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Document Title: EMV Banking: User Interface Design Proposal

Document Type: User Interface Design Proposal

Release: *S70*

Abstract: This document presents a description of the changes to the User Interface to be developed at the Counter Application for EMV Banking

This document is presented on a Subject to Contract and Without Prejudice basis.

Document Status: APPROVED

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0.0 Document Control

0.1 Document History

Version No.	Date	Reason for Issue	Associated CP/PinICL
0.1	15/09/03	First draft for internal comments	
0.2	22/10/04	Second Draft following meeting with PO	
0.3	12/11/03	Third Draft following second meeting with PO and internal review	
0.4	21/11/03	Fourth draft for PO comments	
1.0	19/02/04	Baselined	
1.1	19/03/04	New draft version. Addition of application selection from the counter	CP 3648 CP 3658
1.2	06/07/2004	New draft for PO comments	
1.3	14/07/2004	New draft after 1.2 withdrawn from review.	
1.4	10/09/2004	New draft after 1.3 withdrawn from review	
1.5	29/03/2005	Version incorporating changes from the changes supplement NB/PRP/005 v1.0.	PC0104918 PC0105585 PC0106457 PC0106872 PC0106926 PC0107169 PC0107635 PC0108087 PC0108091 PC0108093 PC0108094 PC0108098 PC0108100 PC0108273 PC0108311 PC0108350 PC0108611 PC0108773 PC0109084 PC0109176 PC0109177 PC0109178 PC0109180 PC0109182 PC0109337 PC0109482 PC0109509

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2.0	21/04/2005	Baselined	

0.2 Review Details

Review Comments by :	Not applicable
Review Comments to :	

Mandatory Review Authority	Name
Fujitsu Services	Pete Lucas*
Post Office Ltd	Bob Booth* ,Vicky Gray*
Optional Review / Issued for Information	
SI Design	Roger Donato, Chris Bailey, Dave Johns
SI Development	Matt Arris, Trish Morris*
SI Test	Julie Havard
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Programmes	Stephen Probert, Gill Jackson
IPDU	Simon Fawkes
Post Office Ltd	Bob Booth* ,Vicky Gray*

(*) = Reviewers that returned comments

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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
CD/CDE/009		Conceptual Design for DDA Beeps	Post Office Ltd
NB/PRP/005	1.0	EMV Banking User Interface Design Proposal – Changes Supplement	Fujitsu Services
NB/REQ/003		EMV Retail User Interface Design Proposal	Fujitsu Services
NB/SPE/003		Network Banking Counter Dialogue – Activity & 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
Banking Card	A credit, debit or bankcard (either magnetic stripe or EMV) used for a Banking Transaction.
Banking Transaction	A Transaction supported in accordance with the Network Banking Service SRS, which lists the following transactions : Cash Withdrawal Withdraw Limit Cash Deposit Cheque Deposit Balance Enquiry Change PIN

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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.
Cancel	A transaction that is terminated before a Request message is generated at the counter is **cancelled**. Cancel includes: - 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 In all cases no record of the transaction is maintained by the counter system.
Chip and PIN	Authentication and verification of an ICC card using EMV standards and a PIN. The card is inserted into a PIN pad, the chip on the card is read by the device, a transaction is executed and is verified by a PIN entered by the customer
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
Customer Verification Method	Different methods of Customer Verification are possible : • Verification by Signature • Verification by PIN • No verification For EMV Banking the verification method is PIN with on-line authorisation from the Financial Institutions: except for deposit transactions which have no verification

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Decline	A transaction is **declined** when it does not proceed as per the initial customer request. Decline includes: - 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 In all cases a record of the transaction is maintained by the counter system.
EMV Transaction	A Banking Transaction that uses a Token that has EMV functionality
First Generate AC	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. 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. Detailed explanations of these commands appear in *EMV Integrated Circuit Card Specifications for Payment Systems* (the published standard for EMV)
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.
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.
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.

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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 using a chip card, 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	Appears where multiple cards have the same PAN: e.g. husband and wife. It is not the same as Issue Number which is only relevant to certain schemes (E.g. Switch)
Receipt	A printed record of the transaction at the office produced for the customer.
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.
Second Generate AC	See First Generate AC
Serve Customer Mode	Desktop environment for conducting a customer 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 financial institution has authorised or declined the transaction
ACK	Acknowledgement. Message type sent by the Counter to the PIN pad
ARQ	Authorisation Request. Message type sent by the PIN pad to the counter
BI3	Banking Increment 3.
[C]	Confirmation

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[C0]	Null Confirmation
CVM	Card Verification Method
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
EPOSS	Electronic Point of Sale Service
EMV	Europay Mastercard Visa
FI	Financial Institution, e.g. Bank
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
MSR	Magnetic Stripe Reader
NBS	Network Banking Service
PAN	Primary Account Number
PIN	Personal Identification Number
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
VFY	Verify. Message type sent by the PIN pad to the counter

0.6 Changes in this Version

Version	Changes
0.2	Changes arising from comments from PO
0.3	Changes arising from walk-through with PO and internal design review

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0.4	• Changes to flow charts and screens as per discussions with PO at workshop on 14/11/03 • Added Annexe A • 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 • Deleted the fee charge screen displays from non-financial transactions (Balance Enquiry and Change PIN) to confirm to existing NBS counter dialogues. • Changed the order of the Fee charge screen display. The original flow had the screen before the Counter passed the online response to the PIN pad. The screen will now appear after the PIN pad returns a TC. The revised order interacts with the card as soon as the response is received; thus minimising potential card removed too early errors as well as simplifying the implementation.[1]
1.0	• Document ownership transferred from Ramesh Kallidai to Roger Donato • Section 1.1 – Disclaimer and Copyright statements added • Section 2.3 - Flowchart in Figure 2 *Activity Flows for Stage 1– Transaction Start for EMV Banking (Technology Selection)* redrawn as Figure 2 *Activity Flows for EMV Banking – Transaction Start* and Figure 3 *Activity Flows for EMV Banking – Swipe Card*. Changes: - 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 2.3 - Flowchart in Figure 3 *Activity Flows for EMV Banking – Offline Checks* renumbered as Figure 4 • Section 2.3 - Flowchart in Figure 4 *Activity Flows for Stage 1 – Transaction Start for EMV Banking (Application Selection)* renumbered as Figure 5. Changed to include fallback to magnetic swipe with PIN • Section 2.3 - Flowchart in Figure 5 *Activity Flows for Stage 1 – Transaction Start for EMV Banking (Transaction Selection)*

[1] Detailed analysis has shown that the only potential problem with card update before displaying the Fee screen could have been in Change PIN transactions. However Change PIN does not have a Fee Charge screen.

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	• renumbered as Figure 6 • Section 2.4.1 - Flowchart in Figure 6 *Activity Flows EMV Cash Withdrawal* renumbered as Figure 7. • Section 2.4.1 - Flowchart in Figure 7 *Activity Flows EMV Cash Withdrawal (continued)* renumbered as Figure 8 • Section 2.4.2 - Flowchart in Figure 8 *Activity Flows for EMV Withdraw Limit* renumbered as Figure 9 • Section 2.4.2 - Flowchart in Figure 9 *Activity Flows for EMV Withdraw Limit (continued)* renumbered as Figure 10 • Section 2.4.3 - Flowchart in Figure 10 *Activity Flows for EMV/Cheque Deposit* renumbered as Figure 11 • Section 2.4.3 - Flowchart in Figure 11 *Activity Flows for EMV/Cheque Deposit (continued)* renumbered as Figure 12 • Section 2.4.4 - Flowchart in Figure 12 *Activity Flows for EMV Balance Enquiry* renumbered as Figure 13 • Section 2.4.4 - Flowchart in Figure 13 *Activity Flows for EMV Balance Enquiry (continued)* renumbered as Figure 14 • Section 2.4.5 - Flowchart in Figure 14 *Activity Flows for EMV Change PIN* redrawn as Figure 15 *Activity Flows for EMV Banking – Change PIN* and Figure 16 *Activity Flows for EMV Banking – Change PIN(2)* • Section 2.4.5 - Flowchart in Figure 15 *Activity Flows for EMV Change PIN (continued)* renumbered as Figure 17 • Section 2.4 - Flowchart in Figure 16 *Activity Flows for Customer Cancel and Clerk Cancel* renumbered as Figure 18 • Section 2.5.1 - Flowchart in Figure 17 *Activity Flows for Decline* renumbered as Figure 19 • Section 3 – Receipt layouts changed • Section 5.1.1 – counter screen EB1 (Proceed as Chip Card) reworded • Section 5.1.2 – counter screen EB2 (Only Proceed as Chip Card) removed • Section 5.1.3 – counter EB3 (Insert card) reworded • Section 5.1.6 – Screen EB4 *Card cannot be read by PIN pad added.* New screen allows clerk to cancel or to swipe card as magnetic swipe • Section 5.2.6 PIN pad screen removed “Too many retries” • Section 5.2.8 PIN pad screen removed “Return Card to

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	• assistant” • Section 5.2.12 PIN pad screen removed “Enter PIN” • Section 5.2.13 PIN pad screen P1a added “Confirm and Enter PIN for Cash Withdrawal” • Section 5.2.14 PIN pad screen P1b added “Confirm and Enter PIN for Withdraw Limit” • Section 5.2.15 PIN pad screen P1c added “Confirm and Enter PIN for Balance Enquiry” • Section 5.2.16 PIN pad screen P3 added “Change PIN - Enter Old PIN” • Section 5.2.17 PIN pad screen P4 added “Change PIN - Enter New PIN” • Section 5.2.18 PIN pad screen P5 added “Change PIN – Re-enter New PIN” • Section 5.2.19 PIN pad screen P6 added “Change PIN – PIN too short” • Section 5.2.20 PIN pad screen P7 added “Change PIN – Re-entered PIN is not the same” • Section 5.2.21 PIN pad screen P8 added “Change PIN – Cancelled by the clerk” • Section 6.1.1 - message text altered to be consistent with ER1 screen • Section 6.2 – modified to give details of text to appear on screen 7 and screen 10 • Section 6.3 – modified to provide more information on the audio beeps on the PIN pad • Section 7.1 – Existing screens from Network Banking added to this document Screen 5: Waiting for Authorisation Screen 6: Charge Confirmation Screen 18: Change PIN - Waiting for PIN Screen 20: Change PIN Error • Section 7.2 – Existing screens from Network Banking added to this document Screen E11: No services available Screen E19: PIN entry error

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1.1	• Document changed to support the following - Application selection from the counter [CP 3658] - Reminding customer to remove card from PIN pad at conclusion of transaction [CP 3648] - Application of comments received from version 1.0 The detailed changes are as follows: • Section 2.3 – Figure 3 corrected (step 3.10) • Section 2.3 - Flowchart in Figure 6 – *Application Selection* replaced by - Figure 6 – *Insert Card to PIN pad* - Figure 7 – *Fallback Processing* - Figure 8 – *PIN pad AID selection* - Figure 9 – *Counter AID selection* Changes required by [CP 3658]: *Counter Clerk Selection of PinPad Application* • Section 2.3 – new Figure 5 – *Remove Card* added • Section 2.3 – Figure 6 – *Transaction Selection* renumbered as Figure 10. To remind clerk to tell customer to remove card from PIN pad: this change required as result of [CP 3648] • Section 2.4.1 - Flowchart in Figure 7 *Activity Flows EMV Cash Withdrawal* renumbered as Figure 11. Screen EBP12 – *Enter PIN* replaced by Screen P1a – *Confirm and Enter PIN for Cash Withdrawal* • Section 2.4.1 - Flowchart in Figure 8 *Activity Flows EMV Cash Withdrawal (continued)* renumbered as Figure 12 • Section 2.4.2 - Flowchart in Figure 9 *Activity Flows for EMV Withdraw Limit* renumbered as Figure 13. Screen EBP12 – *Enter PIN* replaced by Screen P1b – *Confirm and Enter PIN for Withdraw Limit* • Section 2.4.2 - Flowchart in Figure 10 *Activity Flows for EMV Withdraw Limit (continued)* renumbered as Figure 14 • Section 2.4.3 - Flowchart in Figure 11 *Activity Flows for EMV/Cheque Deposit* renumbered as Figure 15 • Section 2.4.3 - Flowchart in Figure 12 *Activity Flows for EMV/Cheque Deposit (continued)* renumbered as Figure 15 • Section 2.4.4 - Flowchart in Figure 13 *Activity Flows for EMV Balance Enquiry* renumbered as Figure 17. Screen EBP12 – *Enter PIN* replaced by Screen P1c – *Confirm and Enter PIN for*

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	• *Balance Enquiry* • Section 2.4.4 - Flowchart in Figure 14 *Activity Flows for EMV Balance Enquiry (continued)* renumbered as Figure 18 • Section 2.4.5 - Flowchart in Figure 15 *Activity Flows for EMV Change PIN* renumbered as Figure 19. Screen EB5 replaced by screen 10 • Section 2.4.5 - Flowchart in Figure 16 *Activity Flows for EMV Change PIN* renumbered as Figure 20 • Section 2.4.5 - Flowchart in Figure 17 *Activity Flows for EMV Change PIN (continued)* renumbered as Figure 21 • Section 2.4 - Flowchart in Figure 18 *Activity Flows for Customer Cancel and Clerk Cancel* renumbered as Figure 22 • Section 2.5.1 - Flowchart in Figure 19 *Activity Flows for Decline* renumbered as Figure 23. Decision box 19.7 corrected to refer to FI instead of MA • Section 3 – changes to receipt layout PAN sequence number shown as PAN Seq No • Section 5.1.4 – Button on EB4 screen changed from Continue to OK • Section 5.1.5 – screen EB5 Change Error removed since this is already covered by Transaction Failure condition for response code 20-29 on screen 10 (see section 6.2.3) • Section 5.1.6 – Screen EB6 *Card cannot be read by PIN pad* added. New screen allows clerk to cancel or use card as magnetic swipe • Sections 5.1.7 and 5.1.8 New screens EB7 and EB8 which monitor problems being experienced by the customer getting his card read by the PIN pad • Section 5.1.9 – Screen EB9 *Remove Card* – added [CP 3648] • Section 5.1.10 – Screen EB10 *Application Selection* – added [CP 3658] • Section 5.2.3 - Application selection screen EBP3 changed to show illustrative application names • Section 5.2 - following PIN pad screens removed 5.2.4 Screen EBP4: Card Invalid 5.2.8 Screen EBP8: Return Card • Section 5.2.22 screen EBP13 added for application selection at the counter: change required by [CP 3658]

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	• Section 5.2 .23 to 5.2.29 following PIN pad screens added relating to card insertion 5.2.22 Screen EBP13: Application Selection at the Counter 5.2.23 Screen EBP14: Remove & Re-insert Card (1) 5.2.24 Screen EBP15: Re-insert Card (1) 5.2.25 Screen EBP16: Remove & Re-insert Card (2) 5.2.26 Screen EBP17: Re-insert Card (2) 5.2.27 Screen EBP18: Remove & Hand Card to Cashier 5.2.28 Screen EBP19: Hand Card to Cashier 5.2.29 Screen EBP20: Cancelled ▪ Section 6.1.1 - message text altered to be consistent with screens
1.2	• Section 2.3 – Card insertion timeout operation added. 2.8 and 2.9. New screen EB13 for this. • Section 2.3 – Notes 3.3 through 3.5 test expanded to include other parameters. • Section 2.3 – 4.6 Remove Card process added. • Section 2.3 – Remove Card – this has been turned into a process with entry and exit points. • Section 2.3 – Remove Card – Addition of ACK command to stop beeping on card removal. • Section 2.3 – Remove Card – Addition of PP End message processing. • Section 2.3 – Insert Card Into PIN pad – addition of Card Inserted counter screen. • Section 2.3 – Fallback Processing – addition of card removal screen with PP beep handling. • Section 2.3 – PIN pad AID selection - An additional box inserted to show the counter acknowledgement of the selected AID. 8.6-8.9 renumbered. • Section 2.3 – PIN pad AID selection – addition of empty candidate list processing. • Section 2.3 – PIN pad AID selection – addition of duff application removal from candidate list. • Section 2.3 – PIN pad AID selection – addition of selected application name PP display. • Section 2.3 – PIN pad AID selection – addition of action

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	• analysis decline processing. • Section 2.4 – Withdraw – Addition of counter ACK cancel and Remove Card processing for Clerk Cancel.. • Section 2.4 – Process Withdraw – addition of counter ACK and remove card processing following TC. • Section 2.4 –Withdraw Limit - rearrangement of PIN entry symbols. • Section 2.4 – Process Limit – addition of counter ACK and remove card processing following TC. • Section 2.4 – Deposit – Addition of counter ACK and remove card processing following clerk abort. • Section 2.4 – Process Deposit – addition of counter ACK and remove card processing following TC.. • Section 2.4 – Balance – Addition of counter ACK and remove card processing following clerk abort. • Section 2.4 – Process Balance – addition of counter ACK and remove card processing following TC.. • Section 2.4 – PIN change – re-designation of PIN Entry screen. • Section 2.4 – Process Change PIN – Addition of counter ACK and remove card processing following TC. Also Extra logic for CAPO PIN change. • Section 2.5 – Decline – Change to end of process, End nor returns to Serve Customer Menu. • Section 2.3 – Figure 5 has bee changed to include error message screen EB11. • Section 5.1 – Prev buttons have been removed from all EB screens. • 5.1.2 New screen for PIN Entry. • 5.1.11 New screen for informing of PIN Pad errors. • 5.1.12 New screen for invalid cards. • 5.1.13 New screen to cover time lapse period after card insertion. • 5.1.14 New Screen for Action Analysis fail. • 5.1.15 New Screen for Card Insertion Timeout.
1.3	• Section 2.4 – figure 11 – branch added for AAC decline. • Section 2.4 – figure 13 – branch added for AAC decline.

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	• Section 2.4 – figure 15 – branch added for AAC decline. • Section 2.4 – figure 17 – branch added for AAC decline. • Section 2.4 – figure 20 – branch added for AAC decline. • Section 2.3 – figure 8 – AAC decline processing relocated. • Section 2.4 – figure 19 – Cancel handling remodelled. • Section 3.1.2 - Changes to Outcome Message Text table. • Section 3.2.3, 3.4.3 and 3.3.3 Field Definition Tables. • Section 5.1 – Miscellaneous screen text changes.
1.4	• Section 5.2.19 – PIN too short screen removed and replaced with Deposit PIN entry screen. • Figure 2 – Card insertion relocated to figure 6a. • Figure 4 – BNK 1 command moved here. • Figure 4 – Remove Card process removed. • Figure 5 – Removed and replaced by figures 5a, 5b and 5c. • Figure 5a – New figure created from figure 5. • Figure 5b – New figure created from figure 5. This is specific to card removal after an authorised transaction. • Figure 5c – New figure created from figure 5. • Figure 6 – Removed and replaced by figures 6a, 6b and 6c to illustrate card removal sequence and beeping. • Figure 6a – New figure created from figure 6. • Figure 6b – New figure created from figure 6. • Figure 6c – New figure created from figure 6. • Figure 7 – screen EBP19 relocated. • Figure 7 – MSR card removal revised. • Figure 7 – End Command Processing added. • Figure 7 – renumbered. • Figure 8 – STA 9 command added. • Figure 8 – AAC decline thread added. • Figure 8 – Remove Card subdivided. • Figure 8 – renumbered. • Figure 9 – Screen EBP13 added.

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	• Figure 9 – KBD command added. • Figure 9 – Clerk abort thread added. • Figure 9 – Renumbered. • Figure 10 – Clerk abort thread added. • Figure 11 – Clerk abort thread added. • Figure 11 – TLV/TDR symbols added. • Figure 11 – Remove Card subdivided. • Figure 11 – screen EBP9 added. • Figure 11 – Renumbered. • Figure 12 - TLV/TDR symbols added. • Figure 12 – Remove Card subdivided. • Figure 12 – Cancel by card removal thread added. • Figure 12 – Renumbered. • Figure 13 – TLV/TDR symbols added. • Figure 13 – Remove Card subdivided. • Figure 13 – Screen EBP9 added. • Figure 13 – Renumbered. • Figure 14 - TLV/TDR symbols added. • Figure 14 – Remove Card subdivided. • Figure 14 – Cancel by card removal thread added. • Figure 14 – Renumbered. • Figure 15 – TLV/TDR symbols added. • Figure 15 – Remove Card subdivided. • Figure 15 – Screen EBP9 added. • Figure 15 – Renumbered. • Figure 15 – PIN entry removed. • Figure 16 - TLV/TDR symbols added. • Figure 16 – Remove Card subdivided. • Figure 16 – Cancel by card removal thread added. • Figure 16 – Renumbered. • Figure 17 – TLV/TDR symbols added. • Figure 17 – Remove Card subdivided.

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	• Figure 17 – Screen EBP9 added. • Figure 17 – Renumbered. • Figure 18 - TLV/TDR symbols added. • Figure 18 – Remove Card subdivided. • Figure 18 – Cancel by card removal thread added. • Figure 18 – Renumbered. • Figure 19 – Remove Card subdivided. • Figure 19 – Screen EB17 Too many PIN retries added . • Figure 19 – Renumbered. • Figure 20 – Remove Card subdivided. • Figure 20 – Screen EBP9 added. • Figure 21 - TLV/TDR symbols added. • Figure 21 – Remove Card subdivided. • Figure 21 – Cancel by card removal thread added. • Figure 21 – Renumbered. • Figure 21 – References to CAPO removed. • Figure 22 – Clerk abort thread removed and relocated to individual figures. • Figure 23 – Declined screens removed as declines occur earlier. • Figure 23 – Renumbered. • New Screen EB17 – Too many PIN change reties added. • New Screen EB18 – Authorised / Remove Card added. • Welsh texts for receipts added.
1.5	Application of changes from NB/PRP/005 v1.0 EMV Banking: User Interface Design Proposal – Changes Supplement • Section 1.2: Comment added to Scope concerning existence of diagnostic screens (PC0106457) • Section 2.1.5 New section inserted between 2.1.5 and 2.1.6 • Section 2.2.1 *Transaction Start:* clarification of notes to Figure 3 (PC0110480) • Section 2.2.3 *End Processing:* minor rewording to Figure 5a • Section 2.2.3 *End Processing:* Figure 5c modified: - screen EB11 *PIN Pad Error* included

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	• Section 2.2.4 *Card Insertion:* Figures 6a, 6b, 6c modified - position of PIN pad beeps altered on card insertion (PC0108773) - flow for counter detected timeout included (PC0112069) - PIN pad screens EBP7 *Cancelled Please Remove Card* and EBP11 *Processing Please Wait* displayed when Clerk cancels transaction (PC0107169) - Card removal timeout shown (PC0106872) • Section 2.2.5 *Fallback Processing:* Figure 7 modified to remove redundant step • Section 2.2.6 *Application Selection:* Figure 8 modified: - Screen EB21 *Application Selection* inserted after PIN pad screen EBP3 in the 'Customer required to confirm' flow (PC0109176) - PIN pad screens *EBP22 Application Blocked* and *EBP23 Card Blocked* added (PC0110822) • Section 2.3.1 *Cash Withdrawal:* Figure 11 modified: - Path added to show Fallback to MSR after PIN entry (PC0108350) - Screen 5 (EMV) *Waiting for Authorisation* used (PC0109180) - Notes expanded to show that customers can cancel transaction by removing card from PIN pad too early - Removal of unnecessary TLV / TDR messages - Footnote added to indicate that PIN entry screen may be bypassed for other CVMs (PC0106926, PC0108311) - Footnote added to indicate that PIN pad screen EBP11 *Processing Please Wait* can be split over 2 separate screens (PC0108611) • Section 2.3.1 *Cash Withdrawal:* Figure 12 modified: - Path changed to show failure at 2nd GenAC (PC0110133) - Removal of unnecessary TLV / TDR messages • Section 2.3.2 *Withdraw Limit:* Figure 13 modified in a similar way to Figure 11 (PC0106926, PC0108311, PC0108611, PC0108350, PC0109180) • Section 2.3.2 *Withdraw Limit:* Figure 14 modified in a similar way to Figure 12 (PC0110133)

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	• Section 2.3.3 *Deposit:* Figure 15 modified: - Path added to show Fallback to MSR after PIN entry (PC0108350) - Screen 5 (EMV) *Waiting for Authorisation* used (PC0109180) - Removal of unnecessary TLV / TDR messages - Footnote added to indicate that PIN pad screen EBP11 *Processing Please Wait* can be split over 2 separate screens (PC0108611) • Section 2.3.3 *Deposit:* Figure 16 modified in a similar way to Figure 12 (PC0110133) • Section 2.3.4 *Balance Enquiry:* Figure 17 modified in a similar way to Figure 11 (PC0106926, PC0108311, PC0108611, PC0108350, PC0109180) • Section 2.3.4 *Balance Enquiry:* Figure 18 modified in a similar way to Figure 12 (PC0110133) • Section 2.3.5 *Change PIN:* Figure 19 modified: - Notes expanded to show that customers can cancel transaction by removing card from PIN pad too early - Flows altered for retries (PC0109177) • Section 2.3.5 *Change PIN:* Figure 20 modified: - Path added to show Fallback to MSR after PIN entry (PC0108350) - Screen 5 (EMV) *Waiting for Authorisation* used (PC0109180) - Removal of unnecessary TLV / TDR messages - Footnote added to indicate that PIN pad screen EBP11 *Processing Please Wait* can be split over 2 separate screens (PC0108611) • Section 2.3.5 *Change PIN:* Figure 21 modified in a similar way to Figure 12 (PC0110133) • Section 2.4.1 *Decline of a Transaction:* Figure 23 modified: - Allow for card retention if requested by Financial Institution - Counter logic changed where request and authorisation amounts are unequal (PC0109482) • Section 3 Receipt layouts for Welsh receipts amended to include "Cod Awdurdod", "Diweddu", "Rif Cyf" etc. (PC0110479)

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	• Sections 3.2.3, 3.3.3 and 3.4.3 altered for derivation of Issuer Scheme name (PC0108273) • Section 4.2 Transaction Result Codes inserted (PC0111064) • Section 4.3 Transaction Response Codes inserted (PC0111064) • Section 5.1: Explanatory notes amended for Counter Screens (PC0109182) • Section 5.1: Prototype screen shots replaced by screen dumps from live system • Section 5.1.3: Message text changed on screen EB3 *Card Insertion* (PC0108087) • Section 5.1.4: Explanatory notes amended for screen EB4 *Transaction Cancelled by Customer* (PC0114477) • Section 5.1.6: Message text changed on screen EB6 *Card cannot be read by PIN Pad* (PC0109182) • Section 5.1.7: Message text changed on screen EB7 *Insert Card (Second attempt)* (PC0108091, PC0109182) • Section 5.1.8: Message text changed on screen EB8 *Insert Card (Third attempt)* (PC0108093, PC0109182) • Section 5.1.9: Message text changed on screen EB9 *Remove Card from PIN Pad* (PC0109182) • Section 5.1.10: Tab heading of left hand panel and help text changed on screen EB10 *Application Selection from Counter* (PC0108094) • Section 5.1.12: Message text changed on screen EB12 *Invalid Card* (PC0109182, PC0109600) • Section 5.1.13: Message text changed on screen EB13 *Card Inserted – Please Wait* (PC0109182) • Section 5.1.14: Message text changed on screen EB14 *Action Analysis Decline* (PC0109182) • Section 5.1.15: Tab heading of left hand panel changed on screen EB15 *Card Insertion Timeout* (PC0109182) • Section 5.1.16: Tab heading of left hand panel changed on screen EB16 *Cancel - Please Wait* (PC0108098) • Section 5.1.18: Message text changed on screen EB18 *Authorised / Remove Card* (PC0108100, PC0109182) • Section 5.1.19: Addition of screen EB19 *Change PIN Retry* (PC0109177, PC0109858) • Section 5.1.20: Addition of screen EB20 *Change PIN Last Try*

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	• (PC0109177) • Section 5.1.21: Addition of screen EB21 - *Application Selection at PIN Pad* (PC0109176, PC0109901) • Section 5.1.22: Addition of screen 5 (EMV) *Waiting for Authorisation*: (PC0109180) • Section 5.2.5: Footnote added to description of PIN pad screen EBP5 *Remove Card* • Section 5.2.11: Comment added concerning the conditions under which PIN Pad Screen EBP11: *Processing* is displayed (PC0104918) • Section 5.2.27: "CASHIER" replaced by "CLERK" in screen EBP18 (PC0109178) • Section 5.2.28: "CASHIER" replaced by "CLERK" in screen EBP19 (PC0109178) • Section 5.2.30: PIN pad screen EBP21 *Processing* inserted (PC0107635) • Section 5.2.31: PIN pad screen EBP22 *Application Blocked* inserted (PC0110822) • Section 5.2.32: PIN pad screen EBP23 *Card Blocked* inserted (PC0110822) • Section 6.1.1: *MessageDefs* - Revision of message text and object definition for screen EB3 (PC0108087, PC0110965) - Revision of message text for screens EB6, EB7, EB8, EB9, EB12, EB14, EB15, EB18 (PC0108091, PC0108093, PC0108100, PC0109182, PC0109600) - Revision of help text for screen EB10 (PC0108094) - Revision of tab heading and object definition for screen EB16 (PC0108098, PC0110973) - Revision to object definition for screens EB4 and EB13 (PC0110982) - Addition of message definitions for screens EB19 and EB20 (PC0109177, PC0109858) - Addition of message definitions for screen EB21 (PC0109176, PC0109901) - Addition of message definitions for amended left hand panel of screen 5 (EMV) (PC0109180) • Section 6.2.3 *Decline Messages on Screen 10* modified

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	- New response codes 90, 91, 92, 95, 96, 97 added for Agent reported communication breaks to the Financial Institution (PC0109337 / PC0109509 / PC0109510) - Footnote added to indicate that Response code 54 only applies when the customer is not present (PC0109084, PC0109948) • Section 6.3 *Audio Cues at PIN pad:* footnote added concerning card insertion (PC0108773) • Section 7.1.7 Screen 8 *Accept Deposit* from Network Banking included (PC0105585) • Section 9.1: Error code 08057 added to Annexe C - *PIN Pad Error Codes and Screen EB11 Clerk Messages* (PC0110822) • Section 10.1: new section added on *PIN Pad Timeouts*
2.0	Minor typographical corrections

0.7 Changes Expected

Changes
None

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0.8 Table of Contents

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1 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.

1.1.2 Copyright

1.2 Scope

This document describes the proposal for changes to the User Interface Design for the Network Banking application resulting from the introduction of EMV cards using Chip and PIN authentication and verification at the Post Office counter (at BI3 S70). The NBS counter dialogues (prior to the introduction of EMV cards) are described in *Network Banking: Counter Dialogue – Activity and Screen Flows (NB/SPE/003)*. 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 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.*

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:

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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 revised layout of the Office and Customer receipts at the introduction of EMV functionality: these revised layouts will apply to both chip and PIN and to magnetic swipe and PIN.

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 not affected by the introduction of EMV Retail and found originally in *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 Ltd 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.

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.

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2 EMV User Interface

The transaction flows in this section show the points at which counter screens are displayed to the Clerk and PIN pad screens displayed to the customer. These screens are used to inform and prompt both Clerk and customer at appropriate steps in the process of each transaction. The flow charts support the following financial transactions:

- Cash Withdrawal
- Withdraw Limit
- Balance Enquiry
- Deposit
- Change PIN

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 Banking from a new menu button from the Serve Customer Menu while the customer inserts the 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 system will prompt the clerk that the card should be used in the PIN pad instead.

If the EMV card cannot be read, the customer will be asked to retry as it may have been inserted incorrectly. If it still fails then the clerk may fall back to swipe the card on the magnetic stripe reader[2].

The description of data capture through magnetic stripe and manual PAN entry are the same as described in *Network Banking: Counter Dialogue – Activity and Screen Flows NB/SPE/003*.

2.1.3 Stage 2

The activity and screen flows in this stage show the customer verification and transaction service for EMV Cards as well as changes appropriate for EMV fallback to MSR.

[2] **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."

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2.1.4 EMV Banking Screen Flows

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

Screenx: NBS screen from NB/SPE/003 that is not affected by introduction of EMV

Ex: Error message screen from NB/SPE/003 that is not affected by introduction of EMV

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

EBx: A new EMV Banking Counter screen or a screen from NB/SPE/003 that is affected by EMV

EBPx: A PIN pad screen added/affected as a result of EMV

Where 'x' is an unique identifier for each screen type

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* (see 5.2.11) 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.

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2.1.6 Conventions used within the flowcharts

The flowcharts within this document use the conventions described below.

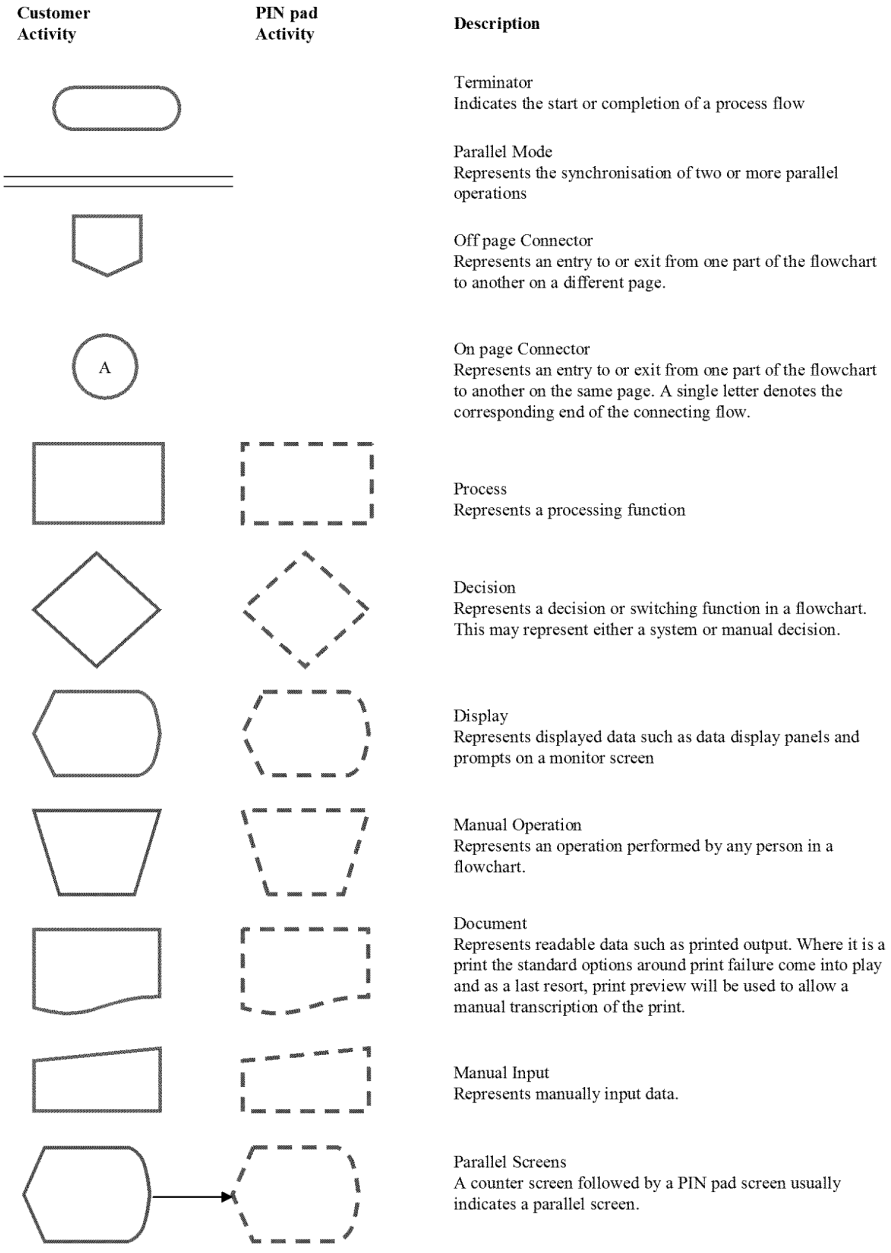

Figure 1: Flow chart conventions used in this document

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2.2 Stage 1

2.2.1 EMV Transaction Start & EMV Token Validation

Pre conditions

1. The system must be in the Serve Customer mode. There cannot be any other transaction in progress[3]
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 try the card using the MSR.

Note: Swap session will not be permitted after the Clerk selects the ICC button.

[3] The current customer session may be a swapped session.

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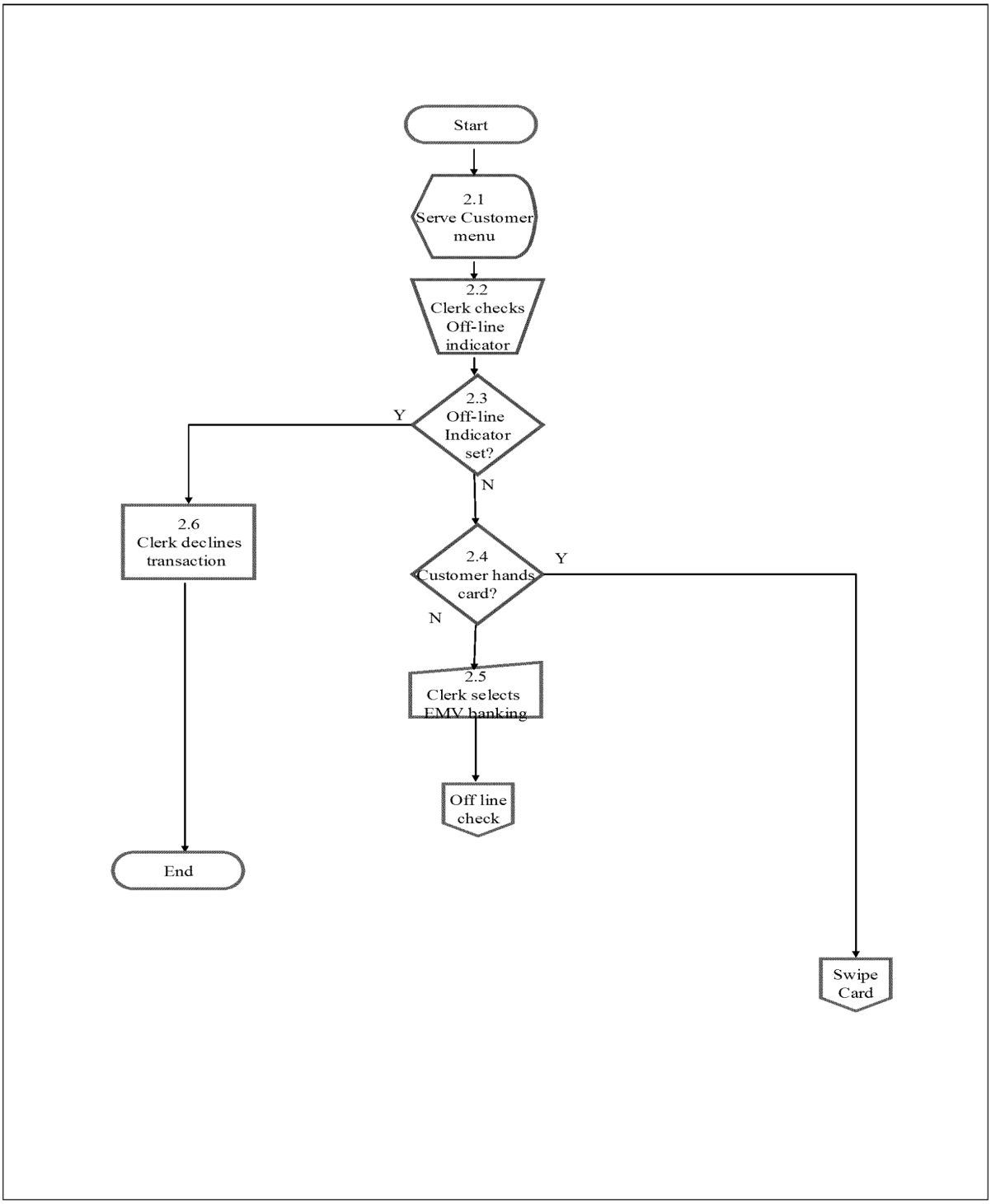

Figure 2: Activity Flows for EMV Banking – Transaction Start

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Notes for Figure 2

2.1 Clerk navigates to Serve Customer menu.

2.2 Clerk checks off-line indicator.

2.3 If the on-line indicator shows that system is not connected to the data centre and processing continues from 2.6.

2.4 If the customer hands his card over to the clerk processing continues from Figure 3: *Swipe Card.*

2.5 Otherwise, clerk selects the ICC Banking button.

2.6 The clerk declines to perform the transaction as there is no online authorisation capability.

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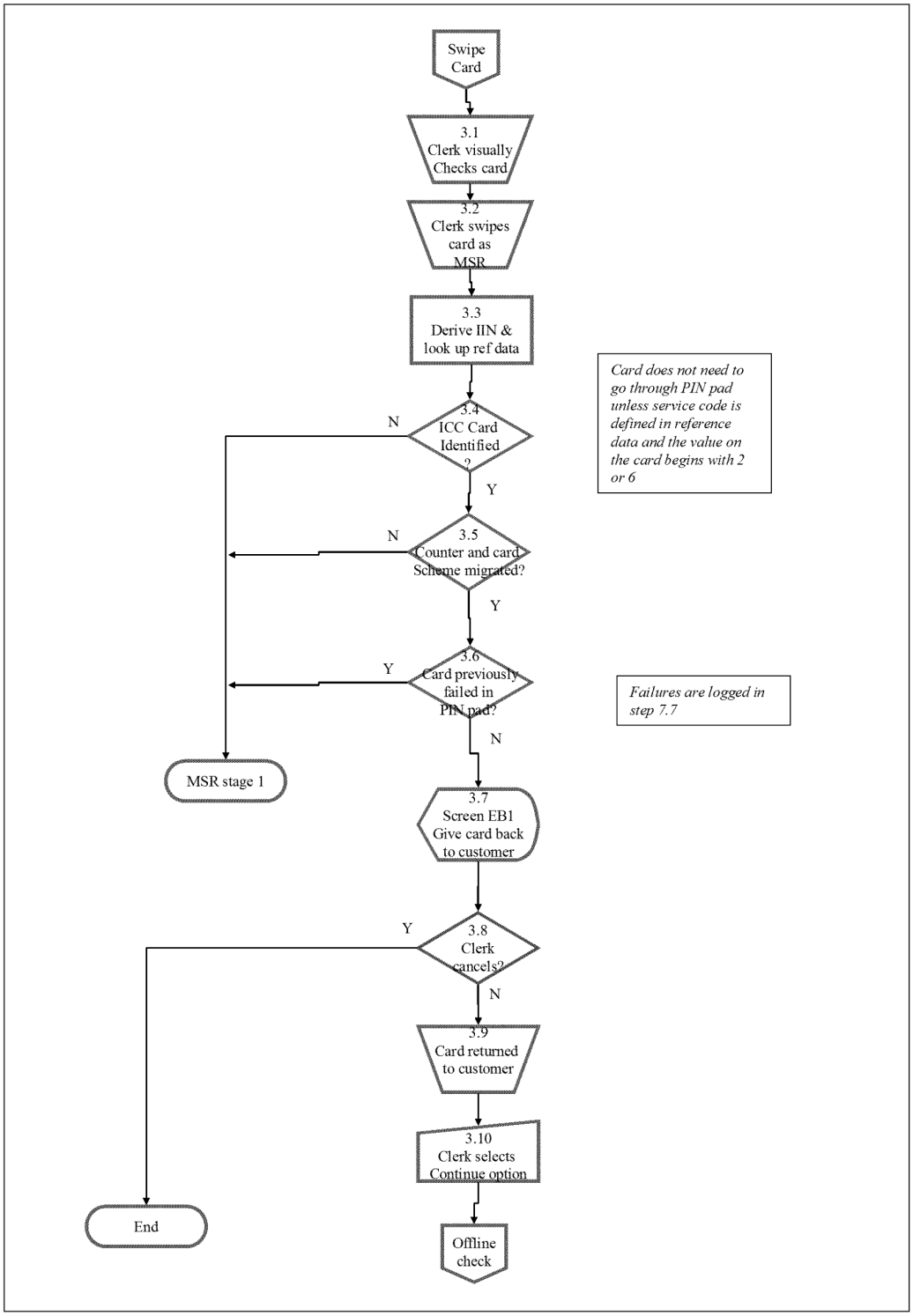

Figure 3: Activity Flows for EMV Banking – Swipe Card

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Notes for Figure 3

3.1 The clerk does a visual check of the card to ensure that the card is not an ICC card.

3.2 The clerk swipes the card in the magnetic stripe reader.

3.3 Counter derives the IIN from the magnetic stripe and using reference data determines the Service Code from the Track 2 data.

3.4 If 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 Network Banking processing as defined in NB/SPE/003 Network Banking Counter Dialogues – Activity & Screen Flows. Method of Entry will be recorded as 2 in this case (Non ICC Magnetic Stripe Read).

3.5 If the IIN is supported and a control product is present for that banking scheme and ICC banking operations exist for that scheme processing continues from 3.6.

Otherwise, processing continues as for existing Network Banking processing as defined in NB/SPE/003 Network Banking: Counter Dialogues – Activity & Screen Flows. Method of Entry will be recorded as 3 in this case (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 Method of Entry will be 3. However, if the SVC of the card which is swiped is not 2 or 6 then the Method of Entry will be 2.

3.7 The counter displays screen EB1 *Proceed as Chip Card* (see 5.1.1). This screen has 2 buttons: one allows the transaction to proceed as an ICC transaction: the other allows the clerk to cancel.

3.8 If the clerk presses the **Cancel** button then the counter returns to the **Serve Customer Menu**.

3.9 If the clerk selects **Continue** on the EB1 screen then an offline check will be made. Pressing the **Continue** button on this screen has the same effect as if the ICC Banking button on the Serve Customer Menu had been pressed.

3.10 The card is returned to the customer to insert in the PIN pad.

Processing continues from Figure 4: *Off-Line Check.*

{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)}.

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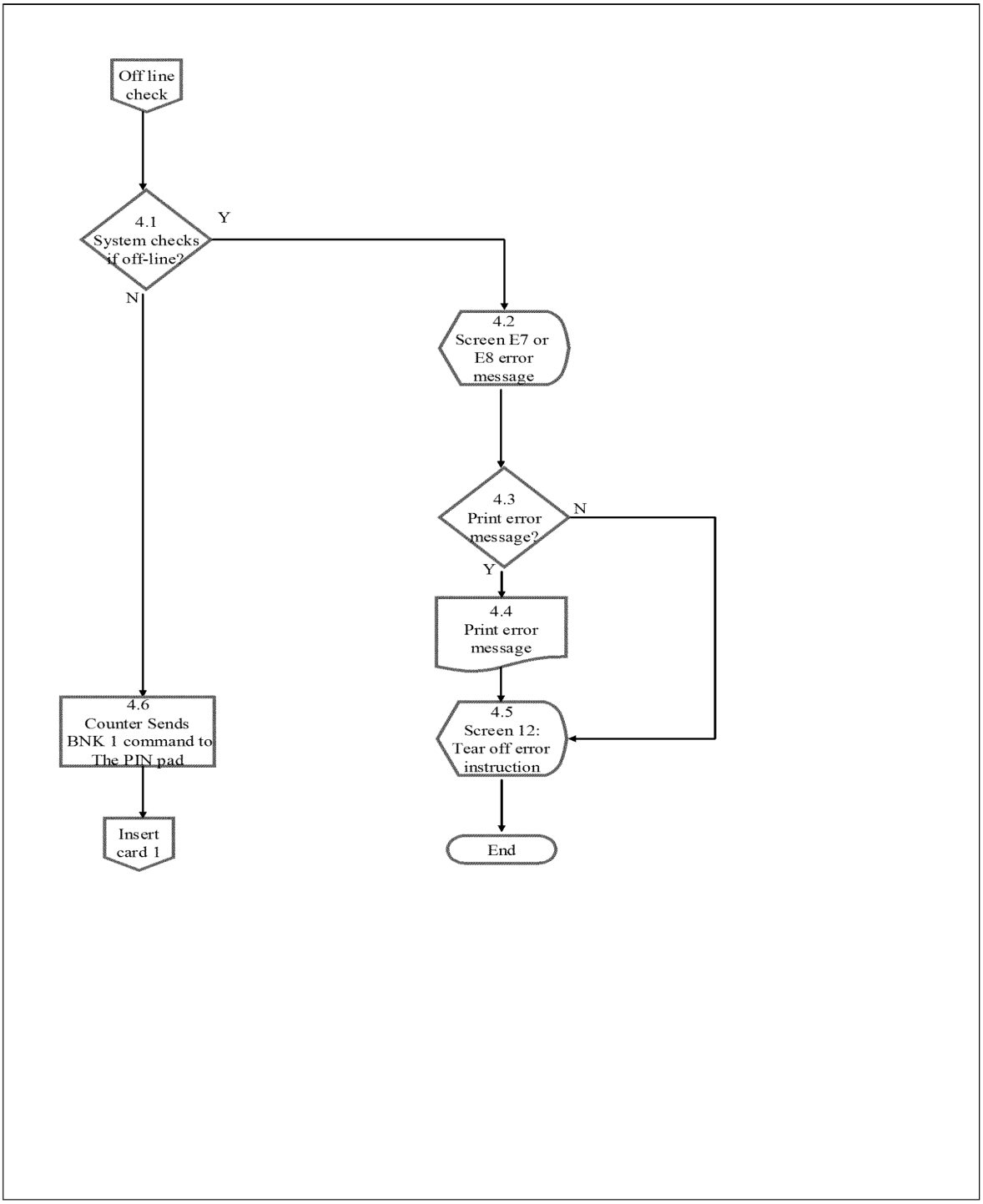

Figure 4: Activity Flows for EMV Banking – Offline Checks

Notes for Figure 4

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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 goes to Figure 6a: *Insert Card (1)*.

4.2 The system is off-line so the counter displays screen E7 *System Failure* (see 7.2.2) or screen E8 *Contact Helpdesk* (see 7.2.3), as appropriate. Both screens have options to continue or to print an error report.

4.3 If the user continues without an error report processing continues from 4.5.

4.4 If the user selects the print option then an error report is printed.

4.5 The counter displays screen 12 *Tear off Error Message Instruction* (see 7.1.10).

The clerk acknowledges the instruction. The counter returns to the Serve Customer Menu.

4.6 The counter sends a BNK 1 type command to the PIN pad. This starts the PIN Pad banking transaction.

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2.2.2 Card Removal

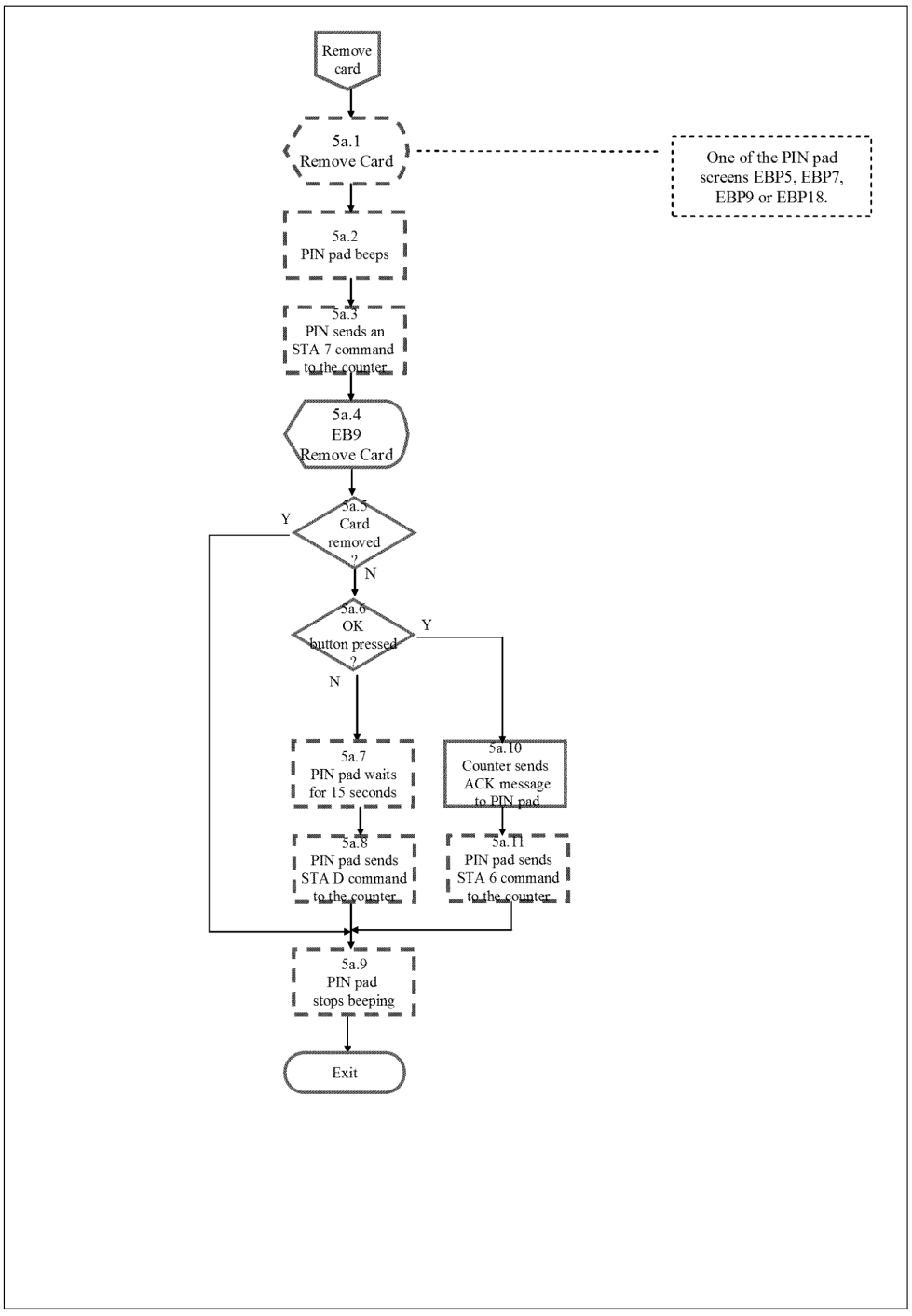

Figure 5a: Activity Flows for EMV Banking – Remove Card

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Notes for Figure 5a

5a.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.

5a.2 The PIN pad beeps for a configurable period (15 seconds) to remind the customer to remove their card.

5a.3 The PIN pad sends STA 7 command to the counter to inform the counter that the card is still in the PIN pad.

5a.4 The counter displays screen EB9 *Ask customer to remove card* (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.

5a.5 If the card is removed then processing continues at 5a.9.

5a.6 The clerk touches the OK button on the EB9 screen then processing continues at 5a.10.

5a.7 The PIN pad waits for a configurable period (15 seconds): (this is a reference data setting).

5a.8 PIN pad sends STA D command to the counter to tell the counter that the remove card timeout has expired.

5a.9 PIN pad stops beeping and the process exits.

5a.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.

5a.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 from 5a.9.

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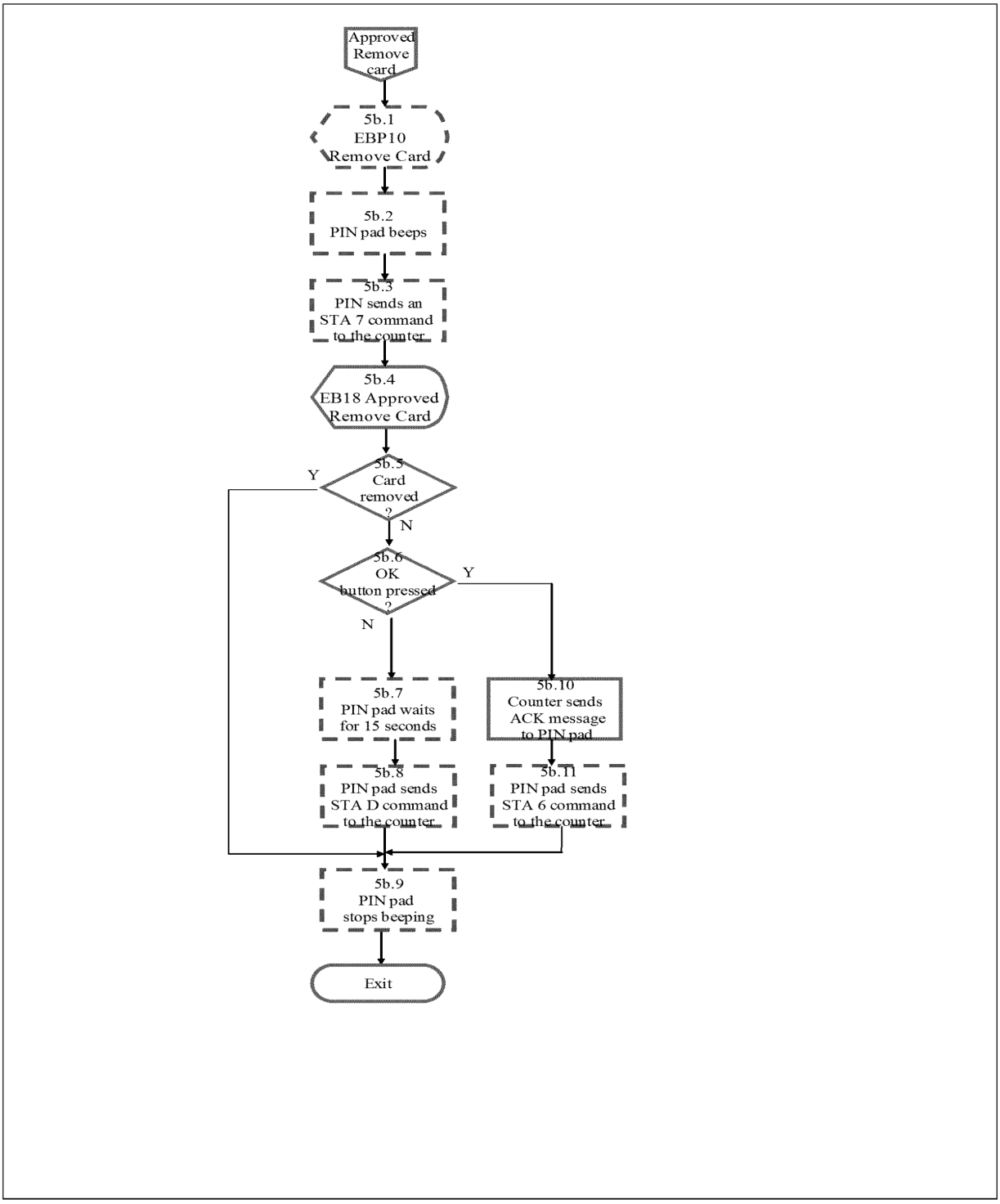

Figure 5b: Activity Flows for EMV Banking – Approved Remove Card

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Notes for Figure 5b

5b.1 The PIN pad screen EBP10 *Approved Remove Card* (see 5.2.10) will be displayed on the PIN Pad.

5b.2 The PIN pad beeps for a configurable period (15 seconds) to remind the customer to remove their card.

5b.3 PIN pad sends STA 7 command to the counter to inform the counter that the card is still in the PIN pad.

5b.4 Counter displays screen EB18 *Authorised / Remove Card* (see 5.1.18).

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.

5b.5 If the card is removed then processing continues at 5b.9.

5b.6 The clerk touches the OK button on the EB18 screen then processing continues at 5b.10.

5b.7 The PIN pad waits for a configurable period (15 seconds): (this is a reference data setting).

5b.8 PIN pad sends STA D command to the counter to tell the counter that the remove card timeout has expired.

5b.9 PIN pad stops beeping and the process exits.

5b.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.

5b.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 from 5b.9.

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2.2.3 End Processing

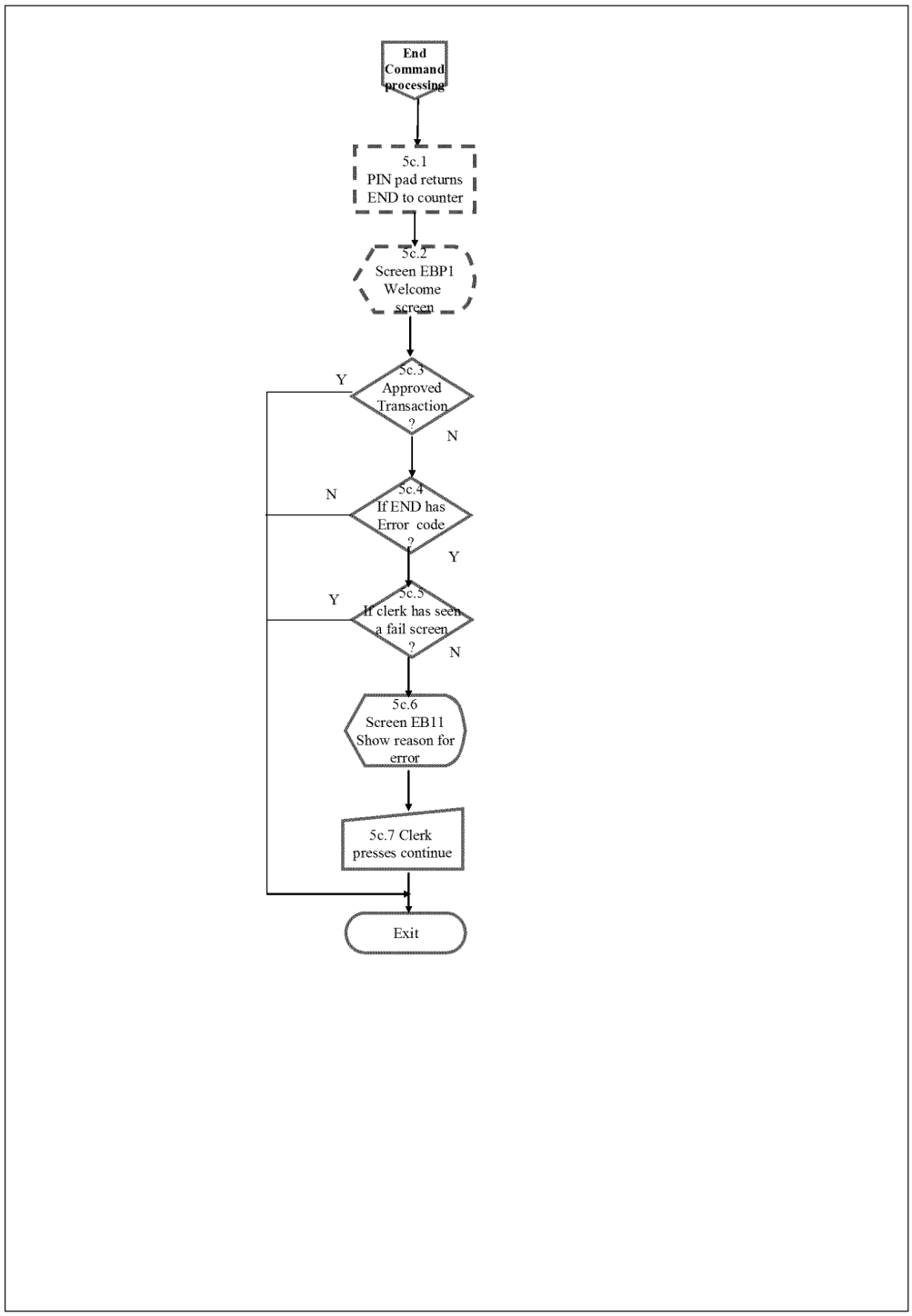

Figure 5c: Activity Flows for EMV Banking – End Command Processing

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Notes on Figure 5c

5c.1 The PIN Pad sends an END command to the counter.

5c.2 The PIN Pad displays the welcome screen EBP1 (see 5.2.1).

5c.3 If the transaction has been approved then the process exits.

5c.4 If the END command does not carry a failure code then the process exits.

5c.5 If a declined or a cancelled screen has been shown to the clerk already then the process exits.

5c.6 The counter sends an EB11 screen (see 5.1.11) describing the reported error. If the error code is an error then an event will also be logged to the event log.

The EB11 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.

5c.7 The clerk presses the continue button and the process exits.

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2.2.4 Card Insertion

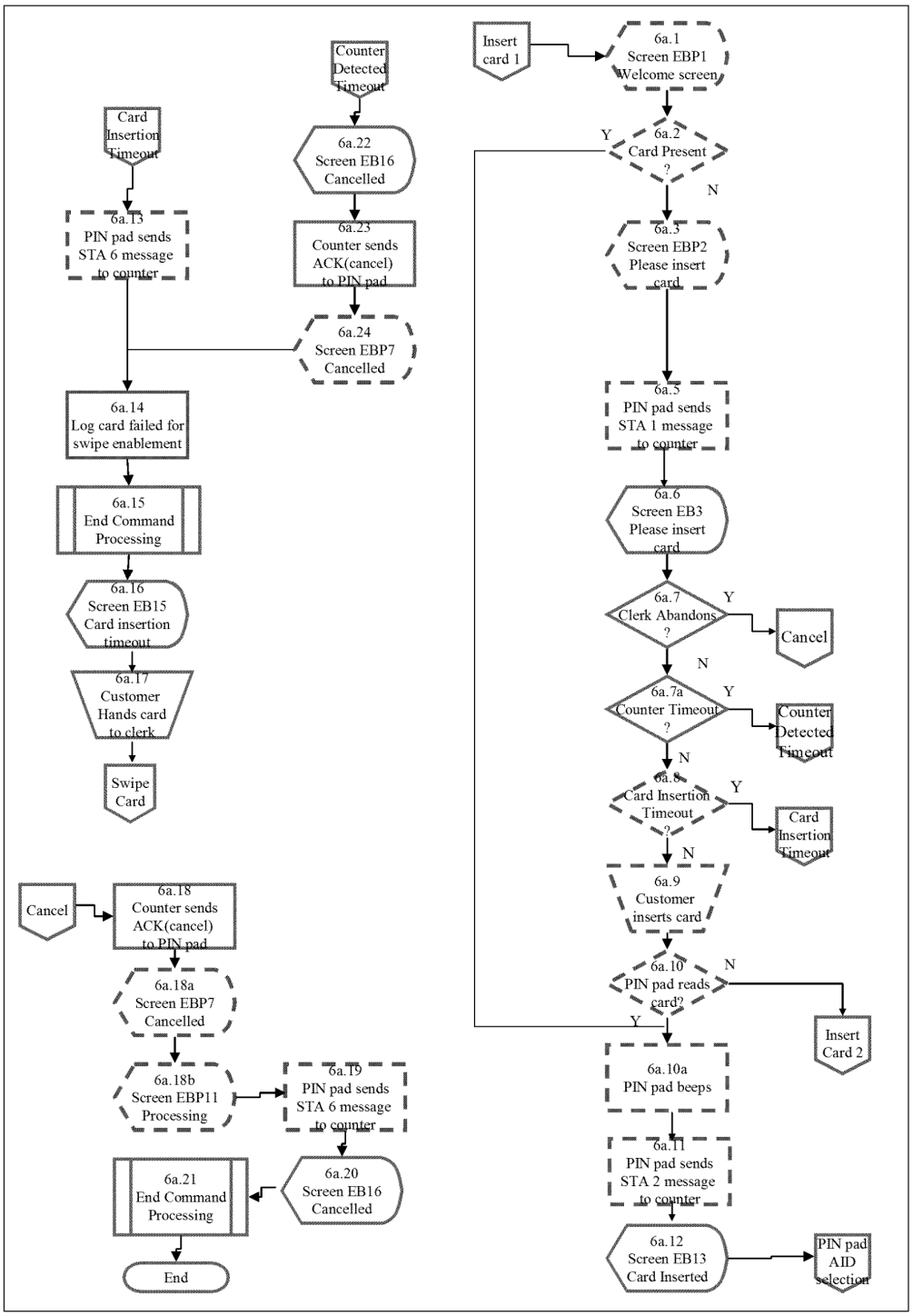

Figure 6a: Activity Flows for EMV Banking – Insert Card (1)

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Notes for Figure 6a

6a.1 Prior to the sending of the BNK 1 command, when the PIN pad is idle it will display a blank screen. This is known as the welcome screen (see 5.2.1).

6a.2 The PIN pad is triggered into life either by the clerk pushing the ICC button on the Serve Customer Menu or by pressing **Continue** on the EB1 screen (see 5.1.1): both of these actions cause a BNK 1 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 The PIN pad displays screen EBP2 *Please insert card* (see 5.2.2).

6a.4 Step removed[4].

6a.5 The PIN pad sends a STA 1 message to the counter to indicate that the customer's card needs to be inserted into the PIN pad.

6a.6 The counter displays screen EB3 *Card Insertion* (see 5.1.3). This screen has a cancel button which may be used to abort the transaction. If it is not used then the EB3 screen remains there until card is inserted into PIN pad or a card insertion timeout occurs.

6a.7 If the clerk presses the cancel button then processing continues 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 sequence 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 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 a card is inserted into the PIN pad and is read successfully then the PIN pad sends a STA 2 message to the counter to indicate that the card has been successfully inserted.

6a.12 The counter displays screen EB13 C*ard Inserted* (see 5.1.13). 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 A flag is set to show that an attempt to use the card in the chip reader was made. This is used in Figure 3 to determine if a swipe operation should be allowed.

6a.15 The process Figure 5c: *End Command Processing* is performed.

6a.16 The counter displays the card insertion timeout screen EB15 (see 5.1.15).

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

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6a.17 The customer hands the card to the clerk for swiping. Processing continues Figure 3: *Swipe Card.*

6a.18 The counter sends an ACK(cancel) command to the PIN Pad to cancel the transaction.

6a.18a The PIN Pad displays screen EBP7 *Cancelled Please Remove Card* (see 5.2.7).

6a.18b The PIN Pad displays screen EBP11 *Processing Please Wait* (see 5.2.11).

6a.19 The PIN pad sends an STA 6 command to the counter indicating a cancel at the PIN Pad.

6a.20 The counter displays screen EB16 *Cancel - Please Wait* (see 5.1.16).

6a.21 The process Figure 5c: *End Command Processing* is performed.

The counter returns to the serve customer screen.

6a.22 The counter displays screen EB16 *Cancel - Please Wait* (see 5.1.16).

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 5.2.7). Processing continues from 6a.14.

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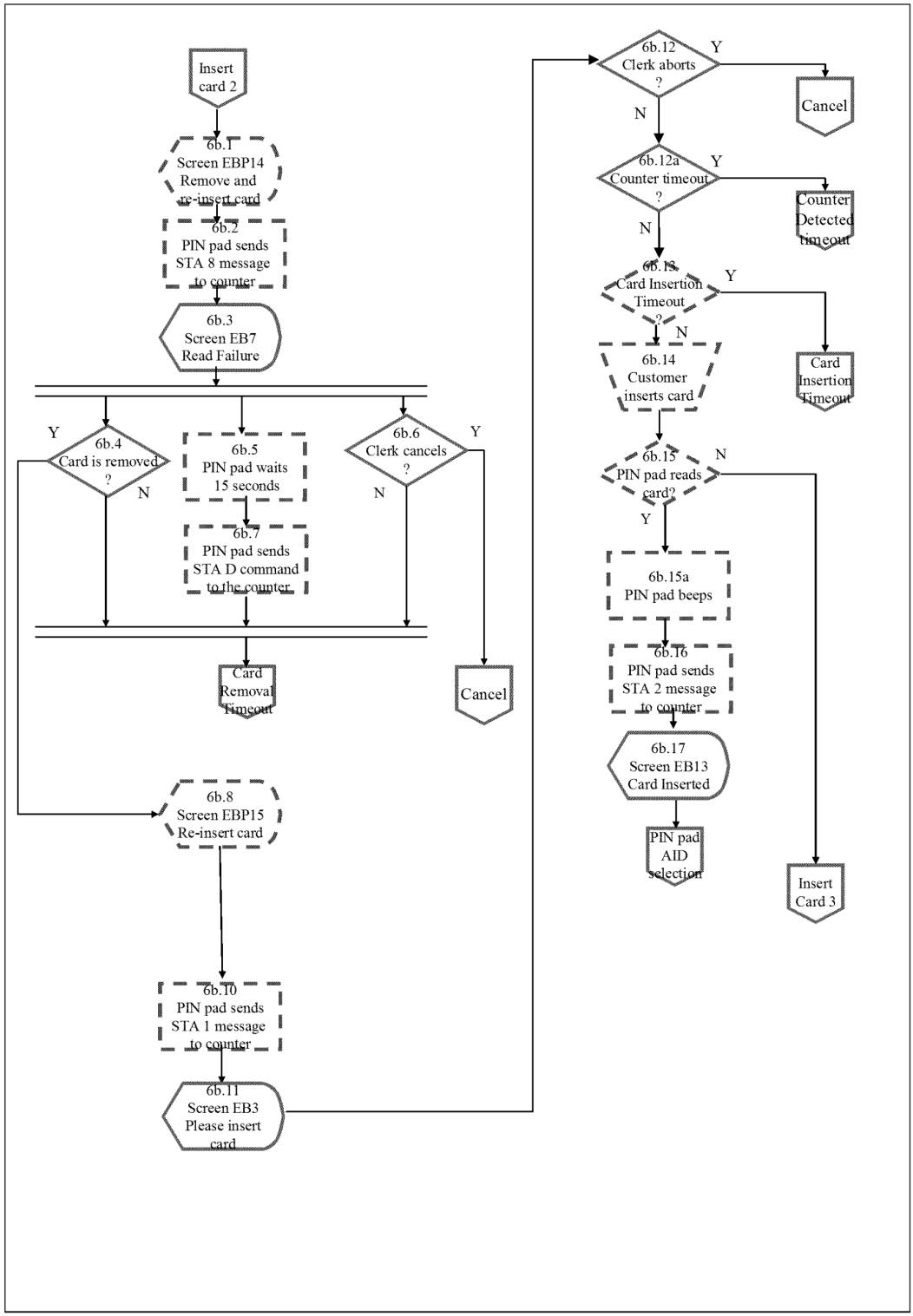

Figure 6b: Activity Flows for EMV Banking – Insert Card (2)

Notes for Figure 6b

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6b.1 PIN pad displays screen EBP14 *Remove & Re-insert card* (see 5.2.23 - first failure).

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 EB7 (see 5.1.7) 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 EB7 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 5.2.24).

6b.9 Step removed[5].

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 EB3 *Card Insertion* (see 5.1.3).

Steps 6b.10, 6b.11, 6b.12 and 6b13 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 EB3 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 EB13 *Card Inserted* (see 5.1.13). Processing continues at Figure 8: *PIN pad AID selection.*

[5] Step 6b.9 PIN pad beeps now moved to 6b.15a.

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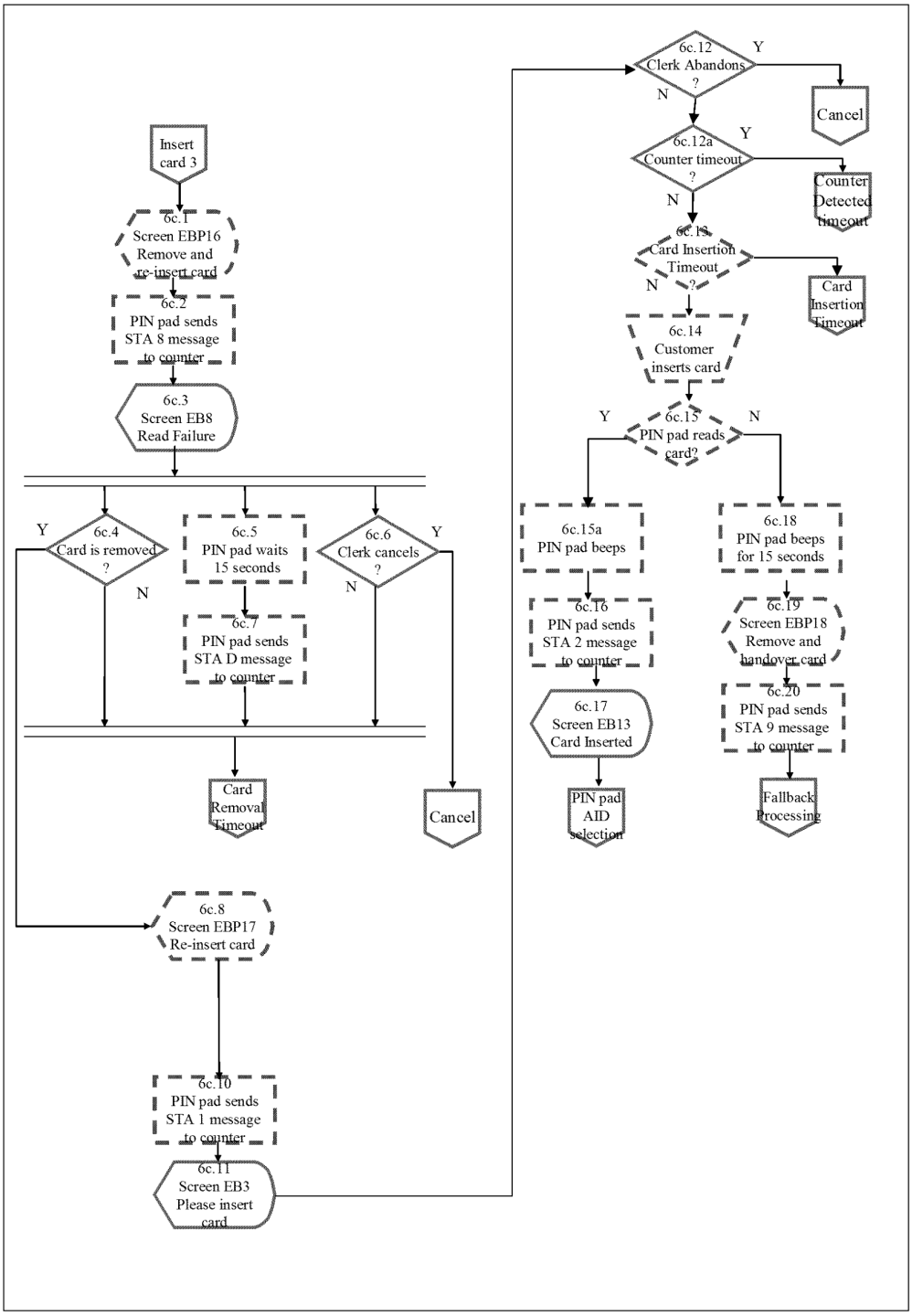

Figure 6c: Activity Flows for EMV Banking – Insert Card (3)

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Notes for Figure 6c

6c.1 The PIN pad displays screen EBP16 *Remove & Re-insert card* (see 5.2.25 - 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 EB8 (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 EB8 screen then processing continues at Figure 6a: *Cancel.*

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 5.2.26).

6c.9 Step removed[6].

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 EB3 *Card Insertion* (see 5.1.3).

Steps 6c.10, 6c.11, 6c12 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 EB3 screen.

6c.12 If clerk presses the cancel button or screen EB3 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.

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

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6c.17 The counter displays screen EB13 *Card Inserted* (see 5.1.13). 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 5.2.27 - 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).

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2.2.5 Fallback Processing

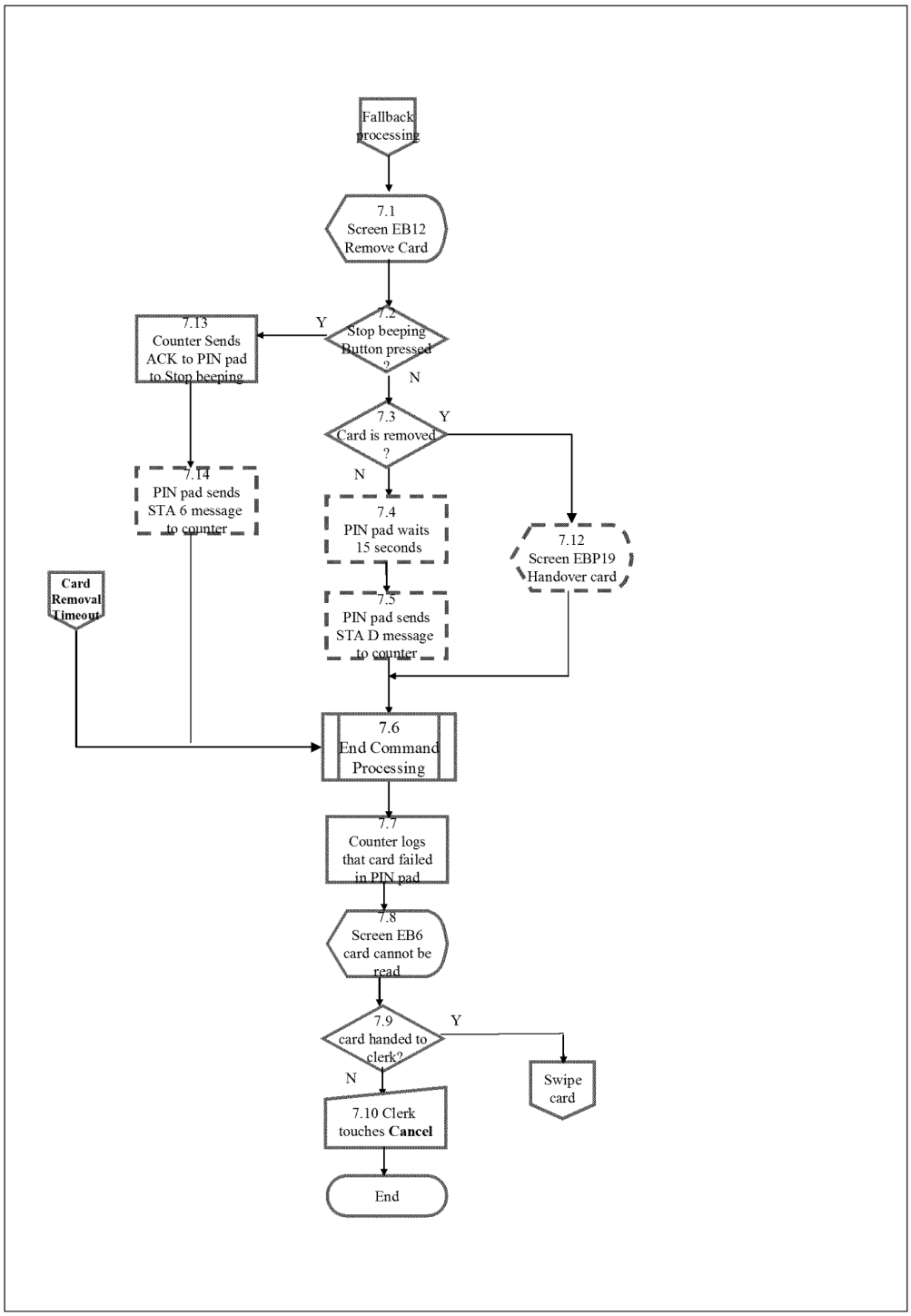

Figure 7: Activity Flows for EMV Banking – Fallback Processing

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Notes for Figure 7

7.1 The counter displays screen EB12 *Invalid Card Screen* (see 5.1.12).

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. When the timer expires then the PIN Pad stops beeping and returns an END command to the counter.

7.5 The PIN pad sends a STA D message to the counter to indicate card removal timeout expiry.

7.6 The process Figure 5c *End Command Processing* is performed.

7.7 The counter sets a flag to show that the card failed in the PIN pad: this is so that the card swipe passes the test in Figure 3 step 3.6.

7.8 The counter displays screen EB6 *Card cannot be read by PIN pad* (see 5.1.6). It may be that the card is not an ICC card or that the chip is broken. This screen informs the clerk that the PIN pad has failed to read the card and that he should try swiping the card instead.

7.9 If the customer gives the card to the clerk then the processing continues at Figure 3: *Swipe Card.*

7.10 The clerk **touches Cancel** on the EB6 screen. The counter returns to the **Serve Customer Menu**.

7.11 Step removed[7].

7.12 The PIN pad displays screen EBP19 *Handover card to clerk* (see 5.2.28). 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 and to continue at the next step of the process (breaking out of the card removal loop).

7.14 The PIN pad sends a STA 6 message to the counter to indicate clerk cancel of card removal loop. Processing continues from 7.6.

[7] Step 7.11 previously situated between 7.3 and 7.12 concerned the customer removing the card.

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2.2.6 Application Selection

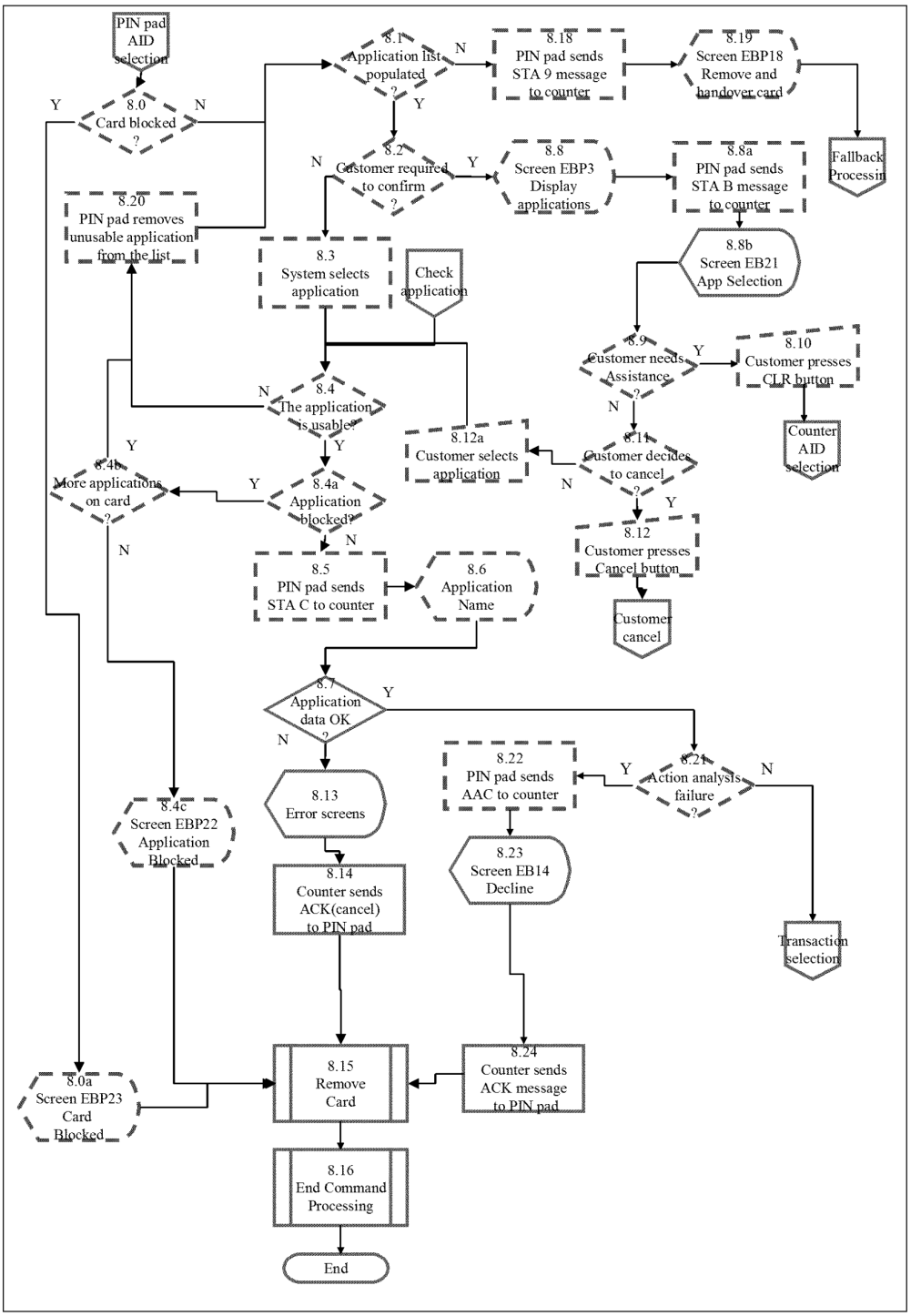

Figure 8: Activity Flows for EMV Banking – PIN pad AID selection

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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 5.2.32). (An error code of 08018 is returned with the STA 7 message in step 8.15).

Processing continues from 8.15.

8.1 If the EMV card contains no matching applications processing continues from 8.18: (the transaction may fallback to MSR).

8.2 If the cardholder is required by ICC settings to confirm the application to be used processing continues at 8.8: (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 8.20.

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 8.20.

8.4c Otherwise, the PIN pad displays screen ERP22 *Application Blocked* (see 5.2.31). (An error code of 08057 is returned with the STA 7 message in step 8.15).

Processing continues from 8.15.

8.5 The PIN pad sends an STA C message to the counter containing the selected application.

8.6 PIN pad displays the selected application name.

8.7 The counter checks the card data – check digit etc and if there is an error processing continues from 8.13.

(There is no check on effective date and expiry date and the request is still sent to the Merchant Acquirer even if the PAN seems to be out of date).

Otherwise, processing continues from 8.21.

8.8 The cardholder is presented with a list of applications on screen EBP3 (see 5.2.3): (it is possible for the PIN pad to display a single application in instances where it needs to be confirmed by the customer).

8.8a The PIN pad sends an STA B command to the counter indicating that customer application selection is in progress.

8.8b The Counter displays screen EB21 (see 5.1.21) to inform the Clerk that the PIN pad is prompting the customer to perform application selection. Screen has a cancel button:

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otherwise, the screen remains there until application selection has completed at the PIN pad, or the Clerk cancels the transaction.

8.9 If the customer needs help processing continues from 8.10: otherwise, processing continues from 8.11.

8.10 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.*

8.11 If the customer decides to cancel processing continues from 8.12: otherwise, processing continues from 8.12a.

8.12 The customer cancels by pushing the cancel button or taking the card out before the transaction is finished. Processing continues from Figure 22: *Customer Cancel.*

8.12a The customer selects application. Processing continues from 8.4.

8.13 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/003 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 7.2.4) and E10 (see 7.2.5) 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).

8.14 The counter sends an ACK cancel message back to the PIN pad.

8.15 Remove Card process is performed – Figure 5a.

8.16 The End Command Processing process is performed – Figure 5c. Counter returns to the **Serve Customer Menu**.

8.18 The Pin pad sends an STA 9 command to the counter.

8.19 PIN pad displays screen EBP18 *Remove and handover card* (see 5.2.27). Processing continues at Figure 7: *Fallback Processing*.

8.20 The unusable application will be removed from the application candidate list and application selection will begin again at 8.1 (If the list is found to be empty then fallback to MSR will be allowed).

8.21 If the PIN Pad detects a failure during Action Analysis then processing continues at 8.22. Otherwise, processing continues from Figure 10: *Transaction Selection*.

8.22 The PIN Pad sends an AAC command to the counter.

8.23 The counter displays screen EB14 *Decline* (see 5.1.14).

8.24 The counter sends an ACK command to the PIN Pad to acknowledge the AAC command. This allows the PIN Pad to move on to the next command. Processing continues at 8.15.

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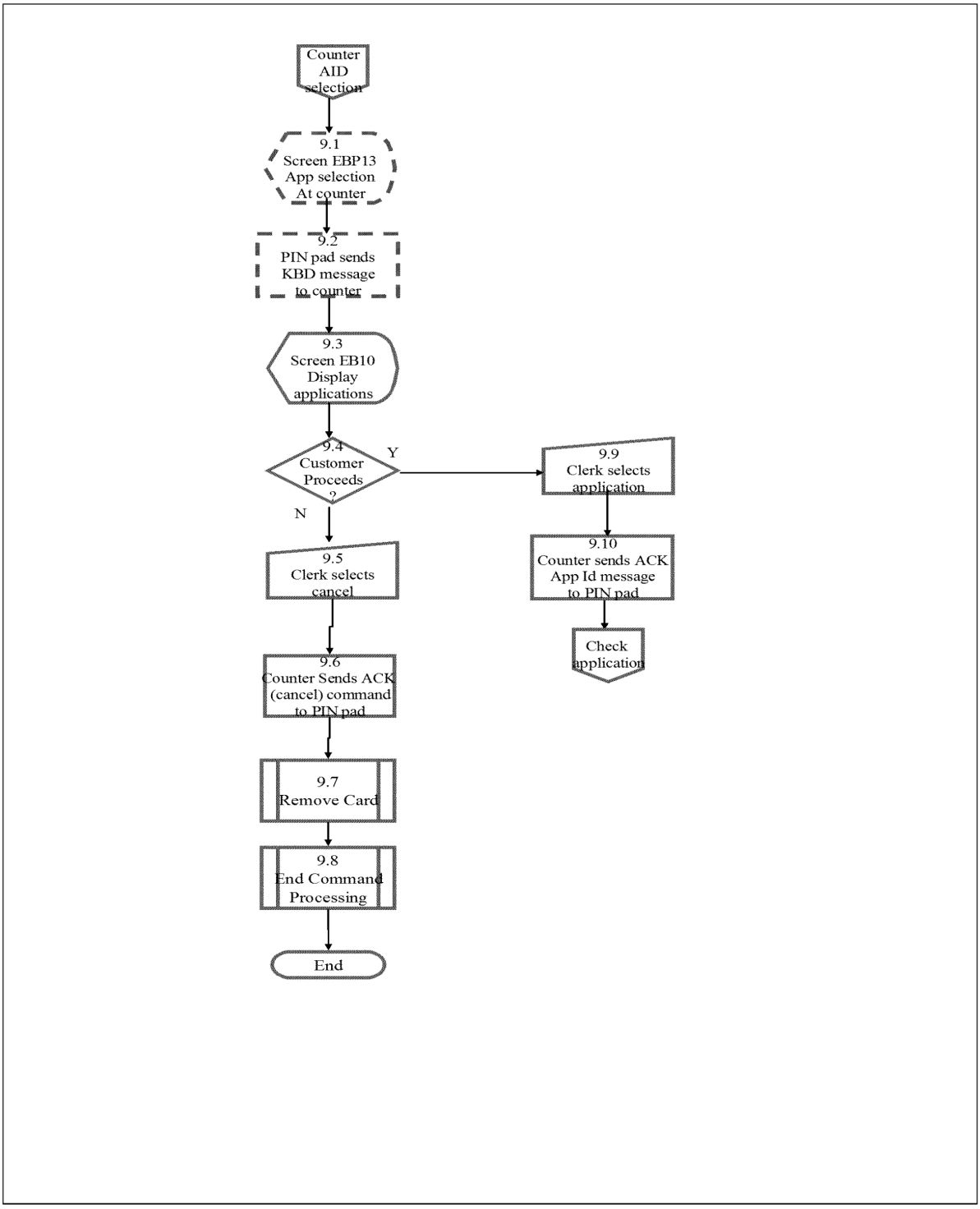

Figure 9: Activity Flows for EMV Banking – Counter AID selection

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Notes for Figure 9

9.1 The PIN pad displays screen EBP13 *selecting application for payment* (see 5.2.22).

9.2 The PIN pad sends a KBD message to the counter informing the counter that the customer has pressed the CLR key: the KBD message contains the list of the available applications.

9.3 In response to the KBD message from the PIN pad the counter displays screen EB10 (see 5.1.10). This is a pick list screen, which lists the available applications listed in the KBD message: additionally another choice available to the clerk is the CANCEL option

9.4 The clerk discusses the available applications with the customer.

If the customer selects an application then processing continues from 9.9.

Otherwise, processing continues from 9.5

9.5 The clerk selects Cancel.

9.6 The counter sends an ACK cancel command to the PIN Pad.

9.7 The process Figure 5a: *Remove Card* is performed.

9.8 The process Figure 5c: *End Command Processing* is performed. The counter returns to the **Serve Customer Menu**.

9.9 The clerk selects the appropriate application.

9.10 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.*

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2.2.7 Transaction Selection

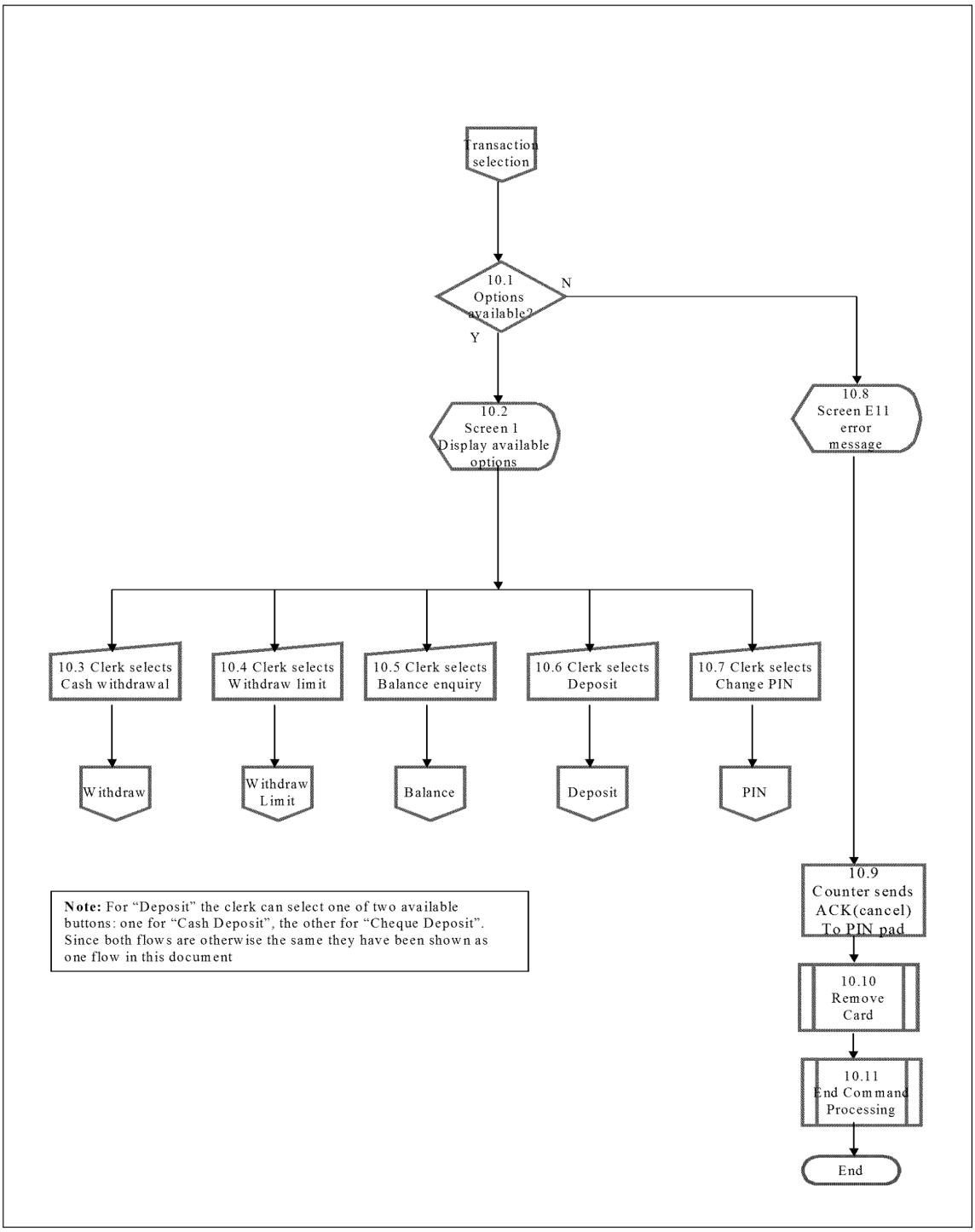

Figure 10: Activity Flows for EMV Banking – Transaction Selection

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Notes on Figure 10

10.1 Using reference data the Counter determines whether there are any transactions which can be performed with this card. If there are none then processing continues from 10.8.

10.2 Otherwise, the available options are displayed on screen 1 *Display available options* (see 7.1.1). This is a pick list screen and can be scrolled.

10.3 If clerk selects Withdraw processing continues from Figure 11: *Withdraw.*

10.4 If clerk selects Withdraw Limit processing continues from Figure 13: *Withdraw Limit.*

10.5 If clerk selects Balance Enquiry processing continues from Figure 17: *Balance Enquiry.*

10.6 If clerk selects Cash Deposit processing continues from Figure 15: *Deposit.*

If clerk selects Cheque Deposit processing continues from Figure 15: *Deposit.*

10.7 If clerk selects Change PIN processing continues from Figure 19: *Change PIN.*

10.8 Where no options are available the counter displays screen E11 *No services available* (see 7.2.6).

10.9 The counter sends an ACK cancel command to the PIN Pad.

10.10 The process Figure 5a: *Remove Card* is performed.

10.11 The process Figure 5c: *End Command Processing* is performed.

The counter returns to the Serve Customer Menu.

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2.3 EMV Banking Transactions Stage 2 (Customer Verification and Transaction Service)

2.3.1 Cash Withdrawal

This section covers the main activities for a Cash withdrawal.

Pre conditions

- The EMV card details have been validated

Post conditions

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

Description

The Clerk enters the transaction amount and the customer enters a PIN. In the normal flow, the transaction goes online for an authorisation. The authorisation response is passed to the PIN pad which may return a TC (to proceed with the transaction) or an AAC (a decline irrespective of institution verdict).

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

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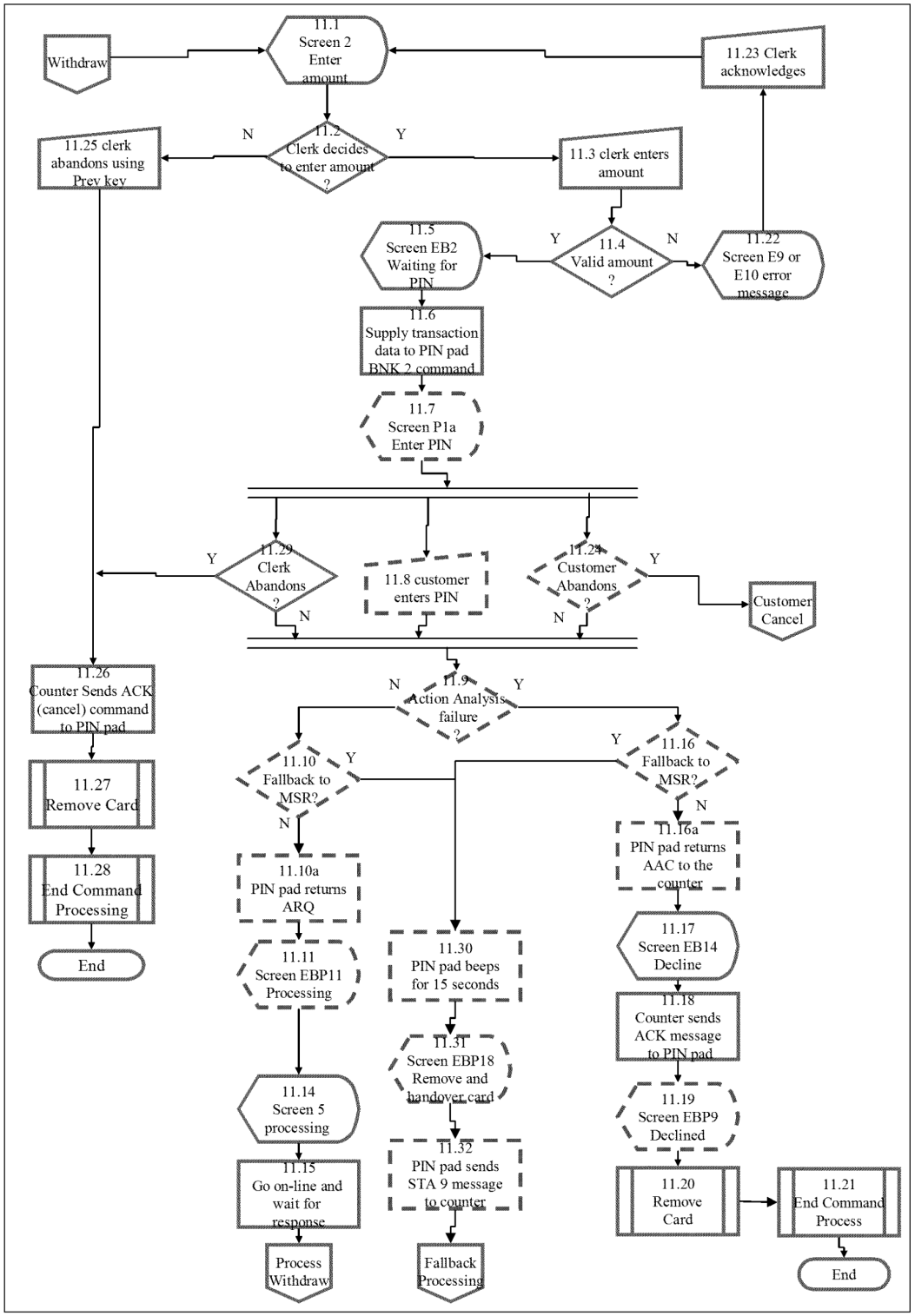

Figure 11: Activity Flows for EMV Banking – Cash Withdrawal

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Notes for Figure 11

11.1 The counter displays screen 2 *Enter Amount* (see 7.1.2).

11.2 If clerk decides to cancel transaction (by pushing Prev key), then processing continues from 11.25.

11.3 Otherwise, the clerk enters the amount.

11.4 The counter checks the amount and if it is valid, processing continues from 11.5. Otherwise, processing continues from 11.22.

11.5 The counter displays screen EB2 *Waiting for PIN* (see 5.1.2).

11.6 If the amount is valid the counter provides relevant data to the PIN pad: this is provided in a BNK 2 command containing the transaction type and the amount.

11.7 PIN pad displays screen P1a *Confirm and Enter PIN for Cash Withdrawal*[8] (see 5.2.13).

11.8 The Customer enters their PIN and pushes the ENT key.

11.9 If action analysis causes a decline (AAC) then processing continues at 11.16: otherwise, processing continues from 11.10.

11.10 If fallback to MSR is required processing continues from 11.30. (This is a rare event but has to be catered for).

11.10a When the PIN is successfully entered the PIN pad returns an ARQ message to the counter: this message includes the PIN number.

11.11 PIN pad displays screen EBP11 *Processing: Please wait*[9] (see 5.2.11).

11.12 Step removed.[10]

11.13 Step removed.

11.14 The counter temporarily displays screen 5 (EMV) *Waiting for authorisation* (see 5.1.22).

11.15 The system goes on line to the financial institution whilst waiting for authorisation.

Processing continues from Figure 12: *Process Withdraw.*

11.16 If fallback to MSR is required processing continues from 11.30. (This is a rare event but has to be catered for).

11.16a The PIN pad sends an AAC command to the counter. This informs the counter that the transaction has been declined.

---

[8] If the card does not support PIN verification and the Terminal Action Codes have not been set to decline such transactions then the transaction skips to 11.9 without displaying PIN pad screen P1a.

[9] Currently the system displays 2 screens instead of one: the first contains “Processing” the second contains “Please Wait” – PC0108611

[10] Steps 11.12 and 11.13 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.

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11.17 The counter displays the EB14 screen (see 5.1.14) showing a transaction declined message.

11.18 The counter sends an ACK message to the PIN pad. This acknowledges the AAC command and allows the PIN Pad to progress to the remove card sequence.

11.19 The PIN Pad displays screen EBP9 *Declined: Remove Card* (see 5.2.9).

11.20 The process Figure 5a: *Remove Card* is performed.

11.21 The process Figure 5c: *End Command Processing* is performed.

The counter returns to the **Serve Customer Menu**.

11.22 If the amount is not valid counter displays screen E9 *Invalid Amount - range* (see 7.2.4) or screen E10 *Invalid Amount – multiples* (see 7.2.5) , as appropriate.

11.23 The clerk acknowledges the error and processing returns to the screen 2 *Enter Amount* (see 7.1.2).

11.24 If the customer decides to cancel processing continues from Figure 22: *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). Otherwise, processing continues from 11.9.

11.25 The Clerk abandons by pressing the Prev key.

11.26 The counter sends an ACK (cancel) command to the PIN pad. This causes the PIN Pad to abort the current activity and progress to the remove card sequence.

11.27 The process Figure 5a: *Remove Card* is performed.

11.28 The process Figure 5c: *End Command Processing* is performed.

The counter returns to the **Serve Customer Menu**.

11.29 If the Clerk abandons by pressing the Cancel button on the EB2 screen (see 5.1.2) then processing continues at 11.26. Otherwise, processing continues from 11.9.

11.30 The PIN pad beeps for 15 seconds until the card is removed or until the clerk touches OK on the EB12 screen (see 5.1.12) in step 7.1.

11.31 PIN pad displays screen EBP18 – *Remove and handover card* (see 5.2.27).

11.32 The PIN pad sends an STA 9 command to the counter indicating an MSR fallback scenario.

Processing continues from Fallback Processing in Figure 7.

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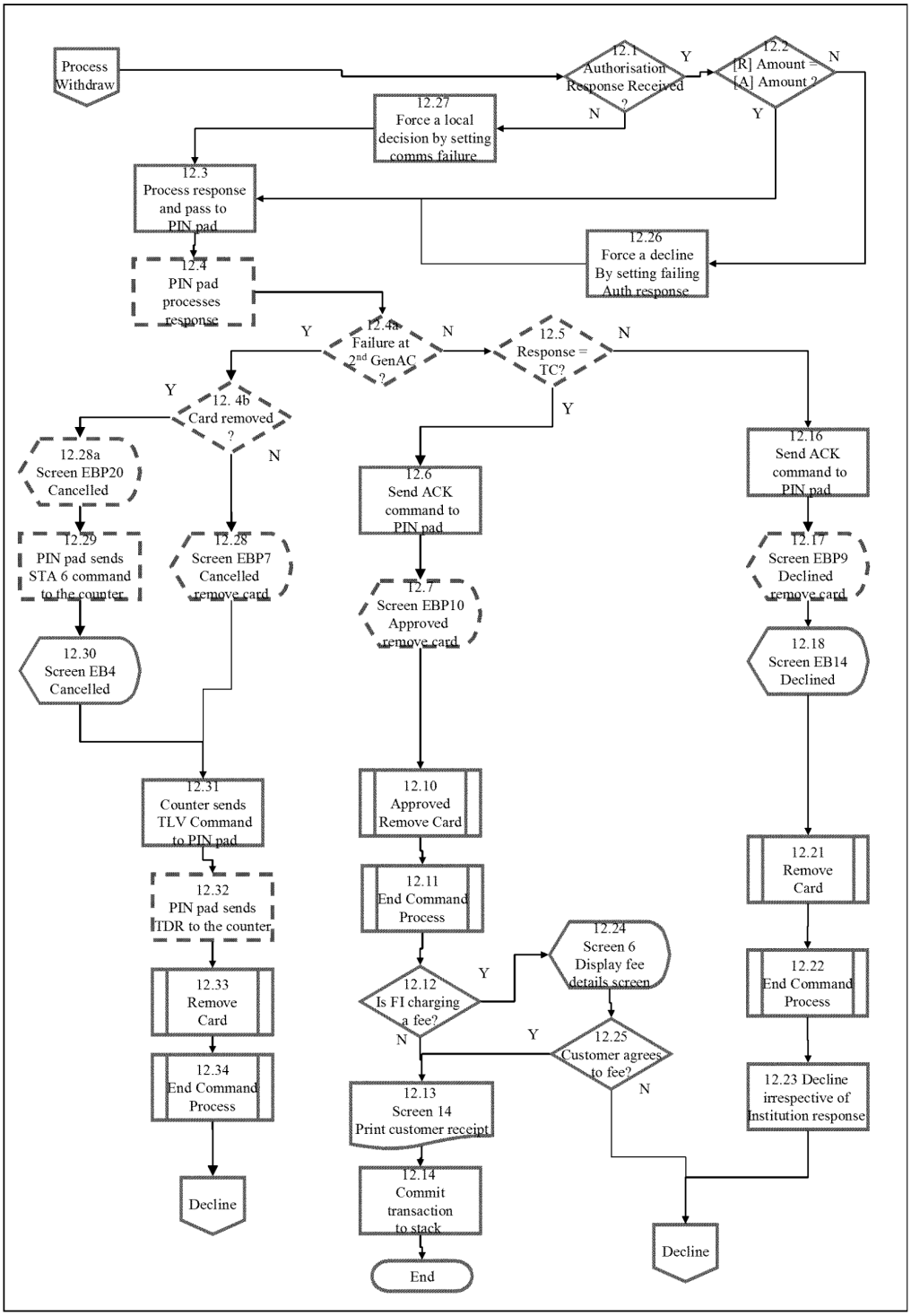

Figure 12: Activity Flows for EMV Cash Withdrawal (continued)

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Notes for Figure 12

12.1 If an authorisation response is not received processing continues from 12.27.

Authorisation Response timeouts still need to be handled by the PIN pad so non-receipt of authorisation response is communicated to the PIN pad as comms failure.

12.2 If the authorised amount and requested amounts are not equal then processing continues from 12.26.

12.3 The counter processes the response and passes the result to the PIN pad: this is within a BNK 3 command.

12.4 The PIN pad then processes the response and passes a TC or AAC response back to the Counter.

12.4a If the EMV transaction has failed at second GenAC processing continues from 12.4b: this may be for one of the following reasons:

- the customer has cancelled the transaction possibly by removing the card too early
- the PIN pad has some other reason for rejecting the transaction.

Otherwise, processing continues from 12.5.

12.4b If the card has been removed from the PIN pad processing continues from 12.28a. Otherwise, processing continues from 12.28.

12.5 If the response is TC the transaction is fully approved and processing continues from 12.6. Otherwise, the transaction has been declined and processing continues at 12.16.

12.6 Counter sends an ACK command to acknowledge the TC PIN Pad command.

12.7 The PIN pad displays screen EBP10 *Approved: Remove Card* (see 5.2.10).

12.8 Step removed[11].

12.9 Step removed.

12.10 The process Figure 5b: *Approved Remove Card* is performed.

12.11 The process Figure 5c: *End Command Processing* is performed.

12.12 If the Financial Institution is charging a fee processing continues from 12.24. Otherwise, processing continues from 12.13.

12.13 The counter displays screen 14 *Printing receipt* (see 7.1.11) whilst the customer's receipt is printed.

12.14 The transaction is committed to the stack. The transaction ends. The counter returns to the **Serve Customer Menu**.

12.16 The counter sends an ACK command to confirm the AAC PIN Pad command.

12.17 The PIN pad displays EBP9 – *Declined: Remove Card* (see 5.2.9).

12.18 The counter displays screen EB14 *Decline* (see 5.1.14).

[11] Steps 12.8, 12.9, 12.19, and 12.20 connected with TLV and TDR messages have been removed as the result of performance improvements to the main paths. However steps 12.31 and 12.32 remain.

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12.19 Step removed. [12]

12.20 Step removed.

12.21 The process Figure 5a: *Remove Card* is performed.

12.22 The process Figure 5c: *End Command Processing* is performed.

12.23 The transaction is declined irrespective of the response received from the Financial Institution and processing continues from Figure 23: *Decline.*

(The PIN pad will decline the transaction if the customer pushes the cancel button or the card is removed too early).

12.24 The counter displays screen 6 *Charge Confirmation* (see 7.1.5) which displays the fee details. This screen allows the clerk to continue or cancel

12.25 If the customer agrees to the fee the clerk selects **Yes** and processing continues from 12.13.

Otherwise, the clerk selects **No** and processing continues from Figure 23: *Decline*.

12.26 When the amount requested is not equal to the amount authorised then set the Authorisation Response Code to force a decline by the PIN Pad. Processing continues from 12.3.

12.27 When no response is received from the financial institution the counter generates an Authorisation message with a Response Code indicating that a failure has occurred: (possibly a timeout). Processing continues from 12.3.

12.28 The PIN pad displays screen EBP7 *Cancelled Please Remove Card* (see 5.2.7). Processing continues from 12.31.

12.28a The PIN pad displays screen EBP20 *Cancelled* (see 5.2.29).

12.29 The PIN Pad sends an STA 6 command to the counter indicating a card removal during the authorisation process.

12.30 The counter displays screen EB4 *Transaction Cancelled by Customer* (see 5.1.4).

12.31 The counter solicits EMV tag data from the PIN pad using the TLV command[13].

12.32 The PIN Pad returns the requested data to the counter using the TDR command.

12.33 The process Figure 5a: *Remove Card* is performed.

12.34 The process Figure 5c: *End Command Processing* is performed.

As a [C0] is possibly required processing continues from Figure 23: *Decline.*

[12] Steps 12.8, 12.9, 12.19, and 12.20 connected with TLV and TDR messages have been removed as the result of performance improvements to the main paths. However steps 12.31 and 12.32 remain.

[13] Steps 12.8, 12.9, 12.19, and 12.20 connected with TLV and TDR messages have been removed as the result of performance improvements to the main paths. However steps 12.31 and 12.32 remain.

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2.3.2 Withdraw Limit

This section covers the main activities for a Withdraw Limit.

Pre conditions

- The EMV card details have been validated

Post conditions

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

Description

After the Clerk chooses Withdraw Limit, the customer enters a PIN. In the normal flow, the transaction goes online for an authorisation. The authorisation is passed to the PIN pad which may return a TC (to proceed with the transaction) or an AAC (a decline irrespective of institution verdict).

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

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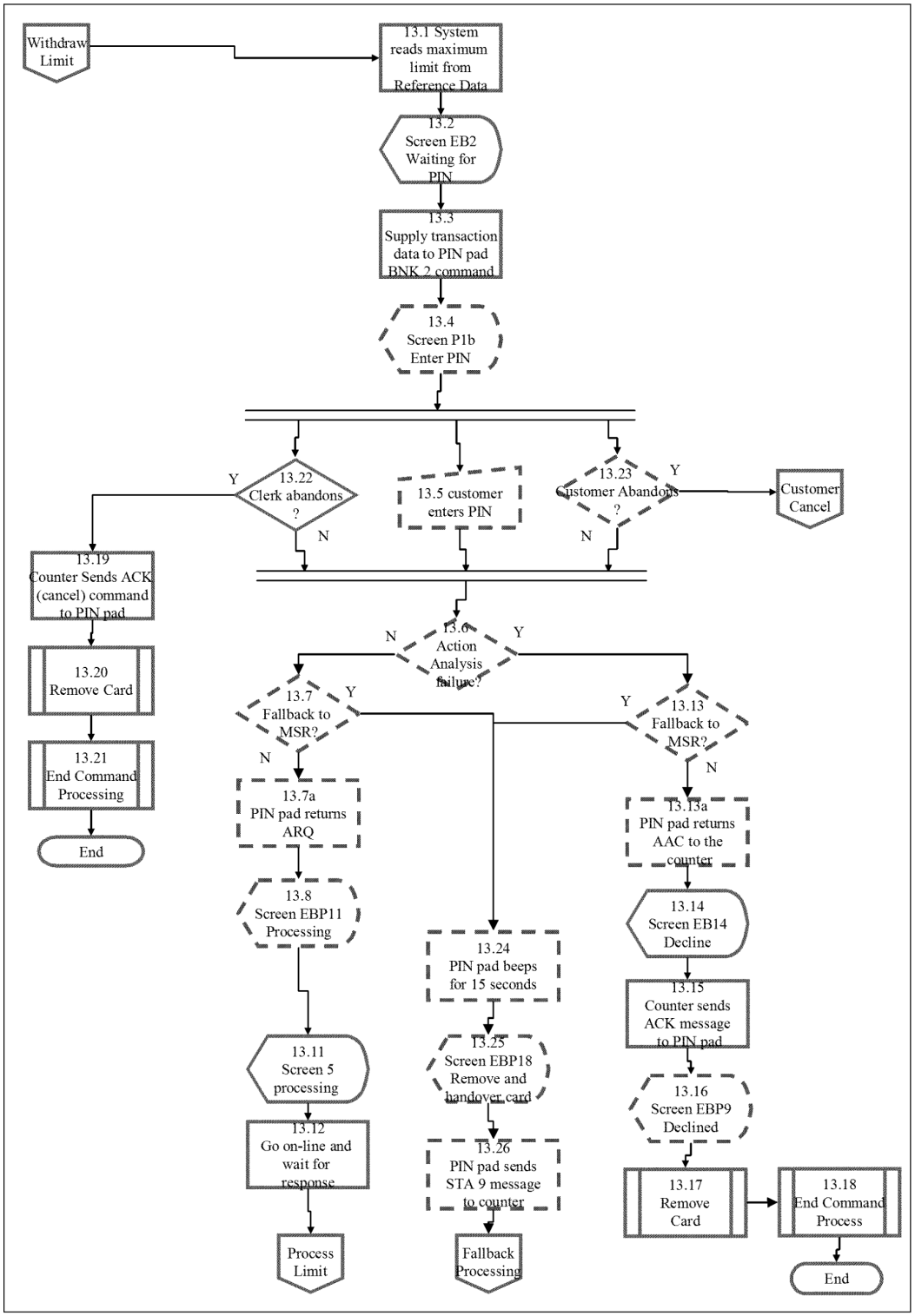

Figure 13: Activity Flows for EMV Banking – Withdraw Limit

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Notes for Figure 13

13.1 The Counter looks up reference data related to the card scheme of the card in use, to determine the maximum amount that can be withdrawn for that particular scheme.

13.2 The counter displays screen EB2 *Waiting for PIN* (see 5.1.2).

13.3 The counter provides relevant data to the PIN pad: this is provided in a BNK 2 command containing the transaction type and the maximum amount.

13.4 The PIN pad displays screen P1b *Confirm and Enter PIN for Withdraw Limit*[14] (see 5.2.14).

13.5 Customer enters their PIN and pushes the ENT key. Processing continues at 13.6.

13.6 If action analysis causes a decline (AAC) then processing continues at 13.13: otherwise, processing continues from 11.7.

13.7 If fallback to MSR is required processing continues from 13.24. (This is a rare event but has to be catered for).

13.7a When the PIN is successfully entered and if action analysis does not reveal an error then the PIN pad returns an ARQ command to the counter: this command includes the encrypted PIN block.

13.8 PIN pad displays screen EBP11 *Processing: Please wait*[15] (see 5.2.11).

13.9 Step removed.[16]

13.10 Step removed.

13.11 The counter temporarily displays screen 5 (EMV) *Waiting for Authorisation* (see 5.1.22).

13.12 The system goes on line to the financial institution to obtain authorisation for the transaction.

Processing continues from Figure 14: *Process Limit.*

13.13 If fallback to MSR is required processing continues from 13.24. (This is a rare event but has to be catered for).

13.13a The PIN pad sends an AAC command to the counter.

13.14 The counter displays the EB14 screen (see 5.1.14) showing a transaction declined message.

13.15 The counter sends an ACK command to the PIN pad, acknowledging the AAC command. This allows the PIN pad to move on to card removal processing.

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[14] If the card does not support PIN verification and the Terminal Action Codes have not been set to decline such transactions then the transaction skips to 13.6 without displaying PIN pad screen P1b.

[15] Currently the system displays 2 screens instead of one: the first contains “Processing” the second contains “Please Wait” – PC0108611.

[16] Steps 13.9 and 13.10 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.

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13.16 The PIN Pad displays screen EBP9 *Declined: Remove Card* (see 5.2.9).

13.17 The process Figure 5a: *Remove Card* is performed.

13.18 The process Figure 5c: *End Command Processing* is performed.

The counter returns to the **Serve Customer Menu**.

13.19 The counter sends an ACK(cancel) command to the PIN pad. This causes the PIN pad application to abort the current activity and enter remove card processing.

13.20 The process Figure 5a: *Remove Card* is performed.

13.21 The process Figure 5c: *End Command Processing* is performed.

The counter returns to the **Serve Customer Menu**.

13.22 If the clerk abandons processing continues 13.19. Otherwise, processing continues from 13.6.

13.23 If the customer decides to cancel processing continues from Figure 22: *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). Otherwise, processing continues from 13.6.

13.24 The PIN pad beeps for 15 seconds until the card is removed or until the clerk touches OK on the EB12 screen (see 5.1.12) in step 7.1.

13.25 PIN pad displays screen EBP18 *Remove and handover card* (see 5.2.27).

13.26 The PIN pad sends an STA 9 command to the counter indicating an MSR fallback scenario.

Processing continues from Fallback Processing in Figure 7.

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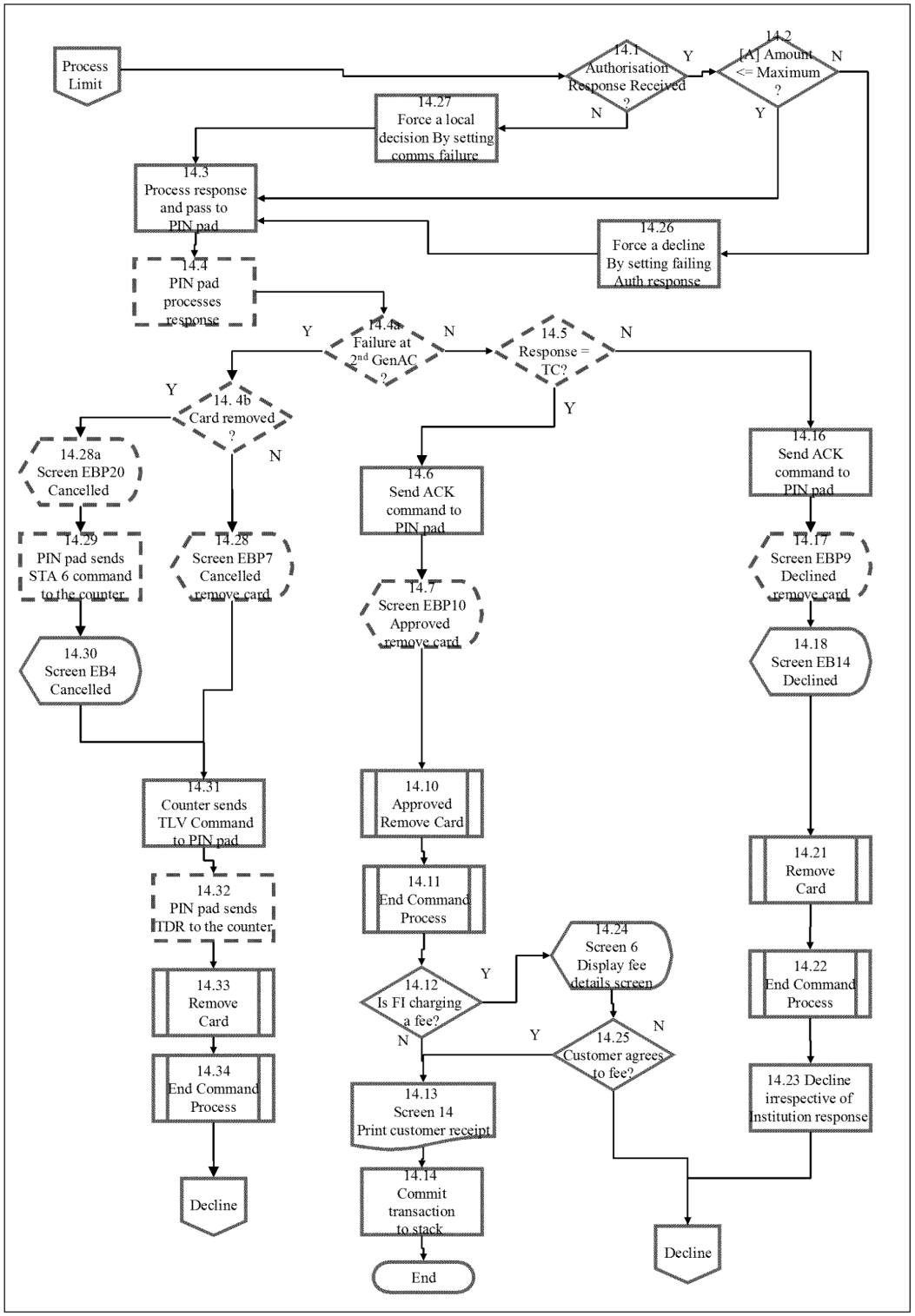

Figure 14: Activity Flows for EMV Banking – Withdraw Limit (continued)

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Notes for Figure 14

14.1 If an authorisation response is not received processing continues from 14.27.

Authorisation Response timeouts still need to be handled by the PIN pad so non-receipt of authorisation response is communicated to the PIN pad as comms failure.

14.2 If the authorised amount is greater than the maximum amount then processing continues from 14.26.

14.3 The Counter processes the response and passes the result to the PIN pad: this is within a BNK 3 command.

14.4 The PIN pad then processes the response and passes the TC or AAC response back to the Counter.

14.4a If the EMV transaction has failed at second GenAC, processing continues from 14.4b: this may be for one of the following reasons:

- the customer has cancelled the transaction possibly by removing the card too early
- the PIN pad has some other reason for rejecting the transaction

Otherwise, processing continues from 14.5.

14.4b If the card has been removed from the PIN pad processing continues from 14.28a. Otherwise, processing continues from 14.28.

14.5 If the response is TC the transaction is fully approved and processing continues from 14.6. Otherwise, the transaction has been declined and processing continues at 14.16.

14.6 The counter sends an ACK command to acknowledge the TC PIN Pad command.

14.7 The PIN pad displays screen EBP10 *Approved: Remove Card* (see 5.2.10).

14.8 Step removed.[17]

14.9 Step removed.

14.10 The process Figure 5b: *Approved Remove Card* is performed.

14.11 The process Figure 5c: *End Command Processing* is performed.

14.12 If the Financial Institution is charging a fee processing continues from 14.24. Otherwise, processing continues from 14.13.

14.13 The counter displays screen 14 *Printing receipt* (see 7.1.11) whilst the customer's receipt is printed.

14.14 The transaction is committed to the stack. The transaction ends. The counter returns to the **Serve Customer Menu**.

14.16 The counter sends an ACK command to acknowledge the AAC PIN Pad command.

14.17 The PIN pad displays screen EBP9 *Declined: Remove Card* (see 5.2.9).

14.18 The counter displays screen EB14 *Decline* (see 5.1.14).

[17] Steps 14.8, 14.9, 14.19, and 14.20 connected with TLV and TDR messages have been removed as the result of performance improvements to the main paths. However steps 14.31 and 14.32 remain.

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14.19 Step removed.[18]

14.20 Step removed.

14.21 The process Figure 5a: *Remove Card* is performed.

14.22 The process Figure 5c: *End Command Processing* is performed.

14.23 The transaction is declined irrespective of the response received from the Financial Institution and processing continues from Figure 23: *Decline.*

(The PIN pad will decline the transaction if the customer pushes the cancel button or the card is removed too early).

14.24 The counter displays screen 6 *Charge Confirmation* (see 7.1.5) which displays the fee details. This screen allows the clerk to continue or cancel

14.25 If the customer agrees to the fee the clerk selects **Yes** and processing continues from 14.13.

Otherwise, the clerk selects **No** and processing continues from Figure 23: *Decline.*

14.26 When the amount requested is not equal to the amount authorised then set the Authorisation Response Code to force a decline by the PIN Pad. Processing continues from 14.3.

14.27 When no response is received from the financial institution then force a decline from the PIN pad by using the comms failure setting on the BNK 3 command. Processing continues from 14.3.

14.28 The PIN pad displays screen EBP7 *Cancelled Please Remove Card* (see 5.2.7). Processing continues from 14.31.

14.28a The PIN pad displays screen EBP20 *Cancelled* (see 5.2.29).

14.29 The PIN Pad sends an STA 6 command to the counter indicating a card removal during the authorisation process.

14.30 The counter displays screen EB4 *Transaction Cancelled by Customer* (see 5.1.4).

14.31 The counter solicits EMV tag data from the PIN pad using the TLV command.

14.32 The PIN Pad returns the requested data to the counter using the TDR command.

14.33 The process Figure 5a: *Remove Card* is performed.

14.34 The process Figure 5c: *End Command Processing* is performed.

As a [C0] is possibly required processing continues from Figure 23: *Decline.*

[18] Steps 14.8, 14.9, 14.19, and 14.20 connected with TLV and TDR messages have been removed as the result of performance improvements to the main paths. However steps 14.31 and 14.32 remain.

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2.3.3 Cheque/Cash Deposit

This section covers the main activities for a Cheque or Cash Deposit.

Pre conditions

- The EMV card details have been validated

Post conditions

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

Description

The Clerk enters an amount for the deposit and the transaction goes online for an authorisation: (a PIN is required). The authorisation is passed to the PIN pad which may return a TC (to proceed with the transaction) or an AAC (a decline irrespective of institution verdict). The clerk confirms the deposit before the transaction is added to the stack.

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

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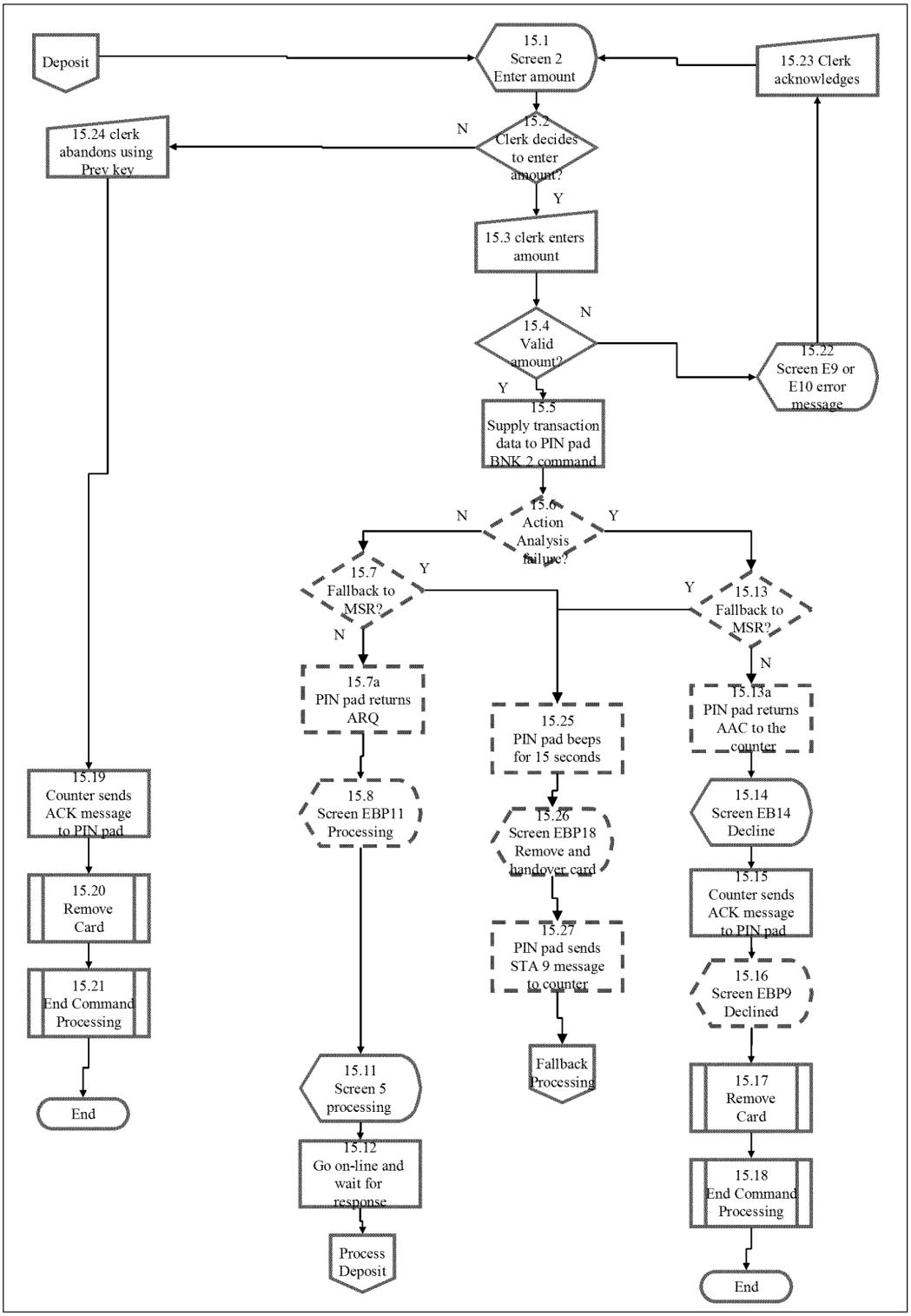

Figure 15: Activity Flows for EMV Banking – Deposit

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Notes for Figure 15

15.1 The counter displays screen 2 *Enter Amount* (see 7.1.2).

15.2 If clerk decides to cancel transaction, processing continues from 15.24.

15.3 The clerk enters the amount.

15.4 The counter checks the amount and if it is valid then processing continues from 15.5.

If the amount is not valid then processing continues at 15.22.

15.5 The counter provides relevant data to the PIN pad: this is provided in a BNK 2 command containing the transaction type and the amount.

15.6 If action analysis causes a decline (AAC) then processing continues at 15.13: otherwise, processing continues from 15.7.

15.7 If fallback to MSR is required processing continues from 15.25. (This is a rare event but has to be catered for).

15.7a The PIN Pad constructs and sends an ARQ command to the counter.

15.8 PIN pad displays screen EBP11 *Processing: Please wait*[19] (see 5.2.11).

15.9 Step removed.[20]

15.10 Step removed.

15.11 The counter displays screen 5 (EMV) *Waiting for Authorisation* (see 5.1.22).

15.12 The counter goes online to request authorisation from the Financial Institution and then waits for a response.

Processing continues from Figure 16: *Process Deposit.*

15.13 If fallback to MSR is required processing continues from 15.25. (This is a rare event but has to be catered for).

15.13a The PIN pad sends an AAC command to the counter.

15.14 The counter displays the EB14 screen (see 5.1.14) showing a transaction declined message.

15.15 The counter sends an ACK message to the PIN pad.

15.16 The PIN Pad displays screen EBP9 *Declined: Remove Card* (see 5.2.9).

15.17 The Remove Card process is performed – Figure 5a.

15.18 The End Command Processing process Figure 5c is performed.

The Counter returns to the **Serve Customer Menu**.

15.19 The counter sends an ACK message to the PIN pad.

15.20 The Remove Card process is performed – Figure 5a.

[19] Currently the system displays 2 screens instead of one: the first contains "Processing" the second contains "Please Wait" – PC0108611.

[20] Steps 15.9 and 15.10 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.

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15.21 The End Command Processing process Figure 5c is performed.

The Counter returns to the **Serve Customer Menu**.

15.22 If the amount is not valid then the counter displays screen E9 *Invalid Amount – range* (see 7.2.4) or screen E10 *Invalid Amount – multiples* (see 7.2.5), as appropriate.

15.23 The clerk acknowledges the error and processing returns to the amount capture screen.

15.24 The Clerk abandons by selecting the **Prev** key and processing continues at 15.19.

15.25 The PIN pad beeps for 15 seconds until the card is removed or until the clerk touches OK on the EB12 screen (see 5.1.12) in step 7.1.

15.26 PIN pad displays screen EBP18 *Remove and handover card* (see 5.2.27).

15.27 The PIN pad sends an STA 9 command to the counter indicating an MSR fallback scenario.

Processing continues from Fallback Processing in Figure 7.

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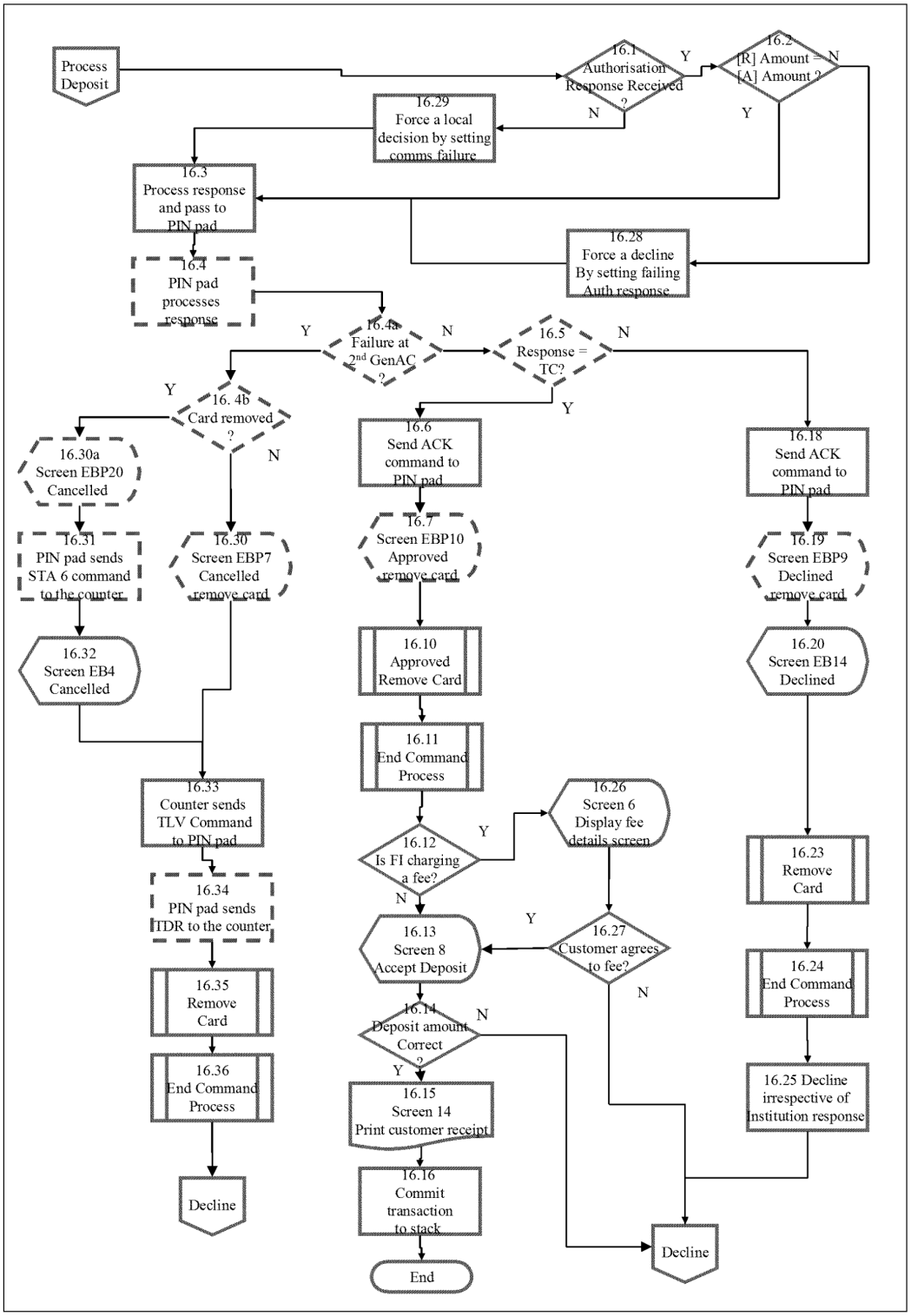

Figure 16: Activity Flows for EMV Banking – Process Deposit (continued)

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Notes for Figure 16

16.1 If an authorisation response is not received processing continues from 16.27.

Authorisation Response timeouts still need to be handled by the PIN pad so non-receipt of authorisation response is communicated to the PIN pad as comms failure.

16.2 If the authorised amount and requested amounts are not equal processing continues from 16.28.

16.3 The counter processes the response and passes the result to the PIN pad: this is within a BNK 3 command.

16.4 The PIN pad then processes the response and passes a TC/AAC response back to the counter.

16.4a If the EMV transaction has failed at second GenAC processing continues from 16.4b: this may be for one of the following reasons:

- the customer has cancelled the transaction possibly by removing the card too early
- the PIN pad has some other reason for rejecting the transaction.

Otherwise, processing continues from 16.5.

16.4b If the card has been removed from the PIN pad processing continues from 16.30a. Otherwise, processing continues from 16.30.

16.5 If the response is TC the transaction is fully approved and processing continues from 16.6. Otherwise, the transaction has been declined and processing continues at 16.18.

16.6 Counter sends an ACK command to confirm the TC PIN Pad command.

16.7 The PIN pad displays screen EBP10 *Approved: Remove Card* (see 5.2.10).

16.8 Step removed.[21]

16.9 Step removed.

16.10 The Approved Remove Card process is performed - Figure 5b.

16.11 The End Command Processing process is performed - Figure 5c.

16.12 If the Financial Institution is charging a fee processing continues from 16.26. Otherwise, processing continues from 16.13.

16.13 The counter displays screen 8 *Deposit Amount Confirmation* (see 7.1.7).

16.14 If the clerk does not accept the deposit amount then processing continues from Figure 23: *Decline*.

16.15 The counter displays screen 14 *Printing receipt* (see 7.1.11) whilst the customer's receipt is printed.

16.16 The transaction is committed to the stack and the counter returns to the **Serve Customer Menu**.

16.18 The counter sends an ACK command to confirm the AAC PIN Pad command.

[21] Steps 16.8, 16.9, 16.21, and 16.22 connected with TLV and TDR messages have been removed as the result of performance improvements to the main paths. However steps 16.33 and 16.34 remain.

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16.19 The PIN pad displays screen EBP9 *Declined: Remove Card* (see 5.2.9).

16.20 The counter displays screen EB14 *Decline* (see 5.1.14).

16.21 Step removed[22].

16.22 Step removed.

16.23 The Remove Card process is performed - Figure 5a.

16.24 The End Command Processing process is performed - Figure 5c.

16.25 The transaction is declined irrespective of the response received from the Financial Institution and processing continues from Figure 23: *Decline*.

16.26 The counter displays screen 6 *Charge Confirmation* (see 7.1.5) which displays the fee details. This screen allows the clerk to continue or cancel.

16.27 If the customer agrees to the fee and the clerk selects **Yes** then processing continues from 16.13.

Otherwise, the clerk selects **No** and processing continues from Figure 23: *Decline*.

16.28 When the amount requested is not equal to the amount authorised then set the Authorisation Response Code to force a decline by the PIN Pad. Processing continues from 16.3.

16.29 When no response is received from the financial institution the counter generates an Authorisation message with a Response Code indicating that a failure has occurred: (possibly a timeout). Processing continues from 16.3.

16.30 The PIN pad displays screen EBP7 *Cancelled Please Remove Card* (see 5.2.7). Processing continues from 16.33.

16.30a The PIN pad displays screen EBP20 *Cancelled* (see 5.2.29).

16.31 The PIN Pad sends an STA 6 command to the counter indicating a card removal during the authorisation process.

16.32 The counter displays screen EB4 *Transaction Cancelled by Customer* (see 5.1.4).

16.33 The counter solicits EMV tag data from the PIN pad using the TLV command.

16.34 The PIN Pad returns the requested data to the counter using the TDR command.

16.35 The process Figure 5a: *Remove Card* is performed.

16.36 The process Figure 5c: *End Command Processing* is performed.

As a [C0] is possibly required processing continues from Figure 23: *Decline.*

2.3.4 Balance Enquiry

This section covers the main activities for a Balance Enquiry.

[22] Steps 16.8, 16.9, 16.21, and 16.22 connected with TLV and TDR messages have been removed as the result of performance improvements to the main paths. However steps 16.33 and 16.34 remain.

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Pre conditions

- The EMV card details have been validated

Post conditions

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

Description

After the Clerk chooses Balance Enquiry, the customer enters a PIN. In the normal flow, the transaction goes online for an authorisation. The authorisation is passed to the PIN pad which may return a TC (to proceed with the transaction) or an AAC (a decline irrespective of institution verdict).

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

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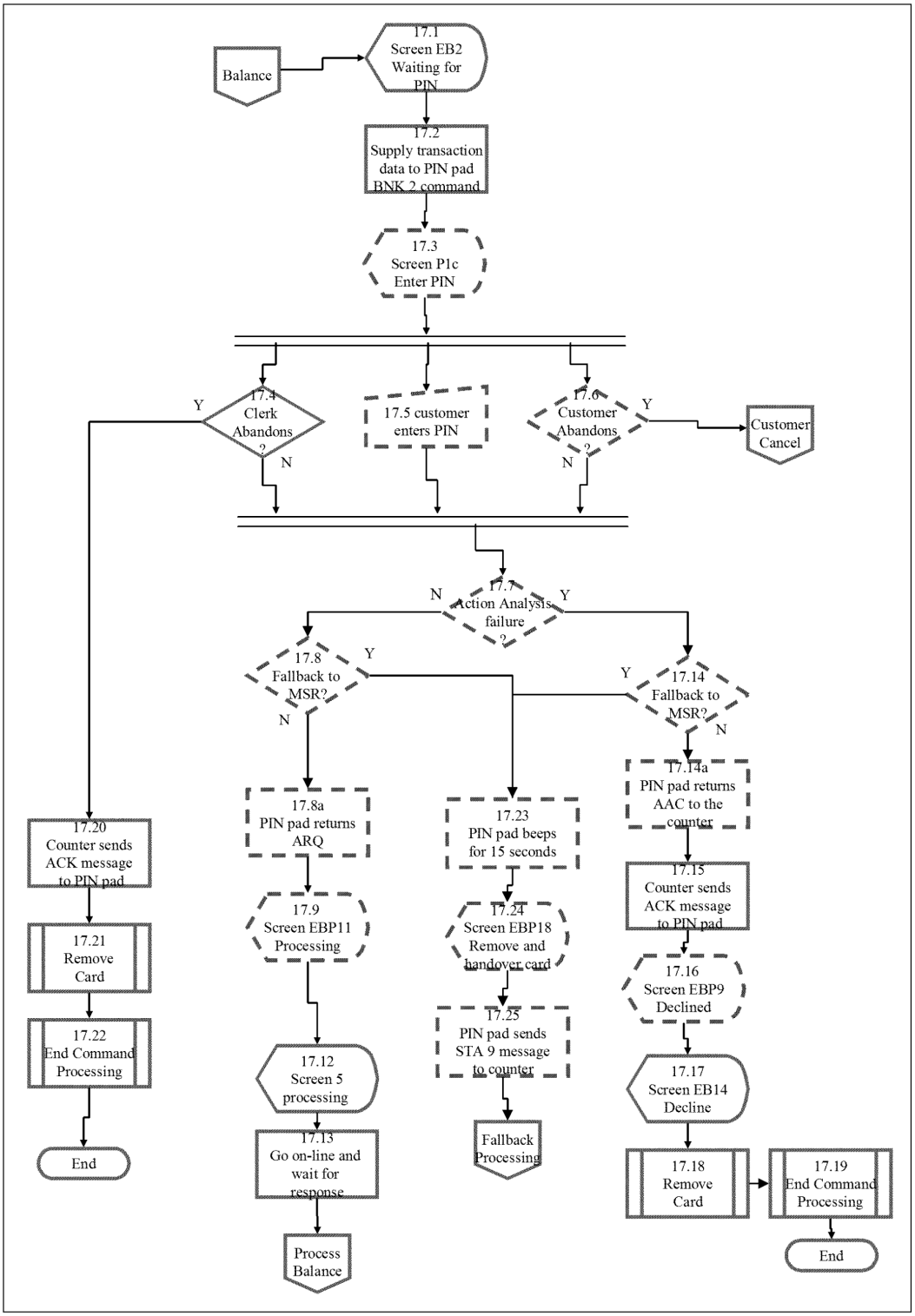

Figure 17: Activity Flows for EMV Banking – Balance Enquiry

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Notes for Figure 17

17.1 The counter displays screen EB2 *Waiting for PIN* (see 5.1.2).

17.2 The counter provides relevant data to the PIN pad: this is provided on a BNK 2 command containing the transaction type.

17.3 PIN pad displays screen P1c *Confirm and Enter PIN for Balance Enquiry*[23] (see 5.2.15).

17.4 If the clerk abandons the transaction by pressing the button on the EB2 screen, processing continues at 17.20.

17.5 The customer enters their PIN and pushes the ENT key. Processing continues from 17.7.

17.6 If the customer decides to cancel processing continues from Figure 22 – *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).

17.7 If action analysis detects an error then processing continues at 17.14.

17.8 If fallback to MSR is required processing continues from 17.23. (This is a rare event but has to be catered for).

17.8a When the PIN is successfully entered and if action analysis does not detect an error then the PIN pad returns an ARQ command to the counter: this command includes the encrypted PIN block.

17.9 The PIN pad displays screen EBP11 *Processing: Please wait*[24] (see 5.2.11).

17.10 Step removed[25].

17.11 Step removed.

17.12 The counter displays screen 5 (EMV) - *Waiting for Authorisation* (see 5.1.22).

17.13 The system goes online to the financial institution for authorisation and waits for a response.

Processing continues from Figure 18 - *Process Balance*.

17.14 If fallback to MSR is required processing continues from 17.23. (This is a rare event but has to be catered for).

17.14a The PIN pad sends an AAC command to the counter.

17.15 The counter sends an ACK message to the PIN pad.

17.16 The PIN pad displays screen EBP9 *Declined: Remove Card* (see 5.2.9).

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[23] If the card does not support PIN verification and the Terminal Action Codes have not been set to decline such transactions then the transaction skips to 17.7 without displaying PIN pad screen P1c.

[24] Currently the system displays 2 screens instead of one: the first contains “Processing” the second contains “Please Wait” – PC0108611.

[25] Steps 17.10 and 17.11 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.

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17.17 The counter displays the EB14 screen (see 5.1.14) showing a transaction declined message.

17.18 The process Figure 5a: *Remove Card* process is performed.

17.19 The process Figure 5c: *End Command Processing* is performed.

Counter returns to the **Serve Customer Menu**.

17.20 The counter sends an ACK message to the PIN pad.

17.21 The process Figure 5a: *Remove Card* process is performed.

17.22 The process Figure 5c: *End Command Processing* is performed.

Counter returns to the **Serve Customer Menu**.

17.23 The PIN pad beeps for 15 seconds until the card is removed or until the clerk touches OK on the EB12 screen (see 5.1.12) in step 7.1.

17.24 PIN pad displays screen EBP18 *Remove and handover card* (see 5.2.27).

17.25 The PIN pad sends an STA 9 command to the counter indicating an MSR fallback scenario.

Processing continues from Fallback Processing in Figure 7.

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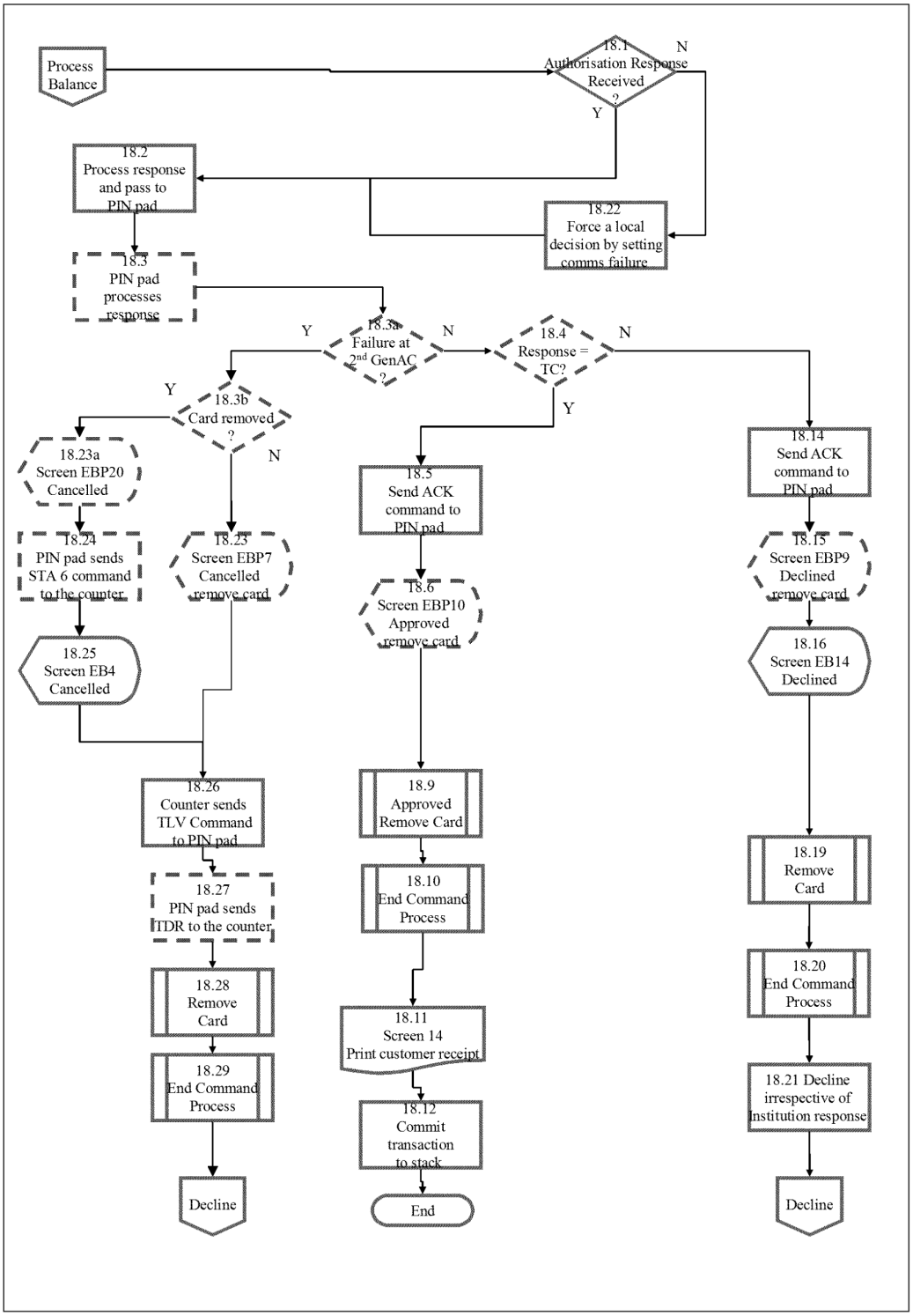

Figure 18: Activity Flows for EMV Banking – Balance Enquiry (continued)

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Notes for Figure 18

18.1 If an authorisation response is not received from the financial institution then processing continues from 18.22.

18.2 The counter processes the response and passes the result to the PIN pad: this is within a BNK 3 command.

18.3 The PIN pad then processes the response and passes either a TC or an AAC command back to the counter.

18.3a If the EMV transaction has failed at second GenAC processing continues from 18.3b: this may be for one of the following reasons:

- the customer has cancelled the transaction possibly by removing the card too early
- the PIN pad has some other reason for rejecting the transaction

Otherwise, processing continues from 18.4.

18.3b If the card has been removed from the PIN pad processing continues from 18.23a. Otherwise, processing continues from 18.23.

18.4 If the response is TC the transaction is fully approved and processing continues from 18.5. Otherwise, the transaction has been declined and processing continues at 18.14.

There is no fee for balance enquiries.

18.5 The counter sends an ACK command to the PIN Pad acknowledging the TC command.

18.6 The PIN pad displays screen EBP10 *Approved: Remove Card* (see 5.2.10).

18.7 Step removed.[26]

18.8 Step removed.

18.9 The process Figure 5b: *Approved: Remove Card* is performed.

18.10 The process Figure 5c: *End Command Processing* is performed.

18.11 The counter displays screen 14 *Printing receipt* (see 7.1.11) whilst the customer's receipt is printed.

18.12 The transaction is committed to the stack and the counter returns to the **Serve Customer Menu**.

18.14 The counter sends an ACK command to the PIN Pad acknowledging the AAC command.

18.15 The PIN pad screen EBP9 *Declined remove card* (see 5.2.9) is displayed on the PIN pad.

18.16 The counter displays screen EB14 *Decline* (see 5.1.14).

[26] Steps 18.7, 18.8, 18.17, and 18.18 connected with TLV and TDR messages have been removed as the result of performance improvements to the main paths. However steps 18.26 and 18.27 remain.

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18.17 Step removed[27].

18.18 Step removed

18.19 The process Figure 5a: Remove Card process is performed.

18.20 The process Figure 5c: End Command Processing is performed.

18.21 Otherwise, the transaction is declined irrespective of the response received from the Financial Institution and processing continues from Figure 23 – *Decline.*

18.22 When no response is received from the financial institution the counter generates an Authorisation message with a Response Code indicating that a failure has occurred: (possibly a timeout). Processing continues from 18.2.

18.23 The PIN pad displays screen EBP7 *Cancelled Please Remove Card* (see 5.2.7). Processing continues from 18.26.

18.23a The PIN pad displays screen EBP20 *Cancelled* (see 5.2.29).

18.24 The PIN Pad sends an STA 6 command to the counter indicating a card removal during the authorisation process.

18.25 The counter displays screen EB4 *Transaction Cancelled by Customer* (see 5.1.4).

18.26 The counter solicits EMV tag data from the PIN pad using the TLV command.

18.27 The PIN Pad returns the requested data to the counter using the TDR command.

18.28 The process Figure 5a: *Remove Card* is performed.

18.29 The process Figure 5c: *End Command Processing* is performed.

As a [C0] is possibly required processing continues from Figure 23: *Decline.*

[27] Steps 18.7, 18.8, 18.17, and 18.18 connected with TLV and TDR messages have been removed as the result of performance improvements to the main paths. However steps 18.26 and 18.27 remain.

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2.3.5 Change PIN

This section covers the main activities for Change PIN

Pre conditions

- The EMV card details have been validated

Post conditions

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

Description

The customer enters the old PIN is prompted to enter the new PIN, and to confirm it. In the normal flow, the transaction goes online for an authorisation. The authorisation is passed to the PIN pad which may return a TC (to proceed with the transaction) or an AAC (a decline irrespective of institution verdict).

On completion of a successful transaction the card issuer will return a script which will update the PIN on the chip so that the off-line Retail PIN will be aligned with the on-line banking PIN.

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

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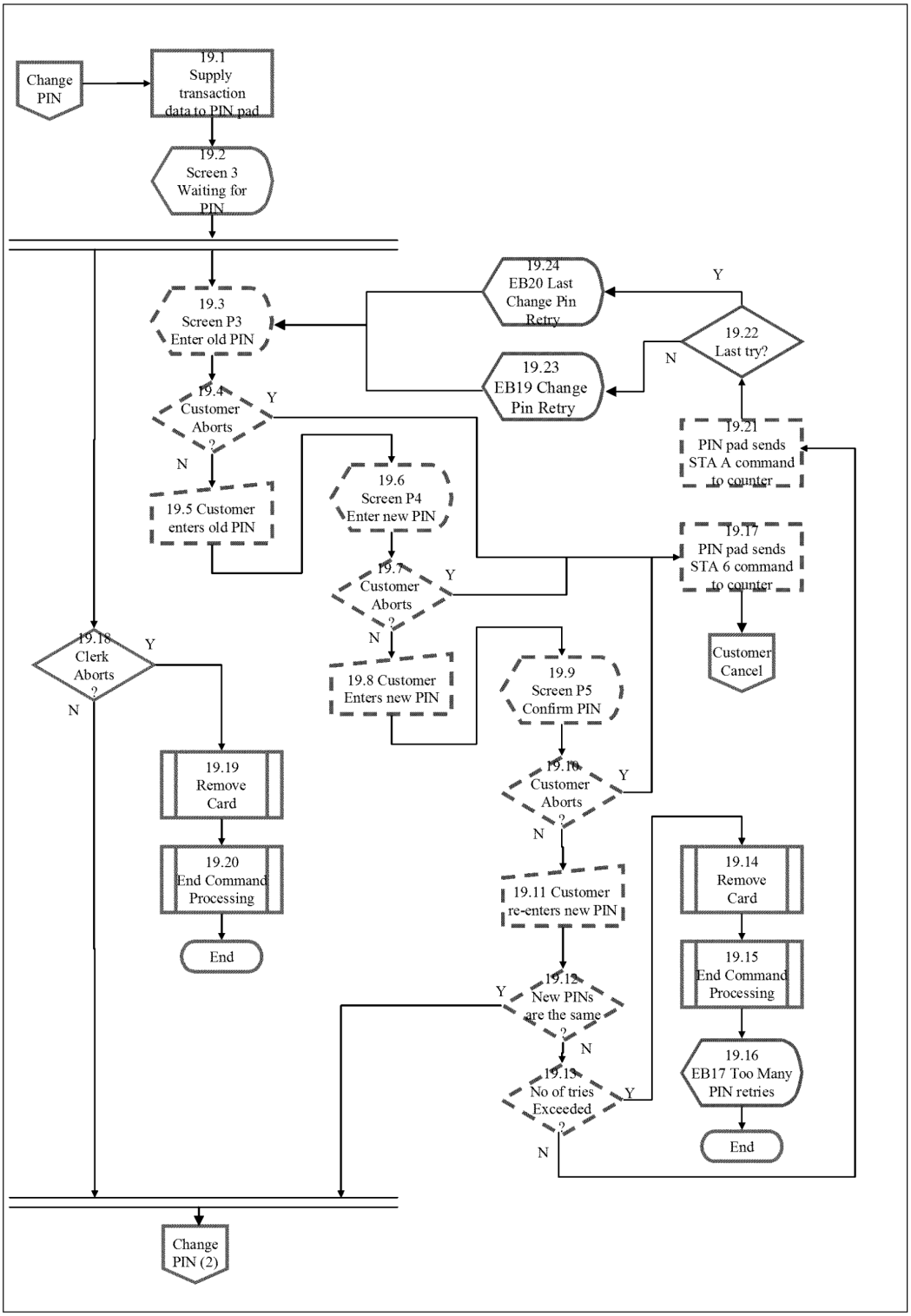

Figure 19: Activity Flows for EMV Banking - Change PIN

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Notes for Figure 19

19.1 The counter provides relevant data to the PIN pad: this is provided in a BNK 2 command containing the transaction type.

19.2 Counter displays screen 3 *Change PIN: Waiting for PIN* (see 7.1.3).

19.3 PIN pad displays screen P3 *Enter Old PIN* (see 5.2.16).

19.4 If the customer chooses to cancel processing continues from 19.17.
(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 old PIN within the Change PIN Old PIN Entry timeout period).

19.5 The customer enters their existing PIN and pushes the ENT key.

19.6 When the existing PIN has been entered the PIN pad displays screen P4 *Enter new PIN* (see 5.2.17).

19.7 If customer chooses to cancel by pressing the cancel button on the PIN Pad or by removing their card then processing continues from 19.17.

19.8 The customer enters a new PIN and pushes the ENT key.

19.9 When the new PIN has been entered the PIN pad displays screen P5 *Confirm new PIN* (see 5.2.18).

19.10 If customer chooses to cancel, then processing continues from 19.17.
(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 new PIN(s) within the Change PIN New PIN Entry timeout period).

19.11 The customer re-enters their new PIN and pushes the ENT key.

19.12 If the customer has successfully entered the 2nd copy of the new PIN and the value is the same as the 1st copy of the new PIN, then processing continues from Figure 20: *Change PIN (2)*.

19.13 The PIN pad checks how many times an attempt has been made to change the PIN during this transaction. If the number of PIN tries has exceeded a reference data limit then processing continues from 19.14

Otherwise, processing continues at step 19.21.

19.14 The process Remove Card, Figure 5a, is performed.

19.15 The process End Command Processing, Figure 5c, is performed.

19.16 The counter displays screen EB17 *Too Many PIN Retries* (see 5.1.17). When the clerk presses the continue button on EB17 then the counter returns to the **Serve Customer Menu**.

19.17 The PIN pad sends an STA 6 command to the counter signifying that the customer has aborted the operation. Processing continues from Figure 22: *Customer Cancel*.

19.18 Screen 3 (see 7.1.3) allows the clerk to abandon the transaction. If the clerk cancels by pushing the cancel button then processing continues at 19.19.

19.19 The process Remove Card, Figure 5a, is performed.

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19.20 The process End Command Processing, Figure 5c, is performed.

The transaction ends and the counter returns to the **Serve Customer Menu**.

19.21 The PIN pad sends an STA A command to the Counter signifying that the Change PIN transaction is being repeated.

19.22 The counter checks whether this is the last Change PIN attempt, if not then processing continues at step 19.23, otherwise, processing continues at step 19.24.

19.23 Counter displays screen EB19 *Change PIN Retry* (see 5.1.19). Processing continues from 19.3.

19.24 Counter displays screen EB20 *Change PIN Last Try* (see 5.1.20). Processing continues from 19.3.

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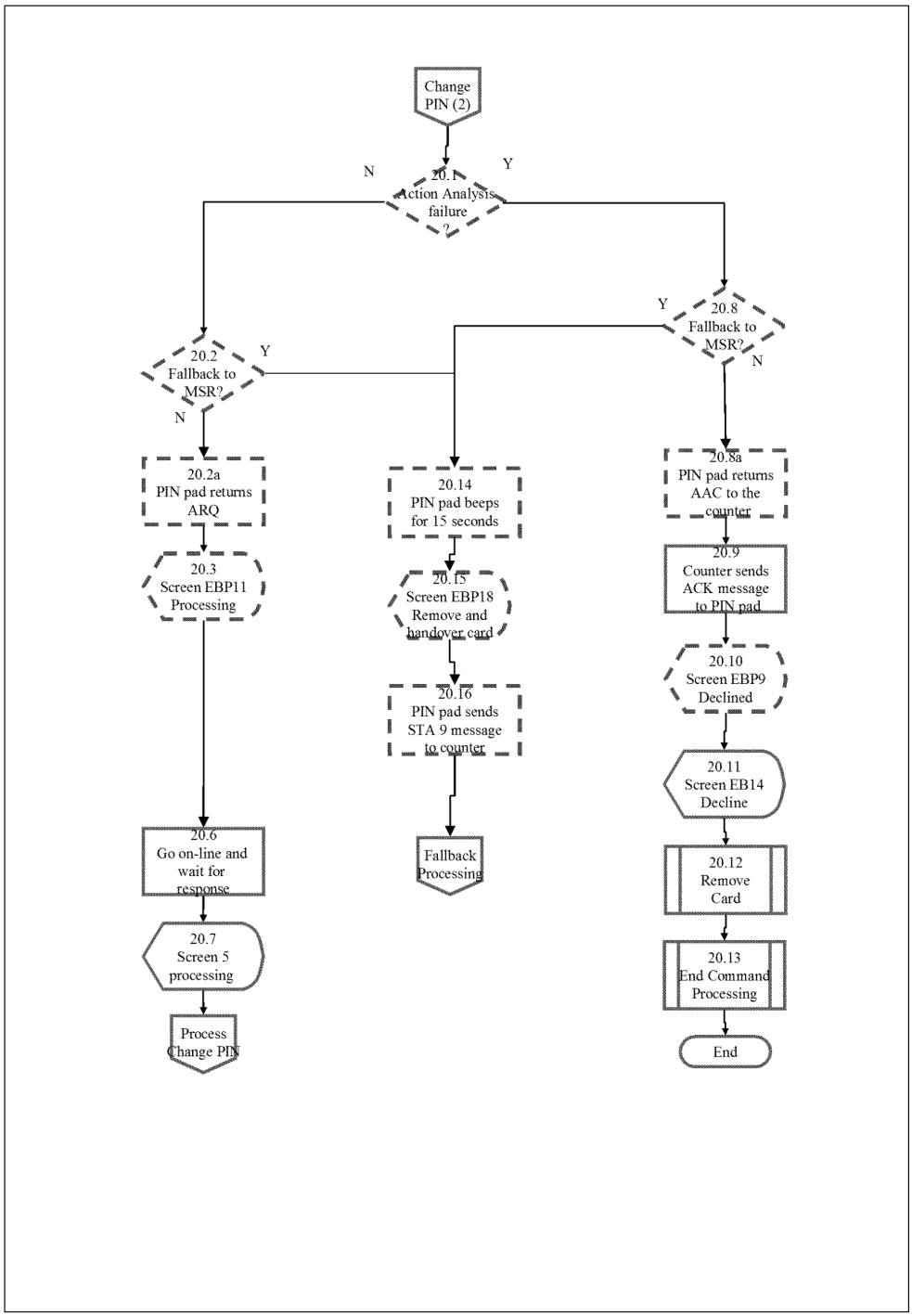

Figure 20: Activity Flows for EMV Banking - Change PIN (continued)

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Notes for Figure 20

20.1 If the action analysis phase of the PIN pad operation reveals a failure then processing continues at 20.8.

20.2 If fallback to MSR is required processing continues from 20.14. (This is a rare event but has to be catered for).

20.2a When the PIN is successfully entered and action analysis does not reveal a failure then the PIN pad returns an ARQ message to the counter: this message includes the old and new PIN blocks.

20.3 PIN pad displays screen EBP11 *Processing: Please wait*[28] (see 5.2.11).

20.4 Step removed[29].

20.5 Step removed.

20.6 The counter displays screen 5 (EMV) - *Waiting for Authorisation* (see 5.1.22).

20.7 The system goes online to the financial institution for authorisation and waits for a response.

Processing continues from Figure 21: *Process Change PIN*.

20.8 If fallback to MSR is required processing continues from 20.14. (This is a rare event but has to be catered for).

20.8a The PIN pad sends an AAC command to the counter.

20.9 The counter sends an ACK message to the PIN pad.

20.10 The PIN Pad displays screen EBP9 *Declined: Remove Card* (see 5.2.9).

20.11 The counter displays the EB14 screen (see 5.1.14) showing a transaction declined message.

20.12 The Remove Card process is performed – Figure 5a.

20.13 The End Command Processing process Figure 5c is performed.

The Counter returns to the **Serve Customer Menu**.

20.14 The PIN pad beeps for 15 seconds until the card is removed or until the clerk touches OK on the EB12 screen (see 5.1.12) in step 7.1.

20.15 PIN pad displays screen EBP18 *Remove and handover card* (see 5.2.27).

20.16 The PIN pad sends an STA 9 command to the counter indicating an MSR fallback scenario.

Processing continues from Fallback Processing in Figure 7.

[28] Currently the system displays 2 screens instead of one: the first contains "Processing" the second contains "Please Wait" – PC0108611.

[29] Steps 20.4 and 20.5 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.

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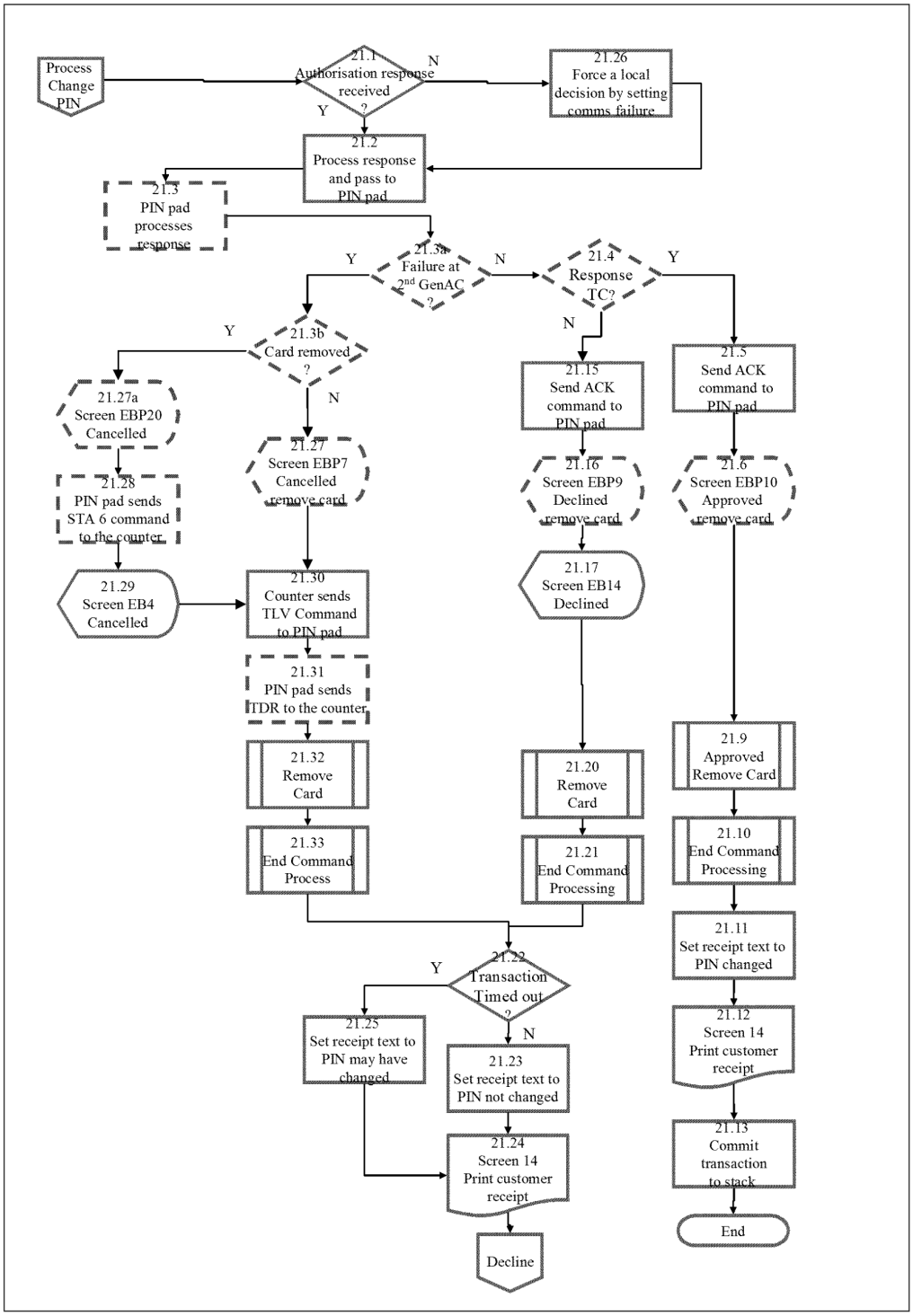

Figure 21: Activity Flows for EMV Banking – Process Change PIN

FUJ00001932

Notes for Figure 21

21.1 If an authorisation response is not received from the FI within a 30 second timeout period then the transaction will be declined irrespective of the action taken by the financial institution. A reversal will then role back the transaction.

(The PIN pad will decline the transaction if the customer pushes the cancel button or the card is removed too early).

21.2 The counter processes the authorisation response and passes the result to the PIN pad.

There is no fee for changing PIN.

21.3 The PIN pad then processes the authorisation response. If authorised the PIN pad may generate a TC response and return this back to the counter. However if a problem is discovered in the action analysis phase then the PIN pad may generate an AAC decline and send this back to the counter.

21.3a If the EMV transaction has failed at second GenAC processing continues from 21.3b: this may be for one of the following reasons:

- the customer has cancelled the transaction possibly by removing the card too early
- the PIN pad has some other reason for rejecting the transaction

Otherwise, processing continues from 21.4.

21.3b If the card has been removed from the PIN pad processing continues from 21.27a. Otherwise, processing continues from 21.27.

21.4 If the response is TC the transaction is fully approved and processing continues from 21.5. Otherwise, the transaction has been declined and processing continues at 21.15.

21.5 The counter sends an ACK back to the PIN pad acknowledging the TC.

21.6 The PIN pad displays screen EBP10 *Approved: Remove Card* (see 5.2.10).

21.7 Step removed[30].

21.8 Step removed.

21.9 The Approved Remove Card process, Figure 5b, is performed.

21.10 The End Command Processing process, Figure 5c, is performed.

21.11 The counter sets up the receipt text to show that the PIN has successfully changed (message RT51).

21.12 The counter displays screen 14 *Printing receipt* (see 7.1.11) whilst the customer's receipt is printed.

21.13 The transaction is committed to the stack. The transaction ends and the counter returns to the **Serve Customer Menu**.

21.15 The counter sends an ACK back to the PIN pad acknowledging the AAC.

[30] Steps 21.7, 21.8, 21.18, and 21.19 connected with TLV and TDR messages have been removed as the result of performance improvements to the main paths. However steps 21.30 and 21.31 remain.

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21.16 The PIN pad displays screen EBP9 *Declined: Remove Card* (see 5.2.9).

21.17 The counter displays screen EB14 *Decline* (see 5.1.14).

21.18 Step removed[31].

21.19 Step removed.

21.20 The Remove Card process, Figure 5a, is performed.

21.21 The End Command Processing process, Figure 5c, is performed.

21.22 If the [A3] was not received in a timely fashion then no response has been received from the Financial Institution and thus the result of the PIN change operation may be in doubt so processing continues at 21.25.

21.23 The counter sets up the receipt text to show that the PIN was not successfully changed (message RT52).

21.24 The counter displays screen 14 *Printing receipt* (see 7.1.11) whilst the customer's receipt is printed. Processing continues from Figure 23: *Decline*.

21.25 The counter sets up the receipt text to show that the PIN may have changed (message RT53). Processing continues from 21.24.

21.26 If an authorisation response is not received from the FI with in a 30 second timeout period then the transaction will be declined irrespective of the action taken by Financial Institution: the counter generates an Authorisation message with a Response Code indicating that a failure has occurred. We have no way of knowing what that outcome was. We will produce a receipt which describes this situation. (The PIN pad will decline the transaction if the customer pushes the cancel button or the card is removed too early).

Processing continues from 21.2.

21.27 The PIN pad displays screen EBP7 *Cancelled Please Remove Card* (see 5.2.7). Processing continues from 21.30.

21.27a The PIN pad displays screen EBP20 *Cancelled* (see 5.2.29).

21.28 The PIN Pad sends an STA 6 command to the counter indicating a card removal during the authorisation process.

21.29 The counter displays screen EB4 *Transaction Cancelled by Customer* (see 5.1.4).

21.30 The counter solicits EMV tag data from the PIN pad using the TLV command.

21.31 The PIN Pad returns the requested data to the counter using the TDR command.

21.32 The process Figure 5a: *Remove Card* is performed.

21.33 The process Figure 5c: *End Command Processing* is performed.

As a [C0] is possibly required and as the correct receipt text is required to inform the customer of the outcome then processing continues at 21.22.

[31] Steps 21.7, 21.8, 21.18, and 21.19 connected with TLV and TDR messages have been removed as the result of performance improvements to the main paths. However steps 21.30 and 21.31 remain.

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2.3.6 Cancel of a transaction

This is marked as transaction flow “Decline”.

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

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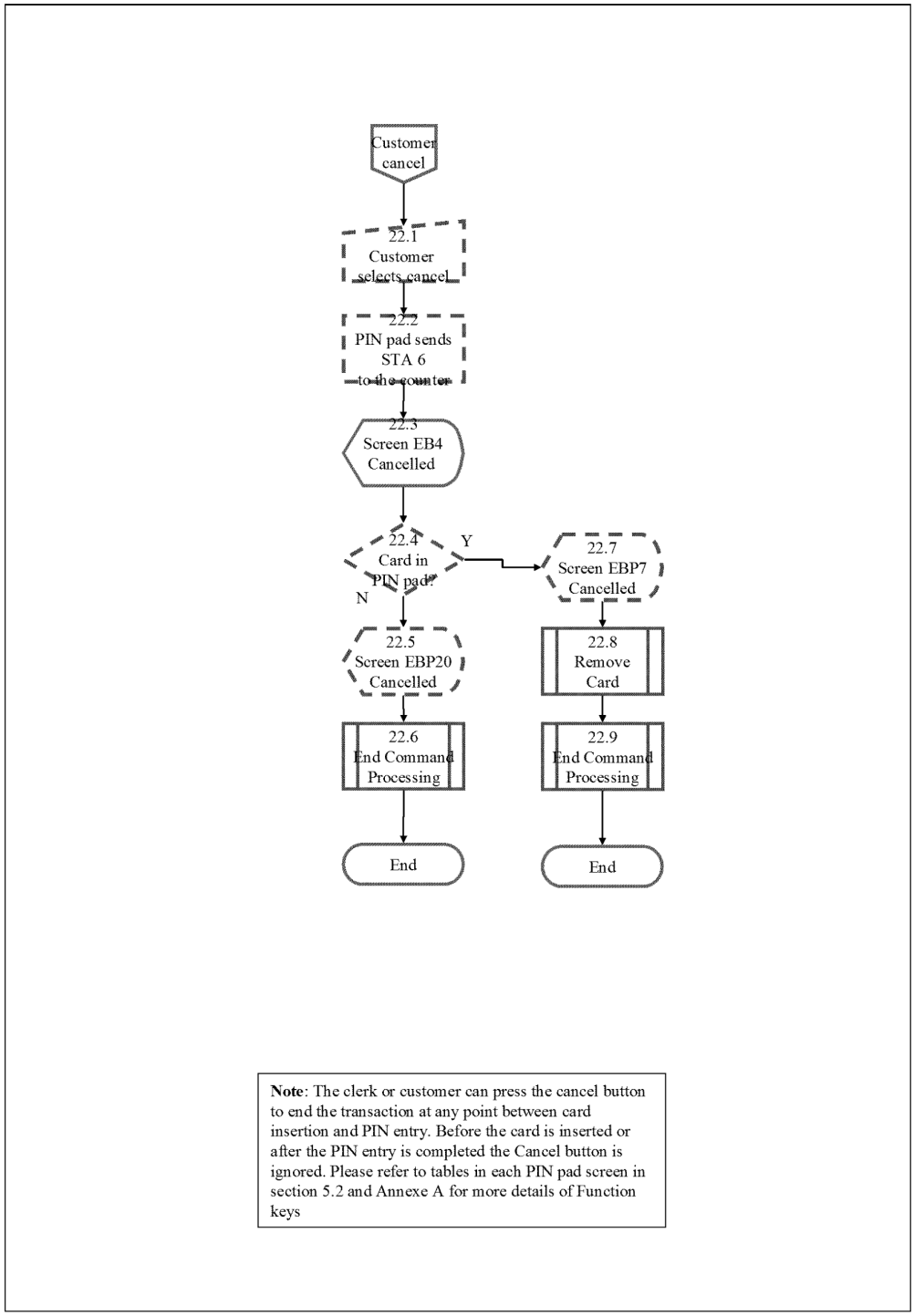

Figure 22: Cancel Flows for EMV Banking

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Notes for Figure 22

22.1 The customer has either selected the cancel button or removed their card from the PIN pad.

22.2 The PIN pad sends an STA 6 to the counter. This indicates that the customer has cancelled the transaction.

22.3 The screen EB4 (see 5.1.4) is displayed to inform the clerk that a cancel has occurred and the transaction is being aborted.

22.4 If the card is still in the PIN pad then an attempt to have it removed will follow and processing continues at 22.7.

22.5 The PIN pad displays the screen EBP20 *Cancelled* (see 5.2.29).

22.6 The process Figure 22: *End Command Processing* is performed. The counter returns to the **Serve Customer Menu**.

22.7 The PIN pad displays the screen EBP7 *Cancelled Please Remove Card* (see 5.2.7).

22.8 The process Figure 5a: *Remove Card* is performed.

22.9 The process Figure 5c: *End Command Processing* is performed.

The counter returns to the **Serve Customer Menu**.

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2.4 Decline/Failure responses

2.4.1 Decline of a transaction

This is marked as transaction flow “Decline”.

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

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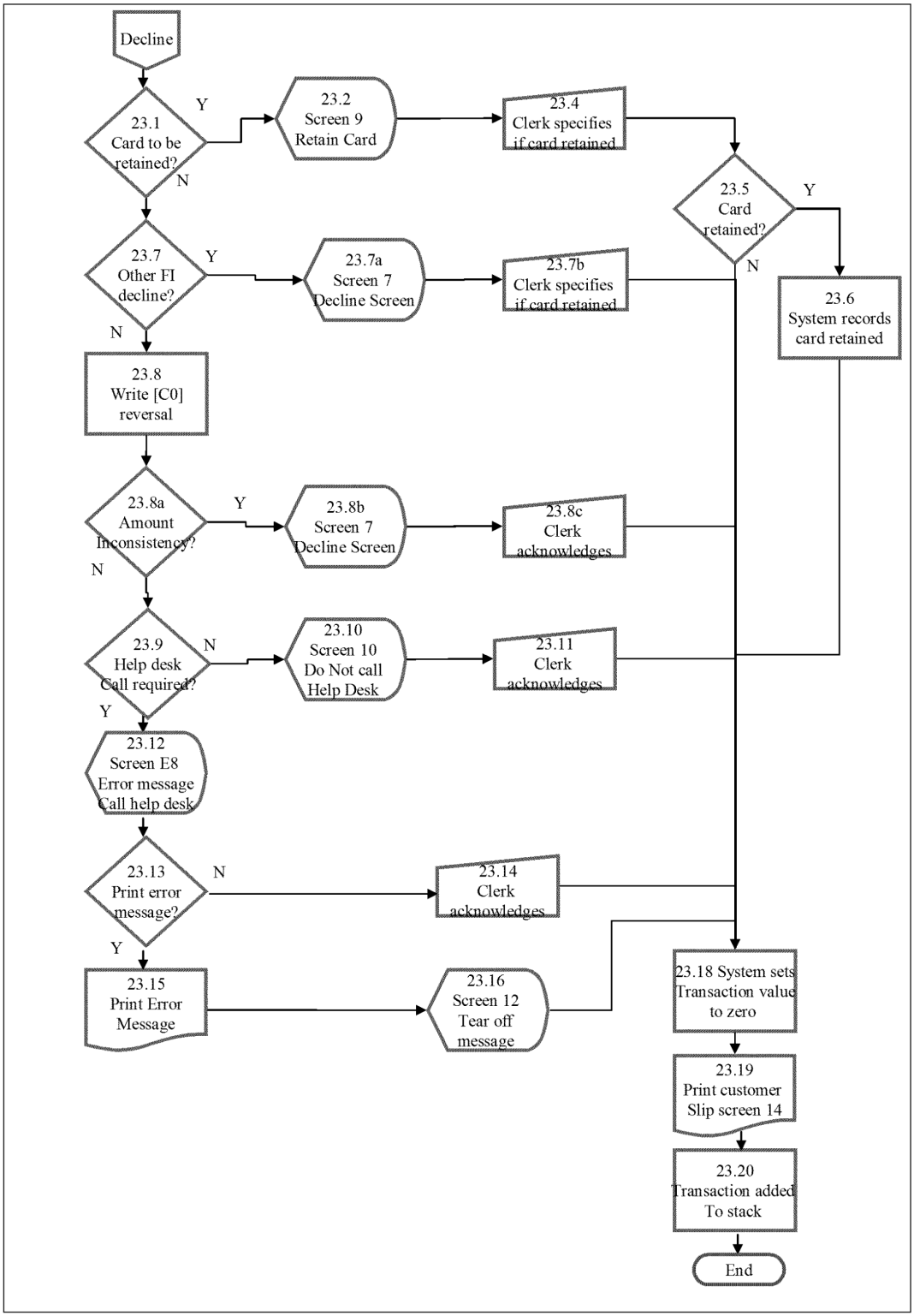

Figure 23: Decline Flows for EMV Banking

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Notes for Figure 23

23.1 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 23.7.

23.2 If the card is the be retained counter displays screen 9 *Retain Card* (see 7.1.8).

23.3 Removed: (PIN pad message to give card to assistant for retention)

23.4 Clerk specifies whether card is retained or not

23.5 If card is retained processing continues from 23.6

Otherwise, processing continues from 23.18.

23.6 The system records that card is retained processing continues from 23.18

23.7 The system checks whether there has been a decline from the Financial Institution and if there has, processing continues from 23.7a. Otherwise, processing continues from 23.8.

23.7a The counter displays screen 7 (see 7.1.6) with the appropriate error (see section 6.2.2)

23.7b The clerk acknowledges the message and processing continues from 23.18.

23.8 Counter records a [C0] to message store as a reversal

23.8a The system checks for amount anomalies between the request message and the authorisation message:

- in the case of Withdraw or Deposit transactions the amounts must be the same: (effectively the system checks the Auth response set by steps 12.26 / 16.28, as appropriate)
- in the case of a Withdraw Limit transaction the authorised amount must not be greater than the maximum value permitted in reference data: (effectively the system checks the Auth response set by step 14.26).

If they are no anomalies processing continues from 23.9. Otherwise, processing continues from 23.8b to display that the amounts are different on screen 7.

23.8b The counter displays screen 7 (see 7.1.6) with the appropriate error (Response code 52 / 53 - see section 6.2.2).

23.8c The clerk acknowledges the message and processing continues from 23.18.

23.9 If a Help desk call is required then processing continues from 23.12.

23.10 Otherwise, counter displays screen 10 (see 7.1.9) telling the clerk NOT to call the Help desk: see section 6.2.3 for possible messages that can appear on screen 10.

23.11 Clerk acknowledges the message and processing continues from 23.18.

23.12 Counter displays screen E8 (see 7.2.3) telling the clerk to call the Help desk.

23.13 If the clerk chooses to print out the error message processing continues from 23.15.

23.14 Otherwise, clerks touches the continue option and processing continues from 23.18.

23.15 Counter prints error message from screen E8.

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23.16 Counter displays screen 12 *Tear off Error Message Instruction* (see 7.1.10).

The clerk acknowledges and processing continues from 23.18.

23.18 The system sets the transaction value to zero.

23.19 The system prints the customer slip.

23.20 The transaction is added to the stack.

End of transaction – return to **Serve Customer Menu**.

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3 Receipts

There will be no Outlet receipts produced, only a Customer receipt.

The proposed changes shown below are subject to confirmation by PO Ltd and, through them, the appropriate financial institutions/issuers.

The following are described:

- *3.1 EMV Banking Receipts: Generic Layout*
- *3.2 Balance Enquiry – Customer Copy*
- *3.3 Cash/Cheque Deposit or Cash Withdrawal Receipt – Customer Copy*
- *3.4 Change PIN Request.*

When the layouts shown below are agreed they will be incorporated into SD/DES/005 *Horizon OPS Reports and Receipts* which will become the master definition.

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3.1 EMV Banking Receipts: Generic Layout

3.1.1 Generic EMV Banking Customer Copy Receipt Layout

The following layout and generic header and footer is used for all EMV Banking customer copy receipts printed on the counter printer.

English text

```
                    1         2         3         4
          12345678901234567890123456789012345678901234
```

Header	01	
	02	Post Office Ltd.
	03	Your Receipt
	04	
	05	*dd/mm/yyyy hh:mm:ss* CAP:*ca* BP:*bp* SU:*sun*
	06	ooooooooooooooooooooooooooooFAD: 123456X
	07	*address 1*
	08	*address 2*
	09	*address 3*
	10	*address 4*
	11	*address 5*
	12	*postcode*
	13	*message*
	14	*title*
Body	15	*receipt-specific details*
	16+n	
Footer	17+n	
	18+n	
	19+n	Please retain for future reference
	20+n	
	21+n	This is not a VAT receipt
	22+n	

```
                    1         2         3         4
          12345678901234567890123456789012345678901234
```

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Welsh/English text

```
                    1         2         3         4
          12345678901234567890123456789012345678901234
```

Header	01	Swyddfa'r Post Cyf.
	02	Post Office Ltd.
	03	Eich Derbynneb
	04	Your Receipt
	05	
	06	*dd/mm/yyyy hh:mm:ss* CAP:*ca* BP:*bp* SU:*sun*
	07	ooooooooooooooooooooooooooooFAD: 123456X
	08	*address 1*
	09	*address 2*
	10	*address 3*
	11	*address 4*
	12	*address 5*
	13	*postcode*
	14	*message*
	15	*title*
Body	16	*receipt-specific details*
	17+*n*	
Footer	18+*n*	
	19+*n*	Cadwch i gyfeirio ati, os gwelwch yn dda
	20+*n*	Please retain for future reference
	21+*n*	Nid derbynneb TAW yw hon
	22+*n*	This is not a VAT receipt
	23+*n*	

```
                    1         2         3         4
          12345678901234567890123456789012345678901234
```

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Header and Footer

Field Name	English		Welsh/English		Length	Contents
	Line No.	Char Pos'ns	Line No.	Char Pos'ns		
Welsh Header	01	-			-	Blank.
			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'.
Date	05	01-19	06	01-19	19	Date and time: *dd/mm/yyyy hh:mm:ss*
CAP	05	26-27	06	26-27	2	Current CAP: *ca*
BP	05	33-34	06	33-34	2	Current Balance Period: *bp*
SU	05	40-42	06	40-42	3	Stock unit: *sun*
Office Name	06	01-30	07	01-30	30	Branch name, up to 30 characters: (*ooo…*)
FAD	06	36-42	07	36-42	7	Office (FAD) code: *fffffff*
Address 1,2,3,4,5	07-11	01-40	08-12	01-40	40	Branch address: a variable number of lines up to a maximum of five.
Postcode	12	01-08	13	01-08	8	Branch postcode: *pppp ppp*
Message	13	01-42			42	Blank or 'D U P L I C A T E'
			14	01-42	42	Blank or 'D Y B L Y G I A D / D U P L I C A T E'.
Title	14	01-42	15	01-42	42	Centred fixed text, receipt-specific.
Footer	18+*n*	-				Blank.
			19+*n*	02-39	38	'Cadwch i gyfeirio ati, os gwelwch yn dda'.
	19+*n*	05-38	20+*n*	05-38	34	'Please retain for future reference'.

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	20+ *n*	-				Blank.
			21+ *n*	09-32	24	'Nid derbynneb TAW yw hon'.
	21+ *n*	09-33	22+ *n*	09-33	25	'This is not a VAT receipt'.

The header and footer are common to all EMV Banking customer copy receipts, with the exception that the 'Please retain for future reference' footer line and its Welsh equivalent are omitted on the Change PIN Request.

Body

The body section is receipt-specific as shown in the following sections.

3.1.2 Receipt Outcome Messages

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

Transaction	Verification	Authorisation Status	Outcome	Message Ref.
All	PIN	Declined – Impound Card	Clerk confirms that the card has been retained	RT09
			Clerk confirms that the card has not been retained	RT10
All except Balance Enquiry and Change PIN	PIN	Authorised OK –Additional Fee	Matched. Fee accepted	RT07
			Fee refused	RT08
All except Cash/ Cheque Deposit and Change PIN	PIN	Declined – PIN blocked	FI declined	RT28
All except Change PIN	PIN	Declined – Transaction not supported	FI declined	RT17
		Declined – Other	FI declined	RT18
		Failed by NBE	System/network failure	RT20
		Failed by Agent	System/network failure	RT21
		Failed by/at Counter (timeouts)	System/network failure	RT22
		Failed by/at Counter (other)	System/network failure	RT27
Balance Enquiry, Cash Withdrawal, Withdraw Limit	PIN	Authorised OK – No Fee	Approved by FI	RT04
		Declined – Incorrect PIN	Invalid PIN entered	RT11

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		Declined – Usage Violation (frequency)	FI declined	RT15
Cash/Cheque Deposit	PIN	Authorised OK – No Fee	Approved	RT05
			Clerk declined	RT06
Cash/Cheque Deposit, Cash Withdrawal	PIN	Authorised OK	Declined – authorised amount differs from requested amount	RT25
Cash Withdrawal	PIN	Declined – Usage Violation (Amount)	FI declined	RT16
Cash Withdrawal (no balance)	PIN	Declined – Insufficient Funds	FI declined (no balance)	RT13
Cash Withdrawal (with balance), Withdraw Limit	PIN	Declined – Insufficient Funds	FI declined (balance will be printed)	RT14
Change PIN only	PIN	Authorised OK – PIN Change successful	Authorised by FI	RT51
		PIN Change declined by FI	Decline response from FI/NBE	RT52
		PIN Change declined by NBE	?	RT50
		Unknown PIN Change outcome	No response from FI/NBE	RT53
		Declined – PIN blocked	FI Declined	RT54
		Declined – Incorrect PIN	Decline response from FI/NBE	RT55
Withdraw Limit	PIN	Authorised OK	Declined – authorised amount greater than maximum	RT26
All	PIN	Authorised OK	Declined – The transaction has been declined by the customer's card.	RT56
All	PIN	Authorised OK	Declined – The customer cancelled the transaction.	RT06

Key:

FI = Financial Institution
NBE = Network Banking Engine

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Outcome Message Text

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

Mess. Ref.	Message Text - English	Message Text - Welsh/English
RT04, RT05	*** AUTHORISED ***	*** AWDURDODWYD/AUTHORISED ***
RT25, RT26	*** DECLINED ***	*** GWRTHODWYD/DECLINED ***
RT06	*** DECLINED *** Transaction cancelled.	*** GWRTHODWYD/DECLINED *** Diddymwyd y gweithrediad. Transaction cancelled.
RT07	*** AUTHORISED *** The Post Office has not charged you for this transaction. The card issuer has charged you £*Z9.99*.	*** AWDURDODWYD/AUTHORISED *** Dydy Swyddfa'r Post ddim wedi codi tâl arnoch am y gweithrediad hwn. Mae dyroddwr y cerdyn wedi codi £Z9.99 arnoch. The Post Office has not charged you for this transaction. The card issuer has charged you £*Z9.99*.
RT08	*** DECLINED *** You have not been charged for this transaction.	*** GWRTHODWYD/DECLINED *** Ni chafodd tâl ei godi arnoch am y gweithrediad hwn. You have not been charged for this transaction.
RT09	*** DECLINED *** The card has been retained. You may wish to contact the card issuer.	*** GWRTHODWYD/DECLINED *** 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.
RT10	*** DECLINED *** The card has been returned. You may wish to contact the card issuer.	*** GWRTHODWYD/DECLINED *** 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.
RT11	*** DECLINED *** Incorrect PIN supplied. You may retry.	*** GWRTHODWYD/DECLINED *** Rhoddwyd PIN anghywir. Gallwch ailgynnig. Incorrect PIN supplied. You may retry.
RT13	*** DECLINED *** Insufficient funds.	*** GWRTHODWYD/DECLINED *** Arian annigonol. Insufficient funds.
RT14	*** DECLINED *** Insufficient funds. Please check your balance.	*** GWRTHODWYD/DECLINED *** Arian annigonol. Ewch dros eich balans, os gwelwch yn dda. Insufficient funds. Please check your balance.
RT15	*** DECLINED *** Exceeded maximum number of allowable daily transactions. You may wish to contact the card issuer.	*** GWRTHODWYD/DECLINED *** Rydych wedi cwblhau'r holl weithrediadau a ganiateir mewn diwrnod. Efallai yr hoffech gysylltu â dyroddwr y cerdyn. Exceeded maximum number of allowable daily transactions. You may wish to contact the card issuer.

[32] ***The word wrap of the sentence containing £%Amount% depends on the amount value of the transaction.***

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RT16[32]	*** DECLINED *** Amount £%Amount% has exceeded daily card limit. You may wish to contact the card issuer.	*** GWRTHODWYD/DECLINED *** Mae'r swm yn ormod ar gyfer uchafswm dyddiol y cerdyn. Efallai yr hoffech gysylltu â dyroddwr y cerdyn. Amount £%Amount% has exceeded daily card limit. You may wish to contact the card issuer.
RT17, RT18	*** DECLINED *** You may wish to contact the card issuer.	*** GWRTHODWYD/DECLINED *** Efallai yr hoffech gysylltu â dyroddwr y cerdyn. You may wish to contact the card issuer.
RT19, RT20, RT21, RT22, RT27	*** DECLINED *** Unable to complete the transaction. Sorry for any inconvenience caused.	*** GWRTHODWYD/DECLINED *** Yn methu cwblhau'r gweithrediad. Ymddiheurwn am unrhyw drafferth. Unable to complete the transaction. Sorry for any inconvenience caused.
RT24	*** DECLINED *** The card has been returned.	*** GWRTHODWYD/DECLINED *** Cafodd y cerdyn ei ddychwelyd. The card has been returned.
RT28	*** DECLINED *** The PIN is now blocked. You may wish to contact the card issuer.	*** GWRTHODWYD/DECLINED *** Cafodd y PIN ei atal nawr. Efallai yr hoffech gysylltu â dyroddwr y cerdyn. The PIN is now blocked. You may wish to contact the card issuer.
RT50	*** DECLINED *** The PIN has not been changed. You may wish to contact the card issuer.	*** GWRTHODWYD/DECLINED *** Ni chafodd y PIN ei newid. Efallai yr hoffech gysylltu â dyroddwr y cerdyn. The PIN has not been changed. You may wish to contact the card issuer.
RT51	*** AUTHORISED *** Your PIN has been successfully changed.	*** AWDURDODWYD/AUTHORISED *** Cafodd eich PIN ei newid yn llwyddiannus. Your PIN has been successfully changed.
RT52	*** DECLINED *** The PIN has not been changed. You may wish to contact the card issuer.	*** GWRTHODWYD/DECLINED *** Ni chafodd y PIN ei newid. Efallai yr hoffech gysylltu â dyroddwr y cerdyn. The PIN has not been changed. You may wish to contact the card issuer.
RT53	*** DECLINED *** PIN change request not confirmed. It is not known if the PIN has been changed. You may wish to contact the card issuer.	*** GWRTHODWYD/DECLINED *** Ni chadarnhawyd y cais i newid y PIN. Ni wyddom a yw'r PIN wedi newid. Efallai yr hoffech gysylltu â dyroddwr y cerdyn. PIN change request not confirmed. It is not known if the PIN has been changed. You may wish to contact the card issuer.
RT54	*** DECLINED *** The PIN has not been changed. Current PIN is blocked. You may wish to contact the card issuer.	*** GWRTHODWYD/DECLINED *** Ni chafodd y PIN ei newid. Cafodd y PIN cyfredol ei atal. Efallai yr hoffech gysylltu â dyroddwr y cerdyn. The PIN has not been changed. Current PIN is blocked. You may wish to contact the card issuer.
RT55	*** DECLINED *** Incorrect PIN supplied. The PIN has not been changed. You may retry.	*** GWRTHODWYD/DECLINED *** Rhoddwyd PIN anghywir. Ni chafodd y PIN ei newid. Gallwch ailgynnig. Incorrect PIN supplied. The PIN has not been changed. You may retry.

[32] ***The word wrap of the sentence containing £%Amount% depends on the amount value of the transaction.***

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RT56	*** DECLINED *** The transaction has been declined by the customer's card.	*** GWRTHODWYD/DECLINED *** Gwrthodwyd y gweithrediad gan gerdyn y cwsmer. The transaction has been declined by the customer's card.

3.1.3 Balance Type Text

The text of the balance type printed on the receipt is as follows:

Bal. Type Code	Balance Type – English Text	Balance Type - Welsh Text
00	(Unknown)	
01	Account balance	Balans y cyfrif
02	Account available balance	Balans ar gael yn y cyfrif
03	Amount owing	Swm dyledus
04	Amount due	Swm dyledus
05	Account available credit	Credyd ar gael yn y cyfrif
16	Credit line	Llinell gredyd
20	Amount remaining this cycle	Swm sy'n weddill y cylch hwn
40	Amount cash	Swm arian parod
56	Hold amount	Cyfanswm cynnal
57	Pre-authorised amount	Swm rhagawdurdodedig
58	Authorised amount	Swm awdurdodedig
90-99	(Reserved for future use)	

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3.2 Balance Enquiry – Customer Copy

3.2.1 Purpose

This is the customer record of the session.

3.2.2 Frequency

Per EMV Banking transaction within a customer session.

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

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3.2.3 Layout and Example Content

English text

```
          1         2         3         4
123456789012345678901234567890123456789012

              Post Office Ltd.
                Your Receipt

17/01/2002 11:47:22  CAP:01  BP:01  SU:SH1
Feltham Post Office            FAD: 123456X

GRO




            Your Balance Details
Visa
Card Number: **** **** **** pppp Issue:nnn
Auth Code: nnnnnn
Application ID: aaaaaaaaaaaaaaaa
From: MM/YY  Expiry: MM/YY  PAN Seq No: mm
Transaction ID: nnnnnnnnnnnnnnnnnnnnnnnnnn

uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
bbbbbbbbbbbbbbbbbbbbbbbbbbb£9999999999.99DR
bbbbbbbbbbbbbbbbbbbbbbbbbbb£9999999999.99DR
bbbbbbbbbbbbbbbbbbbbbbbbbbb£9999999999.99DR
bbbbbbbbbbbbbbbbbbbbbbbbbbb£9999999999.99DR

ffffffffffffffffffffffffffffffffffffffff
ffffffffffffffffffffffffffffffffffffffff



    Please retain for future reference

        This is not a VAT receipt

          1         2         3         4
123456789012345678901234567890123456789012
```

FUJ00001932

Welsh/English text

```
          1         2         3         4
01234567890123456789012345678901234567890123
01              Swyddfa'r Post Cyf.
02               Post Office Ltd.
03                Eich Derbynneb
04                 Your Receipt
05
06  17/01/2002 11:47:22  CAP:01  BP:01  SU:SH1
07  Feltham Post Office            FAD: 123456X
08
09
10
11
12
13
14
15  Manylion Eich Balans/Your Balance Details
16  Visa
17  Rhif Cerdyn:                  Cyhoeddiad:
18  Card Number: **** **** **** pppp Issue:nnn
19  Cod Awdurdodi:
20  Auth Code: nnnnnn
21  ID Cais:
22  Application ID: aaaaaaaaaaaaaaa
23  O:           Diweddu:      Rhif Cyf PAN:
24  From: MM/YY  Expiry: MM/YY  PAN Seq No: mm
25  ID y Gweithrediad:
26  Transaction ID: nnnnnnnnnnnnnnnnnnnnnnnnn
27
28  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
29  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
30  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
31  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
32  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
33  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
34  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
35  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
36  wwwwwwwwwwwwwwwwwwwwwwwwww
37  bbbbbbbbbbbbbbbbbbbbbbbbbb£9999999999.99DR
38  wwwwwwwwwwwwwwwwwwwwwwwwww
39  bbbbbbbbbbbbbbbbbbbbbbbbbb£9999999999.99DR
40  wwwwwwwwwwwwwwwwwwwwwwwwww
41  bbbbbbbbbbbbbbbbbbbbbbbbbb£9999999999.99DR
42  wwwwwwwwwwwwwwwwwwwwwwwwww
43  bbbbbbbbbbbbbbbbbbbbbbbbbb£9999999999.99DR
44
45  ffffffffffffffffffffffffffffffffffffffff
46  ffffffffffffffffffffffffffffffffffffffff
47
48   Cadwch i gyfeirio ati, os gwelwch yn dda
49      Please retain for future reference
50           Nid derbynneb TAW yw hon
51           This is not a VAT receipt
52
          1         2         3         4
01234567890123456789012345678901234567890123
```

FUJ00001932

Field Name	English		Welsh/English		Length	Contents
	Line No.	Char Pos'ns	Line No.	Char Pos'ns		
Title	14	12-31		21-31	20	'Your Balance Details'.
			15	01-41	41	"Manylion Eich Balans'/Your Balance Details'.
Issuer Scheme name	15	01-30	16	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	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
Authorisation code	17	12-17	20	12-17	6	Authorisation code from Financial Institution
Application ID	18	17-32	22	17-32	16	Application Identifier is obtained from the PIN pad when setting up the [C1] ICC data
From Date	19	7-11	24	7-11	5	Obtained from Application data from the card as read by PIN pad: or from track 2 data if magnetic stripe card used
Expiry Date	19	22-26	24	22-26	5	Obtained from Application data from the card as read by PIN pad: or from track 2 data if magnetic stripe card used

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PAN Sequence Number	19	41-42	24	41-42	2	Obtained from Application data from the card as read by PIN pad: or from track 2 data if magnetic stripe card used
Transaction ID	20	17-42	26	17-42	26	Unique system-generated transaction identifier (*nnn*…).
Outcome message	22-29	01-42	28-35	01-42	42	Transaction outcome message (*uuu*… up to 8 lines), suppressed if blank. Note that this is the maximum number of lines available for the message, whether it consists of English or Welsh/English text.
Balance Information			36, 38, 40, 42	01-26	26	Welsh translation of the following line's *bbb* (*www*..., up to 4 lines) if provided, or suppressed. e.g. 'Balans ar gael yn y cyfrif'.
	30-33	01-42	37, 39, 41, 43	01-42	42	Balance Information (up to 4 lines) if provided, or suppressed. Formed from Balance Type (*bbb*…), e.g. 'Account available balance', which is left aligned, and the amount in the format £*9999999999.99* which is right aligned. Overdrawn amounts are suffixed by 'DR'. Repeated for each balance provided.
Free text footer	35, 36	01-40	45, 46	01-40	40	Free text (*fff*…, up to 2 lines) if provided, or suppressed.

FUJ00001932

3.3 Cash/Cheque Deposit or Cash Withdrawal Receipt – Customer Copy

3.3.1 Purpose

This is the customer record of the session.

3.3.2 Frequency

Per EMV Banking transaction within a customer session.

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

FUJ00001932

3.3.3 Layout and Example Content

English text

```
          1         2         3         4
123456789012345678901234567890123456789012

             Post Office Ltd.
               Your Receipt

17/01/2002 11:47:22  CAP:01  BP:01  SU:SH1
Feltham Post Office           FAD: 123456X

   GRO



                  title
Visa
Card Number: **** **** **** pppp Issue:nnn
Auth Code: nnnnnn
Application ID: aaaaaaaaaaaaaaaa
From: MM/YY  Expiry: MM/YY  PAN Seq No: mm
Transaction ID: nnnnnnnnnnnnnnnnnnnnnnnnnn

Amount: £9999999999.99

uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
bbbbbbbbbbbbbbbbbbbbbbbbbb£9999999999.99DR
bbbbbbbbbbbbbbbbbbbbbbbbbb£9999999999.99DR
bbbbbbbbbbbbbbbbbbbbbbbbbb£9999999999.99DR
bbbbbbbbbbbbbbbbbbbbbbbbbb£9999999999.99DR

ffffffffffffffffffffffffffffffffffffffff
ffffffffffffffffffffffffffffffffffffffff


    Please retain for future reference

        This is not a VAT receipt

          1         2         3         4
123456789012345678901234567890123456789012
```

FUJ00001932

Welsh/English text

```
          1         2         3         4
123456789012345678901234567890123456789012
              Swyddfa'r Post Cyf.
               Post Office Ltd.
                Eich Derbynneb
                 Your Receipt

17/01/2002 11:47:22  CAP:01  BP:01  SU:SH1
Feltham Post Office           FAD: 123456X
 GRO






                    title
Visa
Rhif Cerdyn:                 Cyhoeddiad:
Card Number: **** **** **** pppp Issue:nnn
Cod Awdurdodi:
Auth Code: nnnnnn
ID Cais:
Application ID: aaaaaaaaaaaaaaaa
O:           Diweddu:      Rhif Cyf PAN:
From: MM/YY  Expiry: MM/YY  PAN Seq No: mm
ID y Gweithrediad:
Transaction ID: nnnnnnnnnnnnnnnnnnnnnnnnnn

Swm/Amount: £9999999999.99

uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
wwwwwwwwwwwwwwwwwwwwwwwwww
bbbbbbbbbbbbbbbbbbbbbbbbbb£9999999999.99DR
wwwwwwwwwwwwwwwwwwwwwwwwww
bbbbbbbbbbbbbbbbbbbbbbbbbb£9999999999.99DR
wwwwwwwwwwwwwwwwwwwwwwwwww
bbbbbbbbbbbbbbbbbbbbbbbbbb£9999999999.99DR
wwwwwwwwwwwwwwwwwwwwwwwwww
bbbbbbbbbbbbbbbbbbbbbbbbbb£9999999999.99DR

ffffffffffffffffffffffffffffffffffffffff
ffffffffffffffffffffffffffffffffffffffff

 Cadwch i gyfeirio ati, os gwelwch yn dda
    Please retain for future reference
        Nid derbynneb TAW yw hon
        This is not a VAT receipt

```

FUJ00001932


```
          1         2         3         4
12345678901234567890123456789012345678901234
```

Field Name	English		Welsh		Length	Contents
	Line No.	Char Pos'ns	Line No.	Char Pos'ns		
Title	14	01-42			42	'Cash Deposit', 'Cheque Deposit' or 'Cash Withdrawal'.
			15	01-42	42	'Adnau Arian Parod/Cash Deposit', 'Adneuo Siec/Cheque Deposit' or 'Codi Arian Parod/Cash Withdrawal'.
Issuer Scheme name	15	01-30	16	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	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
Authorisation code	17	12-17	20	12-17	6	Authorisation code from Financial Institution
Application ID	18	17-32	22	17-32	16	Application Identifier is obtained from the PIN pad when setting up the [C1] ICC data
From Date	19	7-11	24	7-11	5	Obtained from Application data from the card as read by PIN pad: or from track 2 data if magnetic stripe card used

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Expiry Date	19	22-26	24	22-26	5	Obtained from Application data from the card as read by PIN pad: or from track 2 data if magnetic stripe card used
PAN Sequence Number	19	41-42	24	41-42	2	Obtained from Application data from the card as read by PIN pad: or from track 2 data if magnetic stripe card used
Transaction ID	20	17-42	26	17-42	26	Unique system-generated transaction identifier (*nnn…*).
Amount	22	09-22	28	13-26	14	12-digit amount in the format £*9999999999.99* or zero if the transaction was not successful.
Outcome message	24-31	01-42	30-37	01-42	42	Transaction outcome message (*uuu…* up to 8 lines), suppressed if blank. Note that this is the maximum number of lines available for the message, whether it consists of English or Welsh/English text.
Balance Information			38, 40, 42, 44	01-26	26	Welsh translation of the following line's *bbb* (*www...*, up to 4 lines) if provided, or suppressed. e.g. 'Balans ar gael yn y cyfrif'.

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	32-35	01-42	39, 41, 43, 45	01-42	42	Balance Information (up to 4 lines) if provided, or suppressed. Formed from Balance Type (*bbb*…), e.g. 'Account available balance', which is left aligned, and the amount in the format £*9999999999.99* which is right aligned. Overdrawn amounts are suffixed by 'DR'. Repeated for each balance provided.
Free text footer	37, 38	01-40	47, 48	01-40	40	Free text (*fff*…, up to 2 lines) if provided, or suppressed.

FUJ00001932

3.4 Change PIN Request

3.4.1 Purpose

This is the customer record of the session.

3.4.2 Frequency

Per EMV Banking transaction within a customer session.

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

FUJ00001932

3.4.3 Layout and Example Content

English text

```
          1         2         3         4
01234567890123456789012345678901234567890123
01
02              Post Office Ltd.
03                Your Receipt
04
05  09/04/2002 10:47:22  CAP:02  BP:01  SU:SH1
06  Feltham Post Office            FAD: 123456X
07
08  GRO
09
10
11
12
13
14              Change PIN Request
15  Visa
16  Card Number: **** **** **** pppp Issue:nnn
17  Auth Code: nnnnnn
18  Application ID: aaaaaaaaaaaaaaa
19  From: MM/YY  Expiry: MM/YY  PAN Seq No: mm
20  Transaction ID: nnnnnnnnnnnnnnnnnnnnnnnn
21
22  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
23  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
24  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
25  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
26  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
27  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
28  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
29  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
30
31  ffffffffffffffffffffffffffffffffffffffff
32  ffffffffffffffffffffffffffffffffffffffff
33
34
35          This is not a VAT receipt
36
          1         2         3         4
01234567890123456789012345678901234567890123
```

FUJ00001932

Welsh/English text

```
              1         2         3         4
    123456789012345678901234567890123456789012
01               Swyddfa'r Post Cyf.
02                Post Office Ltd.
03                 Eich Derbynneb
04                  Your Receipt
05
06  09/04/2002 10:47:22  CAP:02  BP:01  SU:SH1
07  Feltham Post Office           FAD: 123456X
08
09
10
11   GRO
12
13
14
15     Cais i Newid PIN/Change PIN Request
16  Visa
17  Rhif Cerdyn:                Cyhoeddiad:
18  Card Number: **** **** **** pppp Issue:nnn
19  Cod Awdurdodi:
20  Auth Code: nnnnnn
21  ID Cais:
22  Application ID: aaaaaaaaaaaaaaaa
23  O:           Diweddu:      Rhif Cyf PAN:
24  From: MM/YY  Expiry: MM/YY  PAN Seq No: mm
25  ID y Gweithrediad:
26  Transaction ID: nnnnnnnnnnnnnnnnnnnnnnnnnn
27
28  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
29  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
30  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
31  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
32  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
33  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
34  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
35  uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
36
37  ffffffffffffffffffffffffffffffffffffffff
38  ffffffffffffffffffffffffffffffffffffffff
39
40          Nid derbynneb TAW yw hon
41          This is not a VAT receipt
42
              1         2         3         4
    123456789012345678901234567890123456789012
```

Field Name	English		Welsh		Length	Contents
	Line No.	Char Pos'ns	Line No.	Char Pos'ns		

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Title	14	13-30			18	'Change PIN Request'.
			15	04-38	35	'Cais i Newid PIN/Change PIN Request'.
Issuer Scheme name	15	01-30	16	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	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
Authorisation code	17	12-17	20	12-17	6	Authorisation code from Financial Institution
Application ID	18	17-32	22	17-32	16	Application Identifier is obtained from the PIN pad when setting up the [C1] ICC data
From Date	19	7-11	24	7-11	5	Obtained from Application data from the card as read by PIN pad: or from track 2 data if magnetic stripe card used
Expiry Date	19	22-26	24	22-26	5	Obtained from Application data from the card as read by PIN pad: or from track 2 data if magnetic stripe card used
PAN Sequence Number	19	41-42	24	41-42	2	Obtained from Application data from the card as read by PIN pad: or from track 2 data if magnetic stripe card used

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Transaction ID	20	17-42	26	17-42	26	Unique system-generated transaction identifier (*nnn*…).
Outcome message	22-29	01-42	28-35	01-42	42	Transaction outcome message (*uuu*… up to 8 lines), suppressed if blank. Note that this is the maximum number of lines available for the message, whether it consists of English or Welsh/English text.
Free text footer	31, 32	01-40	37, 38	01-40	40	Free text (*fff*…, up to 2 lines) if provided, or suppressed.

FUJ00001932

4 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/003 still apply for all existing response codes

4.1 Screens

4.1.1 Fixed screens, no response code based text

No change from NB/SPE/003

4.1.2 Soft screens, based on response code

No change – no new response codes currently identified

4.2 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 (shown here for completeness)
04	Fee Customer Declined
05	Card Check Failed
06	Declined by FI
07	Decline by PIN pad or some other failure

FUJ00001932

4.3 EMV Specific Response Codes

NB Response Code	Cause
80	Declined by customer's card
81	Declined by customer's card: fall back to MSR after 2nd GenAC
90	LINK service unavailable: declined by agent
91	A&L service unavailable: declined by agent
92	Card Account service unavailable: declined by agent
95	LINK service temporarily unavailable: declined by agent
96	A&L service temporarily unavailable: declined by agent
97	Card Account service temporarily unavailable: declined by agent

The message to appear on screen 10 (see 7.1.9) and the receipt text printed for these response codes is shown in section 6.2.3.

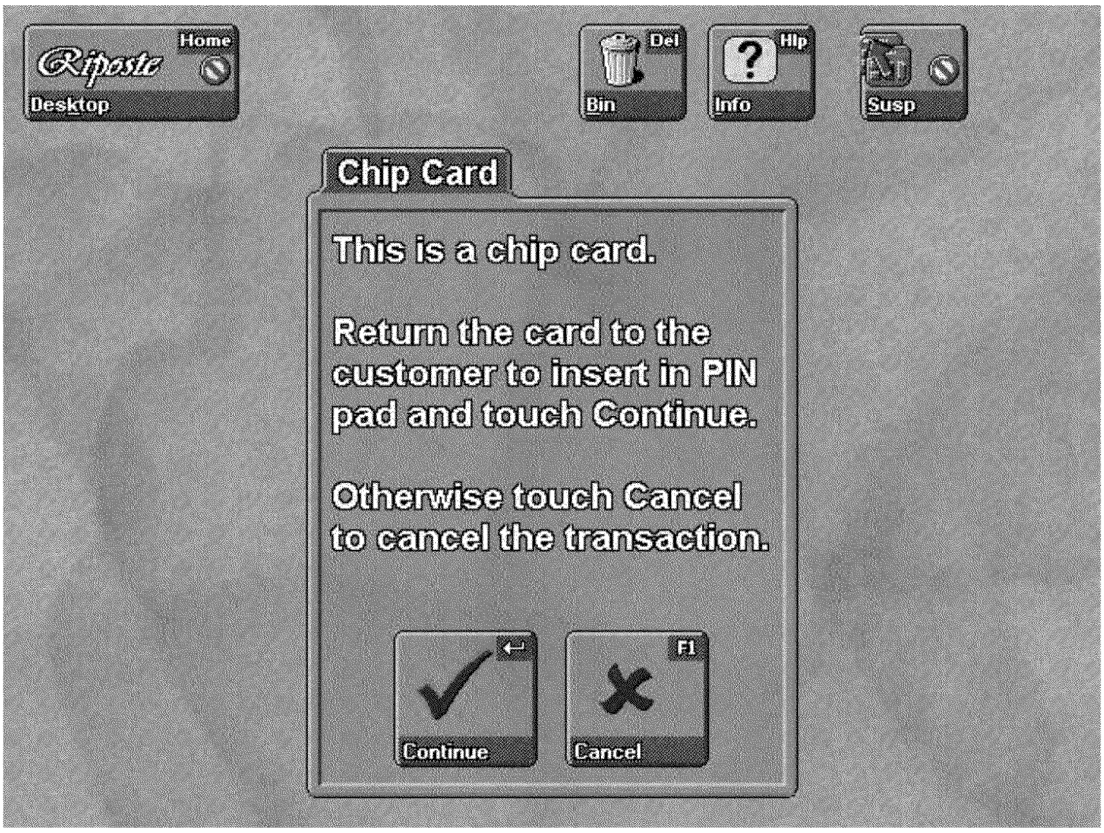
FUJ00001932

5 Screen Layouts

5.1 Counter Screens

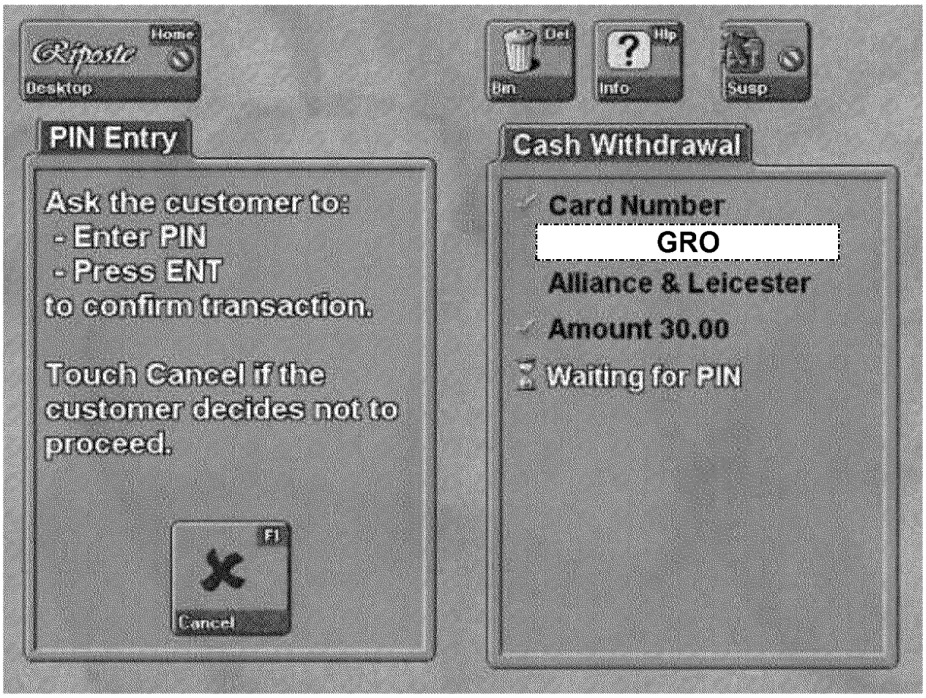
The screens in this section are prototypes only, the final screen layout may vary. In addition, the message texts within these screens are examples only. The definitive version of the message text is contained within section 6.1.1.

5.1.1 Screen EB1: Proceed as Chip Card?



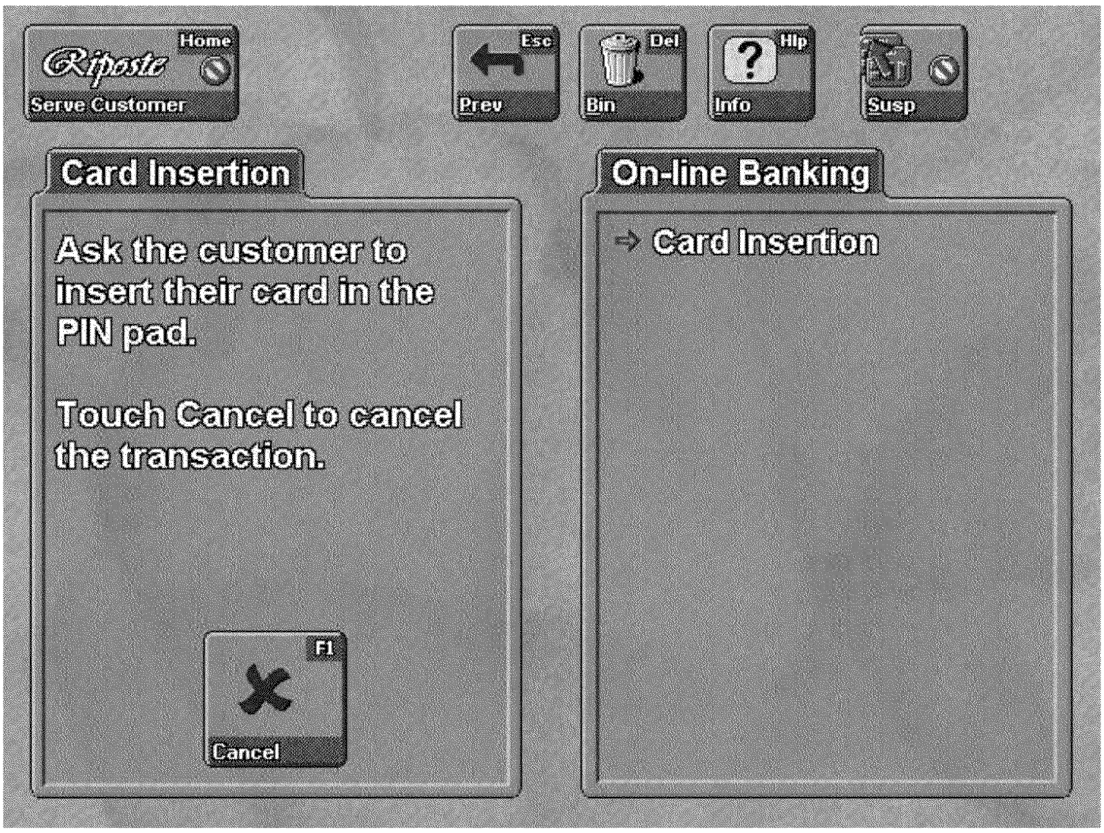
FUJ00001932

5.1.2 Screen EB2: Waiting For PIN



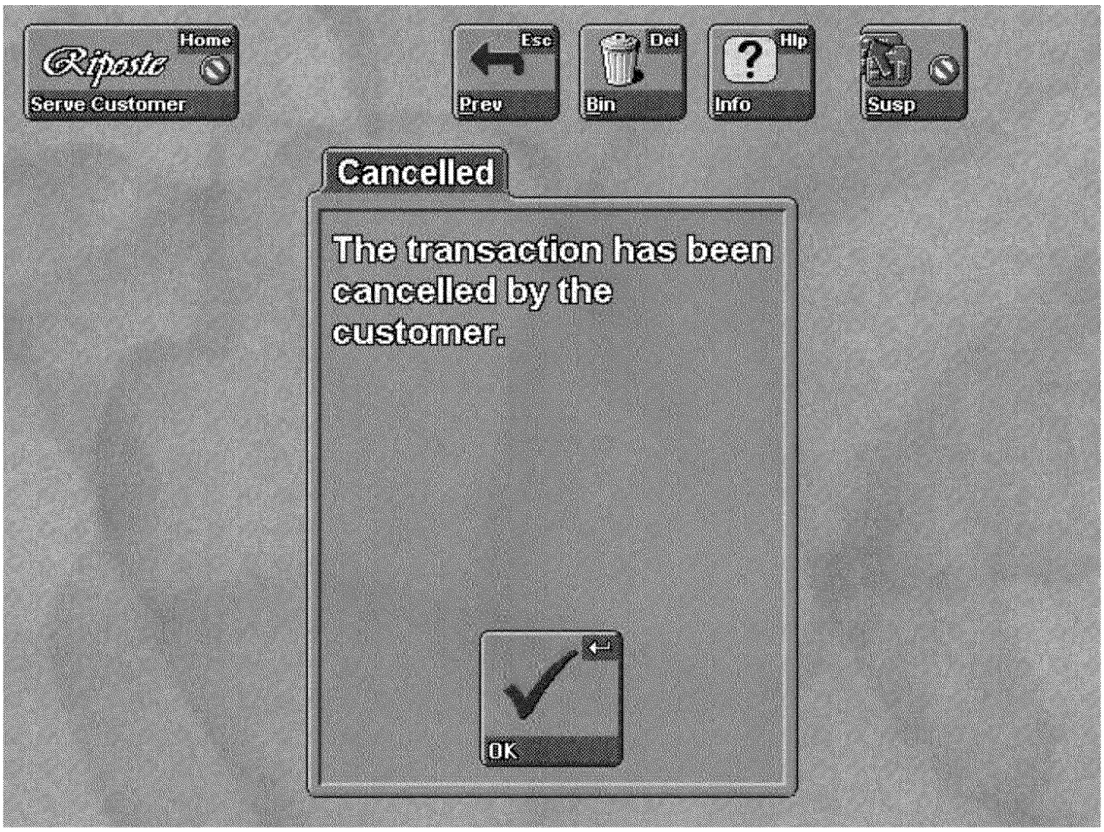
FUJ00001932

5.1.3 Screen EB3: Card Insertion



FUJ00001932

5.1.4 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 Financial Institution.

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.”

FUJ00001932

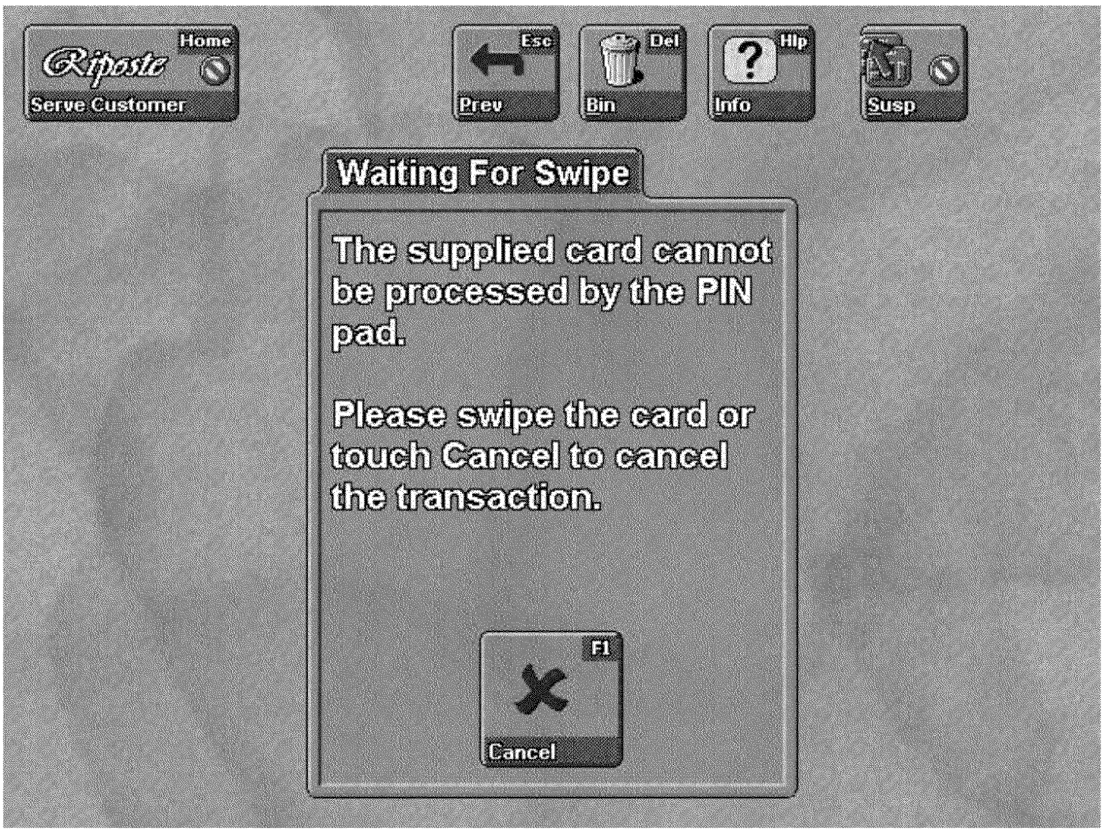
5.1.5 Screen EB5: Change Error

Removed.

This screen was intended to warn users that a change PIN operation may or may not have failed because a response hadn't been received from the financial institution. This situation is already covered by one of the conditions reported on existing screen 10 (see 7.1.9).

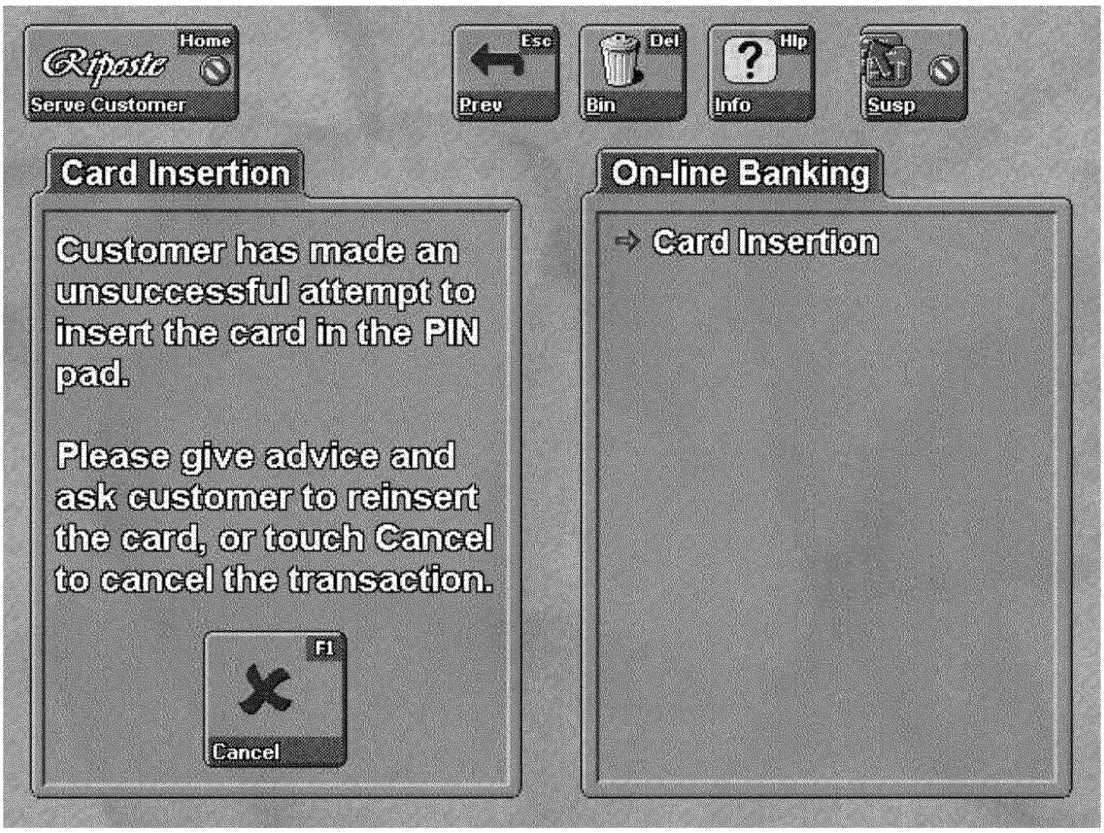
FUJ00001932

5.1.6 Screen EB6: Card cannot be read by PIN pad



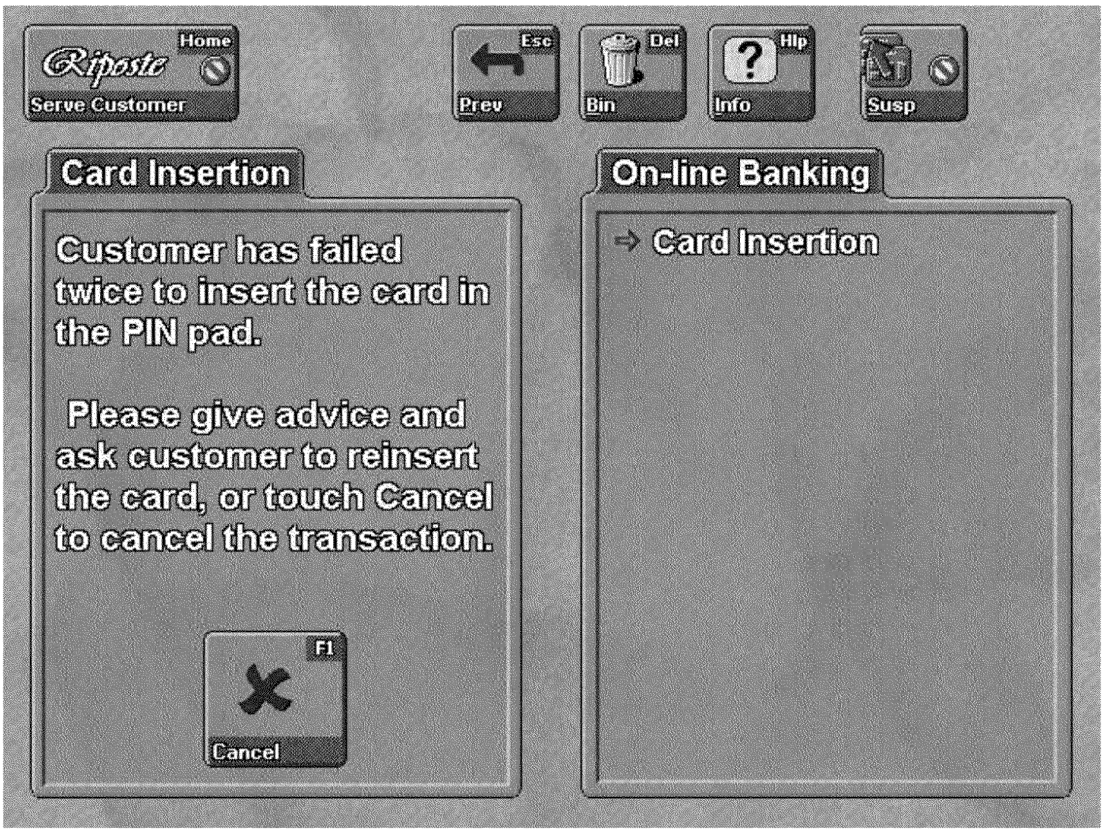
FUJ00001932

5.1.7 Screen EB7: Insert Card (Second attempt)



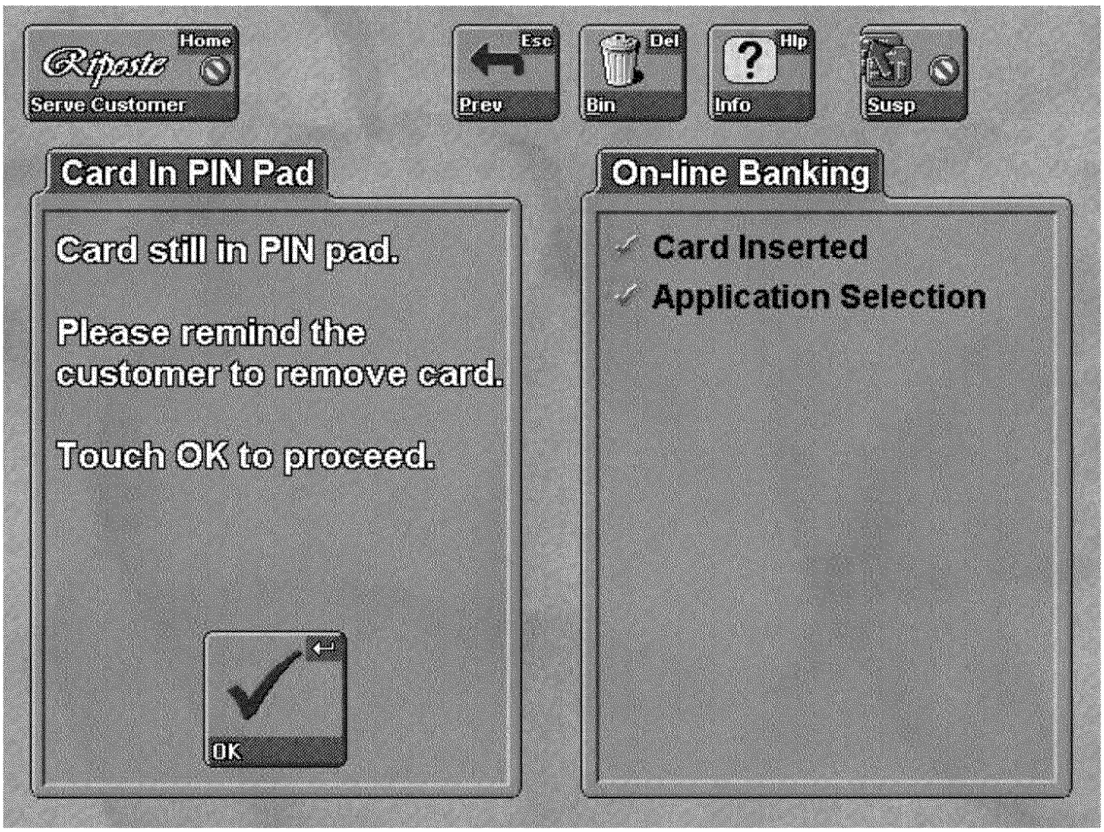
FUJ00001932

5.1.8 Screen EB8: Insert Card (Third attempt)



FUJ00001932

5.1.9 Screen EB9: Remove Card from PIN pad



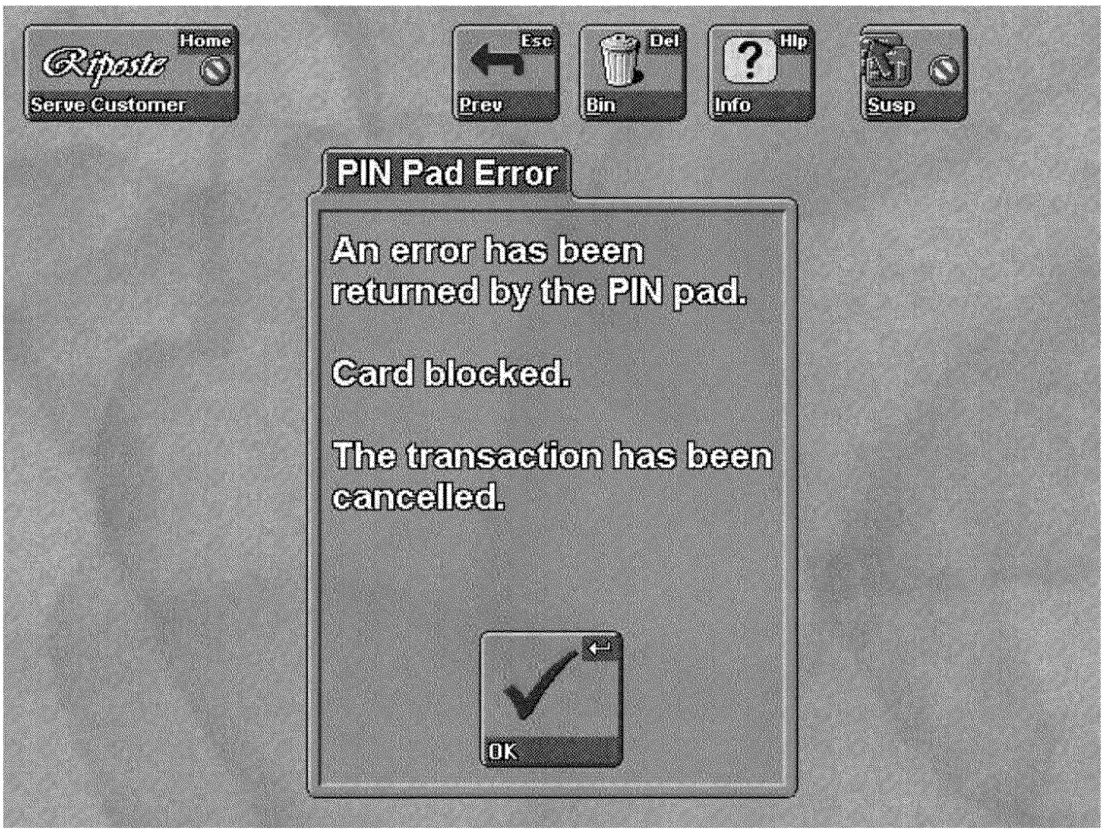
This screen is displayed when a Banking transaction is cancelled or declined.

FUJ00001932

5.1.10 Screen EB10: Application Selection from Counter

FUJ00001932

5.1.11 Screen EB11: PIN Pad Error Screen

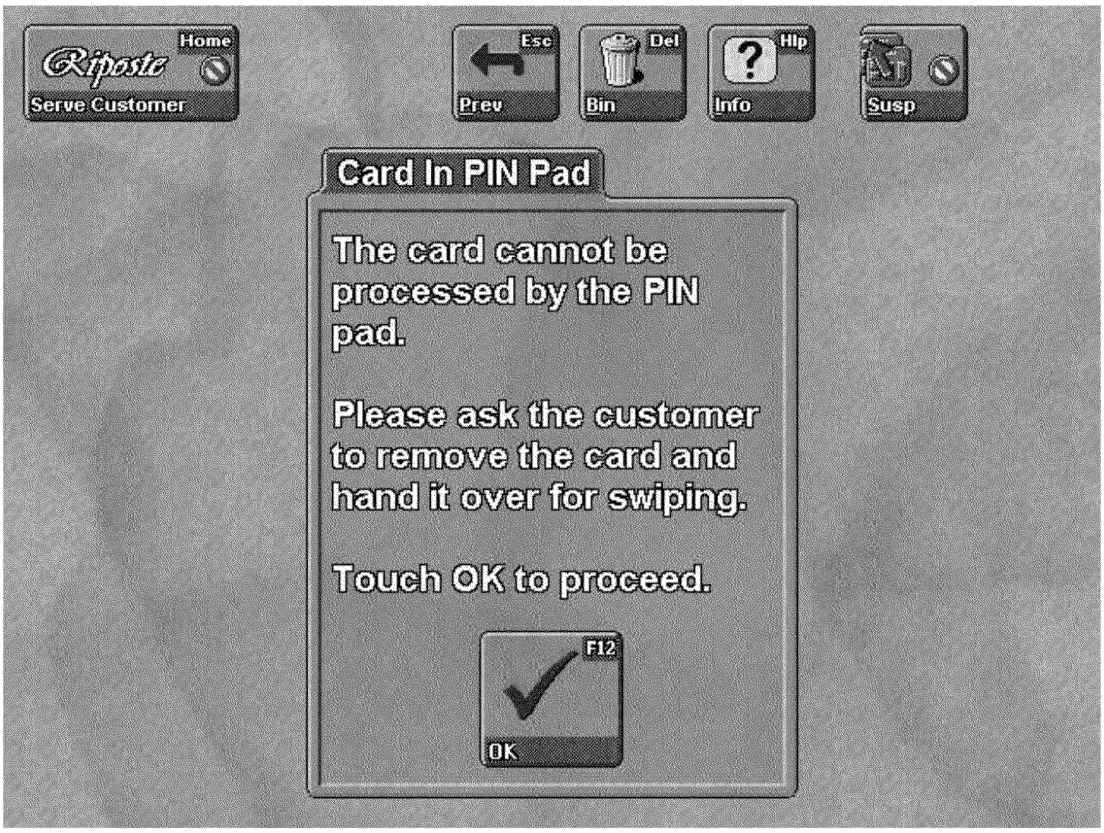


This screen is used if the PIN pad returns an error code at the end of an aborted transaction.

The content of the second sentence depends on the value of the code returned from the PIN pad (see 9.1)

FUJ00001932

5.1.12 Screen EB12: Invalid Card Screen



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 (see 5.2.27).

FUJ00001932

5.1.13 Screen EB13: Card Inserted – Please Wait

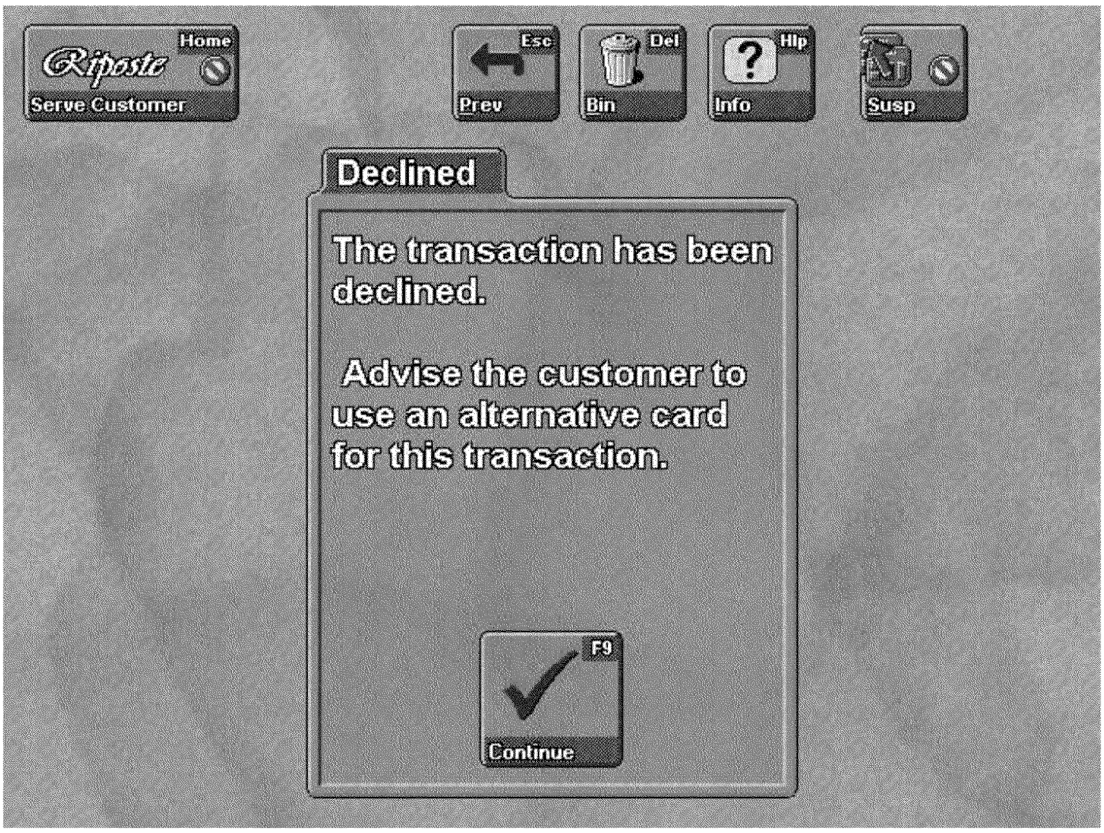
Note this screen will only be displayed:

- When the EMV Banking button is selected from the Serve Customer 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 “On-Line Banking” for all transactions.

FUJ00001932

5.1.14 Screen EB14: Action Analysis Decline Screen

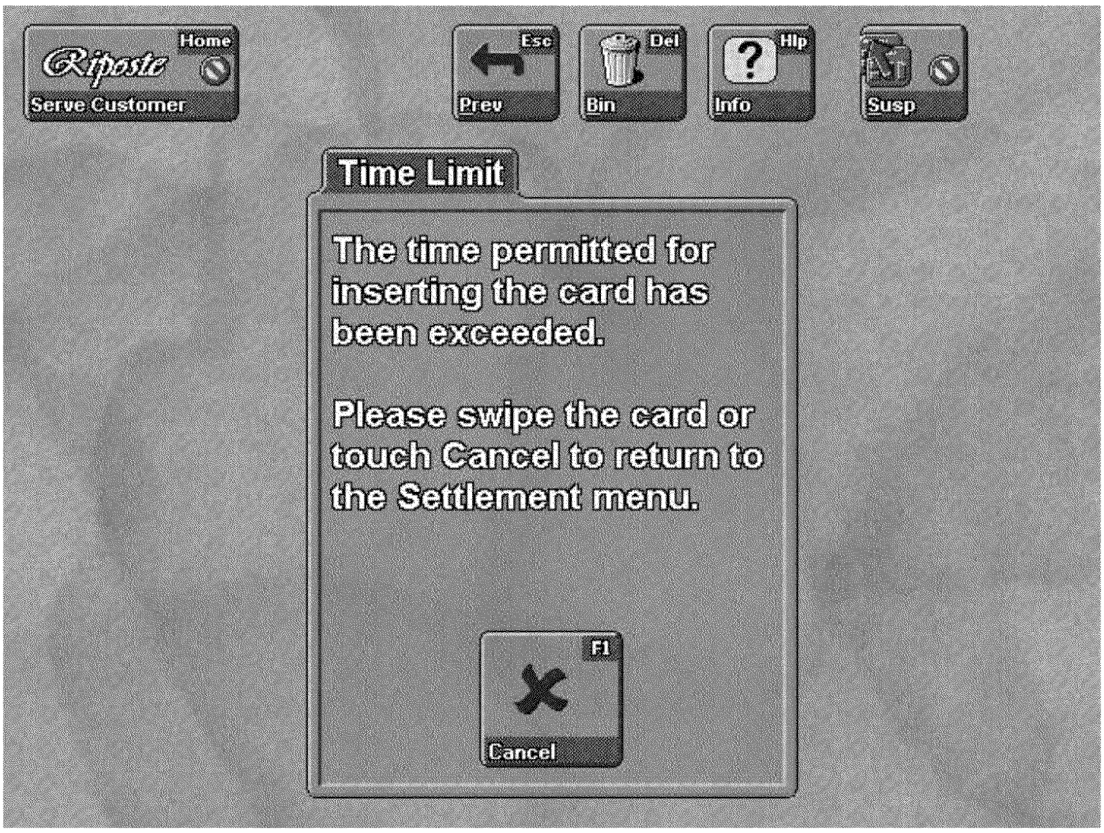


Action analysis performed by the PIN pad and card has detected a condition, which has caused the transaction to be declined. This screen is displayed when the PIN pad has informed the counter of this condition by sending an AAC command.

Pressing Continue will allow the counter to start a card removal operation. When the card has been removed the serve customer menu will be displayed again where a new transaction may be started.

FUJ00001932

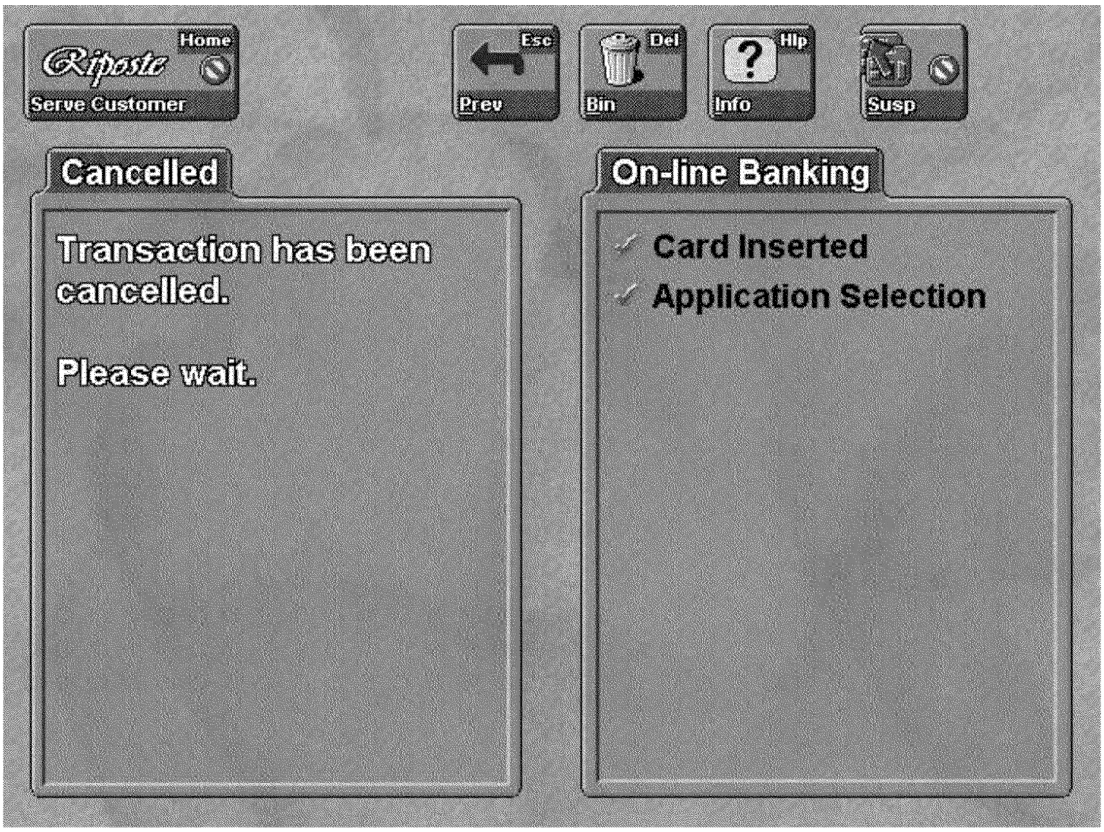
5.1.15 Screen EB15: Card Insertion Timeout



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.

FUJ00001932

5.1.16 Screen EB16: Cancel - Please Wait



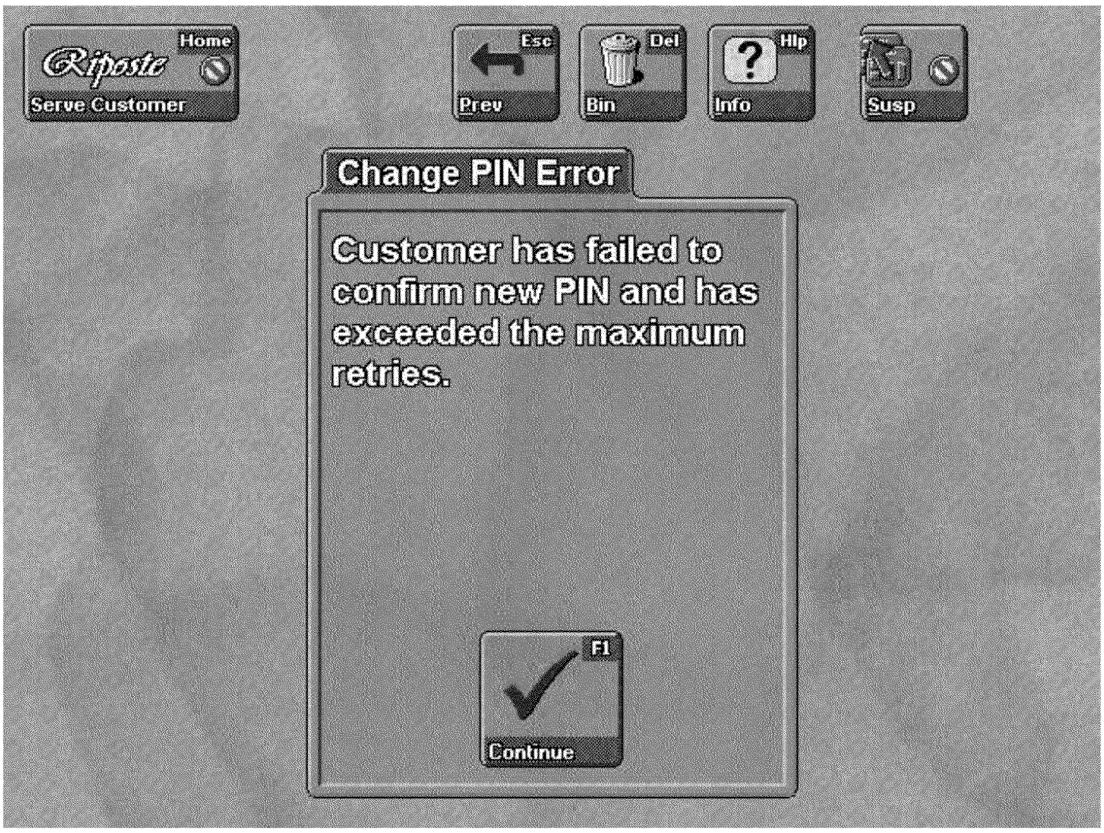
The Cancelled screen is displayed when the clerk cancels during the card insertion or during Application Selection.

If the clerk cancels later in the dialogue then screen EB9 *Remove Card from PIN pad* (see 5.1.9) is displayed.

Screen EB4 (see 5.1.4) is used where the transaction is cancelled by Customer.

FUJ00001932

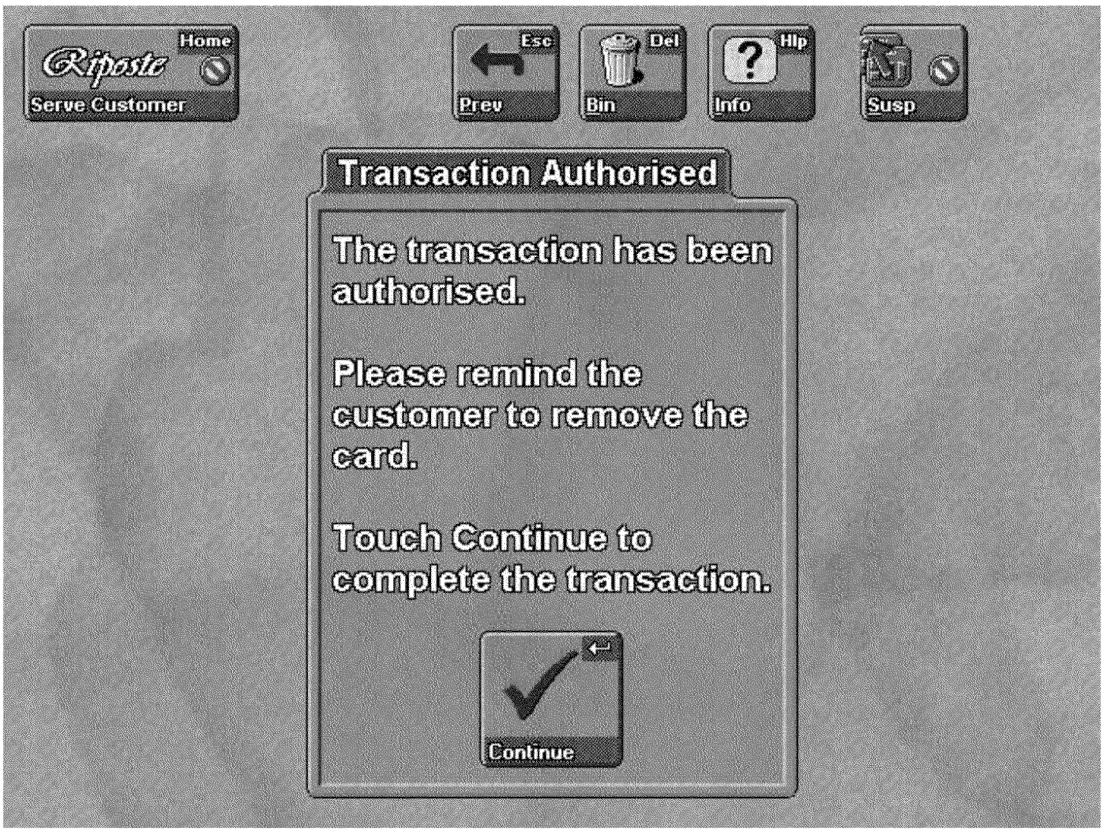
5.1.17 Screen EB17: Too Many PIN Retries



This screen is displayed when the system detects that the customer has exceeded the maximum number of PIN change retries. That is the number of attempts at entering and confirming a new PIN value has been exceeded.

FUJ00001932

5.1.18 Screen EB18: Authorised / Remove Card Screen

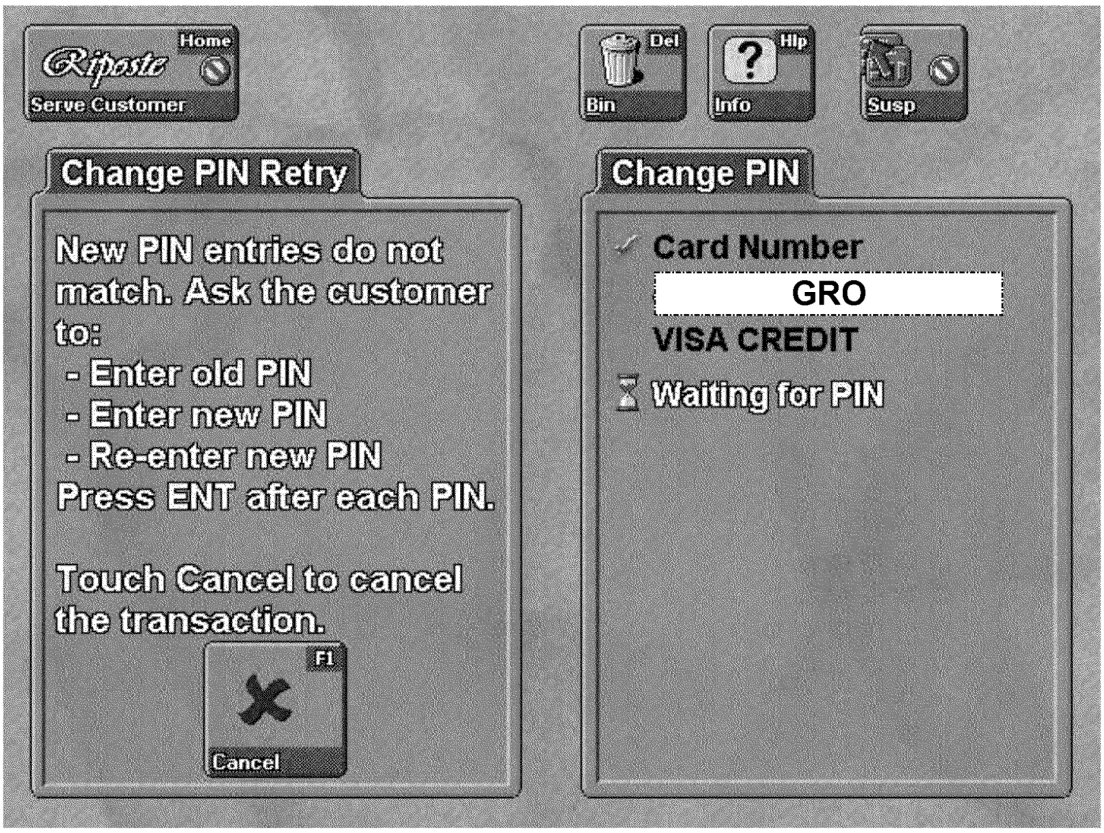


Action analysis performed by the PIN pad and card has reached approval for this transaction. The transaction has therefore been authorised. This screen is displayed after the PIN pad has informed the counter of this condition by sending a TC command and the counter has acknowledged that TC command.

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

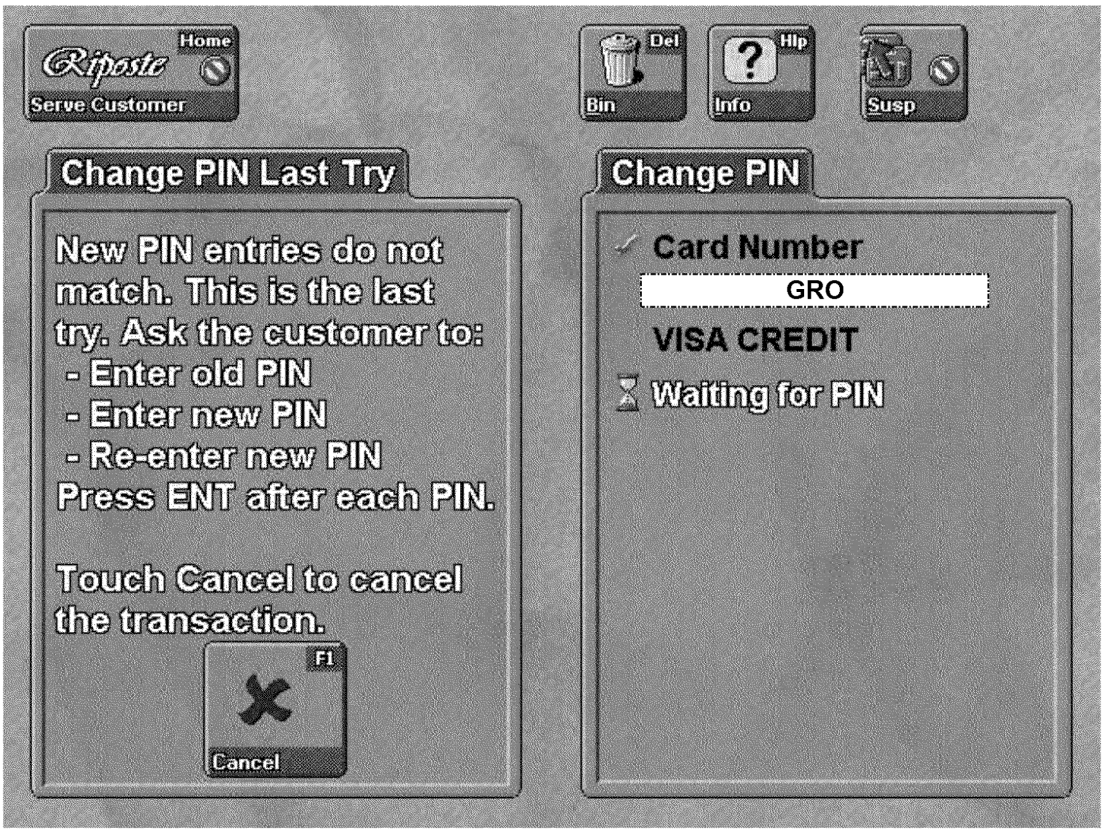
FUJ00001932

5.1.19 Screen EB19: Change PIN Retry



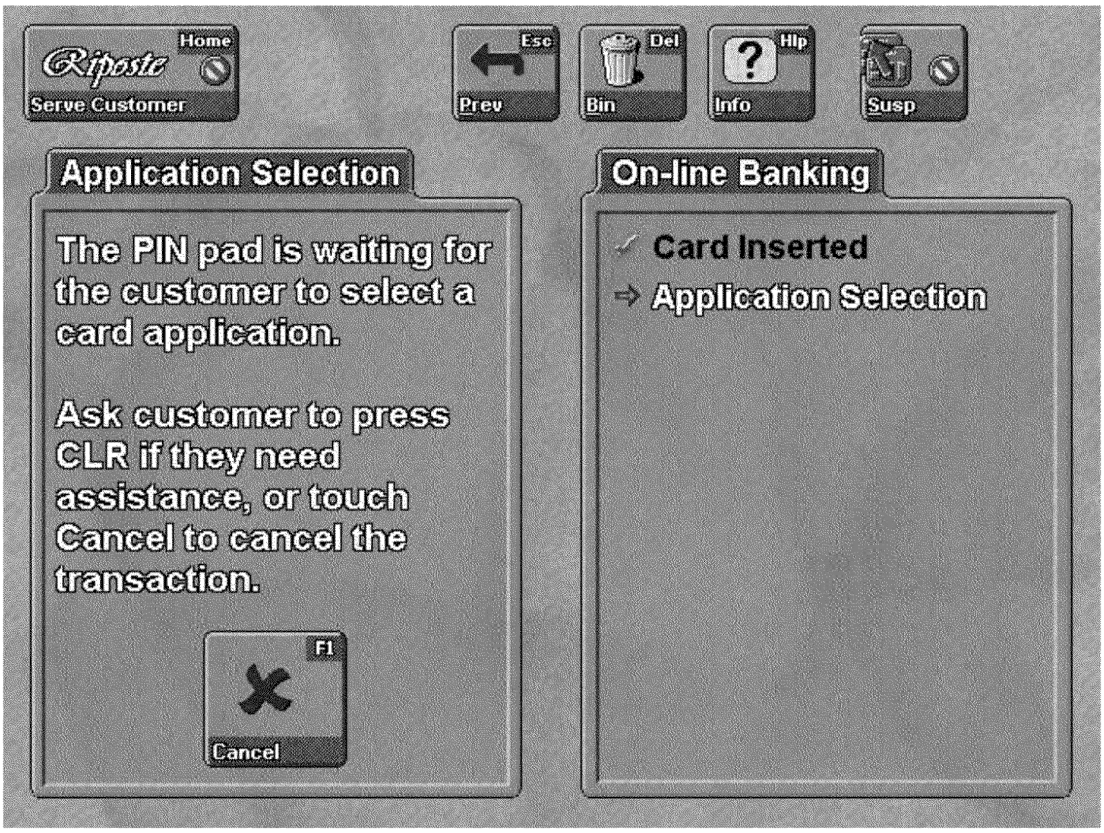
FUJ00001932

5.1.20 Screen EB20: Change PIN Last Try



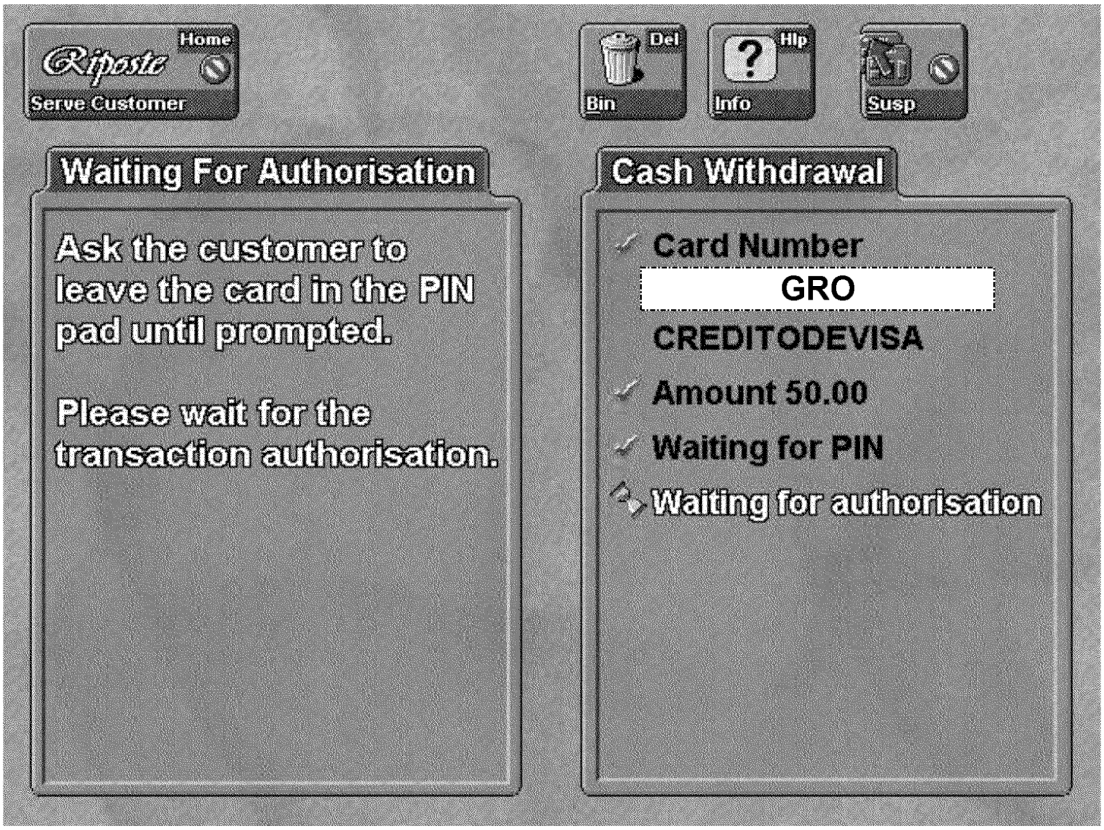
FUJ00001932

5.1.21 Screen EB21: Application Selection at PIN Pad



FUJ00001932

5.1.22 Screen EB22: Screen 5 (EMV) – Waiting for Authorisation



FUJ00001932

5.2 PIN Pad Screens

Please note that messages relating to PIN entry cannot be modified. Other messages may not contain the word 'PIN', 'Pin', 'pin', 'pIn' or 'piN'.

5.2.1 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 screen is intentionally blank. This is Hypercom screen 0Ch 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

5.2.2 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.

FUJ00001932

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

5.2.3 PIN Pad Screen EBP3: Select Application

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1	C	a	r	d		A	c	c	o	u	n	t				
2	B	a	r	c	l	a	y	s		C	u	r	r	e	n	t
3	L	l	o	y	d	s		P	l	a	t	i	n	u	m	
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	Triggers application selection by 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.

FUJ00001932

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 EB10 (see 5.1.10) for application selection from Counter

5.2.4 PIN Pad Screen EBP4: Card Invalid

Removed.

5.2.5 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 requirements[33].

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

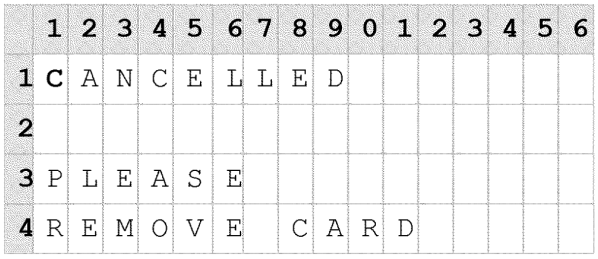
[33] The text for this screen is supplied by Fujitsu as part of the PIN pad reference data. It is not explicitly referenced within the activity flows described within this document, but it may be displayed under certain exception cases.

FUJ00001932

5.2.6 PIN Pad Screen EBP6: too many retries

This screen will not be provided.

5.2.7 PIN Pad Screen EBP7: Cancelled



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 (see 5.2.29) 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

5.2.8 PIN Pad Screen EBP8: Return Card?

FUJ00001932

Removed

5.2.9 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 24h 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

5.2.10 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

FUJ00001932

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

5.2.11 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.

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

[34] PIN validation takes place at the Financial Institution and if PIN entry fails the transaction is declined. User may retry but that is a new transaction. There are no specific PIN pad screens to “Re-enter PIN” or ”Last Try PIN” as there are for EMV Retail.

FUJ00001932

5.2.12 PIN Pad Screen EBP12: Enter PIN[34]

Replaced by screens 5.2.13 to 5.2.15.

5.2.13 PIN Pad Screen P1a: Confirm and Enter PIN for Cash Withdrawal

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1	C	a	s	h		W	i	t	h	d	r	a	w	a	l	
2	£	9	9	9	9	9	9	9	9	9	9	.	9	9		
3	C	o	n	f	i	r	m		w	i	t	h		P	I	N
4	*	*	*	*												

As the PIN is entered it will be displayed as asterisks on the bottom line as shown.

The amount is the amount captured on Screen 2 (see 7.1.2).

The minimum and maximum lengths of the PIN are controlled by the Financial Institutions: not by Horizon reference data.

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
CAN	After PIN is accepted	Ignored
CLR	Before PIN is accepted	Clears all entered PIN digits
CLR	After PIN is accepted	Ignored
BAL	Any time	Ignored
Up Arrow	Any time	Ignored

[34] PIN validation takes place at the Financial Institution and if PIN entry fails the transaction is declined. User may retry but that is a new transaction. There are no specific PIN pad screens to “Re-enter PIN” or ”Last Try PIN” as there are for EMV Retail.

FUJ00001932

Down Arrow	Any time	Ignored

5.2.14 PIN Pad Screen P1b: Confirm and Enter PIN for Withdraw Limit

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1	**W**	i	t	h	d	r	a	w		**L**	i	m	i	t		
2																
3	**C**	o	n	f	i	r	m		w	i	t	h		**P**	**I**	**N**
4	*	*	*	*												

As the PIN is entered it will be displayed as asterisks on the bottom line as shown.

The minimum and maximum lengths of the PIN are controlled by the Financial Institutions: not by Horizon reference data.

Function Key Actions for this screen

As for 5.2.13

5.2.15 PIN Pad Screen P1c: Confirm and Enter PIN for Balance Enquiry

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1	**B**	a	l	a	n	c	e									
2																
3	**C**	o	n	f	i	r	m		w	i	t	h		**P**	**I**	**N**
4	*	*	*	*												

As the PIN is entered it will be displayed as asterisks on the bottom line as shown.

The minimum and maximum lengths of the PIN are controlled by the Financial Institutions: not by Horizon reference data.

Function Key Actions for this screen

As for 5.2.13

5.2.16 PIN Pad Screen P3: Change PIN - Enter Old PIN

FUJ00001932

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1	C	h	a	n	g	e		P	I	N						
2																
3	E	n	t	e	r		o	l	d		P	I	N			
4	*	*	*	*												

As the PIN is entered it will be displayed as asterisks on the bottom line as shown.

The minimum and maximum lengths of the PIN are controlled by the Financial Institutions: not by Horizon reference data.

5.2.17 PIN Pad Screen P4: Change PIN - Enter New PIN

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1	C	h	a	n	g	e		P	I	N						
2																
3	E	n	t	e	r		n	e	w		P	I	N			
4	*	*	*	*												

As the PIN is entered it will be displayed as asterisks on the bottom line as shown.

The minimum and maximum lengths of the PIN are controlled by the Financial Institutions: not by Horizon reference data.

5.2.18 PIN Pad Screen P5: Change PIN – Re-enter New PIN

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1	C	h	a	n	g	e		P	I	N						
2																
3	R	e	-	e	n	t	e	r		n	e	w		P	I	N
4	*	*	*	*												

As the PIN is entered it will be displayed as asterisks on the bottom line as shown.

5.2.19 PIN Pad Screen P1d: Confirm and Enter PIN for Deposit.

FUJ00001932

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1	D	e	p	o	s	i	t									
2	£	9	9	9	9	9	9	9	9	9	9	.	9	9		
3	C	o	n	f	i	r	m		w	i	t	h		P	I	N
4	*	*	*	*												

As the PIN is entered it will be displayed as asterisks on the bottom line as shown.

The amount is the amount captured on Screen 2 (see 7.1.2).

The minimum and maximum lengths of the PIN are controlled by the Financial Institutions: not by Horizon reference data.

5.2.20 PIN Pad Screen P7: Change PIN - New PINs Different

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1	C	h	a	n	g	e		P	I	N						
2	R	e	-	e	n	t	e	r	e	d		P	I	N		
3	i	s		n	o	t		t	h	e		s	a	m	e	
4																

5.2.21 PIN Pad Screen P8: Change PIN - Cancelled by Clerk

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1																
2	C	a	n	c	e	l	l	e	d							
3																
4																

This message will be replaced by a blank display, after a delay, which is configurable from Pathway Reference Data.

5.2.22 PIN Pad Screen EBP13: Application Selection at Counter

FUJ00001932

	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

5.2.23 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 EBP2 (section 5.2.2)

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

FUJ00001932

	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 EBP2 (section 5.2.2)

5.2.25 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 EBP2 (section 5.2.2)

5.2.26 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			

FUJ00001932

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 30h customised to meet Post Office requirements.

Function Key Actions for this screen

As for insert card EBP2 (section 5.2.2)

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

Function Key Actions for this screen

As for insert card EBP2 (section 5.2.2)

5.2.28 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																

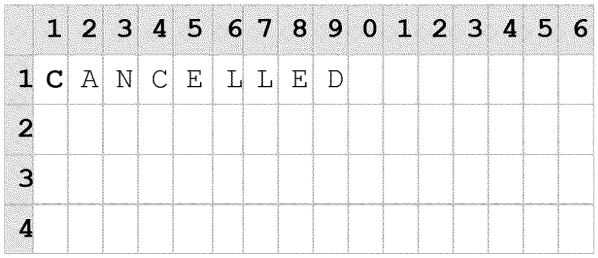
This screen appears after the user takes his card out of the PIN pad in response to the EBP18 screen. This is Hypercom screen 2h customised to meet Post Office requirements.

Function Key Actions for this screen

As for insert card EBP2 (section 5.2.2)

5.2.29 PIN Pad Screen EBP20: Cancelled

FUJ00001932



This is Hypercom screen 0D.

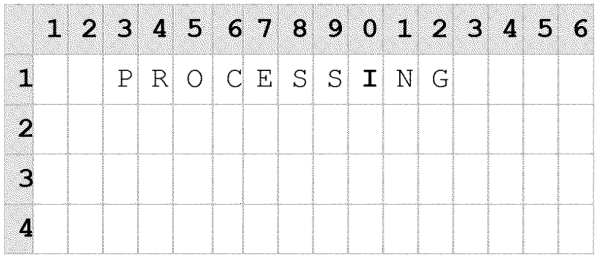
The same screen is used whether the transaction is cancelled by the clerk or by the customer and is displayed when the card is not in the PIN pad.

Screen EBP7 (section 5.2.7) 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 screen EBP7 - *Cancelled* - *Remove Card* (section 5.2.7)

5.2.30 PIN Pad Screen EBP21: Processing

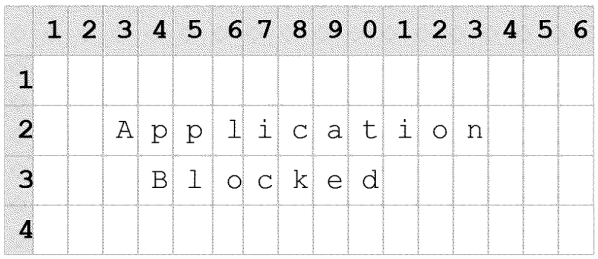


Function Key Actions for this screen

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

FUJ00001932

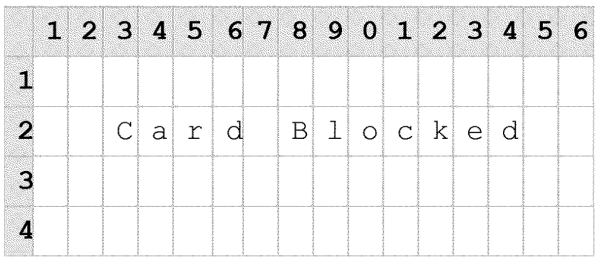
5.2.31 PIN Pad Screen EBP22: Application Blocked



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

5.2.32 PIN Pad Screen EBP23: Card Blocked



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

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Up Arrow	Any time	Ignored
Down Arrow	Any time	Ignored

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6 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 5.1 *Counter Screens*

Object Name[35]*/ Variable*	*Context*	*Caption and Message*[36]	*Caption and Help Text*
MSG955	EB1	Chip Card This is a chip card.||Return the card to the customer to insert in PIN pad and touch Continue.|| Otherwise touch Cancel to cancel the transaction.	Continue (Enter) Touch this button to continue. Cancel (F1) Touch this button to cancel the transaction.
MSG984	EB2	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.
ScreenER1_ InsertCard	EB3	Card Insertion Ask the customer to insert their card in the PIN pad.||	Cancel (F1) Touch this button if the customer does not wish to continue
MSG980	EB4	Cancelled The transaction has been cancelled by the customer.	OK (Enter) Touch this button to continue.

[35] Object names in collection MessageDefs are in the format MSGnnn. Where the object name is not in this format, then other collections are used, e.g. FTScriptDefs.

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

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MSG999 *Note: this format of the message is used if the customer removes his card from the PIN pad between the [R] message being sent to the FI and the [A] message being sent back*	EB4	Cancelled The transaction has been cancelled by the customer removing the card too soon.	OK (Enter) Touch this button to continue.
MSG986	EB6	Waiting For Swipe The supplied card cannot be processed by the PIN pad. ‖Please swipe the card or touch Cancel to cancel the transaction.	Cancel (F1) Touch this button to cancel the transaction
MSG960	EB7	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 (F1) Touch this button if the customer does not wish to continue
MSG971	EB8	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
MSG958	EB9	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)

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ScreenEB10	EB10	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."*
MSG981	EB11	PIN Pad Error An error has been returned by the PIN pad.|| %Reason%|| The transaction has been cancelled.	OK(Enter) Touch this button to continue.
MSG972	EB12	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)
ER1_CardInserted	EB13	Card Inserted	Cancel (F1) Touch this button if the customer does not wish to continue.
MSG985	EB14	Declined The transaction has been declined.|| Advise the customer to use an alternative card for this transaction.	Continue(F9) Touch this button to continue. ICON (tick)
MSG989	EB15	Time Limit The time permitted for inserting the card has been exceeded.|| Please swipe the card or touch Cancel to return to the Serve Customer menu.	Cancel (F1) Touch this button if the customer does not wish to continue. ICON (cross)

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MSG966	EB16	Cancelled Transaction has been cancelled.||Please wait.	
MSG987	EB17	Change PIN Error Customer has failed to confirm new PIN and has exceeded the maximum retries.	Continue(Enter) Touch this button to return to the Serve Customer Menu.
MSG988	EB18	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).
MSG994	EB19	Change PIN Retry New PIN entries do not match. Ask the customer to:| - Enter old PIN| - Enter new PIN| - Re-enter new PIN|Press ENT after each PIN. ||Touch Cancel to cancel the transaction.	Cancel (F1) Touch this button if the customer does not wish to continue. ICON (cross)
MSG995	EB20	Change PIN Last Try New PIN entries do not match. This is the last try. Ask the customer to:| - Enter old PIN| - Enter new PIN| - Re-enter new PIN|Press ENT after each PIN. || Touch Cancel to cancel the transaction.	Cancel (F1) Touch this button if the customer does not wish to continue. ICON (cross)
MSG996 ScreenEB21	EB21	Application Selection 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.	Cancel (F1) Touch this button to cancel the transaction. ICON(cross)
MSG998 Note: MSG998 is also used for screen 5 (EMV) in Retail.	Screen 5 (EMV)	Waiting For Authorisation Ask the customer to leave the card in the PIN pad until prompted.|| %CVMMESSAGE% Please wait for the transaction authorisation. Where %CVMMESSAGE% is blank for Banking transactions:	

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MSG835 %ClerkMsg%	Screen 10	Transaction Failure %ClerkMsg% [see Section 6.2.3]	Continue (F9) Touch this button to continue. ICON (tick)

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6.2 Displayed Variable Message Text

6.2.1 Transaction Types

The text which appears on the various screens depends on the Banking transaction types.

New transaction types have been set up for EMV Banking and PIN verification and the complete set of Transaction Types is shown in the following table

Transaction Type	*Code for MSR & PIN Verification*	*Code for Signature Verification*	*Code for EMV & PIN Verification*	*Code for No Verification*
Balance enquiry	01	11	61	N/A
Deposit	N/A	N/A	62	22
Withdrawal	03	13	63	N/A
Withdrawal with balance	04	14	64	N/A
Withdraw Limit	05	15	65	N/A
Change PIN	06	N/A	66	N/A
Cheque Deposit	N/A	N/A	67	27

6.2.2 Decline messages on screen 7

The message in the table below will appear on screen 7 (see 7.1.6) depending on the Transaction Types and the Response Code received back from the Financial Institution:

Response Code	**Authorisation Status**	**Transaction type**	**Outcome**	**Clerk Screen Soft-coded message**
03	Declined – Incorrect PIN	06 and 66 (Change PIN)	FI Declined (Incorrect PIN entered)	Incorrect current PIN supplied. Please ask the customer to retry.
04-08	PIN Change declined by FI	06 and 66 (Change PIN)	Decline response from FI/NBE	Customer's PIN has not been changed. Advise the customer to contact their card issuer.
09	Declined – PIN blocked	06 and 66 (Change PIN)	FI Declined	PIN tries exceeded. Advise the customer to contact their card issuer.
10-19	Declined (not used - code reserved)	06 and 66 (Change PIN)	Decline response from FI/NBE	Customer's PIN has not been changed. Advise the customer to contact their card issuer.
03	Declined – Incorrect PIN	All except 06 and 66	FI Declined (Incorrect PIN entered)	Incorrect PIN supplied. Please ask the customer to retry.

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04	Declined – Insufficient Funds	03 and 63	FI Declined (No balance provided)	Advise customer that a balance enquiry option may be available.
04	Declined – Insufficient Funds	04, 05, 64 and 65	FI Declined (Balance will be printed on the receipt if provided by FI).	Advise customer that balance may be printed on the receipt and if not that a balance enquiry option may be available.
05	Declined – Usage Violation (frequency)	All except 06 and 66	FI Declined	Advise the customer to contact their card issuer.
06	Declined – Usage Violation (Amount)	All except 06 and 66	FI Declined	Advise the customer to contact their card issuer.
07	Declined – Transaction not supported	All except 06 and 66	FI Declined	This transaction is not supported for this card. Advise the customer to contact their card issuer.
08	Declined – Other	All except 06 and 66	FI Declined	Advise the customer to contact their card issuer.
09	Declined – PIN blocked	All except 06 and 66	FI Declined	PIN tries exceeded. Advise the customer to contact their card issuer.
52	Authorised by FI/NBE	All except 06 and 66	Declined – authorised amount differs from requested amount	Authorised amount incorrect. Advise the customer to contact their card issuer.
53	Authorised by FI/NBE	All except 06 and 66	Declined – authorised amount greater than maximum	Authorised amount over maximum. Please retry later.
80	Declined – card veto	All	Declined - (card veto)	The transaction has been declined by the customer's card.

6.2.3 Decline messages on screen 10

The message in the table below will appear on screen 10 (see 7.1.9) depending on the Transaction Types and the Response Code received back from the Financial Institution / Agent:

Response Code	Authorisation Status	Transaction type	Outcome	Clerk Screen Soft-coded message	Receipt Text

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10-19	Declined (not used - code reserved)	All except 06 and 66	Decline response from FI/NBE	Request unsuccessful, retry the transaction once only, then advise customer of alternatives. ‖Please do not call the Horizon System Helpdesk.	
20-29	Unknown PIN Change outcome	06 and 66 (Change PIN)	No response from FI/NBE	PIN change request may not have completed. Advise the customer to contact their card issuer.	
20-29[37]	Failed by NBE	All except 06 and 66	System/Network Failure	Request unsuccessful, retry the transaction once only, then advise customer of alternatives. Please do not call the Horizon System Helpdesk.	
30	Failed by Agent	All	System/Network Failure	Service temporarily unavailable, retry in 30 minutes or advise customer of alternatives. Please do not call the Horizon System Helpdesk.	
31	Failed by Agent (where Help Desk has been informed of expected date / time when NBE will available)	All	System/Network Failure	Service currently unavailable, retry after [*date/time*], or advise customer of alternatives. Please do not call the Horizon System Helpdesk.	
32-39	Failed by Agent	All	System/Network Failure	Request unsuccessful, retry the transaction once only, then advise the customer of alternatives. Please do not call the Horizon System Helpdesk.	
40-45	Failed by/at Counter	All	System/Network Failure	Request unsuccessful, retry the transaction once only, then advise the customer of alternatives. Please do not call the Horizon System Helpdesk.	
46	Failed by/at Counter	All	System/Network Failure	Service temporarily unavailable, retry in [*number of minutes*] minutes or advise customer of alternatives. Please do not call the Horizon System Helpdesk.	

[37] Individual codes in the range 20 – 29 can be broken out from this range once specific error conditions are defined.

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49	Failed by/at Counter	All	System/Network Failure local to Post Office	Unable to communicate with Gateway. Please follow standard processes and checks. Advise customer of alternatives.	
50	Failed at/by counter (other)	All	System/Network Failure	Request unsuccessful, retry the transaction once only, then advise the customer of alternatives. Please do not call the Horizon System Helpdesk.	
55-59[38]	Failed at/by counter (other)	06 and 66 (Change PIN)	System/Network Failure	Request unsuccessful, retry the transaction once only, then advise the customer of alternatives. Please do not call the Horizon System Helpdesk.	RT53
55-59	Failed at/by counter (other)	All except 06 and 66	System/Network Failure	Request unsuccessful, retry the transaction once only, then advise the customer of alternatives. Please do not call the Horizon System Helpdesk.	RT21
90		06 and 66 (Change PIN)		Banking service for LINK is unavailable, retry after *[date/time]* or advise customer of alternatives.||Please do not call the Horizon System Helpdesk.	RT53
90		All except 06 and 66		Banking service for LINK is unavailable, retry after *[date/time]* or advise customer of alternatives.||Please do not call the Horizon System Helpdesk.	RT21
91		06 and 66 (Change PIN)		Banking service for A&L is unavailable, retry after *[date/time]* or advise customer of alternatives. ||Please do not call the Horizon System Helpdesk.	RT53
91		All except 06 and 66		Banking service for A&L is unavailable, retry after *[date/time]* or advise customer of alternatives. ||Please do not call the Horizon System Helpdesk.	RT21

[38] Previously Response code 54 was documented within this section. However, this code will only be generated by the Recovery process at the counter when the customer is not present, and will never be received from the data centre or the Financial Institution.

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92		06 and 66 (Change PIN)		Banking service for Card Account is unavailable, retry after *[date/time]* or advise customer of alternatives. ||Please do not call the Horizon System Helpdesk.	RT53
92		All except 06 and 66		Banking service for Card Account is unavailable, retry after *[date/time]* or advise customer of alternatives. ||Please do not call the Horizon System Helpdesk.	RT21
95		06 and 66 (Change PIN)		Banking service for LINK is temporarily unavailable, retry in 30 minutes or advise customer of alternatives. ||Please do not call the Horizon System Helpdesk.	RT53
95		All except 06 and 66		Banking service for LINK is temporarily unavailable, retry in 30 minutes or advise customer of alternatives. ||Please do not call the Horizon System Helpdesk.	RT21
96		06 and 66 (Change PIN)		Banking service for A&L is temporarily unavailable, retry in 30 minutes or advise customer of alternatives. ||Please do not call the Horizon System Helpdesk.	RT53
96		All except 06 and 66		Banking service for A&L is temporarily unavailable, retry in 30 minutes or advise customer of alternatives. ||Please do not call the Horizon System Helpdesk.	RT21
97		06 and 66 (Change PIN)		Banking service for Card Account is temporarily unavailable, retry in 30 minutes or advise customer of alternatives. ||Please do not call the Horizon System Helpdesk.	RT53
97		All except 06 and 66		Banking service for Card Account is temporarily unavailable, retry in 30 minutes or advise customer of alternatives. ||Please do not call the Horizon System Helpdesk.	RT21

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Note: the text associated with the RT numbers is shown in the Outcome Message Text in section 3.1.2.

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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[39]	Single beep, 2kHz for 100ms
Card to be removed	Beep, 1kHz for 100ms: followed by 100 ms silence and repeat
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/003

[39] There is a single beep following card insertion. It occurs when the card is recognised as a valid ICC card by the PIN pad, but prior to application selection. There are no beeps on PIN pad prompts to the customer at application selection. This is at variance with CP3648, which did not itself match the underlying Post Office CR (PSO_FSL_00085 v2).

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7 Annexe A

EMV Banking 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 Banking is baselined. The screen layouts defined in NB/SPE/003 take precedence over those shown below.

7.1 Counter Screens from NBS used for EMV Banking

7.1.1 Screen1: Display available options

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7.1.2 Screen 2: Enter Amount

7.1.3 Screen 3: Waiting for PIN – PIN Change

The Waiting for PIN screens for EMV are now shown in 5.1.19 Screen EB19: *Change PIN Retry* and in 5.1.20 Screen EB20: *Change PIN Last Try*.

7.1.4 Screen 5: Waiting for Authorisation

The Waiting for Authorisation screen for EMV is now shown in 5.1.22 Screen 5 (EMV) – Waiting for authorisation.

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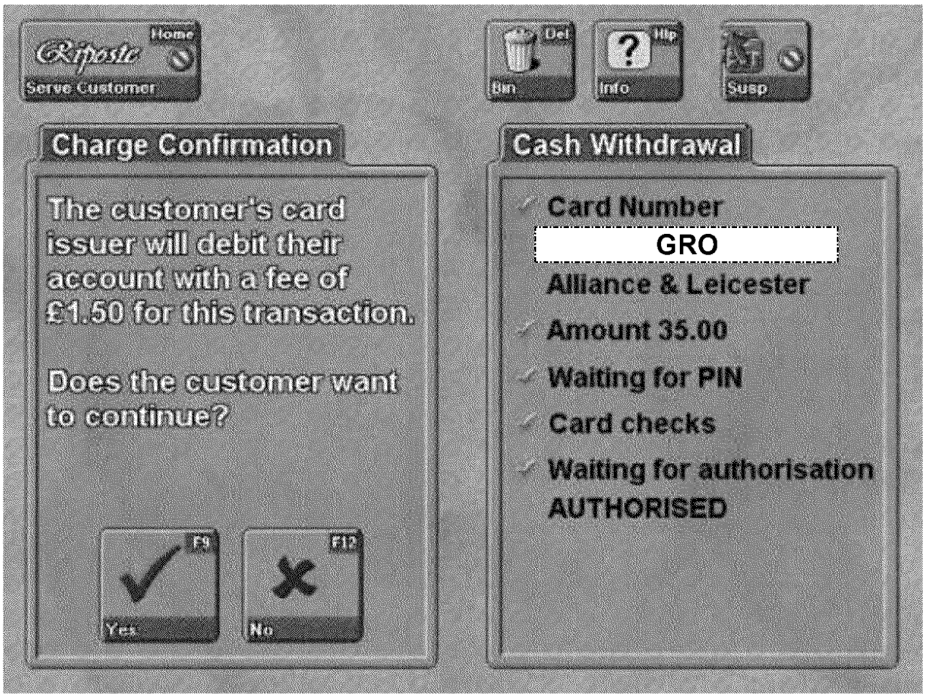
7.1.5 Screen 6: Charge Confirmation

The precise list of information presented in the RH panel varies with the service type.

The value in the Fee field supplied by the FI in the [A] message is displayed within the LH panel. [NBR150]



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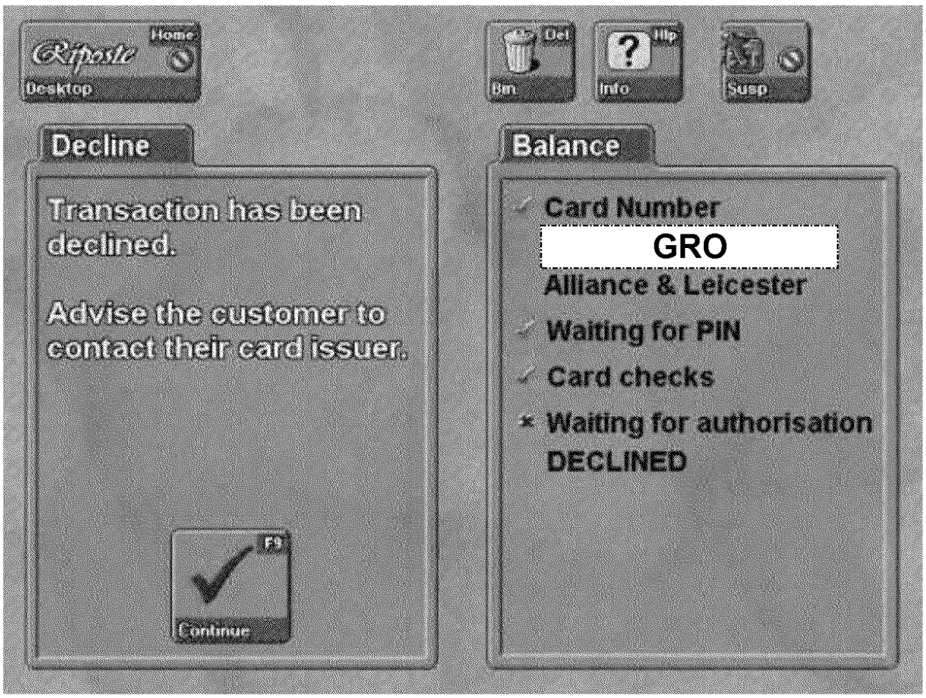
7.1.6 Screen 7: Other Decline

The precise list of information presented in the RH panel varies with the service type. **Card checks** will only be carried out if the card goes through the magnetic swipe reader but not if the card is processed in the PIN pad.

The information in the LH panel varies with the decline reason i.e .response code from FI or local reason defined by the point at which the Clerk declined the transaction. The values of the message text which appear in the LH panel are defined in section 6.2.2.



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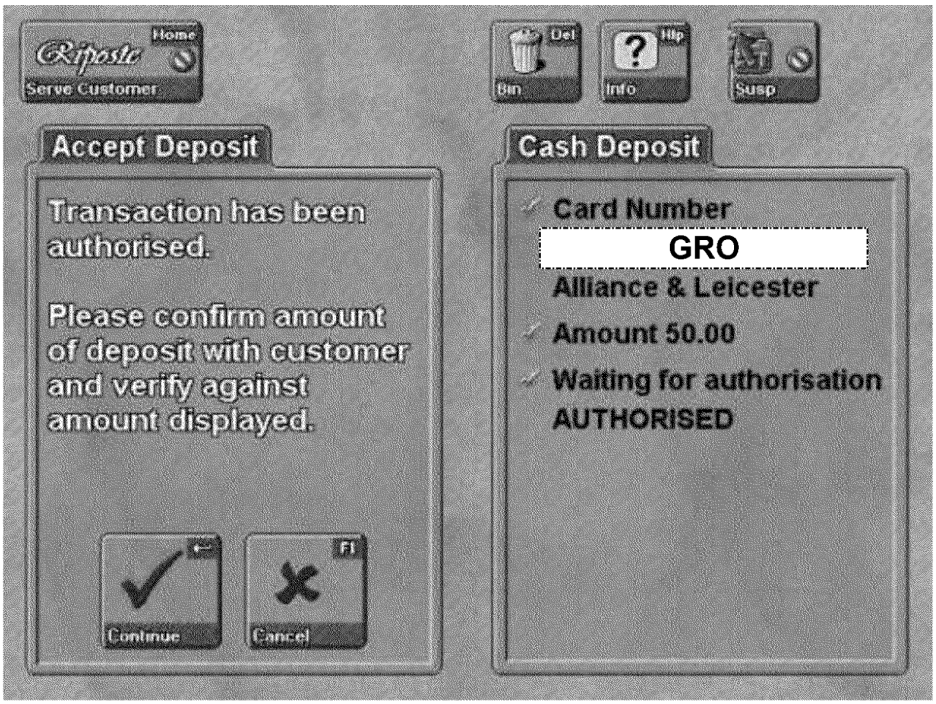
7.1.7 Screen 8: Accept Deposit



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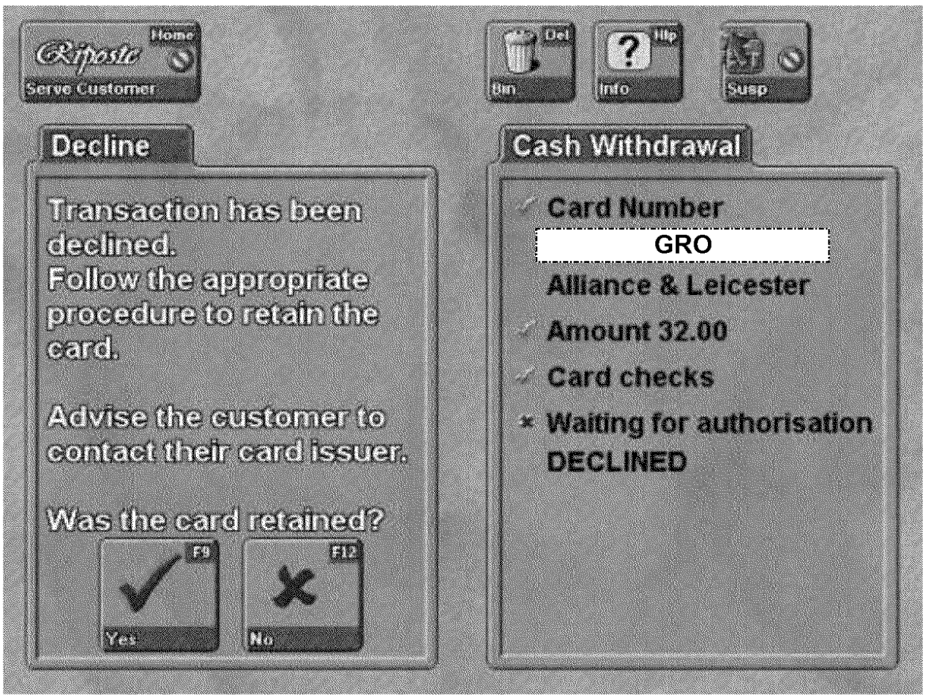
7.1.8 Screen 9: Card Retain



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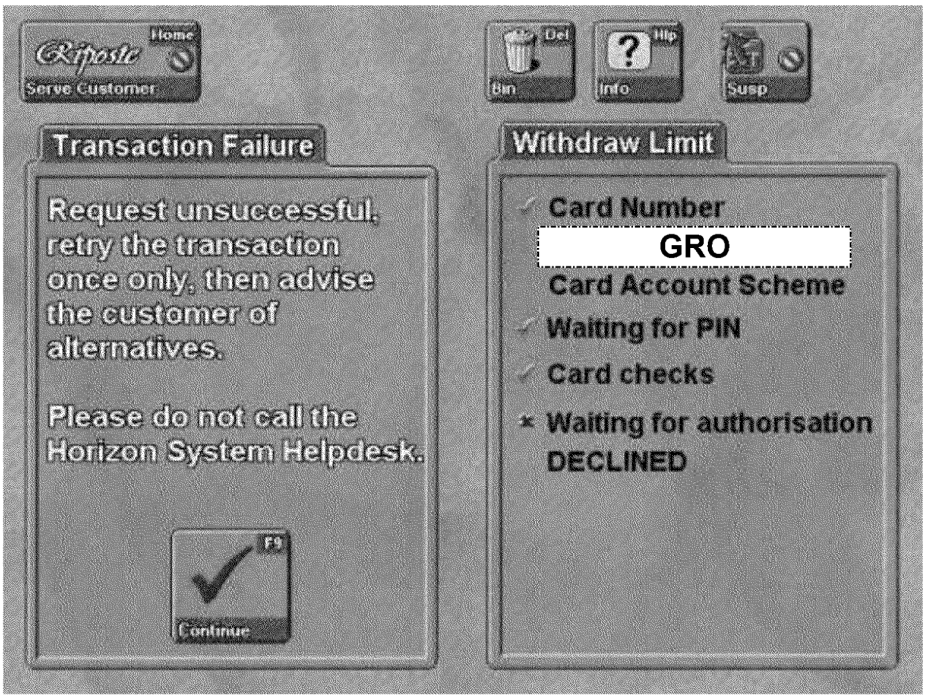
7.1.9 Screen 10: Do not call help desk

The precise list of information presented in the RH panel varies with the service type. **Card checks** will only be carried out if the card goes through the magnetic swipe reader but not if the card is processed in the PIN pad.

The information in the LH panel varies with the decline reason i.e .response code from FI or local reason defined by the point at which the Clerk declined the transaction. The values of the message text which appear in the LH panel are defined in section 6.2.3.



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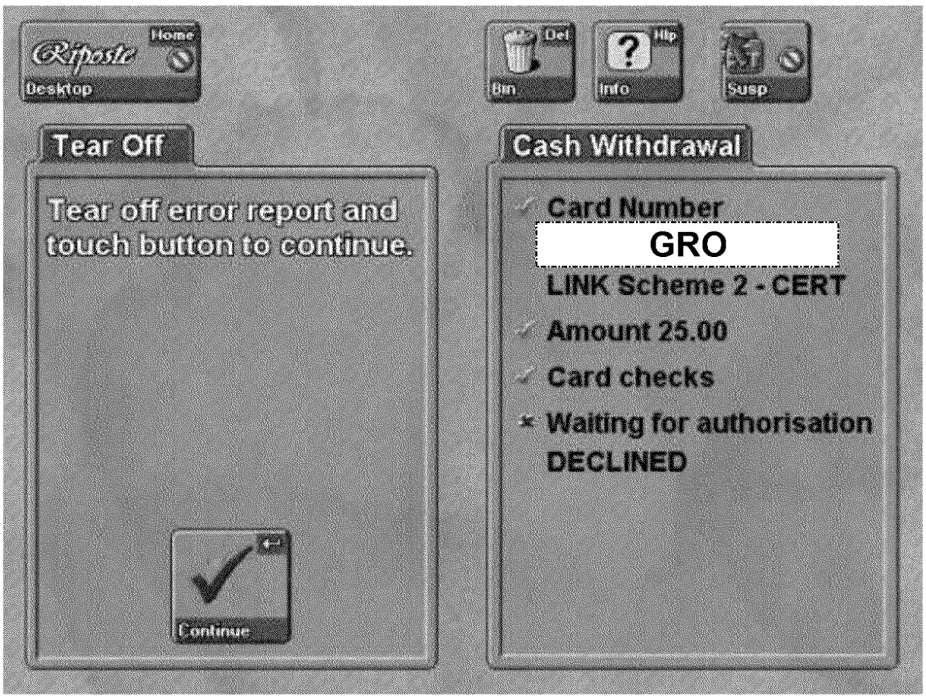
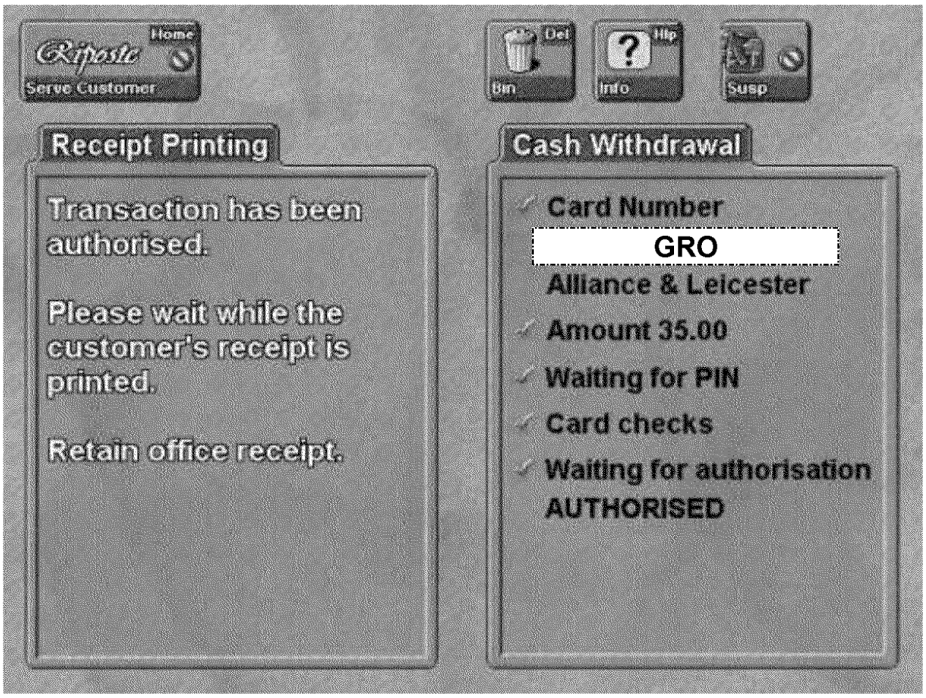
7.1.10 Screen 12: Tear off Error Message Instruction



7.1.11 Screen 14: Printing Receipt



Note: The text “Retain Office Receipt” will not be present on this screen

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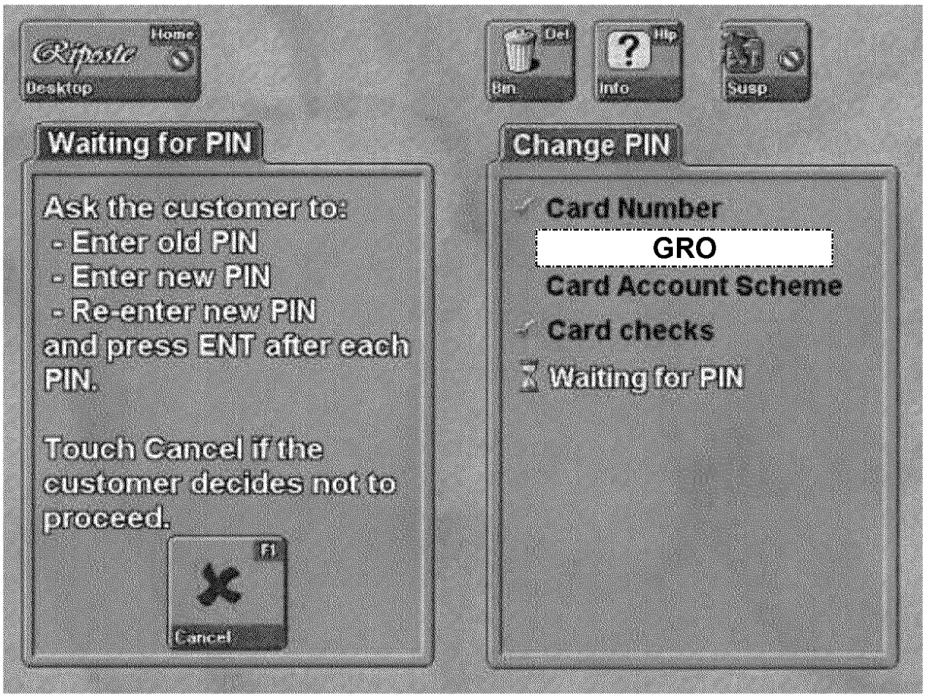
7.1.12 Screen 18: Change PIN - Waiting for PIN

The precise list of information presented in the RH panel varies with the service type.



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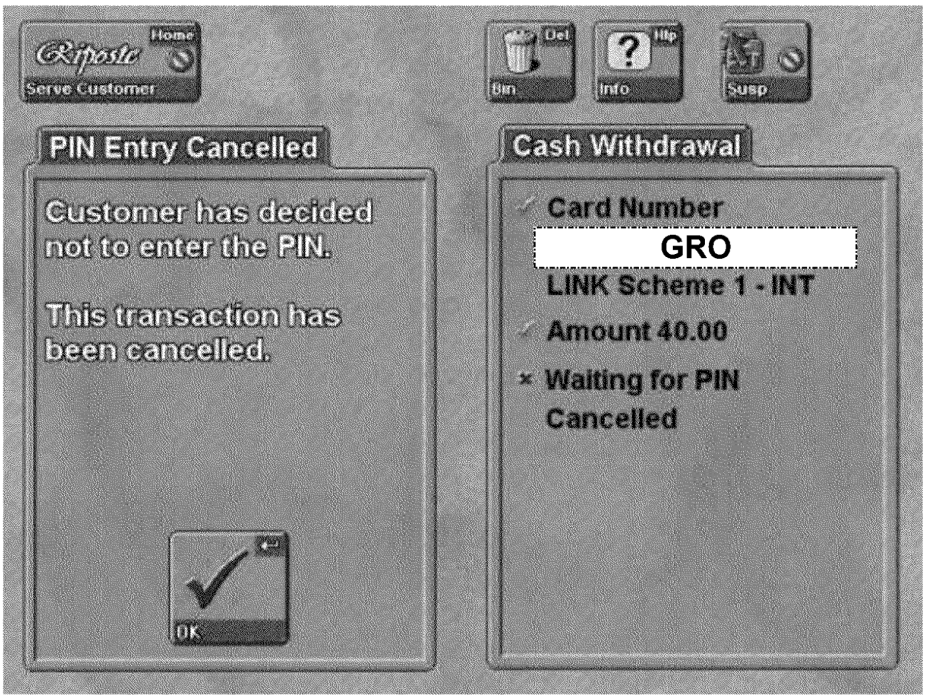
7.1.13 Screen 19: Abandon Message



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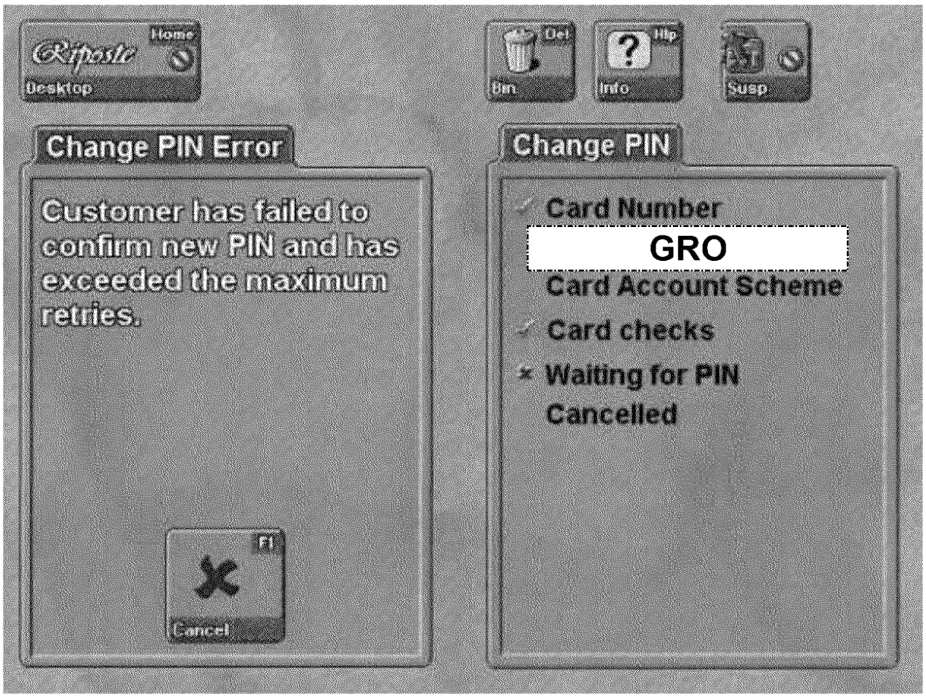
7.1.14 Screen 20: Change PIN Error

The precise list of information presented in the RH panel varies with the service type.

Note : the number of possible retries is controlled by Pathway Reference Data.



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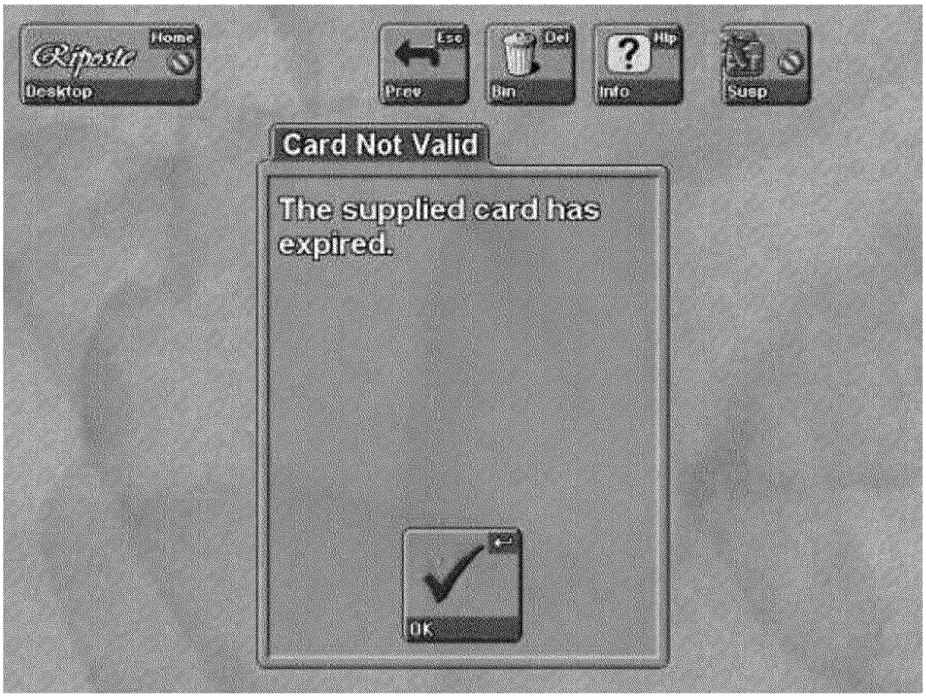
7.2 Error Screens from NBS

7.2.1 Screen E4: Invalid Card

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

- The supplied card is corrupt
- The supplied card has expired
- The supplied card is not valid



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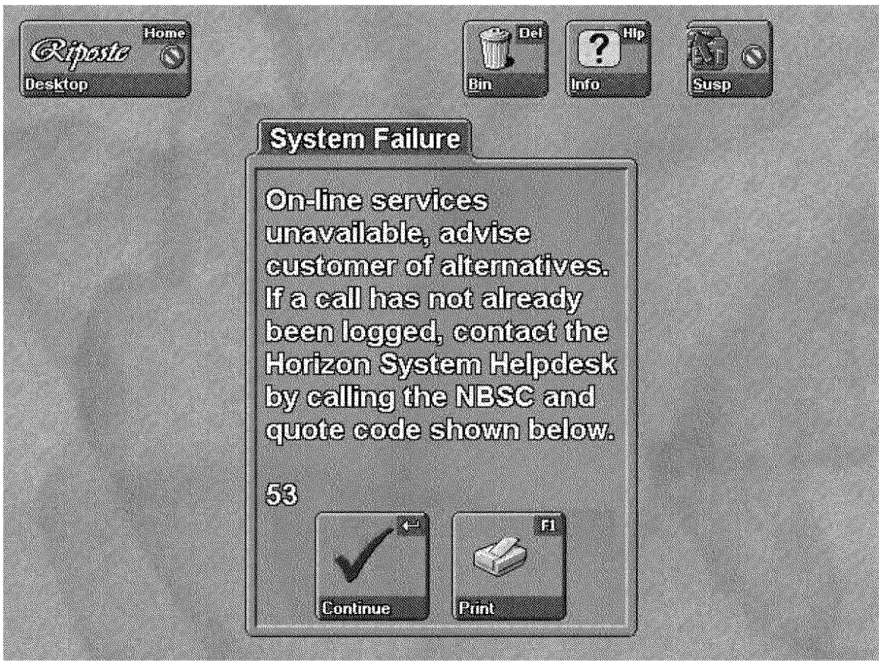
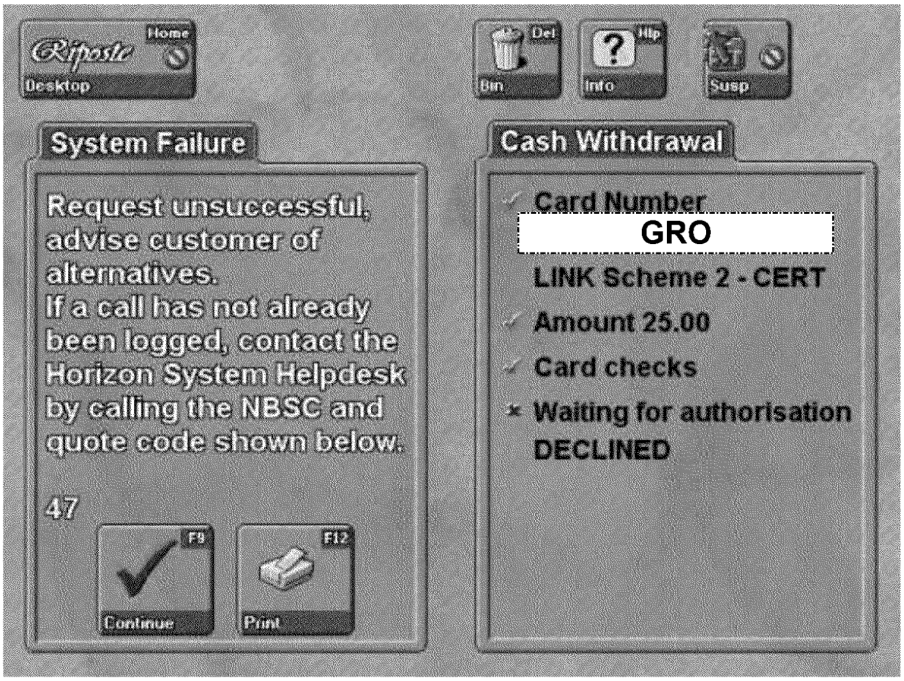
7.2.2 Screen E7: System failure



7.2.3 Screen E8: Contact helpdesk



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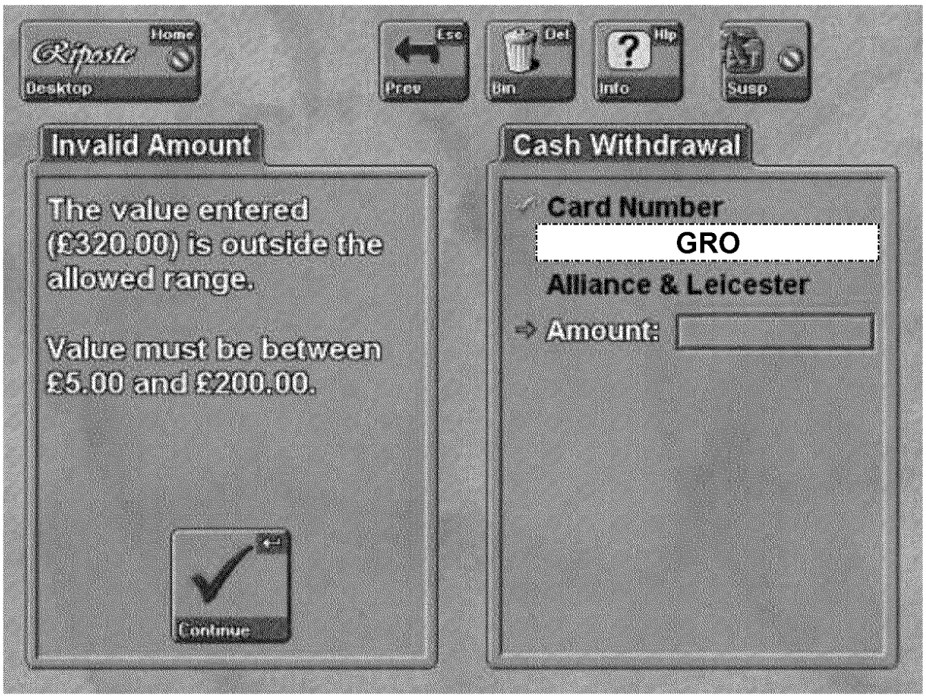
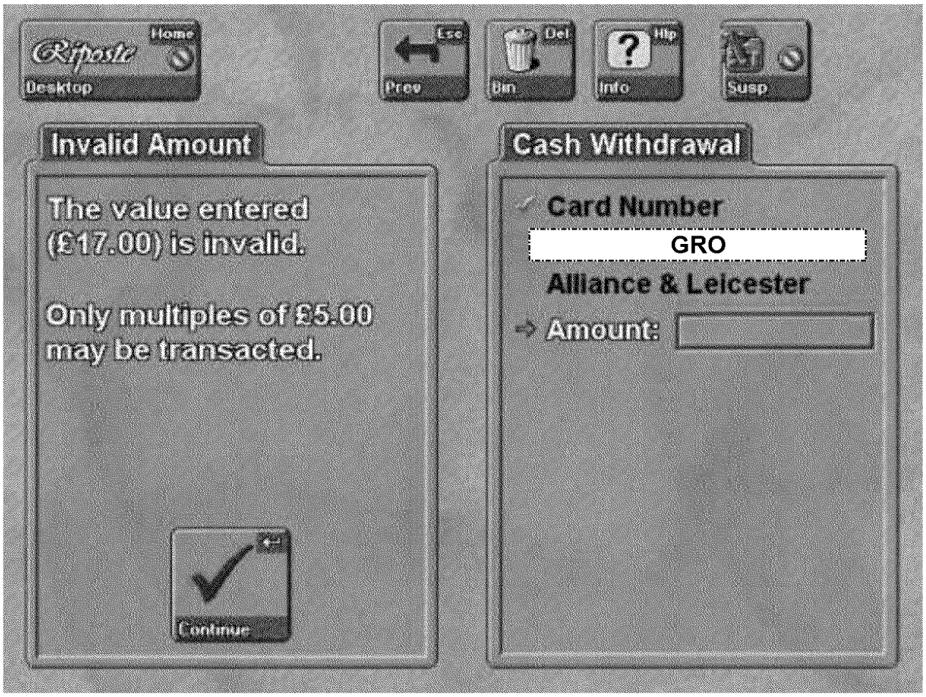
7.2.4 Screen E9: Invalid Amount - range



7.2.5 Screen E10: Invalid Amount - multiples



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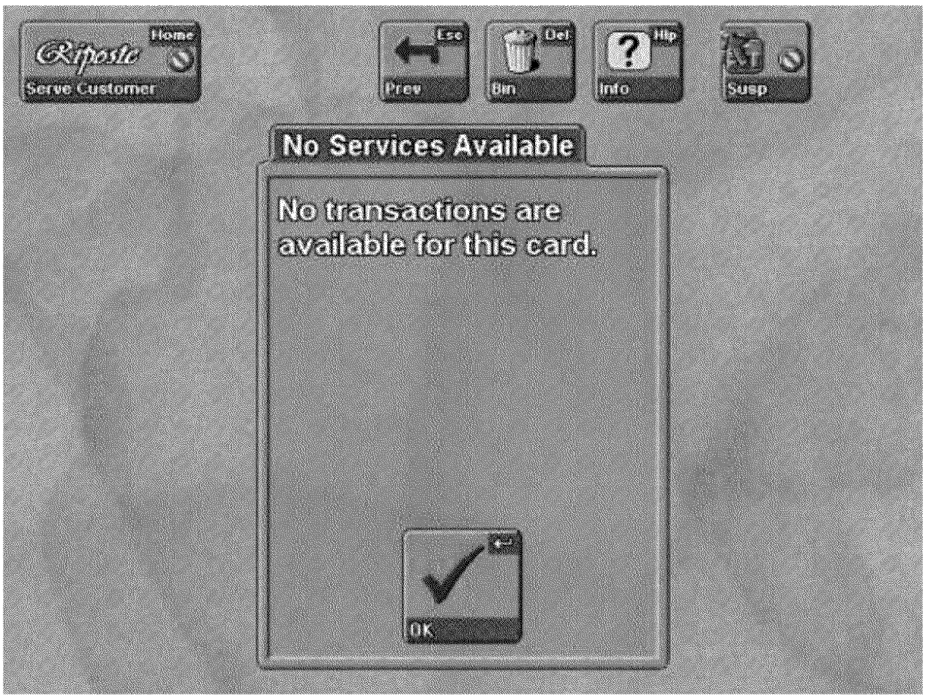
7.2.6 Screen E11: No services available

This screen will be displayed in the following circumstances:

1. The card is known to the system but no transactions are available for it.
2. 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.
3. 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.



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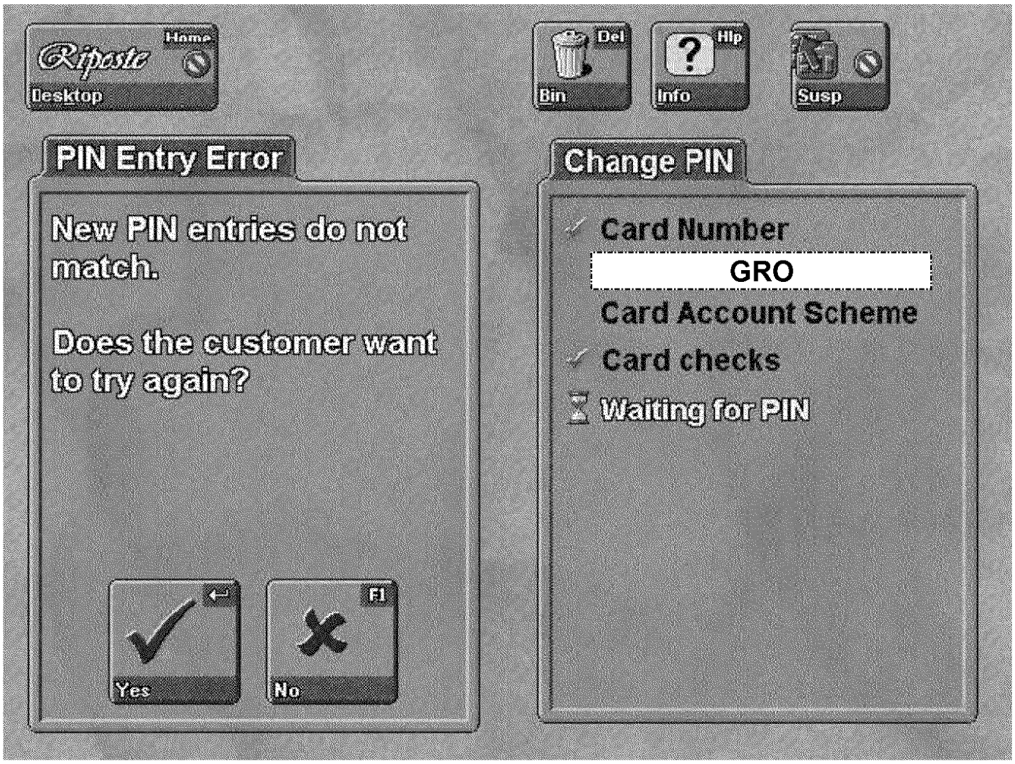
7.2.7 Screen E19: PIN Entry error

The first part of the message will vary according to the error condition.

The precise list of information presented in the RH panel varies with the service type.



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8 Annexe B

8.1 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 us 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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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 acknowledgement may seem to be made to the TDR. In such situations the acknowledgement is made to the command which preceded the TLV command.
VFY		Y	Informs the counter of the outcome of CVM processing. It requires acknowledgement.

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9 Annexe C

9.1 PIN Pad Error Codes and Screen EB11 Clerk Messages

The following table shows the Hypercom error messages with equivalent messages for clerk consumption. The clerk messages will be displayed on the EB11 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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		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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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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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	

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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.[40]	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

[40] For error code 08033 screen EB4 (see 5.1.4) is output instead of screen EB11 (see 5.1.11).

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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.	1st and 2nd 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	

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10 Annexe D

10.1 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 EB15: Card Insertion Timeout (see 5.1.15)
PIN Entry (Financial Transaction)	120 seconds	Counter ceases to display the screen it is currently displaying (i.e. screen EB2) and displays screen EB4: Cancelled Screen (see 5.1.4) instead
PIN Entry of Old PIN (Change PIN)	120seconds	Counter ceases to display the screen it is currently displaying (i.e. screen EB2) and displays screen EB4: Cancelled Screen (see 5.1.4), instead
PIN Entry of New PIN (Change PIN)	240seconds[41]	Counter ceases to display the screen it is currently displaying (i.e. screen EB2) and displays screen EB4: Cancelled Screen (see 5.1.4), instead
Card removal	15 seconds	The process for card removal timeout processing is described in NB/PRP/004 in Figures 5a Remove Card, and 5b Approved Remove Card

[41] The total time allowed for entering the new PIN twice is 240 seconds.