account Identification 1 field must be right justified with leading 0s.</p> <p>Usage:</p> <p>In request messages, to transfer customer selected account number (OAR functionality) to transfer customer selected payee (Bill Payment).</p> <p>In responses, identifies the account number affected by requested transaction.</p>
Field Edits	If present, should be echoed in all subsequent messages.
Constraints	C: The data element is used in 01xx, 02xx, and 04xx messages, whenever account information must be transferred.

DE-103 Account Identification 2

Format	LLVAR
Type	ans..28

DE-I03 Account Identification 2

Description	<p>A series of digits that identify a customer account. It denotes the "to" account number involved in the transaction (e.g. the credit account in deposit or transfer transaction). The account number in the Account Identification 1 field must be right justified with leading 0s.</p> <p>Usage:</p> <p>In request messages, to transfer customer selected account number (OAR functionality) to transfer customer selected payee (Bill Payment).</p> <p>In response, identifies the account number affected by requested transaction.</p>
Field Edits	If present, should be echoed in all subsequent messages.
Constraints	C: The data element is used in 01xx, 02xx, and 04xx messages, whenever account information must be transferred.

DE-I20-DE-I23 Extended Data

Format	LLLVAR
Type	ans..999
Description	These fields are tag-based.
Field Edits	The contents of field can change in responses depending on result of transaction.
Constraints	C: Optional Use.

DE-I24 Additional Transaction Data

Format	LLLVAR
Type	an..999
Description	<p>The additional transaction data consists of a series of sub-elements in the format <tagID><tag-length><tag-value>.</p> <p>The order of the TLV sub-structures is arbitrary. The list of currently defined tags is provided in the following table.</p> <p>The data element is conditional for 01xx and 02xx requests. The data element is not present in 04xx reversal requests and responses.</p> <p>The data element is conditional for 01xx and 02xx messages. It is never present in response messages.</p> <p>See the following table for more information.</p>
Field Edits	None.
Constraints	

Tag Format Definitions		
Tag Format	Length	Description
<tag>	3 bytes	A predefined tag identifying the type of data to follow. For a list of defined tags, see the Tag Definitions table for more information.
<LLL>	3 digits	This field indicates the length of the following data specific to the preceding tag value.
<data value>	Variable	A variable length field containing the data specific to the preceding tag. The actual length of the data is defined by field <LLL>

Supported Tags for Data Element 124		
Process Type	Request (Tag/Usage)	Response (Tag/ Usage)
EMV	ATD C	
CW	ATD C	

DE-125-DE-127 Reserved for Private Use	
Format	LLLVA
Type	ans..999
Description	These fields are tag-based.
Field Edits	The contents of field can change in responses depending on result of transaction.
Constraints	C: Optional Use.

Communications Requirements

The Host-to-Host interface presents the application level protocol designed to run over following transport mechanisms (as described in following sections)

- TCP/IP
- X.25

TCP/IP Connection

This type of connection uses stream sockets. Socket connection is permanent and can be initiated by one of the parties (as agreed between the host and member during project implementation). The messages pass in eight-bit characters, unencrypted. A two-byte header (high-byte first) precedes each message, denoting length of the message excluding header, as per example below (86 is hexadecimal 0x0056):

<high-byte><low-byte><message>

<0x00><0x56><86 bytes of message>

Actual communication parameters (IP address, TCP port) must be mutually agreed upon during project implementation.

TCP/IP is the preferred communication protocol.

Note: Use encryption on the communication level (where routers support it). Use firewall protection.

X.25 Connection

This type of connection uses Switched Virtual Circuit (SVC) initiated by one of parties (as agreed between the host and member during project implementation). The messages pass in eight-byte characters, unencrypted. Actual communication parameters (X.25 address, window and packet size, user data, etc.) must be mutually agreed upon during project implementation.

Note: Use encryption on the communication level (where routers support it)

Security Requirements

Security Zones and Key Management

Acquirer and Issuer security zones are always defined as in the Security Zones example below. The Acquirer Working Key (AWK) encrypts the PIN block in requests originated by the member and sent to the host. The Issuer Working Key (IWK) encrypts the PIN block in requests originated by the host and sent to member.

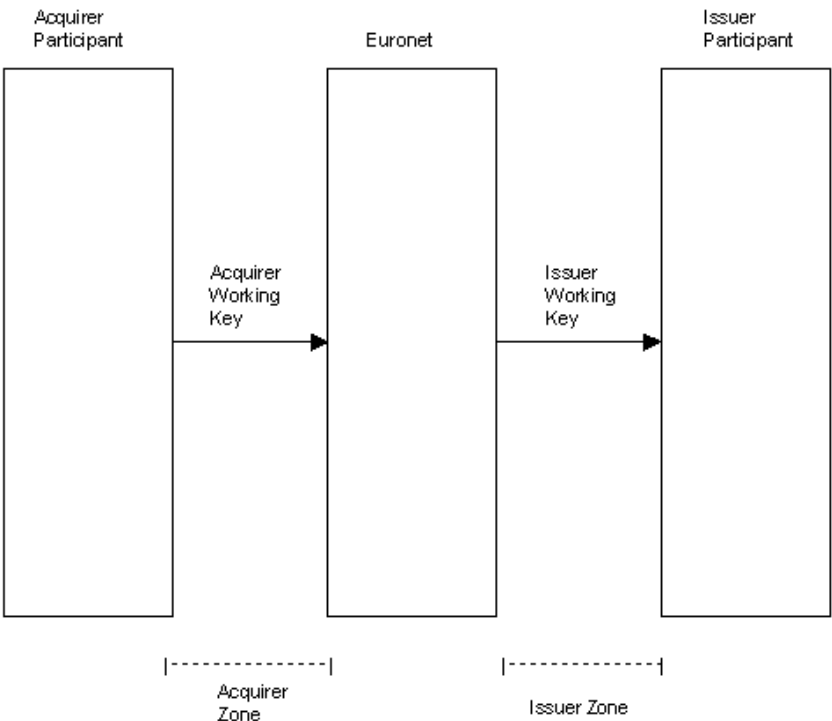


Figure 18 Security Zones flowchart

IWK and AWK exchange between the parties encrypted under Zone Master Key (ZMK). Currently, single DES or triple DES can be used. ZMK exchanges between participants in three clear text components. The working key exchange process can be static or dynamic. Both parties must agree on the encryption method.

If both acquirer and issuer traffic use the same logical connection (i.e. one TCP/IP socket or one X.25 SVC), AWK and IWK have the same value and should be regarded as a Working Key (WK).

PIN Block Encryption

The PIN block is encrypted using an acquirer or issuer working key. The Host-to-Host interface supports only ISO-0 PIN block format (also called ANSI) as described below:

Before encryption, PIN block is formed by XOR-combining original PIN block with the mask consisting of least significant digits of the PAN excluding check digit.

	C	L	P	P	P	P	PF	PF	PF	PF	PF	PF	PF	F	F
XOR	0	0	0	0	A	A	A	A	A	A	A	A	A	A	A
	C	L	P	P	X	X	X	X	X	X	X	X	X	X	X

- C Control field (value 0, hexadecimal value 0x0).
- L PIN Length field (4-12, hexadecimal value 0x4-0xC).
- P PIN digit (0-9, hexadecimal value 0x0-0x9).
- F Filler digit (hexadecimal value 0xF).
- PF PIN or filler digit, depending on PIN length.
- A Twelve least significant PAN digits (check digit excluded). If PAN is less than 12 digits, it must be right justified with leading 0s.
- X Result of XOR operation.

Certification Requirements

Each participant connecting to a Host-to-Host interface is required to perform certification prior to going into live production. Certification is performed on a member's and a host's test systems by sending online messages.

Certification requirements are described in detail in the chapter 4, "Steps of Certification for Host-to-Host" in this document.

Section 2: Optional Extended Transaction Support

Important: Use this section in addition to the basic transaction specifications in order to support optional extended transactions. Some features can require additional modifications to the host system to function correctly.

The following section contains specifications of data elements for use in support of optional extended transactions not supported by the ISO-8583 standard and the modifications required for ISO-8583-based connections to support the following transactions:

- List Account—Open Account Relationship (OAR)
- Mini-statements
- PIN Change
- GSM Recharge
- Bill Payment
- Service Request
- QuasiCash

This is supporting information for use in conjunction with documentation defining the actual version of the ISO-8583 message protocol. The definitions outlined within this section are applicable to any version of the ISO-8583 protocol, although it is recommended that the Euronet Host-to-Host definitions are used as the base for the implementation of the transactions.

Note: The user must be knowledgeable of the ISO-8583 message protocol.

General Message Definitions

Message Types

In accordance with the ISO message standard, the following definitions are applied:

- 0100/0110 Financial Authorization/Financial Authorization Response.
- 0200/0210 Financial Transaction/Financial Transaction Response.
- 0400/0410 Reversal Request/Reversal Request Response.

This manual assumes that the 0200/0210 messages are the base for carrying the data to be passed between systems. The use of 0100/0110 messages instead of 0200/0210 messages can also be supported within the same scope and definition. This document also assumes that 0400/0410 messages are used for reversal processing. Message types 0420/0430 can also serve the same purpose within the same scope and definition.

The following table outlines the message type to use for each transaction type and whether reversal transaction processing is supported:

Transaction Type	Message	Reversal Supported
List Account—Open Account Relationship (OAR)	0200/0210	No

Transaction Type	Message	Reversal Supported
Mini-statements	0200/0210	No
PIN Change	0200/0210	Yes
GSM Recharge	0200/0210	Yes
Bill Payment	0200/0210	Yes
Service Request	0200/0210	No
Quasi Cash	0100/0110 and 0200/0210	Yes

Request Messages

The transaction acquirer generally initiates request messages (0100, 0200, 0400, and 0420). These messages follow the general specifications of the ISO-8583 definitions in accordance with the specific version of the protocol in use. This section defines the format and location of extended data to be included in these messages to support transactions outside of the scope of the ISO-8583 standard. Additionally, the section outlines the relationship with standard ISO-8583 data fields (such as field 3, processing code) and the extended data.

Response Messages

Response messages (0110, 0210, 0410, and 0430) follow the general specifications of the ISO-8583 definitions in accordance with the specific version of the protocol in use. This section defines the format and location of extended data to be included in these messages to support transactions outside of the scope of the ISO-8583 standard. Additionally, the section outlines the relationship with standard ISO-8583 data fields (such as field 3, processing code) and the extended data.

Extended Data Support

ISO Data Fields

The ISO-8583 standard defines fields 120-123 as “Reserved for private use.” These fields carry information required for the support of the optional extended transaction set. In accordance with the ISO-8583 standard, the maximum size of each of these fields is 999 bytes. In cases where the information pass between systems exceeds 999 bytes, more than one field carries the information.

In general, fields 120-123 are used in the following sequence:

- 120 Primary.
- 121 Additional information, if required.
- 122 Additional information, if required.
- 123 Additional information, if required.

This allows the systems to pass a maximum of 7.992 bytes of additional data. Individual implementations of the optional extended transaction specifications can use, at their discretion and requirements, any of the eight data fields as the primary field and subsequent fields for additional information.

For example, if an implementation requires one of the above fields for other purposes, the next available field becomes the primary field. This means that if field 120 is required for other purposes, field 121 becomes the primary field for carrying the extended information.

In addition to fields 120-123, field 3 of the ISO-8583 specifications (processing code) identifies optional extended transactions.

Data Format

Field 3: Processing Code

The optional extended transaction support uses the first two digits of the processing code to identify that an optional extended transaction is in progress. A value of 90 in this position indicates an optional extended transaction. A tag, as defined in the following section, further identifies the actual type of the transaction executed.

Fields 120-123: Extended Data

Fields 120-123 carry extended data required for the processing of a transaction. The contents of these fields are tag-based to identify individual elements within the data field.

The tag-based processing is formatted using the “tag-length-value” encoding procedure. The following is an explanation of the tag-based specification:

Tag Format Definitions		
Field	Size	Description
<tag>	3 bytes	A predefined tag identifying the type of data to follow. For a list of defined tags, see the Tag Definitions table for more information.
<LLL>	3 digits	This field indicates the length of the following data specific to the preceding tag value.
<value>	Variable	A variable length field containing the data specific to the preceding tag. The actual length of the data is defined by field <LLL>

For example, “001002MV” would indicate the following:

- 001 Type of transaction definition to follow.
- 002 Length of two bytes of data to follow.
- MV GSM Mobile Recharge Voucher transaction.

As all tag definitions follow the same format, an application can choose to ignore unknown tags and continue processing with the ability to extract any remaining tags from the data element contents.

The following table lists the currently defined tags:

Tag	Data Length	Data Type	Description
001	2	an	<p>Transaction type identifier.</p> <p>Valid values:</p> <p>07 Mini-statement</p> <p>08 PIN Change</p> <p>11 Service Request</p> <p>13 ATM Bill Pay</p> <p>AL Account List</p> <p>AR Registration for Mobile Recharge</p> <p>AV Account Verification</p> <p>BB Bill Payment Detailed Biller Information</p> <p>BL Bill Payment Defined Bill Payment Relationships</p> <p>BP Bill Payment</p> <p>CI Cash Money Transfer Inquiry</p> <p>CR POS Recharge by Cash</p> <p>CX Follow up Financial Request</p> <p>FI Fast Funds Transfer Inquiry</p> <p>FX Follow up Financial Request</p> <p>IV Mobile Voucher GSM Recharge</p> <p>KD Follow up Financial Request</p> <p>KI Credit Card Transfer Inquiry</p> <p>MR Online GSM Recharge</p> <p>NI Normal Money Transfer Inquiry</p> <p>NV Follow up Financial Request</p> <p>PA Registration for Mobile Bill Payment</p> <p>PR POS Recharge by Card</p> <p>QC QuasiCash Authorization</p> <p>QP QuasiCash Debit</p> <p>VC POS Voucher by Cash</p> <p>VP POS Voucher by Card</p>
002	3	an	<p>Product indicator identifying product originating the transaction.</p> <p>Valid values:</p> <p>ATM ATM Device</p> <p>POS POS Device</p> <p>TLF IVR System</p> <p>WEB Internet-based Application</p> <p>MOB Mobile Phone</p> <p>HST Host System</p> <p>xxx Other acquiring systems</p>

Tag	Data Length	Data Type	Description
003	v..196	ans	<p>List of accounts (in response to OAR request). The structure is as follows:</p> <p>001 - 002 Number of debit accounts, values 00-04.</p> <p>003 - 004 Number of credit accounts, values 00-004.</p> <p>005 – xxx Variable size block with debit and credit account definitions.</p> <p>Account definition is 24-characters long. Debit accounts have to be placed in the beginning of the variable block. Number of debit account definitions has to be equal to the number of debit accounts in position 01 - 02 of Tag 3 specification. Credit account definitions have to follow debit account definitions in the variable block.</p> <p>Number of credit account definitions has to be equal to the number of debit accounts in position 03 - 04 of Tag 3 specification. Structure of one account definition is defined as:</p> <p>01 - 19 Account number (left justified, ans19).</p> <p>20 - 21 Account Type (as per ISO-8583:1987, an2).</p> <p>22 - 24 Account currency code, numeric (as per ISO 4217, ans3).</p>
004	16	ans	Secondary PIN Block – Encrypted new PIN value (PIN change request).
005	Any	n2	<p>If Tag 001 indicates mini-statement, this tag indicates the number of lines in mini-statement data. Currently, a minimum of 01 lines and a maximum of 10 lines are supported. If the number of lines is greater than 10, the message is rejected.</p> <p>If Tag 001 indicates a Special Balance Inquiry, set the number of lines to 1.</p>

Tag	Data Length	Data Type	Description
006	v..460	ans	<p>Mini-statement data. Each data line is 46 characters and will be preformatted in accordance with the following layout:</p> <p>001 - 006 Date (yymmdd). 007 - 026 Description (ans20). 027 - 038 Amount (n12). 039 - 039 Sign (+/-) (ans1). 040 - 046 Transaction Reference Number (n7).</p> <p>A maximum of 10 data lines is currently supported (total data length 460). The total data length of this field is always a multiple of 46. Any data exceeding the total length of 460 will be ignored and any truncated data (i.e. not multiple of 46) will be ignored.</p>
007	12	an	Starting balance. This can indicate a balance prior to a transaction or a starting balance in conjunction with mini-statement data.
008	12	an	Ending balance. This can indicate a balance after a transaction or an ending balance in conjunction with mini-statement data.
009	15	Char	Registered payment card alias name.
010	16	ans	Mobile voucher number, encrypted, for mobile voucher GSM Recharge Transaction.
011	10	Char	Key identifier for key used to encrypt mobile voucher number.
012	12	ans	Mobile voucher serial number.
013	8	an	Expiration date of mobile voucher in format <i>yyyymmdd</i> .
014	v..525	Char	Bill Payment relationship identification codes. This field can contain up a maximum of 35 entries, 15 characters each (total 525 characters). Any entries beyond this will be ignored by the system.
015	v..315	Char	Bill Payment presentment amounts. If a registered vendor relationship supports amount presentments, the corresponding entry in this element in relation to data based on Tag 014 will contain the presentment amount. This field can contain up to 35 entries, nine characters each (total 315 characters). The number of entries is the same as in the data for Tag 014. Any entries beyond 35 will be ignored by the system.

Tag	Data Length	Data Type	Description
016	v..525	Char	Bill Payment prompt codes. The Bill Payment-processing engine supports variable text prompting at the touch-point. In this tag element, the system can pass unique code identifiers for each prompt type. Each entry in this list corresponds to an entry in the data presented for Tag 014. This field can contain up to 35 entries (maximum), 15 characters each (for a maximum total 525 characters). The number of entries is the same as for Tag 014. A <i>blank</i> entry indicates that no prompt is provided. The system ignores any entries beyond 35.
017	v..35	Char	Bill Payment vendor types. The Bill Payment system uses a special code to identify types of vendors. This field can contain up to 35 entries, one character each (total 35 characters). The number of entries is the same as the number of entries for the Tag 014 data element. Any entries beyond 35 will be ignored by the system.
018	v..105	Char	Bill Payment relationship owner. The Bill Payment system supports the sharing of vendor relationships between participants. Individual entries in this data element identify the owner of each presented relationship. This field can contain up to 35 entries, three character each (total 105 characters). The number of entries is the same as the number of entries for the Tag 014 data element. Any entries beyond 35 will be ignored by the system.
019	15	Char	Bill Payment relationship ID code. This data element contains a selected Bill Payment relationship ID code for the actual Bill Payment. The value of this data element has to be known within the Bill Payment engine and can be one of the elements from data presented based on Tag 014.
020	3	Char	Bill Payment relationship owner. This field contains the relationship owner for a selected Bill Payment transaction. The combination of the relationship owner and the relationship ID (Tag 019) must be known within the Bill Payment engine.
021	2	ans	Type of service request. This tag will be populated when the value of Tag 001 is SR. Currently the following service requests are supported: CB Check book request. ST Statement request. AV Account verification.
022	8	Num	Start date for period (for example, statement request) in the format <i>yyyymmdd</i> .

Tag	Data Length	Data Type	Description
023	8	Num	End Date for period (for example, statement request) in the format <i>yyyymmdd</i> .
024	16	ans	Telephone number (for example, for online GSM Recharge).
025	6	ans	Mobile phone operator ID.
026	v..400	Char	Message data. Variable message data with a fixed length of 80 bytes for each line of the message. This data element allows for a maximum of five message lines (maximum size 400). Any entries beyond five will be ignored by the system.
027	3	Char	<p>Bill Payment relationship details. This data element contains the following information:</p> <p>001 - 015 Client ID. 016 - 034 User ID. 035 - 037 Client Country Code. 038 - 052 Relationship ID. 053 - 057 Bill presentment Amount. 058 - 060 Bill Presentment Amount Currency Code. 061 - 080 Bill Reference Number. 081 - 105 Account at Vendor. 106 - 135 Service Description. 136 - 143 Due Date, format <i>yyyymmdd</i>. 144 - 148 Prompt Code. 149 - 151 Relationship Owner. 152 - 156 Phrase Code 1. 157 - 161 Phrase Code 2. 162 - 166 Phrase Code 3. 167 - 171 Phrase Code 4. 172 - 176 Phrase Code 5. 177 - 226 Vendor Name. 227 - 266 Vendor Account #. 267 - 316 Vendor Address 1. 317 - 366 Vendor Address 2. 367 - 396 Note 1. 397 - 426 Note 2. 427 - 456 Note 3. 457 - 486 Note 4.</p> <p>* Note: Selected fields may be <i>blank</i> dependant on the availability of the information.</p>

Tag	Data Length	Data Type	Description
028	5	Char	Encryption descriptor. 001 - 003 Applicable tag identifier for tag data encryption. 004 - 004 Encryption method used: 0 = Encryption is not used. 1 = Single DES. 3 = Triple DES. R = RSA. 005 - 005 Padding character used during encryption process.
029	4	ans	Account qualifiers (to and from account qualifiers, each an2).
030	3	ans	Mini-statement currency code.
032	25	an	For bill pay transactions this tag contains the billing reference number and must be numeric. Other uses for this tag include sending the Name for Money Send transactions.
040	252	Char	Mobile recharge additional data structure. Whole Amount fields are 15,0 P; Decimal Amount fields are 15,9P; all other fields are character. Refer to the Tag 40 table for more information.
090	1	Char	Continuation indicator. A value of plus sign (+) in this data element indicates that further data is present in the message and the receiving system should process the next data field for the additional data. Reserved for future use.
ATI	2	Char	Original QuasiCash processing code from the POS terminal. This value provides the ability to identify network specific requirements based on the original processing code from the POS terminal for a QuasiCash transaction if different than QC.
DCC	203	Char	Dynamic Currency Conversion additional data structure. Unless specified otherwise, the attribute of the fields is character. Refer to the Tag DCC table for more information.
DCS	30	N	DCC Surcharge Amounts. Refer to the Tag DCS table for more information.
EML	7	Char	Identifies the transaction as a MOTO or E-commerce transaction. Bytes 1-3 identify the network the transaction was acquired by. Bytes 4-7 identifies the transaction as MOTO or E-commerce (ECOM).
INS	5	an	Number of installments.

Tag	Data Length	Data Type	Description
LCD	v...2	Char	Language Code.
LCR	6	n	POS invoice (receipt) number.
MT1	v...19	Char	Money transfer order ID.
MT2	v...20	Char	Money transfer secure code.
STN	12	n	System Audit Trace Number.
VRC	v...256	an	Verification Result Code.

Note: Length indication of v..100 indicates a variable length with a maximum size of 100 bytes.

Note: Data types are the following:

Char Any character value.
Num Numerical value.

Tag 40	
Position	Description
1-1	Add Whole Amount 1 Account Type
2-3	Add Whole Amount 1 Type
4-6	Add Whole Amount 1 Currency
7-21	Add Whole Amount 1
22-22	Add Whole Amount 2 Account Type
23-24	Add Whole Amount 2 Type
25-27	Add Whole Amount 2 Currency
28-42	Add Whole Amount 2
43-43	Add Whole Amount 3 Account Type
44-45	Add Whole Amount 3 Type
46-48	Add Whole Amount 3 Currency
49-63	Add Whole Amount 3
64-64	Add Whole Amount 4 Account Type
65-66	Add Whole Amount 4 Type
67-69	Add Whole Amount 4 Currency
70-84	Add Whole Amount 4
85-85	Add Whole Amount 5 Account Type
86-87	Add Whole Amount 5 Type
88-90	Add Whole Amount 5 Currency
91-105	Add Whole Amount 5
106-106	Add Whole Amount 6 Account Type

Tag 40	
Position	Description
107-108	Add Whole Amount 6 Type
109-111	Add Whole Amount 6 Currency
112-126	Add Whole Amount 6
127-127	Add Whole Amount 7 Account Type
128-129	Add Whole Amount 7 Type
130-132	Add Whole Amount 7 Currency
133-147	Add Whole Amount 7
148-148	Add Whole Amount 8 Account Type
149-150	Add Whole Amount 8 Type
151-153	Add Whole Amount 8 Currency
154-168	Add Whole Amount 8
169-169	Add Whole Amount 9 Account Type
170-171	Add Whole Amount 9 Type
172-174	Add Whole Amount 9 Currency
175-189	Add Whole Amount 9
190-190	Add Decimal Amount 1 Account Type
191-192	Add Decimal Amount 1 Type
193-195	Add Decimal Amount 1 Currency
196-210	Add Decimal Amount 1
211-211	Add Decimal Amount 2 Account Type
212-213	Add Decimal Amount 2 Type
214-216	Add Decimal Amount 2 Currency
217-231	Add Decimal Amount 2
232-232	Add Decimal Amount 3 Account Type
233-234	Add Decimal Amount 3 Type
235-237	Add Decimal Amount 3 Currency
238-252	Add Decimal Amount 3
253-253	Add Decimal Amount 4 Account Type
254-255	Add Decimal Amount 4 Type
256-258	Add Decimal Amount 4 Currency
259-273	Add Decimal Amount 4
274-274	Add Decimal Amount 5 Account Type
275-276	Add Decimal Amount 5 Type
277-279	Add Decimal Amount 5 Currency
280-294	Add Decimal Amount 5

Tag 40	
Position	Description
295-295	Add Decimal Amount 6 Account Type
296-297	Add Decimal Amount 6 Type
298-300	Add Decimal Amount 6 Currency
301-315	Add Decimal Amount 6
316-316	Add Decimal Amount 7 Account Type
317-318	Add Decimal Amount 7 Amount Type
319-321	Add Decimal Amount 7 Currency
322-336	Add Decimal Amount 7
337-337	Add Decimal Amount 8 Account Type
338-339	Add Decimal Amount 8 Type
340-342	Add Decimal Amount 8 Currency
343-357	Add Decimal Amount 8
358-358	Add Decimal Amount 9 Account Type
359-360	Add Decimal Amount 9 Type
361-363	Add Decimal Amount 9 Currency
364-378	Add Decimal Amount 9

Tag DCC	
Position	Description
1-1	Action
2-3	Transaction Type
4-5	DCC Eligible/Ineligible
6-19	Internal Use 1: 14 A
20-42	Internal Use 2: 23 S
43-43	Calculation Accepted?: 1 A
44-58	DCC Transaction Amount: 15,0 S
59-73	Internal Use 4: 15,0 S
74-88	DCC Actual Transaction Amount: 15,0 S
89-91	DCC Transaction Currency Code: 3 A
92-181	Internal Use 5: 90 S
182-196	Display Rate: 15,9 S

TAG DCS	
Position	Description
1 – 15	Transaction Surcharge Amount: 15, 0 S
16 – 30	Surcharge Amount in Cardholder Currency: 15, 0 S

The following table defines the usage of tags by transaction type:

Transaction Type	Request (Tag #/Usage*)	Response (Tag #/Usage*)
List Account—Open Account Relationship (OAR)	001 M 002 O	001 M 002 O 003 M
Mini-statement	001 M 002 O	001 M 002 O 005 M 006 M 007 O 008 O 030 M
PIN Change	001 M 002 O 004 M	001 M 002 O
GSM Recharge—Registration for Mobile Recharge	001 M 002 O 024 M 025 C	001 M 002 O 024 O 025 O 026 O
GSM Recharge—Voucher	001 M 002 O 025 M 040 O	001 M 002 O 010 M 011 O 012 M 013 M 025 M 026 O 028 M
GSM Recharge—Online	001 M 002 O 024 M 025 M 028 O	001 M 002 O 024 O 025 O 026 O 028 O
GSM Recharge Account Verification	001 M 002 O 024 O 025 O	001 M 002 O 024 O 025 O
Bill Payment—Registration for Mobile Bill Payment	001 M 002 O	024 M 001 M 002 O 009 M

Transaction Type	Request (Tag #/Usage*)	Response (Tag #/Usage*)
Bill Payment—Request Relationship List	001 M 002 O	001 M 002 O 014 M 015 M 016 M 017 M 018 M 090 C
Bill Payment—Request Relationship Details	001 M 002 O 019 M 020 M	001 M 002 O 019 M 020 M 027 M
Bill Payment—Request Bill Payment	001 M 002 O 019 M 020 M	001 M 002 O
Service Request	001 M 002 O 021 M 022 O 023 O 024 C	001 M 002 O
Financial Authorization Related to Extended Transaction	001 M 002 O 012 O 024 O 025 O	001 M 002 O 012 O 024 O 025 O
Money Transfer Transaction	MT1 M MT2 M 001 M 002 O	001 M 002 O

Note: Money Transfer Transaction (MT2) tags will not be present in reversals.

Note: The following is a list of usage codes for the previous table:

M Mandatory
O Optional
C Conditional

Message Flow by Transaction Type

List Account—Open Account Relationship (OAR)

The List Account—Open Account Relationship (OAR) transaction type presents a customer at a touch-point with a list of accounts valid for a selected transaction type, such as a withdrawal, transfer, deposit, or inquiry. This transaction type is referred to as a Dual-pass Transaction. A Dual-pass Transaction is the process in which a customer selects a transaction type at the touch-point and the device sends a request to the host system to present a list of valid accounts against which to perform the transaction. The typical message flow is the following:

From -> To	Description
Touch-point -> Device Management	Device sends request indicating an OAR transaction.
Device Management -> Issuer System	Request for account list (0200): P3 90xxxx P120 Tag-based request information.
Issuer System -> Device Management	Account list response (0210): P3 90xxxx P120 Tag-based response data (account list).
Device Management -> Touch-point	Account list for selection.

Note: Device management can be the processing center and/or another host system.

Note: The processing center can act as a gateway between the device management system and the actual issuer system.

OAR Data Flow

Acquirer OAR Accounts Returned

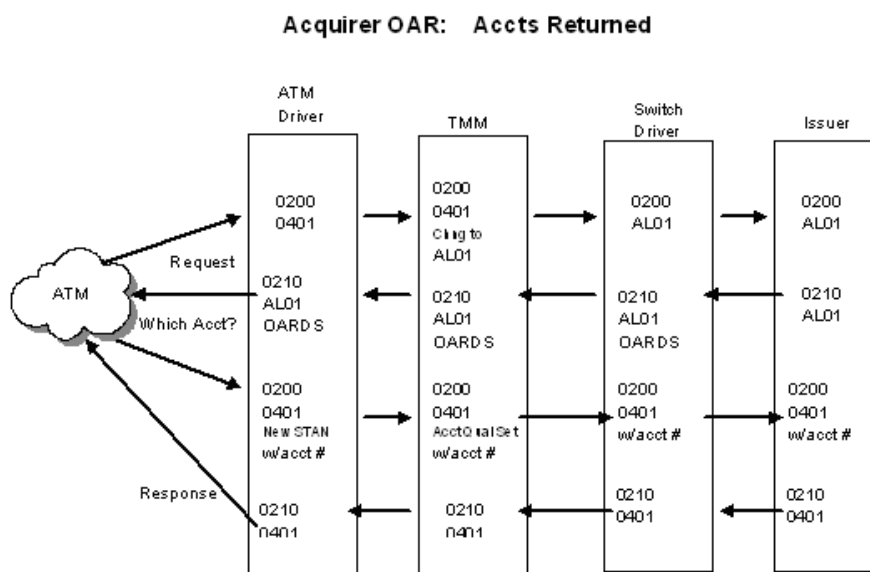


Figure 19 Acquirer OAR: Accounts Returned flowchart

Acquirer—0 Accounts Returned

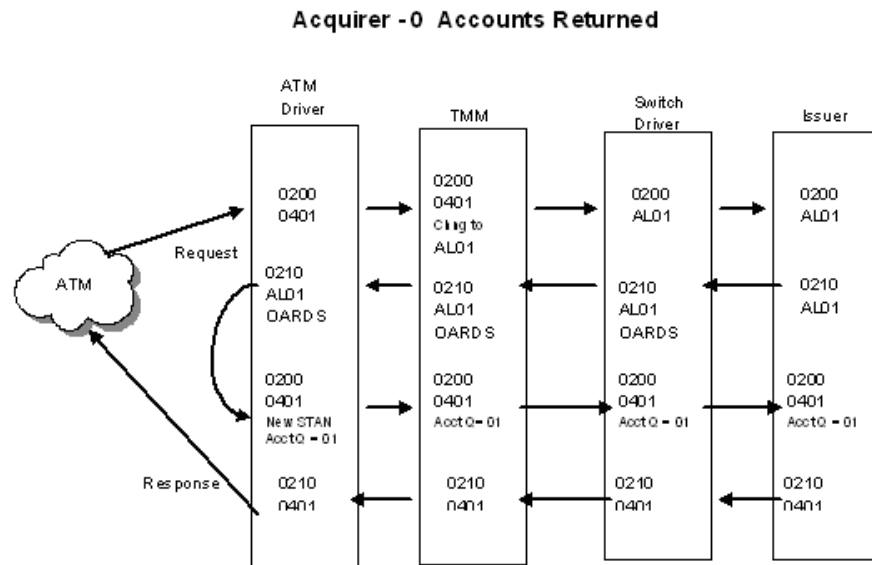


Figure 20 Acquirer—0 Accounts Returned

Acquirer—1 Account Returned

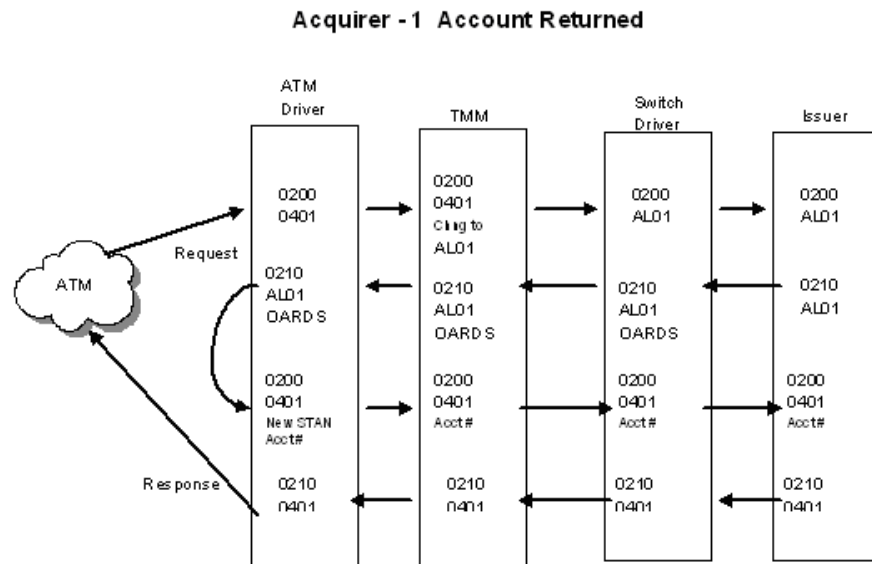


Figure 21 Acquirer—1 Account Returned

Acquirer—OARDS Not Received

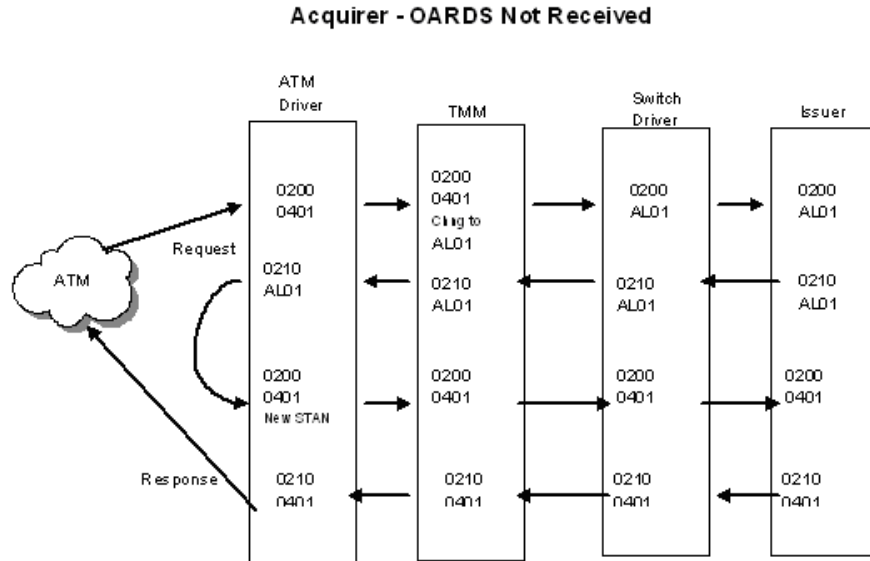


Figure 22 Acquirer—OARDS Not Received

Goldnet

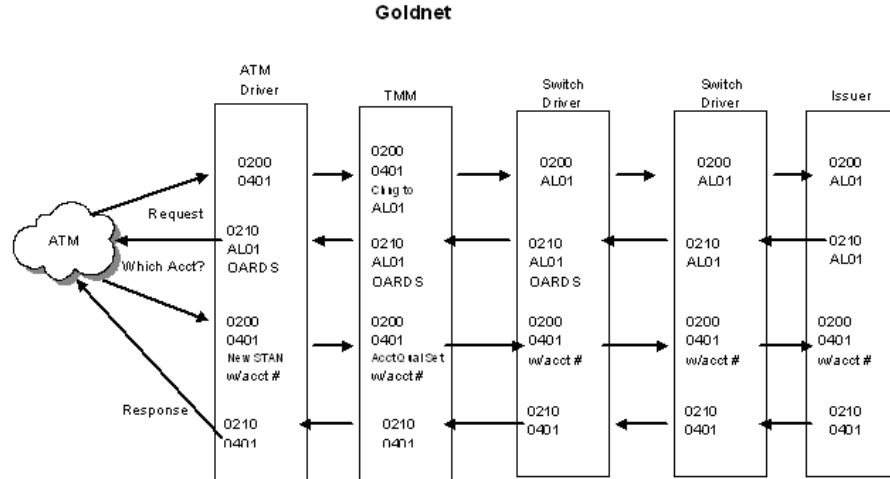


Figure 23 Goldnet

Mini-statement

A mini-statement is a list of the last 10 transactions performed on a selected account. This request can be based on a card number or potentially an account number, because of an OAR transaction. The mini-statement is intended to print on a typical ATM device receipt printer and is limited in the size and amount of information presented. The typical message flow for a mini-statement is the following:

From -> To	Description
Touch-point -> Device Management	Device sends request indicating a mini-statement transaction.
Device Management -> Issuer System	Request for mini-statement data (0200): P3 90xxxx P120 Tag-based request information.
Issuer System -> Device Management	Mini-statement data response (0210): P3 90xxxx P120 Tag-based response data (mini-statement data).
Device Management -> Touch-point	Mini-statement data for printing.

Note: Device management can be the processing center and/or another host system.

Note: The processing center can act as a gateway between the device management system and the actual issuer system.

PIN Change

A PIN change transaction allows a cardholder to request a new PIN. This message contains the current PIN and the new selected PIN value. The transaction flow for a PIN change transaction is the following:

From -> To	Description
Touch-point -> Device Management	Device sends request indicating a PIN change transaction.
Device Management -> Issuer System	Request for PIN change (0200): P3 90xxxx P120 Tag-based request information.
Issuer System -> Device Management	PIN change response (0210): P3 90xxxx P39 Result of PIN change request.
Device Management -> Touch-point	Result of PIN change request.

Note: Device management can be the processing center and/or another host system.

Note: The processing center can act as a gateway between the device management system and the actual issuer system.

GSM Recharge

The GSM Recharge Transaction is a type of transaction that allows a customer with a pre-paid mobile phone to purchase additional airtime for their phone account through various electronic touch-points. The Euronet system supports the following basic types of these recharge transactions:

- Voucher-based
- Online-based
- Registration for Mobile Recharge

The voucher-based transaction produces a printed voucher with a unique code on the printed receipt. The customer then dials in to a predefined service number on a mobile phone and enters the printed voucher number, which generates a credit to the phone account.

The online-based transaction allows the customer's account to credit in a real-time environment as the transaction is processed. To achieve this, the phone number (account number) to credit must be present in the request message.

GSM Recharge, Touch-points

The Euronet system supports various touch-points for the GSM Recharge Transactions. Due to their nature, certain touch-points only support an online recharge. Otherwise, processing of the recharge transactions within the Euronet environment is close to identical, depending on the touch-point used.

GSM Recharge, Voucher-based

The voucher-based recharge transaction uses the following transaction flow:

From > To	Description
Touch-point -> Device Management	Device sends request indicating a voucher-based recharge transaction.
Device Management -> Processing Center	Request for Voucher (0200): P3 90xxxx P120 Tag-based request information.
Processing Center-> Mobile Operator	Validate that voucher is available in requested denomination.
Processing Center -> Issuer System	Request for financial authorization.
Issuer System -> Processing Center	Response to authorization request.
Processing Center -> Mobile Operator	If financial authorization is granted, indicate to mobile operator that voucher is dispensed.
Processing Center -> Device Management	Voucher recharge response (0210): P3 90xxxx P120 Tag-based data with voucher number, if approved.
Device Management -> Touch-point	Result of voucher request and printout of voucher number if approved.

Note: Device management can be the processing center and/or another host system

Note: The processing center can act as a gateway between the device management system and the actual issuer system.

Note: Although in the above scenario, the processing center functions as a central point for voucher retrieval and financial authorization, financial authorization can also be handled by the device management system independent of the voucher retrieval process.

GSM Recharge, Online-based

The online-based recharge transaction uses the following transaction flow:

From ->To	Description
Touch-point -> Device Management	Device sends request indicating an on line-based recharge transaction.
Device Management -> Processing Center	Request for Online Recharge (0200): P3 90xxxx P120 Tag-based request information.

From ->To	Description
Processing Center -> Mobile Operator	Validate that phone number is valid for recharge and that requested amount is available.
Processing Center -> Issuer System	Request for financial authorization.
Issuer System -> Processing Center	Response to authorization request.
Processing Center -> Mobile Operator	If financial authorization is granted, request credit to phone account.
Processing Center -> Device Management	On line recharge response (0210): P3 90xxxx P120 Tag-based data with phone number, if approved.
Device Management -> Touch-point	Result of recharge request.

Note: Device management can be the processing center and/or another host system.

Note: The processing center can act as a gateway between the device management system and the actual issuer system.

Note: Although in the above scenario, the processing center functions as a central point for phone account crediting and financial authorization, financial authorization can also be handled by the device management system independent of the phone account credit process.

Mobile Recharge Registration

The Mobile Recharge Registration transaction uses the following transaction flow:

From -> To	Description
Touch-point -> Device Management	Device sends request indicating a Mobile Recharge Registration transaction.
Device Management -> Processing Center	Request for Mobile Recharge Registration (0200): P3 90xxxx P120 Tag-based request information.
Processing Center	Validate that phone number if it is valid for recharge.
Processing Center -> Issuer System	Request for Card (Account) Verification.
Issuer System -> Processing Center	Response to Card (Account) Verification request.
Processing Center	If financial authorization is granted, register user in the database.
Processing Center -> Device Management	Mobile Recharge Registration response (0210): P3 90xxxx P39 Result of recharge registration.
Device Management -> Touch-point	Result of Mobile Recharge Registration request.

Note: Device management can be the processing center and/or another host system.

Note: The processing center can act as a gateway between the device management system and the actual issuer system.

Note: Although in the above scenario, the processing center functions as a central point for phone registration and financial authorization, financial authorization can also be handled by the device management system independent of the phone registration process.

Note: Card (Account) Verification is described as separate section.

Account Verification

Typically, the processing center sends an Account Verification request to the card issuer as a part of some other flow, such as Bill Payment or Mobile Recharge Registration, and uses the following transaction flow:

From -> To	Description
Processing Center -> Issuer System	Request for Account Verification (0200): P3 90xxxx P120 Tag-based request information.
Issuer System -> Processing Center	Response to authorization request (0210): P3 90xxxx P120 Tag-based response information.

Bill Payment

Bill Payment is a service that allows customers to access billing information and initiate payments of bills through a variety of touch-points. This service supports private billing lists as well as public billing lists. Additionally, the service supports bill amount presentment. The Bill Payment message flow normally consists of separate steps in the transaction process:

- Request list of defined Bill Payment relationships.
- Request details of a selected relationship.
- Request payment of a selected bill or relationship.
- Registration for mobile Bill Payment.

The optional extended transaction set definition provides support for all of the above listed steps.

Bill Payment, Touch-points

Bill Payment can be performed at a variety of touch-points. Certain limitations can apply to individual touch-points, such as number of selections presented to the consumer. In general, the internal processing of Bill Payment transactions is identical, regardless of the touch-point used.

Request List of Defined Bill Payment Relationships

For a standard Bill Payment transaction, the first step is normally a request for a list of defined relationships, or a list of what bills to pay. This, however, is not always required; in certain situations, the customer can initiate the Bill Payment directly without being first presented with a list of defined payment relationships. If a list of available payment relationships is available, the transaction flow is the following:

From -> To	Description
Touch-point -> Device Management	Device sends request for a list of defined Bill Payment relationships.
Device Management -> Issuer System	Request for list of payment relationships (0200): P3 90xxxx P120 Tag-based request information.

From -> To	Description
Issuer System -> Device Management	Bill Payment relationship list response (0210): P3 90xxxx P120/P121 Bill Payment relationship list.
Device Management -> Touch-point	Bill Payment relationship list for selection.

Note: Device management can be the processing center and/or another host system.

Note: The processing center can act as a gateway between the device management system and the actual issuer system.

Request Relationship Details

Once a specific Bill Payment relationship is identified or selected, it can be necessary to retrieve further details about this relationship (for example, vendor details). This is accomplished through the following transaction flow:

From -> To	Description
Touch-point -> Device Management	Device sends request for details about a specific Bill Payment relationship.
Device Management -> Issuer System	Request for details on payment relationship (0200): P3 90xxxx P120 Tag-based request information.
Issuer System -> Device Management	Bill Payment relationship details response (0210): P3 90xxxx P120 Bill Payment relationship details.
Device Management -> Touch-point	Bill Payment relationship details.

Note: Device management can be the processing center and/or another host system.

Note: The processing center can act as a gateway between the device management system and the actual issuer system.

Pay Bill

Once a Bill Payment relationship is identified for payment and, if required, additional information regarding the relationship is retrieved, the actual Bill Payment can take place. This is based on the following transaction flow:

From -> To	Description
Touch-point -> Device Management	Device sends request for Bill Payment of a specific payment relationship
Device Management -> Processing Center	Request for Bill Payment (0200): P3 90xxxx P120 Tag-based request information.
Processing Center -> *internal	Validate that payment relationship is known and valid for customer.
Processing Center -> Issuer System	Request for financial authorization.
Issuer System -> Processing Center	Response to authorization request.
Processing Center -> *internal	If financial authorization is granted, mark bill as paid for settlement and reconciliation.

From -> To	Description
Processing Center -> Device Management	Bill Payment response (0210): P3 90xxxx P39 Result of Bill Payment.
Device Management -> Touch-point	Result of Bill Payment.

Note: Device management can be the processing center and/or another host system.

Note: The processing center can act as a gateway between the device management system and the actual issuer system.

Note: Although in the above scenario, the processing center functions as a central point for Bill Payment processing and financial authorization, the device management system independent of the Bill Payment or reconciliation process financial authorization can also handle financial authorization.

Service Request

The processing center can support the capture and processing of service requests. These requests are normally offline-based requests that require manual intervention or reaction from the service provider. To support this, the system facilitates the capture of these request messages and the forwarding of the requests to the appropriate service provider. Messages use the following message flow:

From -> To	Description
Touch-point -> Device Management	Device sends service request, including details on requested service.
Device Management -> Processing Center	Request for service (0200): P3 90xxxx P120 Tag-based request information.
Processing Center -> *internal	Store service request for batch-based transmission to service provider.
Processing Center -> Device Management	Service request response (0210): P3 90xxxx P39 Result of service request.
Device Management -> Touch-point	Result of service request.

Note: Device management can be the processing center and/or another host system.

Note: Although the above transaction flow depicts the service requests stored internally at the processing center and then forwarded in a batch mode to the service provider, these requests can be forwarded to the service provider in real time if the provider supports this.

Section 3: Enhanced Processing Features

This section outlines the following topics:

- EMV processing
- CVV2 processing

- Dynamic Currency Conversion (DCC)
- Request money transfer sender information

EMV Processing

The purpose of the following information is to specifically enable implementation of the EMV data transfer.

Data Element Usage

The following elements identify chip (ICC) transactions:

- DE-22 subfield 1 indicating chip based transaction through the appropriate value (value equal to 05 or 95).
- DE 55 is present and carrying EMV data in *tag-length-value* (TLV) sub-structures up to the length of 999 characters.
- DE-124 indicating the chip capable terminal.

The following identify a fall-back transaction:

- DE-124 indicating the chip capable terminal.
- DE-22 subfield 1 indicating a value of 80 in fall-back conditions.
- DE-35 (Track 2 data) present, with service code having the value 2xx or 6xx.

Data Element Processing Rules

Originator

The originator of the request message must be able to:

- Correctly populate DE-22 and DE-124 based on the data supplied by the acquiring touch-point and/or other data residing at acquirer host.
- Create TLV (*tag-length-value*) sub-structures from the data supplied by the acquiring touch-point and/or other data residing in acquirer host, when DE-22 indicates chip transaction.
- Create and transmit message containing DE-55 according to the rules specified hereinafter, when DE-22 indicates chip transaction.

The originator of the response message must be able to:

- Correctly populate DE-22 based on the data supplied in original request.
- Create TLV sub-structures (at originator's own discretion) from the data supplied by the authorization or other system.
- Create and transmit message (at originator's own discretion) containing DE-55 according to the rules specified hereinafter.

Recipient

The recipient must be able to receive and process messages containing DE-22 and DE-124. It is the responsibility of the recipient to determine how to interpret and use the values transferred in DE-22 and DE-124.

In addition, the recipient of any message containing DE-55 must be able to receive and process DE-55 and all TLV sub-structures contained within DE-55. It is the responsibility of the recipient to determine how to interpret and use the data contained in TLV sub-structures.

Message Format

Message formats specified hereinafter contain EMV-related information. Bold characters indicate EMV changes in the message structure and/or data element content. These formats supersede the corresponding message formats specified in *Host-to-Host Message Specifications Version 1.0.1*.

Authorization Messages

Bit	Data Element MTID	0100	0110	0120	0130
1	Secondary bitmap	C	C	-	C
2	Primary Account Number	C	C+	C	C+
3	Processing code	M	M+	M	M+
4	Amount, transaction	M	M+	M	M+
5	Amount, settlement	C	M+	C	M+
7	Date/time, transmission	M	M	M	M
8	Fee, cardholder billing	R	R	R	R
9	Conversion rate, settlement	C	C+	C	C+
11	STAN	M	M+	M	M+
12	Time, local transaction	M	M+	M	M+
13	Date, local transaction	M	M+	M	M+
14	Date, expiration	C	-	C	-
15	Date, settlement	C	C+	C	C+
18	Merchant type	M	-	M	-
19	Acquiring institution country code	O	-	O	-
22	POS entry mode	M	C*	M	C*
25	POS condition code	M	-	M	-
26	POS PIN capture code	C	-	C	-
32	Acquirer institution ID	M	M+	M	M+
35	Track 2 data	C	-	C	-
37	Retrieval reference number	M	-	M	-
38	Authorization number	-	M	M	M
39	Response code	-	M	M	M
41	Card acceptor terminal ID	M	-	M	-
42	Card acceptor ID	M	-	M	-
43	Card acceptor name/location	M	-	M	-
49	Currency code, transaction	M	M+	M	M+

Bit	Data Element MTID	0100	0110	0120	0130
50	Currency code, settlement	C	C+	C	C+
52	PIN block	C	-	C	-
54	Additional amounts	-	C	-	C
55	ICC related data	C	C	C	-
60	Account 1 Qualifier	C	-	C	-
61	Account 2 Qualifier	C	-	C	-
64	MAC Code	R	R	R	R
102	Account 1 identification	C	C	C	C
103	Account 2 identification	C	C	C	C
120-123	Private use	C	C*	C	C*
124	Additional transaction data	C	-	C	-
125-127	Private use	C	C*	C	C*
128	MAC Code 2	R	R	R	R

Financial Messages

Bit	Data Element MTID	0200	0210	0220	0230
1	Secondary bitmap	C-	C	C-	C
2	Primary Account Number	C	C+	C	C+
3	Processing code	M	M+	M	M+
4	Amount, transaction	M	M+	M	M+
5	Amount, settlement	C	C+	C	C+
7	Date/time, transmission	M	M	M	M
8	Fee, cardholder billing	R	R	R	R
9	Conversion rate, settlement	C	C+	C	C+
11	STAN	M	M+	M	M+
12	Time, local transaction	M	M+	M	M+
13	Date, local transaction	M	M+	M	M+
14	Date, expiration	C	-	C	-
15	Date, settlement	C	C+	C	C+
18	Merchant type	M	-	M	-
19	Acquiring institution country code	O	-	O	-
22	POS entry mode	M	C*-	M	C*
25	POS condition code	M	-	M	-
26	POS PIN capture code	C	-	C	-
32	Acquirer institution ID	M	M+	M	M+
35	Track 2 data	C	-	C	-

Bit	Data Element MTID	0200	0210	0220	0230
37	Retrieval reference number	M	M+	M	M+
38	Authorization number	-	C	C	C
39	Response code	-	M	M	M
41	Card acceptor terminal ID	M	-	M	-
42	Card acceptor ID	M	-	M	-
43	Card acceptor name/location	M	-	M	-
49	Currency code, transaction	M	M+	M	M+
50	Currency code, settlement	C	C+	C	C+
52	PIN block	C	-	C	-
54	Additional amounts	-	C	-	C
55	ICC related data	C	C	C	-
60	Account 1 Qualifier	C	-	C	-
61	Account 2 Qualifier	C	-	C	-
64	MAC Code	R	R	R	R
102	Account 1 identification	C	C	C	C
103	Account 2 identification	C	C	C	C
120-123	Private Use	C	C*	C	C*
124	Additional transaction data	C	-	C	-
125-127	Private Use	C	C*	C	C*
128	MAC Code 2	R	R	R	R

The following data elements are specific to EMV. Refer to Section I: Basic Transaction Support in this chapter for other data elements.

DE-55 ICC Related Data	
Format	LLVAR
Type	binary, up to 999 bytes

DE-55 ICC Related Data				
Format		LLLVAR		
Description		The ICC data consists of a series of sub-elements in the format of <tag-ID><tag-length><tag-value>.		
		tag-ID	Length 1 or 2	Description Chip tag-ID as defined by EMV specification in the binary representation. The length can be one or two characters depending on the value of tag-ID
		tag-length	1	The length of the chip tag value data in the binary representation
		tag-value	variable	Chip tag variable length value. The length of the data is represented by tag-length. The value itself is in binary representation
		The order of the TLV sub-structures is arbitrary. The data element is present in 01xx and 02xx requests only when DE-22 contains value 05 or 95. The data element is conditionally present in 01xx and 02xx responses – if issuer decides to send EMV data back to acquirer. The data element is supported in 04xx reversal requests and responses.		
Field Edits		None. Tag data is transparently passed through.		
Constraints		Tags can be filled into DE-55, following the TLV sub-structure, up to the full length of the field.		

EMV Tag Definitions

The table below shows the usage of the EMV tags in DE-55 by specific issuer brand (Visa and MasterCard).

Tag ID	Data Len. (bytes)	TLV Len. (bytes)	Description	Request		Response	
				Visa	MC	Visa	MC
9F26	8	11	Application cryptogram	M	M	n/a	n/a
9F37	4	7	Unpredictable number	M	M	O	O
9F36	2	5	Application transaction number	M	M	n/a	n/a
95	5	7	Terminal verification results	M	M	n/a	n/a
9A	3	5	Transaction date	M	M	n/a	n/a
9C	1	3	Transaction type	M	M	n/a	n/a
9F02	6	9	Transaction amount	M	M	n/a	n/a
5F2A	2	5	Transaction currency code	M	M	n/a	n/a
82	2	4	Application interchange profile	M	M	n/a	n/a
9F1A	2	5	Terminal country code	M	M	n/a	n/a
9F03	6	9	Amount, other	M	M	n/a	n/a
9F33	3	6	Terminal capabilities	M	O	n/a	n/a
9F39	1	4	POS Entry mode	C ¹	n/a	n/a	n/a

Tag ID	Data Len. (bytes)	TLV Len. (bytes)	Description	Request		Response	
				Visa	MC	Visa	MC
9F27	1	4	Cryptogram information data		M	n/a	n/a
5F34	1	4	Application PAN sequence number	C ²	M	n/a	n/a
9F10	7-32	10-35	Issuer application data (MC) or Discretionary data (Visa)	O	O	n/a	n/a
9F1E	8	11	Interface device serial number	O	O	n/a	n/a
9F34	3	6	Cardholder verification method results		O	n/a	n/a
9F35	1	4	Terminal type		O	n/a	n/a
9F53	1	3	Transaction category code		O	n/a	n/a
84	7-18	9-20	Dedicated file name		O	n/a	n/a
9F09	2	5	Application version number		O	n/a	n/a
9F41	2-4	5-7	Transaction sequence number	C	C	n/a	n/a
9F5B	2-21	5-24	Issuer script results	O	n/a	n/a	n/a
91	8-16	10-18	Issuer authentication data	n/a	n/a	O ³	O ³
8A	2	4	Authorization response code	n/a	n/a	O ³	O ³
71	3-128	5-131	Issuer script template 1	n/a	n/a	O ³	O ³
72	3-128	5-131	Issuer script template 2	n/a	n/a	O ³	O ³

¹ Present only if EMV tag 9F39 was originally provided by the acquiring touch-point.

² Present only if originally provided by ICC and the acquiring touch-point.

³ Issuer can provide the EMV tag at own discretion.

Note: EMV tags are described in EMV2000 and related VIS 1.4.0 and M/Chip 4 specifications.

Example of DE-55 – Request

In this example, transaction was performed on POS with MasterCard M/Chip card and DE-55 contains tags as defined in the table below:

Tag ID	Data Len. (bytes)	Description	Value	TLV Sub-structure (hex)
5F2A	2	Transaction currency code	840 (numeric)	5F 2A 02 08 40
5F34	1	Application PAN sequence number	100 (numeric)	5F 34 01 00
82	2	Application interchange profile	0101 1000 (byte 1) 0000 0000 (byte 2)	82 02 58 00
84	7	Dedicated file name	A0 00 00 00 04 10 10 (hex)	84 07 A0 00 00 00 04 10 10
95	5	Terminal verification results	0000 0000 (byte 1) 0000 0000 (byte 2) 0000 0100 (byte 3) 0000 1000 (byte 4) 0000 0000 (byte 5)	95 05 00 00 00 04 80 00

Tag ID	Data Len. (bytes)	Description	Value	TLV Sub-structure (hex)
9A	3	Transaction date (YYMMDD)	050510 (numeric)	9A 03 05 05 10
9C	1	Transaction type	00 (numeric)	9C 01 00
9F02	6	Transaction amount	2200 (22.00 USD)	9F 02 06 00 00 00 00 22 00
9F03	6	Amount (other)	0 (0.00 USD)	9F 03 06 00 00 00 00 00 00
9F09	2	Application version number	00 02 (hex)	9F09 02 00 02
9F10	8	Issuer application data (MC)	08 01 01 03 A0 20 0C DA C0 (hex)	9F 10 08 01 01 03 A0 20 0C DA C0
9F1A	2	Terminal country code	840 (numeric)	9F 1A 02 08 40
9F1E	8	Interface device serial number	00042119 (char)	9F1E 08 30 30 30 34 32 31 31 39
9F26	8	Application cryptogram	08 6B E4 F3 F2 24 BF 2E 3D (hex byte)	9F 26 08 6B E4 F3 F2 24 BF 2E 3D
9F27	1	Cryptogram information data	1000 0000 (byte)	9F 27 01 80
9F33	3	Terminal capabilities	1110 0000 (byte 1) 0100 0000 (byte 2) 1011 0000 (byte 3)	9F 33 03 E0 40 B0
9F34	3	Cardholder verification method results	0100 0010 (byte 1) 0000 0011 (byte 2) 0000 0000 (byte 3)	9F 34 03 42 03 00
9F35	1	Terminal type	22 (numeric)	9F 35 01 22
9F36	2	Application transaction counter	6 (numeric)	9F 36 02 00 06
9F37	4	Unpredictable number	00 00 01 00 (hex)	9F 37 04 00 00 01 00
9F41	3	Transaction sequence number	905 (numeric)	9F41 03 00 09 05

DE-55 length: 136

DE-55 data:

5F 34 01 00 82 02 58 00 84 07 A0 00 00 00 04 10 10 95 05 00 00 04 80 00 9A 03 05 05 10 9C 01 00 9F 02 06 00 00 00 00 22 00 9F 03 06 00 00 00 00 00 00 9F 09 02 00 02 9F 10 08 01 01 03 A0 20 0C DA C0 9F 1A 02 08 40 9F 1E 08 30 30 30 34 32 31 31 39 9F 26 08 6B E4 F3 F2 24 BF 2E 3D 9F 27 01 80 9F 33 03 E0 40 B0 9F 34 03 42 03 00 00 9F 35 01 22 9F 36 02 00 06 9F 37 04 00 00 01 00 9F 41 03 00 09 05 5F 2A 02 08 40

Example of DE-55 - Response

In this example, DE-55 contains tags as per table below:

Tag ID	Data Len. (bytes)	Description	Value	TLV Sub-structure (hex)
71	15	Issuer script 1	86 0D 84 24 00 00 08 9F A3 A9 11 BE A2 35 AC (hex)	71 0F 86 0D 84 24 00 00 08 9F A3 A9 11 BE A2 35 AC
91	10	Issuer authentication data	91 0A BA 65 F6 2D 8C AB E3 9E 30 30 (hex)	91 0A BA 65 F6 2D 8C AB E3 9E 30 30

DE-55 length: 029

DE-55 data:

91 0A BA 65 F6 2D 8C AB E3 9E 30 30 71 0F 86 0D 84 24 00 00 08 9F A3 A9 11 BE A2 35 AC

DE-124 Additional Transaction Data														
Format	LLLVAR													
Type	an..999													
Description	<p>The additional transaction data consists of a series of sub-elements in the format of <tag-ID><tag-length><tag-value>.</p> <table><tr><th></th><th>Length</th><th>Description</th></tr><tr><td>tag-ID</td><td>3</td><td>Tag-ID as defined by in the character representation.</td></tr><tr><td>tag-length</td><td>3</td><td>The length of the tag value data in the character representation</td></tr><tr><td>tag-value</td><td>variable</td><td>The length of the data is represented by tag-length. The value itself is in the character representation</td></tr></table> <p>The order of the TLV sub-structures is arbitrary. The list of currently defined tags is provided in the following table</p> <p>The data element is mandatory for in 01xx and 02xx requests. The data element is not present in 04xx reversal requests and responses. The data element is mandatory for 01xx and 02xx request messages. It is never present in response messages.</p>			Length	Description	tag-ID	3	Tag-ID as defined by in the character representation.	tag-length	3	The length of the tag value data in the character representation	tag-value	variable	The length of the data is represented by tag-length. The value itself is in the character representation
	Length	Description												
tag-ID	3	Tag-ID as defined by in the character representation.												
tag-length	3	The length of the tag value data in the character representation												
tag-value	variable	The length of the data is represented by tag-length. The value itself is in the character representation												
Field Edits	None													
Constraints														

Additional Transaction Data Tag Definitions

The table below shows the usage of the EMV tags in DE-I24.

Tag ID	Data Len. (Bytes)	TLV Len. (Bytes)	Description
ATD	2	8	<p>The code providing the additional information about the acquiring touch-point.</p> <p>The Acquiring Touch-point Data tag is a concatenation of two one-character sub-fields:</p> <p>Terminal Type</p> <ul style="list-style-type: none"> 0 POS terminal 1 Limited amount terminal 2 Unattended terminal (ATM) 3 Self-service terminal (ADM or CAT-I) 4 Electronic cash register (ECR) 5 Home terminal, PC, PDA, interactive TV <p>Terminal Entry Capability</p> <ul style="list-style-type: none"> 0 Unspecified or unknown 1 Terminal not used 2 Magnetic stripe entry capability 3 Bar-code read capability 4 OCR read capability 5 Magnetic-stripe and EMV chip entry capability 6 Key entry only 7 Magnetic stripe and key entry capability 8 Magnetic stripe, key and EMV chip reader capability 9 EMV chip reader C Magnetic-stripe and EMV chip entry capability for both Visa and MasterCard E Magnetic-stripe and EMV chip entry capability for MasterCard only V Magnetic-stripe and EMV chip entry capability for Visa only <p>Example: ATD00225 denotes ATM with mag-stripe and EMV chip entry capability</p> <p>Note: New values C, E and V are introduced to support specific network requirements</p>

CVV2 Processing

CVV2 processing provides the ability to forward the customer's CVV2 value entered at the merchant to the issuer for verification and to return the results to the acquirer. This section provides the data elements specifically related to CVV2 processing.

The following data elements are specific to CVV2. Refer to Section I: Basic Transaction Support in this chapter for other data elements.

DE-44 Additional Response Data	
Format	Fixed
Type	1 byte variable length, binary data up to 25 an, EBCDIC maximum 26 bytes

DE-44 Additional Response Data	
Format	Fixed
Description	<p>Bit 44 contains miscellaneous response message data. Data element consists of the sub-fields detailed below.</p> <ul style="list-style-type: none"> 44.1 Response Source/Reason Code 44.2 Address Verification Result Code 44.3 Telecode Verification Result Code 44.4 Card Product Type (IARS) 44.5 CVV Results Code (requests and responses) 44.6 PACM Diversion Level 44.7 PACM Diversion Reason Code 44.8 Card Authentication Results Code 44.9 Latin America Additional Response Data 44.10 CVV2 Result Code 44.11 Original Response Code—SMS-only field 44.12 Check Settlement Code —SMS-only field 44.13 CAVV Results Code <p>The data element is required in responses for transactions that include CVV2. When present, it is echoed in response messages and all subsequent messages. The sub-fields are fixed by position. Even though not all sub-fields are used, they are required to be present by data or <i>blanks</i>.</p>
Field Edits	
Constraints	

Structure of DE-44			
Position	Length	Field Name	Description
01 - 01	1	DE-44 LL	DE44 2 bit length indicator; binary
			DATA:
01 - 01	1	44.1	Response Source/Reason Code
02 - 02	1	44.2	Address Verification Result Code
03 -03	1	44.3	Telecode Verification Result Cd
04-04	1	44.4	Card Product Type (IARS)
05-05	1	44.5	CVV Results Code (requests and responses)
06-07	2	44.6	PACM Diversion Level
08-08	1	44.7	PACM Diversion Reason Code
09-09	1	44.8	Card Authentication Results Cd
10-10	1	44.9	LA Additional Response Data
11-11	1	44.10	CVV2 Result Code
12-13	2	44.11	Original Response Code—SMS-only field
14-14	1	44.12	Check Settlement Code —SMS-only field
15-15	1	44.13	CAVV Results Code
16-25	10		Unused (future use)

The CVV2 value is present in the field 124 tag data. The acquirer does not validate the CVV2 value. If the issuer validated CVV2, the issuer provides the result code in field 44.10 of the response message and the appropriate response code in field 39.

DE-44.10 Result Codes	
Result Code	Definition
M	CVV2 match
N	CVV2 no match
P	Not processed
S	CVV2 should be on the card but merchant indicates it is not.
U	The issuer is not certified

Note: For result code M, DE 39 is 00. For other result codes, DE 39 contains the response code for Invalid CVV.

DE-124 Additional Transaction Data									
Format	LLLVAR								
Type	an256								
Description	<p>Field 124 will carry additional transaction data required for the processing of a transaction. The contents are tag-based to identify individual elements within the data field. The tag-based processing is formatted using the “tag-length-data” encoding procedure.</p> <p>Tag will be in following format: LLL<tag_name><length_of_tag_data><tag_data> where:</p> <table> <tr> <td>LLL</td><td>Contains the total length of the variable data element.</td></tr> <tr> <td><tag_name></td><td>A predefined tag name identifying the type of data to follow. (variable length= 3 to 6 char)</td></tr> <tr> <td><length_of_tag_data></td><td>Contains the length of the tag data. (variable length= 3 to 6 digits.)</td></tr> <tr> <td><tag_data></td><td>Contains the actual tag data.</td></tr> </table> <p>For example, 12 CV2006123456 indicates the following:</p> <p>12 is the total length of DE 124 data CV2 is the tag name 006 is length of the tag data 123456 is the CVV2 value</p> <p>The data element is conditional for 01xx, 02xx, and 04xx request and response messages. As all tag definitions follow the same format, an application can choose to ignore unknown tags and continue processing with the ability to extract any remaining tags from the data element contents.</p>	LLL	Contains the total length of the variable data element.	<tag_name>	A predefined tag name identifying the type of data to follow. (variable length= 3 to 6 char)	<length_of_tag_data>	Contains the length of the tag data. (variable length= 3 to 6 digits.)	<tag_data>	Contains the actual tag data.
LLL	Contains the total length of the variable data element.								
<tag_name>	A predefined tag name identifying the type of data to follow. (variable length= 3 to 6 char)								
<length_of_tag_data>	Contains the length of the tag data. (variable length= 3 to 6 digits.)								
<tag_data>	Contains the actual tag data.								
Field Edits									
Constraints									

Dynamic Currency Conversion (DCC)

Dynamic Currency Conversion (DCC) is a financial service in which cardholders have the value of a transaction converted to their account billing currency when performing a transaction in a foreign currency. This allows cardholders to know exactly how much the purchase will cost them in a currency that is familiar to them.

When the transaction request is received by the host, eligibility verification must be performed to determine if the transaction satisfies the criteria for DCC processing and then determine the rate that is to be used so that the converted amount can be presented to the customer for acceptance. The DCC Inquiry Request/Response, described in this section is used to perform the verification processing. The normal transaction request, that also includes DCC information from the inquiry, is then sent to the host when the customer accepts the DCC offer. A normal transaction request is performed when the customer declines the DCC offer.

This section provides the details of the message to be used for the DCC inquiry and response when dynamic currency conversion is supported and is intended to be an addendum to the specification used for normal transactions.

DCC Inquiry Request and Response (0200/0210)

DE	Data Element Name	Attribute	Request	Response	Comments
			0200	0210	
	Primary Bit Map		M	M	
	Secondary Bit Map		M	M	
2	Primary Account Number	N19	M	M+	The first 12 bytes of the card number, followed by all 0's. This value must have a length of 19.
3	Processing Code	n6	M	M+	Use a value of '890000'
4	Amount, Transaction	n12	M	M+	Sum of the requested amount plus any fees/surcharge.
7	Date/time, transmission	n10	M	M	
11	STAN	n6	M	M+	A unique number that matches response message to request message. It is not intended to remain the same throughout the life of a transaction (e.g. STANs in the reversal and/or store/forward messages differ mutually, and differ from the STAN of the original transaction).
12	Time, local transaction	n6	M	M+	hhmmss format
13	Date, local transaction	n4	M	M+	MMDD format
18	Merchant Category Code	n4	M	-	
22	Pan Entry Mode	n3	M	-	Refer to ISO specification
25	POS Condition Code	n2	M	-	

DE	Data Element Name	Attribute	Request	Response	Comments
28	DCC Margin	x+n8		M	Data element is included in the response when the transaction is DCC eligible. This value is in the transaction currency specified in DE 49. x indicates the fee sign. C =credit, D = debit.
32	Acquirer ID	n11	M	M+	Identifies the acquiring institution for the transaction.
37	Retrieval Reference Number	an12	M	M+	Acquirer transaction reference number
39	Response Code	an2		M	
41	Card Acceptor Terminal ID	ans16	M	-	
42	Card Acceptor ID	ans15	M	-	
49	Transaction Currency Code	a3	M	M+	Currency of the dispensed or sale amount.
120	DCC Information	ans.....256	M	M	<i>Transaction Type</i> is the only value required on the request.
128	MAC Code	b16	O	O	

Field 120: Extended Data

Field 120 carries extended data required for the processing of a transaction. The content of this field is tag-based to identify individual elements within the data field.

The tag-based processing is formatted using the “*tag-length-value*” encoding procedure.

The following is an explanation of the tab-based specification:

Tag Format Definitions		
Field Description	Size	Description
<tag>	3 Char	A predefined tag identifying the type or data to follow.
<LLL>	3 Digits	This field indicates the length of the following data specific to the preceding tag value.
<Value>	Variable	A variable length field containing the data specific to the preceding tag. The actual length of the data is defined by field <LLL>.

For example, “**DCC196*******” would indicate the following:

- **DCC** Dynamic Currency conversion data.
- **196** Length of 196 bytes of data to follow.
- ******* Data in the format below will be present.

The following is the format of the data to be included in the data portion of the DCC tag.

DEI20: DCC Tag			
Position	Description	Attribute	Comments
1-1	Action	1 A	<p>Specifies the status of the DCC processing. Valid values for response messages:</p> <p>0 Not eligible; continue with issuer processing</p> <p>2 Eligible for DCC; prompt for confirmation</p> <p>This value must be <i>blank</i> on the request. An updated value will be provided in the response.</p>
2-3	Transaction Type	2 A	<p>Euronet defined code that identifies the type of transaction being performed. Valid values for DCC include:</p> <p>04 ATM Withdrawal</p> <p>21 POS Authorization</p> <p>25 POS Purchase</p> <p>61 Cash Advance</p> <p>70 Withdrawal Authorization</p> <p>71 Cash Advance Authorization</p> <p>MR Mobile Recharge</p> <p>This value must be provided in the request. It is echoed in the response.</p>
4-5	DCC Eligibility/Ineligibility	2 A	<p>Specifies if the transaction is DCC eligible based on the eligibility check. Valid values:</p> <p>EG DCC Eligible; the transaction is not considered DCC eligible when this value is returned, unless <i>Action</i>, in position 1, has a value of '2'.</p> <p>NE Not DCC Eligible</p> <p>The transaction is not considered DCC eligible unless this value is 'EG' and <i>Action</i> contains a value of '2'.</p> <p>This value must be <i>blank</i> in the request. An updated value is provided in the response.</p>
6-19	Internal Use 1	14 A	<p>This value is not needed to complete the DCC Inquiry processing.</p> <p>This value must be <i>blank</i> in the request.</p>
20-42	Internal Use 2	23,0 S	<p>This value is not needed to complete the DCC Inquiry processing.</p> <p>This value must be zero-filled in the request.</p>
43-43	Internal Use 3	1 A	<p>This value is not applicable to the DCC Inquiry processing.</p> <p>This value must be <i>blank</i> in the request.</p>
44-58	DCC Transaction Amount	15, 0 S	<p>Amount to be presented to the cardholder as the Account Charge amount.</p> <p>This value is right justified, zero filled, with an implied decimal. For example, a value of 15.00 is specified as 000000000001500.</p> <p>This value must be zero-filled in the request. An updated value is provided in the response for a DCC eligible transaction, otherwise the value is echoed.</p>
59-88	Internal Use 4	15,0 S	<p>This value is not needed to complete the DCC Inquiry processing.</p> <p>This value must be zero-filled in the request.</p>

DEI20: DCC Tag			
Position	Description	Attribute	Comments
89-91	DCC Transaction Currency Code	3 A	ISO standard numeric code that identifies the currency presented to the cardholder as Account Charge currency. This value must <i>blank</i> in the request. An updated value is provided in the response for a DCC eligible transaction, otherwise the value is echoed.
92-151	Internal Use 5	60,0 S	This value is not needed to complete the DCC Inquiry processing. This value must be zero-filled in the request.
152-166	Transaction Amount with Margin	15,0 S	The amount of the transaction plus the margin specified in the transaction currency. This value is right justified, zero filled, with an implied decimal. For example, a value of 15.00 is specified as 000000000001500. This value must zero-filled in the request. An updated value is provided in the response for a DCC eligible transaction, otherwise the value is echoed.
167-181	Internal Use 6	15,0 S	This value is not needed to complete the DCC Inquiry processing. This value must be zero-filled in the request.
182-196	Display Rate	15,9 S	Rate to be presented to the cardholder for the conversion. This value must be zero-filled in the request. An updated value is provided in the response for a DCC eligible transaction, otherwise the value is echoed.

DCC offers should be presented to cardholders when *DCC Eligibility/Ineligibility* (position 4-5) has a value of 'EG' and *Action* (position 1) has a value of '2'. Otherwise, the cardholder is considered not eligible for a DCC transaction.

The following information is to be updated and returned in the financial request when the DCC Eligibility flag (position 4-5) has a value of EG in the DCC Inquiry response.

- Action (position 1) must have a value of 3
- Calculation Accepted (position 43) must have a value of Y if the cardholder accepted the DCC offer or a value of N if the cardholder declined the DCC offer.
- The Actual Transaction Amount in terms of DCC id to be filled in by the acquirer.

All other values in DEI20 are to be echoed.

DCC with Surcharge

When a transaction surcharge is to be charged in addition to the DCC margin, the surcharge amount in the transaction currency is provided in the DCS tag. The eligibility processing will convert the amount to the cardholder currency and return it in the same tag.

DEI20: DCS Tag			
Position	Description	Attribute	Comments
1 – 15	Transaction Surcharge Amount	15, 0 S	Amount of the surcharge in the original transaction currency.

DE120: DCS Tag			
Position	Description	Attribute	Comments
16 – 30	Surcharge Amount in Cardholder Currency	15, 0 S	Amount of the surcharge in the cardholder account currency.

3D Secure Processing

3D Secure is the term that means during an Internet payment transaction, the cardholder has been authenticated using as approved process from the Card Associations, or that the Internet merchant is capable to authenticate. Visa 'Verified by Visa' (VbV) and MasterCard 'SecureCode' is the approved cardholder authentication methods by Visa and MC. Visa CAVV and MasterCard UCAF is the actual cardholder authentication data after the authentication occurred.

When a cardholder performs an Internet transaction, the Internet merchant will use a third-party solution to authenticate the cardholder. After this cardholder authentication step, the Internet merchant will pass the authentication results and the security indicator which define how the authentication occurred within the authorization request to the acquiring endpoint.

The ITM system supports the ability to route the 3D Secure data in Host to Host messages, for an authorization request. The response is routed back to the acquiring endpoint with the appropriate values.

The following data elements are specific to 3D Secure data. Refer to Section I: Basic Transaction Support in this chapter for other data elements.

DE-47: 3D Secure Data	
Format	LLVAR
Type	a.. 148
Description	3D Secure data for e-commerce Internet transactions
Field Edits	
Constraints	DE-47 is processed when POS Condition code has a value of '08' or '59'

Structure of DE-47			
Position	Length	Description	Value
	n3	BCD length of data to follow (2 bytes)	'0148'
I	3 A	Tag Format	'FMT'
position 1	1 A	Format Type	Valid values: A American Express M MasterCard V Visa T Telephone/MOTTO Transactions N Verified by Visa Merchant that is non-VBV D Dynamic CC
position 2	1 A	End of field delimiter	'\'
2	3 A	Security Protocol & Cardholder Authentication (MasterCard)	'SEC'

Structure of DE-47			
Position	Length	Description	Value
position 1	1 A	Security Protocol	Valid values: 2 Channel 9 None Value of 2 should be used.
position 2	1 A	Cardholder Authentication	'1' Cardholder certificate not used.
position 3	1 A	End of field delimiter	'\'
4	3 A	UCAF Collection Indicator	'UCI'
position 1	1 A	Values come from MasterCard DE43.42, position 3	Valid values: 0 UCAF not supported by the merchant 1 UCAF supported by the merchant, but was not populated. 2UCAF data present
position 2	1 A	End of field delimiter	'\'
5	3 A	UCAF (MasterCard or CAVV (Visa)	'CAF'
position 1-40	40		CAVV for Visa followed by 11 spaces Or UCAF for MasterCard (position 1-32)
position 41	1 A	End of field delimiter	'\'
6	3 A	Point of Service Data	'PSD'
position 1	1 A	POS Terminal Location	Typically a value of '2' Valid values: 0 On premises of card acceptor facility 1 Off premise (merchant terminal-remote location) 2 Off premise (cardholder terminal including home PC, mobile phone) 3 No Terminal Note: Values come from MasterCard DE 61.3
position 2	1 A	POS Cardholder Presence	Typically a value of '5' Valid values: 0 Cardholder present 1 Cardholder not present, unspecified 2 Mail/Facsimile order (MOTO) 3 Phone/ARU order (MOTO) 5 Electronic order (home PC, Internet, etc) Note: Values come from MasterCard DE 61.4

Structure of DE-47			
Position	Length	Description	Value
position 3	1 A	Cardholder Activated Terminal Level	Typically a value of '6' Valid values: 0 Not a CAT Transaction (MOTO) 6 Authorized level 6 CAT: Electronic Commerce Note: Values come from MasterCard DE 61.10.
position 4	1 A	End of field delimiter	'\'
7	3 A	ECI Indicators- Visa	'ECI'
position 1-2	2 A	Mail/Phone/Electronic Commerce and Payment Indicator	Valid values: Format V 05 CAVV Verified Format N 06 Non-authenticated security transaction at a 3-D Secure-capable merchant. The merchant attempted to authenticate. 07 Non-authenticated 08 Non-Secure 09 Non-authenticated, non-U.S.-domestic security Note: Values come from Visa DE 60.8.
position 3	1 A	End of field delimiter	'\'
8	3 A	CVV2 for Visa or CVC2 for MasterCard	'CV2'
position 1	1 A	Presence Indicator	Valid values: 0 Deliberately bypassed; use this value for MasterCard 1 CCV value is present 2 CCV value is on the card 9 Cardholder states no CVV imprint
position 2	1 A	Type of Response	Valid values: 0 Normal response code use this value for MasterCard 1 Normal response code and CVV2 result code
position 3-6	4 A	CVC2/CVV2 value	MasterCard: 3 digit CVC2 value on the card Visa: 3 digit CVV2 value on the card Note: Right justify, blank filled.
position 7	1 A	End of field delimiter	'\'
9	3 A	Transaction ID (Visa)	'XID'
position 1-40	40 A	Transaction Id	Hexadecimal value
position 41	1 A	End of field delimiter	'\'

Structure of DE-47			
Position	Length	Description	Value
10	3 A	American Express Point of Service Data Codes	'APD'
position 1	1 A	Card Data input Capability	Reserved for future use
position 2	1 A	Card Member Authentication Capability	Reserved for future use
position 3	1 A	Card Capture Capability	Reserved for future use
position 4	1 A	Operating Environment	Reserved for future use
position 5	1 A	Card member Present	Reserved for future use
position 6	1 A	Card Present	Reserved for future use
position 7	1 A	Card Data Input Mode	Reserved for future use
position 8	1 A	Card member Authentication	Reserved for future use
position 9	1 A	Card member Authentication Entity	Reserved for future use
position 10	1 A	Card Data Output Capability	Reserved for future use
position 11	1 A	Terminal Output Capability	Reserved for future use
position 12	1 A	PIN Capture Capability	Reserved for future use
position 13	1 A	End of field delimiter	Reserved for future use

Request Money Transfer Sender Information

Cross-border money transfer transactions, where the sender card and the recipient card were issued in separate countries, require that additional information about the sender be sent with the transaction. This information typically resides on the host; however, the Host-to-Host interface can be used to retrieve this information when the information resides on another system.

A 0200 message is sent using the standard Host-to-Host message specification provided in Section I: Basic Transaction Support in this chapter. The following values are specific to the Retrieve Sender Information message:

Data Element	Data Element Name	Value	Comments
DE-3	Processing Code	90xxxx	
DE-120	Tag 001	Contains a value of CI, FI, NI, or KI.	
DE-125	Tag MTX	Refer to the specification in the DE-125: Money Transfer Sender Information Value table.	

When this message is received, complete the information for the sender in the MTX tag and return in the 0210 response. If the sender information is not available, respond with the Sender Name set to *blanks* in the MTX tag and set DE-39 to 00.

Field 125: Extended Data

Field 125 carries extended data required for the processing of a transaction. The content of this field is tag based to identify individual elements within the data field.

The tag-based processing is formatted using the “tag-length-value” encoding procedure.

The following is an explanation of the tab-based specification:

Tag Format Definitions		
Field Description	Size	Description
<tag>	3 Char	A predefined tag identifying the type or data to follow.
<LLL>	3 Digits	This field indicates the length of the following data specific to the preceding tag value.
<value>	Variable	A variable length field containing the data specific to the preceding tag. The actual length of the data is defined by field <LLL>.

For example, “**MTX132*******” would indicate the following:

- **MTX** Money transfer sender data.
- **132** Length of 132 bytes of data to follow.
- ******* Data in the format below will be present.

The following is the format of the data to be included in the data portion of the MTX tag.

DE-125: Money Transfer Sender Information Value			
Position	Description	Attribute	Comments
01-19	Sender Card	19 A	Card token value of the card that is registered to initiate the money transfer.
20-69	Sender Name	50 A	Name of the sender of the cross-border money transfer. This value is required by the international networks for use in monitoring fraud.
70-119	Sender Street Address	50 A	Street address of the sender. This value is required by the international networks for use in monitoring fraud.
120-144	Sender City	25 A	City portion of the sender's address. This value is required by the international networks for use in monitoring fraud.
145-147	Sender State/Province	3 A	State or province portion of the sender's address. This value is required by the international networks for use in monitoring fraud.
148-150	Sender Country	3 A	ISO standard alpha value that identifies the country portion of the sender's address. This value is required by the international networks for use in monitoring fraud.
151-160	Sender Postal Code	10 A	Postal code portion of the sender's address. This value is required by the international networks for USA residents.
161-163	Sender Phone Type	3 A	ITM code that identifies the type of phone number specified for the sender.
164-213	Sender Phone Number	50 A	Contact phone number for the money transfer sender.
214-233	Sender Phone Description	20 A	Free form description of the sender's phone number.
234-252	Sender ID	19 A	Value that uniquely identifies the sender.
253-254	Transaction Type	2 A	ITM code that identifies the type of transaction.
255-257	Transaction Currency Code	3 A	ISO standard code that identifies the currency of the money transfer.
258-272	Send Amount	15 A	Amount of the money transfer transaction.
273-287	Transaction Fees	15 A	Fee charged for initiating the money transfer.

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Chapter 2: Batch Participant Specifications

The communications program, whether a resident on the participant's host computer or on a communications front-end processor, must handle a variety of communication conditions in addition to the standard and predictable flow of messages. These conditions include, but are not limited to the following:

- A Positive, Negative, Wait, and Delay protocol.
- B Protocol error, retry conditions.
- C Communications software is active and accepting messages, but the message processing software is inactive, potentially resulting in lost messages.
- D Blocked messages can be sent by the network to the participant or from the participant to the network, if required.
- E Contention recovery where the online participant tries to send at the same time as the network. The online participant program must retry communications with the network.

Communication Requirements

All acquirer processors have an online communications link to the network. Most card issuers also have an online link to the network. Other issuer processors operate in a batch mode. The following sections provide the logical and physical requirements for the online link, including the protocol procedures required to support the communications link.

- **TCP/IP**
The TCP/IP connection uses stream sockets. Socket connection is permanent and can be initiated from one of the parties, as agreed between the network and member during project implementation. Actual communication parameters (IP address, TCP port) should be mutually agreed upon during project implementation.

Note: Encryption can be used on communication level, where routers support it.

Note: TCP/IP is the recommended protocol.

- **Binary Synchronous Point-to-Point Communications Link protocol (BSC)**
The BSC Point-to-Point communications link between the network and the acquirer or card issuer processor uses a non-switched point-to-point data line on a contention basis.
- **X.25**
An X.25 type of connection uses Switched Virtual Circuit (SVC) initiated by one of the parties, as agreed between the network and member during project implementation. Messages pass in unencrypted eight-byte characters. Actual communication parameters (X.25 address, window and packet size, user data, etc.) should be mutually agreed upon during project implementation.

Note: Encryption can be used on communication level, where routers support it.

Batch Participant File Specifications

This section provides descriptions of the files required for a batch interface to the network. One file transmits daily transactions to the participant node, while the other file transmits cardholder information and account balances from the participating node to the network:

- Daily Transaction File
 - Batch Update File
 - Account Balance Record
 - Card Account Relationship Update Record
 - Card File Update Record
- History Record

The three record formats for the Batch Update file can be mixed in the actual data file that is transmitted to the network. The first field of the record identifies the different record formats. An example of a typical transmission is a batch participant with 15,000 accounts that have cards managed by the network. Of the 15,000 total accounts, only 1,000 account balances changed from the previous Batch Update file transmission. In addition, five new cards were added to the batch participant's database; each of these cards has two accounts "attached" to them. This scenario would result in a Batch Update file with 1,000 Account Balance records, five Card Update records, and ten Card Account Relationship records.

The Batch Update file layout was designed to reduce problems sometimes caused when numeric fields are transmitted from one type of computer to another. Because many computer systems store numeric fields differently, the Batch Update file requires that the numeric fields are sent as character data. In the following definitions, all the fields that are designated as numeric indicate that the only valid characters are 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9. Note that *blanks* are invalid. No decimal places are indicated. The number of decimal places is implied by the currency code.

In order to reduce data transmission time in the Card Update record and the Card Account Relationship record, several of the fields at the end of the record are optional. If all of the optional fields are not used for this record, the numeric fields can contain *blanks*. Note that if any one optional field contains data, then all of the numeric fields must contain digits.

Daily Transaction File

This file transmits the day's transactions to a participant from the network. All of the transactions processed on behalf of a participant are sent to the participant in the following format:

Daily Transaction File Layout				
Field	Attribute	Description	Position	Use
BTPTID	3A	Participant ID Three-character code that identifies the issuing institution. The network assigns this code	1	M
BTTRTY	2A	Transaction Type Code that identifies the type of transaction performed. This value is right justified, zero-filled. For a complete list of transaction type codes, see Appendix A, "ITM Transaction Types" of the <i>ITM System Technical Guide</i> .	4	M

Daily Transaction File Layout				
Field	Attribute	Description	Position	Use
BTTRFA	2A	From Account Type Code that identifies the type of debit account used in the transaction. This value is right justified, zero-filled.	6	C
BTTRTA	2A	To Account Type Code that identifies the type of credit account used in the transaction. This value is right justified, zero-filled.	8	C
BTSER#	7,0S	Transaction Serial Number Number assigned to the acquiring terminal that uniquely identifies the transaction at that terminal. This value is right justified, zero-filled.	10	M
BTRSPC	2A	Response Code Code defines if the transaction was approved and if not, the reason why it was denied. This value is right justified, zero-filled.	17	M
BTCRD#	19A	PAN Number Series of digits that identify a customer account or relationship; i.e., card number. This value is left justified, blank-filled.	19	M
BTMBR#	1A	Member Number This number distinguishes between separate cards with the same Primary Account Number (PAN).	38	C
BTAPR#	6A	Approval Number Number assigned by the authorizing participant on a Point-of-Service transaction. This value is right justified, zero-filled	39	C
BTSTAN	12,0 S	System Trace Audit Number Network-assigned number that uniquely identifies a transaction. The number remains unchanged throughout the life of the transaction. This value is right justified, zero-filled.	45	M
BTTIM	6,0S	Transaction Time Local time that the transaction was performed at the card acceptor location. The format of this field is hour minute second, <i>hhmmss</i> .	57	M
BTIDAT	7,0S	Transaction Date Local date on which the transaction was performed at the card acceptor location. The format of this field is century year month day, <i>cyymmdd</i> , where: c = 0 For the years 1900-1999 c = 1 For the years 2000-2099	63	M

Daily Transaction File Layout				
Field	Attribute	Description	Position	Use
BTSDAT	7,0S	Settlement Date Date on which funds transfer between the participant and the network. The format of this field is century year month day, <i>cyymmdd</i> , where: c = 0 For the years 1900-1999 c = 1 For the years 2000-2099	70	M
BTMCAT	4,0S	Merchant Category Code ISO standard code that identifies the merchant's type of business product or service.	77	M
BTCATI	8A	Card Acceptor Terminal ID Unique code that identifies the terminal at the card acceptor location. This value is left justified, <i>blank-filled</i> .	81	M
BTCAID	15A	Card Acceptor ID Code that identifies the card acceptor. This code defines the point of the transaction in both local and interchange environments.	89	M
BTCATA	40A	Card Acceptor Terminal Location Name and location of the card acceptor. It defines the Point-of-Service in both a local and interchange environment.	104	M
BTAQID	11A	Acquirer ID Code that identifies the acquiring institution (e.g., merchant bank) or its agent.	144	M
BTNTID	3A	Network ID Code that identifies a single network of a card issuer.	155	M
BTACI#	19A	Account I Number Identifies the account used to perform the transaction.	158	M
BTACIB	10A	Account I Branch ID Code that identifies the branch that owns the account used to perform the transaction	177	M
BTTRCC	3A	Transaction Currency ISO standard numeric code that identifies the currency in which the transaction was performed.	187	C
BTTRN\$	15,0S	Transaction Amount Amount of the transaction requested by the cardholder.	190	C
BTATR\$	15,0S	Actual Transaction Amount The completed amount of the transaction, expressed in terms of the transaction currency	205	C
BTTRFE	15,0S	Transaction Activity Fee Fee charged by the card acceptor to the cardholder for the service of performing the transaction.	220	C

Daily Transaction File Layout				
Field	Attribute	Description	Position	Use
BTIICC	3A	Issuer I Settlement Currency ISO standard numeric code that defines the type of currency that the card issuer uses for settlement purposes with the network.	235	C
BTIIA\$	15,05	Issuer I Settlement Amount The equivalent amount of settlement for the transaction expressed in the Issuer I Settlement Currency.	238	C
BTIIF\$	15,05	Issuer I Settlement Fee Fee that the network charged the card issuer for processing the transaction.	253	C
BTIIP\$	15,05	Issuer I Settlement Fee Fee that the network charged the card issuer for processing the transaction.	268	C
BTCICC	3A	Cardholder I Bill Currency ISO standard code that identifies the currency of the account used to perform the transaction.	283	C
BTCIA\$	15,05	Cardholder I Billing Amount The transaction amount converted to the Cardholder I Bill Currency.	286	C
BTCIAF	15,05	Cardholder I Bill Activity Fee The Transaction Processing Fee expressed in the Cardholder I Bill Currency.	301	C
BTCIPF	15,05	Cardholder I Bill Processing Fee The Issuer I Settlement Fee expressed in the Cardholder I Bill Currency	316	C
BTCISF	15,05	Cardholder I Bill Service Fee Fee charged to the cardholder by the issuing institution for the service of processing the transaction.	331	C
BTTCIR	15,95	Transaction/Cardholder I Conversion Rate The rate for converting the transaction amount from the Transaction Currency to the Cardholder I Bill Currency.	346	C
BTSCIR	15,95	Settlement/Cardholder I Conversion Rate The rate for converting the transaction amount from the Issuer I Settlement Currency to the Cardholder I Bill Currency.	361	C
BTDBCR	1A	Debit/Credit Flag Flag that indicates whether the transaction is debit (D) or credit (C). Valid values: D Debit C Credit	376	M

Daily Transaction File Layout				
Field	Attribute	Description	Position	Use
BTDBTR	1A	Double Sided Transaction A flag that indicates if both a debit and credit are involved in the transaction. Valid values: Y Yes N No	377	M
BTCOCC	3A	Cash out Currency Code ISO standard numeric code that identifies the transaction currency for the cash back portion of a POS Cashback transaction. This value should match the value of the Transaction Currency.	378	C
BTCOT\$	15,0 S	Cash out Transaction Amount Cashback portion of the transaction amount for a POS Cashback transactions.	381	C
BTCICC	3A	Cash in Currency Code ISO standard numeric code that identifies the acquirer settlement currency.	396	C
BTCIT\$	15,0 S	Cash in Amount Cashback amount in the acquirer settlement currency.	399	C

Note: The following is a list of Use column codes:

M Mandatory
C Conditional
O Optional

Note: Total Record Length for this file is 413.

Batch Update File

The Batch Update file contains card and account information sent from the participant to the network each day.

Account Balance Record

This record format contains account balances and information for purposes of issuing transaction authorizations. The participant transmits this record format to the network as a record in the Batch Update File.

Account Balance Record Layout				
Field	Attribute	Description	Position	Use
BBRCID	1A	Record Identifier Code that identifies the record type. Valid value: B Balance	I	M

Account Balance Record Layout				
Field	Attribute	Description	Position	Use
BBACTC	1A	<p>Action Code</p> <p>Specifies how to handle the account.</p> <p>Valid values:</p> <p>A Add</p> <p>D Delete</p> <p>U Update</p> <p>R Refresh</p> <p>A refresh can only apply to the entire balance file. An R (refresh) action code causes the system to delete all records for that participant whenever it encounters an R and then treat the R records as if they are A records. Only the first record has to be an R for this to happen.</p>	2	M
BBPAR#	3A	<p>Participant Number</p> <p>Three-character code that identifies the institution that owns the account. The network assigns this code.</p>	3	M
BBBCH#	10A	<p>Branch Number</p> <p>The specific branch that holds the cardholder's account. This value must be left justified, blank-filled.</p>	6	O
BBTYPE	2A	<p>Account Type</p> <p>Code that identifies whether the account is 01/DDA, 02/Savings, etc. This value must be right justified, zero-filled.</p>	16	M
BBACCT	19A	<p>Account Number</p> <p>The identification number for the account. This value must be right justified, zero-filled.</p>	18	M
BBCURC	3A	<p>Currency Code</p> <p>ISO standard numeric code that identifies the currency of the account.</p>	37	M
BBCONC	3A	<p>Country Code</p> <p>ISO standard code that identifies the country in which this participant is located.</p>	40	O
BBSTAT	1A	<p>Account Status</p> <p>Flag that specifies the status of the account.</p> <p>Valid values:</p> <p>1 Active account</p> <p>2 Dormant account</p> <p>6 Frozen account</p> <p>7 Closed account</p> <p>Format:</p> <p>Numeric</p>	43	M

Account Balance Record Layout				
Field	Attribute	Description	Position	Use
BBCURR	15A	Current Balance The actual “book” balance of the account as well as any unposted items. This value must be right justified, zero-filled. Format: Numeric	44	M
BBAVAL	15A	Available Balance The amount available to the cardholder. It can reflect only a portion of the unposted items. This value must be right justified, zero-filled. Format: Numeric	59	M
BBCOLL	15A	Collected Balance The actual “book” balance of the cardholder's account. This value must be right justified, zero-filled. Format: Numeric	74	M
BBODLM	15A	Overdraft Limit The “line of credit” assigned to this account with regard to overdrafts. This value must be right justified, zero-filled. Format: Numeric	89	M
BBNAME	20A	Customer Short Name A brief and unique identifier that locates each cardholder based on only a few bytes of their name.	104	O
BBCBR#	10A	Correspondent Branch Number Another branch number, as defined above, that is associated with the cardholder's account.	124	O
BBCATY	2A	Correspondent Account Type Another account type, as defined above, that is associated with the cardholder's account.	134	O
BBCACT	19A	Correspondent Account Number Another account number, as defined above, that is associated with the cardholder's account.	136	O
BBCCUR	3A	Correspondent Currency Code Another type of currency, as defined above, that is associated with the cardholder's account.	155	O

Note: The following is a list of Use column codes:

M	Mandatory
C	Conditional
O	Optional

Note: Total Record Length for this file is 164.

Card Account Relationship Update Record

This record format updates the card database on the network's system. It contains information to link the card number to an account number. The participant transmits this record format to the network as a record in the Batch Update file.

Card Account Relationship Update Record Layout				
Field	Attribute	Description	Position	Use
BARCID	1A	Record Identifier Code that identifies the record type. Valid value: A Account Relationship	1	M
BAACTC	1A	Action Code This code instructs how to handle the record; i.e., added, deleted, or updated. Valid values: A Added record D Deleted record U Updated record	2	M
BAPAR#	3A	Participant Number Three-character code that identifies the institution to the network.	3	M
BACRD#	19A	Card Number Number that identifies the card. Format: Numeric	6	M
BAMBR	1A	Member Number This number distinguishes between two separate cards with the same Primary Account Number (PAN). Format: Numeric	25	M
BAACTY	2A	Account Type Code that identifies the type of account associated with the account number field.	26	M
BAACCT	19A	Account Number The identification number for the cardholder's account.	28	M

Card Account Relationship Update Record Layout				
Field	Attribute	Description	Position	Use
BAACDC	2A	Account Description Code Participant-defined short description for this account number.	47	
BACSQ	2A	Account Type Sequence Number Unique number assigned to each cardholder account. Format: Numeric	49	M
BABRCH	10A	Account Owning Branch The branch assigned to this account number (if applicable)	51	O
BALANG	2A	Language Code Code that identifies the language associated with this card. The network to which this file is sent defines this code.	61	O
BACURC	3A	Currency Code ISO standard numeric code that identifies the type of currency for this account.	63	M
BASCWV	1A	Waive Service Charge Flag that indicates if this account is exempt from service charges. Valid values: Y Exempt from service charge N Not exempt from service charge (default value)	66	M
BAPRIM	1A	Primary Account Within Type Flag that indicates the account as primary. Use this account when an account number is not specified. Valid values: Y Primary account N/blank Not primary account	67	M

Note: The following is a list of Use column codes:

M Mandatory
C Conditional
O Optional

Note: Total Record Length for this file is 160.

Card File Update Record

This record format updates the card database on the network's system. It contains information required to authorize a transaction. The participant transmits this record format to the network as a record in the Batch Update File.

Card File Update Record Layout				
Field	Attribute	Description	Position	Use
BCRCID	1A	Record Identifier Code that identifies the record. Valid value: C Card Update Record	1	M
BCACTC	1A	Action Code Code that specifies how to handle the record (i.e., added, deleted, inactive, or updated.) Valid values: A Added record D Deleted record I Inactive record U Updated record	2	M
CPAR#	3A	Participant Number Three-character code that identifies the institution. Format: Numeric	3	M
BCCRD#	19A	Card Number Number that identifies the card. Format: Numeric	6	M
BCMBR	1A	Member Number This number distinguishes between separate cards with the same Primary Account Number (PAN) if not applicably set to 0. Format: Numeric	25	M
BCIETL	10A	Title	26	O
BCNAM1	78A	Name Line 1 Embossing name line 1. Note: Due to embossing restrictions, only the first 24 bytes can be used.	36	M
BCNAM2	78A	Name Line 2 Embossing name line 2. Note: Due to embossing restrictions, only the first 24 bytes can be used.	114	M
BCIEFN	25A	First Name Encode first name. Note: The combined data length of the First Name, Middle Name, and Surname fields cannot exceed 24 bytes.	192	O

Card File Update Record Layout				
Field	Attribute	Description	Position	Use
BCIEMN	25A	Middle Name Encode middle name. Note: The combined data length of the First Name, Middle Name, and Surname fields cannot exceed 24 bytes.	217	O
BCIESN	25A	Surname Encode short name. Note: The combined data length of the First Name, Middle Name, and Surname fields cannot exceed 24 bytes.	242	O
BCSHNM	20A	Short Name Search name.	267	O
BCADR1	40A	Address Line 1 Cardholder's address line 1.	287	O
BCADR2	40A	Address Line 2 Cardholder's address line 2.	327	O
BCCITY	50A	City Cardholder's city.	367	O
BCCOUN	10A	Country Cardholder's country.	417	O
BCZIP1	5A	ZIP-1 (for address verify) Cardholder's ZIP code.	427	O
BCZIP2	4A	ZIP-2 (for address verify) Cardholder's ZIP code extension.	432	O
BCBRCH	10A	Card Owning Branch	436	O
BCLANG	2A	Language Code Code that identifies the language associated with this card. This value must be established with the network to which this file is sent.	446	O
BCSCWV	1A	Waive Service Charge Flag indicating if the card number is exempt from a service charge. If the value is Y, all members and accounts attached to this card are exempt.	448	O
BCEXPC	2A	Expire Date/Century The century the card for this member expires. Format: Numeric	449	M
BCEXPY	2A	Expire Date/Year The year the card for this member expires. Format: Numeric	451	M

Card File Update Record Layout				
Field	Attribute	Description	Position	Use
BCEXPM	2A	<p>Expire Date/Month The month the card for this member expires.</p> <p>Format: Numeric</p>	453	M
BCGEN	1A	<p>Generate Card Indicates the network is to generate a card.</p> <p>Valid values: G Generate Card. <i>blank</i></p>	455	C
BCPINO	12A	<p>PIN Offset/PVV/CVV If this value is a PIN offset, this is the difference between a natural PIN and a customer selected PIN. The offset is produced when the member has a customer selected PIN. If the PIN was generated using the Visa or MasterCard algorithms, this value contains the PVV or CVV code, respectively.</p> <p>This field is currently not used.</p>	456	
BCPVVX	1A	<p>PVV/CVV Index Index for PVV/CVV codes if used.</p> <p>This field is currently not used.</p>	468	
BCACT	1A	<p>Current Action for Negative/Exception Card Flag indicating the action to take on this card.</p> <p>Valid values: A Add D Delete</p>	469	C
BCSTAT	1A	<p>Current Status for Negative/Exception Card Flag indicating the result of the reason code.</p> <p>Valid values: * VIP status B No cash withdrawals (warm card) C Capture the card D Decline the transaction but do not capture card</p>	470	C
BCRECD	2A	<p>Reason Code for Negative Card This code indicates the reason a card can be flagged as negative.</p> <p>Valid values: ST Stolen card FR Fraudulent use WM Warm card</p>	471	C

Card File Update Record Layout				
Field	Attribute	Description	Position	Use
BCBDTE	6A	Birth Date Date of birth for the cardholder in Year Month Day (yymmdd) format. Format: Numeric	473	O
BCSSN#	15A	Social Security Number Identification number for the cardholder. Format: Numeric	479	O

Note: Total Record Length for this file is 586.

Batch Update Balance History Record

The Batch Update Balance History Record contains historical data from batch updates to provide an audit trail.

Batch Update Balance History Record Layout				
Field	Attribute	Description	Position	Use
BHRCID	1A	Record Identifier Code that identifies the record type. Valid value: H History Update Record	1	M
BHACTC	1A	Action Code Specifies how the account should be handled. Valid values: A Add D Delete U Update R Refresh A refresh can only be done to the entire balance file. An R (refresh) action code causes the system to delete all records for that participant whenever it encounters an R and then treat the R records as if they are A records. Only the first record has to be an R for this to happen.	2	M
BHBANK	3A	Participant Number Three-character code that identifies the institution that owns the account. The network assigns this code.	3	M

Batch Update Balance History Record Layout				
Field	Attribute	Description	Position	Use
BHBCH#	10A	Branch Number The specific branch where the cardholder's account is held. This value must be left justified, <i>blank-filled</i> .	6	
BHTYPE	2A	Account Type Code that identifies whether the account is 01/DDA, 02/Savings, etc. This value must be right justified, zero-filled.	16	M
BHACCT	19A	Account Number The identification number for the account. This value must be right justified, zero-filled.	18	M
BHCRCD	3A	Currency Code ISO standard numeric code that identifies the currency of the account.	37	M
BHSTAT	1A	Account Status Flag that specifies the status of the account. Valid values: 1 Active account 2 Dormant account 6 Frozen account 7 Closed account	40	
BHTRCD	2A	Transaction Code Code that identifies the type of transaction that is being performed. This value is right justified, zero-filled. For a complete list of transaction type codes, see Appendix A, "ITM Transaction Types" of the <i>ITM System Technical Guide</i> .	41	M
BHTRDT	8A	Transaction Date The local date on which the transaction was performed at the card acceptor location.	43	
BHEFDT	8A	Posting Date The local date on which the transaction was posted.	51	
BHAMT	15A	Transaction Amount The amount of the transaction that was requested by the cardholder.	59	
BHSER	11A	Transaction Check Number	74	
BHDORC	1A	Debit or Credit Flag that indicates whether the transaction is debit (D) or credit (C). Valid values: D Debit C Credit	85	

Batch Update Balance History Record Layout				
Field	Attribute	Description	Position	Use
BHMSG#	7A	Error Message Number Identifies an error message associated with this record.	86	

Note: The following is a list of Use column codes:

M	Mandatory
C	Conditional
O	Optional
P	Program Updated

Note: Total Record Length for this file is 92.

Chapter 3: ITM Settlement Procedures

This document describes the settlement functions of the network. A detailed presentation of the settlement process follows a conceptual overview of settlement.

The settlement process determines “who owes how much to whom.” In the network environment, multiple entities must settle with each other. The following is a list of common settlement terminology:

Terminology	
Field	Description
Batch Participant	A batch participant transmits balance and card information to the network so that the network can authorize transactions for the participant's cardholders. Periodically, the network sends transactions it has processed to the participant for posting to the cardholder's accounts.
Node	A node is an entity that performs transaction acquisition or authorization. Node values are used for transaction authorization routing. A node can be an online participant or a batch participant.

Settlement Concepts

Two monetary flows exist in the settlement process:

- Funds an institution owes to the network.
- Funds the network owes to an institution.

Two primary settlement reports detail this process:

- **Acquirer Activity Report**
The Acquirer Activity report shows the transactions performed at the ATMs or POS devices owned by the participant and processed by the network. This report details and totals the funds that the network owes the participant for funds dispensed from the participant's devices.
- **Issuer Activity Report**
The Issuer Activity report shows the transactions performed by the participant's cardholders at the ATMs or POS devices that they do not own. This report details and totals the amount that the participant owes the network for the funds dispensed to its cardholders.

Additionally, fees are generally paid in two directions. The participant pays fees to the network for various services (such as ATM driving fees) and for transaction fees. The network generally pays the participant fees for acquiring cardholder transactions for customers of other participants.

The network determines these fees and assesses them to the participants outside of the network settlement reporting.

Settlement Reporting

An issuer/acquirer network participant is an example of settlement. The participant owes the network funds for the transactions its cardholders perform at ATMs they do not own. The network owes the participant funds for the money the participant dispenses from the ATMs it owns.

In this phase of settlement, the network is the controlling factor, and the participants (whether batch or online) settle to the network at the time and on the day dictated by the network.

The network produces previously described Acquirer Activity report and Issuer Activity report. The Acquirer Activity report indicates how much the network owes the participant for funds withdrawn from the participant's ATMs. The Issuer report indicates how much the participant owes the network for the transactions performed by its cardholders at other ATMs.

It is expected that the software on the computers of the network online participants produce settlement reports similar to the network's Acquirer Activity and Issuer Activity reports. The participant must reconcile these reports with the reports produced by the network.

For batch participants, it is usually sufficient for the participant to use the reports produced by the network for their settlement.

Examples of Report Usage

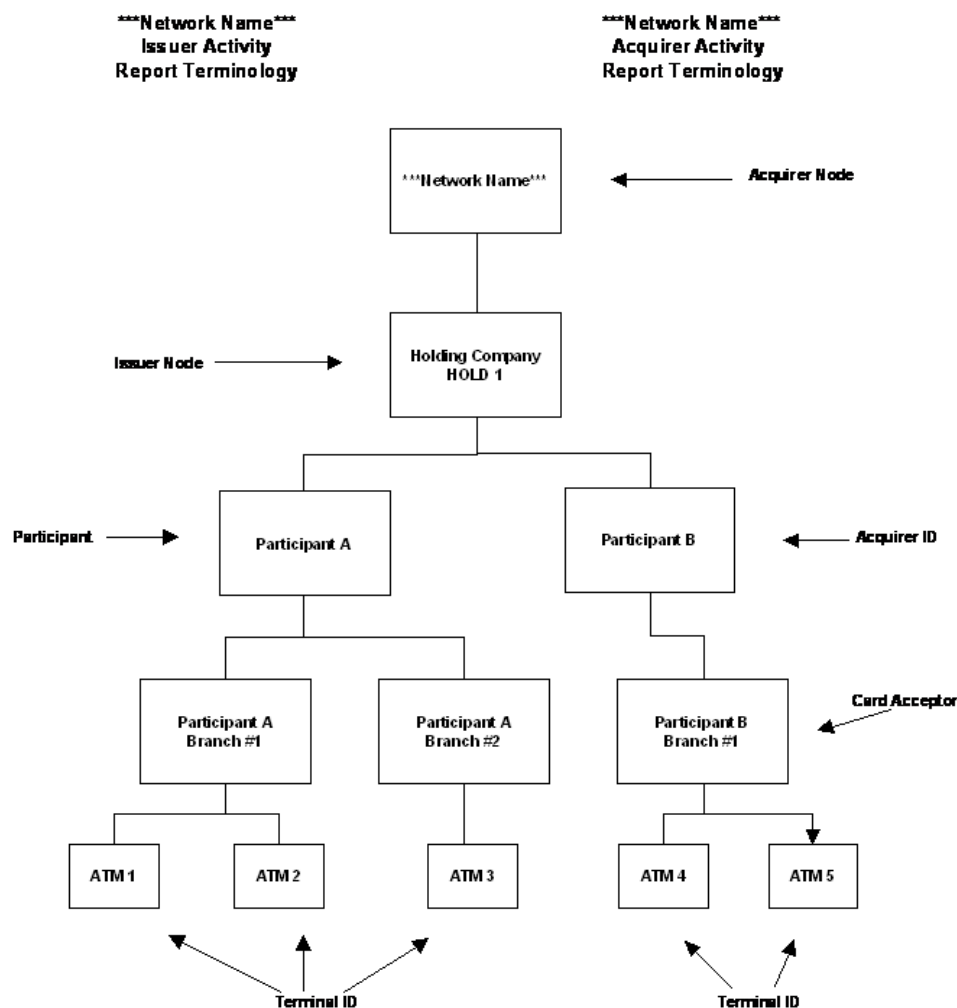


Figure 24 Network Settlement Using Issuer Activity and Acquirer Activity Reports flowchart

In order to settle with the network via Issuer Activity and Acquirer Activity reports, the following sequence of events must occur:

- The node is a participant holding company (HOLD 1).
- HOLD 1 encompasses two participants (A and B).
- Participant A has two branches (A-Branch-1 and A-Branch-2) and participant B has one branch (B-Branch-1).
- Because of its two branches, participant A owns and is responsible for funding and balancing three ATMs (ATM1, ATM2, and ATM3).
- Because of its sole branch, participant B owns and is responsible for funding and balancing two ATMs (ATM4 and ATM5).

Note: While the ATMs are owned by their respective participants, they are driven by the network. Diagram indicates settlement hierarchy only, not physical connections.

Issuer Activity Report

When network settlement runs for the network and its participants, the Issuer Activity report details and totals all transactions processed by the network and performed by a participant's cardholders, regardless of the source ATM or POS device.

Although not part of this example, if an acquirer processor is attached to the network, those transactions performed by its cardholders at its own terminals are not “seen” by the network and therefore not reported. The acquirer “intercepts” these transactions and the processor processes them. (An acquirer processor physically drives the devices, whereas in this example, the network is physically driving the devices.)

In this example, the participant holding company HOLD I is the network node. The two participants it owns are participants A and B.

The Issuer Activity report is produced for HOLD I and within this report are the detail transaction lists for A and B. Within each participant's listing, the transactions are grouped and totaled by currency type. The total settlement amount is listed for each participant.

The settlement total for each participant indicates the amount A and B owe to HOLD I for transactions their customers performed at network ATMs. At the end of the Cardholder Activity report, a total settlement amount displays for HOLD I. This is the amount the node owes the network.

So far, this chapter has addressed what the node owes the network. The following sections address what the network owes the node for funds dispensed at the ATMs it owns and services.

Acquirer Activity Report

When settlement runs for the network and its participants, the Acquirer Activity report details and totals all transactions performed at the terminals owned and funded by the participants. The report totals indicate how much the network owes the participants for transactions that occurred at their ATMs.

In the example, the network is the acquirer node, as it physically drives the devices. The transactions are totaled by currency for each participant and the total indicated in the selected network settlement currency. As illustrated in the example, the branches that service and fund the ATMs are designated as the card acceptors. This shows the activity for A-BRANCH-I terminals ATM1 and ATM2. This total is the amount owed to the card acceptor A-BRANCH-I by the card acquirer A, the next higher level.

The participants owning the branches in this example are designated as the card acquirers. The total on this report in the settlement currency is the amount owed to the card acquirer by the network. This amount is the total funds dispensed at terminals owned by this acquirer. This total is the sum of the totals of the card acceptors within the acquirer.

The sum of the settlement totals for the acquirers A and B is what the network owes to HOLD I. The settlement totals for the card acceptors within each acquirer are what A and B owe to their branches for funds dispensed at their terminals.

Note: There are variations on the setup of acquirer and card acceptor. For example, in a single participant environment with no branches, the participant is set up with a unique acquirer ID that is also its card acceptor ID.

Participant Transaction Posting

For batch participants, the network produces a file of detail transactions for posting. Since the network is the authorizer, the network determines the final disposition of the transaction. However, for online participants, the participant is responsible for producing the posting transaction from the online requests sent to it by the network. The network does not produce a file of posting transactions for an online participant.

Settlement Accounts

It is recommended that the network establish “due-from” settlement accounts for each participant at a local financial institution to receive the funds due to the network from the card issuer participants. As previously discussed, the Cardholder Activity reports indicate how much each issuer participant owes the network.

Likewise, the network should establish “due-to” accounts at each of the participants to credit the funds due to the participants from the network. The Terminal Activity report indicates how much the network owes to each acquirer. Any fees set by the network calculate outside the network settlement process.

Adjustments

Occasionally transactions authorized and posted online must be corrected if, for example, an ATM hardware error occurred. Manually handle such adjustments outside the network.

Suspense Reporting

The network settlement process produces a suspense report of the difference in the balancing of the network and participants. The difference reported is based on the different settlement cutoff times that occur within the network.

Settlement Report Structure

The diagrams in this section describe the sorting order and totaling characteristics of the Issuer Activity and Acquirer Activity reports.

Note: In this example, a notation of I indicates the first instance of a process. A notation of N indicates that the process repeats as necessary.

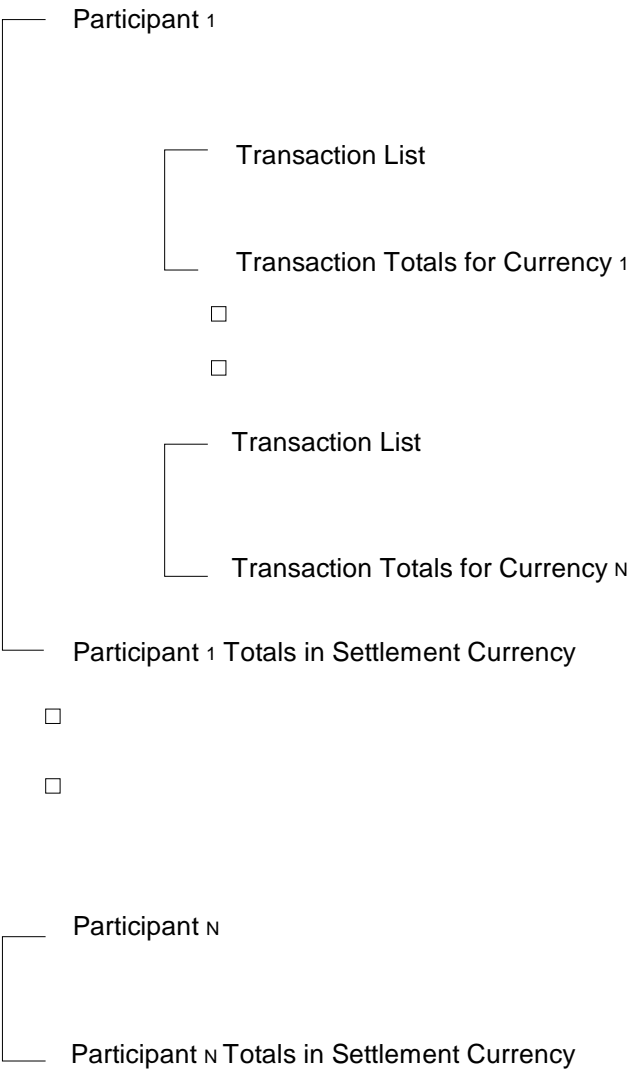


Figure 25 Report Sorting Order diagram

Issuer Activity Report

The Issuer Activity report indicates the amount the participant owes the network for funds dispensed to customers at network ATMs.

The following is an example of the Issuer Activity report:

001 Euronet Banking Corporation 840 US Dollars				PARTICIPANT ISSUER ACTIVITY			Proc Date : 15/05/08 Run Date : 11/06/08 Run Time : 10:19:49		Page : 1 Prog : ZSTL7ISR Id : ISSRP	
CARD NUMBER	TRAN	DESC	TRAN AMT	ACQUIRER FEE	TRAN AMT	ISSUER FEE	NETWORK FEE	APPRVL NUMBER	ERROR	S F
4999999900015209	1	MDB 00	A\$ 55.00-	A\$.00	US\$ 50.32-	US\$ 00	US\$ 00	461242		
5/13/08 :00		722012099864	QANTAS	MASCOT	AU					
4999999900015290	1	MDB 00	A\$ 17.85-	A\$.00	US\$ 16.33-	US\$ 00	US\$ 00	461371		
5/13/08 :00		722013070278	TERRY WHITE CHEMISTS	BANKSTOWN	AU					
4999999900019763	1	MDB 00	A\$ 57.91-	A\$.00	US\$ 52.99-	US\$ 00	US\$ 00	461653		
5/13/08 :00		722015025680	WOOLWORTHS PETROL 2224	NOOSA	AU					
4999999900008287	1	MDB 00	97.48-	0.00	US\$ 79.40-	US\$ 00	US\$ 00	461826		
5/13/08 :00		722006187866	WAREHOUSE SYLVIA PARK	SYLVIA PARK	NZ					
4999999900015290	1	MDB 00	A\$ 19.90-	A\$.00	US\$ 18.20-	US\$ 00	US\$ 00	460124		
5/12/08 :00		721904623707	TEMT	BANKSTOWN	AU					
4999999900019763	1	MDB 00	A\$ 27.00-	A\$.00	US\$ 24.70-	US\$ 00	US\$ 00	460002		
5/12/08 :00		721903887123	POMONA PHARMACY	POMONA	AU					
4999999900015290	1	MDB 00	A\$ 30.00-	A\$.00	US\$ 27.45-	US\$ 00	US\$ 00	461192		

More...

001 Euronet Banking Corporation				PARTICIPANT ISSUER ACTIVITY				Proc Date : 15/05/08		Page : 4	
840 US Dollars								Run Date : 11/06/08		Prog : ZSTL7ISR	
								Run Time : 10:19:49		Id : ISSRP	
SUMMARY TOTALS											
TRANSACTION	---NUMBER---		-----SETTLEMENT AMOUNT-----								
DESCRIPTION	APPRV	DENIED	DEBITS		CREDITS		ISSUER FEE		NETWORK FEE		NET STLMNT AMOUNT
WTD CCD	2	0	US\$	219.05-	US\$	0.00	US\$	0.00	US\$	0.00	US\$ 219.05-
WTD CUR	9	0	US\$	3,497.36-	US\$	0.00	US\$	0.00	US\$	0.00	US\$ 3,497.36-
WTD SAV	3	0	US\$	1,027.64-	US\$	0.00	US\$	0.00	US\$	0.00	US\$ 1,027.64-
SUBTOTAL	14	0	US\$	4,744.05-	US\$	0.00	US\$	0.00	US\$	0.00	US\$ 4,744.05-
CAR CUR	1	0	US\$	0.00	US\$	407.27	US\$	0.00	US\$	0.00	US\$ 407.27
MCR CCD	1	0	US\$	0.00	US\$	61.22	US\$	0.00	US\$	0.00	US\$ 61.22
SUBTOTAL	2	0	US\$	0.00	US\$	468.49	US\$	0.00	US\$	0.00	US\$ 468.49
MDB CCD	3	0	US\$	229.08-	US\$	0.00	US\$	0.00	US\$	0.00	US\$ 229.08-
MDB 00	35	0	US\$	2,916.95-	US\$	0.00	US\$	0.00	US\$	0.00	US\$ 2,916.95-
SUBTOTAL	38	0	US\$	3,146.03-	US\$	0.00	US\$	0.00	US\$	0.00	US\$ 3,146.03-
TOTAL	54	0	US\$	7,890.08-	US\$	468.49	US\$	0.00	US\$	0.00	US\$ 7,421.59-

001 Euronet Banking Corporation				PARTICIPANT ISSUER ACTIVITY				Proc Date : 15/05/08		Page : 5	
840 US Dollars								Run Date : 11/06/08		Prog : ZSTL7ISR	
								Run Time : 10:19:49		Id : ISSRP	
GRAND TOTALS											
TRANSACTION	---NUMBER---		-----SETTLEMENT AMOUNT-----								
DESCRIPTION	APPRV	DENIED	DEBITS		CREDITS		ISSUER FEE		NETWORK FEE		NET STLMNT AMOUNT
WTD CCD	2	0	US\$	219.05-	US\$	0.00	US\$	0.00	US\$	0.00	US\$ 219.05-
WTD CUR	9	0	US\$	3,497.36-	US\$	0.00	US\$	0.00	US\$	0.00	US\$ 3,497.36-
WTD SAV	3	0	US\$	1,027.64-	US\$	0.00	US\$	0.00	US\$	0.00	US\$ 1,027.64-
SUBTOTAL	14	0	US\$	4,744.05-	US\$	0.00	US\$	0.00	US\$	0.00	US\$ 4,744.05-
CAR CUR	1	0	US\$	0.00	US\$	407.27	US\$	0.00	US\$	0.00	US\$ 407.27
MCR CCD	1	0	US\$	0.00	US\$	61.22	US\$	0.00	US\$	0.00	US\$ 61.22
SUBTOTAL	2	0	US\$	0.00	US\$	468.49	US\$	0.00	US\$	0.00	US\$ 468.49
MDB CCD	3	0	US\$	229.08-	US\$	0.00	US\$	0.00	US\$	0.00	US\$ 229.08-
MDB 00	35	0	US\$	2,916.95-	US\$	0.00	US\$	0.00	US\$	0.00	US\$ 2,916.95-
SUBTOTAL	38	0	US\$	3,146.03-	US\$	0.00	US\$	0.00	US\$	0.00	US\$ 3,146.03-
TOTAL	54	0	US\$	7,890.08-	US\$	468.49	US\$	0.00	US\$	0.00	US\$ 7,421.59-

The following information is included on the Issuer Activity report.

Report Information	
Field	Description
Card Number	The card number that was used to perform the transaction.
Transaction Description	Short description of the transaction that was performed.
Transaction Amount	The transaction amount in the currency of the transaction.
Acquirer Fee	The amount charged by the participant that acquired the transaction.
Settlement Transaction Amount	The transaction amount in the currency that is to be used to settle this transaction with the external network.
Settlement Issuer Fee	The amount charged by the acquirer in the currency that is to be used to settle with the network.
Settlement Network Fee	A fee charged by the network for processing the transaction.
Approval Number	Number generated when the transaction was approved.
Error	Short description of any denial or errors that may have occurred.
S/F	An * in this column specifies that the issuer was offline when this transaction was performed.
Date	Date the transaction was performed.
Reference Data	Information that can be used to further research the transaction.
Location	Location information for the terminal used to perform the transaction.

Each of the following totals will be produced for transaction type, transaction class, and for the grand totals. All the amounts will be in the settlement currency.

Report Totals	
Total	Description
Count	The total number of approved and denied transactions.
Transaction Amount	The total transaction amount for debits and credits.
Settlement Issuer Fee	The total amount of fees charged by the acquirer in the settlement currency.
Network Fee	The total amount of fees charged by the network.
NetSettlement Amount	The total amount of the debits, acquirer fees, and network fees less the credits.
Total Count	The total number of approved and denied transactions.
Total Amount	The total amount of the transactions.
Grand Totals	Displays the sum of the Totals and the Unprocessed.

Acquirer Activity Report

The Acquirer Activity report indicates the amount the network owes the participant for funds dispensed from the participant's ATMs. The following diagram illustrates the sorting order and totals contained on the Acquirer Activity report:

The following is an example of the Acquirer Activity report:

001 Neptune Reef Underwater Bank				S E T T L E M E N T			Proc Date : 02/08/09		Page : 12		
840 US Dollars (United States of America)				PARTICIPANT ACQUIRER ACTIVITY			Run Date : 12/08/09		Prog : ZSTL7AQR		
							Run Time : 17:30:37		Id : ACQRP		
-----SETTLEMENT-----											S
CARD NUMBER	M	TRAN	DESC	TRAN AMT	ACQUIRER FEE	TRAN AMT	ACQUIRER FEE	NETWORK FEE	ERROR F		
DATE	TIME	SER#	TRACE#						VND#		

100050*****0001	WTD	CUR		5.00-	0.00	5.00-	0.00	0.00			
21/05/09	2:38	0445	000002062796	ATMNCR3	123 EAST STREET	ARKANSYS	LR				
100050*****0001	WTD	CUR		5.00-	0.00	5.00-	0.00	0.00			
21/05/09	2:56	0446	000002062979	ATMNCR3	CHANNAL PARKWAY	LITTLE ROCK	LR				
100050*****0001	WTD	CUR		5.00-	0.00	5.00-	0.00	0.00			
21/05/09	2:58	0447	000002062996	ATMNCR3	123 EAST STREET	ARKANSYS	LR				
100050*****0001	WTD	CUR		5.00-	0.00	5.00-	0.00	0.00			
21/05/09	3:05	0448	000002063054	ATMNCR3	123 EAST STREET	ARKANSYS	LR				
100050*****0001	WTD	CUR		5.00-	0.00	5.00-	0.00	0.00			
21/05/09	3:07	0449	000002063071	ATMNCR3	CHANNAL PARKWAY	LITTLE ROCK	LR				
100050*****0001	WTD	CUR		5.00-	0.00	5.00-	0.00	0.00			
											More...

001 Neptune Reef Underwater Bank			S E T T L E M E N T		Proc Date : 02/08/09		Page : 80	
			PARTICIPANT ACQUIRER ACTIVITY		Run Date : 12/08/09		Prog : ZSTL7AQR	
840 US Dollars (United States of America)					Run Time : 17:30:37		Id : ACQRP	
SUMMARY TOTALS								
TRANSACTION	---NUMBER---		-----SETTLEMENT AMOUNT-----					
DESCRIPTION	APPRV	DENIED	DEBITS	CREDITS	ACQUIRER FEE	NETWORK FEE	NET STLMNT AMOUNT	

DBA	1	82	0.00	0.00	1.00-	0.00	1.00-	
DBA CCD	2	0	200.00-	0.00	0.00	0.00	200.00-	
DBA CUR	0	7	0.00	0.00	0.00	0.00	0.00	
DBA PPD	0	6	0.00	0.00	0.00	0.00	0.00	
DBA SAV	0	42	0.00	0.00	0.00	0.00	0.00	

SUBTOTAL	3	137	200.00-	0.00	1.00-	0.00	201.00-	
INQ CCD	16	29	0.00	0.00	0.00	0.00	0.00	
INQ CUR	46	50	0.00	0.00	0.00	0.00	0.00	
INQ SAV	22	34	0.00	0.00	0.00	0.00	0.00	

More...								

SUBTOTAL	84	113	0.00	0.00	0.00	0.00	0.00

MDB	0	64	0.00	0.00	0.00	0.00	0.00
MDB CCD	1	0	1.00-	0.00	0.00	0.00	1.00-
MDB CUR	9	0	204.00-	0.00	0.00	0.00	204.00-
MDB PPD	1	2	50.00-	0.00	0.00	0.00	50.00-

SUBTOTAL	11	66	255.00-	0.00	0.00	0.00	255.00-
WTD CCD	5	7	60.00-	0.00	0.00	0.00	60.00-
WTD CUR	195	135	9,122.00-	0.00	0.00	0.00	9,122.00-
WTD SAV	22	48	455.00-	0.00	0.00	0.00	455.00-

SUBTOTAL	222	190	9,637.00-	0.00	0.00	0.00	9,637.00-
=====							
TOTAL	320	506	10,921.01-	0.00	1.00-	0.00	10,093.00-
UNPROCESSED	0	3	0.00	72.00	0.00	0.00	72.00
=====							
GRAND TOTAL	320	509	10,921.00-	72.00	1.00-	0.00	10,165.00-
More...							
F3=Exit F12=Cancel F19=Left F20=Right F24=More keys							

The following information is included on the Acquirer Activity report.

Field	Description
Card Number	Card number that was used to perform the transaction.
Transaction Description	Short description of the transaction that was performed.
Transaction Amount	Transaction amount in the currency of the transaction.
Acquirer Fee	Amount charged by the participant that acquired the transaction.
Settlement	
Transaction Amount	Transaction amount in the currency that is to be used to settle this transaction with the external network.
Acquirer Fee	Amount charged by the acquirer in the currency that is to be used to settle with the network.
Network Fee	Fee charged by the network for processing the transaction.
Error	Short description of any denial or errors that may have occurred.
S/F	An asterisk (*) in this column specifies that the issuer was offline when this transaction was performed.
Date	Date the transaction was performed.
Serial #	Unique number that identifies the transaction and is assigned by the device.
Trace #	Unique number that identifies the transaction and is assigned by ITM
Vendor #	Unique number that identifies the vendor.
Reference Data	Information that can be used to further research the transaction.
Location	Location information for the terminal used to perform the transaction.

Each of the following totals will be produced for transaction type, transaction class, and for the grand totals. All the amounts will be in the settlement currency.

Field	Description
Transaction Description	Three-character description of each transaction.
Number	
Approved	Total number of approved transactions
Denied	Total number of denied transactions.
Settlement Amount	
Debits	Total transaction amount for debits
Credits	Total transaction amount for credits.
Acquirer Fee	Total amount of fees charged by the acquirer in the settlement currency.
Network Fee	Total amount of fees charged by the network.
Net Settlement Amount	Total amount of the debits, acquirer fees, and network fees less the credits.
Total Number	
Approved	Total number of approved transactions.

Field	Description
Denied	Total number of denied transactions.
Total Settlement Amount	
Debits	Total number of debit transactions.
Credits	Total number of credit transactions
Acquirer Fees	Total amount of Issuer Fees.
Network Fees	Total amount of Network Fees.
Net Settlement Amounts	Total Net Settlement Amount.
Grand Total	Grand total numbers and transaction amounts for all fields.

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Chapter 4: Steps of Certification for Host-to-Host

Testing and certification ensures that the member institution is able to communicate properly through online Host-to-Host interface using specified message formats and flows.

The testing and certification process takes place on test systems on both member and the host. For certification purposes, use dedicated test lines (recommended) or production lines transferable to this test system, provided it does not disrupt current service.

This document provides the member institution with information necessary to perform certification of member's online Host-to-Host connection. The document identifies responsibilities of both the host and the member institution, describes certification process, and specifies a full set of certification test scripts.

Note: Member must perform the full or the partial set of certification test scripts, as specified by related the scope of the project.

Related Document

- ISO-8583: 1987 Standard

Areas of Responsibility Host

- Coordinate certification schedule with the participant member.
- Set up host test environment.
- Actively participate in certification.
- Activate host's test system.
- Initiate messages according to certification script.
- Verify test results.

Member Institution

- Set up member's test environment, including acquiring terminals for acquirers.
- Generate and deliver test cards to the host according to Certification Forms (issuer only) in this chapter.
- Actively participate in certification.
- Activate member's test system.
- Initiate messages according to certification script.

Certification Process

Testing Procedure

The technical staffs on both the host side and the member side activate the test systems at the beginning of the scheduled certification time slot. The host and member's technical staff members maintain close communications throughout certification.

The host's technical staff should assist the member with any questions or concerns that arise during the testing process.

A test session lasts the entire scheduled time unless the host's technical staff member specifies otherwise. When the test completes, the member institution logs off the test system and the technical staff member terminates the session.

Test Results

After the test session is completed, the host technical staff member analyzes the results.

Certification Completion

Certification is considered complete when all the steps of testing specified in certification scripts are successfully performed.

Detailed Certification Process

The certification consists of a series of activities that verify and confirm that the member (configured as an acquirer and/or an issuer) is capable of processing all online system messages and message flows in a timely and accurate manner.

Preparatory Activities

In order to begin successful execution of certification test scripts, both the host and member institutions have to perform the following activities:

Host

- Set up the host's test host environment.
- Set up the Host-to-Host interface.
- Set up the new participant (member).
- Set up routing.
- Set up the security and keys according to the Test Encryption Keys Form in this chapter.
- Perform any additional setup according to project scope.
- Set up the appropriate simulators.
- Set up the appropriate test terminals (ATM, POS, etc.) – for issuer certification only.
- Set up the test telecommunications infrastructure.

Member

- Complete certification forms and submit the forms to the host according to table below:

Member Type Form	Acquirer Only	Issuer Only	Both
Test Cards	No	Yes	Yes
Test Encryption Keys	Yes	Yes	Yes

Member Type Form	Acquirer Only	Issuer Only	Both
Off-us Test Cards	Yes	No	Yes

- Generate and deliver test cards to the host according to Test Cards Form (issuer members) in this chapter.
- Set up member's test host environment.
- Set up Host-to-Host interface.
- Perform any additional host setup based on member's system infrastructure.
- Set up test cards and appropriate statuses according to the Test Cards Form (issuer members) in this chapter.
- Set up security and test keys according to the Test Encryption Keys Form in this chapter.
- Set up appropriate test terminals (ATM, POS, etc.) – for acquirer certification only.
- Set up test telecommunications infrastructure.

Connectivity Tests

The purpose of online connectivity tests is to verify and confirm basic connectivity between the host and member systems on the telecommunication and application level. Each member must perform connectivity tests regardless of its type (acquirer/issuer/both).

Telecommunication Connectivity Tests

In order to verify and confirm connectivity on telecommunication level, both the host and member's technical staff establish connection between the two systems according to the certification script. See Test Case 001 for further details.

Application Connectivity Tests

In order to verify connectivity on the application level, both the host and member's technical staff perform the exchange of network management messages according to the certification test script. See Test Case 002 for further details.

Issuer Tests

The purpose of online issuer certification tests is to validate message formats, message flows and contents including cryptographic aspects (where applicable) of the messages processed by issuer hosts. The issuer certification tests do not relate to the issuer's internal processing (it is the issuer's exclusive responsibility) and/or reconciliation between the host and the member (done during user acceptance testing).

An issuer must successfully perform the following activities in order to be certified.

- Perform connectivity tests.
- Process received transaction requests and advices, and generate and send appropriate replies to the host as required by the certification script (within project scope).
- Process received transaction reversal requests and generate and send appropriate transaction reversal replies to the host as required by certification script (within project scope).

Acquirer Tests

The purpose of online acquirer certification tests is to validate message formats, message flows and contents including cryptographic aspects (where applicable) of the messages generated and processed by acquirer's host.

The online acquirer certification tests do not relate to reconciliation between the host and the member (done during user acceptance testing).

An acquirer must successfully perform the following activities in order to be certified:

- Perform connectivity tests.
- Perform transactions at any terminal type as required by the certification script (within project scope or supported by the host) and generate and sent to the host the appropriate transaction request messages.
- Process and complete transactions at the terminal as instructed by the corresponding transaction replies received from the host.
- Perform reversals for transactions at any terminal type as required by the certification script, and then generate and sent appropriate transaction reversal request message to the host.

Certification Forms

Test Cards Form

Member Bank's Name: _____

Test card BINs for cards used during issuer tests.

BIN	Description

Note: * MasterCard, Visa, proprietary, etc.

Test card information (must be supplied for each BIN).

Card Number	PIN	Track 1 Data	Track 2 Data	Valid
1				Valid
2				Valid
3				Valid, used for PIN Tests
4				Refer to Issuer
5				Pickup
6				Do not honor
7				Invalid Transaction
8				Invalid Amount
9				Card not on file
10				Expired card, capture

Card Number	PIN	Track 1 Data	Track 2 Data	Valid
11				Suspected fraud, capture
12				Restricted card, capture
13				Lost card, capture
14				Stolen card, capture
15				Insufficient funds
16				Invalid checking account
17				Invalid savings account
18				Expired card
19				Restricted card
20				Exceeds w/d \$ limit
21				Exceeds w/d # limit
22				Valid, invalid CVV1

Off-us Test Cards Form

Member Bank's Name: _____

Test card BINs for cards used during Acquirer tests.

BIN	Description

Note: * MasterCard, Visa, proprietary, etc.

Off-us test card information (must be supplied for each BIN).

Card Number	PIN	Track 1 Data	Track 2 Data	Valid
1				Valid
2				Valid
3				Valid, used for PIN Tests
4				Refer to Issuer
5				Pickup
6				Do not honor

Card Number	PIN	Track 1 Data	Track 2 Data	Valid
7				Invalid Transaction
8				Invalid Amount
9				Card not on file
10				Expired card, capture
11				Suspected fraud, capture
12				Restricted card, capture
13				Lost card, capture
14				Stolen card, capture
15				Insufficient funds
16				Invalid checking account
17				Invalid savings account
18				Expired card
19				Restricted card
20				Exceeds w/d \$ limit
21				Exceeds w/d # limit
22				Valid, invalid CVV1

Test Encryption Keys Form

Member Bank's Name: _____

Key Type	Value**	Recommended Value
Acquirer Working Key (AWK)		0123456789ABCDEF
Issuer Working Key (IWK)		0123456789ABCDEF

Note: ** Usage of production keys during certification is strongly discouraged.

Should it become necessary for any reason, secure key exchange procedures shall be used in accordance with both the host and member's security requirements.

Certification Scripts

Test Case 001: Telecommunication Level Connectivity

The purpose of this test case is to verify and confirm member's ability to establish and break communication between the member and the host. The member is required to perform appropriate test case depending on communication type.

1. TCP/IP Connectivity				
Step	Tested Function	Originated By	Result	Comment
1.1	Socket establishment	Host/Member*		
1.2	Socket breakdown	Host		
1.3	Socket re-establishment	Host/Member*		
1.4	Socket breakdown	Member		
1.5	Socket re-establishment	Host/Member*		
Tested By		Signature	Date	

Note: * Depending on setup agreed between the host and the member.

2. X.25 Connectivity				
Step	Tested Function	Originated By	Result	Comment
2.1	SVC/PVC establishment	Host/Member*		
2.2	SVC/PVC breakdown	Host		
2.3	SVC/PVC re-establishment	Host/Member*		
2.4	SVC/PVC breakdown	Member		
2.5	SVC/PVC re-establishment	Host/Member*		
Tested By		Signature	Date	

Note: * Depending on setup agreed between the host and the member.

Test Case 002: Application Level Connectivity

The purpose of this test case is to verify and confirm member's ability to originate properly formatted network management requests and process responses received by the host, as well as to receive and process network management requests from the host and respond with properly formatted responses.

I. Application Level Connectivity: Network Management Messages								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
I.1	Network Logon	Host	0800	DE-070 = '001'		'00'		Node Status = Processing
I.2	Echo	Host	0800	DE-070 = '301'		'00'		
I.3	Network Logoff	Host	0800	DE-070 = '002'		'00'		Node Status = Offline
I.4	Network Logon	Member	0800	DE-070 = '001'		'00'		Node Status = Processing
I.5	Echo	Member	0800	DE-070 = '301'		'00'		
I.6	Network Logoff	Member	0800	DE-070 = '002'		'00'		Node Status = Offline
I.7	Network Logon	Host	0800	DE-070 = '001'		'00'		Node Status = Processing
I.8	Cut-over	Master*	0800	DE-070 = '201'		'00'		

Tested By	Signature	Date

Note: * Depending on agreement between the host and the member, one of parties is nominated as master participant.

Test Case 003: Issuer – Request Formats for Standard Transaction Types

The purpose of this test case is to verify and confirm the member's (or issuer's) ability to receive and process standard transaction requests and to respond to the host with properly formatted responses. Balance Inquiries are interwoven to assure proper account balance impact.

I. ATM, PBT, Card Read, Cash Withdrawal

Note:

Special Conditions 1,2
 DE-018 = 6011
 DE-022 = 901
 DE-052-> valid PIN block

I. ATM, PBT, Card Read, Cash Withdrawal								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
I.0	Network Logon	Member	0800	DE-70='001'		'00'		Node Status = Processing.
I.1	Balance Verification	Host	0200	DE-002=card#1 DE-003-31xxxx		'00'		Starting balance for card #1.
I.1a	Financial Request	Host	0200	DE-002=card#1 DE-003=01xxxx		'00'		1000 units of acquirer currency.
I.1.b	Balance Verification	Host	0200	DE-002=card#1 DE-003=31xxxx		'00'		
I.2	Financial Request	Host	0200	DE-002=card#1 DE-003=01xxxx		'00'		500 units of acquirer currency.
I.2a	Full Reversal	Host	0420	DE-002=card#1 DE-003=001xxxx		'17'		Full reversal.
I.2b	Balance Verification	Host	0200	DE-002=card#1 DE-003=31xxxx		'00'		Ending balance for card #1.
I.3	Balance Verification	Host	00200	DE-002=card#2 DE-003=31xxxx		'00'		Starting Balance for Card #2
I.3a	Financial Request	Host	0200	DE-002=card#2 DE-003=01xxxx		'00'		200 units of acquirer currency.
I.3b	Partial Reversal	Host	0420	DE-002=card#2 DE-003=01xxxx		'32'		Partial reversal, actual amount 150.
I.4	Balance Verification	Host	0200	DE-002=card32 DE-003=31xxxx		'00'		
I.4a	Financial Advice	Host	0220	DE-002=card32 DE-003=01xxxx		'00'		1000 units of acquirer currency.

1. ATM, PBT, Card Read, Cash Withdrawal								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
1.4b	Balance Verification	Host	0200	DE-002=card#2 DE-003=3 xxxx		'00'		Ending balance for card #2.
Tested By			Signature			Date		

Note:

1. Condition valid for all steps except 1.0.
2. Condition valid only if field is present in the reversal message.

2. POS PBT, Card Read, Purchase

Note:

Special Conditions 1,2
 DE-003 = '00xxxx'
 DE-018 <> (6011|6010)
 DE-022 = 901
 DE-052 -> valid PIN block

2. POS PBT, Card Read, Purchase								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
2.0	Network Logon	Member	0800	DE-070='001'		'00'		Node Status = Processing
2.1	Authorization Request	Host	0100	DE-002=card#1		'00'		1500 units of acquirer currency.
2.2	Authorization Request and Full Reversal	Host	0100	DE-002=card#1		'00'		500 units of acquirer currency.
			0420			'00'		Full reversal.
2.3	Authorization Request and Partial Reversal.	Host	0100	DE-002=card#2		'00'		200 units of acquirer currency.
			0420			'00'		Partial reversal, actual amount 500 units.
2.4	Authorization Advice	Host	0120	DE-002=card#2		'00'		750 units of acquirer currency.

2. POS PBT, Card Read, Purchase								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
2.5	Financial Advice (follow-up for 2.1)	Host	0220	DE-002=card#1		'00'		1500 units of acquirer currency. STAN same as in 2.1.
2.6	Financial Advice (Stand Alone)	Host	0220	DE-002=card#2		'00'		1200 units of acquirer currency.

Tested By	Signature	Date

Note:

1. Condition valid for all steps except 2.0.
2. Condition valid only if field is present in the reversal message.

3. POS PBT, Card Read, Cash

Note:

Special conditions 1,2
 DE-003 = '01xxxx'
 DE-018 = 6010
 DE-022 = 901
 DE-052 -> valid PIN block

3. POS PBT, Card Read, Cash								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
3.0	Network Logon	Member	0800	DE-70='001'		'00'		Node Status = Processing
3.1	Authorization Request	Host	0100	DE-002=card#1		'00'		1500 units of acquirer currency.
3.2	Authorization Request and Full Reversal	Host	0100	DE-002=card#1		'00'		500 units of acquirer currency.
			0420			'00'		Full reversal.
3.3	Authorization Request and Partial Reversal	Host	0100	DE-002=card#2		'00'		200 units of acquirer currency.
			0420			'00'		Partial reversal. Actual amount 50 units.
3.4	Authorization Advice	Host	0120	DE-002=card#2		'00'		1000 units of acquirer currency.

3. POS PBT, Card Read, Cash								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
3.5	Financial Advice (follow-up for 3.1)	Host	0220	DE-002=card#1		'00'		1500 units of acquirer currency. STAN same as in 3.1.
3.6	Financial Advice (Stand Alone)	Host	0220	DE-002=card#2		'00'		1200 units of acquirer currency.

Tested By	Signature	Date

Note:

1. Condition valid for all steps except 3.0.
2. Condition valid only if field is present in the reversal message.

4. POS SBT, Card Read, Purchase

Note:

Special Conditions 1,2
 DE-003 = '00xxxx'
 DE-018 <> (6001|6010)
 DE-022 = 901

4. POS SBT, Card Read, Purchase								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
4.0	Network Logon	Member	0800	DE-070='001'		'00'		Node Status = Processing
4.1	Authorization Request	Host	0100	DE-002=card#1		'00'		1500 units of acquirer currency.
4.2	Authorization Request and Full Reversal	Host	0100	DE-002=card#1		'00'		500 units of acquirer currency.
			0420			'00'		Full Reversal
4.3	Authorization Request and Partial Reversal	Host	0100	DE-002=card#1		'00'		500 units of acquirer currency.
			0420			'00'		Partial reversal. Actual amount 50 units.
4.4	Authorization Advice	Host	0120	DE-002=card#2		'00'		1000 units of acquirer currency.

4. POS SBT, Card Read, Purchase								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
4.5	Financial Advice (follow-up for 3.1)	Host	0220	DE-002=card#1		'00'		1500 units of acquirer currency. STAN same as in 4.1.
4.6	Financial Advice (Stand Alone)	Host	0220	DE-002=card#2		'00'		1200 units of acquirer currency.

Tested By	Signature	Date

Note:

1. Condition valid for all steps except 4.0.
2. Condition valid only if field is present in the reversal message.

5. POS SBT, Card Read, Cash

Note:

Special Conditions 1,2
 DE-003 = '01xxxx'
 DE-018 = 6010
 DE-022 = 901

5. POS SBT, Card Read, Cash								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
5.0	Network Logon	Member	0800	DE-070='001'		'00'		Node Status = Processing
5.1	Authorization Request	Host	0100	DE-002=card#1		'00'		1500 units of acquirer currency.
5.2	Authorization Request and Full Reversal	Host	0100	DE-002=card#1		'00'		500 units of acquirer currency.
			0420			'00'		Full Reversal.
5.3	Authorization Request and Partial Reversal	Host	0100	DE-002=card#1		'00'		200 units of acquirer currency.
			0420			'00'		Partial Reversal. Actual amount 50 units.
5.4	Authorization Advice	Host	0120	DE-002=card#2		'00'		1000 units of acquirer currency.

5. POS SBT, Card Read, Cash								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
5.5	Financial Advice (follow-up for 5.1)	Host	0200	DE-002=card#1		'00'		1500 units of acquirer currency. STAN same as in 5.1.
5.6	Financial Advice (Stand Alone)	Host	0220	DE-002=card#2		'00'		1200 units of acquirer currency.

Tested By	Signature	Date

Note:

1. Condition valid for all steps except 5.0.
2. Condition valid only if field is present in the reversal message.

6. POS SBT, Manual 3, Purchase

Note:

Special Conditions 1,2
 DE-003 = '00xxxx'
 DE-018 <> (6011|6010)
 DE-022 = 012
 DE-035 -> not present

6. POS SBT, Manual 3, Purchase								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
6.0	Network Logon	Member	0800	DE-070='001'		'00'		Node Status = Processing
6.1	Authorization Request	Host	0100	DE-002=card#1		'00'		1500 units of acquirer currency.
6.2	Authorization Request and Full Reversal	Host	0100	DE-002=card#1		'00'		500 units of acquirer currency.
			0420			'00'		Full Reversal
6.3	Authorization Request and Partial Reversal	Host	0100	DE-002=card#2		'00'		500 units of acquirer currency.
			0420			'00'		Partial reversal. Actual amount 50 units.
6.4	Authorization Advice	Host	0120	DE-002=card#2		'00'		1000 units of acquirer currency.

6. POS SBT, Manual 3, Purchase								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
6.5	Financial Advice (follow-up for 6.1)	Host	0220	DE-002=card#1		'00'		1500 units of acquirer currency. STAN same as in 6.1
6.6	Financial Advice (Stand Alone)	Host	0220	DE-002=card#2		'00'		1200 units of acquirer currency.

Tested By	Signature	Date

Note:

1. Condition valid for all steps except 6.0.
2. Condition valid only if field is present in the reversal message.
3. Manual key entry or voice authorization.

7. POS SBT, Manual 3, Cash

Note:

Special Conditions 1,2
 DE-003 = '01xxxx'
 DE-018 = 6010
 DE-022 = 901
 DE-035 -> not present

7. POS SBT, Manual 3, Cash								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
7.0	Network Logon		0800	DE-070='001'		'00'		Node Status = Processing
7.1	Authorization Request		0100	DE-002=card#1		'00'		1500 units of acquirer currency.
7.2	Authorization Request and Full Reversal		0100	DE-002=card#1		'00'		500 units of acquirer currency.
			0420			'00'		Full reversal.
7.3	Authorization Request and Partial Reversal.		0100	DE-002=card#2		'00'		200 units of acquirer currency.
			0420			'00'		Partial reversal, actual amount 50 units.
7.4	Authorization Advice		0120	DE-002=card#2		'00'		100 units of acquirer currency.

7. POS SBT, Manual 3, Cash								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
7.5	Financial Advice (follow-up for 7.1)		0220	DE-002=card#1		'00'		1500 units of acquirer currency. STAN same as in 7.1.
7.6	Financial Advice (Stand Alone)		0220	DE-002=card#2		'00'		1200 units of acquirer currency.

Tested By	Signature	Date

Note:

1. Condition valid for all steps except 7.0.
2. Condition valid only if field is present in the reversal message.
3. Manual key entry or voice authorization.

Test Case 004: Issuer – Response Code Acceptance

The purpose of this test is to verify and confirm the member's (or issuer's) ability to respond with appropriate response code.

I. Response Code Acceptance								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
I.0	Network Logon	Member		DE-070='001'		'00'		Node Status = Processing
I.1	Authorization Request (Normal Card)	Host		DE-002=card#1		'00'		
I.2	Authorization Request (Normal Card)	Host		DE-002=card#4		'01'		
I.3	Authorization Request (Refer to Issuer)	Host	0800	DE-002=card#5		'04'		
I.4	Authorization Request (Do Not Honor)	Host	0100	DE-002=card#6		'05'		
I.5	Authorization Request (Invalid Transaction)	Host	0100	DE-002=card#7		'12'		
I.6	Authorization Request (Invalid Amount)	Host	0100	DE-002=card#8		'13'		

I. Response Code Acceptance								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
I.7	Authorization Request (Card Not on File)	Host	0100	DE-002=card#9		'14'		
I.8	Authorization Request (Expired Card, Capture)	Host	0100	DE-002=card#10		'33'		
I.9	Authorization Request (Suspected Fraud, Capture)	Host	0100	DE-002=card#11		'34'		
I.10	Authorization Request (Restricted Card, Capture)	Host	0100	DE-002=card#12		'36'		
I.11	Authorization Request (Lost Card, Capture)	Host	0100	DE-002=card#13		'41'		
I.12	Authorization Request (Stolen Card, Capture)	Host	0100	DE-002=card#14		'43'		
I.13	Authorization Request	Host	0100	DE-002=card#15		'51'		
I.14	Authorization Request (Invalid Checking Account)	Host	0100	DE-002=#16		'52'		
I.15	Authorization Request (Invalid Savings Account)	Host	0100	DE-002=card#17		'53'		
I.16	Authorization Request (Expired Card)	Host	0100	DE-002=card#18		'54'		
I.17	Authorization Request (Restricted Card)	Host	0100	DE-002=card#19		'62'		
I.18	Authorization Request (Exceeds w/d \$ Limit)	Host	0100	DE-002=card#20		'61'		
I.19	Authorization Request (Exceeds w/d # Limit)	Host	0100	DE-002=card#21		'65'		
I.20	Authorization Request (Invalid CVVI)	Host	0100	DE-002=card#22		'04'/'05'		Invalid CVVI on track.

Tested By	Signature	Date

Note:

* Card captured or not, depending on issuer settings.

Test Case 005: Issuer – PIN Processing

This test verifies and confirms the member's (or issuer's) ability to process encrypted PIN block (good and bad PINs). Issuer must set its system to react after three incorrect PIN entries (capture or not).

I. PIN Processing								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
I.0	Network Logon	Member	0800	DE-070= '001'		'00'		Node Status = Processing
I.1	Good PIN	Host	0100	DE-002=card#3		'00'		ATM or POS PBT used for test.
I.2	Bad PIN	Host	0100	DE-002=card#3		'55'		ATM or POS PBT used for test.
I.3	Good PIN	Host	0100	DE-002=card#3		'00'		ATM or POS PBT used for test.
I.4	Bad PIN	Host	0100	DE-002=card#3		'55'		ATM or POS PBT used for test.
I.5	Bad PIN	Host	0100	DE-002=card#3		'55'		ATM or POS PBT used for test.
I.6	Good PIN	Host	0100	DE-002=card#3		'05'		ATM or POS PBT used for test.
I.7	Bad PIN	Host	0100	DE-002=card#3		'55'		ATM or POS PBT used for test.
I.8	Bad PIN	Host	0100	DE-002=card#3		'55'		ATM or POS PBT used for test.
I.9	Bad PIN, Action	Host	0100	DE-002=card#3		'38'/'75'*		ATM or POS PBT used for test.
I.10	Good PIN	Host	0100	DE-002=card#3		'38'/'75'*		ATM or POS PBT used for test.
Tested By	Signature	Date						

Note:

* Depending on issuer settings to capture ('38') or not ('75') when maximum incorrect PIN retry limit reached.

Test Case 006: Acquirer – Request Formats for Standard Transaction Types

The purpose of this test is to verify and confirm the member's (or acquirer's) ability to originate properly formatted requests and receive and process responses sent by the host. Balance inquiries are interwoven to assure proper account balance impact.

1. ATM, PBT, Card Read, Cash Withdrawal

Note:

Special Conditions 1,2
 DE-018 = 6011
 DE-022 = 901
 DE-052 -> valid PIN block

1. ATM, PBT, Card Read, Cash Withdrawal								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
1.0	Network Logon	Member	0800	DE-070='001'		'00'		Node Status = Processing
1.1	Balance Verification	Member	0200	DE-002=card#1 DE-003=31xxxx				Starting balance for card #1
1.1a	Financial Request	Member	0200	DE-002=card#1 DE-003=01xxxx				1000 units of acquirer currency.
1.1b	Balance Verification	Member	0200	DE-002=card#1 DE-003=31xxxx				
1.2	Financial Request	Member	0200	DE-002=card#1 DE-003=01xxxx				500 units of acquirer currency.
1.2a	Full Reversal	Member	0420	DE-002=card#1 DE-003=01xxxx		'17'		Full reversal.
1.2b	Balance Verification	Member	0200	DE-002=card#1 DE-003=31xxxx				Ending balance for card #1.
1.3	Balance Verification	Member	0200	DE-002=card#2 DE-003=31xxxx				Starting balance for card #2.

1. ATM, PBT, Card Read, Cash Withdrawal								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
1.3a	Financial Request	Member	0200	DE-002=card#2 DE-003=01xxxx				200 units of acquirer currency.
1.3b	Partial Reversal	Member	0420	DE-002=card#2 DE-003=01xxxx		'32'		Partial reversal. Actual amount 150.
1.4	Balance Verification	Member	0200	DE-002=card#2 DE-003=31xxxx				
1.4a	Financial Advice	Member	0220	DE-002=card#2 DE-003=01xxxx				100 units of acquirer currency.
1.4b	Balance Verification	Member	0200	DE-002=card#2 DE-003=31xxxx				Ending balance for card #2.
Tested By			Signature			Date		

Note:

1. Condition valid for all steps except 1.0.
2. Condition valid only if field is present in the reversal message.

2. POS PBT, Card Read, Purchase

Note:

Special Conditions 1,2
 DE-003 = '00xxxx'
 DE-018 <> (6011|6010)
 DE-022 = 901
 DE-052 -> valid PIN block

2. POS PBT, Card Read, Purchase								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
2.0	Network Logon	Member	0800	DE-70='001'		'00'		Node Status = Processing
2.1	Authorization Request	Member	0100	DE-002=off-us card#1		'00'		1500 units of acquirer currency.
2.2	Authorization Request and Full Reversal	Member	0100	DE-002=off-us card#1		'00'		500units of acquirer currency.
			0420			'00'		Full reversal.

2. POS PBT, Card Read, Purchase								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
2.3	Authorization Request and Partial Reversal	Member	0100	DE-002=off-us card#2		'00'		200units of acquirer currency.
			0420			'00'		Partial reversal. Actual amount 50 units.
2.4	Authorization Advice	Member	0120	DE-002=off-us card#2		'00'		750 units of acquirer currency.
2.5	Financial Advice (follow-up for 2.1)	Member	0220	DE-002=off-us card#1		'00'		1500 units of acquirer currency. STAN same as in 2.1.
2.6	Financial Advice (Stand Alone)	Member	0220	DE-002=off-us card#2		'00'		1200 units of acquirer currency.
Tested By			Signature			Date		

Note:

1. Condition valid for all steps except 2.0.
2. Condition valid only if field is present in the reversal message.

3. POS PBT, Card Read, Cash

Note:

Special Conditions 1,2
 DE-003 = '01xxxx'
 DE-018 = 6010
 DE-022 = 901
 DE-052 -> valid PIN block

3. POS PBT, Card Read, Cash								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
3.0	Network Logon	Member	0800	DE-70='001'		'00'		Node Status = Processing
3.1	Authorization Request	Member	0100	DE-002=off-us card#1		'00'		1500 units of acquirer currency.
3.2	Authorization Request and Full Reversal	Member	0100	DE-002=off-us card#1		'00'		500units of acquirer currency.
			0420			'00'		Full reversal.

3. POS PBT, Card Read, Cash								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
3.3	Authorization Request and Partial Reversal	Member	0100	DE-002=off-us card#2		'00'		200units of acquirer currency.
			0420			'00'		Partial reversal. Actual amount 50 units.
3.4	Authorization Advice	Member	0120	DE-002=off-us card#2		'00'		1000 units of acquirer currency.
3.5	Financial Advice (follow-up for 3.1)	Member	0220	DE-002=off-us card#1		'00'		1500 units of acquirer currency. STAN same as in 3.1.
3.6	Financial Advice (Stand Alone)	Member	0220	DE-002=off-us card#2		'00'		1200 units of acquirer currency.
Tested By			Signature			Date		

Note:

1. Condition valid for all steps except 3.0.
2. Condition valid only if field is present in the reversal message.

4. POS SBT, Card Read, Purchase

Note:

Special Conditions 1,2
 DE-003 = '00xxxx'
 DE-018 <> (6011|6010)
 DE-022 = 901

4. POS SBT, Card Read, Purchase								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
4.0	Network Logon	Member	0800	DE-70='001'				Node Status = Processing
4.1	Authorization Request	Member	0100	DE-002=off-us card#1				1500 units of acquirer currency.
4.2	Authorization Request and Full Reversal	Member	0100	DE-002=off-us card#1				500 units of acquirer currency.
			0420					Full reversal.

4. POS SBT, Card Read, Purchase								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
4.3	Authorization Request and Partial Reversal	Member	0100	DE-002=off-us card#2				500 units of acquirer currency.
			0420					Partial reversal. Actual amount 50 units.
4.4	Authorization Advice	Member	0120	DE-002=off-us card#2				1000 units of acquirer currency.
4.5	Financial Advice (follow-up for 4.1)	Member	0220	DE-002=off-us card#1				1500 units of acquirer currency. STAN same as in 4.1.
4.6	Financial Advice (Stand Alone)	Member	0220	DE-002=off-us card#2				1200 units of acquirer currency.
Tested By			Signature			Date		

Note:

1. Condition valid for all steps except 4.0.
2. Condition valid only if field is present in the reversal message.

5. POS SBT, Card Read, Cash

Note:

Special Conditions 1,2
 DE-003 = '01xxxx'
 DE-18 = 6010
 DE-022 = 901

5. POS SBT, Card Read, Cash								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
5.0	Network Logon	Member	0800	DE-70='001'		'00'		Node Status = Processing
5.1	Authorization Request	Member	0100	DE-002=off-us card#1		'00'		1500 units of acquirer currency.
5.2	Authorization Request and Full Reversal	Member	0100	DE-002=off-us card#1		'00'		500 units of acquirer currency.
			0420			'00'		Full reversal.

5. POS SBT, Card Read, Cash								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
5.3	Authorization Request and Partial Reversal	Member	0100	DE-002=off-us card#2		'00'		200 units of acquirer currency.
			0420			'00'		Partial reversal. Actual amount 50 units.
5.4	Authorization Advice	Member	0120	DE-002=off-us card#2		'00'		1000 units of acquirer currency.
5.5	Financial Advice (follow-up for 5.1)	Member	0220	DE-002=off-us card#1		'00'		1500 units of acquirer currency. STAN same as in 5.1.
5.6	Financial Advice (Stand Alone)	Member	0220	DE-002=off-us card#2		'00'		1200 units of acquirer currency.
Tested By			Signature			Date		

Note:

1. Condition valid for all steps except 5.0.
2. Condition valid only if field is present in the reversal message.

6. POS SBT, Manual 3, Purchase

Note:

Special Conditions 1,2
 DE-003 = '00xxxx'
 DE-018 <> (6011|6010)
 DE-002 = 012
 DE-035 -> not present

6. POS SBT, Manual 3, Purchase								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
6.0	Network Logon	Member	0800	DE-70='001'		'00'		Node Status = Processing
6.1	Authorization Request	Member	0100	DE-002=off-us card#1		'00'		1500 units of acquirer currency.
6.2	Authorization Request and Full Reversal	Member	0100	DE-002=off-us card#1		'00'		500 units of acquirer currency.
			0420			'00'		Full reversal.

6. POS SBT, Manual 3, Purchase								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
6.3	Authorization Request and Partial Reversal	Member	0100	DE-002=off-us card#2		'00'		500 units of acquirer currency.
			0420			'00'		Partial reversal. Actual amount 50 units.
6.4	Authorization Advice	Member	0120	DE-002=off-us card#2		'00'		100 units of acquirer currency.
6.5	Financial Advice (follow-up for 6.1)	Member	0220	DE-002=off-us card#1		'00'		1500 units of acquirer currency. STAN same as in 6.1.
6.6	Financial Advice (Stand Alone)	Member	0220	DE-002=off-us card#2		'00'		1200 units of acquirer currency.
Tested By			Signature			Date		

Note:

1. Condition valid for all steps except 6.0.
2. Condition valid only if field is present in the reversal message.
3. Manual key entry or voice authorization.

7. POS SBT, Manual 3, Cash

Note:

Special Conditions 12,
 DE-003 = '01xxxx'
 DE-018 = 6010
 DE-022 = 901
 DE-035 -> not present

7. POS SBT, Manual 3, Cash								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
7.0	Network Logon	Member	0800	DE-70='001'		'00'		Node Status = Processing
7.1	Authorization Request	Member	0100	DE-002=off-us card#1		'00'		1500 units of acquirer currency.
7.2	Authorization Request and Full Reversal	Member	0100	DE-002=off-us card#1		'00'		500 units of acquirer currency.
			0420			'00'		Full reversal.

7. POS SBT, Manual 3, Cash								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
7.3	Authorization Request and Partial Reversal	Member	0100	DE-002=off-us card#2		'00'		200 units of acquirer currency.
			0420			'00'		Partial reversal. Actual amount 50 units.
7.4	Authorization Advice	Member	0120	DE-002=off-us card#2		'00'		1000 units of acquirer currency.
7.5	Financial Advice (follow-up for 7.1)	Member	0220	DE-002=off-us card#1		'00'		1500 units of acquirer currency. STAN same as in 7.1.
7.6	Financial Advice (Stand Alone)	Member	0220	DE-002=off-us card#2		'00'		1200 units of acquirer currency.
Tested By			Signature			Date		

Note:

1. Condition valid for all steps except 7.0.
2. Condition valid only if field is present in the reversal message.
3. Manual key entry or voice authorization.

Test Case 007: Acquirer – Response Code Acceptance

The purpose of this test is to verify and confirm the member's (or acquirer's) ability to complete transactions according to response codes sent by the host.

1. Response Code Acceptance								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
1.0	Network Logon	Member	0800	DE-070='001'		'00'		
1.1	Authorization Request (Normal Card)	Member	0100	DE-002=off-us card#1		'00'		
1.2	Authorization Request (Refer to Issuer)	Member	0100	DE-002=off-us card#4		'01'		
1.3	Authorization Request (Pick-up)	Member	0100	DE-002=off-us card#5		'04'		

I. Response Code Acceptance								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
I.4	Authorization Request (Do Not Honor)	Member	0100	DE-002=off-us card#6		'05'		
I.5	Authorization Request (Invalid Transaction)	Member	0100	DE-002=off-us card#7		'12'		
I.6	Authorization Request (Invalid Amount)	Member	0100	DE-002=off-us card#8		'13'		
I.7	Authorization Request (Card Not on File)	Member	0100	DE-002=off-us card#9		'14'		
I.8	Authorization Request (Expired Card, Capture)	Member	0100	DE-002=off-us card#10		'33'		
I.9	Authorization Request (Suspected Fraud, Capture)	Member	0100	DE-002=off-us card#11		'34'		
I.10	Authorization Request (Restricted Card, Capture)	Member	0100	DE-002=off-us card#12		'36'		
I.11	Authorization Request (Lost Card, Capture)	Member	0100	DE-002=off-us card#13		'41'		
I.12	Authorization Request (Stolen Card, Capture)	Member	0100	DE-002=off-us card#14		'43'		
I.13	Authorization Request (Insufficient Funds)	Member	0100	DE-002=off-us Card 15		'51'		
I/14	Authorization Request (Invalid Checking Account)	Member	0100	DE-002=off-us card#16		'52'		
I.15	Authorization Request (Invalid Savings Account)	Member	0100	DE-002=off-us card#17		'53'		
I.16	Authorization Request (Expired Card)	Member	0100	DE-002=off-us card#18		'54'		

I. Response Code Acceptance								
Step	Tested Function	Originated By	MTID	Special Conditions	STAN	Expected RC	Result	Comment
I.17	Authorization Request (Restricted Card)	Member	0100	DE-002=off-us card#19		'62'		
I.18	Authorization Request (Exceeds w/d \$ Limit)	Member	0100	DE-002=off-us card#20		'61'		
I.19	Authorization Request (Exceeds w/d # Limit)	Member	0100	DE-002=off-us card#21		'65'		
I.20	Authorization Request (Invalid CVV!)	Member	0100	DE-002=off-us card#22		'04'/'05'*		Invalid CVV! on track.
Tested By			Signature			Date		

Appendix A: Message Format

All message format definition tables use the symbols defined in the following table:

Message Types and Corresponding Data Elements	
Symbol	Meaning
M	Mandatory.
M+	Mandatory, echoed from request.
C	Conditional.
C+	Conditional, echoed from request.
C*	Conditional, value may change.
O	Optional.
O+	Optional, echoed from request.
R	Reserved for future use.
-	Not used.
n/a	Not applicable.

Authorization Messages					Financial Messages						Reversal Messages				Network Mgmt Messages			
Bit	Data Element	0100	0110/0120	0130	Bit	Data Element	0200	0210	0220	0230	Bit	Data Element	0400/0420	0410/0430	Bit	Data Element	0800	0810
1	Secondary Bitmap	C	C	C	1	Secondary bitmap	C-	C	C-	C	1	Secondary bitmap	C	C	1	Secondary bitmap	M	M
2	Primary Account Number	C	C+	C+	2	Primary Account Number	C	C+	C	C+	2	Primary Account Number	M	M+	7	Transmission date/time	M	M
3	Processing Code	M	M+	M+	3	Processing code	M	M+	M	M+	3	Processing code	M	M+	11	STAN	M	M

Authorization Messages					Financial Messages					Reversal Messages				Network Mgmt Messages				
Bit	Data Element	0100	0110/0120	0130	Bit	Data Element	0200	0210	0220	0230	Bit	Data Element	0400/0420	0410/0430	Bit	Data Element	0800	0810
4	Amount, transaction	M	M+	M+	4	Amount, transaction	M	M+	M	M+	4	Amount, transaction	M	M+	15	Date, settlement	C	C+
5	Amount, settlement	C	M+	M+	5	Amount, settlement	C	C+	C	C+	5	Amount, settlement	C	C+	32	Acquirer institution ID	O	O+
7	Date/time, transmission	M	M	M	7	Date/time, transmission	M	M	M	M	7	Date/time, transmission	M	M	39	Response code	-	M
8	Fee, cardholder billing	R	R	R	8	Fee, cardholder billing	R	R	R	R	8	Fee, cardholder billing	R	R	48	Key Data (Optional – Dynamic Key Exchange)	M	-
9	Conversion rate, settlement	C	C+	C+	9	Conversion rate, settlement	C	C+	C	C+	9	Conversion rate, settlement	C	C+	64	MAC Code (Optional – MACing)	R	R
11	STAN	M	M+	M+	11	STAN	M	M+	M	M+	11	STAN	M	M+	70	NMIC	M	M
12	Time, local transaction	M	-	-	12	Time, local transaction	M	M+	M	M+	12	Time, local transaction	M	M+	128	MAC Code 2 (Optional – MACing)	R	R
13	Date, local transaction	M	-	-	13	Date, local transaction	M	M+	M	M+	13	Date, local transaction	M	M+				
14	Date, expiration	C	-	-	14	Date, expiration	C	-	C	-	14	Date, expiration	C	-				
15	Date, settlement	C	C+	C+	15	Date, settlement	C	C+	C	C+	15	Date, settlement	C	C+				
18	Merchant type	M	-	-	18	Merchant type	M	-	M	-	19	Acquirer Country Code	M	-				
19	Acquirer County Code	M	-	-	19	Acquirer Country Code	M	-	M	-	22	POS entry mode	M	-				
24	Network Identifier	O	O	O	24	Network Identifier	O	O	O	O	24	Network Identifier	O	O	24	Network Identifier	O	O

Authorization Messages					Financial Messages						Reversal Messages				Network Mgmt Messages			
Bit	Data Element	0100	0110/0120	0130	Bit	Data Element	0200	0210	0220	0230	Bit	Data Element	0400/0420	0410/0430	Bit	Data Element	0800	0810
22	POS entry mode	M	-	-	22	POS entry mode	M	-	M	-	25	POS condition code	M	-				
25	POS condition code	M	-	-	25	POS condition code	M	-	M	-	26	POS PIN capture code	C	-				
26	POS PIN capture code	C	-	-	26	POS PIN capture code	C	-	C	-	32	Acquirer institution ID	M	M+				
32	Acquirer institution ID	M	M+	M+	32	Acquirer institution ID	M	M+	M	M+	35	Track 2 data	O	-				
35	Track 2 data	C	-	-	35	Track 2 data	C	-	C	-	37	Retrieval reference number	M	M+				
37	Retrieval reference number	M	-	-	37	Retrieval reference number	M	M+	M	M+	38	Authorization number	C	C+				
38	Authorization number	-	M	M	38	Authorization number	-	C	C	C	39	Response code	M	M				
39	Response code	-	M	M	39	Response code	-	M	M	M	41	Card acceptor terminal ID	M	-				
41	Card acceptor terminal ID	M	-	-	41	Card acceptor terminal ID	M	-	M	-	42	Card acceptor ID	M	-				
42	Card acceptor ID	M	-	-	42	Card acceptor ID	M	-	M	-	43	Card acceptor name/location	M	-				
43	Card acceptor name/location	M	-	-	43	Card acceptor name/location	M	-	M	-	49	Currency code, transaction	M	M+				
49	Currency code, transaction	M	M+	M+	49	Currency code, transaction	M	M+	M	M+	50	Currency code, settlement	C	C+				
50	Currency code, settlement	C	C+	C+	50	Currency code, settlement	C	C+	C	C+	64	MAC code	R	R				
52	PIN block	C	-	-	52	PIN Block	C	-	C	-	90	Original data elements	O	O+				
60	Account I Qualifier	C	-	C	60	Account I Qualifier	C	-	C	-	60	Account I Qualifier	-	-	60	Account I Qualifier	-	-

Authorization Messages					Financial Messages						Reversal Messages				Network Mgmt Messages			
Bit	Data Element	0100	0110/0120	0130	Bit	Data Element	0200	0210	0220	0230	Bit	Data Element	0400/0420	0410/0430	Bit	Data Element	0800	0810
61	Account 2 Qualifier	C	-	C	61	Account 2 Qualifier	C	-	C	-	61	Account 2 Qualifier	-	-	61	Account 2 Qualifier	-	-
54	Additional amounts	-	C	C	54	Additional amounts	-	C	-	C	95	Replacement amounts	C	-				
64	MAC code	R	R	R	64	MAC code	R	R	R	R	102	Account 1 identification	C	C				
102	Account 1 identification	C	C	C	102	Account 1 identification	C	C	C	C	103	Account 2 identification	C	C				
103	Account 2 identification	C	C	C	103	Account 2 identification	C	C	C	C	120-123	Extended data	C	C*				
120-123	Extended Data	C	C*	C*	120-123	Extended Data	C	C*	C	C*	128	MAC code 2	R	R				
124	Additional transaction data	M	-	-	124	Additional transaction data	M	-	M	-								
125-127	Private Use	C	C*	C*	125-127	Private use	C	C*	C	C*								
128	MAC code 2	R	R	R	128	MAC Code 2	R	R	R	R								

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