

Fujitsu Services **EMV Retail: User Interface Design Proposal** **Ref:** **NB/REQ/003**
Version: **2.0**
COMMERCIAL IN-CONFIDENCE **Date:** **21st April 2005**

Document Title: EMV Retail – User Interface Design Proposal

Document Type: User Interface Design Proposal

Release: S70

Abstract: This document presents a proposal for the user interface (dialogue, activity flows and screen flows) to be developed at the Counter Application for EMV Retail
This document is presented on a Subject to Contract and Without Prejudice basis.

Document Status: APPROVED

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Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

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COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

0.0 Document Control

0.1 Document History

Version No.	Date	Reason for Issue	Associated CP/PinICL
0.1	24/09/03	First draft for internal comments	
0.2	29/09/03	Second draft for informal PO comments	
0.3	12/11/03	Third draft for informal PO comments	
0.4	13/11/03	Fourth draft for informal PO comments	
0.5	20/11/03	Fifth draft for PO comments	
1.0	03/02/04	Baselined	CP 3647
1.1	11/03/04	New draft version Addition of application selection from the counter, and card removal dialogue at completion of session	CP 3648 CP 3658
1.2	05/04/04	New draft version applying changes from internal review comments	
1.3	25/04/04	New draft version applying changes from internal and external review comments	
1.4	28/05/04	New draft version. Re-alignment due to new PIN pad application documentation.	
1.5	30/06/04	New draft version applying changes from internal and external review comments	CP 3738
1.6	23/07/04	Intermediate version	
1.7	03/09/04	Intermediate version	
1.8	29/03/05	Version incorporating changes from the changes supplement NB/REQ/004 v1.0	PC0104918 PC0106457 PC0106872 PC0107169 PC0107395 PC0107635 PC0107687 PC0107924 PC0107925 PC0107973 PC0108087 PC0108091 PC0108093 PC0108094 PC0108098 PC0108331 PC0108350

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

			PC0108773 PC0109175 PC0109176 PC0109178 PC0109179 PC0109180 PC0109181 PC0109182 PC0109482 PC0109587 PC0109600 PC0109858 PC0109901 PC0110095 PC0110135 PC0110282 PC0110480 PC0110822 PC0110989 PC0111064 PC0112069 PC0114477
2.0	21/04/2005	Baselined	

0.2 Review Details

Review Comments by :	Not applicable
Review Comments to :	

Mandatory Review Authority	Name
Fujitsu Services	Peter Lucas*
Post Office Ltd	Bob Booth* ,Vicky Gray*
Optional Review / Issued for Information	
SI Design	Roger Donato, Chris Bailey, Dave Johns
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(*) = Reviewers that returned comments

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

0.3 Associated Documents

Reference	Version	Title	Source
AS/DPR/008		Design Proposal for DDA - PIN Entry Device Audio System	Fujitsu Services
AS/DPR/009		Design Proposal for EMV, TDES and NBE Replacement	Fujitsu Services
BD/CDE/001		EMV - Banking and Retail - Conceptual Design	Post Office Ltd
CR/CDE/009		Conceptual Design for DDA Beeps	Post Office Ltd
NB/HLD/012	0.10	EMV Retail and Banking, Counter, High-Level Design Specification	Fujitsu Services
NB/PRP/004		EMV Banking User Interface Design Proposal	Fujitsu Services
NB/REQ/004	1.0	EMV Retail User Interface Design Proposal – Changes Supplement	Fujitsu Services
NB/SPE/003		Network Banking Counter Dialogue – Activity & Screen Flows	Fujitsu Services
NB/SPE/013		Debit Card: Counter Dialogue – Activity and Screen Flows	Fujitsu Services
NB/SPE/009 RDP/TEC/977		Network Banking / Reference Data Rules and Values	Post Office Ltd

Unless a specific version is referred to above, reference should be made to the current approved versions of the documents.

0.4 Definition of Terms

An ‘*’ following the Term, e.g. “Counter*”, indicates that the definition is taken from the codified agreement.

Term	Definition
Button	Icon on the Riposte Desktop which can be selected by the user via the touch-screen or equivalent keyboard function key to invoke a particular action.

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

Cancel	<p>A transaction that is terminated before a Request message is generated at the counter is cancelled. Cancel includes:</p> <ul style="list-style-type: none"> - Transactions that cannot proceed i.e. require no action from the Clerk - Transactions that require the Clerk to cancel them by using a function on the screen <p>In all cases no record of the transaction is maintained by the counter system.</p>
Cardholder Verification Method	<p>Different methods of Cardholder Verification are possible :</p> <ul style="list-style-type: none"> • Verification by Signature • Verification by PIN • No verification <p>For EMV Retail the verification method is determined by the card contents and the Hypercom application: (the prime one is normally verification by PIN)</p>
Chip and PIN	Authentication and verification of an ICC card using EMV standards and a PIN
Clerk	Any person who serves customers at a Counter Position in a Post Office.
Client*	An organisation on behalf of which Post Office Ltd provides a service to Customers at Outlets.
Counter*	A serving position in a Post Office, where a Customer transacts business with a Counter Clerk.
Counter Application	An application resident within the counter processor that contains the business logic controlling the dialogue with the Clerk.
Counter Dialogue	The dialogue between the Post Office Clerk and the Horizon platform in the Post Office.
Customer*	A person transacting, or seeking to transact business with Post Office Ltd through any of the supported Services.
Customer Receipt	The Receipt handed to the Customer

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

Decline	<p>A transaction is declined when it does not proceed as per the initial customer request. Decline includes:</p> <ul style="list-style-type: none"> - Transactions that cannot proceed because a decline response has been received at the counter. - Decline by counter due to timeout, i.e. no response received to the request - Decline by PIN pad, irrespective of institutional verdict (by AAC) - Decline because PIN pad cannot process request even though response has been received to request – where Card has been removed <p>In all cases a record of the transaction is maintained by the counter system.</p>
EMV Transaction	A Retail Transaction which uses an ICC and which conforms to the EMV protocol as specified in Europay Mastercard Visa Books 1 to 4.
First Generate AC	<p>The GENERATE AC is a command executed by the PIN pad which sends transaction-related data to the ICC, which computes and returns a cryptogram. The cryptogram determines the subsequent action to take place by application.</p> <p>The Horizon application has been implemented so that a normal card transaction uses two GENERATE AC commands: the first command follows PIN entry and determines whether the transaction should cancel at that point, fallback to an alternative verification method, or proceed by going on line to the financial institution: the second command takes place after the authorisation response is received from the financial institution and determines whether the transaction is approved or declined.</p> <p>Detailed explanations of these commands appear in <i>EMV Integrated Circuit Card Specifications for Payment Systems</i> (the published standard for EMV)</p>
Horizon	The service implemented by Fujitsu Services for Post Office Ltd per the contract awarded in May 1996, and amended in May 1999 following the withdrawal of the DSS.
Merchant Acquirer	A central third party computer system [(contracted for by POL)] which facilitates the handling of DC messages interfacing between the POL Service Infrastructure and [Card Issuers / Banks] as necessary
Method of Payment (MOP)*	The form of payment recorded against a transaction involving a customer.

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

Mode	Environment within the Riposte Desktop where a transaction is processed.
Office / Outlet	A Post Office or any other location where Post Office Ltd (whether directly or by means of agents) transacts business with customers.
Office Receipt	The transaction receipt retained in the Outlet.
Off-line	Where a system elects not to communicate with another system – typically the counter having the rules held locally to enable it to complete the transaction.
Off-line Indicator	A mechanism by which the Clerk can detect that an on-line transaction will not be successful due to network failures prior to swiping a card or manually entering the card details.
On-line	Where a system attempts to communicate with another system – typically the counter seeking authorisation from a Client.
PAN Sequence Number	Means of differentiating between different cards sharing the same PAN
Receipt	A printed record of the transaction at the office. Both office and customer receipts are produced.
Reference Data*	A set of agreed parameters and relationships controlling the operation of Post Office Ltd Services.
Response Code	Code returned in the Authorisation message or created by the Counter if no Authorisation message is returned. It contains the outcome of the request. These codes and their meanings are defined in Section 6.
Retail Payment Card	A credit, debit or bankcard (either magnetic stripe or EMV) used for settling a Retail Transaction.
Retail Transaction	A Transaction supported in accordance with paragraph [4.2.1] of the Debit Card Functional Description which states : DC Transaction Types Purchase Refund to card Implicit Reversal Explicit Reversal
Second Generate AC	See First Generate AC
Serve Customer Mode	Desktop environment for conducting a customer transaction.

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

Session Receipt	Receipt produced at end of customer session containing a summary of the transactions carried out during that session: it contains details of purchases, refunds and settlement. In some instances the session receipt may be optional, but it will always be printed if any of the items is marked in reference data as requiring a receipt. It is intended that debit card settlement products will be marked as requiring a receipt so a session receipt will always be produced with all debit card transactions
Settlement Mode	Desktop environment for conducting a customer retail transaction.
Transaction*	A recorded and auditable instance of business activity, involving service provision or stock movement across organisational or service boundaries.

0.5 Abbreviations

Abbreviation	Definition
[A]	Authorisation
AID	Application Identifier
AAC	Application Authentication Cryptogram. Message type sent by the PIN pad to the counter which declines the transaction regardless of whether the merchant acquirer has authorised or declined the transaction
ACK	Acknowledgement. Message type sent by the Counter to the PIN pad
ARP	An abbreviation for the message which is sent from the client host system in response to an online request for authorisation the message contains amongst other things the ARPC cryptogram and the authorisation response code.
ARQ	Application Request. Message type sent by the PIN pad to the counter
BI3	Banking Increment 3.
[C]	Confirmation
[C0]	Null Confirmation
CVM	Cardholder Verification Method
DC	Debit Card
DSP	Display. Message type sent by the PIN pad to the counter

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

EPOSS	Electronic Point of Sale Service
EFT	Electronic Funds Transfer. Message type sent by the counter to the PIN pad to launch a new financial transaction: this triggers the PIN pad to ask for a card to be inserted (unless already present) and to process that card
EMV	Europay Mastercard Visa
GenAC	Generate Application Cryptogram (see First Generate AC / Second Generate AC)
ICC	Integrated Circuit Card
IIN	Issuer Identification Number
KBD	Keyboard and Display Request. Message type sent by the PIN pad to the counter
MA	Merchant Acquirer
MOP	Method of Payment
MSR	Magnetic Stripe Reader
NBS	Network Banking Service
PAN	Primary Account Number
PED	PIN Entry Device
PIN	Personal Identification Number
PKE	PAN Key Entry
STA	Status. Message type sent by the PIN pad to the counter
TC	Transaction Confirmed. Message type sent by the PIN pad to the counter for successful financial transaction
TDR	TLV Response. Message type sent by the PIN pad to the counter which provides data in response to a TLV message
TLV	Tag length variable: data format used by the PIN pad. Also the name of a message type sent by the counter to the PIN pad asking for information
VF Y	Verify. Message type sent by the PIN pad to the counter

0.6 Changes in this Version

Version	Changes
0.2	<ul style="list-style-type: none"> Changes made as a result of internal comments to structure of document and activity flows
0.3	<ul style="list-style-type: none"> Changes arising from walk-through with PO and internal design

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

	<ul style="list-style-type: none"> • review
0.4	<ul style="list-style-type: none"> • Changes arising from discussions with Hypercom: • PIN Length check for Capture PIN removed • Introduced section 7.2 for variations of messages of screen ERP2 depending on PIN-retry counter
0.5	<ul style="list-style-type: none"> • Changes to flow charts and screens as per discussions with PO at workshop on 14/11/03 • Added Annexe A and B • Deleted Section 6 • Added Table for Audio Cues in Section 6.3 (renumbered after deletion of the original section 6) • Added Function Key activity table for PIN pad screens • Declined Transactions Receipt expanded
1.0	<ul style="list-style-type: none"> • Document ownership transferred from Ramesh Kallidai to Roger Donato • Section 1.1 – Disclaimer and Copyright statements added • Section 2.2 - Flowchart in Figure 2 <i>Activity Flows for EMV Retail – Transaction Start</i> redrawn as Figure 2 <i>Transaction Start</i> and Figure 3 <i>Swipe Card</i>. Changes: <ul style="list-style-type: none"> • other settlement options shown • screen EB1 wording modified • screen EB2 removed • ICC card not allowed as MSR transaction (fallback) unless card has been rejected in PIN pad or PIN pad is broken • Section 2.2 - Flowchart in Figure 3 <i>Activity Flows for Retail – Offline Checks</i> renumbered as Figure 4 • Section 2.3 - Flowchart in Figure 4 <i>Activity Flows for EMV Retail – Amount Capture</i> renumbered as Figure 5 • Section 2.3 - Flowchart in Figure 5 <i>Activity Flows for EMV Retail – Application Selection</i> renumbered as Figure 6. Changes: <ul style="list-style-type: none"> • options introduced for signature verification and No CVM as result of [CP 3647] • logging of failed chip cards so that they can be re-tried as MSR • Section 2.3 - Flowchart in Figure 6 renumbered as Figure 7 <i>Activity Flows for EMV Retail – PIN Verification</i>. Changes:

	<ul style="list-style-type: none">• clerk allowed to select bypass option on ER4 screen• processing allowed to continue in PIN bypass mode when PIN is locked: (so long as card allows)• clerk also allowed to try EMV card as swipe card following a failure in the PIN pad• Section 2.3 – New flowchart added for signature verification in Figures 8 as result of [CP 3647]• Section 2.3 - Flowchart in Figure 7 <i>Activity Flows for EMV Retail – Process Response</i> renumbered as Figure 9. Changed to support Signature verification as result of [CP 3647]• Section 2.3 – New flowchart added for <i>Print Receipt for Signature</i> in Figure 10 as result of [CP 3647]• Section 2.3 – New flowchart added for <i>Reprint Receipt for Signature</i> in Figure 11 as result of [CP 3647]• Section 2.3 – New flowchart added for <i>Completion</i> in Figure 11• Section 2.3 - Flowchart in Figure 8 <i>Cancel Flows for EMV Retail</i> renumbered as Figure 13• Section 2.4 - Flowchart in Figure 9 <i>Activity Flows for System Decline</i> renumbered as Figure 14. Also PIN pad message was been removed to give card to clerk for retention• Section 3 – Receipt layout changed• Section 5.1.4 – Screen ER4 <i>Waiting for PIN</i> added to replace screen 3. New screen allows clerk to cancel or to bypass PIN entry• Section 5.2 – PIN Pad layouts for PIN entry and retry changed• Section 6.1.1 - message text altered to be consistent with ER1 screen• Section 6.1.2 – PIN entry and PIN locking code changes• Section 6.3 – modified to provide more information on the audio beeps on the PIN pad• Section 7.1.1 – counter screen EB1 (Proceed as Chip Card) reworded• Section 7.1.2 – counter screen EB2 (Only Proceed as Chip Card) removed• Section 7.2.7 – PIN pad screen EBP8 (Please hand card to assistant) removed for card retention• Section 7.2.11 – PIN Pad layout for PIN entry moved to section 5.2
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	<ul style="list-style-type: none"> • Section 8.1 – Existing screens from Network Banking added to this document <ul style="list-style-type: none"> Screen 11: Office Receipt Printing Screen 13: Check Signature Screen E1: Signature Receipt OK Screen E2: Signature Check (2nd Receipt) Screen E3: Signature Check (2nd attempt) Screen E5: Signature Checks Failure Options Screen E6: Print Preview • Section 8.1.1 – Existing screen 3 Waiting for PIN now removed: replaced by screen ER3 in section 5.1.3 • Section 8.1.13 – Existing screen E4 <i>Invalid Card</i> will also now also report on cards not read in PIN pad
<p>1.1</p>	<ul style="list-style-type: none"> • Document changed to support the following <ul style="list-style-type: none"> • Application selection from the counter [CP 3658] • Reminding customer to remove card from PIN pad at conclusion of transaction [CP 3648] • PIN bypass to be switched off at the counter by reference data • Application of comments received from version 1.0 <p>The detailed changes are as follows:</p> <ul style="list-style-type: none"> • Section 2.3 - Flowchart in Figure 6 – <i>Application Selection</i> replaced by <ul style="list-style-type: none"> • Figure 6 – <i>Insert Card to PIN pad</i> • Figure 7 – <i>Fallback Processing</i> • Figure 8 – <i>PIN pad AID selection</i> • Figure 9 – <i>Counter AID selection</i> <p>Changes required by [CP 3658]: <i>Counter Clerk Selection of PIN Pad Application</i></p> • Section 2.3 - Flowchart in Figure 7 – <i>PIN Verification</i> replaced by <ul style="list-style-type: none"> • Figure 10– <i>PIN Verification</i> • Figure 11 – <i>PIN already locked</i> • Figure 12 – <i>Enter PIN</i> • Figure 13 – <i>Customer locks PIN</i>

	<p>Changes made to provide clarification</p> <ul style="list-style-type: none"> • Section 2.3 – Figure 8 - <i>Signature Verification</i> renumbered as Figure 14 • Section 2.3 - Figure 9 - <i>Process Response</i> renumbered as Figure 15 • Section 2.3 – Figure 10 - <i>Print Receipt for Signature</i> renumbered as Figure 16 • Section 2.3 – Figure 11 - <i>Reprint Receipt for Signature</i> renumbered as Figure 17 • Section 2.3 – Figure 12 – <i>Completion Flows for EMV Retail</i> renumbered as Figure 18 • Section 2.3 - Figure 13 <i>Cancel Flows for EMV Retail</i> renumbered as Figure 19 • Section 2.4 - Figure 14 - <i>System Decline</i> renumbered as Figure 20 • Section 2.4 - Figure 21 – <i>Remove Card</i> added. To remind clerk to tell customer to remove card from PIN pad: this change required as result of [CP 3648] • Section 3 – Receipt layouts modified • Section 5.1.1 – Screen ER1 <i>Insert Card</i> – renamed as <i>Insert Card (First attempt)</i> and wording modified • Section 5.1.2 – Screen ER2 <i>Multiple Cards</i> – wording modified • Section 5.1.3 – Screen ER3 <i>PIN Locked</i> – wording modified and action sequence modified in right hand panel • Section 5.1.4 – Screen ER4 <i>Waiting for PIN</i> (2 buttons) – wording modified • Section 5.1.5 – Screen ER5 <i>Waiting for PIN</i> (1 button) – added • Section 5.1.6 – Screen ER6 <i>Card cannot be read by PIN pad</i> added. New screen allows clerk to cancel or use card as magnetic swipe • Sections 5.1.7 and 5.1.8 New screens ER7 and ER8 which monitor problems being experienced by the customer getting his card read by the PIN pad • Section 5.1.9 – Screen ER9 <i>Remove Card</i> – added [CP 3648] • Section 5.1.10 – Screen ER10 <i>Application Selection</i> – added [CP 3658] • Section 5.2.1 to 5.2.3 – PIN pad screens EBP12a, EBP12b, EBP12c used for PIN entry reformatted according to Hypercom
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	<ul style="list-style-type: none"> • Retail application • Section 5.2: following screens removed: <ul style="list-style-type: none"> 5.2.4 ERP2a <i>PIN Locked – Remove Card</i> 5.2.5 ERP2b <i>PIN Locked – Don't Remove Card</i> , 5.2.6 ERP2c <i>PIN Now Locked – Remove Card</i> 5.2.7 ERP2d <i>PIN Now Locked – Don't Remove Card</i> and replaced by single screen <i>ERP2 PIN BLOCKED</i> • Section 5.3 – table amended to be consistent with screens • Section 6.1.1 - message text altered to be consistent with screens • Section 6.3 – audio beep for 0-9 corrected to 2kHz to be consistent with AS/DPR/008 - <i>Design Proposal for DDA - PIN Entry Device Audio System</i> • Section 7.2 - PIN pad screens modified in response to comments from the Post Office and technical data received from Hypercom • Section 7.2.4 – screen EBP4 no longer output by PIN pad • Section 7.2.12 screen EBP13 added for application selection at the counter: change required by [CP 3658] • 7.2.13 to 7.2.18 following PIN pad screens added relating to card insertion <ul style="list-style-type: none"> Screen EBP14: Remove & Re-insert Card (1) Screen EBP15: Re-insert Card (1) Screen EBP16: Remove & Re-insert Card (2) Screen EBP17: Re-insert Card (2) Screen EBP18: Remove & Hand Card to Cashier Screen EBP19: Hand Card to Cashier Screen EBP20: Cancelled • Section 8.1 – Existing screens from Network Banking added to this document <ul style="list-style-type: none"> Screen 5: <i>Waiting for Authorisation</i> • Section 8.1.14 – Screen E4: <i>Invalid Card</i>. Messages modified
1.2	<ul style="list-style-type: none"> • Section 2.2 – Figure 2 – <i>Transaction Start</i> modified • Section 2.3 – Figure 7 – <i>Fallback Processing</i> modified • Section 2.3 – Figure 8 – <i>PIN pad AID selection</i> modified <ul style="list-style-type: none"> • Box 8.9 altered to allow on line authorisation for cards

	<ul style="list-style-type: none"> • where from date and/or expiry date are out of range • Clarification of cancel by the customer • Section 2.3 – Figure 10– <i>PIN Verification</i> modified <ul style="list-style-type: none"> • Screen ER13 <i>Please Wait</i> added at box 10.11 when clerk touches Cancel on Waiting for PIN screen • Section 2.3 – Figure 11 – <i>PIN already locked</i> modified <ul style="list-style-type: none"> • Screens ER11 <i>Please Wait</i> and ER12 <i>Please Wait</i> added at boxes 11.5 and 11.7 when clerk touches Bypass on Waiting for PIN screen • Section 2.3 – Figure 12 – <i>Enter PIN</i> modified <ul style="list-style-type: none"> • Box 12.4 single panel screen EB4 <i>Customer Cancelled</i> used instead of double panelled screen 19 • Correction at box 12.11 • Section 2.3 – Figure 13 – <i>Customer locks PIN</i> modified <ul style="list-style-type: none"> • Box 13.1 PIN pad screen ERP2 used instead of EBP11 • Section 2.3 – Figure 14 - <i>Signature Verification</i>. Title modified <ul style="list-style-type: none"> • Screens ER11 <i>Please Wait</i> and ER12 <i>Please Wait</i> added at boxes 14.4 and 14.14 • Process boxes added at 14.5, 14.6 14.15 and 14.16 to provide more details of message flows between Counter and PIN pad • Section 2.3 – Figure 15 – <i>Process Response</i> modified. Flow for non CVM corrected at box 15.7 <ul style="list-style-type: none"> ▪ Section 3 – line 17 of receipt layouts corrected to remove reference to “Parcel Traffic” which will never appear on a retail card receipt ▪ Section 3.2.5.1 Receipt outcome messages: references to magnetic swipe and PIN removed ▪ Section 5.1.1 – Screen ER1 <i>Insert Card</i> – Prev button removed, wording modified, and right hand panel amended ▪ Section 5.1.2 – Screen ER2 <i>Multiple Cards</i> – Prev button removed and wording modified ▪ Section 5.1.3 – Screen ER3 <i>PIN Locked</i> – Prev button removed and wording modified ▪ Section 5.1.4 – Screen ER4 <i>Waiting for PIN</i> (2 buttons) – Prev button removed and wording modified ▪ Section 5.1.5 – Screen ER5 <i>Waiting for PIN</i> (1 button) – Prev
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	<ul style="list-style-type: none"> ▪ button removed and wording modified ▪ Section 5.1.6 – Screen ER6 <i>Card cannot be read by PIN pad</i> Prev button removed and wording modified ▪ Section 5.1.7 – Screen ER7 <i>Insert Card (Second Attempt)</i> – Prev button removed, wording modified, and right hand panel amended ▪ Section 5.1.8 – Screen ER8 <i>Insert Card (Third Attempt)</i> – Prev button removed, wording modified, and right hand panel amended ▪ Section 5.1.9 – Screen ER9 <i>Remove Card from PIN pad</i> – Prev button removed and wording modified ▪ Section 5.1.10 – Screen ER10 <i>Application Selection</i> – Prev button removed, and right hand panel amended ▪ Section 5.1.11 - Screen ER11 <i>Please Wait – Signature CVM</i> added ▪ Section 5.1.12 - Screen ER12 <i>Please Wait – No CVM</i> added ▪ Section 5.1.13 - Screen ER13 <i>Please Wait</i> added ▪ Section 7.1.1 – Screen EB1 <i>Proceed as Chip Card?</i> – Prev button removed ▪ Section 7.1.2 – Screen EB2 <i>Transaction Cancelled by the Customer</i> – Prev button removed ▪ Section 7.2.12 – PIN pad Screen <i>EBP13: Application Selection at Counter</i> – Function key actions corrected ▪ Section 8.1 - Screen E11 – No Services Available. Screen added
<p>1.3</p>	<ul style="list-style-type: none"> • Section 2.3 – Figure 2 – <i>Transaction Start</i> <ul style="list-style-type: none"> - Completion of Fast Cash and Fast Cheque settlements now routed to Figure 18 – <i>Complete Non EMV</i> - step 2.21 modified • Section 2.3 – Figure 3 – <i>Swipe Card</i> minor change • Section 2.3 – Figure 8 – <i>PIN pad AID selection</i> minor wording change • Section 2.3 – Figure 11 – <i>PIN already locked</i> simplified to fit in with Figure 14 • Section 2.3 – Figure 12 – <i>Enter PIN</i> changed <ul style="list-style-type: none"> - now includes PIN pad screens ERP3 and ERP4 - Screen 5 <i>Waiting for Authorisation</i> added - extra boxes to show messages between PIN pad and

	<ul style="list-style-type: none"> - counter - support multiple verification methods • Section 2.3 – Figure 14 – <i>Signature Verification & No CVM</i> simplified to have single entry points • Section 2.3 – Figure 15 – <i>Process Response</i> changed: PIN pad screen EBP10 Approved / Remove card repositioned (in line with changes made to Figures 16 and 18) • Section 2.3 – Figure 16 – <i>Check Signature</i>: step removed to display PIN pad screen EBP10 <i>Approved / Remove card</i>: (in line with change made to Figure 15) • Section 2.3 – Figure 18 – <i>Completion</i>: changed <ul style="list-style-type: none"> - Completion of Retail card transaction now always returns to settlement menu - step removed to display PIN pad screen EBP10 <i>Approved / Remove card</i>: (in line with change made to Figure 15) • Section 2.3 – Figure 20 – <i>System Decline</i> diagram corrected to reverse “Y” and “N” flows out of step 20.14 • Section 3.2.5 , 3.3.5 & 3.4.5 – Electronic Funds Transfer Sequence Number added to Session Receipt • Section 3.2.5.1 Receipt Outcome messages extended to support multiple verification methods • Section 3.5.5 – Application ID, PAN Sequence Number, and Electronic Funds Transfer Sequence Number added to Office Signature Receipt • Section 5.1.7 – Screen ER7 <i>Insert Card (Second attempt)</i> - wording modified • Section 5.1.9 – Screen ER9 <i>Card in PIN pad</i> - wording modified and Cancel button changed to OK • Section 5.1.11 - Screen ER11 <i>Signature CVM</i> – title changed and wording modified • Section 5.1.12 - Screen ER12 <i>No CVM</i> - title changed and wording modified • Section 5.1.13 - Screen ER13 <i>Cancelled</i> - title changed and wording modified • Section 5.2.5 - PIN pad screen ERP3 <i>Incorrect PIN - Retry</i> introduced • Section 5.2.6 - PIN pad screen ERP4 <i>Incorrect PIN – Last Retry</i> introduced
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1.4	<ul style="list-style-type: none"> • Section 2.2 – Figure 3 – Tests adjusted for migration status. • Section 2.2 – Figure 4 – 4.6 removed as redundant. • Section 2.3 – Figure 8 – Additional test for No applications. • Section 2.3 – Figure 5 – 5.14 removed as redundant. • Section 2.3 – Figure 8 – 8.24 removed as redundant. • Section 2.3 – Figure 11 – 11.9 removed as redundant. • Section 2.3 – Figure 12 – 12.5 and 12.17 removed as redundant. • Section 2.3 – Figure 13 – 13.8 removed as redundant. • Section 2.3 – Figure 20 – 20.26 removed as redundant. • Section 2.3 – Figure 21 - has been changed to use error message screen ER14. • Section 2.3 – Figure 8 – the Send END message box was incorrectly placed and has been relocated in Figure 21. • Section 2.3 – Figure 19 – missing PIN pad messages and a Timeout path have been included. • Section 2.3 – Figure 11 – END from PIN pad described too early – box removed. • Section 2.3 – Figure 12 – ARQ processing amalgamated with figure 14. • Section 2.3 – Figure 14 – ARQ path duplication removed. • Section 2.3 – Figure 17 – PIN pad dialogue for signature added. • Section 2.3 – Figure 18 – PIN pad dialogue for signature added. • Section 2.3 – Figure 10 – New screens added for PIN entry. • Section 2.3 – Figure 12 – PIN Verification off page markers changed. • Section 2.3 – Figure 7 – Add the remove card message to the dialogue.
1.5	<ul style="list-style-type: none"> • Section 2.2 – figure 2 – Show the existence of card insertion timeout. • Section 1.5 introduced to following comment by BB on absence of application selection rules statement. • Section 2.2 – figure 3 – Notes 3.5 and 3.6 changed. • Section 2.3 – figure 6 – New card inserted screen inserted into the flow 6.27. • Section 2.3 – figure 7 – Document card removal process i.e. PIN

	<ul style="list-style-type: none">• pad beeping, beep override button, following PIN pad action and customer action.• Section 2.3 – figure 8 - PIN pad timeout for application selection removed. No such thing.• Section 2.3 – figure 8 – New screen ER22 for card decline before RAC authorisation sequence.• Section 2.3 – figure 9 – New screen ER23 for pause between clerk application selection and PIN entry.• Section 2.3 – figure 10 and 12 – The flow charts document the PIN retry process incorrectly. New symbols have been added to figure 10 and existing symbols removed from figure 12.• Section 2.3 – figure 12 - New screen ER22 added to the flow to document card sponsored declines as a result of card action analysis. I.e. decline as a result of an attempt to bypass PIN entry for a card, which does not allow it.• Section 2.3 – figure 13 – Notes – correction to off page marker comment.• Section 2.3 – figure 15 – Document TLV/TDR dialogues.• Section 2.3 – figure 16 – Document printer and clerk actions.• Section 2.3 – figure 17 – new symbol to document printer re-print action.• Section 2.3 – figure 18 – Write [C1] box removed as misleading.• Section 2.3 – figure 19 – PIN pad timeout off page marker moved to include screen EB4.• Section 2.3 – figure 20 – Decline is only performed once that card has been removed form the PIN pad. The Remove card off page marker has therefore been replaced with and end of process symbol.• Section 2.3 – figure 20 – 20.20 replaced with Print Error Message report. Print Customer Slip was incorrect.• Section 2.3 – figure 21 – New End Process off page marker added.• Section 2.3 – figure 21 – Remove Card 2 off page marker added.• Section 2.3 – figure 19 – Remove Card 2 off page marker diverted to Remove Card 2.• Section 2.3 – figure 21 – 21.12 clerk acknowledged symbol removed the step was repeated at 21.6.
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	<ul style="list-style-type: none"> • Section 2.3 – figure 21 – Document counter action when clerk acknowledges the ER9 screen. • Section 2.3 – figure 21 – 21.19 added to test if declined processing is required. If so off page marker takes the flow to the Decline page. • 3.2.5 – keyed indicator added to receipts. • 3.3.5 – keyed indicator added to receipts. • 3.4.5 – keyed indicator added to receipts. • 5.1.20 – New screen ER20 Partner Bank. This is to be displayed when the system recognises that the card in the PIN pad can be used for banking as well as retail. • 5.1.21 – New screen ER21 Card Inserted. Displayed when an ICC card has been recognised and read. • 5.1.22 – New screen ER22 for transactions, which are declined by the card before authorisation. • 6.0 – several changes to message texts. • Section 3.2.5 - Date and time of payment added to receipts • Section 3.3.5 - Date and time of payment added to receipts • Section 3.4.5 - Date and time of payment added to receipts • Section 3.5.5 - Date and time of payment added to receipts • 7.2.13 changed to include customised statement. • 7.2.14 changed to include customised statement. • 7.2.15 changed to include customised statement. • 7.2.16 changed to include customised statement. • 7.2.18 changed to include customised statement. • Assorted message text changes.
<p>1.6</p>	<ul style="list-style-type: none"> • Section 2.2 – figure 2 – changed to bring the PIN pad back to a stable state following card insert timeout. • Section 2.2 – figure 2 – Changed to add EFT PIN pad command. • Section 2.2 – figure 4 – Remove Card Process added. • Section 2.3 – figure 6 – Omitted PIN pad screens added. • Section 2.3 – figure 6 – STA 8 command added. • Section 2.3 – figure 7 – Diagram modelled with extra branches. • Section 2.3 – figure 8 – Remove Card process added.

	<ul style="list-style-type: none"> • Section 2.3 – figure 8 – STA 9 command added. • Section 2.3 – figure 8 – addition of Application selection PIN Pad screen. • Section 2.3 – figure 12 – Remove Card process added. • Section 2.3 – figure 11 - removed and amalgamated into figure 13. • Section 2.3 – figure 12 – 12.8 and 12.28 removed. Clerk cancel is handled in figure 10. • Section 2.3 – figure 13 - renamed PIN Blocked. • Section 2.3 – figure 14 – AAC decline processing added to first generate AC level code. • Section 2.3 – figure 14 – Remove Card process added. • Section 2.3 – figure 14 – PIN ok branch relocated to this figure. • Section 2.3 – figure 15 – new branch added for customer cancel by card removal whilst waiting for authorisation. • Section 2.3 – figure 15 – forced decline paths added. • Section 2.3 – figure 15 – Remove Card process added. • Section 2.3 – figure 21 – Removal of customer cancel to figure 15.
1.7	<ul style="list-style-type: none"> • Section 2.3 – figure 8 – Off page marker changed from fallback processing 2 to fallback processing. • Section 7.2.3 – Application selection PIN pad screen changed to agree with the PIN Pad application which shows a better format. • Section 2.3 – figure 2 – card insertion timeout diagram moved to figure 6. • Section 2.2 – figure 2 EFT command moved to figure 5. • Section 2.2 – figure 4 – Remove Card process removed because of relocation of insert card and insert card timeout. • Section 2.3 – figure 6 – beeps symbols included at Peter Clerk’s request. • Sections 3.1.5 - Customer Session Receipt (Non debit card), 3.2.5 - Customer Session Receipt (with debit card), and 3.3.5 Duplicate Customer Session Receipt - MoP Value field width increased from 13 to 16.
1.7	<ul style="list-style-type: none"> • Figure 2 – 2.25 EFT moved to figure 5 – 5.13. • Figure 2 – card insertion flow moved to figure 6a.

	<ul style="list-style-type: none">• Figure 3 – 3.9 and 3.10 swapped.• Figure 4 – 4.6 removed.• Figure 5 – 5.13 changed to jump to Insert Card 1.• Figure 6 – Removed and replaced by Figures 6a, 6b and 6c. This was to include PIN pad beeps and card removal flows.• Figure 7 – 7.3 moved to figures 6 and 8.• Figure 7 – restructured to show card removal paths and beeps.• Figure 7 – renumbered.• Figure 8 – new 8.26 added to show PIN pad informing an MSR fallback situation.• Figure 8 – 8.15 and 8.16 moved to Figure 9.• Figure 8 – New 8.22 End Command Process added.• Figure 8 – 8.11 and 8.12 changed 8.12 now goes to PIN entry or CVM Processing.• Figure 8 – new 8.28 now goes directly to <i>PIN Pad AID Selection</i> marker.• Figure 8 – renumbered.• Figure 9 – new 9.1 and 9.2 moved from Figure 8.• Figure 9 – new 9.6, 9.7, 9.8 included for Clerk cancel.• Figure 9 - renumbered.• Figure 10 – new 10.7 goes to <i>CVM processing</i>.• <i>Figure 10 – new 10.29, 10.30, 10.31, 10.32 clerk cancel process added.</i>• <i>Figure 10 – new 10.12 loops back to 10.1 for PIN retry.</i>• <i>Figure 10 – Renumbered.</i>• <i>Figure 11- replaced by new Figure 11- CVM Processing.</i> This new diagram shows more closely how the counter dialogues are determined by the PIN pad dialogue.• Figure 12 – removed as functionality is described in new Figure 11.• Figure 13 – removed as functionality is described in new Figure 11.• Figure 14 – old 14.25 removed as functionality is described in Figure 11.• Figure 14 – new 14.2 and 14.10 added to show action analysis
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	<ul style="list-style-type: none">• checks in the PIN pad before showing the CVM screens ER11 or ER12. These screens should not be displayed if the PIN Pad declines the transaction.• Figure 14 – TLV/TDR dialogues not required in the AAC path as we have not sent an R1 at this stage. Therefore no Recov2, C0 and C1 required.• Figure 14 – PIN processing marker added.• Figure 14 – End Command Process 14.21 added in AAC path.• Figure 14 – renumbered.• Figure 15 – new 15.12, 15.13 Remove card and End Command processing moved before signature verification test.• Figure 15 – When card removed by customer while waiting for authorisation, PIN pad shows the decline (AAC) then sends an STA 6 cancel. 15.19,15.20,15.21 and 15.24,15.25,15.26 now show this in better detail with the use of screen ER22.• Figure 15 - 15.23 End Command Processing included in the decline path.• Figure 15 – new authorised screen implemented at 15.12 for PIN and NoCVM transactions.• Figure 15 – renumbered.• Figure 16 – 16.5, 16.7, 16.9 new clerk direction symbols added.• Figure 16 - new authorised screen implemented for signature and combination transactions.• Figure 16 – renumbered.• Figure 17 – 17.17 and 17.18 removed as this functionality is performed in Figure 15.• Figure 17 renumbered.• Figure 18 – 18.1 and 18.2 removed as this functionality is performed in Figure 15.• Figure 18 – renumbered.• Figure 19 – 19.1 and 19.2 removed as Clerk cancels are handled with their individual circumstances. Clerk Cancel marker removed.• Figure 19 – new 19.6, 19.8 and 19.9 added these are processes which perform the same function.• Figure 19 – renumbered.• Figure 20 – Rearranged with End command processing
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	<ul style="list-style-type: none">• separated out into a Figure of its own.• Figure 20 – renumbered.• Figure 21 – new Figure to introduced End Command Processing. A process which encapsulates the handling of the End command and any error processing.• Section 3.2.5.1 – new RT codes added for payment/refund not verified by cardholder.• Section 3.2.5.2 – message texts for new RT codes.• Section 5.1.3 – PIN Locked now reads PIN Blocked to bring it in line with the PIN Pad display.• Section 5.1.14 – additional text to explain %Reason%.• Section 5.1.24 – Additional screen ER24 Card Insertion Timeout.• Section 5.1.25 – Additional screen ER25 Action Analysis Approval Screen.• Section 3 – Welsh receipt texts have now been included.• <u>PCnnn Welsh/English receipt variants (3.2.5, 3.3.5, 3.4.5, 3.5.5)</u> Population with translations.• <u>PCnnn MoP value (enhancement to accommodate longer MoP name) (3.1.5, 3.2.5)</u> Clarification of the character positions for MoP values of up to and more than 99999.99.<ul style="list-style-type: none">• <u>‘Keyed’ indicator (3.2, 3.4, 3.5)</u>• ‘Keyed indicator’ renamed ‘entry indicator’ as it now has ‘ICC’ and ‘swiped’ options. <p>The indicator on the Declined Receipt and Signature Slip extended to include the ‘ICC’ or ‘swiped’ options.</p> <p><u>Typographical corrections:</u></p> <p>Customer Session Receipt (With debit card payment) (3.2.5) and Duplicate (3.3.5): In English illustrations, two blank lines before ‘Thank You’ instead of one.</p> <p>Office Debit Card Receipt for Signature (3.5.5) In illustration, ‘PAN Seq No’ fieldname moved one space right to match character positions given in field definition table.</p> <ul style="list-style-type: none">• A new Figure, Figure 23 has been introduced to show card removal for an authorised, non-signature transaction.• Section 8.1.14 - Additional text added to screen 5.
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	<ul style="list-style-type: none"> • A new screen ER25 has been introduced to cover transaction authorisation with card removal. • Figure 20 – redrawn to omit redundant threads.
1.8	<p>Application of changes from NB/REQ/004 v1.0 EMV Retail: User Interface Design Proposal - Changes Supplement</p> <ul style="list-style-type: none"> • Section 1.2: Comment added to Scope concerning existence of diagnostic screens (PC0106457) • Section 2.1.5: Paragraph reworded to cover scope of the PIN pad screens that have been documented within the flowcharts (PC0104918) • Section 2.2 <i>Transaction Start</i>: clarification of notes to - Figure 3 (PC0110480) • Section 2.3.1 <i>Amount Capture</i> - screen ER26 <i>Multiple Cards (Refund)</i> added to Figure 5 (PC0109179) • Section 2.3.2 <i>Card Insertion</i>: Figures 6a, 6b, 6c modified <ul style="list-style-type: none"> - position of PIN pad beeps altered on card insertion (PC0108773) - flow for counter detected timeout included (PC0112069) - PIN pad screens EBP7 <i>Cancelled Please Remove Card</i> and EBP11 <i>Processing Please Wait</i> displayed when Clerk cancels transaction (PC0107169) - Card removal timeout shown (PC0106872) • Section 2.3.3 <i>Fallback Processing</i>: Figures 7 modified (PC0106872) • Section 2.3.4 <i>Application Selection</i> Figure 8 modified: <ul style="list-style-type: none"> - Screen ER27 <i>Declined (Refund)</i> added (PC0109179) - Screen ER28 <i>Application Selection</i> inserted after PIN pad screen EBP3 in the 'Customer required to confirm' flow (PC0109176) - Screen ER20 <i>Partner Bank</i> added (CP3738) (PC0109182, PC0110282) - PIN pad screens added EBP23 <i>Card Blocked</i> and EBP22 <i>Application Blocked</i> added (PC0110822) - TLV / TDR messages removed • Section 2.3.5 <i>PIN Verification</i> - Figure 10 modified: <ul style="list-style-type: none"> - Correction of flows concerning the number of attempts at

	<ul style="list-style-type: none"> - PIN entry - Test added to flow to show effect of customer cancel from the PIN pad • Section 2.3.6 <i>CVM Processing</i> – Figure 11 modified: <ul style="list-style-type: none"> - PIN pad screen added EBP21 <i>Processing</i> (PC0107635) - Wait step shown • Section 2.3.6 <i>CVM Processing</i> – Figure 14 modified: <ul style="list-style-type: none"> - Replacement of screens ER11 and ER12 by screen 5 (EMV) <i>Waiting for Authorisation</i> (PC0109180) - Routing to allow fallback to MSR after PIN entry (PC0108350) • Section 2.3.7 <i>Process Response</i> – Figure 15 modified: <ul style="list-style-type: none"> - Split into separate flows Figure 15a and Figure 15b - Flows for Chip and Signature updated to be in line with implementation (PC0107395 & PC0107973) - TLV / TDR messages removed / added • Section 2.3.7 <i>Process Response</i> – Figure 16: updated to include display and processing of screen 4 <i>Card Checks</i> (PC0109175) • Section 2.3.10 <i>Declined Transaction</i> – Figure 20 modified: <ul style="list-style-type: none"> - Allow for card retention if requested by Merchant Acquirer - Counter logic changed where request and authorisation amounts are unequal (PC0109482) • Section 2.3.11 <i>Card Removal and End Processing</i> - Figure 21: minor clarification • Section 2.3.11 <i>Card Removal and End Processing</i> - Figure 22: minor clarification • Section 3.2.5 – Customer session receipt text changed to meet Streamline requirements <ul style="list-style-type: none"> - Addition of “Transaction confirmed” text (PC0107687) - Addition of cardholder signature text on signature CVM (PC0109587) - Addition of cardholder signature text on combination CVMs (PC0107925) • Section 3.5.5: Office debit card receipt text changed for combination CVM (PC0107924, PC0108331) • Section 4.2.1: Response code 81 added (PC0111064)
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	<ul style="list-style-type: none">• Section 4.2.2: Transaction Result Codes now shown and definition of code 02 changed to include customer cancel (PC0111064)• Section 5.1: Prototype screen shots replaced by screen dumps from live system• Section 5.1.1: Message text changed on screen ER1 <i>Card Insertion</i> (PC0108087)• Section 5.1.2: Message text and button definition changed on screen ER2 <i>Multiple Cards (Payment)</i> (PC0109179, PC0109901)• Section 5.1.3: Message text changed on screen ER3 <i>Pin Locked</i> (PC0109182)• Section 5.1.4: Message text changed on screen ER4 <i>Waiting for PIN</i> (2 buttons) (PC0109182)• Section 5.1.5: Message text changed on screen ER5 <i>Waiting for PIN</i> (1 button) (PC0109182)• Section 5.1.6: Tab heading in left hand panel changed on screen ER6 <i>Card Cannot be Read By PIN pad</i> (PC0109182, PC0109858)• Section 5.1.7: Message text changed on screen ER7 <i>Insert Card (Second attempt)</i> (PC108091, PC0109182)• Section 5.1.8: Message text changed on screen ER8 <i>Insert Card (Third attempt)</i> (PC0108093, PC0109182)• Section 5.1.95.1.5: Message text and button definitions changed on screen ER9 <i>Remove Card from PIN pad</i> (PC0109181, PC0109182, PC0109858)• Section 5.1.10: Tab heading in left hand panel changed on screen ER10 <i>Application Selection from the Counter</i> (PC0108094)• Section 5.1.11: Screen ER11 <i>Signature CVM Selected</i> removed from flows and replaced by screen 5 (EMV) <i>Waiting for Authorisation</i> (PC0109180)• Section 5.1.12: Screen ER12 <i>No CVM Selected</i> removed from flows and replaced by screen 5 (EMV) <i>Waiting for Authorisation</i> (PC0109180)• Section 5.1.13: Tab heading in left hand panel changed on screen ER13 <i>Cancelled</i> (PC0108098)• Section 5.1.15: Message text and help text changed on screen ER15 <i>Remove Card From PIN Pad</i> (PC0109182, PC0109600)• Section 5.1.16: Message text changed on screen ER16 <i>PIN</i>
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	<ul style="list-style-type: none">• <i>Entry – PIN Re-try (2 buttons) (PC0109182)</i>• <i>Section 5.1.17: Message text changed on screen ER17 PIN Entry – PIN Re-try (1 button) (PC0109182)</i>• <i>Section 5.1.18: Message text changed on screen ER18 PIN Entry – Last Try (2 buttons) (PC0109182)</i>• <i>Section 5.1.19: Message text changed on screen ER19 PIN Entry – Last Try (1 button) (PC0109182)</i>• <i>Section 5.1.20: Message text and button definitions changed on screen ER20 Partner Bank (PC0109182, PC0109858, PC0110282)</i>• <i>Section 5.1.22: Message text changed on screen ER22 Declined (Payment) (PC0109179 / PC0109182)</i>• <i>Section 5.1.24: Message text changed on screen ER24 Card Insertion Timeout (PC0109182)</i>• <i>Section 5.1.25: Message text and button definitions changed on screen ER25 Transaction authorised remove card (PC0109181 / PC0109182)</i>• <i>Section 5.1.26: Insertion of screen ER26 Multiple Cards (Refund) (PC0109179, PC0109901)</i>• <i>Section 5.1.27: Insertion of screen ER27 Declined (Refund) (PC0109179)</i>• <i>Section 5.1.28: Insertion of screen ER28 Application Selection (PC0109176)</i>• <i>Section 5.1.29: Insertion of screen 5 (EMV) Waiting for Authorisation (PC0109180, PC0109858)</i>• <i>Section 5.2.2: minor change to line 2 on PIN Pad Screen ERP12b: Re-enter PIN - First Retry (PC0110095)</i>• <i>Section 5.3: screens EBP20, EBP21, EBP21 added to list of PIN displays shared with EMV Banking (PC0110822)</i>• <i>Section 6.1.1:</i><ul style="list-style-type: none">- <i>Revision to screen ER1 (PC0108087)</i>- <i>Revision to screens ER2 and ER22 for refund (PC0109179)</i>- <i>Revision to screens ER3, ER4, ER5, ER6, ER7, ER8, ER15, ER16, ER17, ER18, ER19, ER20, ER22, ER24, ER25 (PC0108091, PC0108093, PC0109182, PC0109600, PC0109858, PC0110282)</i>- <i>Revision to button definitions on screens ER9 and ER25 (PC0109181)</i>
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	<ul style="list-style-type: none"> - Revision to button definitions on screens ER10, ER21 and ER23 (PC0110989) - Revision to screens ER13 (PC0108098) - Addition of screens ER26 and ER27 for refunds (PC0109179) - Addition of screen ER28 <i>Application Selection</i> (PC0109176) - Addition of message definitions for amended left hand panel of screen 5 (PC0109180) • Section 7.1.2: Comment added relating to contents of Screen EB4: <i>Transaction cancelled by Customer</i> (PC0114477) when the customer removes card from the PIN pad too soon • Section 7.2.5: Footnote added to description of PIN Pad Screen EBP5: <i>Remove Card</i> • Section 7.2.10: Comment added concerning the conditions under which PIN Pad Screen EBP11: <i>Processing</i> is displayed (PC0104918) • Section 7.2.17: “Clerk” replaces “Cashier” in PIN Pad Screen EBP18: <i>Remove & Hand Card to Clerk</i> (PC0109178) • Section 7.2.18: “Clerk” replaces “Cashier” in PIN Pad Screen Pad Screen EBP19: <i>Hand Card to Clerk</i> (PC0109178) • Section 7.2.20: Insertion of PIN Pad Screen EBP21: <i>Processing</i> (PC0107635) • Section 7.2.21: Insertion of PIN Pad Screen EBP22: <i>Application Blocked</i> (PC0110822) • Section 7.2.22: Insertion of PIN Pad Screen EBP23: <i>Card Blocked</i> (PC0110822) • Section 8.1.2: Insertion of screen 4 <i>Card Checks</i>) (PC0109175) • Section 8.1.3: Comment added to show that screen 5 <i>Waiting for Authorisation</i> will only be used for MSR transactions (PC0109180) • Section 10.1: Error code 08057 added to Annexe D - <i>PIN Pad error messages</i> and Screen ER14 clerk messages (PC0110822) • Section 11.1: new section added on <i>PIN Pad Timeouts</i> (PC0110135)
2.0	Minor typographical corrections

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

0.7 Changes Expected

Changes
None

0.8 Table of Contents

1.0	INTRODUCTION.....	36
1.1	Privacy and Confidentiality.....	36
1.1.1	Accuracy.....	36
1.1.2	Copyright.....	36
1.2	Scope.....	36
1.3	Structure of this document.....	36
1.4	Overview of EMV functionality.....	37
1.5	Application Selection.....	38
2.0	EMV USER INTERFACE.....	38
2.1	Overview Description.....	38
2.1.1	EMV Transaction Stages.....	38
2.1.2	Stage 1.....	38
2.1.3	Stage 2.....	39
2.1.4	DC EMV Screen Flows.....	39
2.1.5	Inclusion of PIN pad Displays in the Screen Flows.....	39
2.1.6	Conventions used within the flowcharts.....	40
2.2	Stage 1: EMV Transaction Start & Off-line Checks.....	41
2.3	Stage 2: EMV Card Payment/Refund.....	48
2.3.1	Amount Capture.....	49
2.3.2	Card Insertion.....	51
2.3.3	Fallback Processing.....	60
2.3.4	Application Selection.....	62
2.3.5	PIN Verification.....	68
2.3.6	CVM Processing.....	72
2.3.7	Process Response.....	78
2.3.8	Add Authorised Transaction to Stack.....	87
2.3.9	Cancel Transaction.....	89
2.3.10	Decline Transaction.....	91
2.3.11	Card Removal and End Processing.....	93
3.0	RECEIPTS.....	99
3.1	Customer Session Receipt (Non debit card).....	100
3.1.1	Purpose.....	100
3.1.2	Frequency.....	100
3.1.3	Notes.....	100
3.1.4	Sequence.....	100
3.1.5	Layout and Example Content.....	101
3.2	Customer Session Receipt (With debit card payment).....	106
3.2.1	Purpose.....	106
3.2.2	Frequency.....	106
3.2.3	Notes.....	106
3.2.4	Sequence.....	106
3.2.5	Layout and Example Content.....	106
3.3	Duplicate Customer Session Receipt.....	122
3.3.1	Purpose.....	122
3.3.2	Frequency.....	122
3.3.3	Notes.....	122
3.3.4	Sequence.....	122
3.3.5	Layout and Example Content.....	123
3.4	Customer Debit Card Payment/Refund Receipt – Declined Transaction.....	127

COMMERCIAL IN-CONFIDENCE

3.4.1	Purpose.....	127
3.4.2	Frequency.....	127
3.4.3	Notes.....	127
3.4.4	Sequence.....	127
3.4.5	Layout and Example Content.....	128
3.5	Office Debit Card Receipt for Signature.....	135
3.5.1	Purpose.....	135
3.5.2	Frequency.....	135
3.5.3	Notes.....	135
3.5.4	Sequence.....	135
3.5.5	Layout and Example Content.....	135
4.0	RESPONSE CODES AND THEIR EFFECTS.....	141
4.1	Screens.....	141
4.1.1	Fixed screens, no response code based text.....	141
4.1.2	Soft screens, based on response code.....	141
4.2	Receipts.....	141
4.2.1	Receipt Messages by response code/outcome.....	141
4.2.2	Transaction result codes.....	142
5.0	SCREEN LAYOUTS.....	143
5.1	EMV specific counter screens.....	143
5.1.1	Screen ER1: Card Insertion (First attempt).....	143
5.1.2	Screen ER2: Multiple Cards (Payment).....	144
5.1.3	Screen ER3: PIN Locked.....	145
5.1.4	Screen ER4: Waiting for PIN (2 buttons).....	146
5.1.5	Screen ER5: Waiting for PIN (1 button).....	146
5.1.6	Screen ER6: Card cannot be read by PIN pad.....	147
5.1.7	Screen ER7 Insert Card (Second attempt).....	148
5.1.8	Screen ER8 Insert Card (Third attempt).....	149
5.1.9	Screen ER9: Remove Card from PIN pad.....	150
5.1.10	Screen ER10: Application Selection from Counter.....	151
5.1.11	Screen ER11: Signature CVM Selected.....	151
5.1.12	Screen ER12: No CVM Selected.....	151
5.1.13	Screen ER13: Cancelled - Please Wait.....	152
5.1.14	Screen ER14: PIN pad Error Screen.....	153
5.1.15	Screen ER15: Remove Card from PIN pad.....	154
5.1.16	Screen ER16: PIN Entry - PIN Re-try(2 buttons).....	155
5.1.17	Screen ER17: PIN Entry - PIN Re-try (1 button).....	155
5.1.18	Screen ER18: PIN Entry – Last Try(2 buttons).....	156
5.1.19	Screen ER19: PIN Entry – Last Try (1 button).....	156
5.1.20	Screen ER20: Partner Bank.....	157
5.1.21	Screen ER21: Card Inserted.....	158
5.1.22	Screen ER22: Declined (Payment).....	159
5.1.23	Screen ER23: Application Selected Screen.....	160
5.1.24	Screen ER24: Card Insertion Timeout.....	161
5.1.25	Screen ER25: Transaction Authorised Remove Card Screen.....	162
5.1.26	Screen ER26: Multiple Cards (Refund).....	163
5.1.27	Screen ER27: Declined (Refund).....	164
5.1.28	Screen ER28: Screen ER28: Application Selection.....	165
5.1.29	Screen 5 (EMV): Waiting for Authorisation.....	166
5.1.30	Counter Screens shared with EMV Banking.....	168
5.2	EMV Specific PIN displays.....	169
5.2.1	PIN Pad Screen ERP12a: Enter PIN.....	169
5.2.2	PIN Pad Screen ERP12b: Re-enter PIN - First Retry.....	170
5.2.3	PIN Pad Screen ERP12c: Re-enter PIN - Last Retry.....	170

COMMERCIAL IN-CONFIDENCE

5.2.4	PIN Pad Screen ERP2: PIN Blocked.....	171
5.2.5	PIN Pad Screen ERP3: Incorrect PIN - Retry.....	172
5.2.6	PIN Pad Screen ERP4: Incorrect PIN – Last Retry.....	172
5.3	PIN displays shared with EMV Banking.....	173
6.0	EMV SPECIFIC MESSAGE TEXTS.....	174
6.1	Message Collections.....	174
6.1.1	Collection: MessageDefs.....	174
6.2	PIN pad messages.....	180
6.3	Audio Cues at PIN Pad.....	181
6.4	Help Text for data selection and input.....	181
7.0	ANNEXE A.....	182
7.1	Counter Screens Shared with EMV Banking.....	182
7.1.1	Screen EB1: Proceed as Chip Card?.....	182
7.1.2	Screen EB4: Transaction cancelled by Customer.....	183
7.2	PIN Pad Screens shared with EMV Banking.....	184
7.2.1	PIN Pad Screen EBP1: Welcome Screen.....	184
7.2.2	PIN Pad Screen EBP2: Please Insert Card.....	185
7.2.3	PIN Pad Screen EBP3: Application Selection PIN pad.....	185
7.2.4	PIN Pad Screen EBP4: Card Invalid.....	186
7.2.5	PIN Pad Screen EBP5: Remove Card.....	186
7.2.6	PIN Pad Screen EBP7: Cancelled - Remove Card.....	187
7.2.7	PIN Pad Screen EBP8: Return Card?.....	188
7.2.8	PIN Pad Screen EBP9: Declined – Remove Card.....	188
7.2.9	PIN Pad Screen EBP10: Approved – Remove Card.....	188
7.2.10	PIN Pad Screen EBP11: Processing.....	189
7.2.11	PIN Pad Screen EBP12: Enter PIN.....	189
7.2.12	PIN Pad Screen EBP13: Application Selection at Counter.....	190
7.2.13	PIN Pad Screen EBP14: Remove & Re-insert Card (1).....	190
7.2.14	PIN Pad Screen EBP15: Re-insert Card (1).....	191
7.2.15	PIN Pad Screen EBP16: Remove & Re-insert Card (2).....	191
7.2.16	PIN Pad Screen EBP17: Re-insert Card (2).....	191
7.2.17	PIN Pad Screen EBP18: Remove & Hand Card to Clerk.....	192
7.2.18	PIN Pad Screen EBP19: Hand Card to Clerk.....	192
7.2.19	PIN Pad Screen EBP20: Cancelled.....	193
7.2.20	PIN Pad Screen EBP21: Processing.....	193
7.2.21	PIN Pad Screen EBP22: Application Blocked.....	194
7.2.22	PIN Pad Screen EBP23: Card Blocked.....	194
8.0	ANNEXE B.....	195
8.1	Screens for EMV Retail used from existing NBS Applications.....	195
8.1.1	Screen 3: Waiting for PIN.....	195
8.1.2	Screen 4 Card Checks.....	196
8.1.3	Screen 5: Waiting for Authorisation.....	197
8.1.4	Screen 7: Other Decline.....	198
8.1.5	Screen 9: Card Retain.....	198
8.1.6	Screen 10: Transaction Failure.....	199
8.1.7	Screen 11: Office Receipt Printing.....	200
8.1.8	Screen12: Tear off Error Message Instruction.....	200
8.1.9	Screen13: Check Signature.....	201
8.1.10	Screen 14: Printing Receipt.....	202
8.1.11	Screen 19: Cancel Message.....	203
8.1.12	Screen E1: Signature Receipt OK.....	204
8.1.13	Screen E2: Signature Check (2 nd Receipt).....	204

8.1.14	Screen E3: Signature Check (2 nd attempt).....	205
8.1.15	Screen E4: Invalid Card.....	206
8.1.16	Screen E5: Signature Checks Failure Options.....	207
8.1.17	Screen E6: Print Preview.....	208
8.1.18	Screen E7: Error Message.....	209
8.1.19	Screen E8: Error Message.....	209
8.1.20	Screen E9: Error Message.....	210
8.1.21	Screen E10: Error Message.....	210
8.1.22	Screen E11 – No Services Available.....	211
8.2	Screens for EMV Retail used from existing DCS Applications.....	212
8.2.1	Screen D1: Amount Capture.....	212
8.2.2	Screen D2: Error Message.....	213
8.2.3	Screen D5: Nothing to Settle.....	213
8.2.4	Screen D6: Error Message.....	214
9.0	ANNEXE C.....	215
9.1	PIN Pad Commands.....	215
10.0	ANNEXE D.....	217
10.1	PIN Pad error messages and Screen ER14 clerk messages.....	217
11.0	ANNEXE E.....	224
11.1	PIN Pad Timeouts.....	224

1.0 Introduction

1.1 Privacy and Confidentiality

1.1.1 Accuracy

Fujitsu Services endeavours to ensure that the information contained in this document is correct but, whilst every effort is made to ensure the accuracy of such information, it accepts no liability for any loss (however caused) sustained as a result of any error or omission in the same.

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1.2 Scope

The Post Office requirements for EMV are incorporated in BD/CDE/001 *EMV - Banking and Retail - Conceptual Design*, and the overview response from Fujitsu Services is documented in AS/DPR/009 - *Design Proposal for EMV, TDES and NBE Replacement*.

This particular document describes the User Interface Design Proposal for the Retail Payment Card application resulting from the introduction of EMV cards using Chip and PIN authentication and verification at the Post Office counter (at BI3 S70). The Debit Card counter dialogues (prior to the introduction of EMV cards) are described in *Debit Card: Counter Dialogue – Activity and Screen Flows (NB/SPE/013)*. This document describes the changes to the flow of activities, screen displays and prompts, and receipt layouts at the counter described in the above document as a result of the introduction of EMV cards. It will refer back to the above document for the flows, screens and prompts of both magnetic card swiped operations and manual entry of card details that do not change as a result of the introduction of EMV.

The primary purpose of the flow charts in this document is to define the User Interface, and in particular, to define the sequence of screens displayed. They are not intended to be definitive statements of the low-level design of the counter application.

The screens in this document are only for the purpose of understanding the information content on the screens, and do not constitute a statement of low-level design.

The document describes only the screens seen during typical business transactions, including error cases that can arise in normal processing. There are, however, additional diagnostic screens that are not described within this document. These screens are only displayed in exceptional cases, e.g. software, reference data configuration or exceptional hardware errors. Such screens are beyond the scope of this document.

1.3 Structure of this document

This document is structured as follows:

Section 2 provides the list of unique counter dialogues that are supported for EMV cards (BI3 S70) and describes the changes arising as a result of the introduction of EMV. For each dialogue, there is a top level flow chart, which references further common sequences as necessary.

Section 3 provides the layout of the Office and Customer receipts for those receipts that have changed as a result of EMV functionality.

Section 4 is a table mapping the response codes returned to the counter in the [A] into system actions with associated Clerk messages, receipt text and outgoing result code within the [C] message.

Section 5 lists the unique screens that are supported for EMV, and defines the type of data that appears on each screen.

Section 6 contains details of new messages/receipt text and help text.

Annexe A contains those screens that are shared between EMV Retail and EMV Banking and found originally in *EMV Banking – User Interface Design Proposal [NB/PRP/004]*

Annexe B contains those screens that are not affected by the introduction of EMV Retail and found originally in either *Debit Card: Counter Dialogue – Activity and Screen Flows (NB/SPE/013)* or *Network Banking: Counter Dialogue - Activity & Screen Flows [NB/SPE/003]*.

1.4 Overview of EMV functionality

In line with the rest of the payments service industry Post Office Limited will be migrating to the acceptance of EMV cards using Chip and PIN authentication for added security and reduction of fraud. The counter service is therefore being enhanced to support Chip and PIN authentication and verification. Existing services based on magnetic stripe card will be continued for as long as there is a client demand.

For EMV transactions, the customer retains control over the card and interacts with the existing PIN pad and integral smartcard device on the customer side of the counter. The clerk is able to offer support to the customer, where required, through a series of prompts by the system to the clerk indicating the sequence of operations to be followed and the current status of the transaction.

EMV transactions will normally be supported by a CVM (Cardholder Verification Method) of PIN entry but additional verification methods of Signature and No CVM will also be supported. CVMs of Signature and No CVM may be offered when the PIN is locked on the card. Some cards for disabled people may be set up with no support for PIN entry but will instead use Signature CVM as the main verification method.

For magnetic stripe based transactions, including EMV cards operating in fallback mode, the transaction is conducted by the clerk using the magnetic stripe reader on the clerk side of the counter.

The counter provides receipt printing capability using industry standard counter printer devices.

1.5 Application Selection

In an application selection scenario, where the customer's card contains multiple applications and some of those applications are also supported by PED reference data then the PIN pad will assemble a candidate list of mutually supported applications. The list may be in priority order or in the order in which the applications are listed on the card. The candidate list will be the intersection of the two sets of application identifiers, one from the PIN Pad and the other from the card.

If the card is set up to make the selection on a priority basis then the highest priority application will be selected.

If the card is not set up to make a selection on priority basis then as the Hypercom terminal supports cardholder selection of application, the PIN pad will present the candidate list to the customer.

When the customer has made their choice, that choice will be the application used for the transaction. In a situation where the PIN pad detects that the chosen application is unusable then a new candidate list will be assembled minus the unusable application and the new list will be presented to the customer for selection. This process may continue until a successful candidate has been chosen or until the list is exhausted. If no application is successfully selected then this is a recognised fallback situation and MSR will be allowed for this card. Application selection will be performed by the PIN pad as per EMV book 1.

An option to allow clerk selection of application will be provided for customers with a disability. This facility is totally within the control of the customer and selection will be performed by agreement with the customer.

2.0 EMV User Interface

The transaction flows in this section show the points at which screens are displayed to the Clerk. These screens are used to inform and prompt the Clerk at appropriate steps in the process of each transaction. The flow charts cover both Settlement mode (payment) and Reversal mode (refund) transactions.

2.1 Overview Description

2.1.1 EMV Transaction Stages

EMV Transactions have two main stages:

1. Transaction Start & Token Validation
2. Transaction Service, Customer Verification, Receipt Printing and Transaction Completion

2.1.2 Stage 1

The normal start point for an EMV transaction is where the Clerk selects the appropriate menu button from the settlement menu while the customer inserts the EMV card in the PIN pad. However, if the card is swiped instead, and the service code in the Track 2 data indicates that the card has an ICC, then the clerk will be given a warning that the card should be used in

the PIN pad: the clerk will then remove the card from the magnetic swipe reader and hand it back to the customer to insert in the PIN pad.

If the EMV card cannot be read in the PIN pad the customer will be asked to retry as it may have been inserted incorrectly. If it still fails or if there are no usable ICC applications on the card then the clerk may fall back to swipe the card in the magnetic stripe reader.¹

The description of data capture through magnetic stripe and manual PAN entry are the same as described in *Debit Card: Counter Dialogue – Activity and Screen Flows NB/SPE/013*.

2.1.3 Stage 2

The activity and screen flows in this stage show the customer verification and transaction service for EMV Cards.

2.1.4 DC EMV Screen Flows

The numbering convention for screens in this document is as follows:

Dx: Debit Card screen from NB/SPE/013 that is not affected by introduction of EMV

Ex: Error message screen from NB/SPE/013 that is not affected by introduction of EMV

Px: PIN pad screen from NB/SPE/003 that is not affected by introduction of EMV

ERx: A new Retail Payment Card Counter screen

ERPx: A new PIN pad screen for EMV Retail

EBx: A counter screen used for EMV Banking (from NB/PRP/004) shared with EMV Retail

EBPx: A PIN pad screen used for EMV Banking (from NB/PRP/004) shared with EMV Retail

Where 'x' is an integer that uniquely identifies each screen

2.1.5 Inclusion of PIN pad Displays in the Screen Flows

The flowcharts within this document only contain references to the primary PIN Pad screens that are displayed to the customer during the EMV transaction flows. There are further additional points within the flows where the PIN pad may display additional information screens, such as *EBP11 Processing Please Wait* which is displayed whilst the PIN pad is busy or waiting for a response from the Counter software. It is not within the scope of these flow charts to document every potential sequence where the PIN Pad can display one of these screens.

¹ **Network Banking / Reference Data Rules and Values** [NB/SPE/009] will be updated to include two new permitted methods of entry for "PIN pad read" and "Mag swipe fallback for ICC card."

2.1.6 Conventions used within the flowcharts

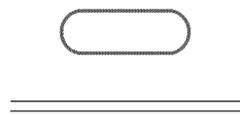
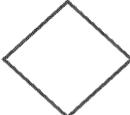
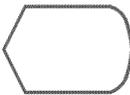
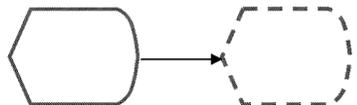
Customer Activity	PIN pad Activity	Description
		Terminator Indicates the start or completion of a process flow
		Off page Connector Represents an entry to or exit from one part of the flowchart to another on a different page.
		On page Connector Represents an entry to or exit from one part of the flowchart to another on the same page. A single letter denotes the corresponding end of the connecting flow.
		Process Represents a processing function
		Decision Represents a decision or switching function in a flowchart. This may represent either a system or manual decision.
		Display Represents displayed data such as data display panels and prompts on a monitor screen
		Manual Operation Represents an operation performed by any person in a flowchart.
		Document Represents readable data such as printed output. Where it is a print the standard options around print failure come into play and as a last resort, print preview will be used to allow a manual transcription of the print.
		Manual Input Represents manually input data.
		Parallel Screens A counter screen followed by a PIN pad screen usually indicates a parallel screen.

Figure 1: Flow chart conventions used in this document

2.2 Stage 1: EMV Transaction Start & Off-line Checks

Pre conditions

1. The system must be displaying a Settlement menu in Serve Customer Mode or in Existing or New Reversal Modes. There cannot be any other transaction in progress²
2. The Token has an Integrated Circuit Chip meeting EMV standards

Post conditions

1. Transaction progresses to Stage 2, or
2. Transaction cancelled.

Description

The system validates the EMV token that is placed on the integrated smartcard reader on the PIN pad by the customer and progresses to Stage 2. If the ICC card is not read, the clerk may opt to read the card using the MSR.

² The current customer session may be a swapped session.

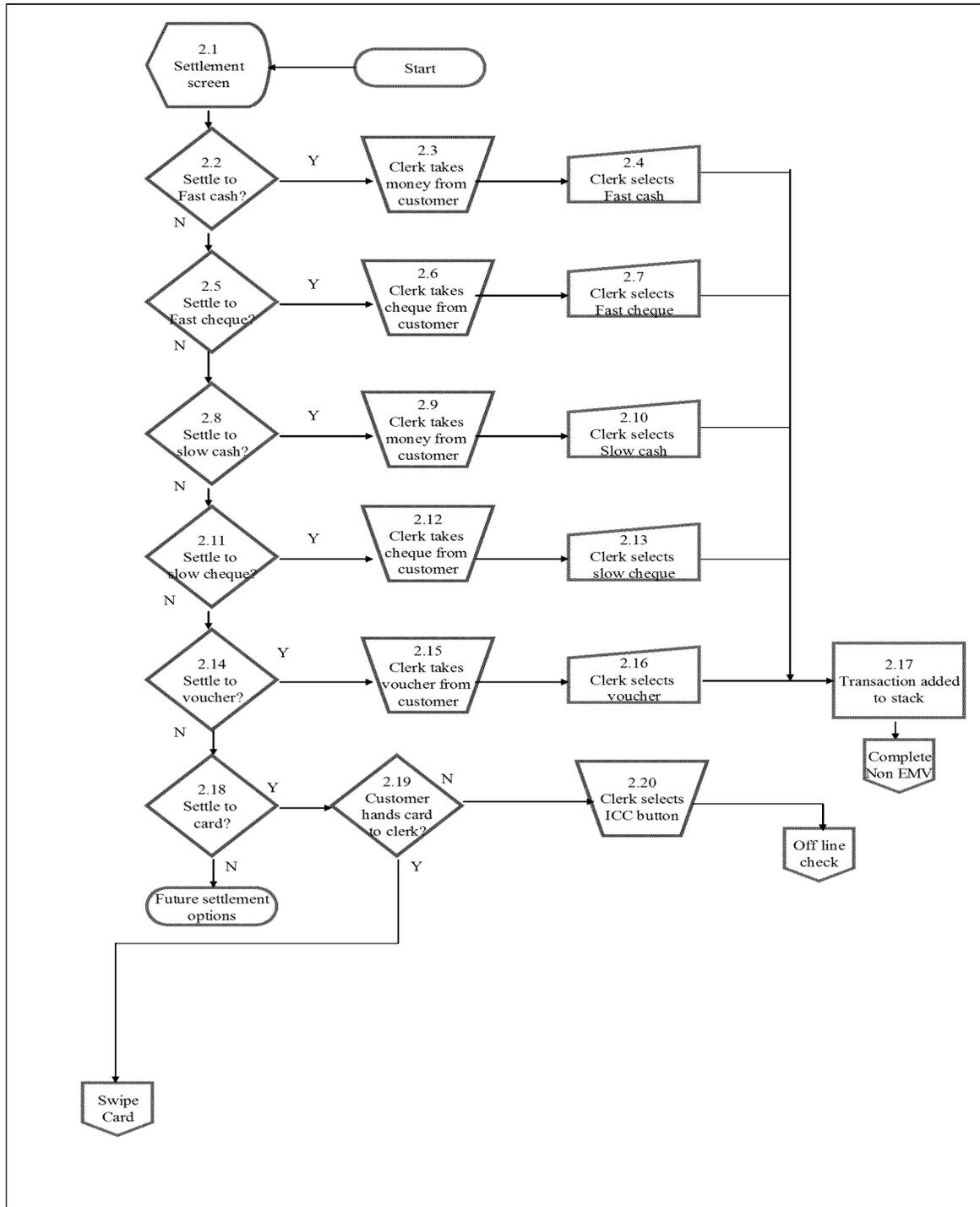


Figure 2: Activity Flows for EMV Retail – Transaction Start

Notes on Figure 2

- 2.1 Clerk navigates to settlement screen.
- 2.2 Clerk decides to settle to Fast Cash.
- 2.3 Clerk takes money from (or gives money to) customer.
- 2.4 Clerk selects Fast Cash.
Transaction ends and system continues from 2.17.
- 2.5 Clerk decides to settle to Fast Cheque.
- 2.6 Clerk takes cheque from customer.
- 2.7 Clerk selects Fast Cheque.
Transaction ends and system continues from 2.17.
- 2.8 Clerk decides to settle to “slow” Cash.
- 2.9 Clerk takes money from or gives money to customer.
- 2.10 Clerk selects “slow” Cash and enters amount.
Processing continues from 2.17.
- 2.11 Clerk decides to settle to slow Cheque.
- 2.12 Clerk takes cheques from customer.
- 2.13 Clerk selects slow Cheque and enters amount.
Processing continues from 2.17.
- 2.14 Clerk decides to settle to voucher.
- 2.15 Clerk takes voucher from customer.
- 2.16 Clerk selects voucher and enters amount.
- 2.17 Transaction is added to stack and system continues from Figure 18 - *Complete Non EMV Transaction*.
- 2.18 Clerk decides to settle by card.
- 2.19 If customer hands card to clerk he swipes it in the magnetic stripe reader and processing continues from Figure 3 - *Swipe Card*.
- 2.20 Otherwise, clerk selects the ICC button on the settlement screen. This effectively launches the EMV transaction.

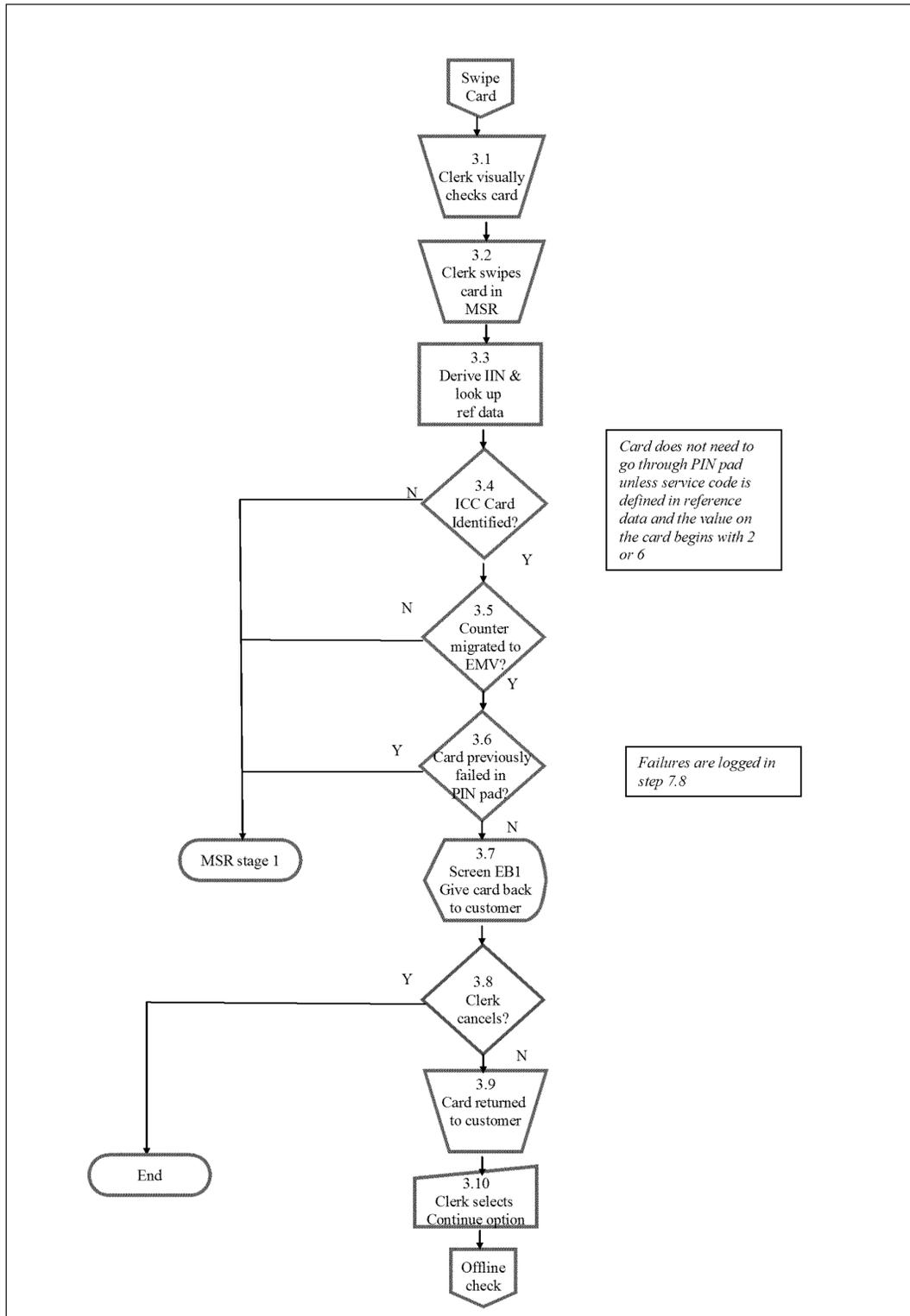


Figure 3: Activity Flows for EMV Retail – Swipe Card

Notes for Figure 3

- 3.1 The Clerk inspects card and may hand back to customer if it is deemed to be a chip card.
- 3.2 The Clerk swipes card in the Magnetic stripe reader.
- 3.3 The Counter derives the IIN from the magnetic stripe and using reference data determines the Service Code from the Track 2 data.
- 3.4 If reference data indicates a Service Code in the track 2 data and the Service Code begins with 2 or 6 then the card is an ICC card and processing continues from 3.5. Otherwise, the processing continues as for existing debit card processing as defined in NB/SPE/013 Debit Card Counter Dialogues – Activity & Screen Flows. Method of Entry will be recorded as 2 in this case (Non ICC Magnetic Stripe Read).
- 3.5 If EMV retail functionality is enabled at the Counter then the card must be handed back to the customer and used in the PIN pad card reader. Such transactions unless a failure in the PIN pad occurs will be treated as Method of Entry 4 (Integrated chip card in chip read mode). Otherwise, the processing continues as for existing DCS processing as defined in NB/SPE/013 Debit Card: Counter Dialogues – Activity & Screen Flows. Method of Entry would be set in this case to 3 (Integrated chip card in magnetic stripe fallback mode).
- 3.6 If the PIN pad has previously failed to read the card during the same transaction then again the system will allow it to be treated as a magnetic stripe card. Method of Entry will be recorded as 3 in this case (Integrated chip card in magnetic stripe fallback mode). This could be caused by chip damage or because the customer has not been able to insert the card correctly in the PIN pad.
- Note: if the PIN pad has failed to read the card then the system will allow it to be treated as a MSR card. If the clerk goes on to swipe a card then if the SVC is 2 or 6 the MOE will be 3. However, if the SVC of the card which is swiped is not 2 or 6 then the MOE will be 2.*
- 3.7 Otherwise, the counter displays screen EB1 (see 7.1.1) asking the clerk to launch the card as a chip card or to cancel.
- 3.8 If the clerk decides to cancel, then the transaction ends and system returns to the settlement menu.
- 3.9 The card is returned to the customer to insert in the PIN pad.
{Transactions which are successfully processed by the PIN pad will be recorded with Method of Entry set to 4 (Integrated chip card in chip read mode)}.
- 3.10 If the clerk pushes the Continue button on the EB1 screen, this launches the EMV transaction. The effect is equivalent to pressing the ICC_Settlement button on the settlement menu.
- Processing continues from Figure 4: *Off line check.*

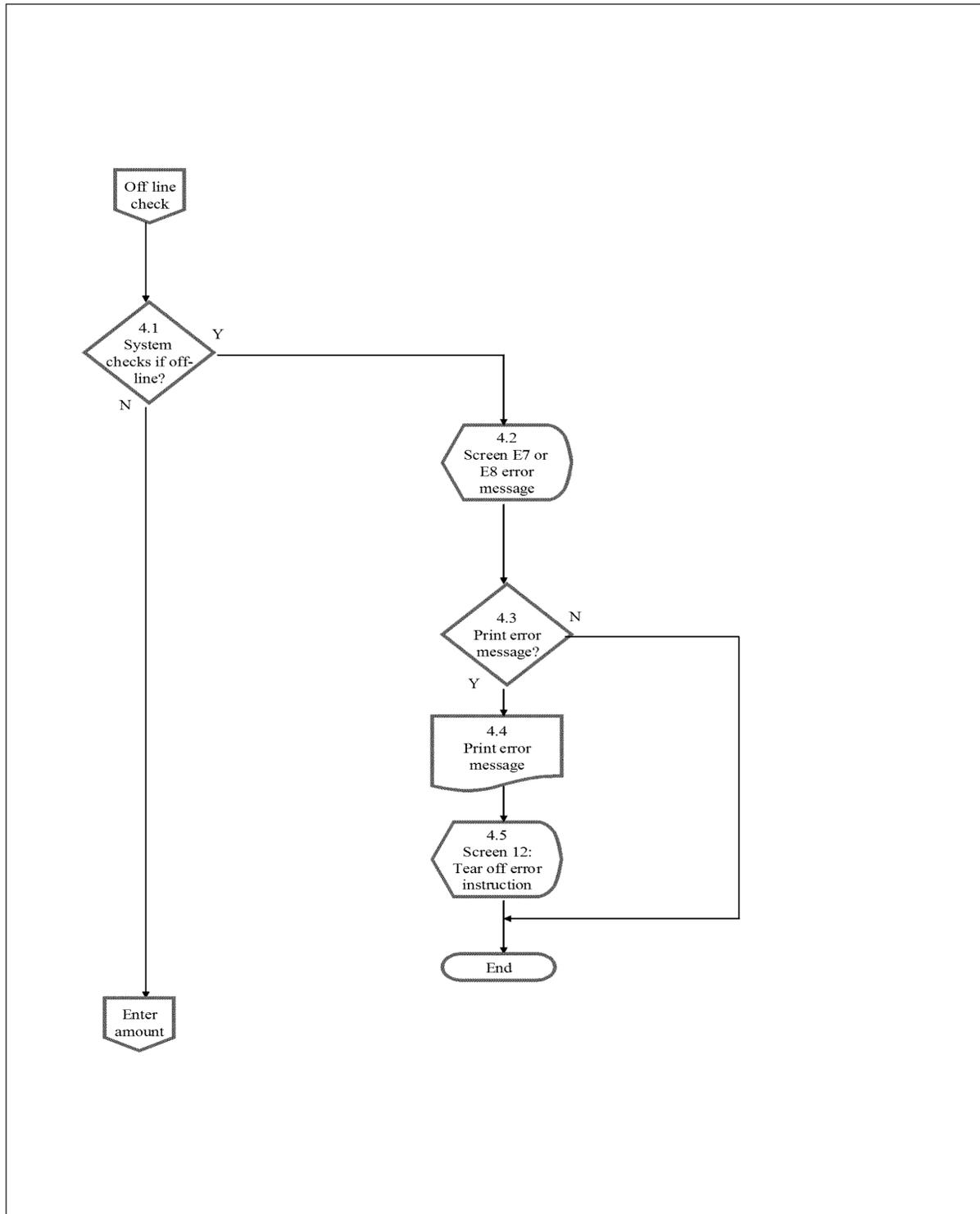


Figure 4: Activity Flows for EMV Retail – Offline Checks

Notes for Figure 4

- 4.1 System checks whether it is still on line to the data centre.
If the system is off line, processing continues from 4.2.
Otherwise, processing continues at Figure 5 - *Enter Amount*.
- 4.2 The system is off line so the counter displays screen E7 (see 8.1.18) or screen E8 (8.1.19), as appropriate. Both screens have options to continue or to print an error report.
- 4.3 If the clerk continues without an error report then the counter returns to the Settlement Menu.
- 4.4 If the clerk selects the print option an error report is printed.
- 4.5 The counter displays screen 12 *Tear Off Error Message Instruction* (see 8.1.8) asking the clerk to tear off the report.
The clerk acknowledges the instruction. The counter returns to the Settlement Menu.

2.3 Stage 2: EMV Card Payment/Refund

This section covers the main activities for a Card Payment or Refund. Note there is no operational difference between these 2 transactions. Whether any particular transaction operates as a Payment or a Refund is determined by the current transaction mode. For a transaction to operate as a Refund the counter must be in either New Reversal or Existing Reversal mode.

Pre conditions

1. System is on-line
2. Transaction proceeds as chip card

Post conditions

1. The transaction is added to the EPOSS stack, or
2. The transaction is cancelled.

Description

The Clerk enters the transaction amount, the customer enters a PIN and the customer verification and transaction are authorised on-line.

Please note that if the Card has been removed, then even if the MA has issued an approval for the transaction, the PIN pad will be unable to return a TC, and the transaction fails.

2.3.1 Amount Capture

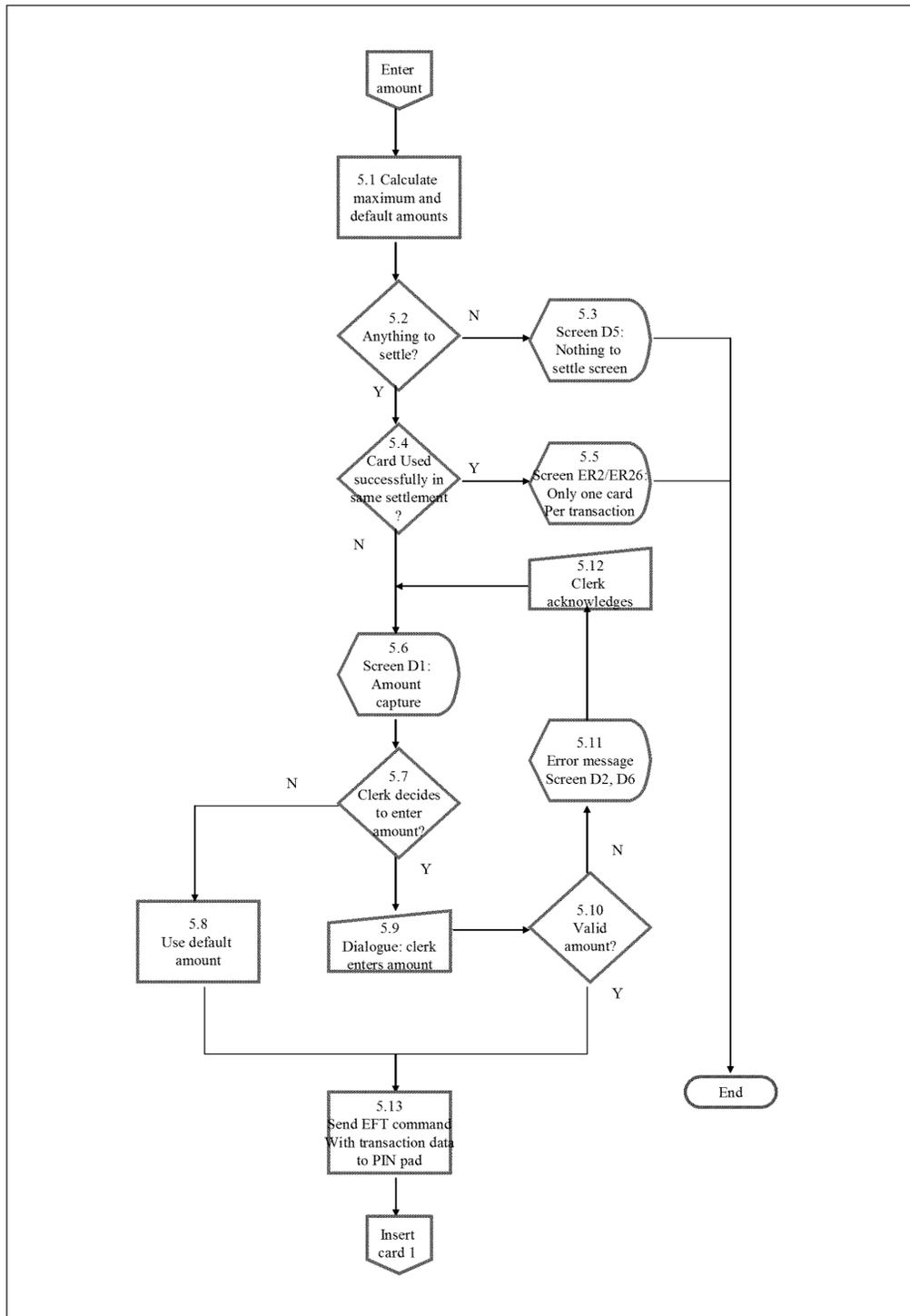


Figure 5: Activity Flows for EMV Retail – Amount Capture

Notes for Figure 5

- 5.1 System calculates minimum, maximum and default amounts: (in some instances the customer will be allowed to pay more than the settlement value remaining on the stack: for example, if during the session he has withdrawn money with a banking transaction and has purchased some other items).
- 5.2 If there is something to settle processing goes to 5.4.
- 5.3 Otherwise, counter displays screen D5: *Nothing to Settle* (see 8.2.3).
The clerk acknowledges.
Processing returns to the Settlement Menu.
- 5.4 Counter checks whether any retail card transaction (i.e. ICC, magnetic swipe, or PKE) has been successfully used for settlement in the same customer session: (this also prevents the same card being used twice in the same session).
If no other card has been used processing continues from 5.6.
- 5.5 Otherwise, for a payment transaction counter displays screen ER2 *Multiple Cards – Payment* (see 5.1.2), or for a refund transaction screen ER26 *Multiple Cards – Refund* (see 5.1.26).
The clerk acknowledges. Processing returns to the Settlement Menu.
- 5.6 Counter displays screen D1 *Amount Capture* (see 8.2.1).
This contains a default amount but can be overwritten by the clerk.
- 5.7 If clerk overwrites the default amount processing goes to 5.9.
- 5.8 Otherwise, the default amount is used and processing goes to 5.13.
- 5.9 Clerk enters the amount.
- 5.10 System checks the entered value.
If the amount is valid it is accepted and processing continues from 5.13.
- 5.11 If amount is invalid the counter displays one of the following:
- screen D2 – amount entered is too much (see 8.2.2)
 - screen D6 – amount entered must exceed zero (see 8.2.4)
- 5.12 Clerk acknowledges the message and processing returns to 5.6.
- 5.13 Counter provides amount and transaction type to PIN pad (in the EFT message) and this launches the PIN pad retail application.
Processing continues from Figure 6a: *Insert Card (1)*.

2.3.2 Card Insertion

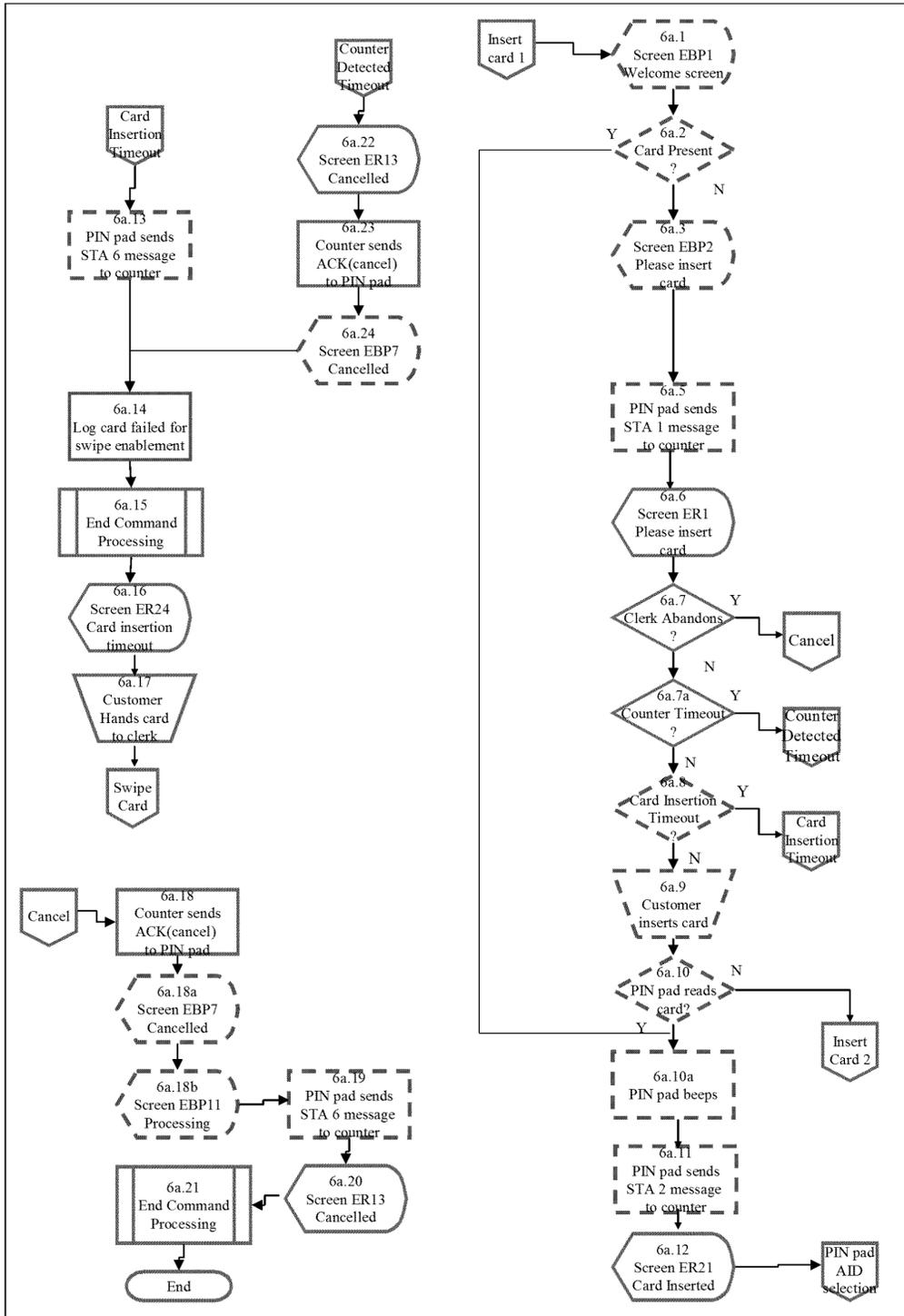


Figure 6a: Activity Flows for EMV Retail – Insert Card (1)

Notes for Figure 6a

- 6a.1 When the PIN pad is idle a blank screen is displayed.
- 6a.2 The PIN pad is triggered into life either by the clerk pushing the ICC button on the settlement screen or by pressing **Continue** on the EB1 screen (see 7.1.1): both of these actions cause an EFT message to be sent from the counter to the PIN pad to launch the transaction.
- The PIN pad tests whether a card is present.
- If the card is present processing goes to 6a.10a.
- 6a.3 PIN pad displays screen EBP2 *Please Insert Card* (see 7.2.2).
- 6a.4 Step deleted³.
- 6a.5 The PIN pad sends a STA 1 message to the counter to indicate that the customer's card needs to be inserted in the PIN pad.
- 6a.6 The counter displays screen ER1 *Card Insertion* (see 5.1.1). This screen has a cancel button which may be used to abort the transaction. If it is not used then the ER1 screen remains there until card is inserted into PIN pad or a card insertion timeout occurs.
- 6a.7 If clerk cancels processing goes to Figure 6a: *Cancel*.
- 6a.7a If the counter detects that card insertion has exceeded timeout, processing continues from 6a.22. (This test was introduced as a workaround for an error on the PIN pad).
- 6a.8 If card insertion times out then processing continues at Figure 6a: *Card Insertion Timeout*.
- 6a.9 The customer inserts the card into the PIN pad – first attempt
- 6a.10 If the PIN pad can read the card then processing continues from 6a.10a.. Otherwise, processing continues at Figure 6b: *Insert Card (2)*.
- 6a.10a The PIN pad beeps once to indicate that the expected card has been correctly inserted.
- 6a.11 When the card is inserted into the PIN pad, the PIN pad sends an STA 2 message to the counter to indicate that the card has been successfully inserted. The PIN pad beeps once to show that the card has been read successfully.
- 6a.12 The counter displays screen ER21 *Card Inserted* (see 5.1.21). Processing continues at Figure 8: *PIN pad AID selection*.
- 6a.13 The PIN pad sends an STA 6 command to the counter indicating a cancel at the PIN Pad.
- 6a.14 Set a flag to show that an attempt to use the card in the chip reader was made, so that a subsequent swipe operation will be allowed.
- 6a.15 The process Figure 22: *End Command Processing* is performed.
- 6a.16 The counter displays the card insertion timeout screen ER24 (see 5.1.24).
- 6a.17 The customer hands the card to the clerk for the swiping. Processing continues at Figure 3 – *Swipe Card*.

³ Step 6a.4 PIN pad beeps now moved to 6a.10a.

- 6a.18 The counter sends an ACK(cancel) command to the PIN pad aborting the transaction.
- 6a.18a The PIN pad displays screen EBP7 *Cancelled Please Remove Card* (see 7.2.6).
- 6a.18b The PIN Pad displays screen EBP11 *Processing Please Wait* (see 7.2.12).
- 6a.19 The PIN pad sends an STA 6 command to the counter indicating a cancel from card removal.
- 6a.20 The counter displays screen ER13 *Transaction has been cancelled* (see 5.1.13).
- 6a.21 The process Figure 22: *End Command Processing* is performed. The counter returns to the Settlement Menu.
- 6a.22 The counter displays screen ER13 *Transaction has been cancelled* (see 5.1.13).
- 6a.23 The counter sends an ACK (cancel) message to the PIN pad.
- 6a.24 The PIN pad displays screen EBP7 *Cancelled Please Remove Card* (see 7.2.6).
Processing continues from 6a.14.

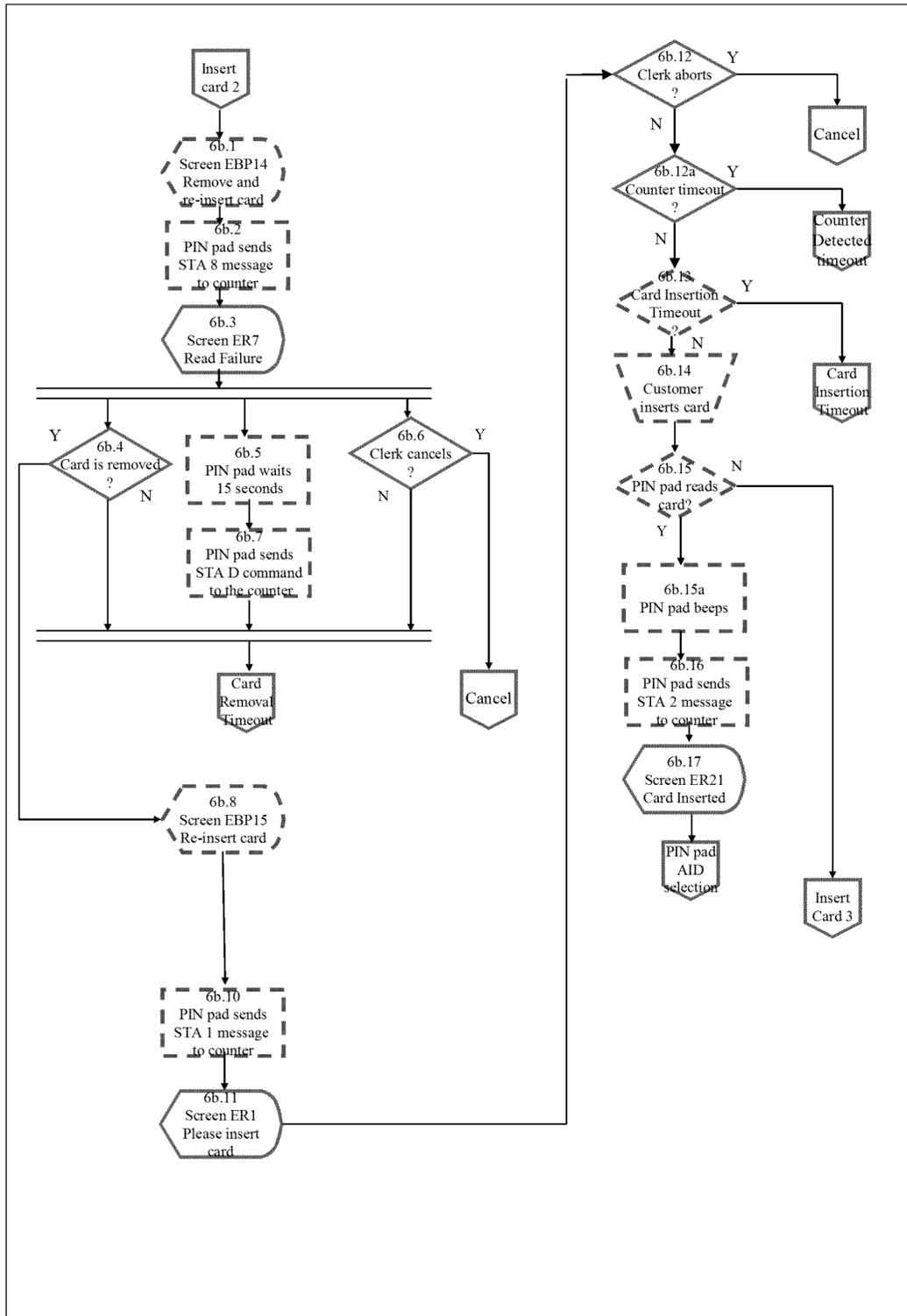


Figure 6b: Activity Flows for EMV Retail – Insert Card (2)

Notes for Figure 6b

- 6b.1 PIN pad displays screen EBP14 *Remove & Re-insert card* - first failure (see 7.2.13). PIN pad beeps for a configurable period (15 seconds) or until card is removed or the transaction aborted.
- 6b.2 The PIN pad sends a STA 8 message to the counter to indicate that the card needs to be removed and re-inserted in the PIN pad with the correct orientation.
- 6b.3 The counter displays screen ER7 informing the clerk that the customer is having problems inserting their card with the correct orientation.
- 6b.4 If the card is removed then processing continues at 6b.8.
- 6b.5 The PIN Pad waits for a configurable period (15 seconds) before displaying the next screen and sending an STA D command. During this time it beeps.
- 6b.6 If the clerk presses the cancel button on the ER7 screen then processing continues at Figure 6a: *Cancel*.
- 6b.7 The PIN pad sends an STA D command to the counter signalling card removal timeout. Processing continues at Figure 7: *Card Removal Timeout*.
- 6b.8 PIN pad displays screen EBP15 *Re-insert card* (see 7.2.14).
- 6b.9 Step deleted⁴.
- 6b.10 The PIN pad sends a STA 1 command to the counter to indicate that the card needs to be inserted in the PIN pad.
- 6b.11 Counter displays screen ER1 *Card Insertion* (see 5.1.1).
Steps 6b.10, 6b.11, 6b.12 and 6b.13 may not actually occur. If the customer is quick about re-inserting their card then the PIN pad may not send the STA 1 message and the counter will correspondingly not display the ER1 screen.
- 6b.12 If clerk presses the Cancel button then processing continues at Figure 6a: *Cancel*.
- 6b.12a If the counter detects that card insertion has exceeded timeout, processing continues from Figure 6a: *Counter Detected Timeout*. (This test was introduced as a workaround for an error on the PIN pad).
- 6b.13 If card insertion times out then processing continues at Figure 6a: *Card Insertion Timeout*.
- 6b.14 The customer inserts the card into the PIN pad – second attempt.
- 6b.15 If the PIN pad fails to read the card then processing continues at Figure 6c: *Insert Card (3)*.
- 6b.15a The PIN Pad beeps once to indicate that the expected card has been correctly inserted.
- 6b.16 When a card is inserted into the PIN pad and is successfully read then the PIN pad sends an STA 2 command to the counter to indicate that the card has been successfully inserted.
- 6b.17 The counter displays screen ER21 *Card Inserted* (see 5.1.21). Processing continues at Figure 8: *PIN pad AID selection*.

⁴ Step 6b.9 PIN pad beeps now moved to 6b.15a.

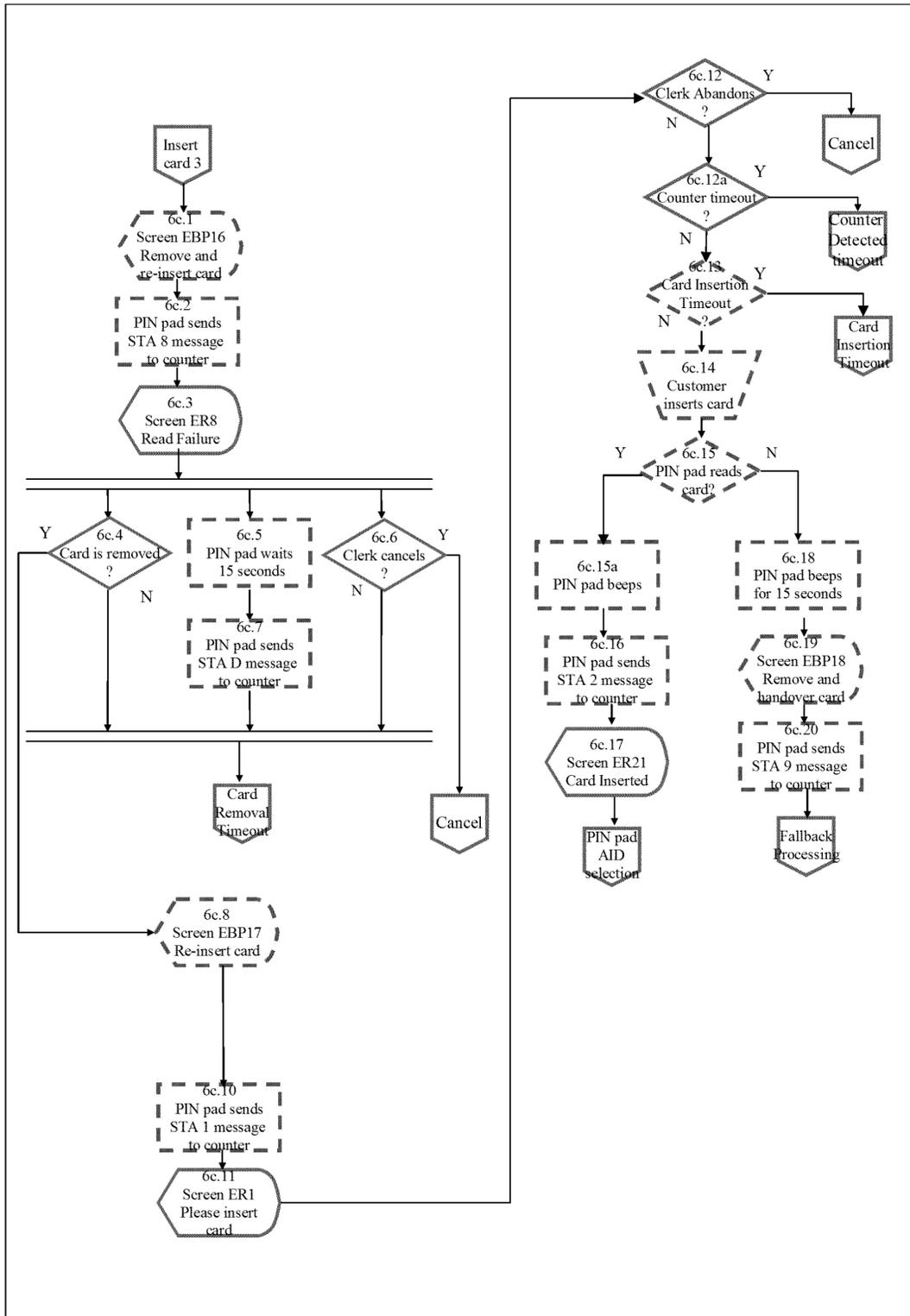


Figure 6c: Activity Flows for EMV Retail – Insert Card (3)

Notes for Figure 6c

- 6c.1 The PIN pad displays screen EBP16 *Remove & Re-insert card* (see 7.2.15) - second failure). The PIN pad beeps for a configurable period (15 seconds) or until the card is removed or the transaction is aborted.
- 6c.2 The PIN pad sends an STA 8 message to the counter to indicate that the card needs to be removed and re-inserted in the PIN pad with the correct orientation.
- 6c.3 The counter displays screen ER8 (see 5.1.8) informing the clerk that the customer is still having problems inserting their with the correct orientation.
- 6c.4 If the card is removed then processing continues at 6c.8.
- 6c.5 The PIN Pad waits for a configurable period (15 seconds) before displaying the next screen and sending an STA D command. During this time it beeps.
- 6c.6 If the clerk presses the cancel button on the ER8 screen then processing continues at 6c.8.
- 6c.7 The PIN pad sends an STA D command to the counter signalling card removal timeout. Processing continues at Figure 7: *Card Removal Timeout*.
- 6c.8 PIN pad displays screen EBP17 *Re-insert card* (see 7.2.16).
- 6c.9 Step deleted⁵.
- 6c.10 The PIN pad sends an STA 1 command to the counter to indicate that the customer's card needs to be inserted into the PIN pad.
- 6c.11 The counter displays screen ER1 *Card Insertion* (see 5.1.1).
Steps 6c.10, 6c.11, 6c.12 and 6c.13 may not actually occur. If the customer is quick about re-inserting their card then the PIN pad may not send the STA 1 command and the counter will correspondingly not display the ER1 screen.
- 6c.12 If clerk presses the cancel button on screen ER1 then processing continues at Figure 6a: *Cancel*.
- 6c.12a If the counter detects that card insertion has exceeded timeout, processing continues from Figure 6a: *Counter Detected Timeout*. (This test was introduced as a workaround for an error on the PIN pad).
- 6c.13 If card insertion times out then processing continues at Figure 6a: *Card Insertion Timeout*.
- 6c.14 The customer inserts the card into the PIN pad – third attempt.
- 6c.15 If the PIN pad fails to read the card processing continues from 6c.18.
- 6c.15a The PIN Pad beeps once to indicate that the expected card has been correctly inserted.
- 6c.16 When the card is inserted into the PIN pad and successfully read then the PIN pad sends an STA 2 command to the counter to indicate that the card has been successfully inserted.

⁵ Step 6c.9 PIN pad beeps now moved to 6c.15a.

Fujitsu Services

EMV Retail: User Interface Design Proposal

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- 6c.17 The counter displays screen ER21 *Card Inserted* (see 5.1.21). Processing continues at Figure 8: *PIN pad AID selection*.
- 6c.18 PIN pad beeps for a configurable period (15 seconds) – card removal beeps.
- 6c.19 PIN pad displays screen EBP18 *Remove and handover card* (see 7.2.17 - third failure).
- 6c.20 The PIN pad sends an STA 9 command to the counter signalling that fallback to swipe and signature processing is allowed.

Processing continues from Figure 7: *Fallback Processing*. Method of Entry would be set in this case to 3 (Integrated chip card in magnetic stripe fallback mode).

2.3.3 Fallback Processing

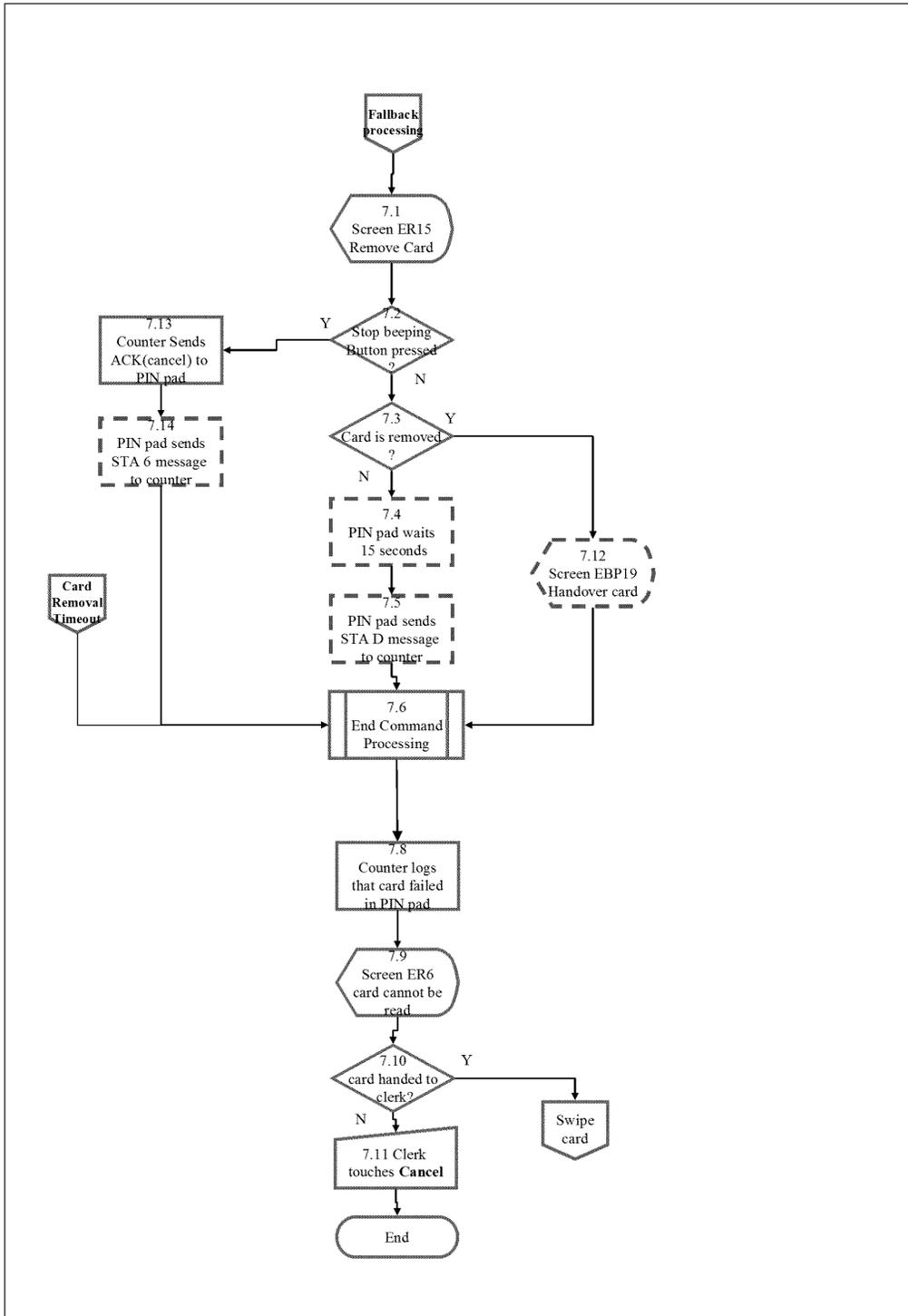


Figure7: Activity Flows for EMV Retail – Fallback Processing

Notes for Figure 7

- 7.1 Counter displays screen ER15: *Remove the card and hand it to the clerk* (see 5.1.15).
- 7.2 If the clerk presses the OK button to stop the PIN pad from beeping then processing continues from 7.13.
- 7.3 If the card is removed from the PIN Pad then processing continues at 7.12.
- 7.4 The counter waits for a configurable period (15 seconds) whilst the PIN pad beeps. After the timer expires then the PIN Pad stops beeping and will return an STA D command to the counter.
- 7.5 The PIN pad sends a STA D command to the counter to indicate card removal timeout.
- 7.6 The process Figure 22: *End Command Processing* is performed.
- 7.7 Step deleted.⁶
- 7.8 The Counter sets a flag to indicate that the card failed in the PIN pad: this is so that the card swipe flow passes the test in step 3.6.
- 7.9 Counter displays screen ER6 *Card cannot be read by PIN pad* (see 5.1.6).
- 7.10 If the customer gives the card to the clerk then the processing continues at Figure 3: *Swipe Card*.
- 7.11 The clerk touches **Cancel** on the ER6 screen. The counter returns to the Settlement Menu.
- 7.12 The PIN pad displays screen EBP19 *Hand Card to Clerk* (see 7.2.18). Processing continues from 7.6.
- 7.13 The counter sends an ACK(cancel) to the PIN pad to cause the PIN pad to stop the beeping.
- 7.14 The PIN pad sends a STA 6 message to the counter to indicate clerk cancel of card removal beeping. Processing continues from 7.6.

⁶ The PIN pad displays the welcome screen in Figure 22: *End Command Processing*.

2.3.4 Application Selection

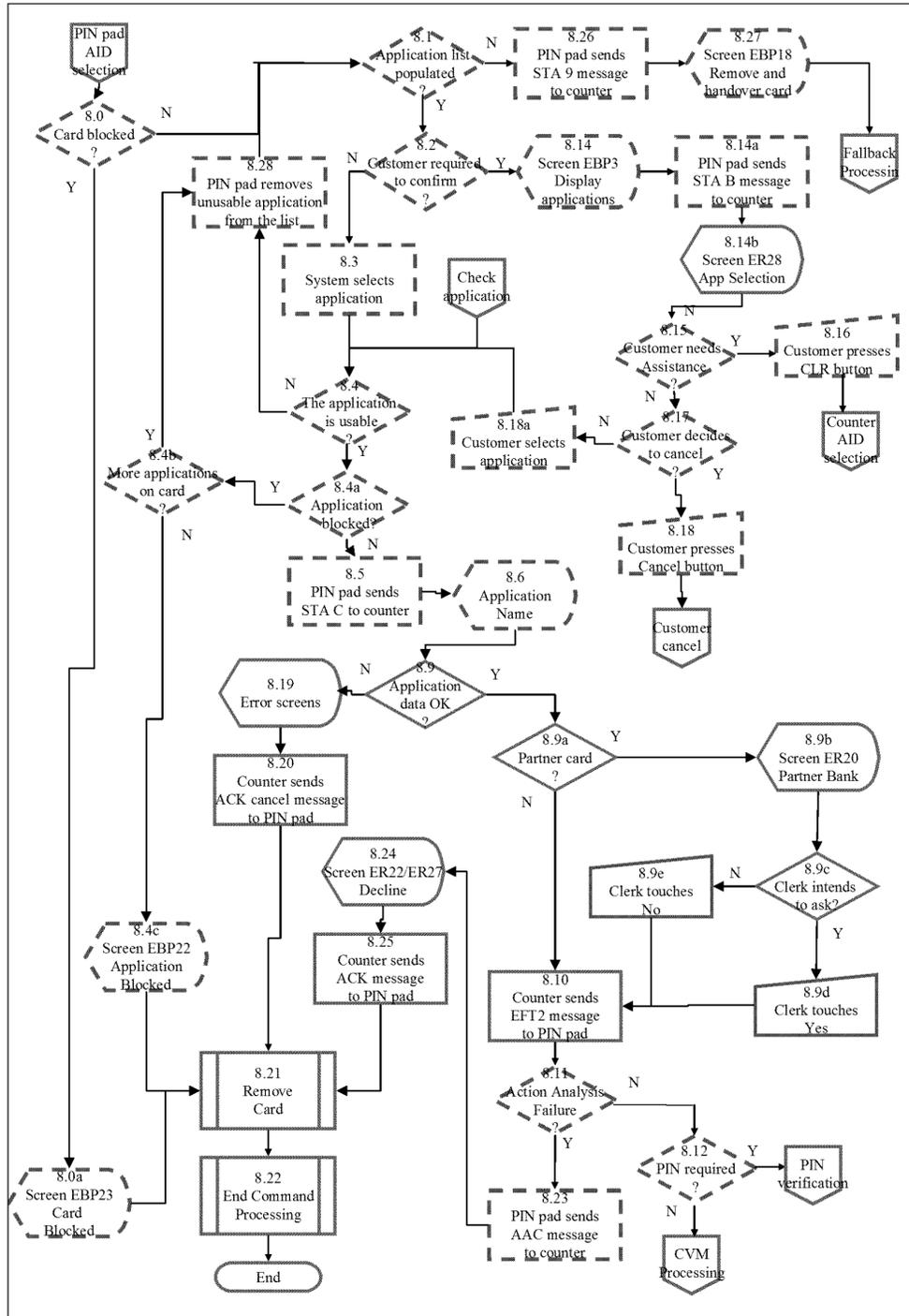


Figure 8: Activity Flows for EMV Retail – PIN pad AID Selection

Notes for Figure 8

- 8.0 The PIN pad checks whether the card is blocked and if it is, processing continues from 8.0a: otherwise, processing continues from 8.1.
- 8.0a The PIN pad displays screen ERP23 – *Card Blocked* (see 7.2.22). (An error code of 08018 is returned with the STA 7 message in step 8.21).
Processing continues from 8.21.
- 8.1 If the EMV card contains no AIDs which can be matched with those in the PIN data then (the transaction may fallback to MSR) and processing continues from 8.26.
- 8.2 If the cardholder is required by ICC settings to confirm the application to be used processing continues at 8.14: (typically this happens when the customer needs to make a selection from a list of retail applications which are on the card, but it can also happen if the card contains a single retail application that needs to be confirmed by the customer).
- 8.3 The PIN pad automatically selects the application.
- 8.4 If the selected application is found by the PIN pad to be unusable possibly as a result of the PAN not being supported by POL reference data then processing continues at 8.28.
- 8.4a The PIN pad checks whether the application is blocked and if it is, processing continues from 8.4b: otherwise, processing continues from 8.5.
- 8.4b The PIN pad checks whether there are further applications on the card to be considered and if there are, processing continues from 8.28.
- 8.4c Otherwise, the PIN pad displays screen ERP22 – *Application Blocked* (see 7.2.21). (An error code of 08057 is returned with the STA 7 message in step 8.21).
Processing continues from 8.21.
- 8.5 The PIN pad sends a STA C command to the counter containing the selected application label.
- 8.6 PIN pad displays the selected application label.
- 8.7 Step deleted⁷.
- 8.8 Step deleted.
- 8.9 The counter checks the card data –and if there is an error processing continues from 8.19.
(There is no check on effective date or expiry date and the request is still sent to the Merchant Acquirer even if the application seems to be out of date).
- 8.9a The counter checks whether the card is a Partner card and if it is processing continues from 8.9b. Otherwise, processing continues from 8.10.
- 8.9b The counter displays Partner Bank screen ER20 (see 5.1.20).

⁷ Steps 8.7 and 8.8 previously concerned the passing of TLV and TDR messages between the counter and the PIN pad: steps were removed from main processing flow to improve performance.

- 8.9c If the clerk intends to ask the customer whether he wants to use Banking later processing continues from 8.9d. Otherwise, processing continues from 8.9e.
- 8.9d. The clerk touches the Yes button and processing continues from 8.10.
- 8.9e The clerk touches the No button and processing continues from 8.10.
- 8.10 The counter sends an EFT2 command back to the PIN pad to continue processing
- 8.11 If the action analysis phase of EMV processing indicates a failure then processing continues from 8.23.
- 8.12 If the first usable (supported) CVM on the card is a PIN entry CVM then processing continues from Figure 10: *PIN verification*: otherwise, processing continues at Figure 11: *CVM processing*,
- 8.14 The cardholder is presented with a list of applications on screen EBP3 (see 7.2.3): (it is possible that the PIN pad will display only a single application in instances where there is no choice but the card dictates that the only application needs to be confirmed by the customer).
- 8.14a The PIN pad sends an STA B command to the counter indicating that customer application selection is in progress.
- 8.14b The counter displays screen ER28 (see 5.1.28) to inform the clerk that the PIN pad is prompting the customer to perform application selection. Screen has a cancel button: otherwise, the screen remains there until application selection has completed at the PIN pad, or the clerk cancels the transaction.
- 8.15 If the customer needs help processing continues from 8.16: otherwise, processing continues from 8.17.
- 8.16 If the customer needs help with application selection he may allow the clerk to perform that operation for him. This is achieved by the customer pressing the CLR button on the PIN Pad. The clerk will explain this to the customer. Processing continues from Figure 9: *Counter AID Selection*.
- 8.17 If the customer decides to cancel processing continues from 8.18: otherwise, processing continues from 8.18a.
- 8.18 The customer cancels by pushing the cancel button or taking the card out before the transaction is finished. Processing continues from Figure 19: *Customer Cancel*.
- 8.18a The customer selects application. Processing continues from 8.4.
- 8.19 The counter displays one of a number of error screens. As this is part of the existing system process it will not be expanded here. See NB/SPE/013 for details.
- Range checking will also be carried out here for the amount, to ensure that it falls within the bounds set out by reference data. The screens E9 (see 8.1.20) and E10 (see 8.1.21) will be used to display bound check errors.
- screen E9 - amount entered is outside limits supported for this card
 - screen E10 - amount entered isn't a correct multiple: (unlikely depends on reference data).
- 8.20 The counter sends an ACK cancel command back to the PIN pad

- 8.21 The **Remove Card** process is performed – Figure 21.
- 8.22 The **End Command Processing** process is performed – Figure 22. The counter returns to the **Settlement Menu**.
- 8.23 The PIN pad sends an AAC command to the counter.
- 8.24 The counter displays the ER22 screen (see 5.1.22 - for a payment transaction) or ER27 screen (see 5.1.27- for a refund transaction) showing a transaction declined message.
- 8.25 The counter sends an ACK cancel command back to the PIN pad. Processing continues from 8.21.
- 8.26 The PIN pad sends an STA 9 command to the counter indicating an MSR fallback scenario.
- 8.27 PIN pad displays screen EBP18 *Remove and handover card* (see 7.2.17). Processing continues from Figure 7: *Fallback Processing*.
- 8.28 The unusable application will be removed from the application candidate list and application selection will begin again at *PIN Pad AID selection*. If the list is found to be empty then fallback to MSR will be allowed.
- Processing continues from 8.1.

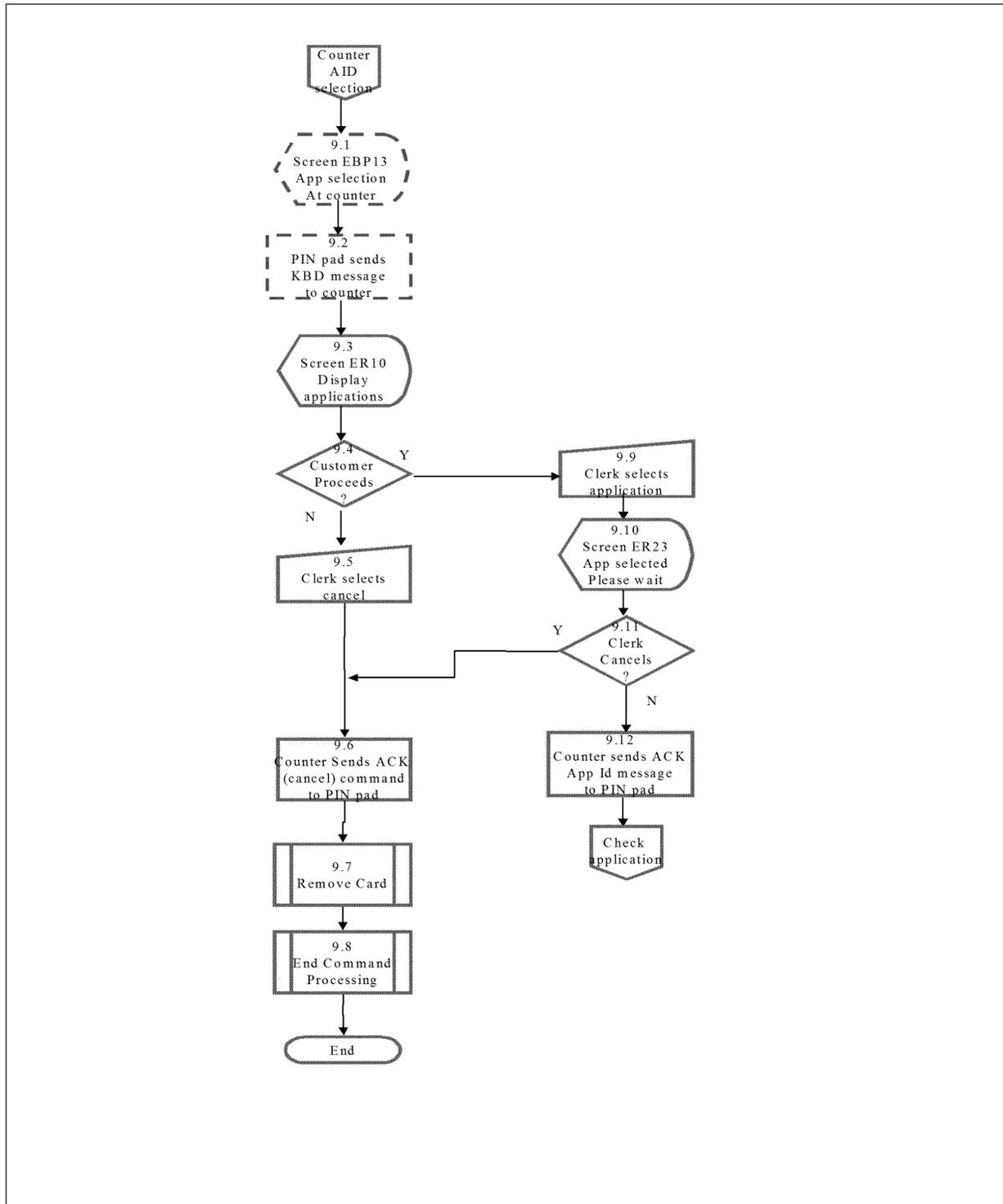


Figure 9: Activity Flows for EMV Retail – Counter AID Selection

Notes for Figure 9

- 9.1 The PIN pad displays screen EBP13 *Selecting application for payment* (see 7.2.12).
- 9.2 The PIN pad sends a KBD command to the counter informing the counter that the customer has pressed the CLR key: the KBD command contains a list of the application labels from the card who's corresponding AIDs have matched AIDs supported by the PIN pad.
- 9.3 In response to the KBD command from the PIN pad the counter displays screen ER10 (see 5.1.10). This is a pick list screen, which lists the matched application labels listed in the KBD command: additionally another choice available to the clerk is the CANCEL option.
- 9.4 The clerk discusses the available options with the customer.
If the customer selects an option then processing continues from 9.9.
- 9.5 The clerk selects **Cancel**.
- 9.6 The counter sends an ACK cancel command to the PIN Pad.
- 9.7 The process Figure 21: *Remove Card* is performed.
- 9.8 The process Figure 22: *End Command Processing* is performed. The counter returns to the **Settlement Menu**.
- 9.9 The clerk selects the appropriate application.
- 9.10 The counter displays the ER23 screen (see 5.1.23). As there is a pause between application selection and PIN entry this screen informs the clerk and offers the opportunity, if needed, to cancel the transaction.
- 9.11 If the clerk presses the Cancel button on the ER23 screen then processing continues from 9.6.
- 9.12 The counter sends an ACK command back to the PIN pad informing the PIN pad of the selected application.
Processing continues from Figure 8: *Check Application*.

2.3.5 PIN Verification

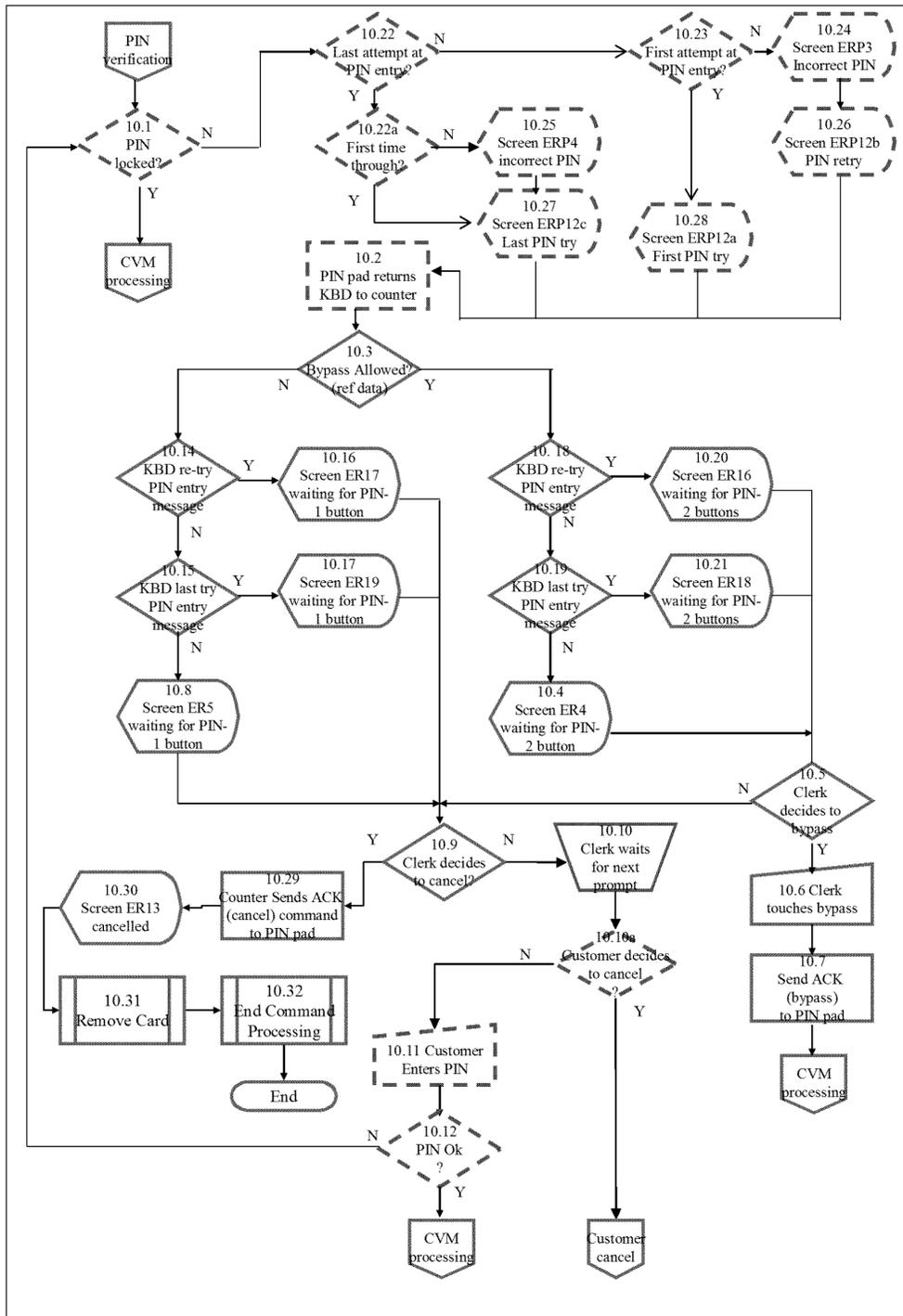


Figure 10: Activity Flows for EMV Retail – PIN Verification

Notes for Figure 10

10.1 The PIN pad checks whether the PIN is already blocked before PIN entry is attempted.
If card is OK processing continues to 10.22.

If PIN is locked processing continues to Figure 11: *CVM Processing*

10.2 The PIN pad returns the KBD command to the counter. This indicates to the counter which of 'PIN Entry', 'PIN Retry' or 'Last Try' PIN attempts is currently in process. This is dependant on the PIN Retry Counter on the card.

10.3 The Counter checks whether the clerk is allowed to select the Bypass option: this is controlled by Counter reference data.

If the bypass option is available processing continues from 10.18.

Otherwise, processing continues to 10.14.

10.4 Counter displays screen ER4 *Waiting for PIN* (see 5.1.4).

The clerk has 3 options

- a button on the screen allows the clerk to select the bypass option
- a button on the screen allows the clerk to select cancel
- alternatively the clerk can wait until the PIN has been entered at the PIN pad.

At the same time as the counter is displaying screen ER4 (or ER5), the customer is attempting to enter his PIN on the PIN pad screen ERP12a (see 5.2.1). The normal path would be for the customer to successfully complete PIN entry but it is possible for either the clerk or customer to cancel the transaction before the PIN is entered.

Counter screen ER4 (or ER5, ER16, ER17, ER18 or ER19) will only disappear:

- on successful PIN entry
- when customer cancels or pulls card
- on PIN entry timeout
- when counter clerk touches Bypass
- when counter clerk touches Cancel.

10.5 If the clerk chooses to press the bypass button then processing continues from 10.6.
Otherwise, processing continues from 10.9.

10.6 The clerk presses the bypass button.

10.7 The counter sends an ACK command back to the PIN pad indicating that the bypass option has been selected.

Processing continues from Figure 11: *CVM Processing*.

10.8 Counter displays screen ER5 *Waiting for PIN* (see 5.1.5).

This screen is similar to screen ER4 but only presents the clerk with 2 options

- a button on the screen allows the clerk to select cancel

- alternatively the clerk can wait until the PIN has been entered at the PIN pad.
(See comments for note 10.4).
- 10.9 If clerk decides to cancel processing continues from 10.29.
Otherwise, processing continues from 10.10.
- 10.10 The clerk waits until the PIN is entered at PIN pad.
- 10.10a If the customer decides to cancel, processing continues from Figure 19: *Customer Cancel*. (The customer cancels explicitly by pushing the cancel button or taking the card out before the transaction is finished, or implicitly if the customer does not enter the PIN within the PIN Entry timeout period).
- 10.11 The customer enters their PIN number.
- 10.12 If the PIN is not valid then processing continues at 10.1.
Otherwise, processing continues at Figure 11: *CVM Processing*.
- 10.14 If the KBD command has a screen id of 07 (PIN Entry re-try in progress) then processing continues at 10.16.
Otherwise, processing continues from 10.15.
- 10.15 If the KBD command has a screen id of 08 (Last PIN Entry in progress) then processing continues at 10.17.
Otherwise, processing continues from 10.8.
- 10.16 The counter displays screen ER17 *Pin Entry Retry – one button* (see 5.1.17).
Processing continues at 10.9.
- 10.17 The counter displays screen ER19 *PIN Entry Last Try – one button* (see 5.1.19).
Processing continues at 10.9.
- 10.18 If the KBD command has a screen id of 07 (PIN Entry re-try in progress) then processing continues at 10.20.
Otherwise, processing continues from 10.19.
- 10.19 If the KBD command has a screen id of 08 (Last PIN Entry in progress) then processing continues at 10.21.
Otherwise, processing continues from 10.4.
- 10.20 The counter displays screen ER16 *Pin Entry Retry – two buttons* (see 5.1.16).
Processing continues at 10.5.
- 10.21 The counter displays screen ER18 *PIN Entry Last try – two buttons* (see 5.1.18).
Processing continues at 10.5.
- 10.22 If the ICC indicates this is the last permitted PIN entry attempt, processing continues at 10.22a. Otherwise, processing continues at 10.23.
- 10.22a If this is the first (and last) PIN entry attempt this transaction, processing continues at 10.27. Otherwise, processing continues at 10.25.

- 10.23 If this is the first PIN entry attempt this transaction, processing continues at 10.28. Otherwise, processing continues at 10.24.
- 10.24 There has already been at least one PIN attempt this transaction. The PIN pad displays screen ERP3 *Incorrect PIN – retry* (see 5.2.5). Processing continues at 10.26.
- 10.25 The PIN pad displays screen ERP4 *Incorrect PIN – last try* (see 5.2.6) to indicate this is the last attempt for PIN entry. Processing continues at 10.27.
- 10.26 The PIN pad displays screen ERP12b *Re-enter PIN – First Retry* (see 5.2.2). Processing continues at 10.2.
- 10.27 The number of PIN retries have been exhausted, this is the last permitted attempt at PIN entry. The PIN pad displays screen ERP12c *Re-enter PIN – Last Try* (see 5.2.3). Processing continues at 10.2.
- 10.28 The PIN pad displays screen ERP12a *Enter PIN* (see 5.2.1). Processing continues at 10.2.
- 10.29 If the clerk presses the cancel button on one of the PIN entry screens then the counter sends an ACK(cancel) command to the PIN pad.
- 10.30 The counter displays screen ER13 *Cancelled - Please wait* (see 5.1.13).
- 10.31 The process Figure 21: *Remove Card* is performed.
- 10.32 The process Figure 22: *End Command Processing* is performed.
- The counter returns to the **Settlement Menu**.

2.3.6 CVM Processing

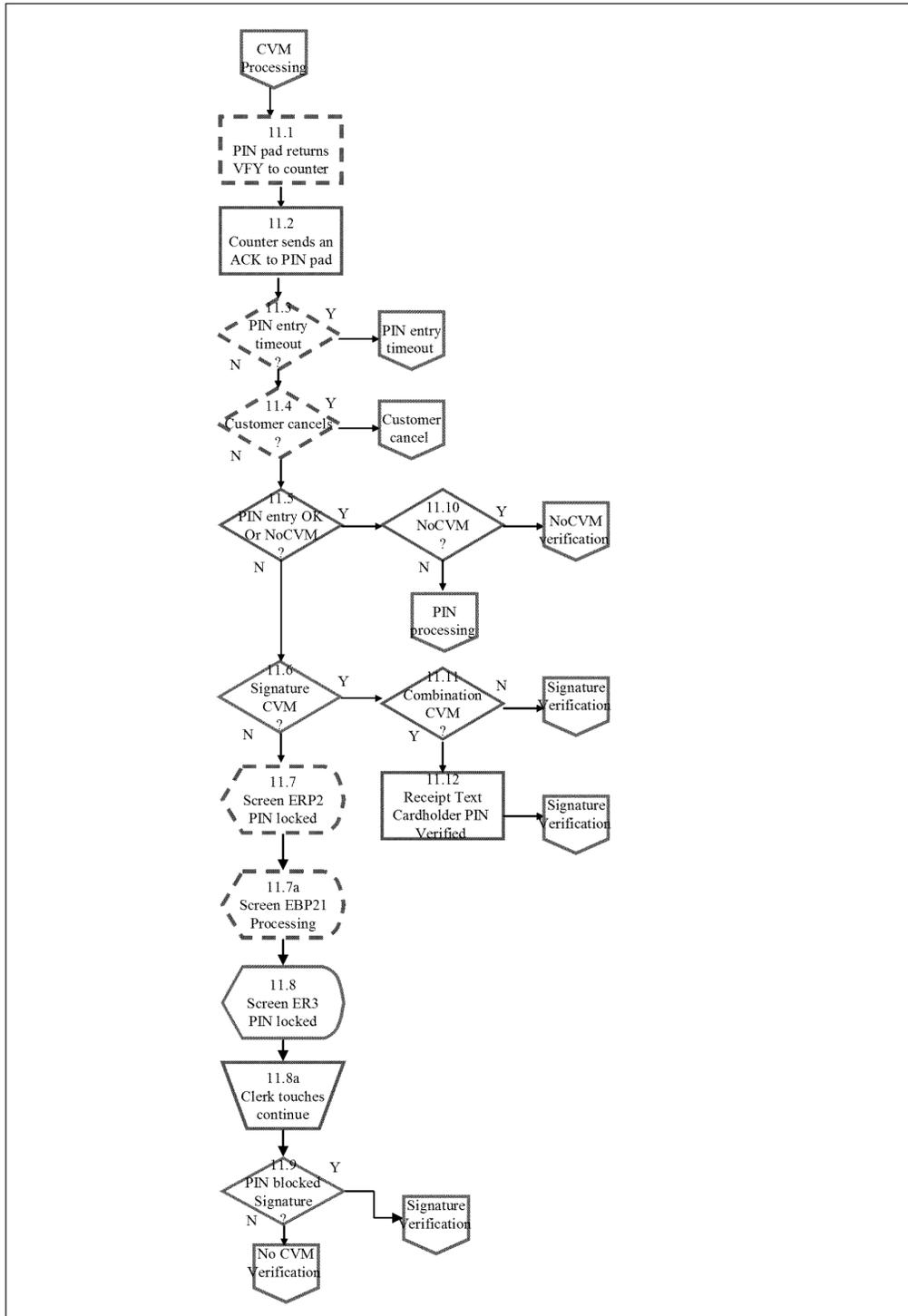


Figure 11: Activity Flows for EMV Retail – CVM Processing

Notes for Figure 11

11.1 The PIN pad sends a VFY command to Counter. This informs the counter of the outcome of CVM processing.

The VFY command returns one of the following status indicators:

- PIN ok or NoCVM.

If this status is returned then either the PIN number has been entered correctly or the CVM is NoCVM. This could include the case where the clerk has bypassed PIN entry to the next available CVM and that CVM is NoCVM. It could also include the case where there is no further CVM.

- Signature Verification Required.

If this status is returned then the CVM in use is signature. This may include the case where the clerk has bypassed PIN entry and the next available CVM is signature.

In the case of combined CVM even though the PIN is entered correctly, the VFY command will not return PIN entry Ok. Having satisfied itself that PIN entry was successful it will behave from that point as if the CVM had been signature. The indication returned on the VFY would be CVM signature.

- PIN Blocked, Signature Verification Required

If this status is returned then the card is blocked. That is, the PIN try counter has reached zero. It could have been blocked to begin with or as a result of inaccurate attempts at PIN entry in this session. In this case the next available CVM is signature and the card does not prevent its use in a PIN blocked situation.

- PIN blocked, no CVM required

If this status is returned then the card is blocked and either the next available CVM is NoCVM or there are no further CVMs in the CVM list.

11.2 Counter returns ACK command to the PIN pad.

11.3 If the PIN pad times out due to the PIN number not being entered in a timely fashion. (I.e. within the duration set in reference data for PIN entry timeout) then processing continues at Figure 19: *PIN Entry Timeout*.

11.4 If the customer cancels by pressing the cancel button or by pulling their card prematurely, then processing continues at Figure 19: *Customer Cancel*.

11.5 If the VFY command returned **PIN Ok or NoCVM** then processing continues at 11.10.

11.6 If the VFY command returns **Signature Verification Required** then processing continues at 11.11.

11.7 If the VFY command returns a blocked CVM indication, then the screen ERP2 *PIN Blocked* (see 5.2.4) will be displayed by the PIN pad. If the returned status is neither

PIN Ok or NoCVM nor **Signature Verification Required** then by default it is a PIN blocked situation.

- 11.7a PIN pad displays screen EBP21 *Processing* (see 7.2.20).
- 11.8 The counter displays the ER3 *PIN Blocked* screen (see 5.1.3). When the continue button is pressed then processing continues at 11.9.
- 11.8a System waits until clerk touches Continue.
- 11.9 If the VFY command returns **PIN Blocked, Signature Verification Required** then the processing continues at Figure 14: *Signature Verification*.
If the VFY command returns **PIN Blocked, NoCVM Required** then processing continues at Figure 14: *NoCVM Verification*.
- 11.10 If after analysis the CVM is NoCVM then processing continues at Figure 14: *NoCVM Verification*. If the CVM is PIN then the processing continues at Figure 14: *PIN Processing*.
- 11.11 If the CVM is a combination CVM then processing continues at 11.12. If not a combination CVM then processing continues at Figure 14: *Signature Processing*.
- 11.12 A flag is set to cause the receipt text '**Cardholder PIN Verified**' to be printed on the session receipt. Processing continues at Figure 14: *Signature Verification*.

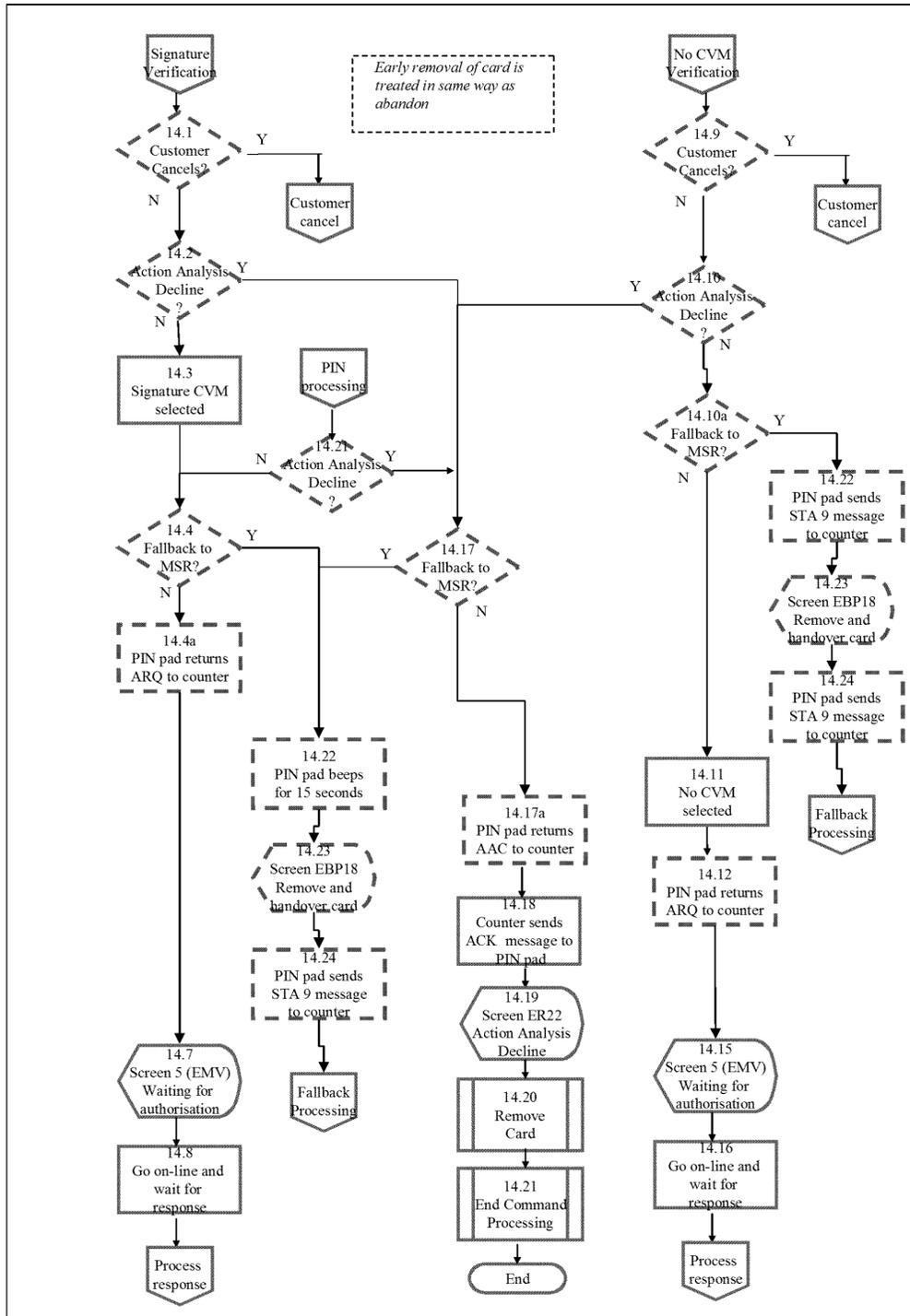


Figure 14: Activity Flows for EMV Retail – Signature Verification & No CVM

Notes for Figure 14.

- 14.1 If customer cancels processing continues at Figure 19 - *Customer Cancel*. (The customer cancels by pushing the cancel button or taking the card out before the transaction is finished).
- 14.2 If the PIN pad detects an action analysis failure then processing continues at 14.17.
- 14.3 The counter prepares to display 'Signature CVM' message on screen 5 (EMV).
- 14.4 If fallback to MSR is required processing continues from 14.22. (This is a rare event but has to be catered for).
- 14.4a The PIN pad sends ARQ command to the counter, indicating a requirement to go on-line to obtain authorisation.
- 14.5 Step removed⁸.
- 14.6 Step removed.
- 14.7 The counter displays screen 5 (EMV) *Waiting for authorisation* (see 5.1.29).
- 14.8 The counter goes on line to the merchant acquirer and waits for authorisation. Processing continues to Figure 15: *Process Response*.
- 14.9 If customer cancels processing continues at Figure 19: *Customer Cancel*. (The customer cancels by pushing the cancel button or taking the card out before the transaction is finished).
- 14.10 If the PIN pad detects an action analysis failure then processing continues at 14.17. This includes the following situations:
- A CVM bypass finds no alternative usable CVM in the CVM list and the card is set to cause a decline in such situations.
 - A PIN blocked fallback finds no alternative usable CVM in the CVM list and the card is set to cause a decline in such situations.
- 14.10a If fallback to MSR is required processing continues from 14.22. (This is a rare event but has to be catered for).
- 14.11 The counter prepares to display 'No CVM' message on screen 5 (EMV).
- 14.12 The PIN pad sends ARQ command to the counter. Indicating a requirement to go online to obtain authorisation.
- 14.13 Step removed⁹.
- 14.14 Step removed.
- 14.15 The counter displays screen 5 (EMV) *Waiting for authorisation* (see 5.1.29).

⁸ Steps 14.5, and 14.6 connected with TLV and TDR messages have been removed as the result of performance improvements to the main paths.

⁹ Steps 14.13, and 14.14 connected with TLV and TDR messages have been removed as the result of performance improvements to the main paths.

- 14.16 The counter goes on line to the merchant acquirer and waits for authorisation.
Processing continues to Figure 15: *Process Response*.
- 14.17 If fallback to MSR is required processing continues from 14.22. (This is a rare event but has to be catered for).
- 14.17a The PIN pad returns an AAC command to the counter, showing action analysis decline.
- 14.18 The counter sends an ACK to the PIN pad acknowledging the AAC command.
- 14.19 The counter displays screen ER22 *Declined* (see 5.1.22).
- 14.20 The process Figure 21: *Remove Card* is performed.
- 14.21 The process Figure 22: *End Command Processing* is performed.
The counter returns to the **Settlement Menu**.
- 14.22 The PIN pad beeps for 15 seconds until the card is removed or until the clerk touches OK on the EB12 screen in step 7.1.
- 14.23 PIN pad displays screen EBP18 *Remove and handover card* (see 7.2.17).
- 14.24 The PIN pad sends an STA 9 command to the counter indicating an MSR fallback scenario.
Processing continues from Fallback Processing in Figure 7.

2.3.7 Process Response

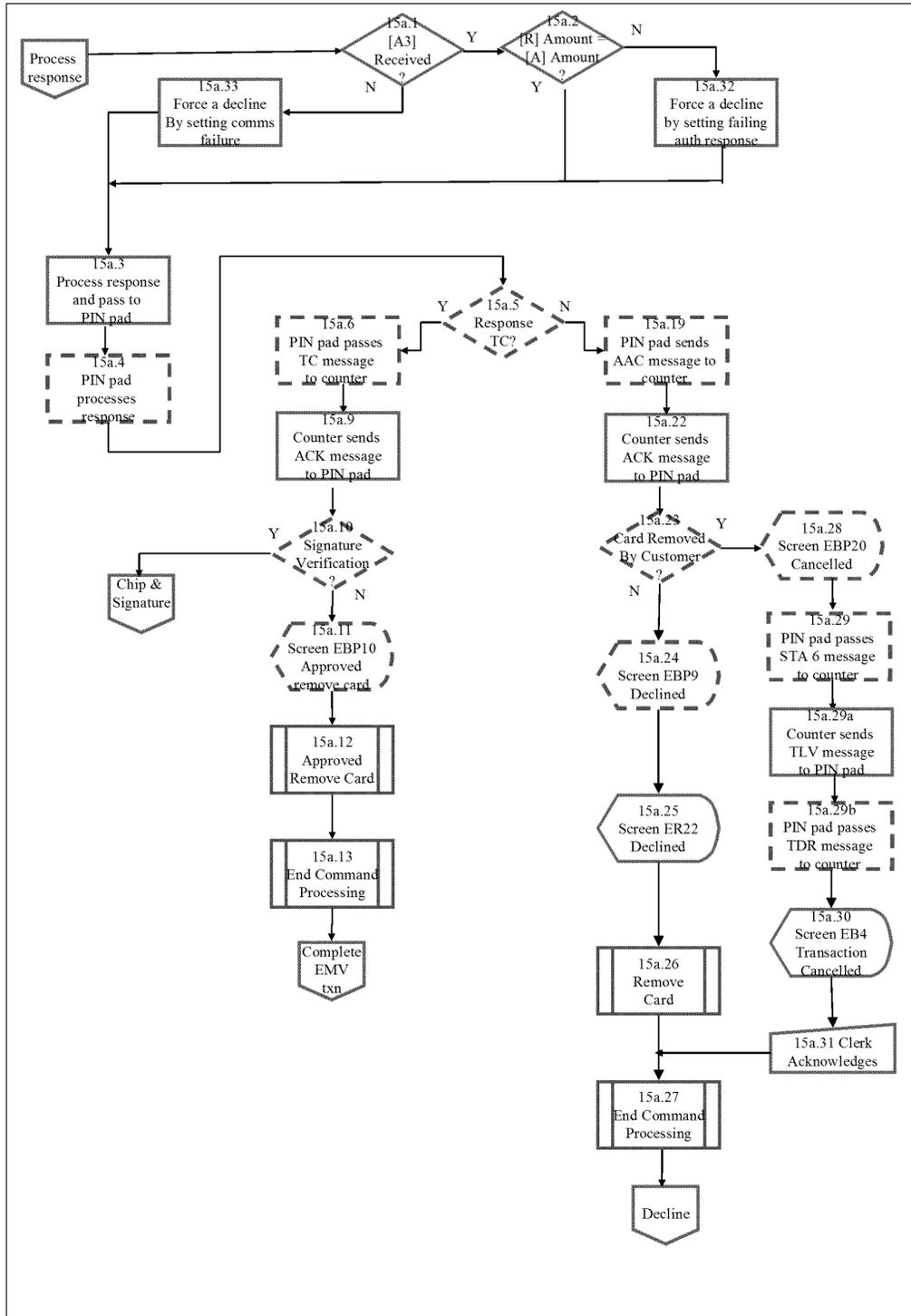


Figure 15a: Activity Flows for EMV Retail – Process Response

Notes for Figure 15a

- 15a.1 If the authorisation request times out then processing continues at 15a.33.
- 15a.2 The counter compares the [R] amount against the [A] amount. If they are not the same processing continues from 15a.32.
- 15a.3 The counter passes the authorisation response data through to the PIN pad as an ACK command.
- 15a.4 The PIN pad processes the authorisation response.
- 15a.5 The PIN pad decides whether to accept the authorisation response. The card and PIN pad may even in the event of a successful authorisation response, decide to decline the transaction. If the decision is to accept the transaction then the PIN pad generates and issues a TC command and processing continues from 15a.6. If the decision is to decline the transaction then the PIN pad generates and issues an AAC command and processing continues from 15a.19.
- 15a.6 The PIN pad generates and sends a TC command to the counter.
- 15a.7 Step removed¹⁰.
- 15a.8 Step removed.
- 15a.9 The counter acknowledges the TC command by sending an ACK command to the PIN pad.
- 15a.10 If the CVM was signature or a combination CVM then further proof of identity is required, so the counter solicits a proof by signature from the cardholder and processing continues at Figure 15b: *Chip & Signature*.
- 15a.11 PIN pad displays screen EBP10 *Approved / Remove card* (see 7.2.9).
- 15a.12 The process Figure 23: *Approved Remove Card* is performed.
- 15a.13 The process Figure 22: *End Command Processing* is performed. Processing continues at Figure 18: *Complete EMV Txn*.
- 15a.14 Step removed: now covered by Figure 15b.
- 15a.15 Step removed: now covered by Figure 15b.
- 15a.16 Step removed: now covered by Figure 15b.
- 15a.17 Step removed: now covered by Figure 15b.
- 15a.18 Step removed: now covered by Figure 15b.
- 15a.19 The PIN pad generates and sends an AAC command to the counter.
- 15a.20 Step removed¹¹.
- 15a.21 Step removed.

¹⁰ Steps 15a.7 and 15a.8 previously concerned the passing of TLV and TDR messages between the counter and the PIN pad: steps were removed from main processing flow to improve performance.

¹¹ Steps 15a.20 and 15a.21 previously concerned the passing of TLV and TDR messages between the counter and the PIN pad: steps were removed from main processing flow to improve performance.

- 15a.22 The counter acknowledges the AAC command by sending an ACK command to the PIN pad.
- 15a.23 If the card was removed by the customer before the authorisation cryptogram was generated processing will continue at 15a.28.
- 15a.24 The PIN pad displays screen EBP9 *Declined / Remove card* (see 7.2.8).
- 15a.25 The counter displays screen ER22 *Declined* (see 5.1.22).
- 15a.26 The process Figure 21: *Remove Card* is performed.
- 15a.27 The process Figure 22: *End Command Processing* is performed.
Processing continues at Figure 20: *Decline*.
- 15a.28 The PIN pad displays EBP20 *Cancelled* (see 7.2.19).
- 15a.29 The PIN pad sends an STA 6 command to the counter indicating that the customer has aborted the transaction by pulling their card from the reader before an authorisation cryptogram was generated.
- 15a.29a The counter solicits TLV information from the PIN Pad by sending a TLV command¹².
- 15a.29b The PIN pad responds to the TLV command satisfying the request for TLV data.
(*Note: this exception path still includes a TLV/TDR dialogue between the PIN pad and the counter*).
- 15a.30 The screen EB4 *Transaction cancelled by the customer* (see 7.1.2) is displayed by the counter.
- 15a.31 When the clerk acknowledges reading the EB4 screen processing continues at 15a.27.
- 15a.32 The counter forces a local authorisation decline by altering the authorisation response code which is passed to the PIN pad.
Processing continues from 15.3.
- 15a.33 The counter forces a local authorisation decision by informing the PIN pad of comms failure.
Processing continues from 15.3.

¹² Although TLV and TDR messages between the counter and the PIN pad have been removed from the main processing flow to improve performance they are still required in exception paths.

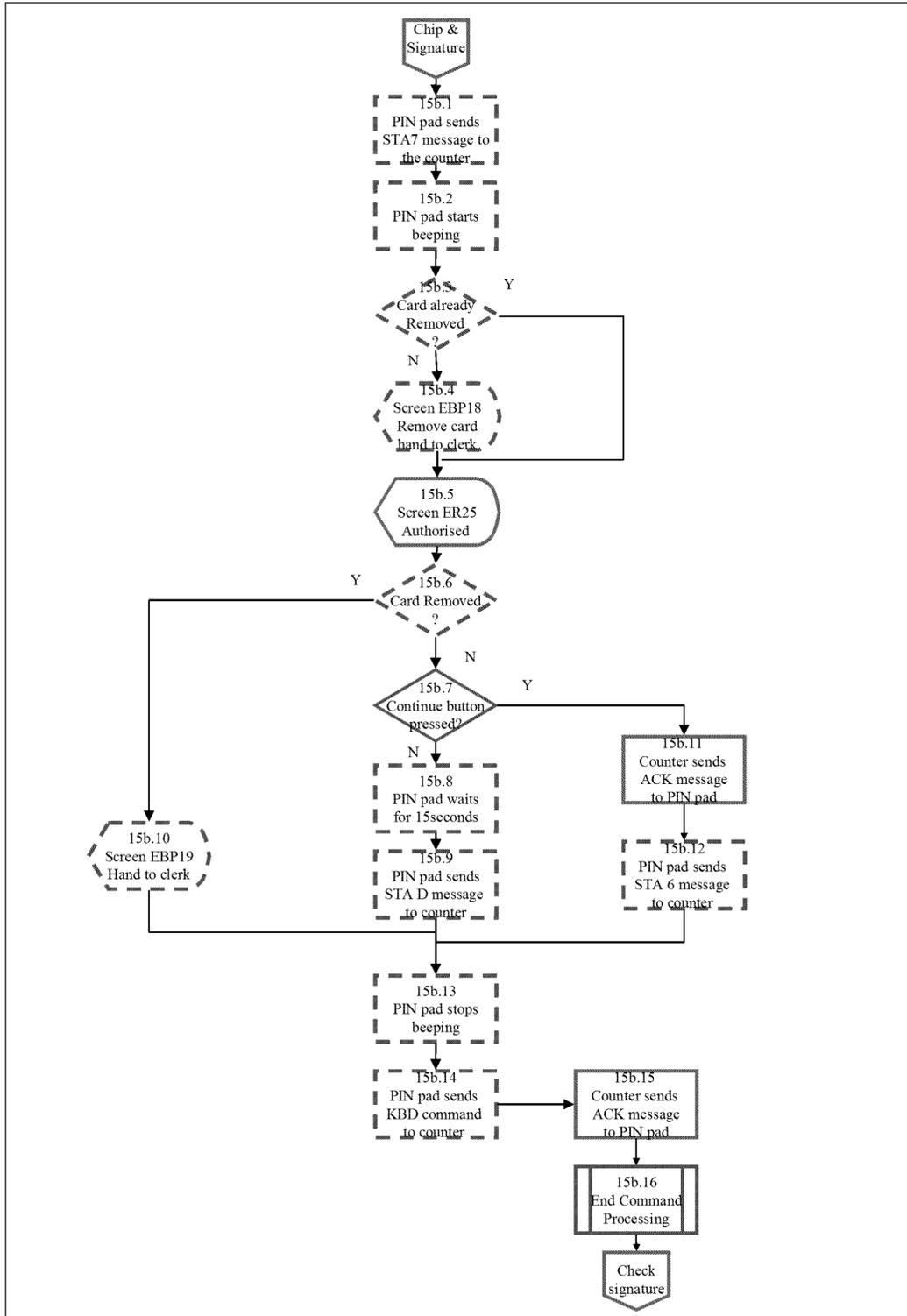


Figure 15b: Activity Flows for EMV Retail – Chip & Signature

Notes for Figure 15b

- 15b.1 The PIN pad sends STA 7 message to the counter to inform the counter that the card is still in the PIN pad.
- 15b.2 The PIN pad beeps for a configurable period (15 seconds) to remind the customer to remove their card.
- 15b.3 If the card has been removed from the PIN pad processing continues from 15b.5.
- 15b.4 The PIN pad displays Screen EBP18 *Remove card and hand to clerk* (see 7.2.17).
- 15b.5 Counter displays screen ER25 *Transaction authorised remove card* (see 5.1.25).
The screen has an acknowledge button which the clerk can use to stop the PIN pad from beeping and to move the PIN Pad to its next operation.
- 15b.6 If the card is removed then processing continues at 15b.10.
- 15b.7 If the clerk touches the Continue button on the ER25 screen then processing continues at 15b.11.
- 15b.8 The PIN pad waits for a configurable period (15 seconds): (this is a reference data setting).
- 15b.9 The PIN pad sends STA D command to the counter to tell the counter that the remove card timeout has expired. Processing continues from 15b.13.
- 15b.10 The PIN Pad displays screen EBP19 *Hand card to clerk* (see 7.2.18). Processing continues from 15b.13.
- 15b.11 The counter returns an ACK command to the PIN pad. This will stop the beeping.
- 15b.12 PIN pad sends an STA 6 command to the counter to inform the counter that the card removal loop has been aborted.
- 15b.13 PIN pad stops beeping.
- 15b.14 The PIN pad sends a KBD command to the counter. This is the trigger for the counter to invoke signature checking.
- 15b.15 The counter returns an ACK command to the PIN pad to acknowledge the KBD message.
- 15b.16 End command processing is carried out. Processing continues from Figure 16: *Check Signature*.

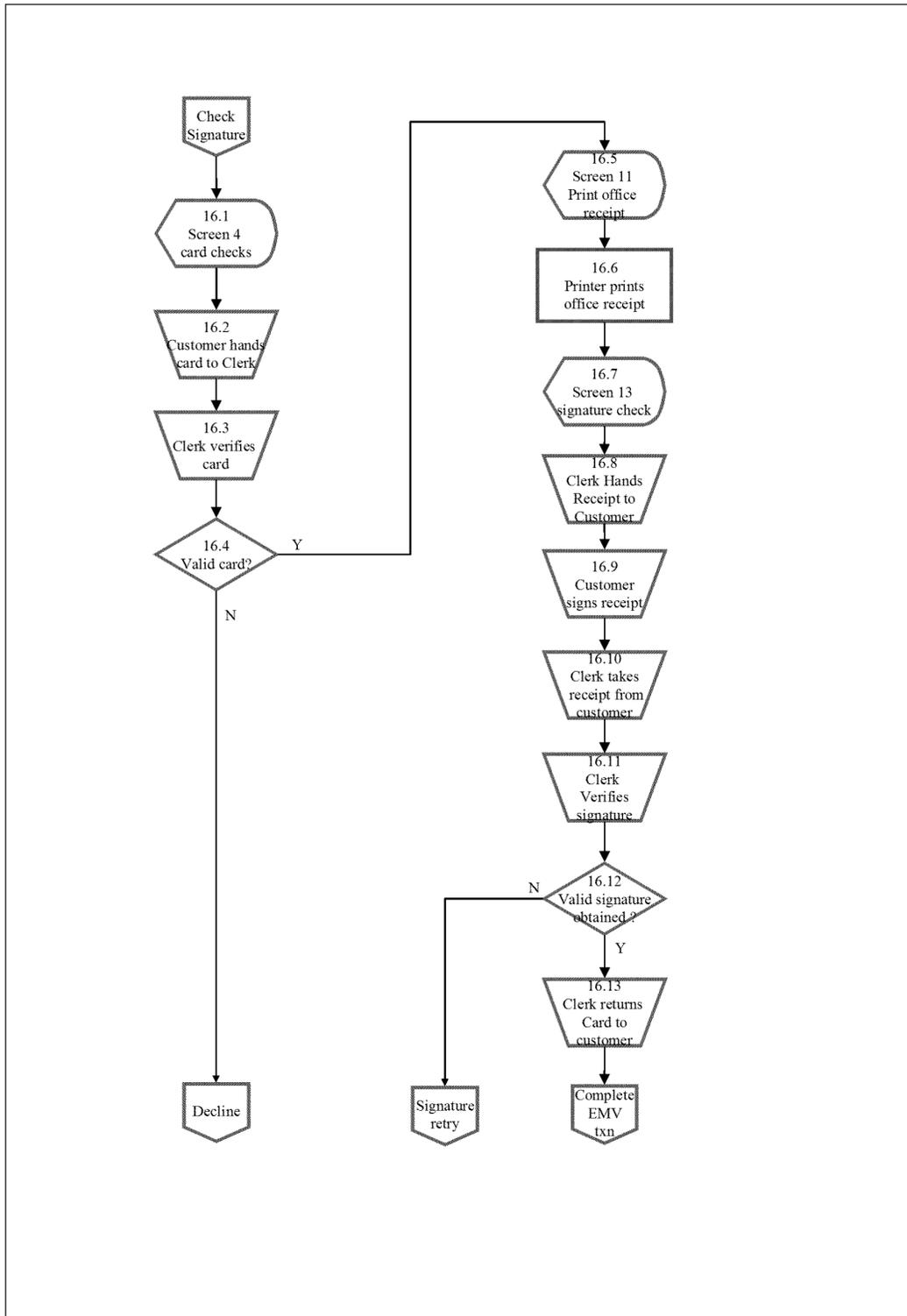


Figure 16: Activity Flows for EMV Retail – Print Receipt for Signature

Notes for Figure 16.

- 16.1 Counter displays screen 4 (see 8.1.2) prompting the clerk to conduct card checks.
- 16.2 Clerk takes card from customer.
- 16.3 Clerk performs card checks.
- 16.4 Selecting the Yes (card passes checks) option then processing continues at 16.5.
Selecting the No (card fails checks) option goes to Figure 20: *Decline*.
- 16.5 Counter displays screen 11 *Office receipt printing* (see 8.1.7) to show that the office receipt is being printed.
- 16.6 The printer prints the office receipt for the customer to sign.
- 16.7 Counter displays screen 13 (see 8.1.9) asking clerk to confirm whether the office receipt has been successfully printed and to verify the customer's signature.
- 16.8 The clerk hands the receipt to the customer to sign.
- 16.9 The customer signs the receipt.
- 16.10 Clerk takes receipt from customer and compares the signature on the office receipt against the signature on the back of the card.
- 16.11 The clerk returns the card to the customer after verifying that the customer's signature on the office receipt agrees with the signature on the back of the customer's card.
- 16.12 Selecting the **Yes** (good signature) option then processing continues at 16.13.
Selecting the **No** (bad signature) option goes to Figure 17: *Signature Retry*.
- 16.13 The clerk hands the card back to the customer and processing continues at Figure 18: *Complete EMV Txn*.

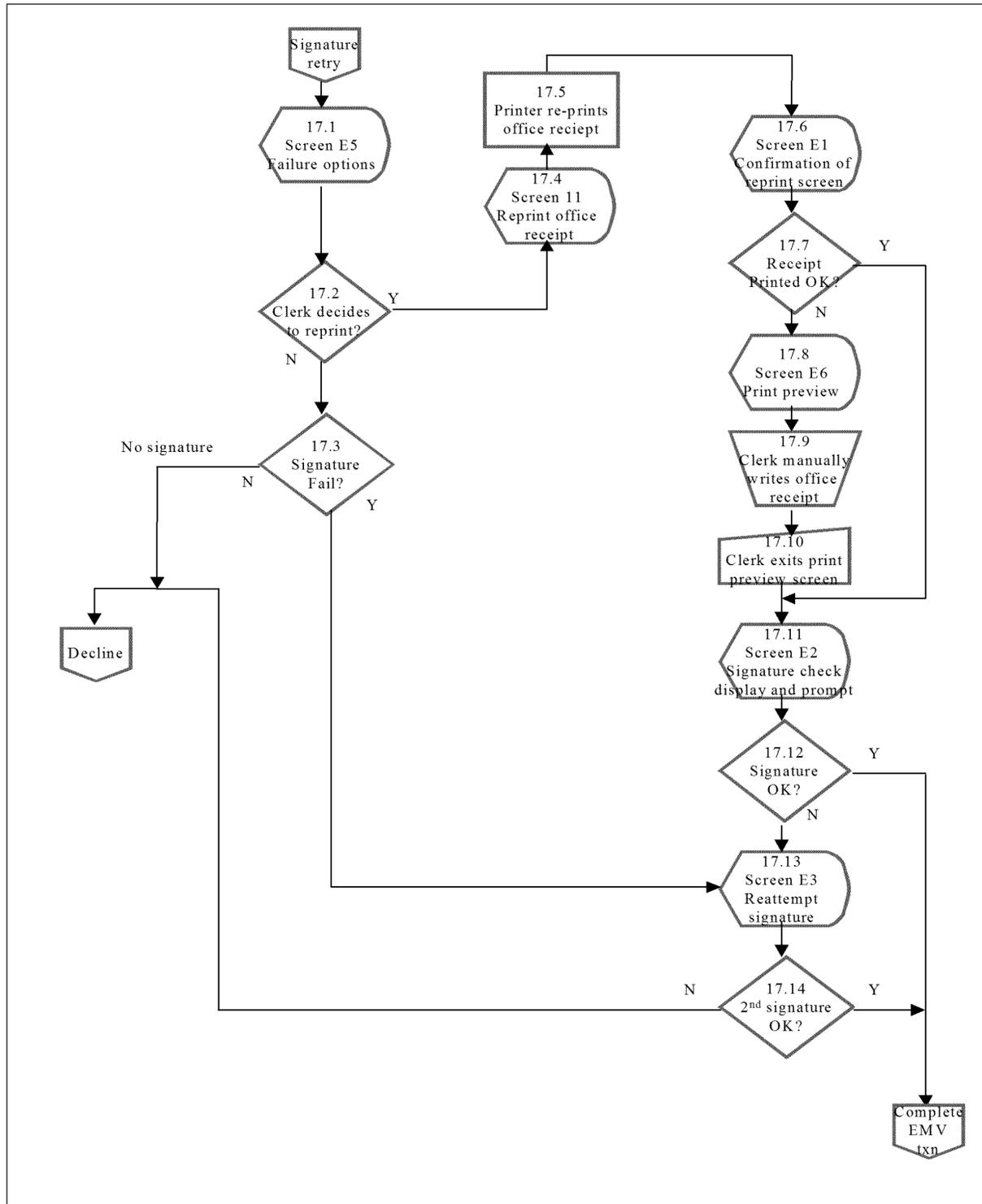


Figure 17: Activity Flows for EMV Retail – Reprint Receipt for Signature

Notes for Figure 17

- 17.1 The counter displays screen E5 *Signature check failure options* (see 8.1.16) which lists the failure options:
- Signature fail
 - No customer signature
 - Reprint
- 17.2 If the clerk selects the **Reprint** option then processing continues at 17.4.
- 17.3 If the clerk selects the **Signature fail** option then processing continues at 17.13.
If the clerk selects the **No customer signature** option then processing continues at Figure 20: *Decline*.
- 17.4 The counter displays screen 11 (see 8.1.7) to show that the office receipt is being printed again.
- 17.5 The printer re-prints the office receipt.
- 17.6 The counter displays screen E1 (see 8.1.12) asking clerk to confirm whether the office receipt has been successfully printed.
- 17.7 If the clerk selects **Yes** then processing continues at 17.11.
If the clerk selects **No** then processing continues at 17.8.
- 17.8 The counter displays screen E6 the print preview screen (see 8.1.17).
- 17.9 The clerk manually writes out the office receipt.
- 17.10 The clerk exits print preview screen by pushing the End button.
- 17.11 The counter displays screen E2 (see 8.1.13) to request clerk to get the customer to sign the receipt and compare the signature against that on the back of the card.
- 17.12 If the clerk selects the **Yes** (good signature) option then processing continues at Figure 18: *Complete EMV Txn*
If the clerk selects the **No** (bad signature) option then processing continues at 17.13.
- 17.13 The counter displays screen E3 (see 8.1.14) to request that the clerk ask the customer to sign the receipt a second time and compare the signature against that on the back of the card.
- 17.14 If the clerk selects the **Yes** (good signature) option then processing continues at Figure 18: *Complete EMV Txn*.
If the clerk selects the **No** (bad signature) option then processing continues at Figure 20: *Decline*.

2.3.8 Add Authorised Transaction to Stack

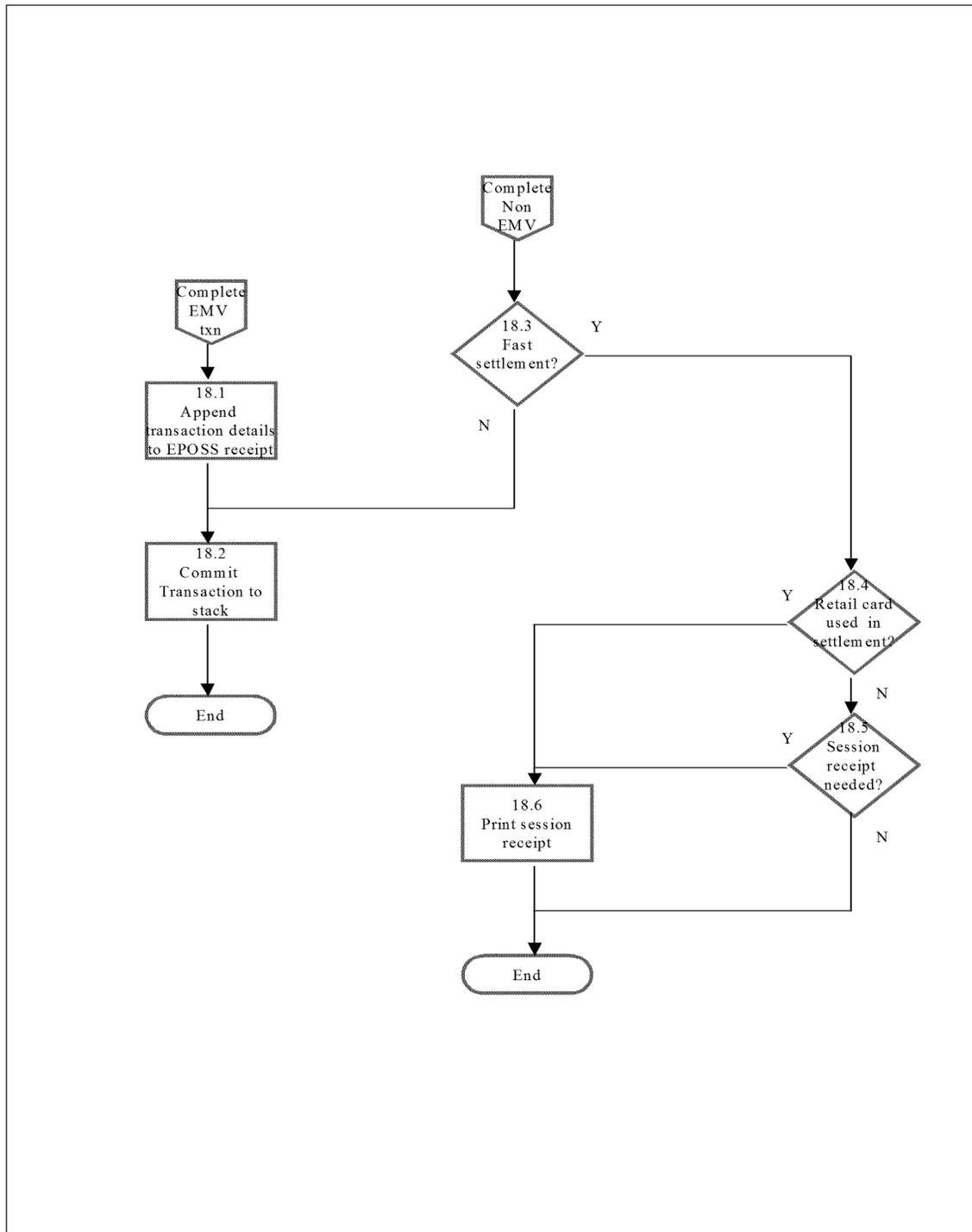


Figure 18: Completion Flows for EMV Retail

Notes for Figure 18

- 18.1 The Transaction details for the Retail Card transaction are stored so that they can be added to the bottom of the EPOSS receipt when is produced: (this applies to EMV, magnetic stripe and PKE).
- 18.2 The Transaction is added to the stack and counter returns to the settlement menu.
- 18.3 On completion of non-retail card transactions the counter checks whether the transaction just completed was to Fast Cash or Fast Cheque.
If it was not then fast settlement processing continues at 18.2.
Otherwise, processing continues at 18.4.
- 18.4 For fast settlement the counter checks whether any retail card settlement (ICC, magnetic stripe, or PKE) has also taken place during the session.
If it has, a session receipt is required and processing continues from 18.6.
- 18.6 Otherwise, the counter checks whether there is any other requirement to print a session receipt: if there is, then processing continues at 18.6.
If no receipt is required, the transaction is completed, the stack is cleared and the counter returns to the serve customer menu.
- 18.6 The Session receipt is printed. The stack is cleared and the counter returns to the serve customer menu.

2.3.9 Cancel Transaction

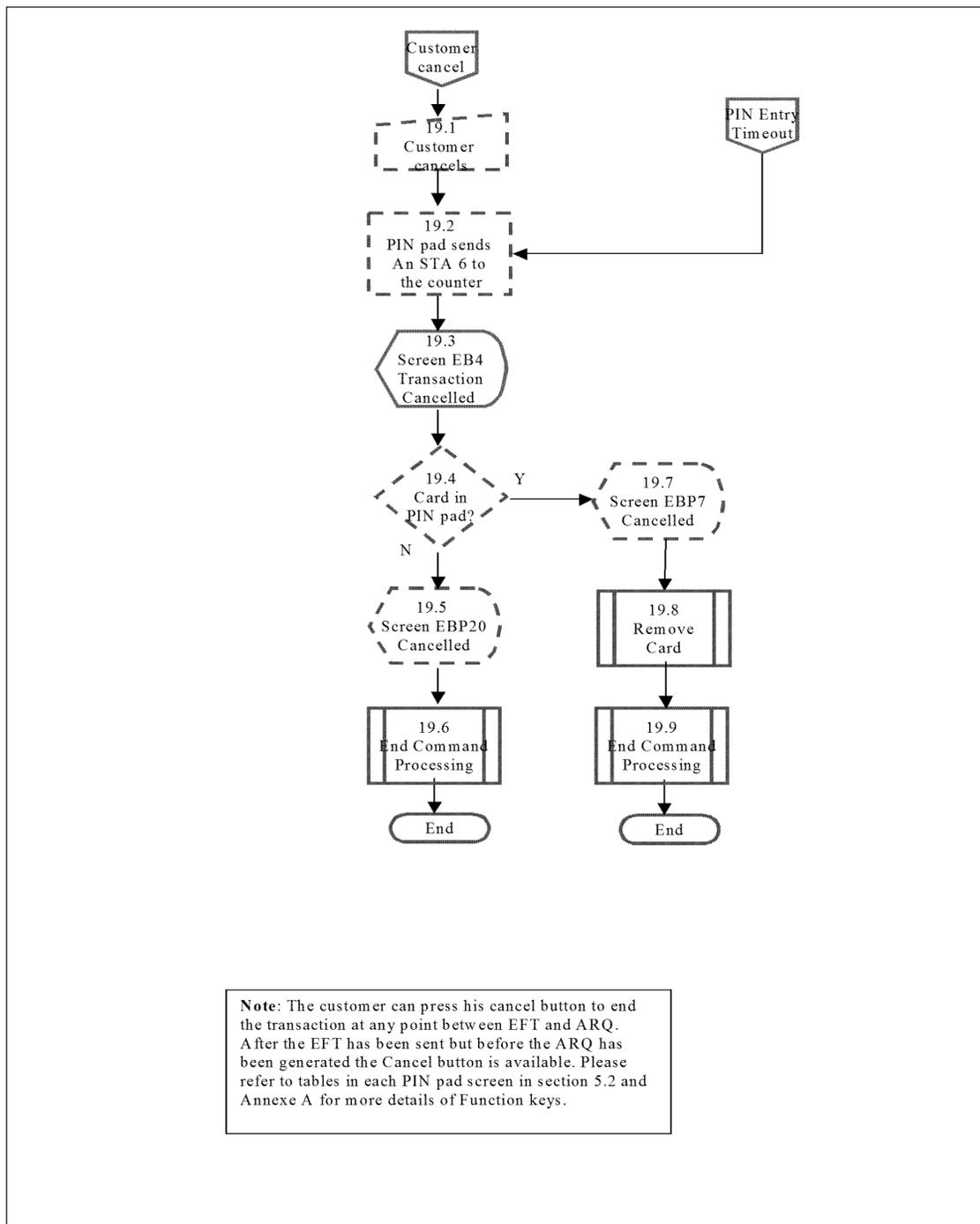


Figure 19: Cancel Flows for EMV Retail

Notes for Figure 19

- 19.1 The customer has either selected the cancel button or removed their card from the PIN pad. Processing continues at 19.4.
- 19.2 The PIN pad sends an STA 6 to the counter. This indicates that the customer has cancelled the transaction.
- 19.3 Screen EB4 *Transaction cancelled by customer* (see 7.1.2) is displayed to inform the clerk that a cancel has occurred and the transaction is being aborted.
- 19.4 If the card is still in the PIN pad then an attempt to have it removed will follow and processing continues at 19.7.
- 19.5 The PIN pad displays the screen EBP20 *Cancelled* (see 7.2.19).
- 19.6 The process Figure 22: *End Command Processing* is performed. The counter returns to the **Settlement Menu**.
- 19.7 The PIN pad displays the screen EBP7 *Cancelled Remove Card* (see 7.2.6).
- 19.8 The process Figure 21: *Remove Card* is performed.
- 19.9 The process Figure 22: *End Command Processing* is performed. The counter returns to the **Settlement Menu**.

2.3.10 Decline Transaction

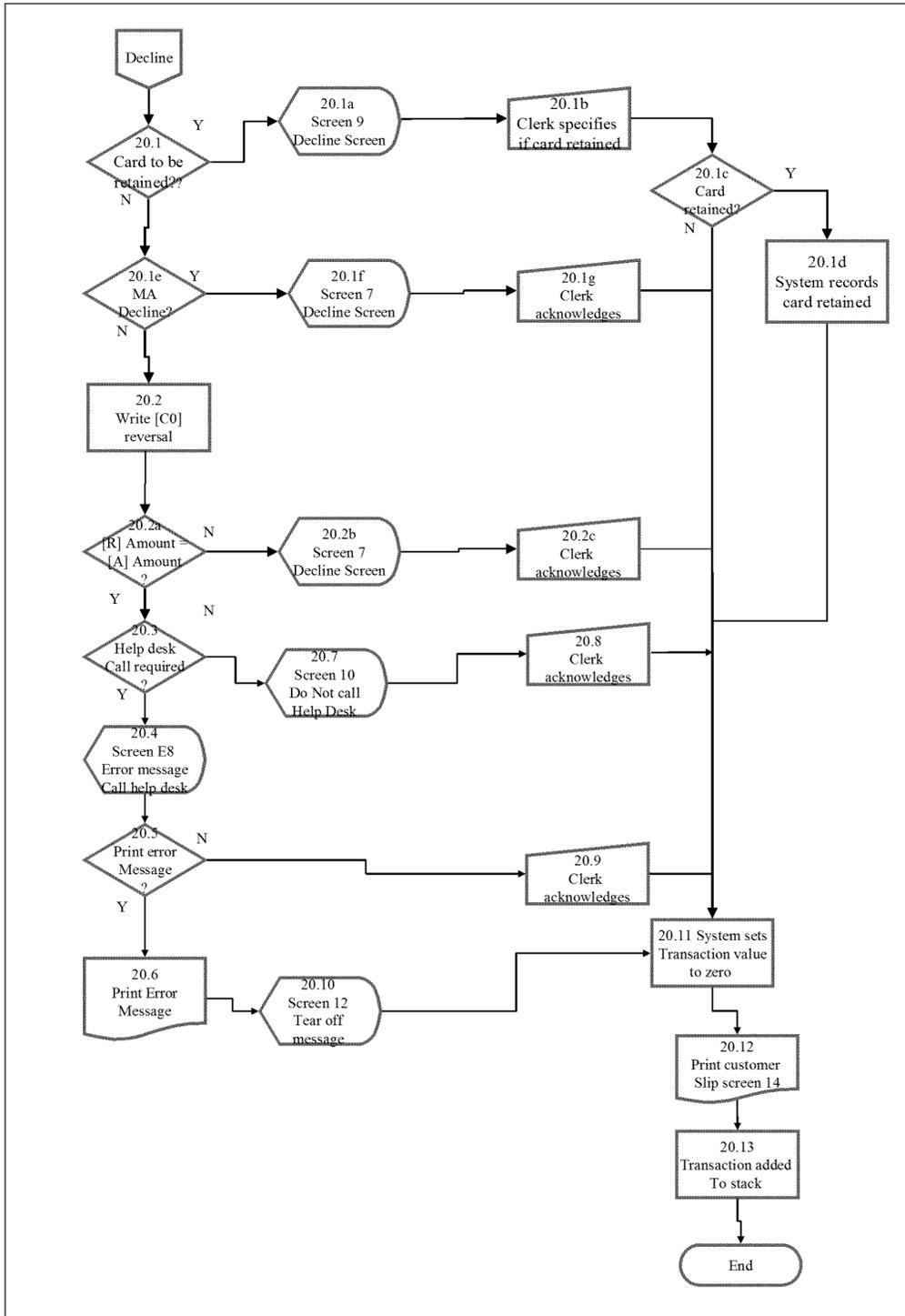


Figure 20: Activity Flows for System Decline

Notes for Figure 20

- 20.1 System checks response from Financial Institution to see whether card is to be retained.
If the card is not to be retained processing continues from 20.1e.
- 20.1a If the card is to be retained counter displays screen 9 *Retain Card* (see 8.1.5).
- 20.1b Clerk specifies whether card is retained or not.
- 20.1c If card is retained processing continues from 20.1d.
Otherwise, processing continues from 20.11.
- 20.1d The system records that card is retained: processing continues from 20.11.
- 20.1e The system checks whether there has been a decline from the Merchant Acquirer. If the merchant acquirer declines the transaction then no reversal [C0] is required and processing continues at 20.1f: otherwise, processing continues at 20.2.
- 20.1f The counter displays screen 7 to show that the transaction has been declined.
- 20.1g The clerk acknowledges the message: processing continues from 20.11.
- 20.2 The counter records a [C0] to message store as a reversal.
- 20.2a The system checks whether [R] Amount = [A] Amount: (effectively the system checks the Auth response set by step 15.32). If they are the same processing continues from 20.2b: otherwise, processing continues at 20.3.
- 20.2b The counter displays screen 7 *Other decline* (see 8.1.4) to show that the amounts are unequal.
- 20.2c The clerk acknowledges the message: processing continues from 20.11.
- 20.3 If a Help desk call is required processing continues from 20.7.
- 20.4 Counter displays screen E8 (see 8.1.19) telling the clerk to call the Help desk.
- 20.5 If the clerk chooses not to print out the error message processing continues from 20.9
- 20.6 The counter prints an error message from screen E8 (see 8.1.19).
- 20.7 Otherwise, the counter displays screen 10 *Transaction failure* (see 8.1.6) telling the clerk NOT to call the Help desk.
- 20.8 The clerk acknowledges the message and processing continues at 20.11
- 20.9 The clerk acknowledges the message and processing continues at 20.11
- 20.10 Counter displays screen 12 (see 8.1.8) asking the clerk to tear off the slip, processing continues from 20.11
- 20.11 The system sets the transaction value to zero.
- 20.12 The system prints the customer slip.
- 20.13 The transaction is added to the stack, the transaction ends and the counter returns to the **Settlement Menu**.

2.3.11 Card Removal and End Processing

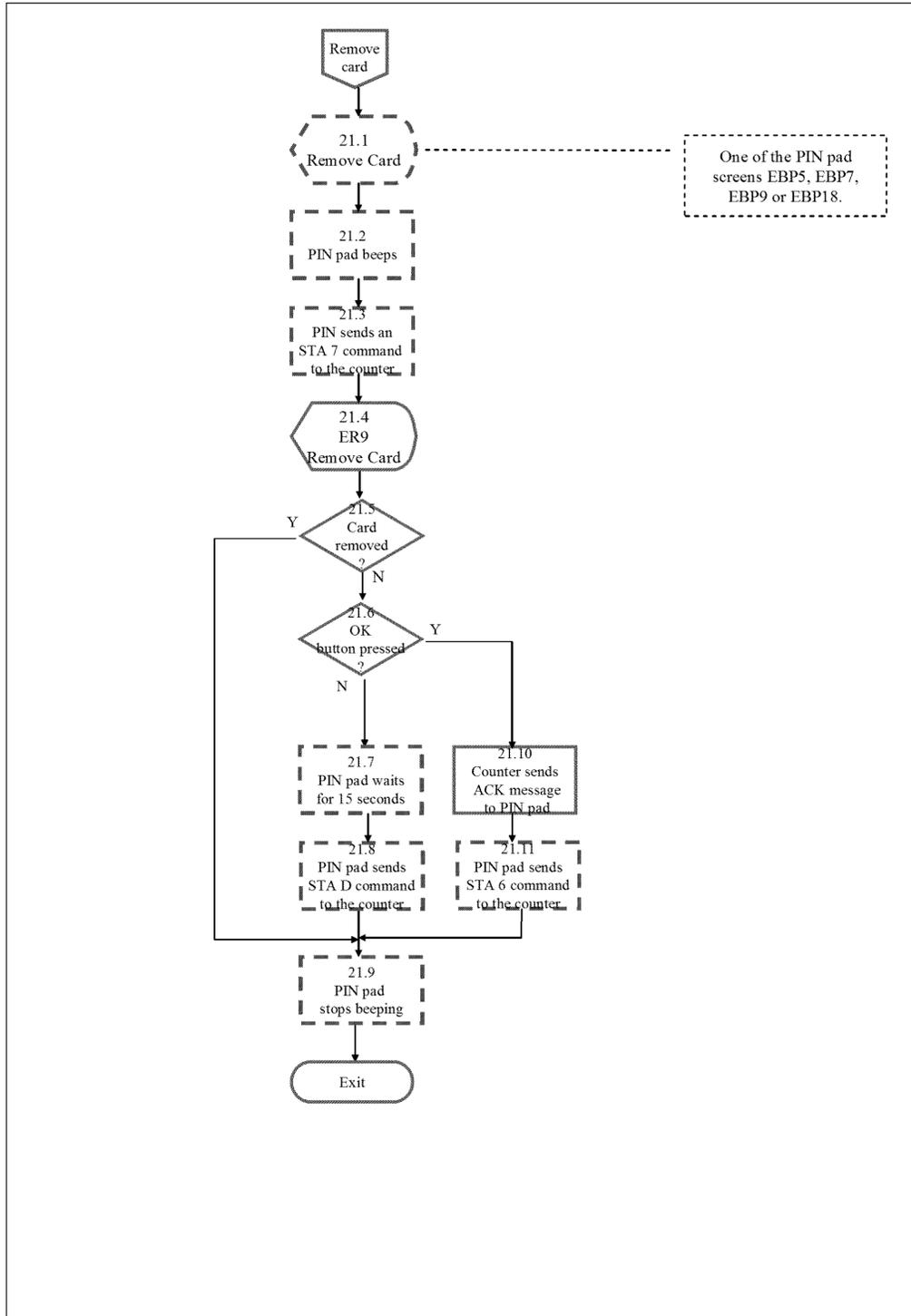


Figure 21: Activity Flows for Remove Card

Notes for Figure 21

- 21.1 A remove card screen will be displayed on the PIN Pad. This may be any one of the screens EBP5, EBP7, EBP9 or EBP18 depending on the outcome of previous PIN Pad processing.
- 21.2 The PIN pad beeps for a configurable period (15 seconds) to remind the customer to remove their card.
- 21.3 PIN pad sends STA 7 command to the counter to inform the counter that the card is still in the PIN pad.
- 21.4 Counter displays screen ER9 *Remove card from PIN pad* (see 5.1.9).
The screen has an acknowledge button which the clerk can use to stop the PIN pad from beeping and to move the PIN Pad to its next operation.
- 21.5 If the card is removed then processing continues at 21.9.
- 21.6 The clerk touches the OK button on the ER9 screen then processing continues at 21.10.
- 21.7 The PIN pad waits for a configurable period (15 seconds): (this is a reference data setting).
- 21.8 PIN pad sends STA D command to the counter to tell the counter that the remove card timeout has expired.
- 21.9 PIN pad stops beeping and the process exits.
- 21.10 The counter returns an ACK command to the PIN pad. This will stop the beeping and break the PIN pad out of its card removal loop.
- 21.11 PIN pad sends an STA 6 command to the counter to inform the counter that the card removal loop has been aborted. Processing continues at 21.9.

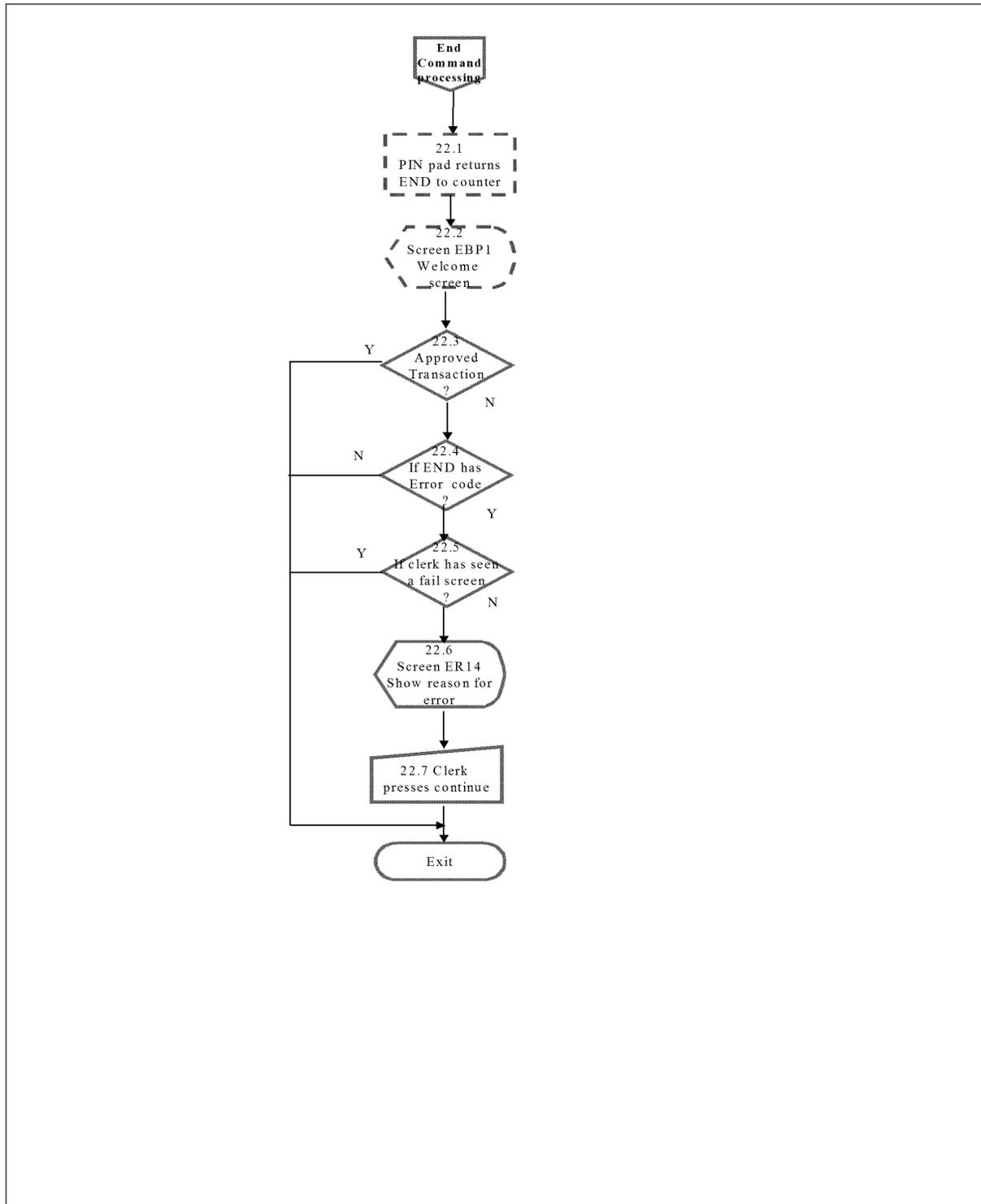


Figure 22: Activity Flows for End Command Processing

Notes on Figure 22

- 22.1 The PIN Pad sends an END command to the counter.
- 22.2 The PIN Pad displays the welcome screen EBP1.
- 22.3 If the transaction has been approved then the process exits.
- 22.4 If the END command does not carry a failure code then the process exits.
- 22.5 If a declined or a cancelled screen has been shown to the clerk already then the process exits.
- 22.6 The counter displays screen ER14 *PIN pad error screen* (see 5.1.14) describing the reported error. If the error code is an error then an event will also be logged to the event log.

The ER14 screen will only be displayed if the PIN pad has returned an error code on the END command and no other cancel or decline screen has been shown: so it won't appear if screen 7 *Other decline* (see 8.1.4) or screen 10 *Transaction failure* (see 8.1.6) has appeared earlier.
- 22.7 The clerk presses the continue button and the process exits.

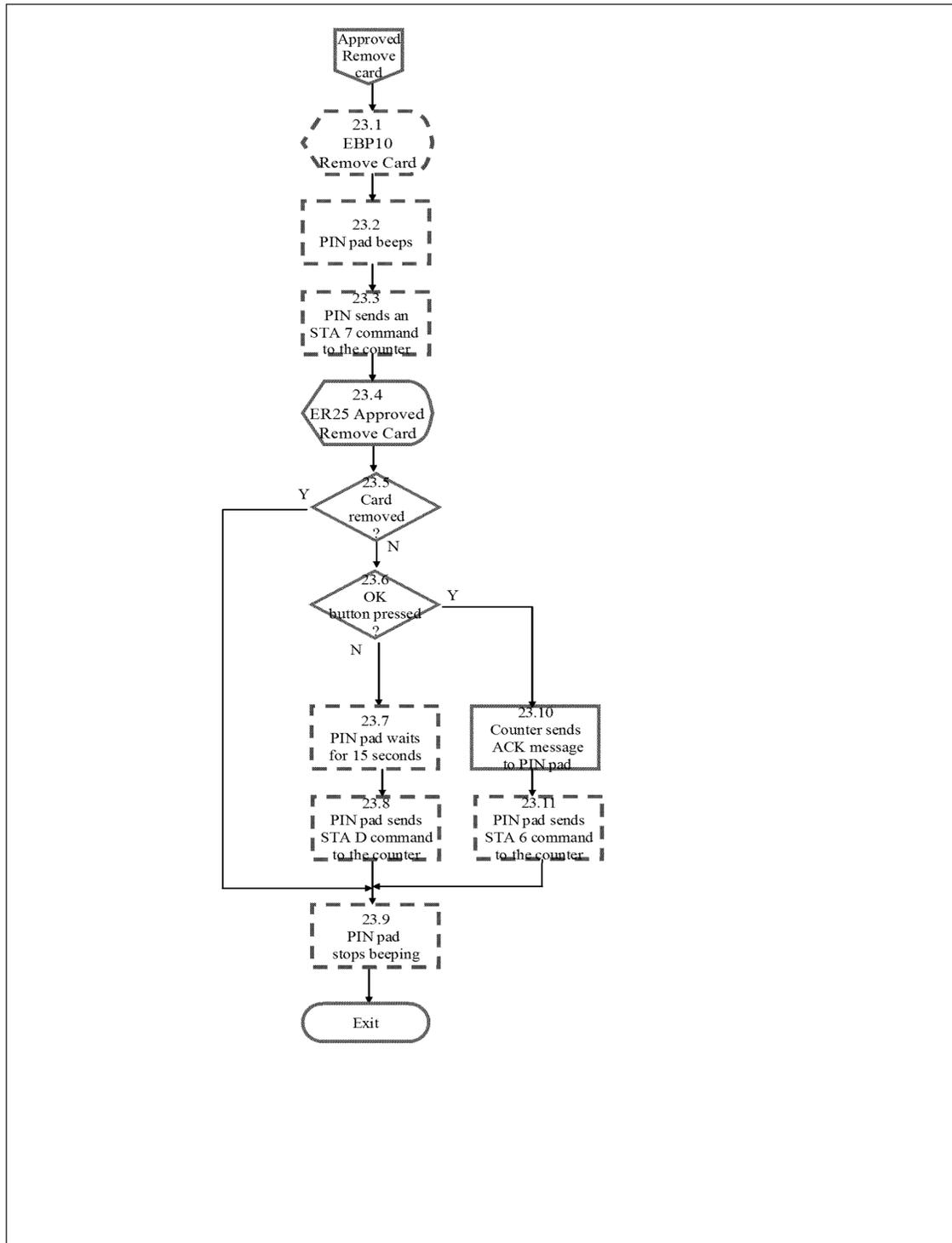


Figure 23: Activity Flows for Approved Remove Card

Notes for Figure 23

- 23.1 Screen EBP10 *Approved remove card* (see 7.2.9) will be displayed on the PIN Pad.
- 23.2 The PIN pad beeps for a configurable period (15 seconds) to remind the customer to remove their card.
- 23.3 PIN pad sends STA 7 command to the counter to inform the counter that the card is still in the PIN pad.
- 23.4 Counter displays screen ER25 *Transaction authorised remove card* (see 5.1.25).
The screen has an acknowledge button which the clerk can use to stop the PIN pad from beeping and to move the PIN Pad to its next operation.
This screen also confirms to the clerk that the transaction has been authorised.
- 23.5 If the card is removed then processing continues at 21.9.
- 23.6 The clerk touches the OK button on the ER25 screen then processing continues at 21.10.
- 23.7 The PIN pad waits for a configurable period (15 seconds): (this is a reference data setting).
- 23.8 PIN pad sends STA D command to the counter to tell the counter that the remove card timeout has expired.
- 23.9 PIN pad stops beeping and the process exits.
- 23.10 The counter returns an ACK command to the PIN pad. This will stop the beeping and break the PIN pad out of its card removal loop.
- 23.11 PIN pad sends an STA 6 command to the counter to inform the counter that the card removal loop has been aborted. Processing continues at 23.9.

3.0 Receipts

At release S70 the customer receipt will be incorporated as part of the session receipt. Only where a signature is required will there be an outlet “receipt”.

All debit card products will be set up so as to force the printing of a session receipt for successful transactions.

For declined transactions, a Customer receipt will be printed immediately (since it results in a Zero value transaction on the stack), and the data for the declined transaction will not be included in the session receipt.

This section describes the following receipts:

3.1 Customer Session Receipt (Non debit card)

3.2 Customer Session Receipt (With debit card payment)

3.3 Duplicate Customer Session Receipt

3.4 Customer Debit Card Payment/Refund Receipt – Declined Transaction

3.5 Office Debit Card Receipt for Signature

The circumstances in which the debit card receipts are printed as follows:

Result	Verification	Card details on session receipt?	Office Receipt?	Customer Receipt?
Approved	Chip & PIN	Yes	No	No
Approved	Magnetic swipe & signature	Yes	Yes	No
Approved	Chip and Signature	Yes	Yes	No
Approved	Chip and PIN and Signature	Yes	Yes	No
Approved	No CVM	Yes	No	No
Abandon before [R]	All	No	No	No
MA decline	All	No	No	Yes
PIN pad decline	Chip & PIN	No	No	Yes
PIN pad decline	No CVM	No	No	Yes
Decline network fail	All	No	No	Yes
Card check fail	Magnetic swipe & signature	No	Yes	Yes
Signature fail	Magnetic swipe & signature	No	Yes	Yes
Signature fail	Chip & signature	No	Yes	Yes

3.1 Customer Session Receipt (Non debit card)

3.1.1 Purpose

This particular section covers non debit card sessions.

3.1.2 Frequency

Ad hoc.

3.1.3 Notes

A receipt is only available for the last completed session.

3.1.4 Sequence

Receipts and Payments (excluding filtered products) in chronological order, then MoP (including filtered products).

**The data shown in the examples is illustrative only –
the exact text can change, and so differ from that in the examples.**

3.1.5 Layout and Example Content

English text

	1	2	3	4																																																											
	123456789012345678901234567890123456789012																																																														
01	<div style="text-align: center;"> Post Office Ltd. Your Receipt Feltham Post Office 1, The Walkway Kings Parade Middle of Town Feltham Middlesex TW1 3DD VAT REG No. 243 1700 02 11/02/2003 13:54 SESSION : 1-6774-1 <table border="0" style="width: 100%;"> <tr> <td colspan="4">Stmp bk 1st x 10</td> </tr> <tr> <td style="width: 10%;">20</td> <td style="width: 10%;">1</td> <td style="width: 10%;">@</td> <td style="width: 10%;">2.60</td> <td style="width: 10%; text-align: right;">2.60</td> </tr> <tr> <td colspan="5">21 Postage stmp</td> </tr> <tr> <td>22</td> <td>1</td> <td>@</td> <td>3.00</td> <td style="text-align: right;">3.00</td> </tr> <tr> <td colspan="5">23 Colour TV lic</td> </tr> <tr> <td>24</td> <td>1</td> <td>@</td> <td>97.50</td> <td style="text-align: right;">97.50</td> </tr> <tr> <td>25</td> <td>US Dollar</td> <td>@1.6121</td> <td></td> <td style="text-align: right;">USD/GBP</td> </tr> <tr> <td>26</td> <td>60-</td> <td></td> <td></td> <td style="text-align: right;">32.22-</td> </tr> <tr> <td>27</td> <td>Commission</td> <td></td> <td></td> <td style="text-align: right;">5.00</td> </tr> <tr> <td>29</td> <td colspan="3">TOTAL DUE TO POST OFFICE</td> <td style="text-align: right;">75.88</td> </tr> <tr> <td>31</td> <td>Cheque</td> <td>FROM CUSTOMER</td> <td></td> <td style="text-align: right;">75.88</td> </tr> <tr> <td>32</td> <td>BALANCE</td> <td></td> <td></td> <td style="text-align: right;">0.00</td> </tr> </table> </div>				Stmp bk 1st x 10				20	1	@	2.60	2.60	21 Postage stmp					22	1	@	3.00	3.00	23 Colour TV lic					24	1	@	97.50	97.50	25	US Dollar	@1.6121		USD/GBP	26	60-			32.22-	27	Commission			5.00	29	TOTAL DUE TO POST OFFICE			75.88	31	Cheque	FROM CUSTOMER		75.88	32	BALANCE			0.00
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Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

Welsh/English text

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123456789012345678901234567890123456789012
01          1          2          3          4
02          Swyddfa'r Post Cyf.
03          Post Office Ltd.
04          Eich Derbynneb
05          Your Receipt
06 Feltham Post Office
07 1, The Walkway
08 Kings Parade
09 Middle of Town
10 Feltham
11 Middlesex
12 TW1 3DD
13          Rhif COF.TAW/VAT REG No. 243 1700 02
14          11/02/2003 13:54
15          SESIWN/SESSION : 1-6774-1
16
17
18
19
20 Stmp bk 1st x 10
21 1 @ 2.60 2.60
22 Postage stmp
23 1 @ 3.00 3.00
24 Colour TV lic
25 1 @ 97.50 97.50
26 US Dollar @1.6121 USD/GBP
27 60- 32.22-
28 Commission 5.00
29
30 CYF DYLEDUS I SWYDDFA'R POST
31 TOTAL DUE TO POST OFFICE 75.88
32
33 Siec GAN Y CWSMER
34 Cheque FROM CUSTOMER 75.88
35 BALANS/BALANCE 0.00
36
37
38
39          Diolch Yn Fawr
40          Thank You
41
123456789012345678901234567890123456789012

```

Field Name	English		Welsh/English		Length	Contents
	Line No.	Char Pos'ns	Line No.	Char Pos'ns		
Welsh Header	01	-			-	Blank.

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

			01	13-31	19	'Swyddfa'r Post Cyf.'
English Header	02	14-29	02	14-29	16	'Post Office Ltd.'
Welsh Text	-	-			-	Suppressed.
			03	15-28	14	'Eich Derbynneb'.
English Text	03	16-27	04	16-27	12	'Your Receipt'.
Office Name	04	01-30	05	01-30	30	Branch name, up to 30 characters: (ooo...)
Address 1,2,3,4,5	05-09	01-40	06-10	01-40	40	Branch address: a variable number of lines up to a maximum of five.
Postcode	10	01-08	11	01-08	8	Branch postcode: <i>pppp ppp</i>
Date	13	13-29	14	13-29	17	Date and time: <i>dd/mm/yyyy hh:mm</i>
Session ID	14	21-31	15	27-37	11	Session ID.
Message	17	01-42			42	Blank or 'R E V E R S A L' or 'Recovery'.
			18	01-42	42	Blank or 'D I R Y M U / R E V E R S A L' or 'Recovery'.

Field Name	English		Welsh/English		Length	Contents
	Line No.	Char Pos'ns	Line No.	Char Pos'ns		
Non-MoP Product:						Repeated as necessary.

Non-BdeC
txn:

Product

Additional data

Qty

Unit Price

Value

BdeC txn:

Product
Rate

Currency code

Currency code

Qty

COMMERCIAL IN-CONFIDENCE

Page: 101 of 224

Without Prejudice and Subject to Contract

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

	19	01-16	20	01-16	16	Only present if applicable. E.g. Girobank account number
	19	21-42	20	21-42	22	
	20	01-05	21	01-05	5	
	20	10-18	21	10-18	9	
	20	29-40	21	29-40	12	
	25	01-16	26	01-16	16	Only present if applicable. At most, 4 decimal places. Changed currency. Local currency. Negative for a buy transaction. Negative for a buy transaction. If zero, whole line is blank.
	25	19-30	26	19-30	12	
	25	32-34	26	32-34	3	
	25	36-38	26	36-38	3	
	26	01-15	27	01-15	15	
	26	29-40	27	29-40	12	
	27	29-40	28	29-40	12	
Non-MoP Detail:						
Non-MoP Session Effect (Welsh)	-	-	30	01-26	26	'CYF DYLEDUS I SWYDDFA'R POST' or 'CYF DYLEDUS I'R CWSMER'.
Non-MoP Session Effect (English)	29	01-26	31	01-26	26	'TOTAL DUE TO POST OFFICE' or 'TOTAL DUE TO CUSTOMER'.
Non-MoP Value	29	29-40	31	29-40	12	

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

MoP Detail:						
MoP Name (Welsh)	-	-	33	01-16	16	E.g. 'Siec'
MoP Name (English)	31	01-16	34	01-16	16	E.g. 'Cheque'.
MoP Session Effect (Welsh)	-	-	33	18-30	13	'GAN Y CWSMER' or I'R CWSMER'.
MoP Session Effect (English)	31	18-30	34	18-30	13	'FROM CUSTOMER' or 'TO CUSTOMER'.
MoP Value						Amount:
	31	32-40	34	32-40	9	For not more than 99999.99
	31+1	29-40	34+1	29-40	12	For more than 99999.99
Non-MoP Total	32	29-40	35	29-40	12	
Welsh Footer	36	-				Blank.
			39	14-27	14	'Diolch yn Fawr'.
English Footer	37	16-24	40	16-24	9	'Thank You'.

3.2 Customer Session Receipt (With debit card payment)

3.2.1 Purpose

This section covers the new format for the customer session receipt at S70 where settlements have used debit cards. The new format will cover settlement by PIN and settlement to the fallback scenarios of chip and signature, and magnetic swipe and signature or PAN Key entry and signature.

3.2.2 Frequency

End of customer session when debit card transaction has taken place.

3.2.3 Notes

The circumstances in which the debit card receipts are printed are given in Section 3.

A Horizon parameter defines a filter, which determines the Post Office Ltd products that are printed below the TOTAL DUE TO POST OFFICE line. For example, debit card payments/refunds appear below this line and not as part of the transaction listing.

The additional debit card portion will contain the following:

Card Number, Issue Number, Authorisation Code, MID, TID, Application ID, Application Effective Date, Application Expiry Date, Pan Sequence Number, Transaction Sequence Number and the Amount of the debit card transaction, issuer scheme name, EFT number, an entry indicator, and the date and time of payment.

3.2.4 Sequence

Printed at end of session.

**The data shown in the examples is illustrative only –
the exact text can change, and so differ from that in the examples.**

3.2.5 Layout and Example Content

This is a change to the customer session receipt (with debit card payment) to meet Streamline requirements:

- For a combination CVM (both PIN & signature), instead of RT201/203, two new outcome messages (RT206/207), containing the words 'Cardholder signature', have been provided
- For signature CVM outcome messages RT200/202 now include the words 'Cardholder signature'
- For all CVMs, the words 'Transaction confirmed' has been appended to the receipt text.

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

Welsh/English text - Payment

	1	2	3	4
	123456789012345678901234567890123456789012			
01		Swyddfa'r Post Cyf.		
02		Post Office Ltd.		
03		Eich Derbynneb		
04		Your Receipt		
05	Feltham Post Office			
06	1, The Walkway			
07	Kings Parade			
08	Middle of Town			
09	Feltham			
10	Middlesex			
11	TW1 3DD			
12				
13		Rhif COF.TAW/VAT REG No. 243 1700 02		
14		11/02/2003 13:54		
15		SESIWN/SESSION : 1-6774-1		
16				
17				
18				
19				
20	Stmp bk 1st x 10			
21	1 @ 2.60			2.60
22	Postage stmp			
23	1 @ 3.00			3.00
24	Colour TV lic			
25	1 @ 97.50			97.50
26	US Dollar @1.6121		USD/GBP	
27	60-			32.22-
28	Commission			5.00
29				
30	CYF DYLEDUS I SWYDDFA'R POST			
31	TOTAL DUE TO POST OFFICE			75.88
32				
33	Siec GAN Y CWSMER			
34	Cheque FROM CUSTOMER			25.88
35	Taliad Cerdyn GAN Y CWSMER			
36	Card Payment FROM CUSTOMER			50.00
37	BALANS/BALANCE			0.00
38				
39		Taliad/Payment		
40	Visa			
41	Rhif Cerdyn:		Cyhoeddiad:	
42	Card Number: **** *ppp		Issue: nnn	
43	www/kkkk			
44	Cod Awdurdodi:		Rhif EFT:	
45	Auth Code: nnnnnn		EFT No: www	
46	ID y Masnachwr:			
47	Merchant ID: rrrrrrrrrrrrrrrr			
48	ID y Derfynell:			
49	Terminal ID: tttttttt			
50	ID Cais:			
51	Application ID: aaaaaaaaaaaaaaaaaa			
52	O: Diweddu:		Rhif Cyf PAN:	
53	From: MM/YY Expiry: MM/YY		PAN Seq No: mm	
54	ID y Gweithrediad:			

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

Welsh/English text - Refund

	1	2	3	4
	123456789012345678901234567890123456789012			
01		Swyddfa'r Post Cyf.		
02		Post Office Ltd.		
03		Eich Derbynneb		
04		Your Receipt		
05	Feltham Post Office			
06	1, The Walkway			
07	Kings Parade			
08	Middle of Town			
09	Feltham			
10	Middlesex			
11	TW1 3DD			
12				
13		Rhif COF.TAW/VAT REG No. 243 1700 02		
14		11/02/2003 13:54		
15		SESIWN/SESSION : 1-6774-1		
16				
17		D I R Y M U / R E V E R S A L		
18				
19				
20	Stmp bk 1st x 10			
21	1 @ 2.60			2.60
22	Postage stmp			
23	1 @ 3.00			3.00
24	Colour TV lic			
25	1 @ 97.50			97.50
26	US Dollar @1.6121			USD/GBP
27	60-			32.22-
28	Commission			5.00
29				
30	CYF DYLEDUS I'R CWSMER			
31	TOTAL DUE TO CUSTOMER			75.88
32				
33	Siec I'R CWSMER			
34	Cheque TO CUSTOMER			25.88
35	Taliad Cerdyn I'R CWSMER			
36	Card Payment TO CUSTOMER			50.00
37	BALANS/BALANCE			0.00
38				
39		Ad-daliad/Refund		
40	Visa			
41	Rhif Cerdyn:		Cyhoeddiad:	
42	Card Number: **** *ppp		Issue:nnn	
43	www/kkkk			
44	Cod Awdurdodi:		Rhif EFT:	
45	Auth Code: nnnnnn		EFT No: www	
46	ID y Masnachwr:			
47	Merchant ID: rrrrrrrrrrrrrrr			
48	ID y Derfynell:			
49	Terminal ID: tttttttt			
50	ID Cais:			
51	Application ID: aaaaaaaaaaaaaaaaa			
52	O: Diweddu:		Rhif Cyf PAN:	
53	From: MM/YY Expiry: MM/YY		PAN Seq No: mm	
54	ID y Gweithrediad:			

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

Session ID	14	21-31	15	27-37	11	Session ID.
Message	17	01-42			42	Blank or 'REVERSAL' or 'Recovery'.
			18	01-42	42	Blank or 'DIRYMU / REVERSAL' or 'Recovery'.

Field Name	English		Welsh		Length	Contents
	Line No.	Char Pos'ns	Line No.	Char Pos'ns		
Non-MoP Product:						Repeated as necessary.
Non-BdeC txn:						Only present if applicable.
Product	19	01-16	20	01-16	16	E.g. Girobank account number
Additional data	19	21-42	20	21-42	22	
Qty	20	01-05	21	01-05	5	
Unit Price	20	10-18	21	10-18	9	
Value	20	29-40	21	29-40	12	
BdeC txn:	20	29-40	21	29-40	12	
Product						Only present if applicable.
Rate	25	01-16	26	01-16	16	At most, 4 decimal places.
Currency code	25	19-30	26	19-30	12	
Currency code	25	32-34	26	32-34	3	Changed currency.
Qty	25	36-38	26	36-38	3	Local currency.
Value	26	01-15	27	01-15	15	Negative for a buy transaction.
Commission	26	29-40	27	29-40	12	Negative for a buy transaction.
	27	29-40	28	29-40	12	If zero, whole line is blank.

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

Non-MoP Detail:						
Non-MoP Session Effect (Welsh)	-	-	30	01-26	26	'CYF DYLEDUS I SWYDDFA'R POST' or 'CYF DYLEDUS I'R CWSMER'.
Non-MoP Session Effect (English)	29	01-26	31	01-26	26	'TOTAL DUE TO POST OFFICE' or 'TOTAL DUE TO CUSTOMER'.
Non-MoP Value	29	29-40	31	29-40	12	
MoP Detail:						
MoP Name (Welsh)	-	-	33	01-16	16	E.g. 'Siec'
MoP Name (English)	31	01-16	34	01-16	16	E.g. 'Cheque'.
MoP Session Effect (Welsh)	-	-	33	18-30	13	'GAN Y CWSMER' or I'R CWSMER'.
MoP Session Effect (English)	31	18-30	34	18-30	13	'FROM CUSTOMER' or 'TO CUSTOMER'.
MoP Value	31	32-40	34	32-40	9	Amount: For not more than 99999.99
	31+1	29-40	34+1	29-40	12	For more than 99999.99

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

MoP Detail:						
MoP Name (Welsh)	-	-	33	01-16	16	E.g. 'Taliad Cerdyn'
MoP Name (English)	32	01-16	34	01-16	16	E.g. 'Card Payment'.
MoP Session Effect (Welsh)	-	-	33	18-30	13	'GAN Y CWSMER' or I'R CWSMER'.
MoP Session Effect (English)	32	18-30	34	18-30	13	'FROM CUSTOMER' or 'TO CUSTOMER'.
MoP Value						Amount:
	32	32-40	34	32-40	9	For not more than 99999.99
	32+1	29-40	34+1	29-40	12	For more than 99999.99
Non-MoP Total	33	29-40	37	29-40	12	

Field Name	English		Welsh		Length	Contents
	Line No.	Char Pos'ns	Line No.	Char Pos'ns		
Title	35	01-42			42	'Payment' or 'Refund'.
			39	01-42	42	'Taliad/Payment' or 'Ad-daliad/Refund'.
Issuer Scheme name	36	01-30	40	01-30	30	Issuer Scheme name. For cards processed by the PIN pad this field is obtained from the application label from the chip. For MSR the field will be derived from Reference data
Card Number	37	14-32	42	14-32	19	Obscured PAN (only last four digits shown, remaining digits replaced by asterisks): formatted with spaces if a 16-digit PAN, unformatted if any other length.
Issue Number	37	40-42	42	40-42	3	Obtained from card: not always present

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

Entry indicator (<i>kkk...</i>) English	38	01-03			3	'ICC'=chip read
		01-06			6	'swiped'=magnetic stripe read
		01-05			6	'keyed'=manual entry
(www.../kkk...) Welsh/English			43	01-07	7	'ICC/ICC'=chip read
				01-16	16	'sweipiwyd/swiped'=magnetic stripe read
				01-16	16	'bysellwyd/keyed'=manual entry
Authorisation code	39	12-17	44	12-17	6	Authorisation code from Financial Institution
Electronic Funds Transfer Sequence Number	39	32-35	44	32-35	4	Number assigned by counter and sent in [R] message to Merchant Acquirer
Merchant ID ¹³	40	14-28	47	14-28	15	Merchant identifier (<i>rrr...</i>), when available.
Terminal ID	41	14-21	49	14-21	8	Terminal identifier (<i>ttt...</i>), when available.
Application ID	42	17-32	51	17-32	16	Obtained from Application data from the card as read by PIN pad: Blank for Swipe and Signature and PKE.
From Date	43	7-11	53	7-11	5	Obtained from Application data from the card as read by PIN pad: or from track 2 data if magnetic swipe card used
Expiry Date	44	22-26	53	22-26	5	Obtained from Application data from the card as read by PIN pad: or from track 2 data if magnetic swipe card used

¹³ If an [A] from the Merchant Acquirer has been received the Merchant ID will be available. If there has been a network problem or timeout or if the transaction was cancelled by the Clerk at the Card Check screen before the [A] was received neither the Merchant ID nor the Terminal ID will be available

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

PAN Sequence Number	43	41-42	53	41-42	2	Obscured PAN (only last four digits shown, remaining digits replaced by asterisks): formatted with spaces if a 16-digit PAN, unformatted if any other length.
Transaction ID	44	17-42	55	17-42	26	Unique system-generated transaction identifier (<i>nmm...</i>).
Date & time of payment	45	01-37	56, 57	01-37	37	The date and time that the payment or refund was made
Amount	47	09-17	59	13-21	9	7-digit amount in the format £99999.99 for the requested transaction value.
Outcome message (see Section 3.2.5.1)	49-56	01-42			42	Transaction outcome message in English (<i>mmi...</i> up to 8 lines), suppressed if blank.
			61-68	01-42	42	Transaction outcome message in bilingual text (<i>vvv...</i> up to 8 lines), suppressed if blank.
Free text footer	58, 59	01-40	70, 71	01-40	40	Free text (<i>fff...</i> , up to 2 lines) if provided, or suppressed.
Please Retain	61	-				Blank.
			73	02-41	40	‘Cadwch i gyfeirio ati, os gwelch yn dda’
	62	05-38	74	05-38	34	‘Please retain for future reference’
Welsh Footer	64	-				Blank.
			76	14-27	14	‘Diolch yn Fawr’.
English Footer	65	16-24	77	16-24	9	‘Thank You’.

3.2.5.1 Receipt Outcome Messages

The message printed in the 'Outcome message' field of the customer copy receipt (see Section 3.2.5) is dependent on a number of circumstances, as shown in the following table.

The Message refs relate to entries in the table in Section 3.2.5.2 that define the text of each message.

Authorisation Status	Outcome	Message Ref.
Authorised OK	Payment Authorised by MA and signature matched by clerk	RT200
	Payment Authorised by MA and verified by PIN pad	RT201
	Refund Authorised by MA and signature matched by clerk	RT202
	Refund Authorised by MA and verified by PIN pad	RT203
	Payment Authorised by MA and verified by PIN pad and by signature	RT206
	Refund Authorised by MA and verified by PIN pad and by signature	RT207
	Payment Authorised by MA and not verified by cardholder	RT204
	Refund Authorised by MA and not verified by cardholder	RT205

Key:

MA = Merchant Acquirer

3.2.5.2 Outcome Message Text

The message text is the same as pre S70 and includes the new authorisation status for transactions accepted by the Merchant Acquirer but failed by the PIN pad. New codes have been added to cover combination CVMs.

The text of the outcome message printed is as follows (word wrap as shown):

Mess. Ref.	Message Text - English	Message Text - Welsh/English
RT200	Your account will be debited with the above amount. Cardholder signature. Transaction confirmed.	Debydir eich cyfrif gyda'r swm uchod. Llofnod deiliad y cerdyn. Cadarnhawyd y gweithrediad. Your account will be debited with the above amount. Cardholder signature. Transaction confirmed.
RT201	Your account will be debited with the above amount. Cardholder PIN verified. Transaction confirmed.	Debydir eich cyfrif gyda'r swm uchod. Gwiriwyd PIN deiliad y cerdyn. Cadarnhawyd y gweithrediad. Your account will be debited with the above amount. Cardholder PIN verified. Transaction confirmed.

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

RT202	Your account will be credited with the above amount. Cardholder signature. Transaction confirmed.	Credydur eich cyfrif gyda'r swm uchod. Llofnod deiliad y cerdyn. Cadarnhawyd y gweithrediad. Your account will be credited with the above amount. Cardholder signature. Transaction confirmed.
RT203	Your account will be credited with the above amount. Cardholder PIN verified. Transaction confirmed.	Credydur eich cyfrif gyda'r swm uchod. Gwiriwyd PIN deiliad y cerdyn. Cadarnhawyd y gweithrediad. Your account will be credited with the above amount. Cardholder PIN verified. Transaction confirmed.
RT204	Your account will be debited with the above amount. Transaction confirmed.	Debydur eich cyfrif gyda'r swm uchod. Cadarnhawyd y gweithrediad. Your account will be debited with the above amount. Transaction confirmed.
RT205	Your account will be credited with the above amount. Transaction confirmed.	Credydur eich cyfrif gyda'r swm uchod. Cadarnhawyd y gweithrediad. Your account will be credited with the above amount. Transaction confirmed.
RT206	Your account will be debited with the above amount. Cardholder PIN verified. Cardholder signature. Transaction confirmed.	Debydur eich cyfrif gyda'r swm uchod. Gwiriwyd PIN deiliad y cerdyn. Llofnod deiliad y cerdyn. Cadarnhawyd y gweithrediad. Your account will be debited with the above amount. Cardholder PIN verified. Cardholder signature. Transaction confirmed.
RT207	Your account will be credited with the above amount. Cardholder PIN verified. Cardholder signature. Transaction confirmed.	Credydur eich cyfrif gyda'r swm uchod. Gwiriwyd PIN deiliad y cerdyn. Llofnod deiliad y cerdyn. Cadarnhawyd y gweithrediad. Your account will be credited with the above amount. Cardholder PIN verified. Cardholder signature. Transaction confirmed.

3.3 Duplicate Customer Session Receipt

3.3.1 Purpose

This is a copy of the customer record of the session.

3.3.2 Frequency

Ad hoc.

3.3.3 Notes

Replica of last receipt issued. Any number may be taken, all say 'D U P L I C A T E'.

A Horizon parameter defines a filter which determines the Post Office Ltd products that are printed below the TOTAL DUE TO POST OFFICE line. For example, debit card payments/refunds appear below this line and not as part of the transaction listing.

3.3.4 Sequence

Receipts and Payments (excluding filtered products) in chronological order, then MoP (including filtered products).

**The data shown in the examples is illustrative only –
the exact text can change, and so differ from that in the examples.**

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

Welsh/English text - Payment

	1	2	3	4
	123456789012345678901234567890123456789012			
01	Swyddfa'r Post Cyf.			
02	Post Office Ltd.			
03	Eich Derbynneb			
04	Your Receipt			
05	Feltham Post Office			
06	1, The Walkway			
07	Kings Parade			
08	Middle of Town			
09	Feltham			
10	Middlesex			
11	TW1 3DD			
12				
13	Rhif COF.TAW/VAT REG No. 243 1700 02			
14	11/02/2003 13:54			
15	SESIWN/SESSION : 1-6774-1			
16				
17	D Y B L Y G I A D / D U P L I C A T E			
18				
19				
20	Stmp bk 1st x 10			
21	1	@	2.60	2.60
22	Postage stmp			
23	1	@	3.00	3.00
24	Colour TV lic			
25	1	@	97.50	97.50
26	US Dollar	@1.6121		USD/GBP
27	60-			32.22-
28	Commission			5.00
29				
30	CYF DYLEDUS I SWYDDFA'R POST			
31	TOTAL DUE TO POST OFFICE			75.88
32				
33	Siec	GAN Y CWSMER		
34	Cheque	FROM CUSTOMER		25.88
35	Taliad Cerdyn	GAN Y CWSMER		
36	Card Payment	FROM CUSTOMER		50.00
37	BALANS/BALANCE			0.00
38				
39	Taliad/Payment			
40	Visa			
41	Rhif Cerdyn:		Cyhoeddiad:	
42	Card Number: **** * www/kkkkk		pppp Issue:nnn	
43				
44	Cod Awdurdodi:		Rhif EFT:	
45	Auth Code: nnnnnn		EFT No: www	
46	ID y Masnachwr:			
47	Merchant ID: rrrrrrrrrrrrrrr			
48	ID y Derfynell:			
49	Terminal ID: tttttttt			
50	ID Cais:			
51	Application ID: aaaaaaaaaaaaaa			
52	O:	Diweddu:	Rhif Cyf PAN:	
53	From: MM/YY	Expiry: MM/YY	PAN Seq No: mm	
54	ID y Gweithrediad:			

3.4 Customer Debit Card Payment/Refund Receipt – Declined Transaction

3.4.1 Purpose

This is the debit card customer receipt for a declined debit card transaction. The receipt format contains additional data items not present pre S70: Card Issue Number, Authorisation Code, Application ID, Effective From Date, Effective To Date, PAN Sequence Number, EFT Number, issuer scheme name, an entry indicator, and the date and time of payment. Less detail of the card number is now shown.

3.4.2 Frequency

For declined debit card transactions within a customer session.

3.4.3 Notes

The circumstances in which the debit card receipts are printed are given in Section 3.

3.4.4 Sequence

On completion of failed transaction.

**The data shown in the examples is illustrative only –
the exact text can change, and so differ from that in the examples.**

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

123456789012345678901234567890123456789012

Field Name	English		Welsh		Length	Contents
	Line No.	Char Pos'ns	Line No.	Char Pos'ns		
Title	14	01-42			42	'Payment' or 'Refund'.
			15	01-42	42	'Taliad/Payment' or 'Ad-daliad/Refund'.
Issuer Scheme name	15	01-30	16	01-30	30	Issuer Scheme name (<i>jjj...</i>). For cards processed by the PIN pad this field is obtained from the application label from the chip. For MSR the field will be derived from Reference data
Card Number	16	14-32	18	14-32	19	Obscured PAN (only last four digits shown, remaining digits replaced by asterisks): formatted with spaces if a 16-digit PAN, unformatted if any other length.
Issue Number	16	40-42	18	40-42	3	Obtained from card: not always present
Entry indicator (<i>kkk...</i>) English (<i>www.../kkk...</i>) Welsh/English	17	01-03			3	'ICC'=chip read
		01-06			6	'swiped'=magnetic stripe read
		01-05			6	'keyed'=manual entry
			19	01-07	7	'ICC/ICC'=chip read
				01-16	16	'sweipwyd/swiped'= magnetic stripe read
				01-16	16	'bysellwyd/keyed'= manual entry
Authorisation code	18	12-17	21	12-17	6	Authorisation code from Financial Institution, if present
Electronic Funds Transfer Sequence Number	18	32-35	21	32-35	4	Number assigned by counter and sent in [R] message to Merchant Acquirer
Merchant ID	19	14-28	23	14-28	15	Merchant identifier (<i>rrr...</i>), when available.

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

Terminal ID	20	14-21	25	14-21	8	Terminal identifier (<i>ttt...</i>), when available.
Application ID	21	17-32	27	17-32	16	Obtained from Application data from the card as read by PIN pad: or from track 2 data if magnetic swipe card used
From Date	22	7-11	29	07-11	5	Obtained from Application data from the card as read by PIN pad: or from track 2 data if magnetic swipe card used
Expiry Date	22	22-26	29	22-26	5	Obtained from Application data from the card as read by PIN pad: or from track 2 data if magnetic swipe card used
PAN Sequence Number	22	41-42	29	41-42	2	Obtained from Application data from the card as read by PIN pad: or from track 2 data if magnetic swipe card used
Transaction ID	23	17-42	31	17-42	26	Unique system-generated transaction identifier (<i>mmm...</i>).
Date & Time of Payment/ Refund			32	01-37	37	Welsh translation of the following line's fieldname: <i>wwwwwww</i> should be set to 'y Taliad' for a payment or 'yr Ad-daliad' for a refund
	24	01-37	33	01-37	37	The date and time that the payment or refund was made <i>pppppppp</i> should be set to 'Payment' or 'Refund'
Amount	26	09-17	35	13-21	9	7-digit amount in the format £99999.99 for the requested transaction value.
Outcome message (see Section 3.2.5.2)	28-35	01-42			42	Transaction outcome message in English (<i>uuu...</i> up to 4 lines), suppressed if blank.
			37-44	01-42	42	Transaction outcome message in bilingual text (<i>vvv...</i> up to 8 lines), suppressed if blank.
Free text footer	37, 38	01-40	46, 47	01-40	40	Free text (<i>fff...</i> , up to 2 lines) if provided, or suppressed.

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

Footer	40	-				Blank.
			49	02-39	38	‘Cadwch i gyfeirio ati, os gwelwch yn dda’.
	41	05-38	50	05-38	34	‘Please retain for future reference’.
	42	-				Blank.
			51	09-32	24	‘Nid derbynneb TAW yw hon’.
	43	09-33	52	09-33	25	‘This is not a VAT receipt’.

3.4.5.1 Receipt Outcome Messages

The message printed in the 'Outcome message' field of the customer copy receipt (see Section 3.3.5) is dependent on a number of circumstances, as shown in the following table.

The Message refs relate to entries in the table in Section 3.4.5.2 that define the text of each message.

The messages are the same as pre S70 but there is a new authorisation status for transactions accepted by the Merchant Acquirer but failed by the PIN pad.

Authorisation Status	Outcome	Message Ref.
Authorised OK	Declined by clerk – no customer signature	RT101
	Declined by clerk – signature fail	RT115
	Declined – authorised amount differs from requested amount	RT113
	Declined by PIN pad: (card error or customer cancel)	RT117
Card Check Failure by clerk	Declined	RT116
Declined – Impound Card	Clerk confirms that the card has been retained	RT102
	Clerk confirms that the card has not been retained	RT103
Declined – Other	MA declined	RT104
Failed by Debit Card agent	System/network failure	RT110/114
Failed by/at Counter (timeouts)	System/network failure	RT111
Failed by/at Counter (other)	System/network failure	RT112/118

Key:

MA = Merchant Acquirer

3.4.5.2 Outcome Message Text

The message text is the same as pre S70 and includes the new authorisation status for transactions accepted by the Merchant Acquirer but failed by the PIN pad.

The text of the outcome message printed is as follows (word wrap as shown):

Mess. Ref.	Message Text - English	Message Text - Welsh/English
RT101, RT113, RT115, RT116	*** CANCELLED ***	*** DIDDYMWYD/CANCELLED ***
RT102	*** CANCELLED *** The card has been retained. You may wish to contact the card issuer.	*** DIDDYMWYD/CANCELLED *** Cafodd y cerdyn ei gadw. Efallai yr hoffech gysylltu â dyroddwr y cerdyn. The card has been retained. You may wish to contact the card issuer.
RT103	*** CANCELLED *** The card has been returned. You may wish to contact the card issuer.	*** DIDDYMWYD/CANCELLED *** Cafodd y cerdyn ei ddychwelyd. Efallai yr hoffech gysylltu â dyroddwr y cerdyn. The card has been returned. You may wish to contact the card issuer.
RT104	*** CANCELLED *** You may wish to contact the card issuer.	*** DIDDYMWYD/CANCELLED *** Efallai yr hoffech gysylltu â dyroddwr y cerdyn. You may wish to contact the card issuer.
RT110, RT111, RT112, RT114, RT117	*** CANCELLED *** Unable to complete the transaction. Sorry for any inconvenience caused.	*** DIDDYMWYD/CANCELLED *** Yn methu cwblhau'r gweithrediad. Ymddiheurwn am unrhyw drafferth. Unable to complete the transaction. Sorry for any inconvenience caused.
RT118	*** CANCELLED *** The transaction has been declined by the customer's card.	*** DIDDYMWYD/CANCELLED *** Gwrthodwyd y gweithrediad gan gerdyn y cwsmer. The transaction has been declined by the customer's card.

3.5 Office Debit Card Receipt for Signature

3.5.1 Purpose

This is to obtain the customer's signature for verification in a *retail* card payment/refund request. The signature slip is retained in the office. The office receipt will be produced when a signature CVM is required and:

- a non ICC card is used in the magnetic stripe reader

- an ICC card cannot be processed in the PIN pad and falls back to the magnetic stripe reader

- an ICC card is read by the PIN pad but the PIN pad requests signature verification.

Also, the format of the receipt will be changed for S70.

3.5.2 Frequency

Per debit card transaction requiring a customer signature.

3.5.3 Notes

The circumstances in which the debit card receipts are printed are given in Section 3.

3.5.4 Sequence

Printed prior to signature dialogue.

**The data shown in the examples is illustrative only –
the exact text can change, and so differ from that in the examples.**

3.5.5 Layout and Example Content

This is a change to the signature slip to meet Streamline requirements. A variable text area will be provided on the slip so that for a combination CVM (both PIN and signature), the text 'Cardholder PIN verified' will be printed.

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

Field Name	English		Welsh		Length	Contents
	Line No.	Char Pos'ns	Line No.	Char Pos'ns		
Office Copy Text	13	09-36	13	09-36	28	‘*** Office Copy – Retain ***’.
Title	15	01-42			42	‘Payment’ or ‘Refund’.
			15	01-42	42	‘Taliad/Payment’ or ‘Ad-daliad/Refund’.
Issuer Scheme name	16	01-30	16	01-30	30	Issuer Scheme name (<i>jjj...</i>). For cards processed by the PIN pad this field is obtained from the application label from the chip. For MSR the field will be derived from Reference data
Welsh entry indicator (<i>www...</i>)			17			Welsh translation of the following line’s entry:
				34-36	3	‘ICC’=chip read
				34-42	9	‘sweipiwyd’=magnetic stripe read
				34-42	9	‘bysellwyd’=manual entry
Card Number	17	14-32	18	14-32	19	Un-obscured PAN formatted with spaces if a 16-digit PAN, unformatted if any other length.
Entry indicator (<i>kkk...</i>)	17	34-36	18	34-36	3	‘ICC’=chip read
		34-39		34-39	6	‘swiped’=magnetic stripe read
		34-38		34-38	5	‘keyed’=manual entry
Application ID	18	06-21	20	06-21	16	Obtained from Application data from the card as read by PIN pad: or from track 2 data if magnetic swipe card used
PAN Sequence Number	18	41-42	20	41-42	2	Obtained from Application data from the card as read by PIN pad: or from track 2 data if magnetic swipe card used
Expiry Date	19	01-05	21	01-05	5	Card ‘Expires End’ date in the format <i>mm/yy</i> , or blank.

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

Valid From Date	19	07-11	21	07-11	5	Card 'Valid From' date in the format <i>mm/yy</i> , or blank.
Issue No.	19	13-15	21	13-15	3	Card Issue Number (<i>iii</i>) or blank.
Merchant ID	19	17-31	21	17-31	15	Merchant identifier (<i>rrr...</i>), when available.
Authorisation Code	19	34-39	21	34-39	6	Authorisation code (<i>aaaaaa</i>) or blank.
Terminal ID	20	14-21	23	14-21	8	Terminal identifier (<i>ttt...</i>), when available.
Electronic Funds Transfer Sequence Number	20	32-35	23	32-35	4	Number assigned by counter and sent in [R] message to Merchant Acquirer
Transaction ID	21	17-42	25	17-42	26	Unique system-generated transaction identifier (<i>mmm...</i>).
Date & Time of Payment/ Refund			26	01-37	37	Welsh translation of the following line's fieldname: <i>wwwwwww</i> should be set to 'y Taliad' for a payment or 'yr Ad-daliad' for a efund.
	22	01-37	27	01-37	37	The date and time that the payment or refund was made <i>ppppppp</i> should be set to 'Payment' or 'Refund'.
Welsh text	-	-	29	01-35	35	For a payment: 'Debydwch fy nghyfrif fel y dangosir'.
				01-36	36	For a refund: 'Credydwch fy nghyfrif fel y dangosir'.
Combination CVM only: verification message (see below)	24-31	01-42			42	Verification message in English (<i>uuu...</i> up to 8 lines), suppressed if blank.
			29-36	01-42	42	Verification message in bilingual text (<i>vvv...</i> up to 8 lines), suppressed if blank.

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

Text	24	01-32	30	01-32	32	For a payment: 'Please debit my account as shown'.
		01-33		01-33	33	For a refund: 'Please credit my account as shown'.
Amount	25	09-17	31	13-21	9	7-digit amount in the format £99999.99 for the requested transaction value.
Footer			39	09-32	24	'Nid derbynneb TAW yw hon'.
	33	09-33	40	09-33	25	'This is not a VAT receipt'.

PIN verification message

The text of the verification message printed is as follows (word wrap as shown):

Mess. Ref.	Message Text - English	Message Text - Welsh/English
RT150	Cardholder PIN verified.	Gwiriwyd PIN deiliad y cerdyn. Cardholder PIN verified.

(Note: If RT150 is not printed, its following blank line is also suppressed.)

4.0 Response Codes and their Effects

This section describes only the new response codes which may be returned as a consequence of using an EMV/ICC card. The responses described in NB/SPE/013 still apply for all existing response codes.

A new response code 80 is introduced here to describe a situation where the merchant acquirer approves a transaction but the card reverses that decision. In this case the response code from the acquirer will be 0 but this will be converted to 80 if the card returns an AAC cryptogram.

4.1 Screens

4.1.1 Fixed screens, no response code based text

If there are any changes from NB/SPE/013 Section 6.1.1, as a result of new APACS codes, these will be included in later versions of this document.

4.1.2 Soft screens, based on response code

No change – no new response codes currently identified

4.2 Receipts

4.2.1 Receipt Messages by response code/outcome

See sections 3.2.5.1 and 3.2.5.2 for authorised transactions.

See sections 3.4.5.1 and 3.4.5.2 for declined transactions.

Additional Response codes for EMV.

NB Response Code	Authorisation Status	Outcome	Receipt Outcome Message	Message lookup code	Possible Transaction Result Code in [C]
80	Declined	Declined by customer's card	*** CANCELLED ***	RT118	06
81	Declined	Fall back to MSR after 2 nd GenAC	*** CANCELLED ***	RT118	07

4.2.2 Transaction result codes

These are recorded with the transaction details.

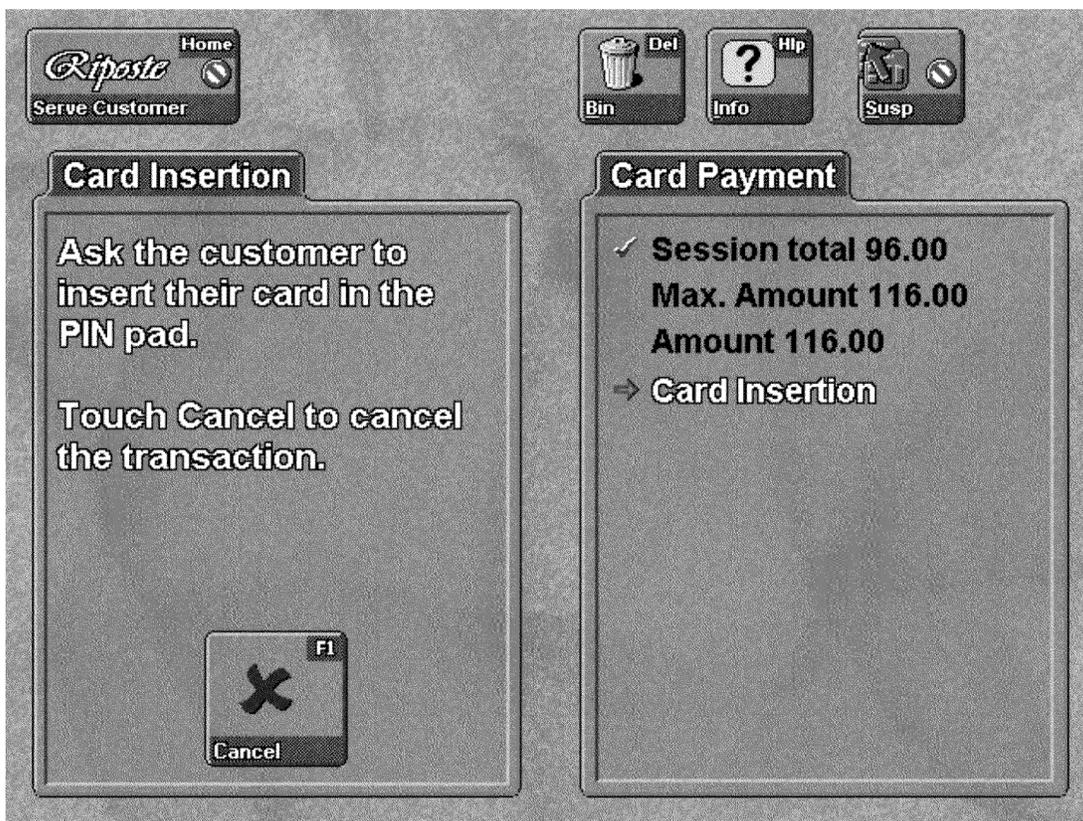
Transaction Result Code in [C]	Meaning
01	Authorised by FI and accepted by PIN pad
02	Cancelled – either by the clerk or by the customer pushing the cancel button on the PIN pad or by removing the card too soon
03	Customer Signature Failed
04	Fee Customer Declined
05	Card Check Failed
06	Declined by FI
07	Decline by PIN pad or some other failure

5.0 Screen Layouts

5.1 EMV specific counter screens

Screens in this section are EMV specific. That is, only new screens which have been introduced for the EMV development. Screens which are common to EMV, NBS and DCS can be found in Annexe B.

5.1.1 Screen ER1: Card Insertion (First attempt)



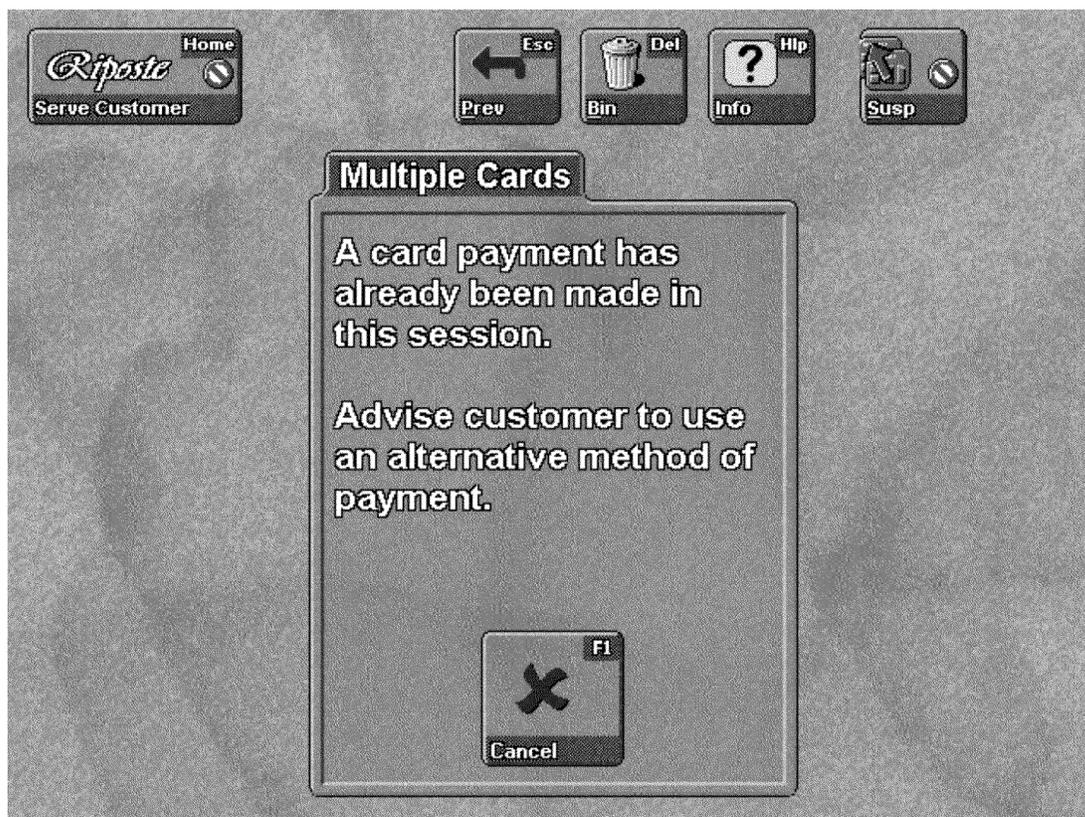
Note this screen will only be displayed:

- When the EMV Retail button is selected from the settlement menu, and
- When the card hasn't been inserted in the PIN pad

The tab heading at the right hand side of the screen will contain "Card Refund" for reversal transactions.

In the event of card insertion timeout, This screen will be replaced by EB4 cancelled and subsequently by ER24 Card Insertion Timeout.

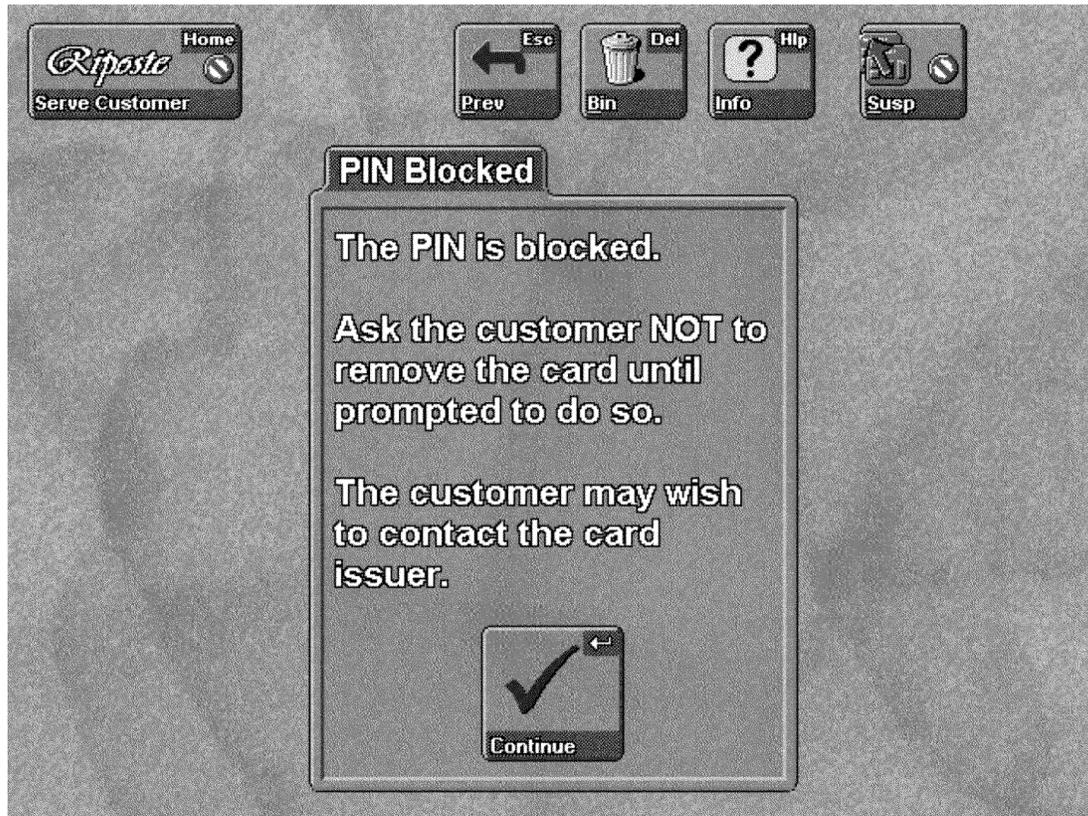
5.1.2 Screen ER2: Multiple Cards (Payment)



This screen is displayed when the counter detects that a second attempt is being made to settle using a debit card. This is not necessarily the same card. The counter is set to reject use of a second card.

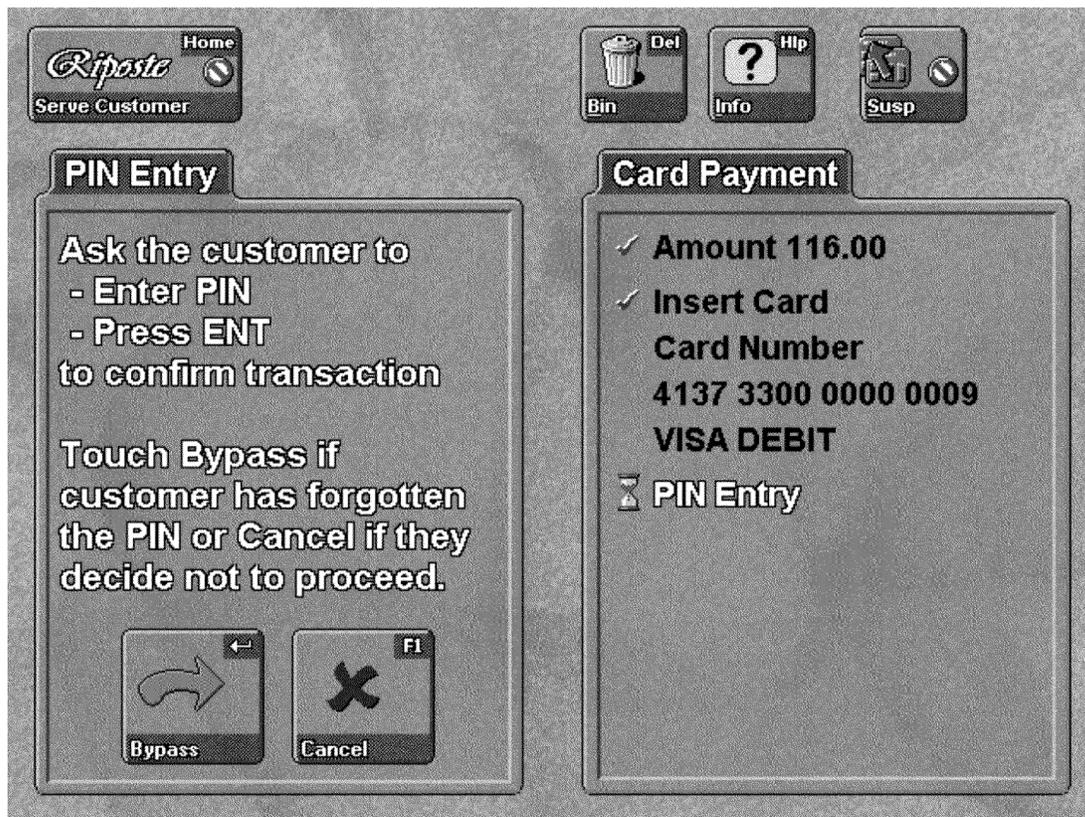
If a refund is being processed the screen ER26 (see 5.1.26) is used instead.

5.1.3 Screen ER3: PIN Locked



This screen is displayed when the PIN Pad discovers that the customer's card has been PIN blocked. This may be from the outset when the customer's card is already blocked or as a result of invalid PIN entry. Seeing this screen does not necessarily mean that the transaction will be declined. It is a decision for the card and PIN pad based on issuer supplied data to decline or approve usage if such a card.

5.1.4 Screen ER4: Waiting for PIN (2 buttons)

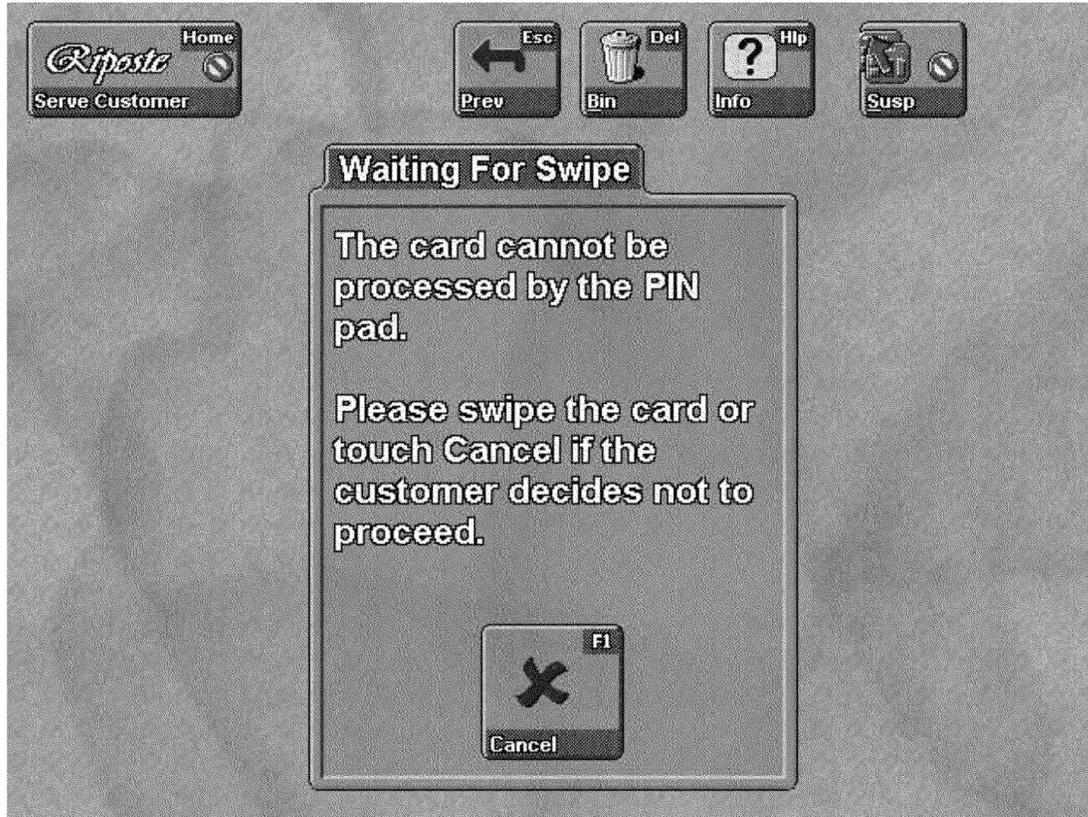


This screen is used when the clerk is able to select the bypass option. This is under reference data control and when the bypass option in reference data is switched off the clerk will be presented with screen ER5 instead.

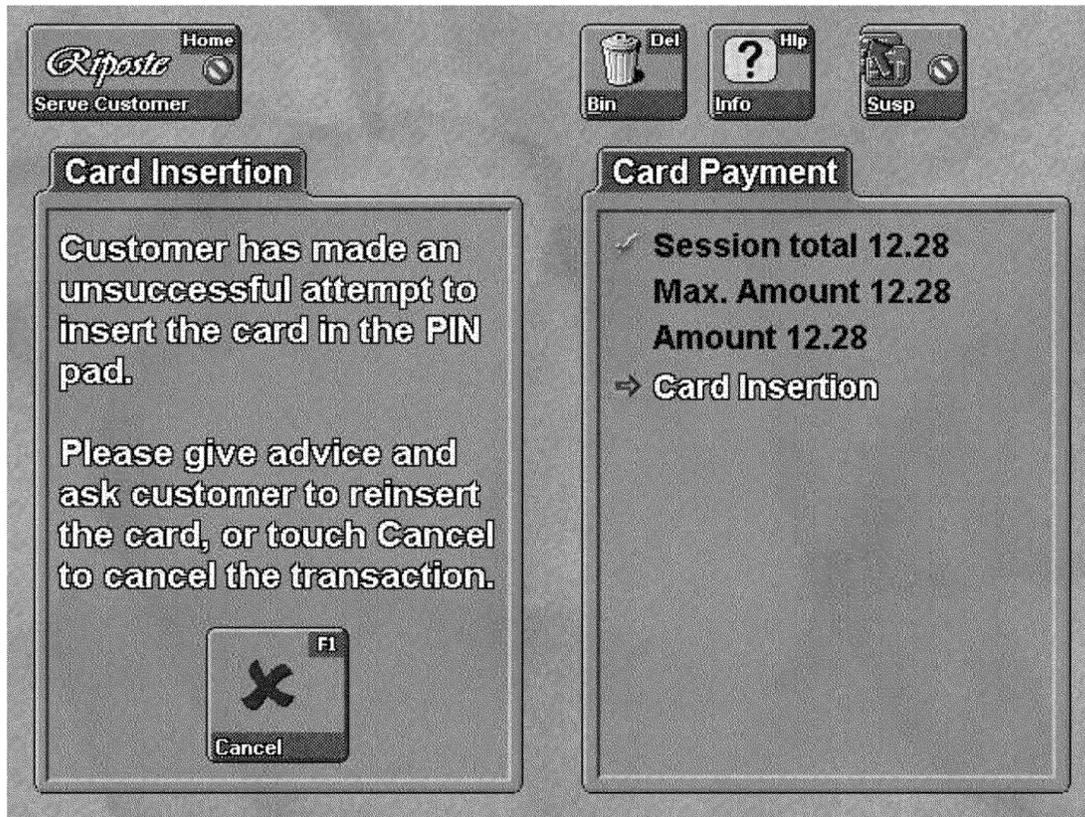
5.1.5 Screen ER5: Waiting for PIN (1 button)

This screen is the same as screen ER4 except that the left hand panel has a single Cancel button. This screen is used when the clerk is no longer allowed to select the bypass option. Until that point the clerk will be presented with screen ER4 instead. Reference data determines whether screen ER4 or ER5 is presented to the clerk.

5.1.6 Screen ER6: Card cannot be read by PIN pad



5.1.7 Screen ER7 Insert Card (Second attempt)



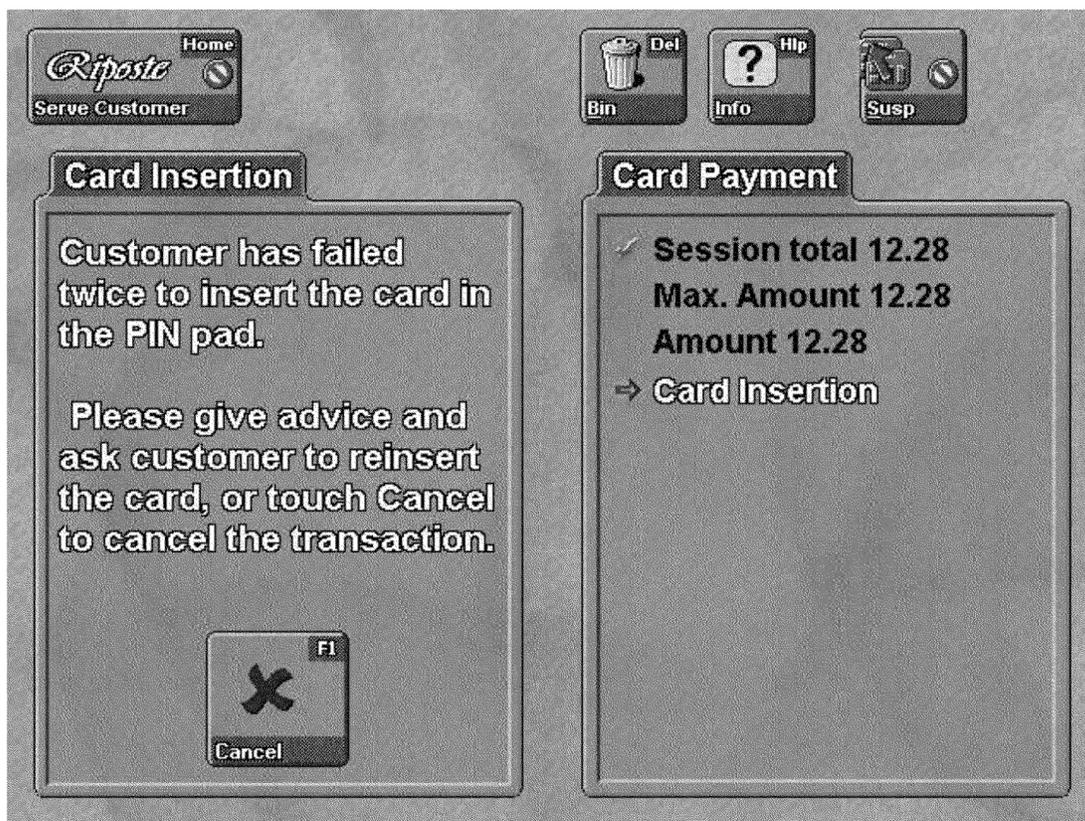
This screen is what happens to screen ER1 if the customer has had an attempt at inserting his card into the PIN pad but it cannot be read. Possible reasons:

- the card has been inserted upside down
- the card has been inserted back to front
- the card is not valid
- the chip is damaged.

The PIN pad allows the customer 3 attempts at inserting the card at which point it will allow the transaction to fallback to swipe mode.

The tab heading at the right hand side of the screen will contain “Card Refund” for reversal transactions.

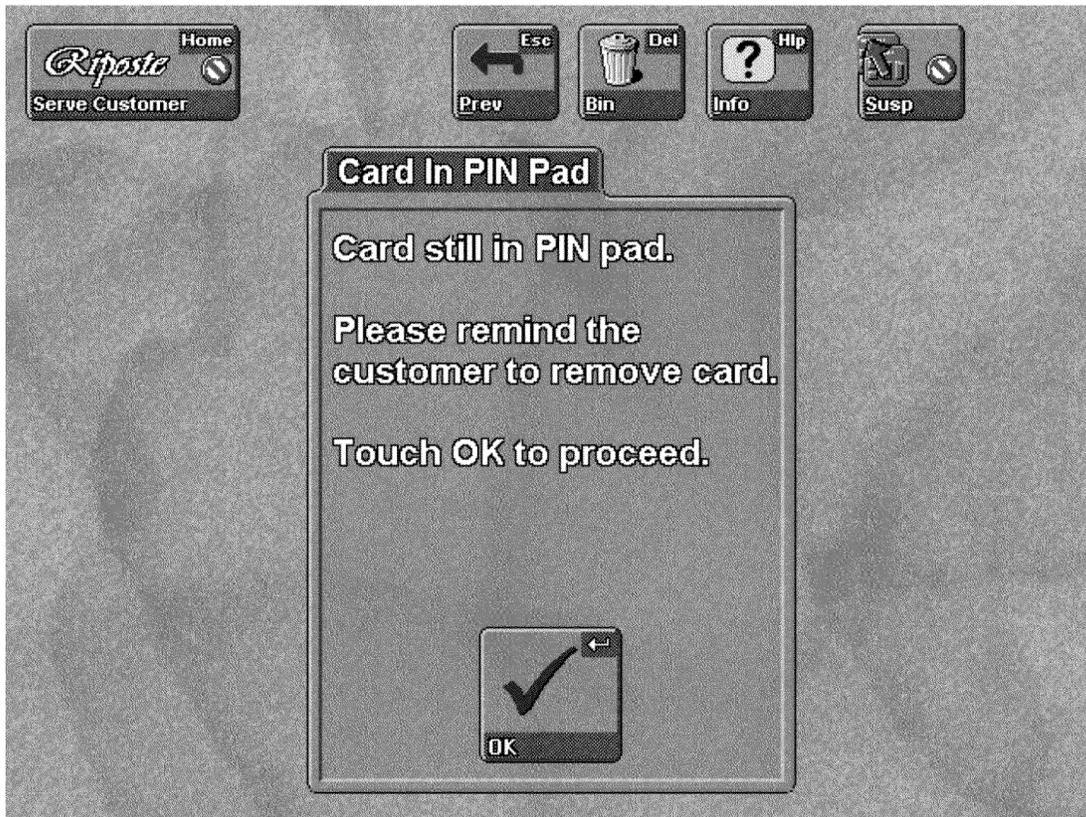
5.1.8 Screen ER8 Insert Card (Third attempt)



This screen is what happens to screen ER7 if the customer has had 2 attempts at inserting his card into the PIN pad but it cannot be read.

The tab heading at the right hand side of the screen will contain "Card Refund" for reversal transactions.

5.1.9 Screen ER9: Remove Card from PIN pad



This screen is returned at the end of a transaction if the card has been left in the PIN pad. At the same time the PIN pad beeps to remind the customer to remove the card.

5.1.10 Screen ER10: Application Selection from Counter



This screen is returned when the counter is invited to help the customer select the application.

5.1.11 Screen ER11: Signature CVM Selected

This screen has been removed as a separate screen. The information previously displayed on this screen is now displayed as additional text within Screen 05 (EMV). See section 5.1.29.

5.1.12 Screen ER12: No CVM Selected

This screen has been removed as a separate screen. The information previously displayed on this screen is now displayed as additional text within Screen 05 (EMV). See section 5.1.29.

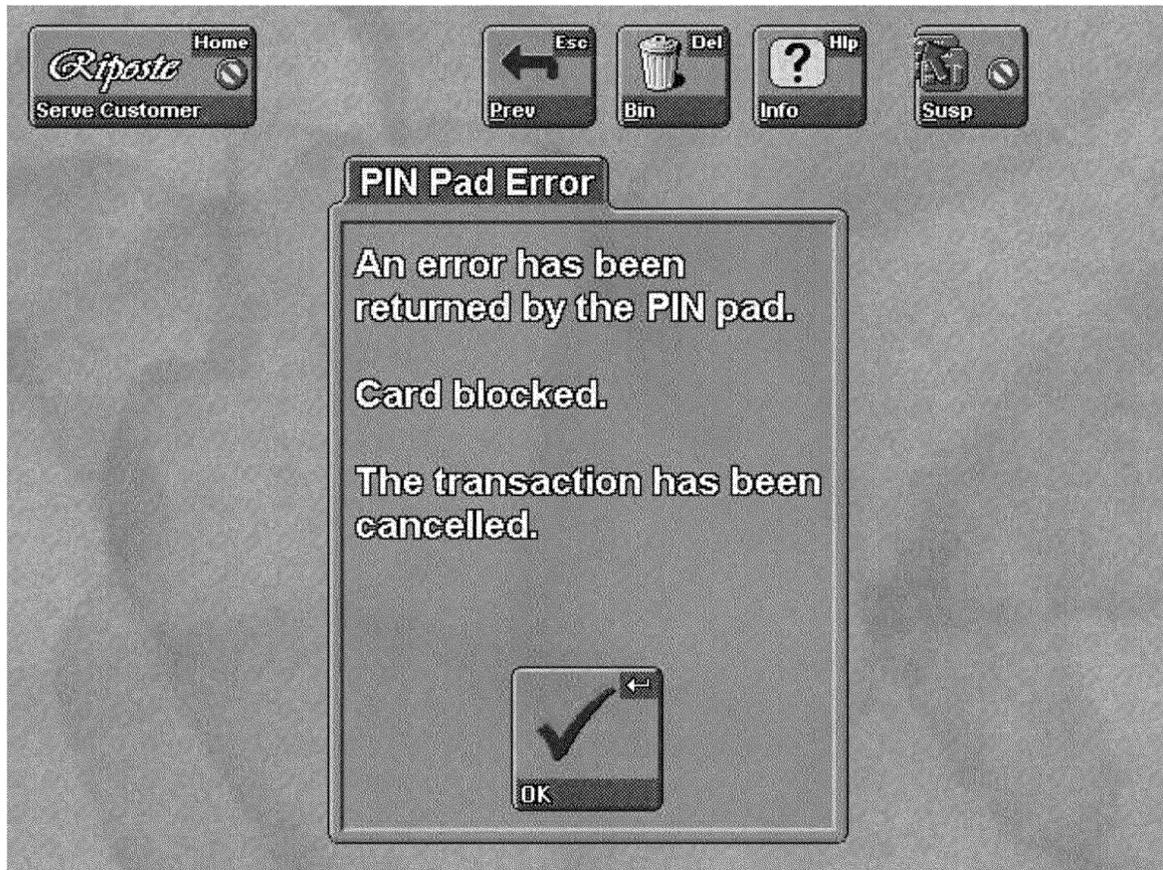
5.1.13 Screen ER13: Cancelled - Please Wait



This screen is shown when the transaction is cancelled by the clerk. The right hand panel will show how far the transaction has progressed: in this particular example the cancel has happened early on in the dialogue before the customer has inserted his card in the PIN pad.

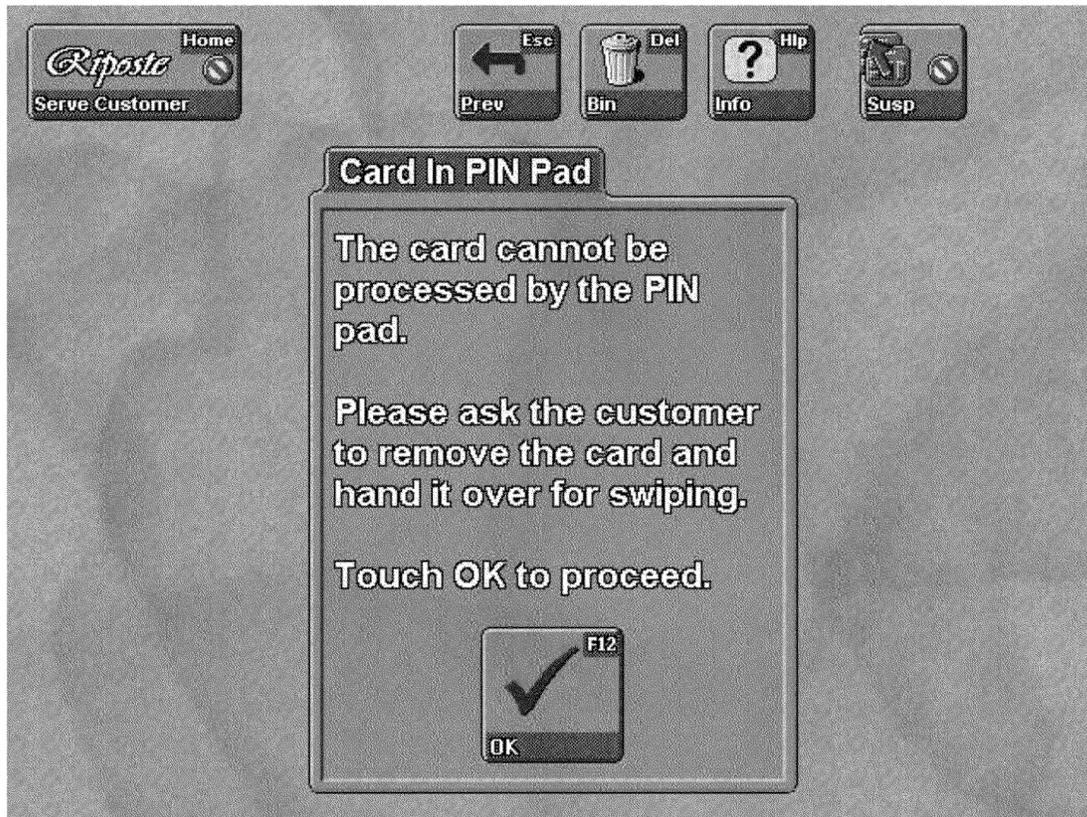
Screen EB4 (see 7.1.2) is used where the transaction is cancelled by Customer.

5.1.14 Screen ER14: PIN pad Error Screen



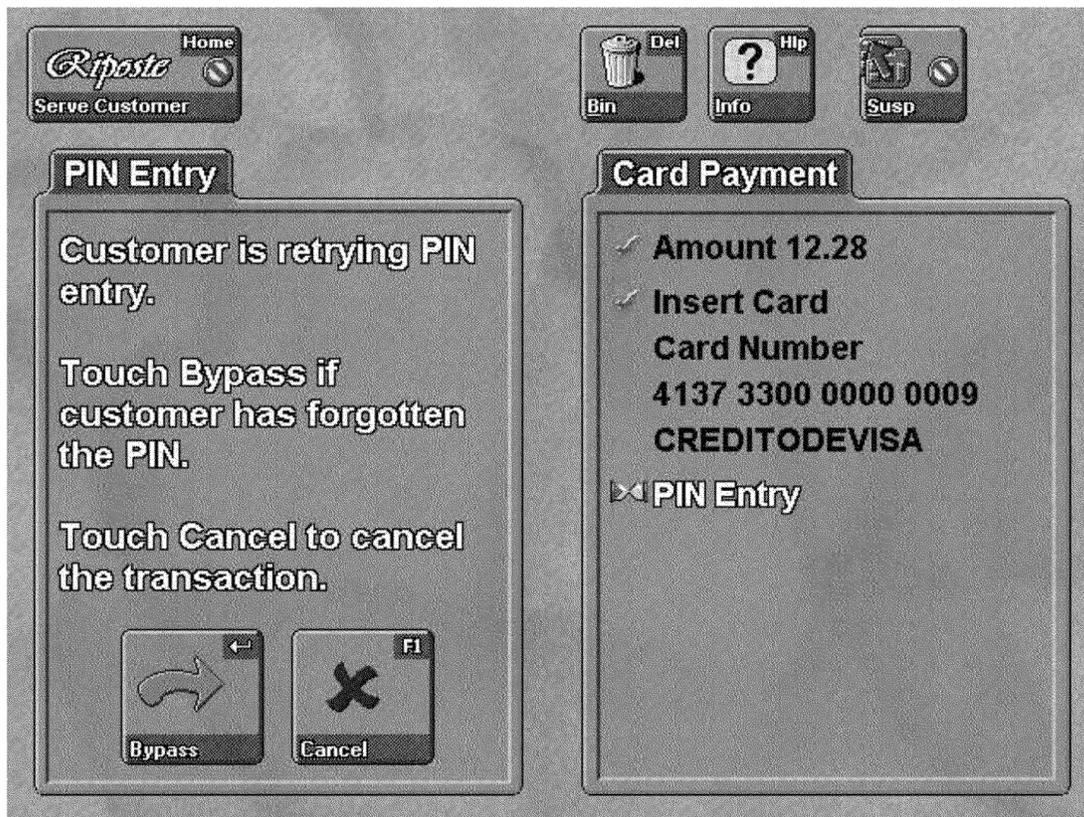
This screen is used if the PIN pad returns an error code at the end of an aborted transaction. The content of the second sentence is determined by the response received from the PIN Pad in the END command. A table of interpretations can be found in Annexe D.

5.1.15 Screen ER15: Remove Card from PIN pad



This screen is displayed in a recognised MSR fallback situation. The purpose is to inform the clerk that the transaction cannot continue as an EMV transaction and must fallback to a swipe and signature transaction. The card here is still in the PIN pad reader and must be removed and handed to the clerk for further processing. At the same time the PIN pad beeps to remind the customer to remove the card. The simultaneous PIN pad display will be EPB18.

5.1.16 Screen ER16: PIN Entry - PIN Re-try(2 buttons)

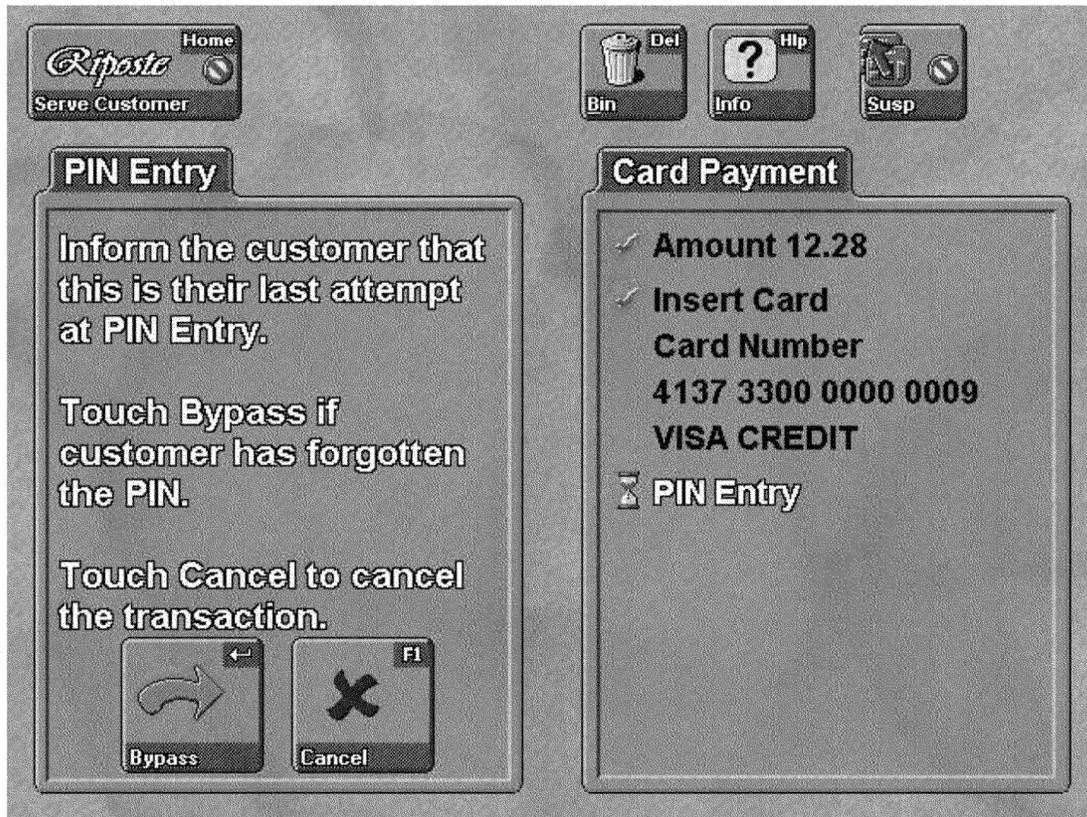


This screen is used when the clerk is able to select the bypass option. This is under reference data control and when the reference data is switched off the clerk will be presented with screen ER17 instead.

5.1.17 Screen ER17: PIN Entry - PIN Re-try (1 button)

This is the same as screen ER16 except that it has no Bypass button: it has a single Cancel button in the left hand panel. Reference data determines whether screen ER16 or ER17 is presented to the clerk.

5.1.18 Screen ER18: PIN Entry – Last Try(2 buttons)

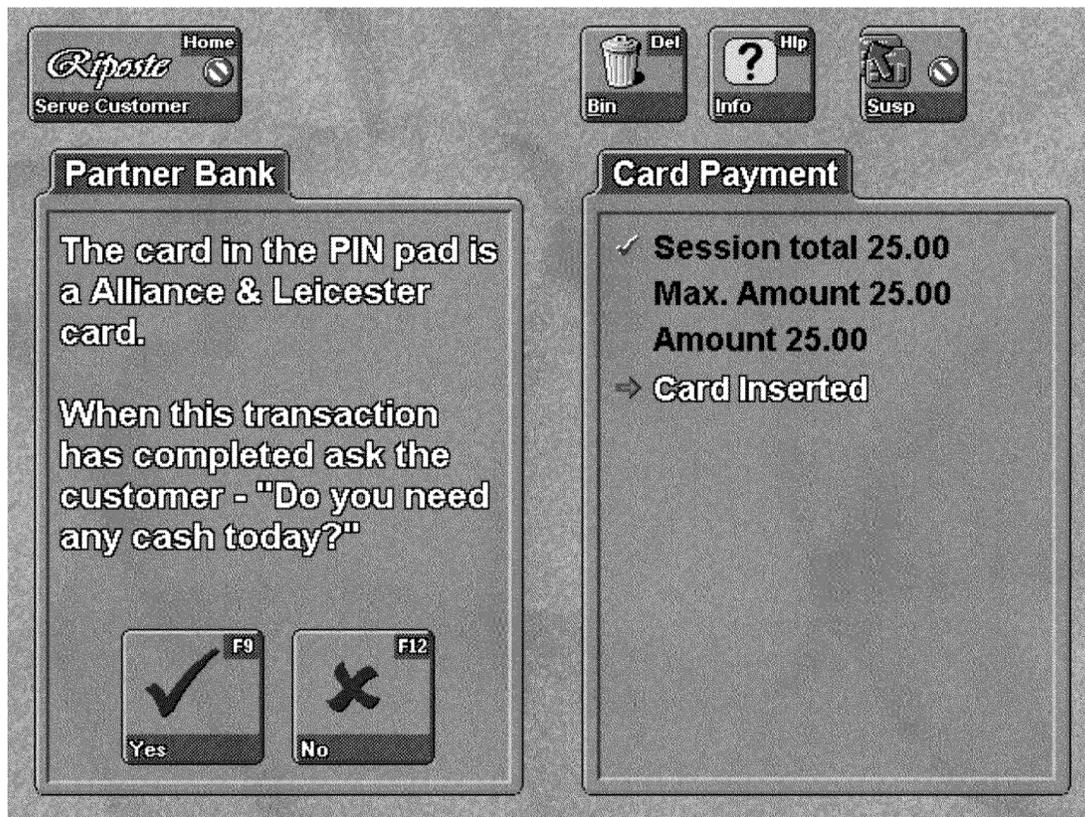


This screen is used when the clerk is able to select the bypass option. This is under reference data control and when the reference data is switched off the clerk will be presented with screen ER19 instead.

5.1.19 Screen ER19: PIN Entry – Last Try (1 button)

This is the same as screen ER18 except that it has no Bypass button: it has a single Cancel button in the left hand panel. Reference data determines whether screen ER18 or ER19 is presented to the clerk.

5.1.20 Screen ER20: Partner Bank



This screen is displayed when Horizon detects that the debit card being used for a settlement operation may also be used for banking operations. The screen is presented after application selection has taken place but before PIN entry occurs. The screen informs the clerk that the customer's card may also be used for banking transactions with the Post Office. The screen has been introduced in response to CP3738. The %card scheme% parameter will be populated by Horizon when it deduces the partner scheme. When the clerk has absorbed the information they may resume by pressing the continue button. Processing resumes at PIN entry.

5.1.21 Screen ER21: Card Inserted

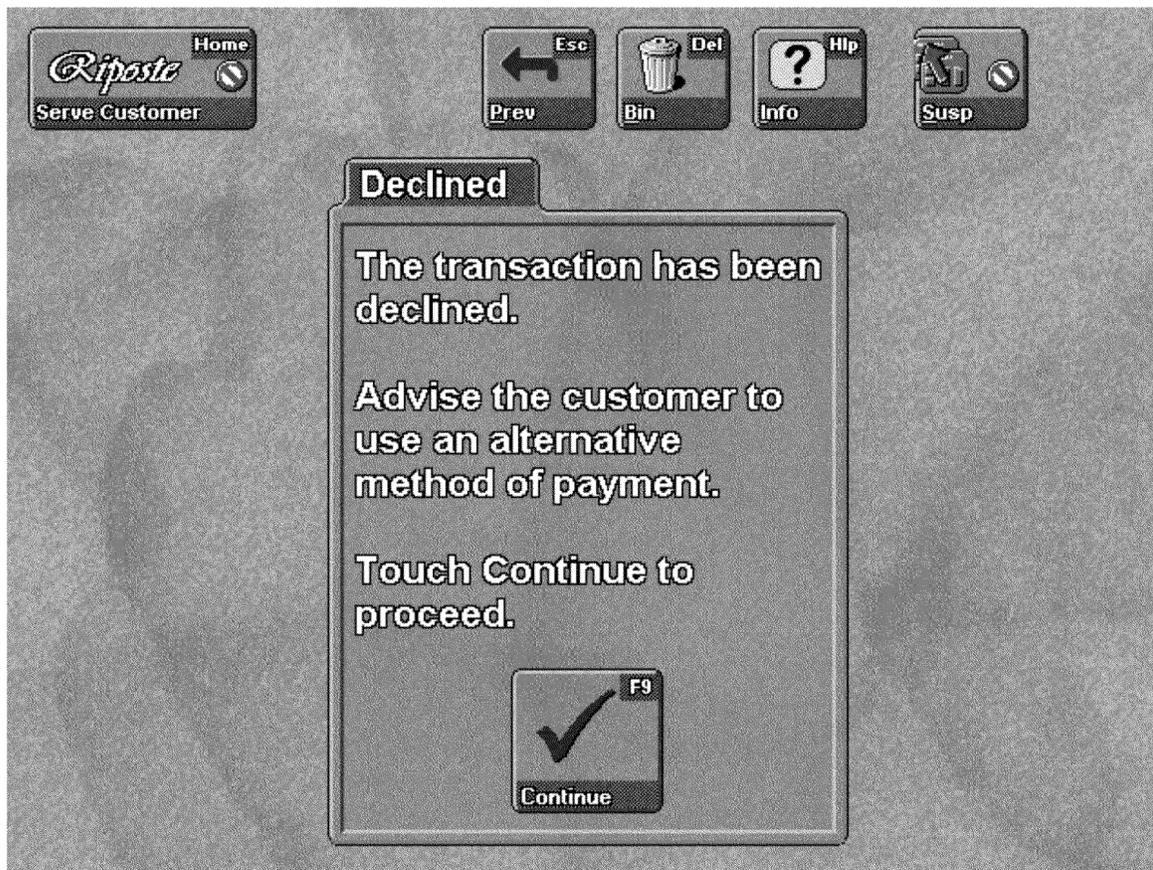


Note this screen will only be displayed:

- When the EMV Retail button is selected from the settlement menu, and
- When the card has been inserted in the PIN pad

The tab heading at the right hand side of the screen will contain “Card Refund” for reversal transactions.

5.1.22 Screen ER22: Declined (Payment)

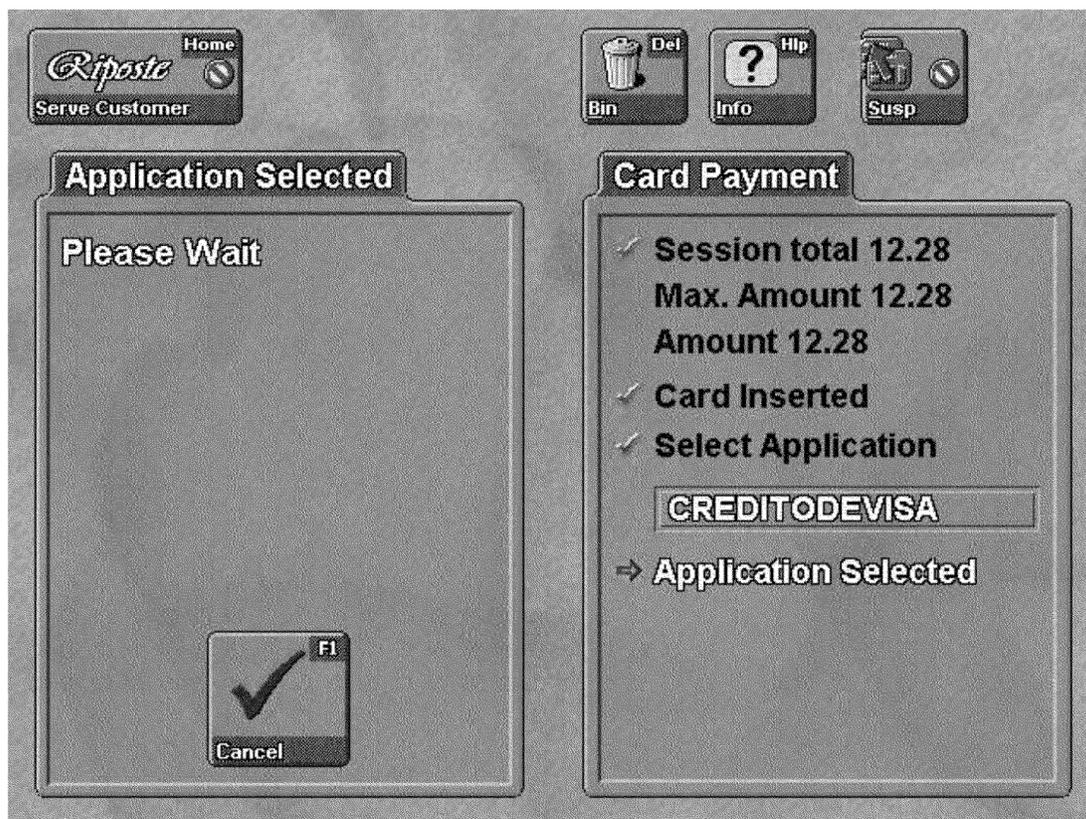


If a refund is being processed the screen shown in 5.1.27 is used instead.

Action analysis performed by the PIN pad and card has detected a condition, which has caused the transaction to be declined. This screen is displayed when the PIN pad has informed the counter of this condition by sending an AAC command.

Pressing Continue will allow the counter to start a card removal operation. When the card has been removed the settlement menu will be displayed again for a new method of payment to be chosen.

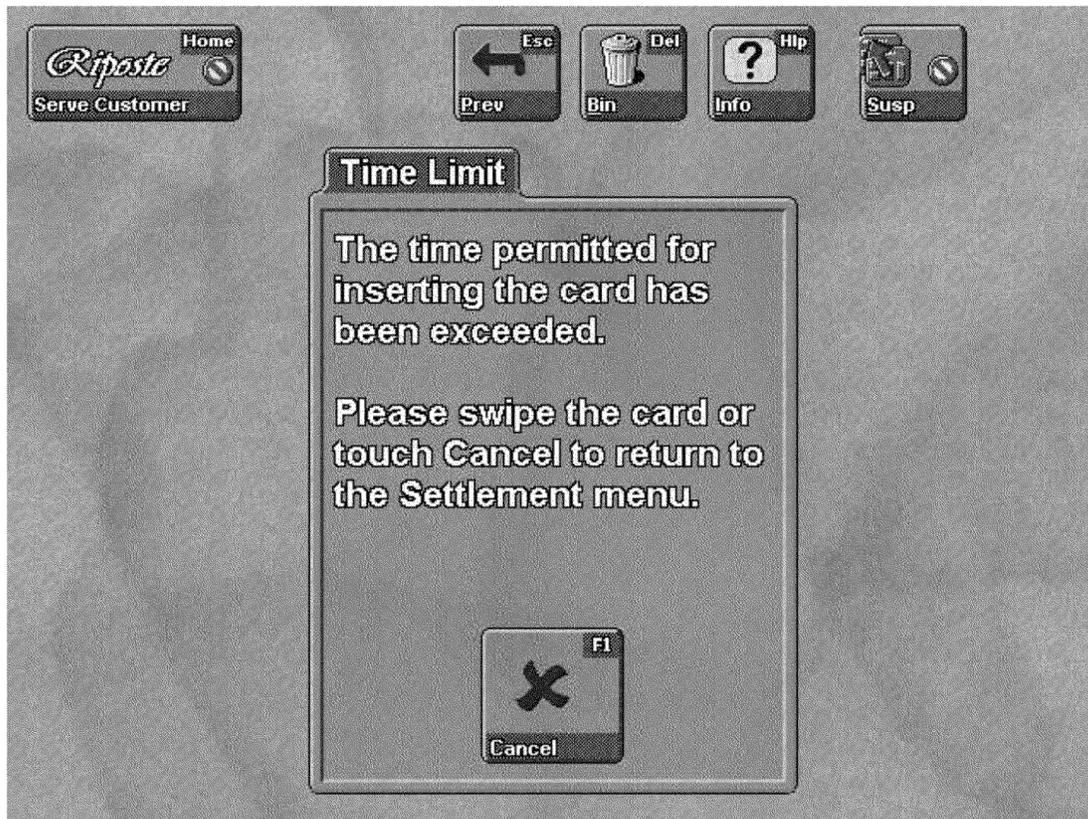
5.1.23 Screen ER23: Application Selected Screen



In a multiple application situation, a pause may occur; once the application has been selected but before the PIN pad is ready for PIN entry. This screen has been added to the flow diagrams to smooth the transition between screens and to prevent confusion. It will also allow the clerk to cancel the transaction.

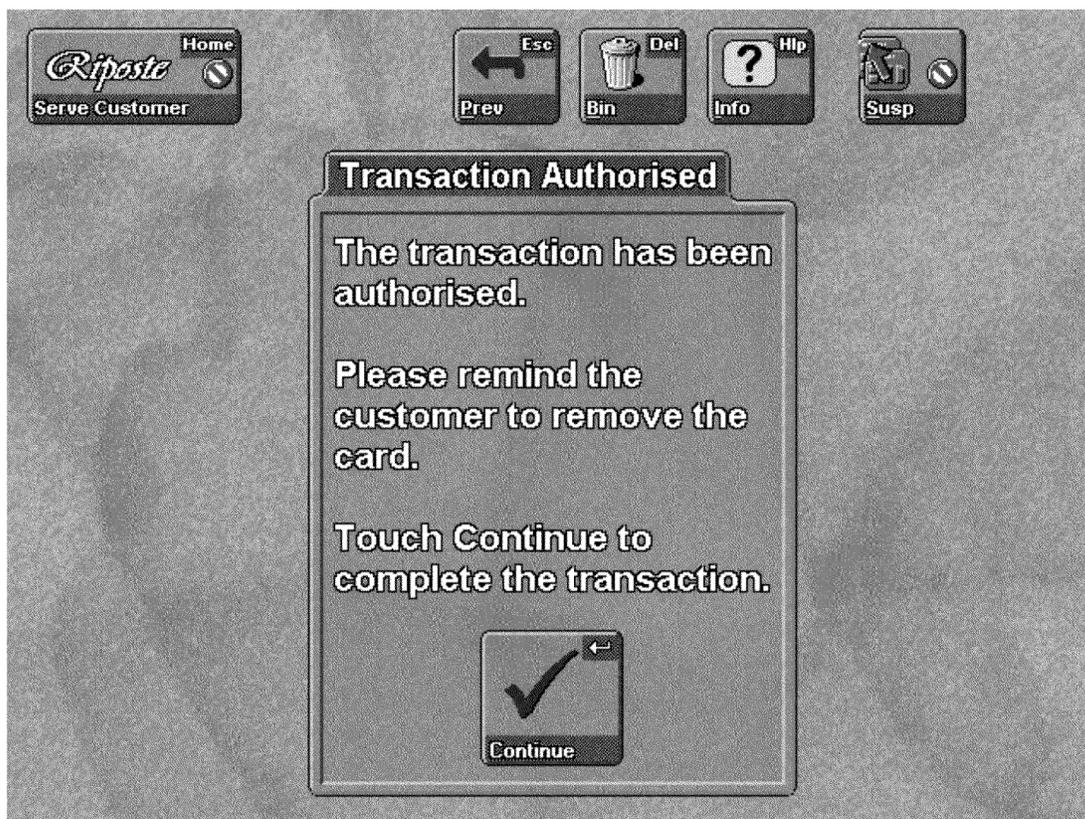
Pressing Cancel will cause an ACK(cancel) command to be sent to the PIN pad aborting the transaction.

5.1.24 Screen ER24: Card Insertion Timeout



This screen is displayed when the customer has not inserted their card into the PIN pad within a configurable timeout period. If this occurs then magnetic stripe swipe operations will be enabled for this card.

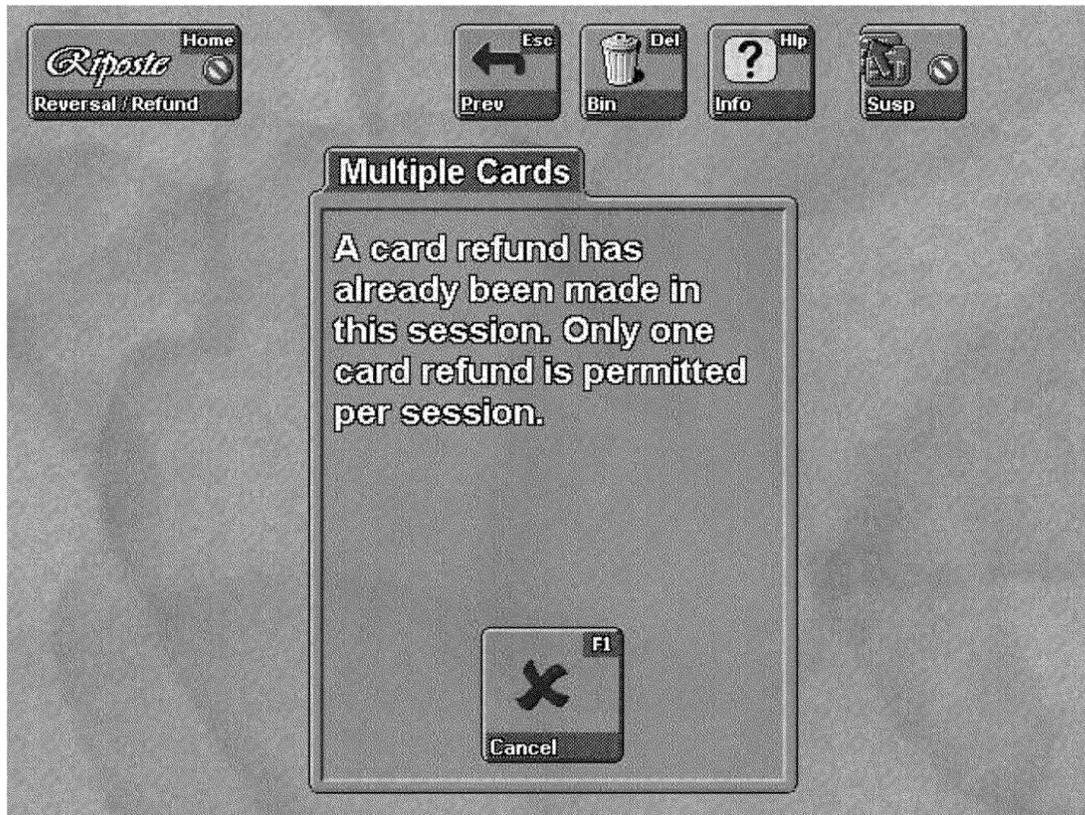
5.1.25 Screen ER25: Transaction Authorised Remove Card Screen



Action analysis performed by the PIN pad and card has reached approval for this transaction. The transaction has therefore been approved. This screen is displayed after the PIN pad has informed the counter of this condition by sending a TC command and the counter has acknowledged that TC command. It is not displayed when the CVM is signature or when the CVM is a combination CVM.

Pressing OK will allow the PIN pad to break out of its card removal loop and complete the transaction.

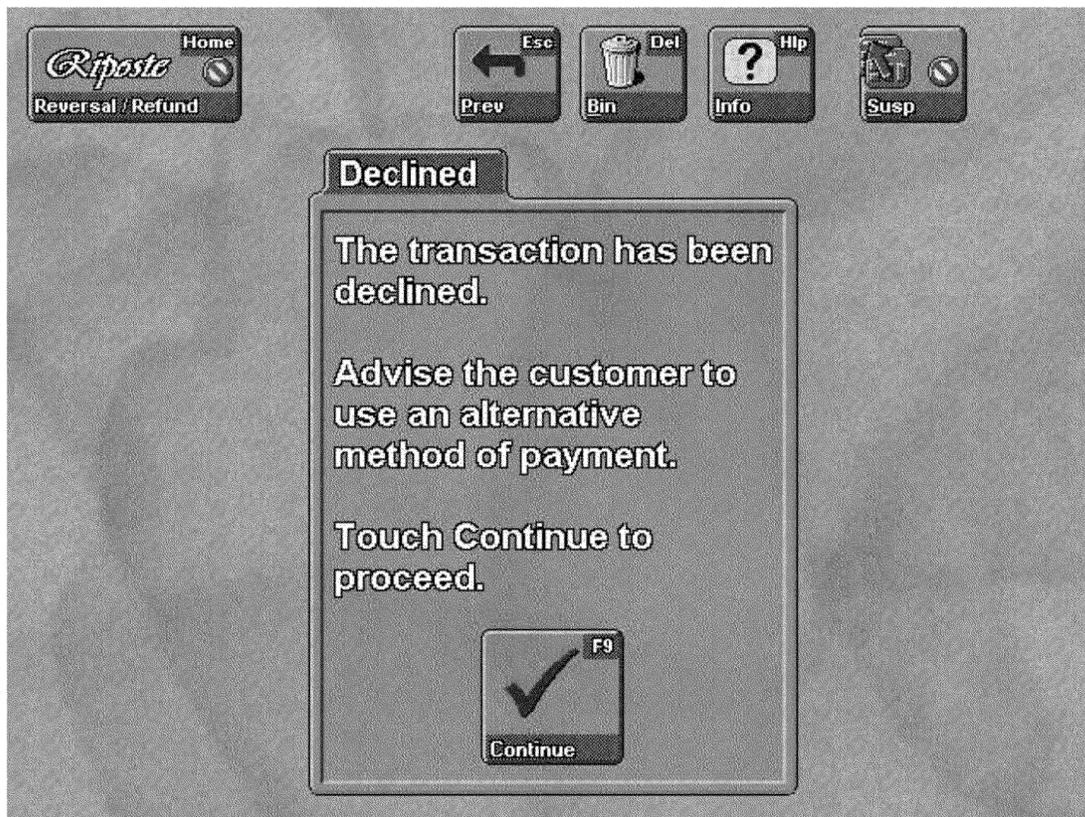
5.1.26 Screen ER26: Multiple Cards (Refund)



This screen is displayed when the counter detects that a second or subsequent attempt is being made to settle using a debit card. This is not necessarily the same card. The counter is set to reject use of a second card.

This screen is used for refunds: if a payment is being processed the screen shown in 5.1.2 is used instead.

5.1.27 Screen ER27: Declined (Refund)

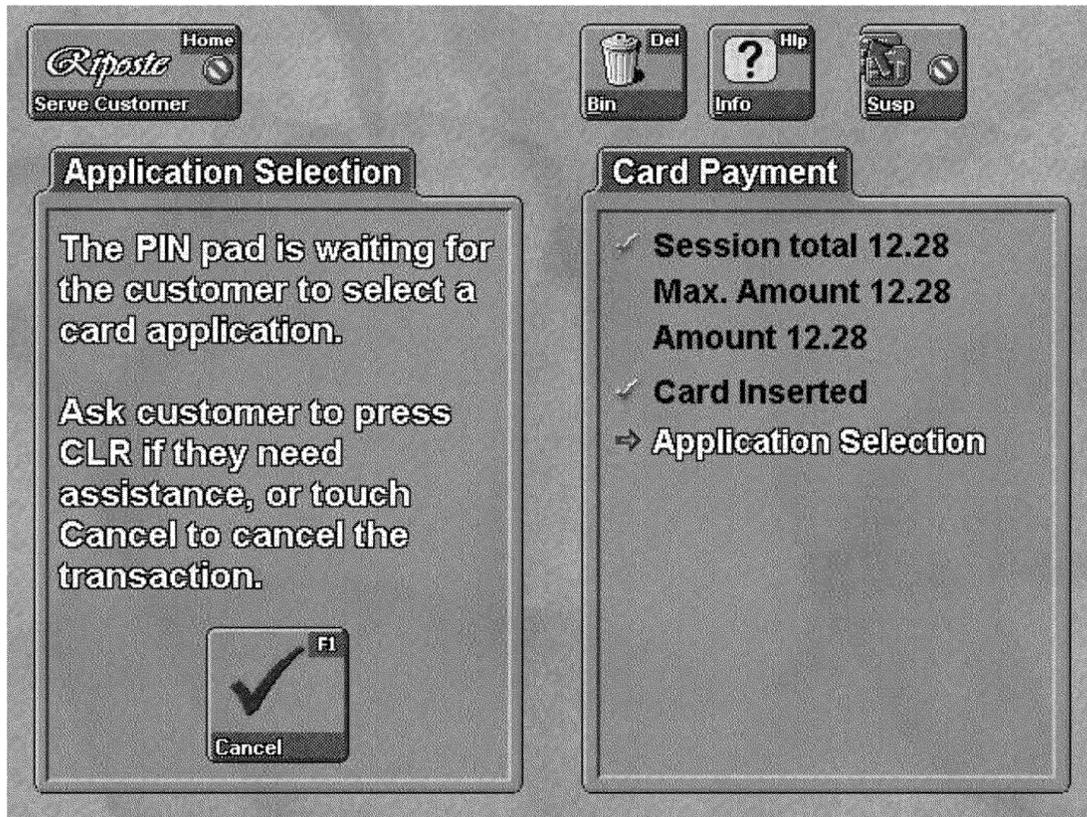


This screen is used for refunds: if a payment is being processed the screen shown in 5.1.22 is used instead.

Action analysis performed by the PIN pad and card has detected a condition, which has caused the transaction to be declined. This screen is displayed when the PIN pad has informed the counter of this condition by sending an AAC command.

Pressing Continue will allow the counter to start a card removal operation. When the card has been removed the settlement menu will be displayed again for a new method of payment to be chosen.

5.1.28 Screen ER28: Screen ER28: Application Selection



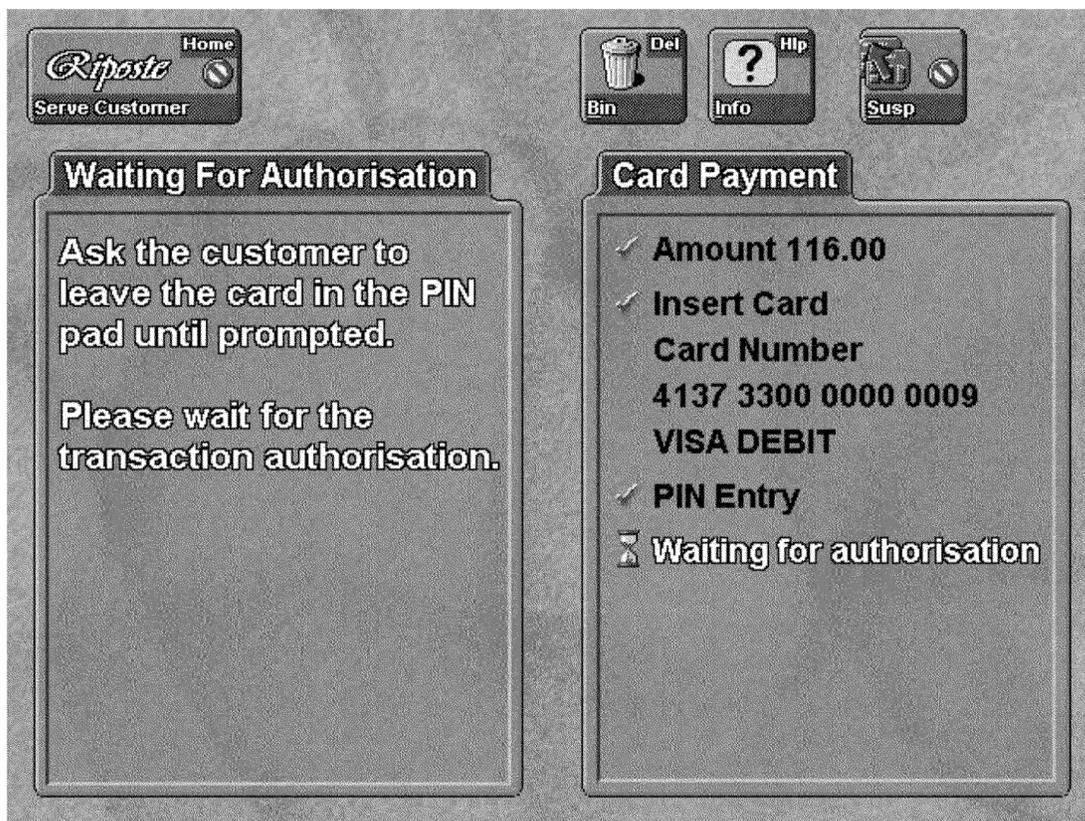
5.1.29 Screen 5 (EMV): Waiting for Authorisation

For EMV transactions, Screen 5 will be a dual panel screen. The LH panel contains a reminder to the Clerk that the card must remain in the PIN pad until after authorisation is complete. Swiped transactions will continue to use the existing screen 5 format where the left hand panel is not populated.

The content of the LH panel varies according to the verification method.

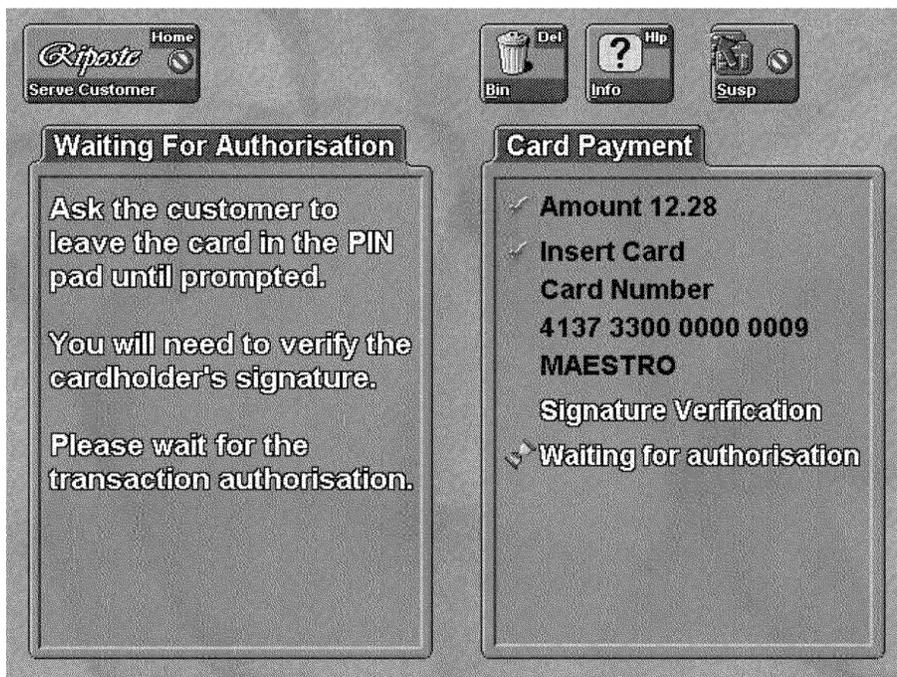
Pin Verification

The screen will look like this for normal PIN verification:



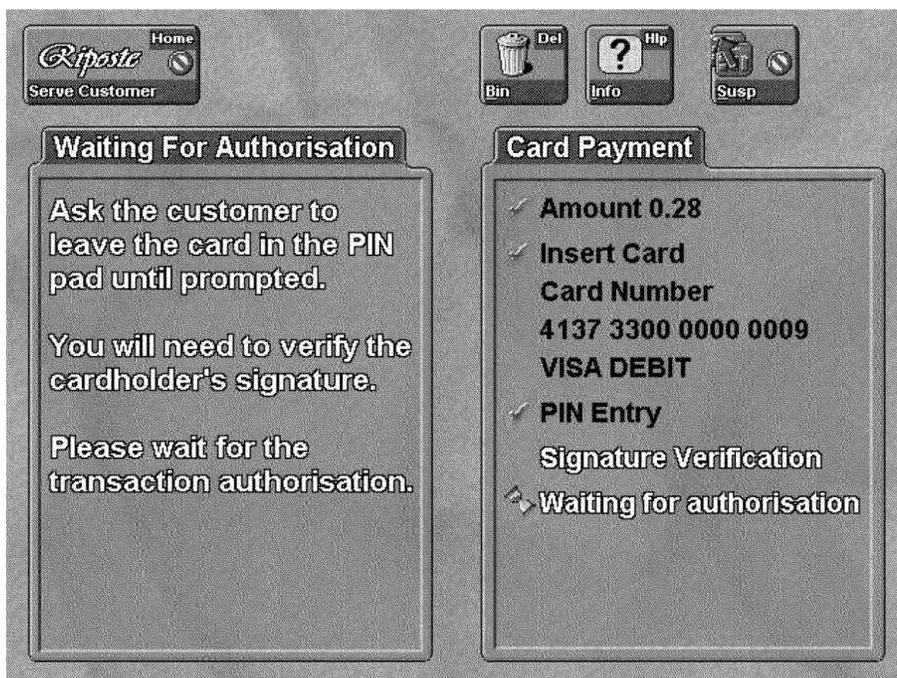
Signature CVM

The screen will look like this for Signature CVM:



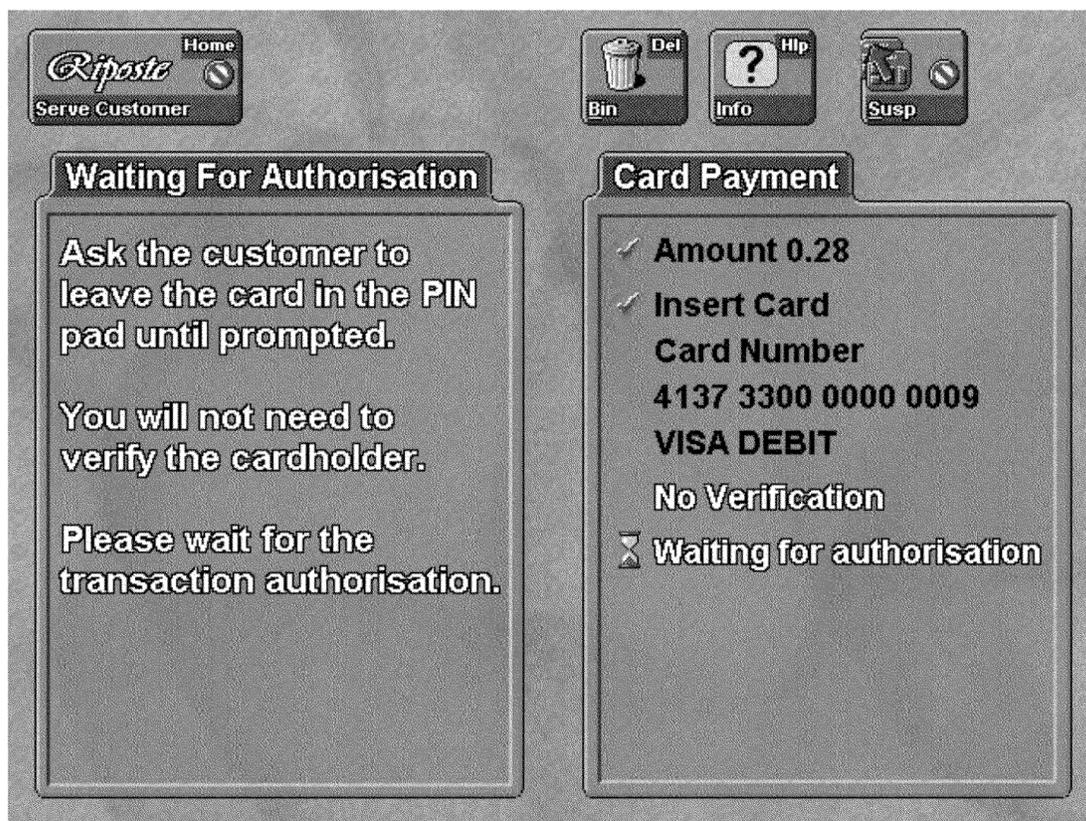
Combination CVMs

The screen will look like this for combination CVMs:



No CVM

The screen will look like this for No CVM:



5.1.30 Counter Screens shared with EMV Banking

The following Counter screens for EMV Banking found in NB/PRP/004 are shared by the EMV Retail application, and are attached in Annexe A:

Screen Number	Particulars
EB1	Proceed as Chip Card?
EB4	Transaction cancelled by Customer

5.2 EMV Specific PIN displays

PIN pad Messages for EMV fall into two categories:

- Those which contain the word 'PIN', 'Pin', 'pin', 'pIn', 'PiN' or 'piN'. These are messages used by the Hypercom software and cannot be customised.
- Other messages not related to PIN processing. These may be customized for specific implementations but must not be changed to contain the word 'PIN', 'Pin', 'pin', 'pIn', 'PiN' or 'piN'. The messages may be changed by altering a reference data table. The tables will be held as type C data and changes will be downloaded to the PIN pad at the start of day they become effective.

5.2.1 PIN Pad Screen ERP12a: Enter PIN

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1			£	9	9	9	9	9	9	9	9	9	.	9	9	R
2	E	N	T	E	R		P	I	N				*	*	*	*
3	a	n	d		p	r	e	s	s		E	N	T		o	r
4	p	r	e	s	s		C	A	N		t	o		e	n	d

The screen contents cannot be changed since it is a PIN message. R only appears after amount for refunds. The PIN entry is right justified and the asterisk signs move to the right as the customer enters an extra digit. If the customer enters more than 7 digits the asterisks are written over the letters of the text 'Enter PIN'. If the customer presses CLR to re-attempt PIN entry the stored PIN will be reset but the PIN Pad display will remain as was at the end of the previous attempt. A new PIN attempt will start overwriting again from column 16 of line 2.

Function Key Actions for this screen

Key	When Pressed	Action
ENT	Before minimum digits of PIN entered	Ignore
ENT	After minimum digits of PIN entered	Accept PIN
CAN	Before PIN is accepted	Transaction ends with no record of the attempted transaction being recorded
CAN	After PIN is	Ignored with no

	accepted	record of the transaction attempt being recorded
CLR	Before PIN is accepted	Clears PIN
CLR	After PIN is accepted	Ignored
BAL	Any time	Ignored
Up Arrow	Any time	Ignored
Down Arrow	Any time	Ignored

5.2.2 PIN Pad Screen ERP12b: Re-enter PIN - First Retry

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1			£	9	9	9	9	9	9	9	9	9	.	9	9	R
2	R	E	-	E	N	T	E	R		P	I	N	*	*	*	*
3	a	n	d		p	r	e	s	s		E	N	T		o	r
4	p	r	e	s	s		C	A	N		t	o		e	n	d

This screen may appear several times to allow several attempts to re-enter the PIN: the number of appearances depends on a value set in reference data.

R only appears after amount for refunds.

The screen contents cannot be changed. The PIN entry is right justified and the asterisk signs move to the right as the customer enters an extra digit. If the customer enters more than 5 digits the asterisks are written over the letters of the text 'Reenter PIN'.

The Function Key Actions for this screen are the same as for PIN entry (see 5.2.1)

5.2.3 PIN Pad Screen ERP12c: Re-enter PIN - Last Retry

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1			£	9	9	9	9	9	9	9	9	9	.	9	9	R
2	L	A	S	T		P	I	N		T	R	Y	*	*	*	*
3	a	n	d		p	r	e	s	s		E	N	T		o	r
4	p	r	e	s	s		C	A	N		t	o		e	n	d

This screen appears on the last allowed attempt to enter the PIN: if PIN entry fails on this try then the card is locked.

R only appears after amount for refunds.

The screen contents cannot be changed. The PIN entry is right justified and the asterisk signs move to the right as the customer enters an extra digit. If the customer enters more than 4 digits the asterisks are written over the letters of the text 'LAST PIN TRY'.

The Function Key Actions for this screen are the same as for PIN entry (see 5.2.1).

5.2.4 PIN Pad Screen ERP2: PIN Blocked

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	
1			P	I	N		B	L	O	C	K	E	D				
2																	
3																	
4																	

This screen cannot be customised. The transaction may or may not fail at this point: in some instances an alternative CVM may be allowed.

Function Key Actions for this screen

Key	When Pressed	Action
ENT	Any time	Ignored
CAN	Any time	Ignored
CLR	Any time	Ignored
BAL	Any time	Ignored
Up Arrow	Any time	Ignored
Down Arrow	Any time	Ignored

5.2.5 PIN Pad Screen ERP3: Incorrect PIN - Retry

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1		I	N	C	O	R	R	E	C	T		P	I	N		
2	P	L	E	A	S	E		W	A	I	T		T	O		
3		T	R	Y		A	G	A	I	N						
4																

This is Hypercom screen 21h: it cannot be customised.

The screen is displayed if the customer has entered an incorrect PIN and several outstanding retries are allowed. The screen is displayed for a few seconds before being replaced by PIN pad screen ERP12b. The text of this screen is centred. As the Hypercom documentation does not show exact column positions this may be an approximation.

Function Key Actions for this screen

Key	When Pressed	Action
ENT	Any time	Ignored
CAN	Any time	Ignored
CLR	Any time	Ignored
BAL	Any time	Ignored
Up Arrow	Any time	Ignored
Down Arrow	Any time	Ignored

5.2.6 PIN Pad Screen ERP4: Incorrect PIN – Last Retry

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1		I	N	C	O	R	R	E	C	T		P	I	N		
2			L	A	S	T		P	I	N						
3	P	L	E	A	S	E		W	A	I	T		T	O		
4			T	R	Y		A	G	A	I	N					

This is Hypercom screen 22h: it cannot be customised.

The screen is displayed if the customer has entered an incorrect PIN but only one more retry is allowed before the PIN is locked. The screen is displayed for a few seconds before being replaced by PIN pad screen ERP12c. The text of this screen is centred. As the Hypercom documentation does not show exact column positions this may be an approximation.

Function Key Actions for this screen

As for screen ERP3.

5.3 PIN displays shared with EMV Banking

The following PIN pad screens for EMV Banking found in NB/PRP/004 are shared by the EMV Retail application and are attached in Annexe A.

Screen Number	Particulars
EBP1	Welcome screen
EBP2	Please Insert Card
EBP3	Application Selection
EBP5	Remove Card
EBP7	Cancelled – Remove Card
EBP9	Declined – Remove Card
EBP10	Approved – Remove Card
EBP11	Processing
EBP13	Application selection at counter
EBP14	Remove & Re-insert Card (1)
EBP15	Re-insert Card (1)
EBP16	Remove & Re-insert Card (2)
EBP17	Re-insert Card (2)
EBP18	Remove & Hand card to clerk
EBP19	Hand card to clerk
EBP20	Cancelled
EBP21	Processing
EBP22	Application Blocked
EBP23	Card Blocked

6.0 EMV specific Message texts

This section details only those texts, which are specific to EMV.

6.1 Message Collections

6.1.1 Collection: MessageDefs

The context in column 2 refers to the number defined for the screen in Section 7, *Screen Layouts* or Section 8, *Screens common to NB and Debit Cards*.

<i>Object Name¹⁴/ Variable</i>	<i>Context</i>	<i>Caption and Message¹⁵</i>	<i>Caption and Help Text</i>
ScreenER1	ER1	Card Insertion Ask the customer to insert their card in the PIN pad. Touch Cancel to cancel the	Cancel (F1) Touch this button if the customer does not wish to continue. ICON (cross)
MSG957	ER2	Multiple Cards A card payment has already been made in this session. Advise customer to use an alternative method of payment.	Cancel (F1) Touch this button to cancel the transaction. ICON (cross)
MSG969	ER3	PIN Blocked The PIN is blocked. Ask the customer NOT to remove the card until prompted to do so. The customer may wish to contact the card issuer.	Continue (Enter) Touch this button to continue. ICON (tick)

¹⁴ Object names in collection MessageDefs are in the format MSGnmm. Where the object name is not in this format, then other collections are used, e.g. FTScriptDefs.

¹⁵ A vertical bar '|' symbol indicates the start of a new line and two vertical bars '||' indicate a blank line.

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

MSG963	ER4	PIN Entry Ask the customer to - Enter PIN - Press ENT to confirm transaction Touch Bypass if customer has forgotten the PIN or Cancel if they decide not to proceed.	Bypass (Enter) Touch this button to continue using alternative verification. Cancel (F1) Touch this button if the customer does not wish to continue. ICON (cross)
MSG962	ER5	PIN Entry Ask the customer to - Enter PIN - Press ENT to confirm transaction Touch Cancel if the customer decides not to proceed.	Cancel (F1) Touch this button if the customer does not wish to continue. ICON (cross)
MSG959	ER6	Waiting For Swipe The card cannot be processed by the PIN pad. Please swipe the card or touch Cancel if the customer decides not to proceed.	Cancel (F1) Touch this button if the customer does not wish to continue. ICON (cross)
MSG960	ER7	Card Insertion Customer has made an unsuccessful attempt to insert the card in the PIN pad. Please give advice and ask customer to reinsert the card, or touch Cancel to cancel the transaction.	Cancel (F1) Touch this button if the customer does not wish to continue. ICON (cross)
MSG971	ER8	Card Insertion Customer has failed twice to insert the card in the PIN pad. Please give advice and ask customer to reinsert the card, or touch Cancel to cancel the transaction.	Cancel (F1) Touch this button if the customer does not wish to continue. ICON (cross)

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

MSG958	ER9	Card In PIN Pad Card still in PIN pad. Please remind the customer to remove card. Touch OK to proceed.	OK (Enter) Touch this button to continue. ICON(tick)
ScreenER10_ Option and ScreenER10_ OptionsElement	ER10	Application Selection	Left hand panel is a pick list and the Help text for each option: Touch this button to select ?????? (where ?????? is the option as presented on the screen) The option selection box in the right hand panel has Help text: “Please select the required application from the pick list.”
ScreenER13	ER13	Cancelled Transaction has been cancelled. Please wait.	
MSG981	ER14	PIN Pad Error An error has been returned by the PIN pad. %reason% The transaction has been cancelled.	OK Touch this button to continue.
MSG972	ER15	Card In PIN Pad The card cannot be processed by the PIN pad. Please ask the customer to remove the card and hand it over for swiping. Touch OK to proceed.	OK (F12) Touch this button to process card swipe. ICON (tick)
MSG973	ER16	PIN Entry Customer is retrying PIN entry. Touch Bypass if customer has forgotten the PIN. Touch Cancel to cancel the transaction.	Bypass (Enter) Touch this button to continue using alternative verification Cancel (F1) Touch this button if the customer does not wish to continue. ICON (cross)

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

MSG974	ER17	PIN Entry Customer is retrying PIN entry. Touch Cancel to cancel the transaction.	Cancel (F1) Touch this button if the customer does not wish to continue. ICON (cross)
MSG975	ER18	PIN Entry Inform the customer that this is their last attempt at PIN entry. Touch Bypass if customer has forgotten the PIN. Touch Cancel to cancel the transaction.	Bypass (Enter) Touch this button to continue using alternative verification Cancel (F1) Touch this button if the customer does not wish to continue. ICON (cross)
MSG976	ER19	PIN Entry Inform the customer that this is their last attempt at PIN entry. Touch Cancel to cancel the transaction.	Cancel (F1) Touch this button if the customer does not wish to continue. ICON (cross)
MSG978	ER20	Partner Bank The card in the PIN pad is a %card scheme% card. When this transaction has completed ask the customer -“Do you need any cash today?”	Yes (F9) Touch this button if you intend to ask the customer at the end of the transaction. ICON (tick) No (F12) Touch this button if you do not intend to ask the customer at the end of the transaction. ICON (cross)

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

ScreenER1 CardInserted	ER21	Card Inserted	Cancel (F1) Touch this button if the customer does not wish to continue.
MSG982	ER22	Declined The transaction has been declined. Advise the customer to use an alternative method of payment. Touch Continue to proceed	Continue (F9) Touch this button to continue. ICON (tick)
ScreenEMVApplicationSelected	ER23	Application Selected Please Wait	Cancel Touch this button if the customer does not wish to continue.
MSG983	ER24	Time Limit The time permitted for inserting the card has been exceeded. Please swipe the card or touch Cancel to return to the Settlement menu.	Cancel (F1) Touch this button to return to the Settlement menu. ICON (cross)
MSG988	ER25	Transaction Authorised The transaction has been authorised. Please remind the customer to remove the card. Touch Continue to complete the transaction.	Continue (Enter) Touch this button to continue. ICON (tick)
MSG990	ER26	Multiple Cards A card refund has already been made in this session. Only one card refund is permitted per session.	Cancel (F1) Touch this button to cancel the transaction. ICON(cross)
MSG991	ER27	Declined The transaction has been declined. Touch Continue to proceed.	Continue(F9) Touch this button to continue. ICON(tick)

Fujitsu Services **EMV Retail: User Interface Design Proposal** **Ref: NB/REQ/003**
Version: 2.0
COMMERCIAL IN-CONFIDENCE **Date: 21st April 2005**

ScreenER28	ER28	<p>Application Selection</p> <p>The PIN pad is waiting for the customer to select a card application. Ask customer to press CLR if they need assistance, or touch Cancel to cancel the transaction.</p>	<p>Cancel (F1)</p> <p>Touch this button to cancel the transaction.</p> <p>ICON(cross)</p>
<p>MSG998</p> <p>Note: MSG998 is also used for screen 5 (EMV) in Banking</p>	Screen 5 (EMV)	<p>Waiting For Authorisation</p> <p>Ask the customer to leave the card in the PIN pad until prompted. %CVMMESSAGE% Please wait for the transaction authorisation.</p> <p>Where %CVMMESSAGE% is</p> <p>For No CVM: You will not need to verify the cardholder. </p> <p>For Signature and combination CVM: You will need to verify the cardholder's signature. </p> <p>Otherwise blank (i.e. for PIN only):</p>	

6.2 PIN pad messages

The following table shows the PIN messages associated with PIN entry and PIN blocking:

<i>Screen</i>	<i>PIN try status</i>	<i>Message</i>	<i>Change possible?</i>
ERP12a	First Try	£999999999.99R ENTER PIN **** and press ENT or press CAN to end	Standard Hypercom message. Messages containing PIN are not normally altered.
ERP12b	Retry	£999999999.99R RE-ENTER PIN**** and press ENT or press CAN to end	Standard Hypercom message. Messages containing PIN are not normally altered
ERP12c	Last retry	£999999999.99R LAST PIN TRY**** and press ENT or press CAN to end	Standard Hypercom message. Messages containing PIN are not normally altered
ERP2	PIN locked. Customer not allowed to enter PIN. Transaction may or may not be allowed to continue	PIN BLOCKED	Standard Hypercom message. Messages containing PIN are not normally altered

Note: non PIN related messages can be altered by Fujitsu Services by altering a reference data table. The tables will be held as type C data and changes will be downloaded to the PIN pad at the start of day they become effective

6.3 Audio Cues at PIN Pad

The PIN pad will provide distinct audio cues to the Customer for key entries made at the PIN pad and also at the time of insertion or removal of the Card from the PIN pad.

The Post Office requirements for audio cues are documented in CD/CDE/009 *Conceptual Design for DDA Beeps*, and the Fujitsu Services response in AS/DPR/008 *Design Proposal for DDA - PIN Entry Device Audio System*. The following will be used for EMV:

PIN Pad Event	Signal
Insertion of Card	Single beep, 2kHz for 100ms
Card to be removed	Beep, 1kHz for 100ms: followed by 100 ms silence and repeat. Unattended this will continue for a configurable period (15 seconds) (determined by reference data): however, the clerk will receive a screen prompt at the same time on screen ER9 or ER25 which he can acknowledge to move the transaction along. This also has the side affect of switching the beeping off – CP 3648).
Customer presses “Enter”	Single beep, 2kHz for 600ms
Customer presses “Cancel”	1kHz for 100ms: followed by 100 ms silence and repeated 8 more times
Customer presses “Clear”	1kHz for 100ms: followed by 100 ms silence and repeated 2 more times
Customer presses 0-9	Single beep, 2kHz for 100ms
Others	No sound

6.4 Help Text for data selection and input

No change from NB/SPE/013

7.0 Annexe A

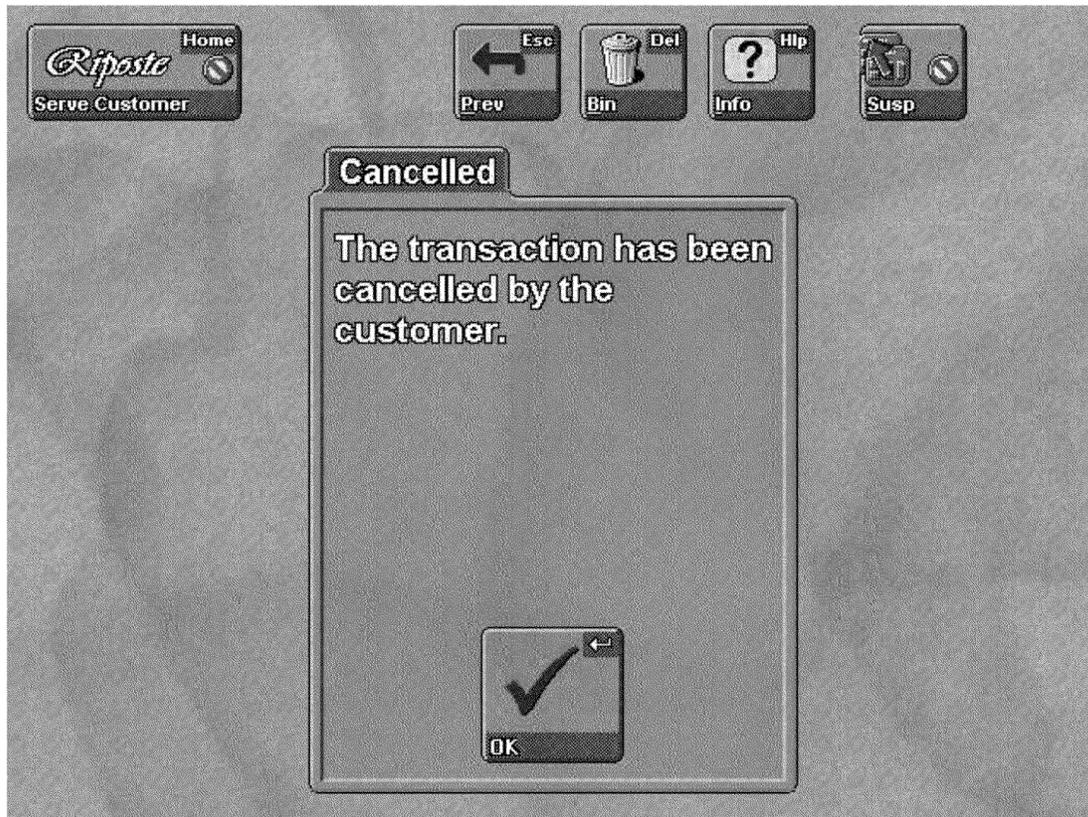
7.1 Counter Screens Shared with EMV Banking

The following screens found in NB/PRP/004 will also be used for EMV Retail. The screen layouts are repeated here for information purposes only: they may require to be changed for EMV Banking after the document for EMV Retail is baselined. The screen layouts defined in NB/PRP/004 take precedence over those shown below:

7.1.1 Screen EB1: Proceed as Chip Card?



7.1.2 Screen EB4: Transaction cancelled by Customer



This screen is displayed if the customer pushes the Cancel button on the PIN pad or removes the card before the [R] message is sent to the Merchant Acquirer.

If the customer removes the card between the time that the [R] message is sent and the [A] message is received at the PIN pad then the message is changed to “The transaction has been cancelled by the customer removing the card too soon.”

7.2 PIN Pad Screens shared with EMV Banking

The following screens found in NB/PRP/004 are used for EMV Retail. The text on these screens are for purpose of illustration and can be changed if required.

7.2.1 PIN Pad Screen EBP1: Welcome Screen

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1																
2																
3																
4																

This is Hypercom screen 0Ch customised to meet Post Office requirements. It is intentionally blank.

Key	When Pressed	Action
ENT	Any time	Ignored
CAN	Any time	Ignored
CLR	Any time	Ignored
BAL	Any time	Ignored
Up Arrow	Any time	Ignored
Down Arrow	Any time	Ignored

7.2.2 PIN Pad Screen EBP2: Please Insert Card

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1	P	L	E	A	S	E										
2	I	N	S	E	R	T		C	A	R	D					
3																
4																

This is Hypercom screen 1Bh with line 1 customised to meet Post Office requirements.

Key	When Pressed	Action
ENT	Any time	Ignored
CAN	Any time	Ignored
CLR	Any time	Ignored
BAL	Any time	Ignored
Up Arrow	Any time	Ignored
Down Arrow	Any time	Ignored

7.2.3 PIN Pad Screen EBP3: Application Selection PIN pad

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1	A	p	p	l	i	c	a	t	i	o	n	1				
2	A	p	p	l	i	c	a	t	i	o	n	2				
3	A	p	p	l	i	c	a	t	i	o	n	3				
4	S	c	r	o	l	l		t	o		s	e	l	e	c	t

Function Key Actions for this screen

Key	When Pressed	Action
ENT	Any time	Accept 'flashing' application
CAN	Any time	Transaction Ends
CLR	Any time	Switches application selection to Counter
BAL	Any time	Ignored

Up Arrow	Any time	Selects application above the currently 'flashing' application, if available. Selected application flashes.
Down Arrow	Any time	Selects application below the currently 'flashing' application, if available. Selected application flashes.

NOTE:

1. The PIN pad must undertake application selection by AID and partial AID.
2. If required by ICC setting a list of available applications – identified by Application label – should be displayed on the PIN pad for selection by the cardholder.

See screen PIN pad EBP13 and counter screen EB7 for application selection from Counter

7.2.4 PIN Pad Screen EBP4: Card Invalid

Removed.

7.2.5 PIN Pad Screen EBP5: Remove Card

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1																
2																
3	P	L	E	A	S	E										
4	R	E	M	O	V	E		C	A	R	D					

This is Hypercom screen 08h customised to meet Post Office requirements¹⁶.

Key	When Pressed	Action
ENT	Any time	Ignored
CAN	Any time	Ignored

¹⁶ The text for this screen is supplied by Fujitsu as part of the PIN pad reference data. It is not explicitly referenced within the activity flows described within this document, but it may be displayed under certain exception cases.

CLR	Any time	Ignored
BAL	Any time	Ignored
Up Arrow	Any time	Ignored
Down Arrow	Any time	Ignored

7.2.6 PIN Pad Screen EBP7: Cancelled - Remove Card

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1	C	A	N	C	E	L	L	E	D							
2																
3	P	L	E	A	S	E										
4	R	E	M	O	V	E		C	A	R	D					

This is Hypercom screen 26h customised to meet Post Office requirements.

The same screen is used whether the transaction is cancelled by the clerk or by the customer and is displayed when the card is still in the PIN pad.

Screen EBP20 (section 7.2.19) is also a cancel screen which is displayed when the card is not present in the PIN pad.

Function Key Actions for this screen

Key	When Pressed	Action
ENT	Any time	Ignored
CAN	Any time	Ignored
CLR	Any time	Ignored
BAL	Any time	Ignored
Up Arrow	Any time	Ignored
Down Arrow	Any time	Ignored

7.2.7 PIN Pad Screen EBP8: Return Card?

Removed.

7.2.8 PIN Pad Screen EBP9: Declined – Remove Card

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1	D	E	C	L	I	N	E	D								
2																
3	P	L	E	A	S	E										
4	R	E	M	O	V	E		C	A	R	D					

This is Hypercom screen 04h customised to meet Post Office requirements.

Key	When Pressed	Action
ENT	Any time	Ignored
CAN	Any time	Ignored
CLR	Any time	Ignored
BAL	Any time	Ignored
Up Arrow	Any time	Ignored
Down Arrow	Any time	Ignored

7.2.9 PIN Pad Screen EBP10: Approved – Remove Card

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1	A	P	P	R	O	V	E	D								
2																
3	P	L	E	A	S	E										
4	R	E	M	O	V	E		C	A	R	D					

This is Hypercom screen 23h customised to meet Post Office requirements.

Function Key Actions for this screen

Key	When Pressed	Action
ENT	Any time	Ignored
CAN	Any time	Ignored
CLR	Any time	Ignored
BAL	Any time	Ignored
Up Arrow	Any time	Ignored

Down Arrow	Any time	Ignored
------------	----------	---------

7.2.10 PIN Pad Screen EBP11: Processing

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	
1	P	R	O	C	E	S	S	I	N	G							
2	P	L	E	A	S	E		W	A	I	T						
3																	
4																	

This is Hypercom screen 06h customised to meet Post Office requirements. The screen will be displayed in various scenarios when the PIN pad is busy or waiting for a response from the counter. Examples are following card insertion and whilst waiting for online authorisation. The details of all cases where this screen can be displayed are omitted from the detailed flowcharts in section 2.

Key	When Pressed	Action
ENT	Any time	Ignored
CAN	Any time	Ignored
CLR	Any time	Ignored
BAL	Any time	Ignored
Up Arrow	Any time	Ignored
Down Arrow	Any time	Ignored

7.2.11 PIN Pad Screen EBP12: Enter PIN

Removed. Now appears in section 5.2

7.2.12 PIN Pad Screen EBP13: Application Selection at Counter

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	
1	S	E	L	E	C	T	I	N	G								
2	A	P	P	L	I	C	A	T	I	O	N						
3	F	O	R		P	A	Y	M	E	N	T						
4																	

This is Hypercom screen 15h: (not customised).

Function Key Actions for this screen

Key	When Pressed	Action
ENT	Any time	Ignored
CAN	Any time	Transaction Ends
CLR	Any time	Ignored
BAL	Any time	Ignored
Up Arrow	Any time	Ignored
Down Arrow	Any time	Ignored

7.2.13 PIN Pad Screen EBP14: Remove & Re-insert Card (1)

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	
1	R	E	M	O	V	E		A	N	D							
2	R	E	-	I	N	S	E	R	T		C	H	I	P			
3	C	A	R	D													
4																	

This screen appears if the customer enters his card wrongly into the PIN pad in response to the Insert card request in EBP1: e.g. if it were inserted upside down or back to front.

This is Hypercom screen 27h customised to meet Post Office requirements.

Function Key Actions for this screen

As for insert card EBP1 (section 7.2.1)

7.2.14 PIN Pad Screen EBP15: Re-insert Card (1)

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
1															
2	R	E	-	I	N	S	E	R	T		C	H	I	P	
3	C	A	R	D											
4															

This screen appears on first on the first attempt to re-enter the card into the PIN pad after the first attempt fails: e.g. if it were inserted upside down or back to front.

This is Hypercom screen 28h customised to meet Post Office requirements.

Function Key Actions for this screen

As for insert card EBP1 (section 7.2.1)

7.2.15 PIN Pad Screen EBP16: Remove & Re-insert Card (2)

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1	R	E	M	O	V	E		A	N	D						
2	R	E	-	I	N	S	E	R	T		C	A	R	D		
3	S	E	E		P	I	C	T	U	R	E		N	E	A	R
4	C	A	R	D		E	N	T	R	A	N	C	E			

This screen appears if the customer enters his card wrongly twice into the PIN pad.

This is Hypercom screen 29h customised to meet Post Office requirements.

Function Key Actions for this screen

As for insert card EBP1 (section 7.2.1)

7.2.16 PIN Pad Screen EBP17: Re-insert Card (2)

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1																
2	R	E	-	I	N	S	E	R	T		C	A	R	D		
3	S	E	E		P	I	C	T	U	R	E		N	E	A	R
4	C	A	R	D		E	N	T	R	A	N	C	E			

This screen appears on first on the second attempt to re-enter the card into the PIN pad after the first two attempts have failed.

This is Hypercom screen 2Ah customised to meet Post Office requirements.

Function Key Actions for this screen

As for insert card EBP1 (section 7.2.1)

7.2.17 PIN Pad Screen EBP18: Remove & Hand Card to Clerk

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1	R	E	M	O	V	E		C	A	R	D		A	N	D	
2	H	A	N	D		T	O		C	L	E	R	K			
3																
4																

This screen appears if the customer enters his card wrongly three times into the PIN pad.

Function Key Actions for this screen

As for insert card EBP1 (section 7.2.1)

7.2.18 PIN Pad Screen EBP19: Hand Card to Clerk

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1																
2	H	A	N	D		T	O		C	L	E	R	K			
3																
4																

This screen appears after the customer takes his card out of the PIN pad in response to the EBP18 screen.

This is Hypercom screen 2Ch customised to meet Post Office requirements.

Function Key Actions for this screen

As for insert card EBP1 (section 7.2.1)

7.2.19 PIN Pad Screen EBP20: Cancelled

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1	C	A	N	C	E	L	L	E	D							
2																
3																
4																

This is Hypercom screen 0Dh.

The same screen is used whether the transaction is cancelled by the clerk or by the customer and is displayed when the card is not in the PIN pad.

Screen EBP7 (section 7.2.6) is also a cancel screen which is displayed when the card is present in the PIN pad.

Function Key Actions for this screen

As for insert card EBP7 (section 7.2.6)

7.2.20 PIN Pad Screen EBP21: Processing

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1			P	R	O	C	E	S	S	I	N	G				
2																
3																
4																

Function Key Actions for this screen

Key	When Pressed	Action
ENT	Any time	Ignored
CAN	Any time	Ignored
CLR	Any time	Ignored
BAL	Any time	Ignored
Up Arrow	Any time	Ignored
Down Arrow	Any time	Ignored

7.2.21 PIN Pad Screen EBP22: Application Blocked

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1																
2			A	p	p	l	i	c	a	t	i	o	n			
3			B	l	o	c	k	e	d							
4																

Function Key Actions for this screen

Key	When Pressed	Action
ENT	Any time	Ignored
CAN	Any time	Ignored
CLR	Any time	Ignored
BAL	Any time	Ignored
Up Arrow	Any time	Ignored
Down Arrow	Any time	Ignored

7.2.22 PIN Pad Screen EBP23: Card Blocked

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1																
2			C	a	r	d		B	l	o	c	k	e	d		
3																
4																

Function Key Actions for this screen

Key	When Pressed	Action
ENT	Any time	Ignored
CAN	Any time	Ignored
CLR	Any time	Ignored
BAL	Any time	Ignored
Up Arrow	Any time	Ignored
Down Arrow	Any time	Ignored

8.0 Annexe B

8.1 Screens for EMV Retail used from existing NBS Applications

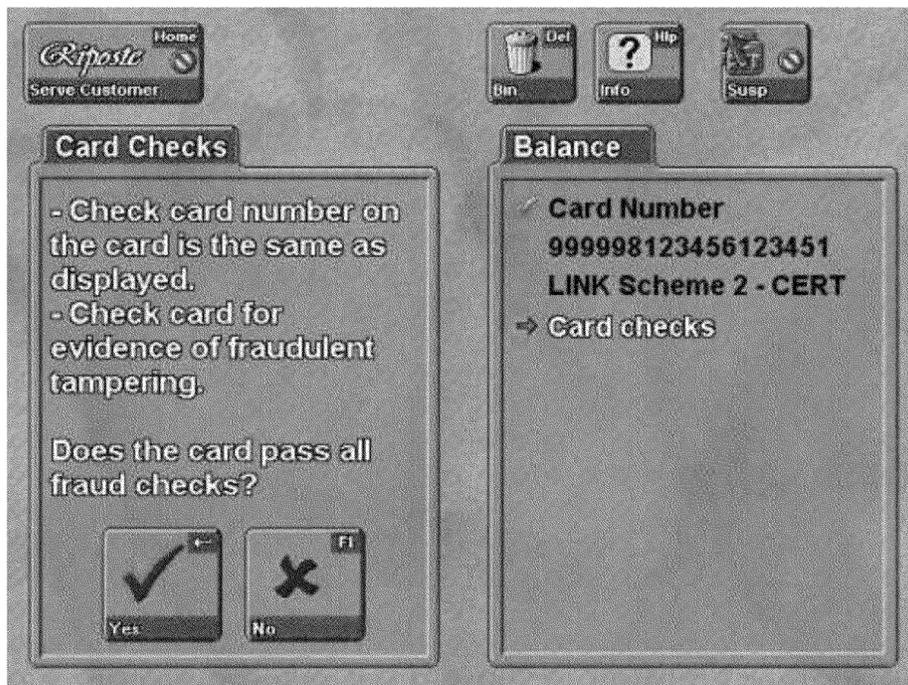
EMV Retail will also utilize the following screens found in NB/SPE/003 Network Banking Counter Dialogue –Activity and Screen Flows. The screen layouts are repeated here for information purposes only: future change controls may require the screens to be changed for Network Banking after the document for EMV Retail is baselined. The screen layouts defined in NB/SPE/003 take precedence over those shown below.

In the examples the tab heading on the top right hand side of the screen contains banking terms such as “Cash Withdrawal”, “Withdraw Limit”, “Balance” etc. For EMV Retail these will be replaced with retail terms such as “Card Payment” or “Card Reversal” as appropriate:

8.1.1 Screen 3: Waiting for PIN

Screen 3 no longer used: screen ER4 used instead

8.1.2 Screen 4 Card Checks



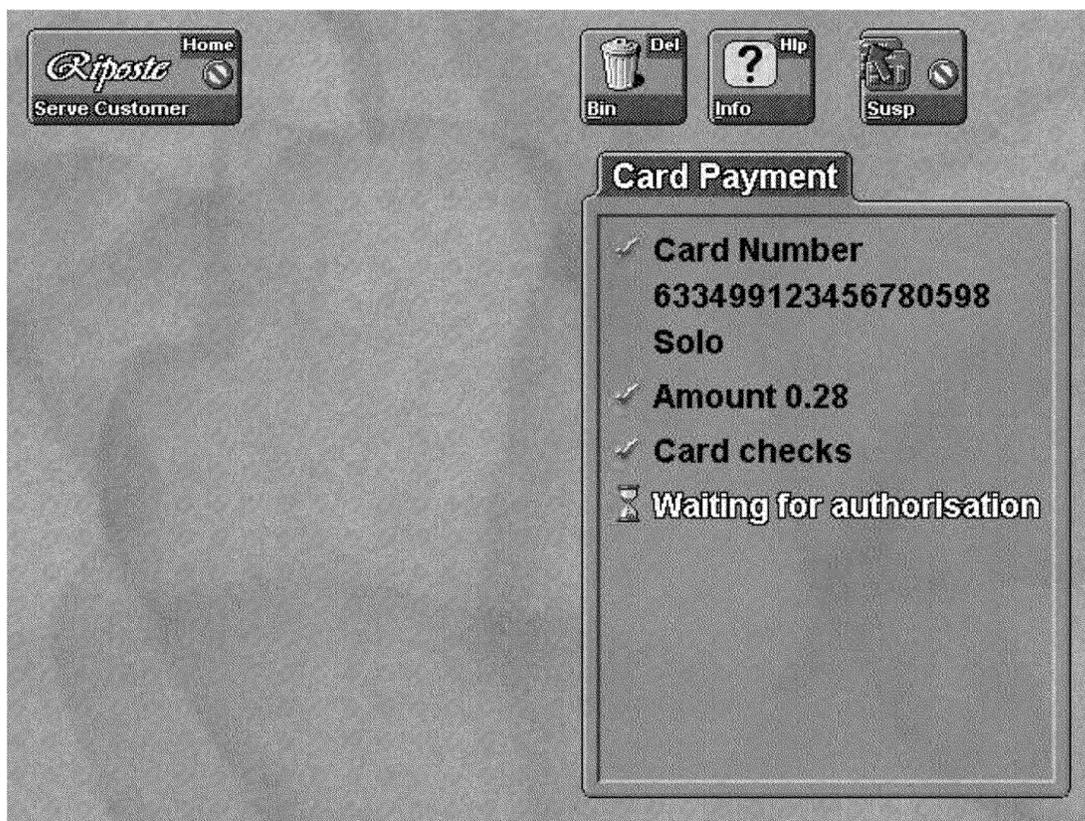
Note

- this screen is present to illustrate the contents of the LH panel only. The RH panel will contain the transaction sequence from the transaction dialogue similar to other EMV Retail screens.
- the first sentence in the left hand panel is the existing MSG829 and reads 'Check card number on the card (if available) is...' (the '(if available)' was added in Oct 03 for CP3429).

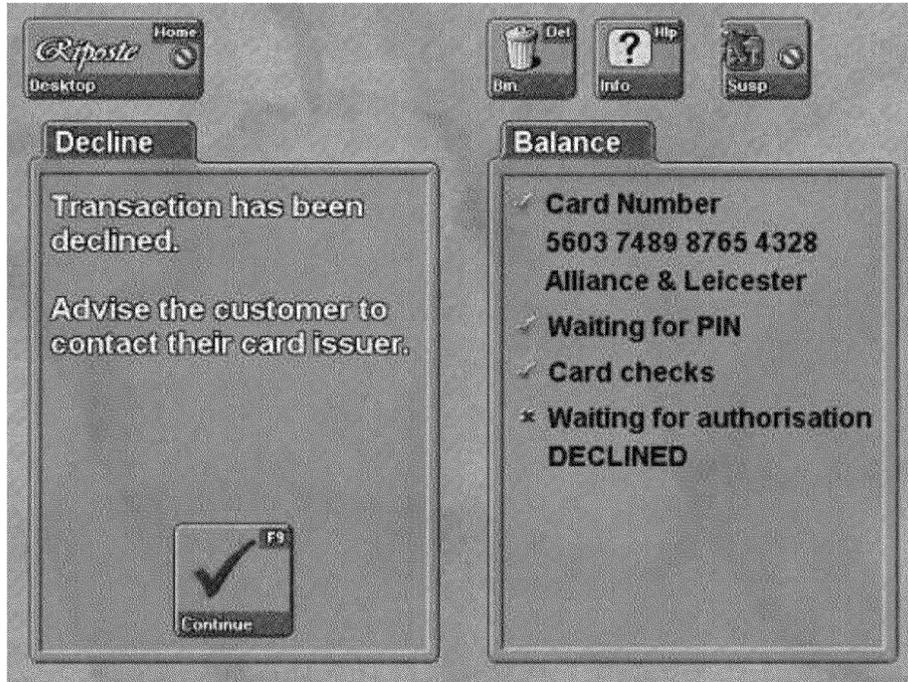
8.1.3 Screen 5: Waiting for Authorisation

This screen will still be used for MSR transactions: for EMV the screen ER29 Screen 5 (EMV): *Waiting for Authorisation* (see 5.1.29) will be used instead.

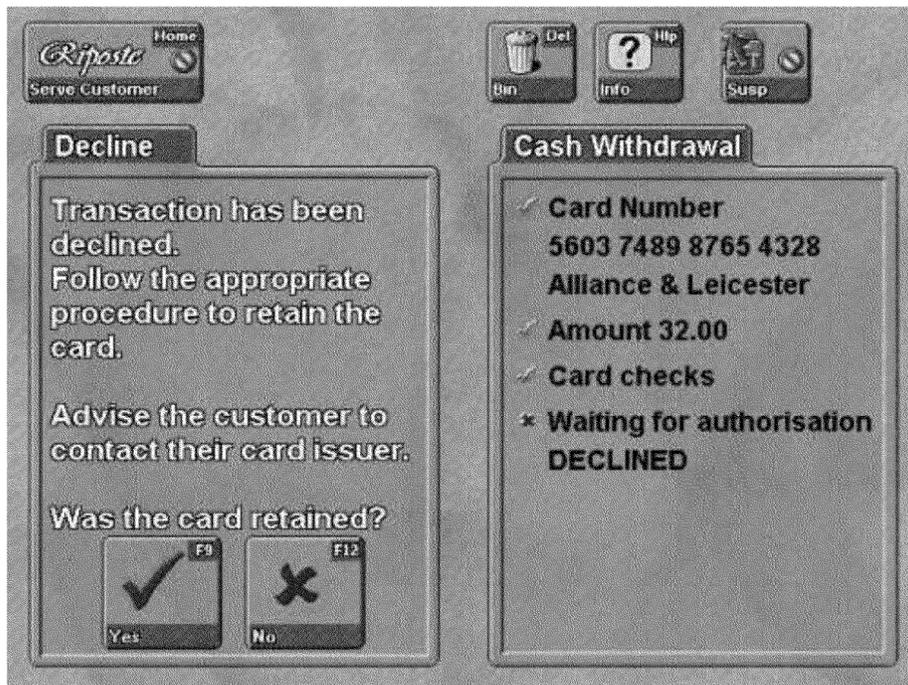
The Tab at the top of the RH panel will contain "Debit Card". The "Card checks" item will not appear.



8.1.4 Screen 7: Other Decline



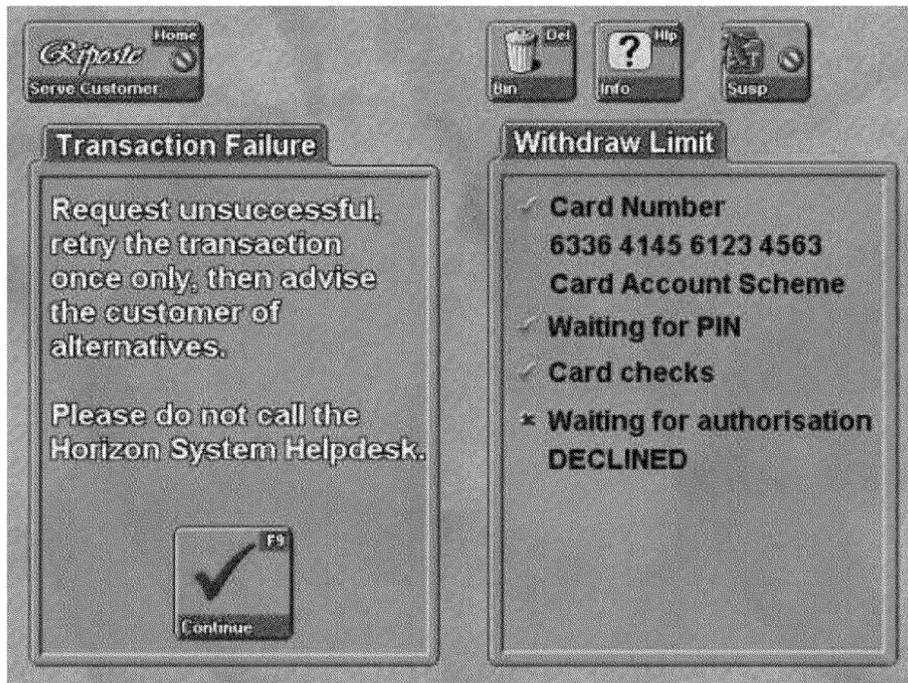
8.1.5 Screen 9: Card Retain



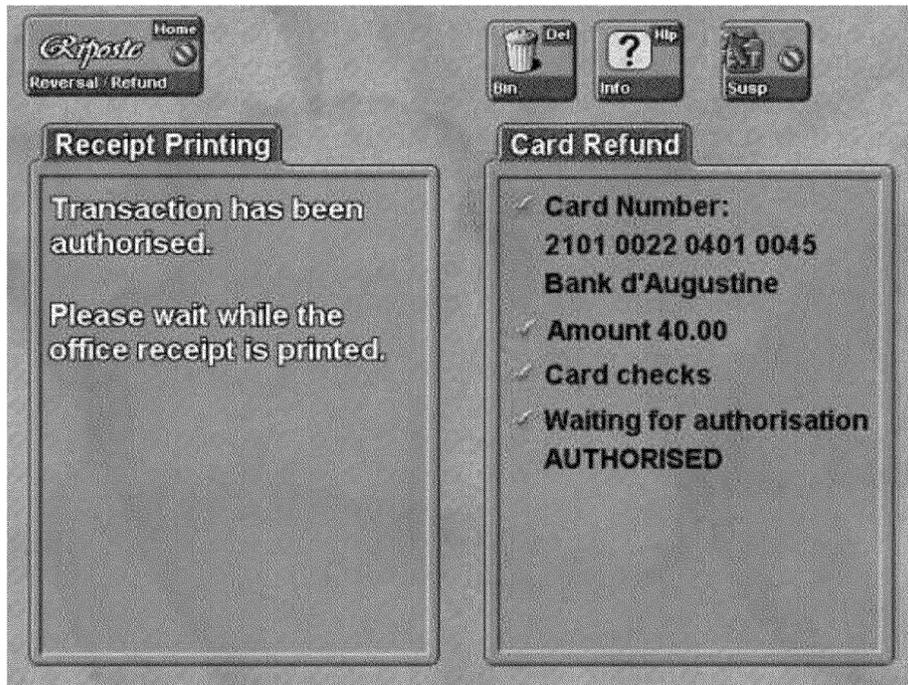
8.1.6 Screen 10: Transaction Failure

This screen is used to report failed transactions. The message text which appears in the left hand column depends on the response code as defined in

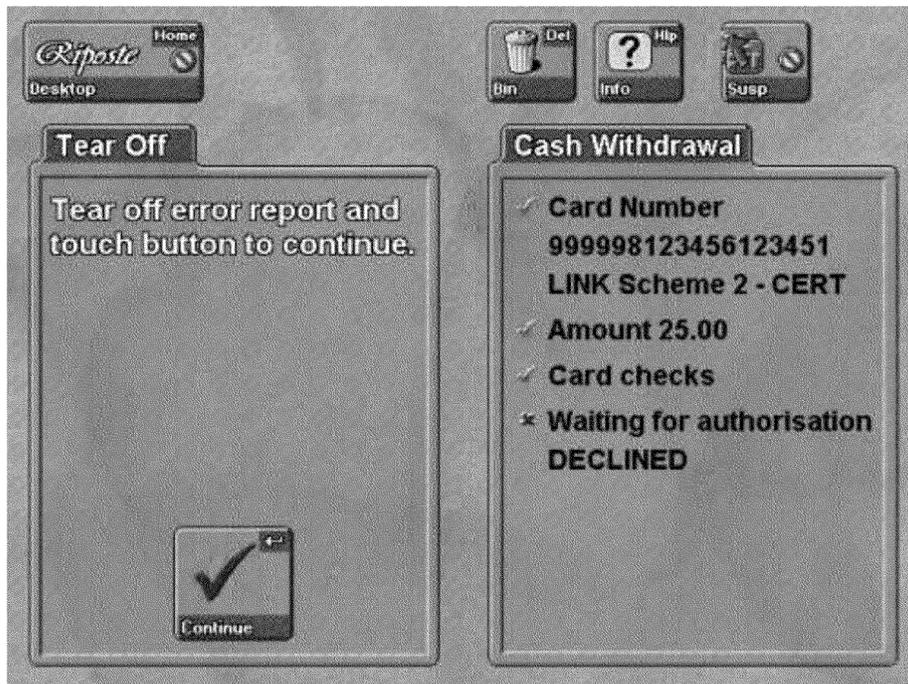
- NB/SPE/003 Network Banking Counter Dialogue – Activity & Screen Flows
- NB/SPE/013 Debit Card: Counter Dialogue – Activity and Screen Flows.



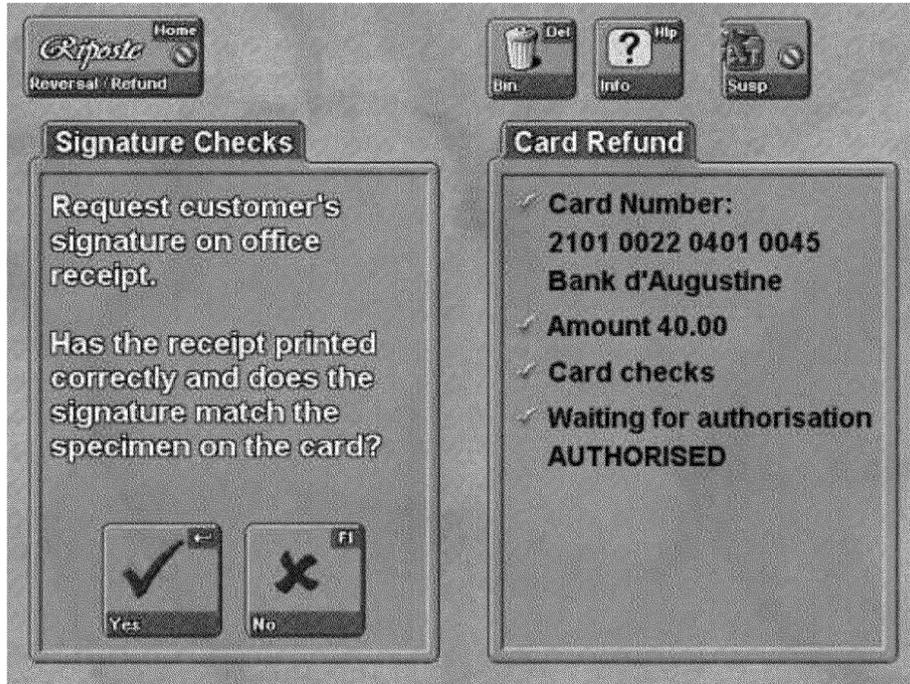
8.1.7 Screen 11: Office Receipt Printing



8.1.8 Screen12: Tear off Error Message Instruction

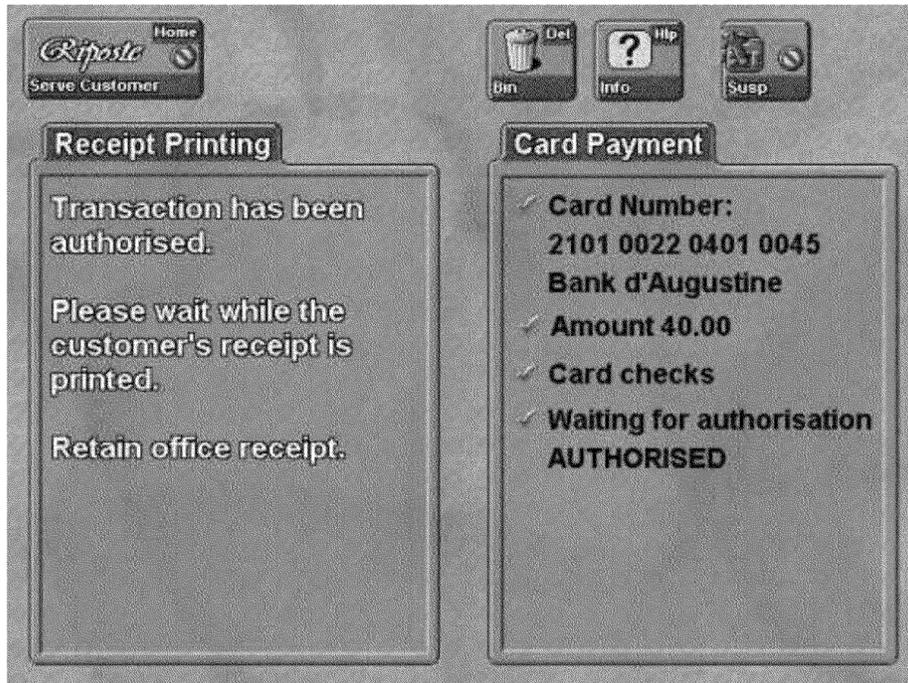


8.1.9 Screen13: Check Signature



8.1.10 Screen 14: Printing Receipt

The first part of the text is dependent on the transaction outcome. It may say "authorised" as in the example below or "declined" if the transaction was declined.



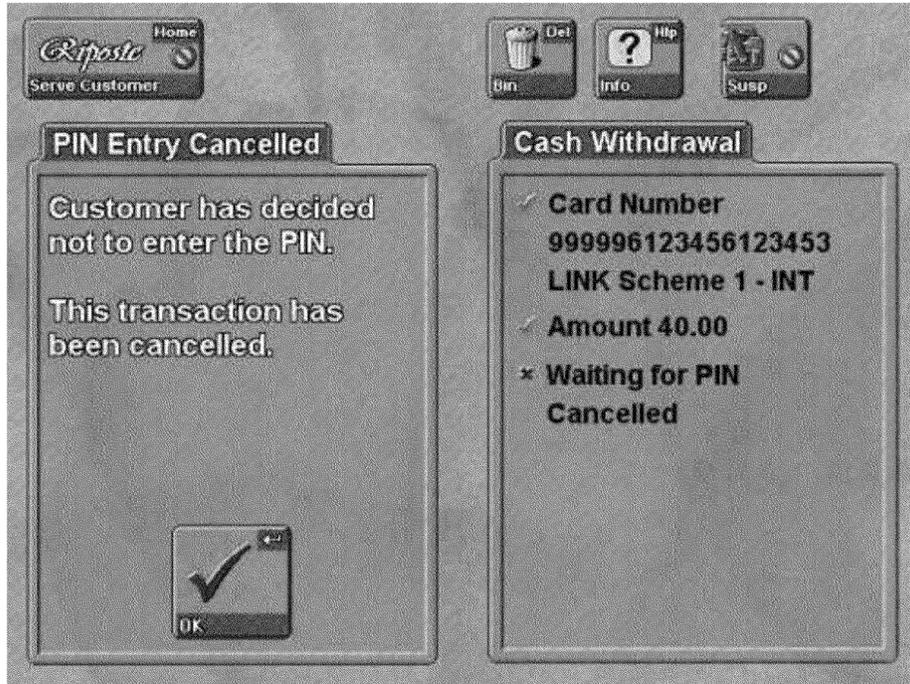
Screen Variations

RH panel, last line may be AUTHORISED or DECLINED

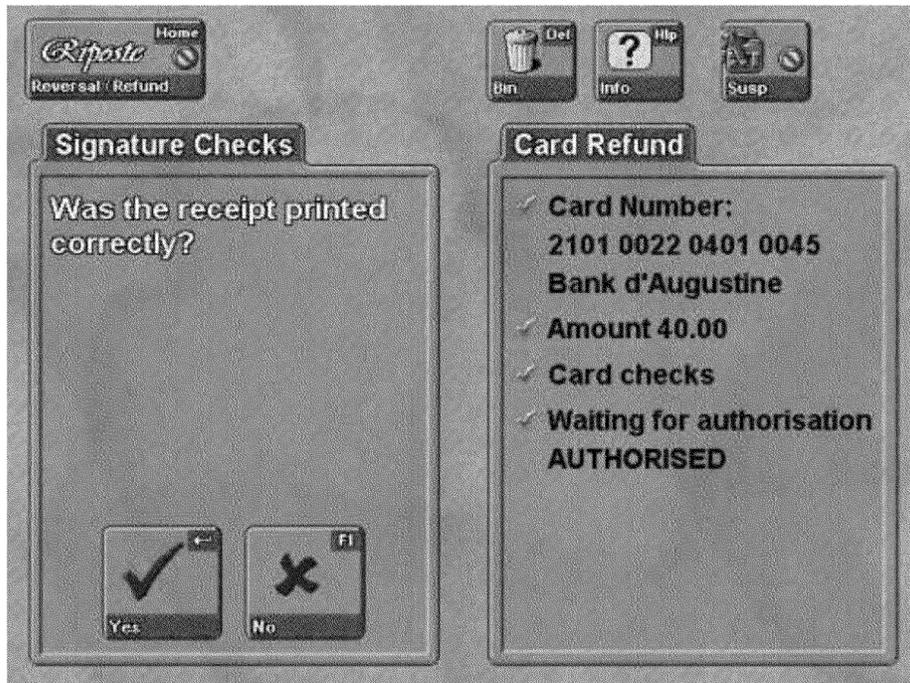
The LH Panel may contain :

- Transaction has been declined. Please wait while the customer's receipt is printed.

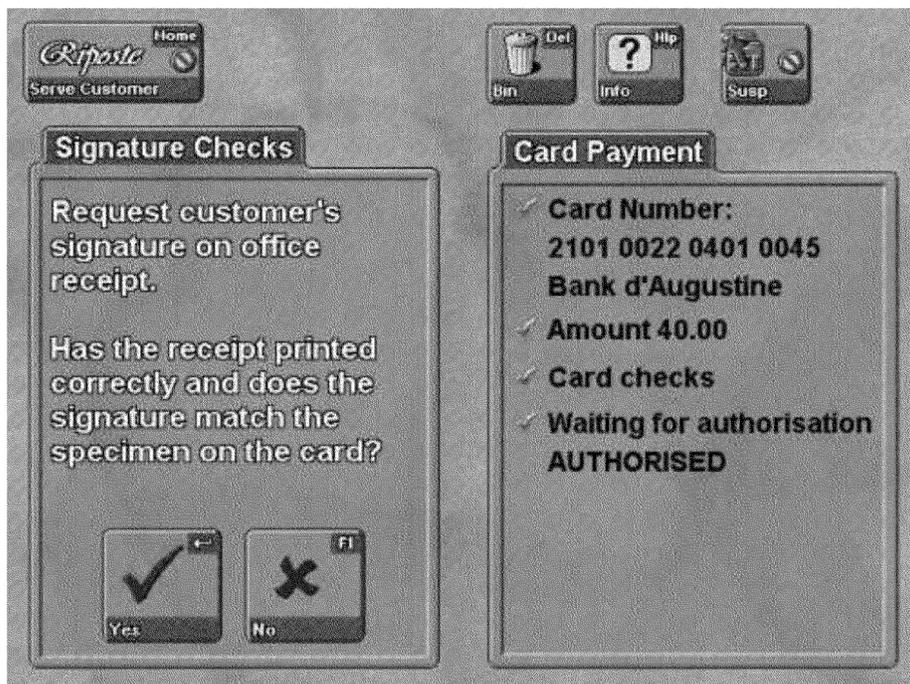
8.1.11 Screen 19: Cancel Message



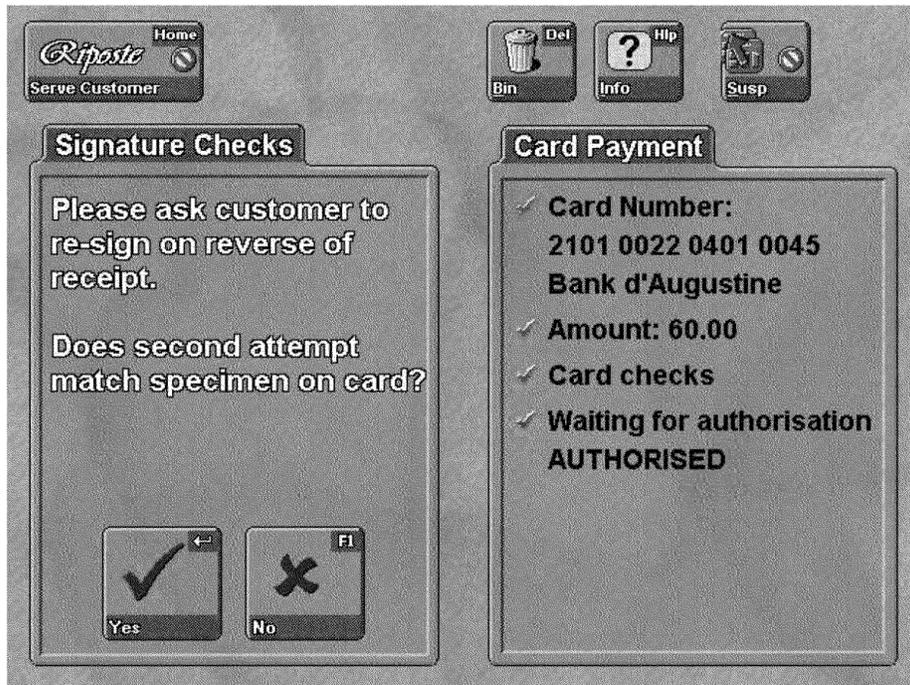
8.1.12 Screen E1: Signature Receipt OK



8.1.13 Screen E2: Signature Check (2nd Receipt)



8.1.14 Screen E3: Signature Check (2nd attempt)



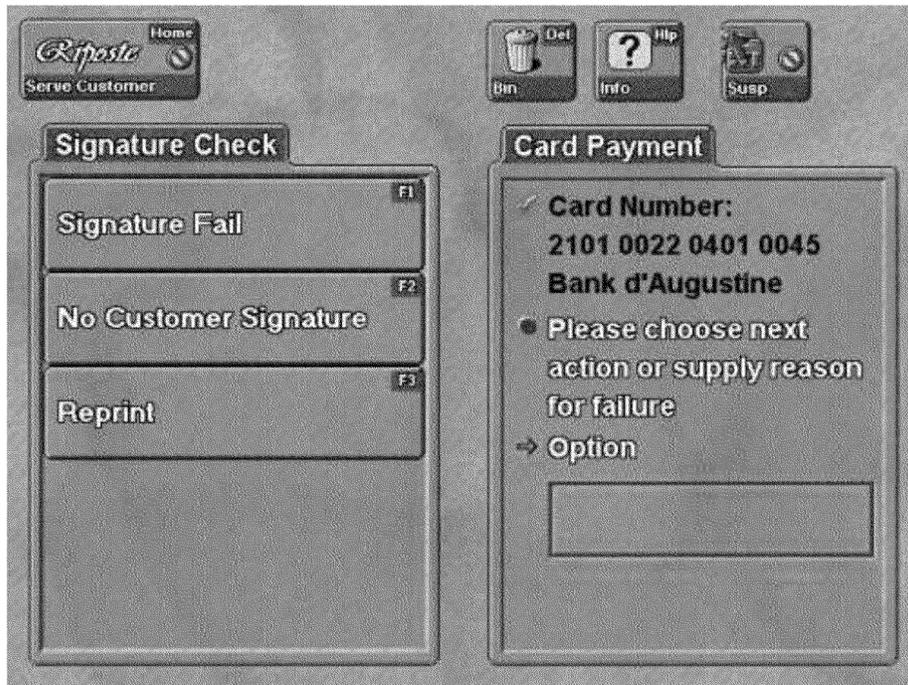
8.1.15 Screen E4: Invalid Card

This screen will be used to display errors when validating the card as follows:

- The check digit(s) on the card are incorrect
- The start date indicates that card is not valid: please tell customer
- The supplied card has expired: please tell customer
- The supplied card is not valid: please tell customer



8.1.16 Screen E5: Signature Checks Failure Options



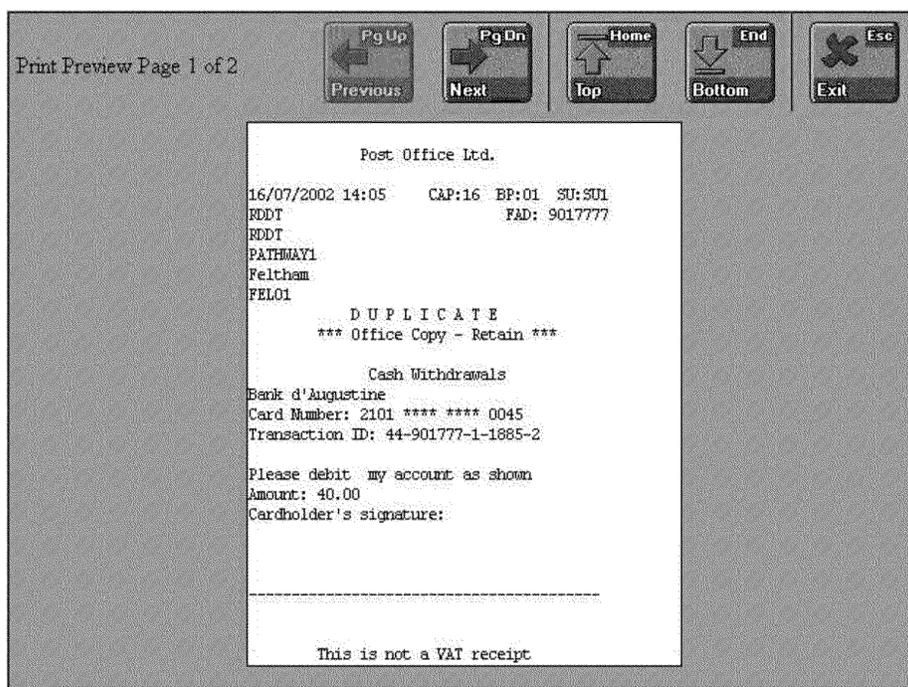
8.1.17 Screen E6: Print Preview

This screen shot provided for background information only and is not necessarily representative of the user interface for Print Preview screens. The style used for this screen will be the same as for EPOSS – indeed the same display technology will be used.

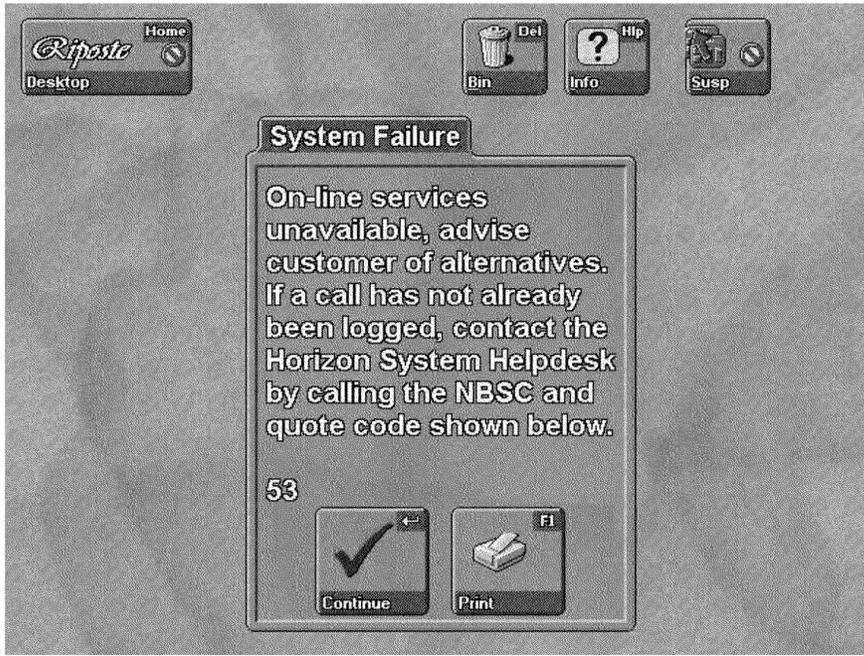
For Debit Card Transactions the receipt will be as described in Section 5

"Cash Withdrawals" will be replaced with "Payment" or "Refund".

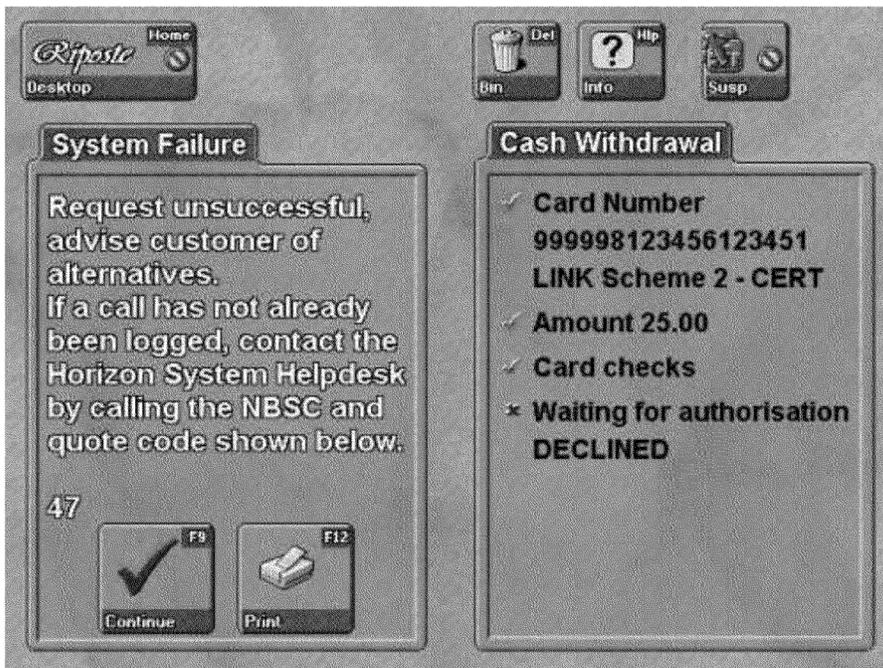
For a Card Refund transaction "Please debit my account as shown" will be replaced with "Please credit my account as shown".



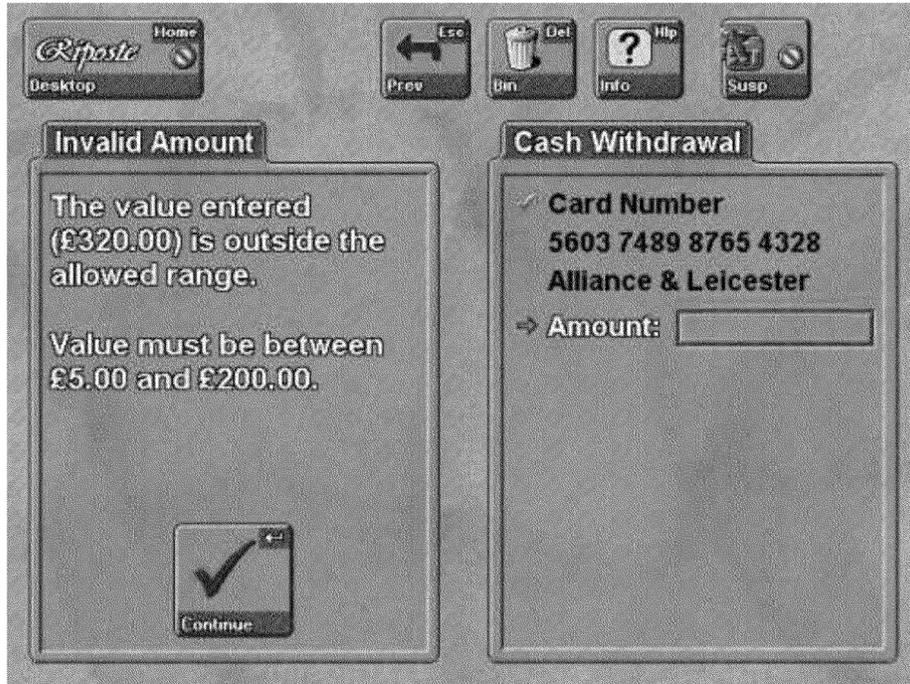
8.1.18 Screen E7: Error Message



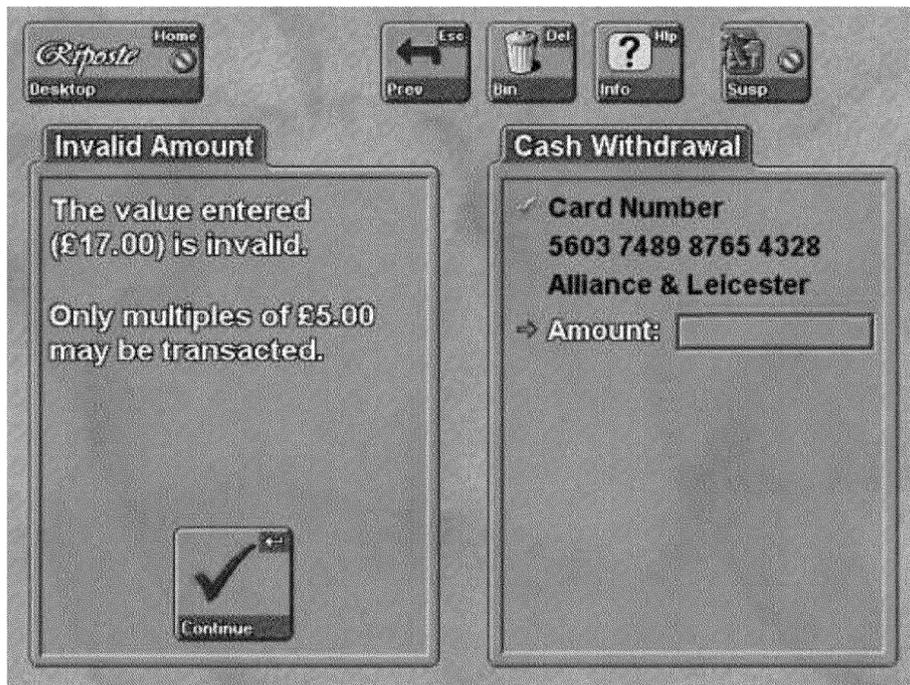
8.1.19 Screen E8: Error Message



8.1.20 Screen E9: Error Message



8.1.21 Screen E10: Error Message

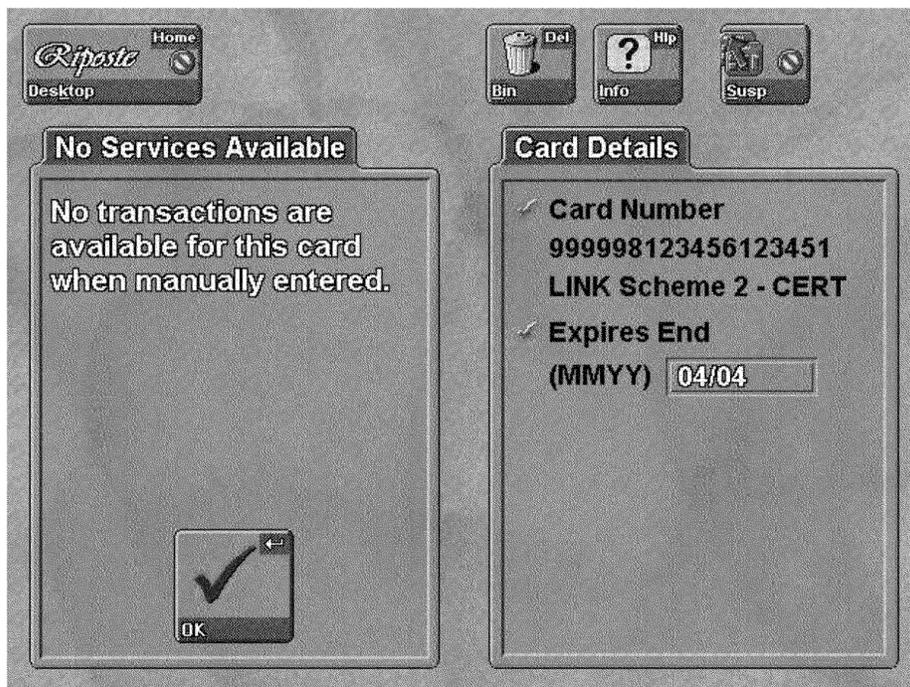


8.1.22 Screen E11 – No Services Available

This screen will be displayed in the following circumstances :

- The card is an ICC card which has been inserted in the PIN pad but reference data does not allow ICC as a valid method of card entry for the scheme to which the selected application belongs
- The card is an ICC card and has been read in fallback mode by the magnetic stripe reader but reference data does not allow fallback magnetic stripe entry as a valid method of card entry for the scheme to which the card belongs
- The card is not an ICC card and has been read by the magnetic stripe reader but reference data does not allow magnetic stripe entry as a valid method of card entry for the scheme to which the card belongs
- The counter has not had a PIN pad installed but all transactions require one. In this case the text “without a PIN pad” will be appended.
- The card was entered manually but no transactions are available when manually entered. If there would have been at least one transaction available had the card been successfully swiped the text “when manually entered” will be appended.

Note: This screen will have a single panel if the transaction started from a card swipe and two panels if it started from manual input.



8.2 Screens for EMV Retail used from existing DCS Applications

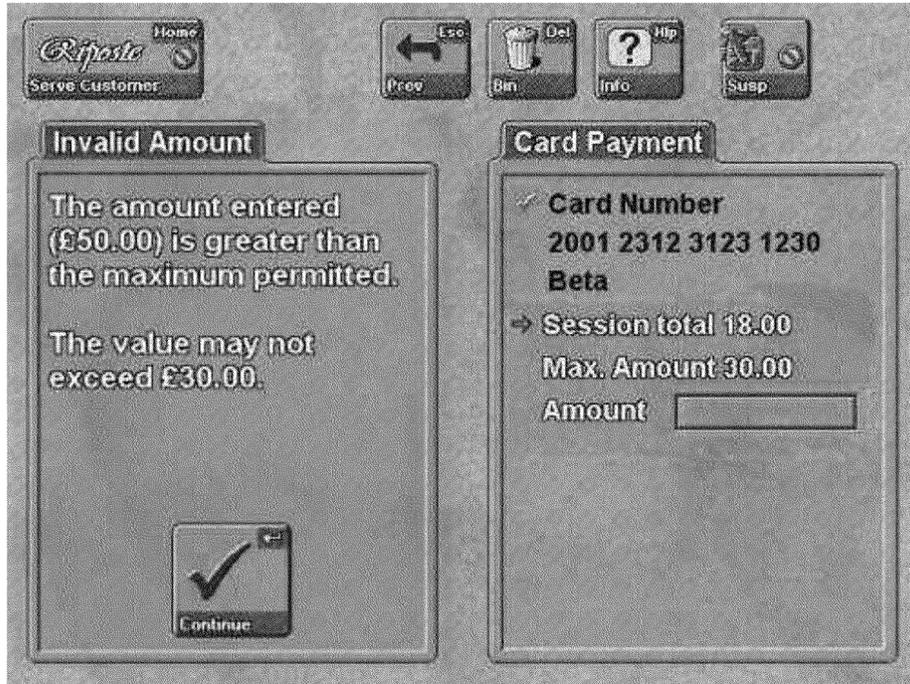
The following screens found in NB/SPE/013 are used for EMV Retail:

8.2.1 Screen D1: Amount Capture

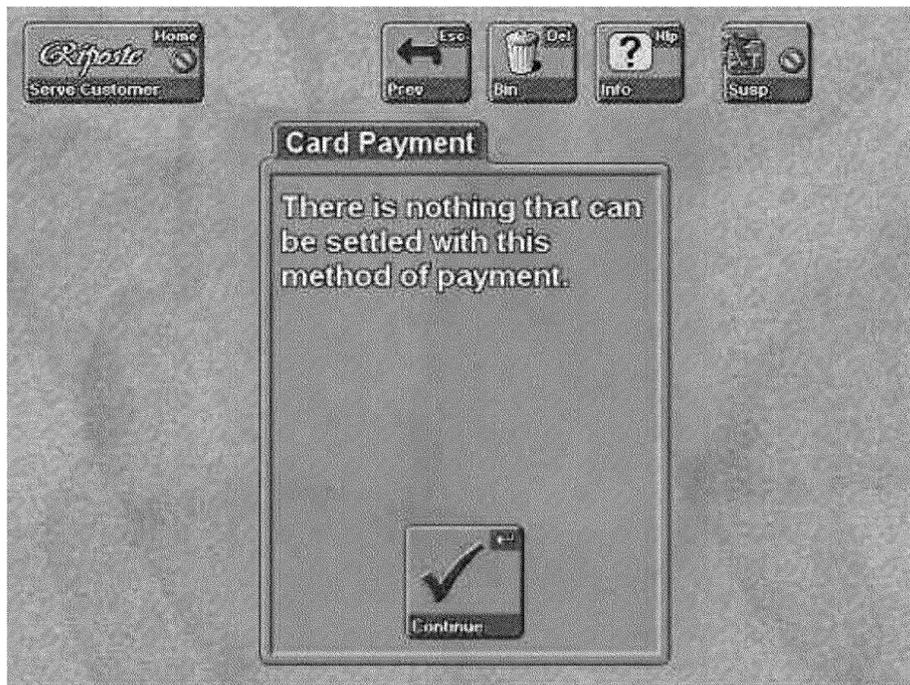


For Retail Card payments the Amount is captured before the card is read so Card Number and Scheme will not appear in the right hand panel.

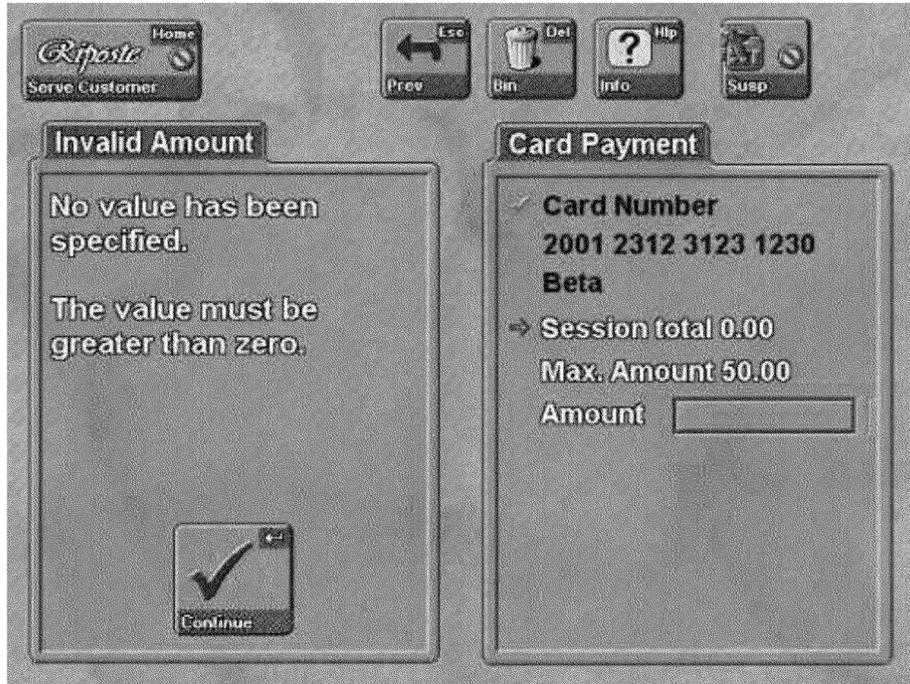
8.2.2 Screen D2: Error Message



8.2.3 Screen D5: Nothing to Settle



8.2.4 Screen D6: Error Message



9.0 Annexe C

9.1 PIN Pad Commands

The flow diagrams in section 2 make many references to PIN Pad application commands either flowing from the counter to the PIN pad or from the PIN Pad to the counter. Their purpose is to keep the counter informed of the progress of the transaction and to give it the opportunity to alter the direction of the transaction in defined ways. Whilst the counter is responsible for starting the transaction, the PIN pad application and the customer's card, once the transaction has started, are in complete control. The PIN pad application dialogue is in essence a framework upon which the counter dialogues are hung. The following table of PIN pad application commands is provided not as a complete description of those commands but as a guide to assist the reader in interpreting the flow diagrams. There is no attempt here to describe the data passed on these commands unless it is essential to explain the meaning. The description of the commands is also constrained to the context of a financial transaction, i.e. not administrative transactions(not data loading etc.).

Command	From Counter	To Counter	Purpose
AAC		Y	To inform to the counter that the transaction has been declined. It carries the AAC cryptogram.
ACK	Y		Multiple purposes, to inform the PIN pad that the counter has received a command which requires confirmation. Also to determine a course of action at a defined decision point. e.g. PIN bypass.
ARQ		Y	To inform the counter that online authorization is required. This command passes EMV tag data for the authorization request. The counter solicits further tag data in TLV format where that data is required.
DSP		Y	To carry status and information to the counter. It is a command which requires acknowledgement. An example of its use is to carry the Application Label to the counter after application selection has been performed.
EFT	Y		To start the EFT transaction. It requires the transaction type and amount.
END		Y	To signal the end of the transaction. This may contain error information where a transaction has failed.
KBD		Y	Similar to the DSP this command carries data to the PIN pad. It has a different shape depending on the context of its use. It requires acknowledgement.

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EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

STA 1		Y	To inform the counter that card insertion is required.
STA 2		Y	To inform the counter that an ICC card has been inserted and read successfully.
STA 6		Y	To inform the counter that the transaction has been cancelled, either by the customer or by the PIN pad.
STA 7		Y	To inform the counter that card removal has been requested at the PIN pad.
STA 8		Y	To inform the counter that a card read error has been detected.
STA 9		Y	To inform the counter that fallback to MSR is required.
STA D		Y	To inform the counter that the card removal timer has expired and the PIN pad is moving on to the next event in the process.
TC		Y	To inform the counter that the transaction has received authorization from the merchant acquirer and card. The command also carries the Transaction Cryptogram. It requires acknowledgement.
TDR		Y	To convey the EMV tag data requested in a TLV command to the counter.
TLV	Y		To solicit EMV tag data from the PIN pad. TLV/TDR dialogues are issued when the PIN pad is expecting an acknowledgment this can cause confusion as a following acknowledgment may seem to be made to the TDR. In such situations the acknowledgment is made to the command which preceded the TLV command.
VFY		Y	Informs the counter of the outcome of CVM processing. It requires acknowledgement.

10.0 Annexe D

10.1 PIN Pad error messages and Screen ER14 clerk messages

The following table shows the Hypercom error messages with equivalent messages for clerk consumption. The clerk messages will be displayed on the ER14 clerk screen. The intent is to display an error message when PIN pad failures occur but to tailor the message in such a way that both clerk and customer will not be too confused by the verbosity of the originals. It is also important that the messages do not convey the wrong meaning or alarm the customer. Following the display of such messages the system will also log information events to the event log.

Error Code	Clerk Message	Description	Severity
00001	System error.	Communication error ERR_COMMUNICATION	E
00002	System error.	Timeout ERR_TIMEOUT	E
00003	System error.	LRC error ERR_LRC	E
00004	System error.	Parity error ERR_PARITY	E
00005	System error.	Buffer overflow ERR_BUFFER_OVERFLOW	E
00010	System error.	Message code not implemented ERR_NOT_IMPLEMENTED	E
00016	System error.	Data format error ERR_FORMAT	E
00022	System error.	Wrong prefix code ERR_PREFIX_CODE	E
00023	System error.	STAN out of range ERR_OUT_OF_RANGE_STAN	E
00025	System error.	STAN out of sequence ERR_INVALID_STAN	E
00026	System error.	Remove card, check signature	E

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EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

		REMOVE_CARD_CHECK_SIG	
00027	System error.	Wrong date/time ERR_TIME_DATE_ERROR	E
00028	System error.	Timer length error ERR_TIMER_LENGTHS	E
00030	System error.	Date error ERR_DAY_RANGE	E
00031	System error.	Hour error ERR_HOUR_RANGE	E
00032	System error.	Minute error ERR_MIN_RANGE	E
00033	System error.	Second error ERR_SEC_RANGE	E
00034	System error.	Invalid length ERR_LENGTH	E
00037	System error.	Other error ERR_NOT_OK	E
00038	Card error	Card not supported ERR_CRD_NOT_SUPPORTED	
00039	Operation cancelled.	Cancelled ERR_CANCELLED	
00040	System error.	POS device ID incorrect ERR_DEV_ID	E
00041	System error.	STAN error ERR_STAN	E
00042	System error.	Application not supported ERR_APP_NOT_PRESENT	E
00043	Card error	Start sentinel, end sentinel or LRC is incorrect ERR_TRACK	
00044	Card error	Luhn check digit in last position of the PAN ERR_PAN_LUHN	

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EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

00045	Card error	International Identification Number (IIN) invalid ERR_NO_IIN	
00046	Card error	PAN length invalid ERR_PAN_LENGTH	
00047	Card error	Start date error ERR_DATE_START	
00048	Card error	Date validity or expired ERR_DATE_EXPY	
00049	Card error	Issue number length invalid ERR_ISSUE	
00050	Card error	Hot card match is found ERR_HCF	
00051	Card error	Service code validation error ERR_SCDE	
00052	Card error	Service code indicates reject ERR_SCDE_REJECT	
00053	Card error	If purchase with cashback SCDE_NO_CASHBACK	
00054	Card error	Transaction type rejected for this terminal ERR_TXN_TYPE_TERM	
00055	Card error	Transaction type rejected for this IIN ERR_TXN_TYPE_IIN	
00056	Card error	PIN required SCDE_PIN_REQUIRED	
00057	Card error	Service code indicates chip should be read SCDE_PROMPT_ICC	
00058	System error.	Problem with key data loaded into Public Key table ERR_VALIDATE_KEY_ERR	E
00059	System error.	Error writing data to tag store EMV_L2_ERROR	E
00060	System error.	Public key error ERR_PUBLIC_KEY	E

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EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

05001	Card error.	The contents of Tag 5A (Application PAN) does not match the PAN in Tag 57 (Track 2 Equivalent Data). The 2 tags should be contained in the data section of the error message. This means a bad card or bad chip data.	
05049	System error.	Insufficient parameter data downloaded to the device - cannot begin EFT	E
08001	System error.	System file error	E
08002	System error.	EMV level not set to 1 or 2	E
08003	System error.	EMV library initialization error	E
08004	Transaction not allowed.	No applications supported	I
08005	This is a swipe card.	Magnetic stripe – fallback to MSR (track data may be appended to error code)	
08006	Operation cancelled.	Customer cancelled/says no to application selection	
08007	Time limit exceeded.	Customer timeout	
08008	Card error.	Select application error	I
08009	Invalid PIN.	PIN error	
08010	Cardholder verification failure.	Cardholder verification error	
08011	Card error.	Select application returns non-EMV	
08012	Card error.	Select application fails	
08013	Card error.	Select application format	
08014	Transaction not allowed.	No more applications available	
08015	This is a swipe card.	Non EMV – fallback to MSR	
08016	Card not recognised.	No issuer match	I
08017	System error.	Write tag data to library error – tag data may be present after the error code	E
08018	Card blocked.	ICC blocked	
08019	Card error.	Mandatory data missing	
08020	Card error.	Select application library returns bad format	
08021	Card error.	Authenticate data, encryption failure	

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

08022	Card error.	Authenticate data, error	
08023	Cardholder verification failure.	Cardholder verification, failure	
08024	Transaction not allowed.	Transaction type, error	E
08025	System error.	Read tag data error	W
08026	Cardholder verification failure.	Verify at EPOS returned not OK.	
08027	System error.	Validate transaction, error	I
08028	Transaction not allowed.	Action analysis, failure	I
08029	Transaction not allowed.	Action analysis, decline	I
08030	System error.	DOL does not contain 9F37	W
08031	System error.	Terminal capabilities error (9F33)	W
08032	System error.	Advice, error	W
08033	The transaction has been cancelled by the customer removing the card too soon. ¹⁷	Card removed within EMV transaction	
08034	Transaction not allowed.	Facilities Code for acquirer does not allow this transaction	I
08035	Transaction not allowed.	Facilities Code for card scheme does not allow this transaction	I
08036	Cardholder verification failure.	Refund attempted with bypass on PIN entry – not successful	
08037	Operation cancelled.	Refund attempted with cancel pressed on keypad by customer	
08038	System error.	Refund with PED failure during process	E
08039	System error.	DDOL Index error	E
08040	System error.	TDOL Index error	E
08041	System error.	Throw error on TC. NACK response to TC, we send AAC	W
08042	System error.	Error setting ICC reader for EMV txn	E
08043	System error.	Error writing data to additional data tag store	E
08044	System error.	Throw error on RSA key load request	E
08045	Transaction not allowed.	Action analysis, failure 2	I
08046	Transaction not allowed.	Action analysis, failure 3	I

¹⁷ For error code 08033 screen EB4 (see 7.1.2) is output instead of screen ER14 (see 5.1.14).

Fujitsu Services

EMV Retail: User Interface Design Proposal

Ref: NB/REQ/003

Version: 2.0

COMMERCIAL IN-CONFIDENCE

Date: 21st April 2005

08047	System error.	ACK response error for KBD – data format not correct	E
08048	Transaction no longer available.	Throw error: expired application	
08049	Transaction not yet available.	Throw error: application not yet effective	
08050	This error can occur if the customer removes the card too soon.	Failure to complete online transaction (EMV Lvl 2 library cannot complete txn)	W
08051	System error.	If end of txn control = 31 or 33, and ACK response to KBD for check signature is negative, then this error code will appear in END msg.	E
08052	System error.	Throw error on VISA easy entry card (Track2 equivalent data may be appended to error code)	W
08053	Maximum amount exceeded.	Throw error on Terminal Ceiling Limit in General parameter table.	I
08054	Operation cancelled.	1 st and 2 nd instance of new online PIN do not match	
08055	System error.	Format error –Data structure or data format incorrect	E
08056	System error.	69 85 returned in answer to External Authenticate	E
08057	Application blocked.	Application blocked	
08058	System error.	Signature CVM required signature not checked	E
08059	Card error.	Not accepted – service not allowed indicated by card in 1st GenAc	

11.0 Annexe E

11.1 PIN Pad Timeouts

These are the timeouts used by the PIN pad.

Event	Timeout	Outcome if Timeout Exceeded
Insertion of Card	30 seconds	Counter displays Screen ER24: Card Insertion Timeout
PIN Entry	120 ¹⁸ seconds	Counter ceases to display the screen it is currently displaying (i.e. screen ER4 / ER5 / ER16 / ER17 / ER18 / ER19) and displays screen EB4 Cancelled, instead
Card removal	15 seconds	The process for card removal timeout processing is described in NB/REQ/003 in Figure 21: <i>Remove Card</i> , and Figure 23: <i>Approved Remove Card</i>

¹⁸ There is currently a restriction with the PIN pad that enforces an upper limit of 99 seconds on the setting of the PIN Entry timeout value for EMV Retail. (See PC0110135)