

**Field  
Engineering  
Division**

CONFIDENTIAL MATERIAL FOR THE EXCLUSIVE USE OF NCR

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be made up of a Superintendent supported by two Area Supervisors, one responsible for Centre Control and the second for Technical support of the Products, and Training Requirements of the Engineers. They will, of-course, work closely together to ensure coverage is provided during Holiday, Sickness, and Courses, etc.

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Bill Robertson, Supervision, Service Parts Distribution Centre.

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Managing Director Mr. Shingleton, and provides greatly improved facilities for customers and staff alike.

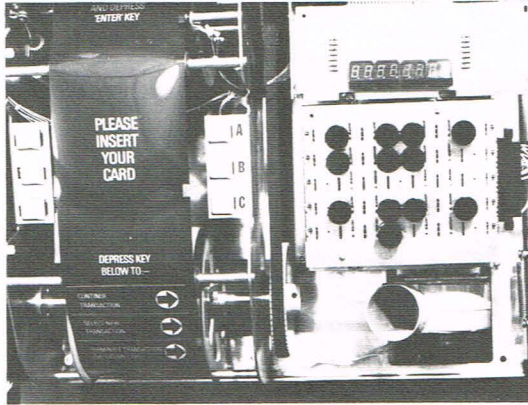
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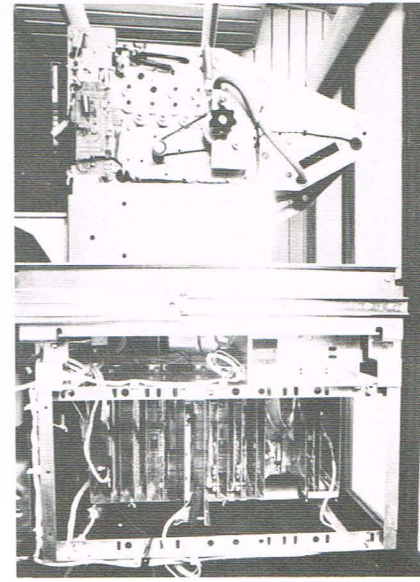




# Class 770



## SELF SERVICE FINANCIAL TERMINAL



The Class 770 introduces a new concept in fully automated terminals by extending banking facilities to customers on a 24 hour basis. The basic unit will be able to dispense cash to authorised clients. Additional options will permit deposits, transfers, and account inquiries. It is of modular design allowing optional modules to be added in production or at a later time. These can be installed in the field within the physical dimensions of the base unit.

### DESCRIPTION

The Class 770 can be operated by clients who have been issued with a magnetically encoded card. The information encoded on the card contains the clients personal account number and permits the client to perform varied operations, i.e. Withdrawals, Deposits, and Balance of the clients account.

The terminal operates only when the card is inserted and found to be valid. Instructions are then given to enter the secret number through the ten key keyboard and guide the client through the selected operation.

Accounts may be updated by:

1. On line communication.
  2. Recorded on a magnetic tape cassette for processing later.
  3. On a basic system details are extracted from the journal tape.
- The client will receive a printed receipt of the transaction.

All C770 systems will contain the M80 currency dispenser. This module will allow dispensing of a maximum of two denominations of bank notes on withdrawal transactions. These notes will be dispensed into the customer access drawer which opens upon completion of the transaction.

The console is fully protected by a steel vandal door, which opens only after the clients card has been verified as valid.

### TEN KEY KEYBOARD

A ten key keyboard with two function keys "(ENTER and VOID)" is similar to that used on other terminals but the keys are larger and spaced further apart to prevent entry errors. An additional keyboard is available as a feature for replenishment purposes and is located internally in the rear of the system to allow bank officials to enter necessary data without access to the front of the machine.

### FUNCTIONAL DISPLAY KEYBOARD

The M04 FDK consists of a 105 mm film strip display and 6 function keys. Each frame of the film strip displays a customer instruction and will advance after each entry in sequence leading the customer through the operation.

### INTERCOUPLER

The M11 Intercoupler connects into the terminal in place of M50 (TCA) and M51 (Modem). This allows the terminal to be connected to a NCR 751 digital concentrator permitting several terminals to be coupled to a high order telephone line without the use of bridges.

### TERMINAL CONTROL UNIT (T.C.U.)

The T.C.U. controls functions required to process each transaction for frame sequencing, print formatting, and provides communications control between the terminal and the Central Processor. The firmware programme is made up of Electrically Alterable Read Only Memory (EAROM), a new technique developed by NCR. The EAROM components are pluggable MOS/LSI packs which provide a programme in excess of eight thousand words.

### TRANSACTION PROGRAMMER (T.P.)

The T.P. is a read/write core memory which is 2048 characters of 8 bits each. This module contains the I/O (input/output) data registers, totals and the transaction programme. The transaction programme is a set of program functions and parameters required for transaction processing

### HOT CARD FILE

The "HOT CARD FILE" is merely an additional M16-4K Core Memory Module which when programmed will contain a list of account numbers that have been reported lost.

### TERMINAL CLOCK

This module generates the 2-phase clock used to time the entire system. The M19 is contained on a single PIB. The clock frequency is 144KHZ.

### M19 TIME OF DAY CLOCK (TOD CLOCK)

The M19 TOD clock module supplies time in four digits to the M15 TCU upon request. The time is provided on a 24 hour basis commencing at 00.00 progressing to 23.59 hours. The time may be set by the TCU or manually through the replenishment keyboard. This module has a rechargeable battery power supply which will operate automatically when a power failure occurs. When normal power returns the clock will send the T.C.U. a status which will indicate how many days power has been down.

### MISCELLANEOUS TERMINAL CONTROL

Provides the logic control circuit and status of the Customer Access Drawer, Vandal Door, Replenishment Needed Indication and Terminal Message Control. The 'Not in Service' message will be displayed if the terminal loses power, becomes inoperative, or replenishment is required.

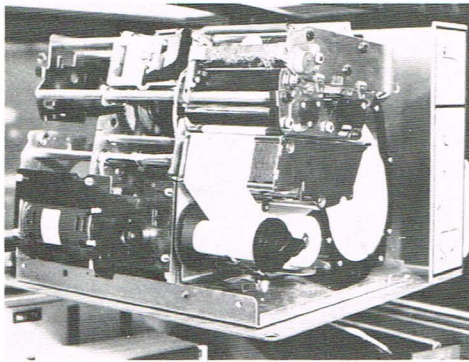
### ACKNOWLEDGEMENT/JOURNAL PRINTER

The printer is a 25 character per second helical printer with alpha/numeric print capability similar to that used in the 250 Retail Terminal. It contains two separate print stations (journal and acknowledgement) and is capable of up to 30 columns of print for each station.

### DEPOSITORY PRINTER

The Depository Printer is a solenoid operated four digit counter which will advance sequentially when instructed to do so by the TCU.





#### ENVELOPE DEPOSITORY

A feature of the 770 is an envelope depository to enable customers to make deposits of cash/cheques etc. During a deposit transaction the TCU will instruct the depository door to open allowing an envelope or document to be inserted. When sensed the envelope will be transported to a print station where a sequence number will be printed. The envelope will then continue to the depository container.

#### COMMUNICATIONS

##### ASYNCHRONOUS TERMINAL COMMUNICATIONS ADAPTOR (T.C.A.)

The M50 - 02 is the same as the adaptor used in the NCR 270. It provides an interface between the TCU and the M51 modem or M58 CCITT Adapter. It will operate in the poll/select mode in the 770 application.

##### SYNCHRONOUS TCA

The M50 - 03 TCA exchanges information between the TCU and a synchronous modem. It operates in multipoint with two or four wire option and has the capability of transmission rates up to 7200 bits/second. The transmit and receive clocks must be provided by the modem.

##### AUXILIARY TCA

This TCA through strap options operates as an auxiliary module to the M50-2 to provide compatibility with Burroughs TC500 poll/select system. It communicates between the M50-2 TCA and M51 or M58.

##### MODEM

The M51 conditions signals from the M50 for use by the telephone lines and receives the telephone signal and converts it to a form usable by the M50.

##### CCITT ADAPTER

The M58 is used to adapt the M50 TCA logic to a standard CCITT interface thereby allowing the use of external modems. When the M58 is used, it is substituted in the same card slot normally occupied by the M51.

##### CASSETTE TRANSPORT/INTERFACE

The 770 uses a cassette similar to the NCR 761 but in a different form of packaging. Both the transport and interface are the same.

#### MAGNETIC CARD WRITER/READER

The Writer/Reader is the first customer interface. It reads the stripe data performing a parity and longitudinal redundancy check. Basic functions of the Magnetic Stripe Writer/Reader are:-

1. Activate a shutter upon sensing a card to allow insertion.
2. Read data from the card stripe and transfer it to the TCU.
3. If required, write new data from the TCU on the stripe.
4. Capture the card when instructed by the TCU.

#### ENCRYPTER

Information magnetically recorded on the customer's card is in a scrambled format. The encrypter is a module which is capable of deciphering this information allowing it to be processed by the TCU. It will also encipher information prior to recording it on the card in cases where the information must be updated. On units without this feature, the scrambled data must be handled by the central computer.

#### M90 CURRENCY DISPENSER

This module provides a means to dispense currency to a customer. A maximum of two different denominations of new or used notes is available.

#### M90 NUMERIC DISPLAY

This module is installed on the customer console and will display numeric data fields entered from the data keyboard except the secret number where a dash will be displayed.

#### MAINTENANCE

The C770 in many cases will be part of an "On Line" system and unit down time will be critical. For this reason module/PIB replacement is recommended to correct critical failures. The resident diagnostics are designed to indicate each module is functioning correctly. Most of the electronic circuitry in the 770 is MOS/LSI which lends itself to the card change philosophy. The level of training planned will enable the field engineer to diagnose and perform repairs, adjustments, module replacements, and preventive maintenance. As the NCR 770 may be installed in a safe it has been designed so that all modules slide out on rails. This enables access by the NCR Field Engineer to perform both corrective and preventive maintenance.

#### TRAINING

The course duration is four weeks and at present is being undertaken in Dayton. IEC Instruction George Chalmers will attend the course shortly to enable training to commence in Dundee during October/November. Pre-requisites are B.C.C. - D.C.C. and 280, 270 or 299 experience.

# Technical Jargon

**L.P.C. - LONGITUDINAL PARITY CHECK** known also as L.R.C. Longitudinal Redundancy Check, and Sum Check in older systems. The LPC character is written on seven or nine track, NRZ - 1 Encoded, Magnetic Tape as the last character in a data block. The binary configuration of the LPC character is such that it makes the sum of the "one" bits in a tack an even number. The LPC is used to check for bit "Drop Out" or "Pick Up" during Write and Read functions.

#### LIMITATIONS

1. Compensating errors can result in undetected malfunctions.
2. If an even number of identical characters are written in a block, the LPC character is all zeros i.e. nothing is written.

**C.R.C. - Cyclic Redundancy Check -** The C.R.C. character is written on nine track NRZ 1,800 BPI. Encoded on Magnetic Tape after the last data character, but before the LPC character. The CRC has 2 features:-

1. It completely overcomes the limitations of the LPC as a check character by being a function of every data bit (ones and zeros) within the block. Undetected errors cannot occur.
2. Can be used to automatically correct error characters during a Read function, provided the errors, (bit Drop Out or Pick Up) occur in only one track.

**BRIDGE** - Is a communication multiplexer enabling many terminals to be connected to a central computer using a minimum number of telephone lines.

**LOW ORDER** - Refers to the on-site communication lines between the terminal and the bridge.

**HIGH ORDER** - Refers to the telephone communication lines linking the bridge to the computer.

## P.I.B. Package

We have taken delivery of a quantity of STAY FOAM SLIDE PACKS for the exclusive use in forwarding Plug-in-Boards to Centres.

Due to the high cost of this type of packaging it is important they are continually re-cycled and not destroyed. Please ensure the packs are used immediately to return damaged PIB's or if this is not possible, are returned empty, clearly marked for the attention of the Stores Department, L.S.C., NCR. 1000.



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