The Cheque Processing Module

Chapter 16.3

INTRODUCTION ................................................................. 16.3-1
OPERATIONAL ENVIRONMENT ........................................ 16.3-1
SECURITY ................................................................. 16.3-1
SPECIFICATION .......................................................... 16.3-1
  Cheque Dimensions ................................................. 16.3-1
  Power Requirements ............................................ 16.3-1
  Weight ................................................................. 16.3-2
  Dimensions .......................................................... 16.3-2
  Storage Capacities ............................................... 16.3-2
  Consumable Capacities ........................................... 16.3-2

FUNCTIONAL DESCRIPTION .............................................. 16.3-3

MECHANICAL DESCRIPTION ............................................. 16.3-3
  DETACHING THE TRANSPORT MODULE .................. 16.3-4
  DETACHING THE SCANNER MODULE ....................... 16.3-5
  TRANSPORT MODULE .................................................. 16.3-7
    CPM Control Board ........................................... 16.3-7
    Outfeed Transport ............................................ 16.3-11
  SCANNER MODULE .................................................... 16.3-14
    Stamp ............................................................ 16.3-15
    Inking Roller ................................................... 16.3-15
    Print Head ....................................................... 16.3-15
    MICR Reader .................................................. 16.3-15
    Scanner Module Sensors ..................................... 16.3-15
  STORAGE MODULE ..................................................... 16.3-16
    Detaching The Scanner AC Power Supply ............... 16.3-16

ELECTRONIC/ELECTRICAL DESCRIPTION ...................... 16.3-17
  CPM CONTROL BOARD ........................................... 16.3-17
    CPM Control Board Block Diagram ....................... 16.3-18
    CPM Control Board Assembly .............................. 16.3-19
    Configuration Switch ......................................... 16.3-20
  SCANNER CONTROL BOARD .................................... 16.3-21
    Configuration Switches ...................................... 16.3-22
THE CHEQUE PROCESSING MODULE

SENSORS ............................................................................................................ 16.3-23
Photosensors.................................................................................................... 16.3-23
Shutter Microswitch.................................................................................... 16.3-24
MOTOR OPERATION...................................................................................... 16.3-25
SOLENOID OPERATION.................................................................................. 16.3-26

ERROR CODES AND DIAGNOSTICS................................................................. 16.3-27
LEVEL 0 DIAGNOSTICS .................................................................................. 16.3-27
LEVEL 1 DIAGNOSTICS .................................................................................. 16.3-27
Enable.............................................................................................................. 16.3-27
Eject................................................................................................................. 16.3-27
Print.................................................................................................................. 16.3-27
Stamp................................................................................................................ 16.3-27
Capture Bin 1, 2 or 3 ....................................................................................... 16.3-28
Clear.................................................................................................................. 16.3-28
Display Front Image....................................................................................... 16.3-28
Display Rear Image........................................................................................ 16.3-28
Sensors ............................................................................................................ 16.3-28
Run To Run ..................................................................................................... 16.3-28
Nip Solenoid Test............................................................................................ 16.3-28
Bin1 Solenoid Test .......................................................................................... 16.3-28
Bin2 Solenoid Test .......................................................................................... 16.3-28
Rocker Solenoid Test ...................................................................................... 16.3-29
Shutter Solenoid Test ...................................................................................... 16.3-29
M_STATUS .................................................................................................... 16.3-29
M_DATA ........................................................................................................ 16.3-30
LEVEL 3 DIAGNOSTICS .................................................................................. 16.3-31
S_DATA.......................................................................................................... 16.3-31
Tallies.............................................................................................................. 16.3-31

STRAPPING............................................................................................................. 16.3-32

ADJUSTMENTS .................................................................................................... 16.3-33
PRINT HEAD REPLACEMENT ................................................................. 16.3-33
INKING ROLLER REPLACEMENT ............................................................... 16.3-35
STAMP REPLACEMENT .................................................................................. 16.3-36

TEST EQUIPMENT ................................................................................................. 16.3-37

INTERNAL CABLES .............................................................................................. 16.3-38
CPM INTERCONNECTION DIAGRAM .......................................................... 16.3-38
445-0643597 - SCSI RIBBON CABLE .............................................................. 16.3-38
445-0643370 - DC POWER CABLE ............................................................... 16.3-39
445-0643372 - AC POWER CABLE ............................................................... 16.3-39
445-0643726 - TRANSPORT INFEED HARNESS ............................................ 16.3-40
445-0645193 - TRANSPORT OUTFEED HARNESS ..................................... 16.3-41

SCHEMATICS......................................................................................................... 16.3-42
The Cheque Processing Module

INTRODUCTION

The Cheque Processing Module (CPM) allows for the payment of services or lodgement of cheques with a financial organization.

The functions of the CPM are activated by control boards in response to sensors in the module. The transport sensors monitor the position of a document within the module and verify that transactions have been correctly performed.

OPERATIONAL ENVIRONMENT

The CPM operates under the control of its own on-board microprocessors. It communicates with the ATM central processing unit over the SCSI bus.

SECURITY

A security shutter at the entry of the CPM prevents unauthorized material being entered into the module.

SPECIFICATION

Cheque Dimensions

Cheques and giros must be within the following size limits:

- Length - 150 mm to 225 mm (5.91 in. to 8.89 in.)
- Width - 63.5 mm to 108.0 mm (2.50 in to 4.25 in.)
- Thickness - 0.076 mm to 0.120 mm (0.003 in. to 0.0047 in.)
- Weight - 75 g/m² to 105 g/m².

Power Requirements

The power requirements for the CPM are:

- Direct current:
  - +12 V ± 2% 0.045 A
  - +24 V ± 2% 0.75 A

- Alternating current:
  - 110 V ± 2%, frequency 60 Hz, 0.42 A r.m.s.
THE CHEQUE PROCESSING MODULE

Weight
The weight of the CPM is 20 kg (44 lb).

Dimensions
The dimensions of the CPM are:
- Width = 165 mm (6.50 in.)
- Height = 950 mm (37.40 in.)
- Depth = 535 mm (21.06 in.)

Storage Capacities
The capacities of the storage bins is as follows:
- Main bin (1) - 700 flat or 300 conditioned cheques
- Reject bin (2) - 50 flat or 21 conditioned cheques
- Auxiliary bin (3) - 35 flat or 15 conditioned cheques.

Consumable Capacities
The CPM consumable items have the following capacities:
- Ink-Jet cartridge - the ink jet cartridge has the capacity to print 600,000 normal characters or 250,000 bold face characters. This corresponds to a lifetime of approximately 3 months in normal service.
- The inking roller life is approximately 3 months in normal service.
FUNCTIONAL DESCRIPTION

The following sections cover the mechanical and electronic/electrical functional descriptions.

MECHANICAL DESCRIPTION

The main mechanical elements of the CPM are as follows:

- CPM transport module comprising:
  - Security shutter and infeed transport
  - Scanner module
  - Outfeed transport
  - CPM Control Board

- Scanner power supply
- Document storage bins.
DETACHING THE TRANSPORT MODULE

Detach the transport module as follows:

1. Release the two retaining screws on the right-hand side of the module.

2. Release the single retaining screw on the left-hand side of the module.

3. Lift the transport module from the storage module.
DETACHING THE SCANNER MODULE

Detach the scanner module as follows:

1. Push back the SCSI connector latches and detach the SCSI ribbon cable.

2. Remove the 4 retaining screws and 2 spacers at the right-hand side of the scanner module, as shown in the diagram below.
3. Remove the 4 retaining screws and 2 spacers at the left-hand side of the scanner module, as shown in the diagram below.

4. Lift off the scanner module.
TRANSPORT MODULE
The transport module comprises:

- CPM Control board
- Infeed transport
- Outfeed transport.

CPM Control Board
The CPM Control Board, NCR Part No. 445-0643375, is a replaceable item. It is replaced as follows:

1. Carefully remove the SCSI ribbon cable from the retaining brackets on the Control Board cover plate.
2. Release the SCSI plug latches and unplug the SCSI cable from the Control Board.
3. Remove the three screws retaining the cover plate.
4. Remove the cover plate through the bottom of the transport module.

5. Disconnect the Infeed and Outfeed cables from the Control Board, unscrew the three standoff pillars, and lift the Control Board from its retaining pillars.
6. Remove the board through the bottom of the transport module

Infeed Transport
THE CHEQUE PROCESSING MODULE

The Infeed Transport:
- has a Media Entry Indicator
- accepts documents presented at the entry shutter
- transports documents to the scanner module
- returns unacceptable documents to the entry shutter.

The components which achieve these functions are:
- security shutter, shutter solenoid and shutter microswitch
- infeed drive motor, drive belts and drive wheels
- infeed divert solenoid, rocker arm and pinch rollers
- infeed front, middle and rear photosensors.

The electronic components are connected to the CPM Control Board which monitors the sensors and operates the motor and solenoids accordingly.

Security Shutter
The security shutter is opened by a solenoid when authorized by the ATM. A microswitch senses when the shutter is open for error detection purposes. When a document has been accepted into the CPM, or when no document is inserted within 15 seconds of the shutter opening, the shutter is closed.

Infeed Drive Motor and Drive Belts

![Diagram of infeed motor and drive belts]

The infeed drive stepper motor is driven in a direction determined by the CPM Control Board. The motor drives two wheels via O-ring drive belts. These drive belts are replaceable components.
The drive wheels each have a replaceable O-ring.
Infeed Divert Solenoid and Mechanism
The transport direction of a document in the infeed is controlled by the infeed divert solenoid. The solenoid operates a rocker arm on which are mounted two pinch rollers. In the de-energized state of the solenoid, the rocker arm provides pinch action to the infeed drive wheel, taking a document presented at the shutter into the CPM.

When the solenoid is energized, the rocker arm provides pinch action to the divert drive wheel, taking a document returned from the scanner module and transporting it to the entry shutter for return to the user.

Photosensors
The infeed photosensors consist of two printed circuit assemblies:

- an infra-red LED
- an infra-red photo-transistor.

These are located on either side of the transport path. The circuit boards are soldered into the infeed harness.

The photosensors are used to detect the presence of documents.

Outfeed Transport
The main elements of the outfeed transport are shown in the following illustrations:
The Outfeed transport:

- transports accepted documents to the bin module feed
- diverts documents to one of the three bins.

The components which achieve these functions are:

- nip solenoid
- outfeed drive motor, drive belt and guide wheels
- bin 1 divert solenoid
- bin 2 divert solenoid
- outfeed nip and bin photosensors.

The electronic components are connected to the CPM Control Board which monitors the sensors and operates the motor and solenoids accordingly.

**Nip Solenoid**

The nip solenoid operates pinch rollers on a pair of drive wheels so that an accepted document passed from the scanner module is transported to the storage module.

**Outfeed Drive**

The outfeed drive is provided by a stepper motor and single belt driving the outfeed transport wheels.

**Bin Divert Solenoids**

Two solenoids can be operated to control the movement of a document into one of the three storage bins in the storage module.
Photosensors
The outfeed sensors consist of a photo-emitter and photo-transistor that are a snap fit into the metalwork. The emitter and transistor assemblies have integral leads which form part of the outfeed harness.
SCANNER MODULE

The scanner module is a self-contained unit attached to the transport module. The module is serviced by the manufacturers. The description that follows is for general information only. The main features of the scanner module are shown in the following diagram:

1. Rear scanner
2. Front scanner
3. Front document stamp
4. Inking roller
5. MICR code line read head
6. MICR magnetizing head
7. Document entrance
8. Document transport motor
9. Ink-jet write head.

The components which achieve these functions are:

- front and rear document scanner units
- cancellation stamp and inking roller
- ink-jet print head
- MICR reader, comprising the read head and the magnetizing head
- position and synchronizing photosensors.

The module has its own Scanner Control Board to control the transport and functions of the module.

The scanner module:

- accepts documents from the infeed transport
- magnetizes a document code line
- reads a document magnetized code line
- stamps a cancellation on the front of documents
- prints an endorsement on the rear of documents
- scans and stores document front and rear images
- passes documents to the bin outfeed transport or returns documents to the infeed transport.
Stamp
The endorsement stamp is NCR Part No. 905273.
The void stamp is NCR Part No. 905260.

Inking Roller
- The inking roller is NCR Part No. 905286. This is a throw away item.

Print Head
- The print head is a Hewlett Packard (HP) HP51604A ink jet print head cartridge (NCR Part No. 529840). This is a throw away item.

MICR Reader
The MICR reader supports the following character formats:
- OCR-A Numeric and Alphanumeric
- OCR-B Numeric and Alphanumeric
- OCR-B Special
- CMC7
- E13B

NOTE: Only E13B is supported in the CPM configuration.

Scanner Module Sensors

1. Document entrance sensor
2. Gear motor sensor
3. MICR alignment synchronism sensor
4. Stamp and Ink-jet synchronism sensor
5. Scanner synchronism sensor.
STORAGE MODULE
The document storage module, NCR Part No. 445-0643439, comprises three bins. Refer to Detaching the Transport Module earlier in this chapter for separating the Bin Module and Transport Module.

Detaching The Scanner AC Power Supply
The ac power supply is attached underneath the storage module. The power supply is detached by slackening the rear supply retaining nut and sliding the power unit off the front “mushroom” retaining stud.
ELECTRONIC/ELECTRICAL DESCRIPTION

CPM CONTROL BOARD
The CPM Control Board, Part No. 445-0643375, comprises the following main functional blocks:

- Infeed control
- Outfeed control
- SCSI Interface.

The board is connected to the ATM SCSI bus. The bus is daisy chained through the board to a connector output to the scanner module Scanner Control board.

A dc power input connects to the ATM Uniharness via an extension cable. The infeed and outfeed signals and controls are routed to separate board connectors.

The following figures show a block diagram of the CPM Control Board and the board component layout:
Configuration Switch

DIP switch S1 is used to configure the CPM Control Board SCSI address. The default setting for the CPM is as follows:

<table>
<thead>
<tr>
<th>Peripheral address</th>
<th>S1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>OFF</td>
</tr>
</tbody>
</table>
The SB500 Scanner Control Board is a proprietary board supplied as part of the scanner module. A functional description of the board is beyond the scope of this document.

The Scanner Control Board controls the transport and processing of documents within the scanner module. The board is part of the scanner module, which is a return-to-maker assembly. A block diagram of the scanner control board interconnection is shown below for information only.
Configuration Switches

There are two DIP switches used to set up the Scanner Control Board SCSI address and the configuration of the scanner module peripherals as follows:

Scanner Module Peripherals Configuration Switch

The CPM default switch SW1 settings for the scanner module are as follows:

<table>
<thead>
<tr>
<th>Device</th>
<th>SW1</th>
</tr>
</thead>
<tbody>
<tr>
<td>MICR codeline reader</td>
<td>1 ON</td>
</tr>
<tr>
<td>Front stamp</td>
<td>2 ON</td>
</tr>
<tr>
<td>Ink Jet calibration</td>
<td>3 OFF</td>
</tr>
<tr>
<td>Reserved. Always set to OFF</td>
<td>4 OFF</td>
</tr>
</tbody>
</table>

Scanner SCSI Address Configuration Switch

Switch SW2 sets the SB500 board default SCSI address as follows:

<table>
<thead>
<tr>
<th>Peripheral address</th>
<th>SW2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>ON</td>
</tr>
</tbody>
</table>
SENSORS

Photosensors

There are four sensors in the infeed transport system. The infeed transport system sensors consist of two pcbs as follows:

- An LED pcb with an infra-red emitter diode
- A sensor pcb with a phototransistor.

There are four sensors in the outfeed transport system. The outfeed sensors consist of an infra-red emitter module and a phototransistor module. Both modules have integral flying leads.

The infra-red emitters are powered from a +5V supply on the CPM Control Board.

The phototransistors provide an open-collector drive to the CPM Control Board.

The assembly and schematic diagrams for the infeed sensors are as follows:

445-0628462 - Infeed Sensor Assembly

![Infeed Sensor Assembly Diagram]

445-0628464 - Infeed Sensor Schematic

![Infeed Sensor Schematic Diagram]
445-0632049 - Infeed LED Assembly

445-0632050 - Infeed LED Schematic

The outfeed emitter module is NCR Part No. 009-0016581.
The outfeed photosensor is NCR Part No. 009-0016582.
The outfeed emitter and photosensor are supplied with integral leads and form part of the outfeed harness.

Shutter Microswitch
The infeed shutter microswitch is part no. 009-0016592.
The microswitch provides a short circuit to 0V digital at the input to the CPM Control Board.
MOTOR OPERATION

There are two stepper motors associated with the CPM Control Board.

- The motor used in the transport infeed is NCR Part No. 009-0016531
- The motor used in the transport outfeed is NCR Part No. 009-0016532.

The motors are driven by a 24 Vdc supply on the Transport Control Board.
THE CHEQUE PROCESSING MODULE

Solenoid Operation

The solenoids used in the transport system are NCR Part No. 009-0009605. There are five solenoids in the transport module as follows:

- Shutter solenoid
- Infeed divert solenoid
- Outfeed nip solenoid
- Bin 1 divert solenoid
- Bin 2 divert solenoid.

The solenoids are driven by a 24 Vdc supply on the CPM Control Board.
ERROR CODES AND DIAGNOSTICS

LEVEL 0 DIAGNOSTICS
There are no Level 0 Diagnostics associated with the CPM.

LEVEL 1 DIAGNOSTICS
The Level 1 Diagnostics for the CPM are:
1. Enable
2. Eject
3. Print
4. Stamp
5. Capture Bin 1
6. Capture Bin 2
7. Capture Bin 3
8. Clear
9. Display Front Image
10. Display Rear Image
11. Sensors
12. Run To Run
13. Nip Solenoid Test
14. Bin1 Solenoid Test
15. Bin2 Solenoid Test
16. Rocker Solenoid Test
17. Shutter Solenoid Test

NOTE: Looping is allowed on tests 1, 2, 3, 4, 8, 10, 11, 12, 13, 14, 15, 16 and 17.

Enable
The Enable option enables the CPM. If no document is present in the CPM, the device waits 15 seconds. If a document is inserted, the document is scanned, its front and rear images are stored, and the codeline is displayed. The document is retained in the rear pocket transport and can be manipulated by other test options.

NOTE: A document must be inserted within 15 seconds of selecting this test or else the shutter will close and the test will terminate.

Eject
The Eject test returns a document from the transport system to the user. The user is prompted to remove the document.

NOTE: If the document is not removed within 15 seconds, it is retracted.

Print
The Print test prints a test endorsement on the rear of a document. The endorsement is upper case characters A to Z inclusive.

Stamp
The Stamp test prints a cancellation stamp on the front of a document.
THE CHEQUE PROCESSING MODULE

Capture Bin 1, 2 or 3
The Capture Bin 1, 2 or 3 tests move a document from the transport to the selected storage bin.

Clear
The Clear test checks the sensors to determine whether a document is present in the transport. A document in the transport is moved to the reject storage bin.

Display Front Image
The Display Front Image test displays the last captured front image. The image is displayed as 16 shade grey scale at a resolution of 200 dots per inch.

Display Rear Image
The Display Rear Image test displays the last captured rear image. The image is displayed as 16 shade grey scale at a resolution of 200 dots per inch.

Sensors
The Sensors test checks that all the photosensors in the CPM are operational. When the test is run in a loop, the solenoid on the shutter can be operated manually and photosensors can be individually blocked to check that a sensor state is detectable. If loop is off, running the Sensors test will only display M_DATA for the sensors that are currently blocked by a document in the transport.

Run To Run
The Run To Run test performs the following operations:

- Enable
- Read codeline
- Stamp
- Lift front image
- Lift rear image
- Eject

Nip Solenoid Test
The Nip Solenoid test allows the action of the solenoid in the rear pocket transport to be checked. If Loop is ON, the solenoid is toggled on and off approximately once per second. If Loop is OFF, the solenoid is toggled on and off once.

Bin1 Solenoid Test
The Bin1 Solenoid test allows the action of the Bin1 solenoid in the lower transport to be checked. If Loop is ON, the solenoid is toggled on and off approximately once per second. If Loop is OFF, the solenoid is toggled on and off once.

Bin2 Solenoid Test
The Bin2 Solenoid test allows the action of the Bin2 solenoid in the lower transport to be checked. If Loop is ON, the solenoid is toggled on and off approximately once per second. If Loop is OFF, the solenoid is toggled on and off once.
Rocker Solenoid Test
The Rocker Solenoid test allows the action of the Rocker solenoid in the entry transport to be checked. If Loop is ON, the solenoid is toggled on and off approximately once per second. If Loop is OFF, the solenoid is toggled on and off once.

Shutter Solenoid Test
The Shutter Solenoid test allows the action of the Shutter solenoid in the entry transport to be checked. If Loop is ON, the solenoid is toggled on and off approximately once per second. If Loop is OFF, the solenoid is toggled on and off once.

M_STATUS
The M_STATUS codes returned for the CPM are:

<table>
<thead>
<tr>
<th>M_STATUS</th>
<th>Severity</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>GOOD - No errors</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>JAM_ERROR - A jam occurred while moving a document</td>
</tr>
<tr>
<td></td>
<td></td>
<td>see note 1</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>NO_DOC_PRESENT - Command not completed because no document was in transport</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>DOC_PRESENT - Document already present when enable was issued</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>COMMAND_IN_PROGRESS - Command not completed because previous command was still in progress</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>HARDWARE_ERROR - a Hardware/Communication failure occurred</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>ALREADY_FATAL - Command not completed because device severity is already Fatal</td>
</tr>
<tr>
<td>7</td>
<td>3 or 4</td>
<td>ENTRY_FAILURES_EXCEEDED - Jam or timeout on document entry has exceeded threshold</td>
</tr>
<tr>
<td></td>
<td></td>
<td>see note 2</td>
</tr>
<tr>
<td>8</td>
<td>3</td>
<td>SHUTTER_JAM - Shutter jammed closed</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>SHORT_DOC - Short document entered</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>WRONG_POCKET - Document placed in wrong pocket. This occurs if bin divert gates fail</td>
</tr>
<tr>
<td>13</td>
<td>3 or 4</td>
<td>JAM_WITH_ACCESS - Shutter still open so user has access to document</td>
</tr>
<tr>
<td></td>
<td></td>
<td>see note 2</td>
</tr>
<tr>
<td>14</td>
<td>4</td>
<td>TOO_MANY_WITH_ACCESS - Jam with access count exceeded threshold</td>
</tr>
<tr>
<td>15</td>
<td>4</td>
<td>JAM_IN_OUTFEED - Document jammed in outfeed, possibly not covering any sensor</td>
</tr>
<tr>
<td>16</td>
<td>4</td>
<td>TOO_MAN_COMMS_ERROR - Consecutive comms errors exceeded internal threshold</td>
</tr>
</tbody>
</table>

NOTE: 1. If an M_STATUS of JAM_ERROR is reported during a capture, the severity will become FATAL (4).

NOTE: 2. Severity will be SUSPEND (3) if the system event counter Consecutive Failed Entry is greater than or equal to the lower threshold but less than the upper threshold. Severity will become FATAL (4) if the Consecutive Failed Entry counter is greater than or equal to upper threshold.
THE CHEQUE PROCESSING MODULE

M_DATA

The M_DATA returned for the CPM is as follows:

- **Byte 0** - Internal command being executed
  - 00 = Reset - resetting device
  - 01 = Enable - enabling device
  - 02 = Disable - disabling device
  - 03 = Eject - ejecting document
  - 04 = Capture - capturing document
  - 05 = Endorse - endorsing document
  - 06 = Clear - clearing device
  - 07 = Config - querying device configuration
  - 08 = Sensors - querying device sensors
  - 09 = Retract - retracting document
  - 10 = Status - querying device status
  - 11 = Sol_Test - testing solenoid
  - 12 = Generic - event generated while idle

- **Byte 1** - Shutter switch
  - 00 = Closed
  - 01 = Open

- **Byte 2** - Infeed left entrance sensor
  - 00 = Clear
  - 01 = Blocked

- **Byte 3** - Infeed right entrance sensor
  - 00 = Clear
  - 01 = Blocked

- **Byte 4** - Infeed middle sensor
  - 00 = Clear
  - 01 = Blocked

- **Byte 5** - Infeed rear sensor
  - 00 = Clear
  - 01 = Blocked

- **Byte 6** - Scanner front sensor
  - 00 = Clear
  - 01 = Blocked

- **Byte 7** - Scanner sensor at MICR head
  - 00 = Clear
  - 01 = Blocked

- **Byte 8** - Scanner sensor at print station
  - 00 = Clear
  - 01 = Blocked

- **Byte 9** - Scanner sensor at camera
  - 00 = Clear
  - 01 = Blocked

- **Byte 10** - Outfeed sensor at nip solenoid
  - 00 = Clear
  - 01 = Blocked
THE CHEQUE PROCESSING MODULE

- Byte 11 - Outfeed sensor Bin 1
  - 00 = Clear
  - 01 = Blocked
- Byte 12 - Outfeed sensor Bin 2
  - 00 = Clear
  - 01 = Blocked
- Byte 13 - Outfeed sensor Bin 3
  - 00 = Clear
  - 01 = Blocked

LEVEL 3 DIAGNOSTICS

S_DATA

The S_DATA returned for the CPM are as follows:

<table>
<thead>
<tr>
<th>S_DATA</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>GOOD (No error)</td>
</tr>
<tr>
<td>01</td>
<td>ROUTINE (Minor fault)</td>
</tr>
<tr>
<td>02</td>
<td>WARNING (May require attention)</td>
</tr>
<tr>
<td>03</td>
<td>SUSPEND (Possible customer tampering)</td>
</tr>
<tr>
<td>04</td>
<td>FATAL (Requires immediate attention)</td>
</tr>
</tbody>
</table>

Tallies

The tallies are incremented by one when the appropriate condition occurs during diagnostic testing and normal operation.

<table>
<thead>
<tr>
<th>Tally</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUM DOCS</td>
<td>Number of documents inserted</td>
</tr>
<tr>
<td>TRAN JAM</td>
<td>Number of transport jams</td>
</tr>
<tr>
<td>FRNT IMG</td>
<td>Number of front image document requests</td>
</tr>
<tr>
<td>REAR IMG</td>
<td>Number of rear image document requests</td>
</tr>
<tr>
<td>ENDORSED</td>
<td>Number of documents endorsed</td>
</tr>
<tr>
<td>STAMPED</td>
<td>Number of documents stamped</td>
</tr>
<tr>
<td>TAKEN</td>
<td>Number of documents processed and transported to storage bins</td>
</tr>
<tr>
<td>BIN 1</td>
<td>Number of documents captured to bin 1</td>
</tr>
<tr>
<td>BIN 2</td>
<td>Number of documents captured to bin 2</td>
</tr>
<tr>
<td>BIN 3</td>
<td>Number of documents captured to bin 3</td>
</tr>
</tbody>
</table>
THE CHEQUE PROCESSING MODULE

STRAPPING

Refer to the Configuration Switch sections on the Transport Control Board and Scanner Control Board earlier in this chapter.
ADJUSTMENTS

PRINT HEAD REPLACEMENT

1. Lift the guard plate on the side of the scanner module to gain access to the print head.

2. Loosen the green knob screw and pull in the arrow direction shown above.

3. Push the plastic bridge in the arrow direction shown in the inset above until it stops on the base.

4. Hold the wing on the Ink-Jet cartridge and remove the cartridge.

5. Insert a flat-ended metal probe, such as a straightened paper clip, into the hole in the centre rear of the plastic casing of the new print head.
6. With the print face horizontal, press the probe gently against the inner bladder until a large droplet of ink covers most of the print head area.

7. Remove the probe and allow the ink to absorb back into the print head for approximately 30 seconds.
8. Wipe the excess ink from the print face using a tissue.

9. Insert the new Ink-Jet cartridge making sure that it rests flat on the guide.
10. Raise the plastic bridge until the cartridge is locked in position.
11. Push the Ink-Jet unit into the printing position and tighten the green knob screw.
12. Lower the guard plate.
INKING ROLLER REPLACEMENT

1. Slacken the guide plate retaining screw on the scanner module and carefully hinge up the plate until it rests on its rear support.

2. Remove the inking roller from its shaft using the plastic glove supplied with the packaging to avoid soiling your fingers.

3. Slide a new inking roller onto the shaft.
4. Carefully lower the guide plate and tighten the retaining screw.
STAMP REPLACEMENT

1. Slacken the grub screw on the drum.

2. Using the plastic glove supplied with the packaging to avoid soiling your fingers, pull the drum in the arrow direction until it has been detached from its guide shaft.

3. Slide a new drum onto the guide shaft and ensure that the pin on the drum locates in the slot at the base of the guide shaft. When the stamp is correctly installed, a click is heard from a device within the drum which hooks into the shaft. Tighten the grub screw.
TEST EQUIPMENT

The following test equipment is required to test the Cheque Processing Module outside the ATM.

1. Pentium PC with a minimum specification:
   - 166 MHz
   - 64 Mb RAM
   - 1.2 Gb hard disk drive
   - PCI to SCSI host adapter Adaptec AHA-2940AU with the PROM removed
   - SCSI cable.

2. Ulysses Platform S/W D531-0300-0000 version 1.2.2
3. CPM Test S/W D531-0337-0000 version 01.00.05
INTERNAL CABLES

The following cable information is module specific. Further cable information for the Personas 75 ATM is detailed in NCR Publication No. FM-0547-A Automated Teller Machines - Service Aids Mini Manual.

Cables that are specific to the scanner module are beyond the scope of this document.

CPM INTERCONNECTION DIAGRAM

445-0643597 - SCSI RIBBON CABLE
This is a 50 way ribbon cable.
445-0643370 - DC POWER CABLE

ATM UNIHARNESS

DEP P1

J1

+12V
+12V RET
+24V
+24V RET

8
2
10
4

CPM CONTROL BOARD

445-0643372 - AC POWER CABLE

SB500 TRANSFORMER

J13

110 V AC L
110 V AC N
110 V AC E

3
4
1

SB500 CONTROL BOARD

L
N
E
SCHEMATICs

This section shows the schematic diagrams for the CPM Control board.
THE CHEQUE PROCESSING MODULE

Schematic Diagram Sheet 9 of 10