NCR
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Field
Engineering
Division

CIRCUIT NEWS

I E C N E W S D U N D E E

The Maybole apartments are now being extended through Blocks 2 and 3 which will provide us with a total occupancy of 250 bedrooms by the end of June.

We understand the weekly through-put of students attending the I.E.C. is now well in excess of 200 and almost reached 250 recently.

David Grey recently took charge of the Administration and Welfare for the I.E.C. Certainly a name to remember lads as he is the chap who arranges the expenses to keep us solvent whilst we are in Dundee. Before his recent appointment David was the Sports and Social Officer for Dundee Manufacturing and, therefore, provides us with a wonderful source of information on social activities.

A number of keys to the flats have been mislaid or lost when Engineers return to their Centres. Please remember to hand these in before your return.

Mr. D.A. Triggs, Divisional Director I.E.C. has asked me to convey to you that if you feel any improvements could be made on any aspect please contact his office, or through Circuit News. It is only in this way that we can do just that.

Whilst attending a Century Course Johnny Walker V.R.C. London was taken ill and needed his appendix removed. The treatment he received at the Nine Wells Hospital was apparently first class with every possible facility on hand. His ward overlooked the River Tay with the Hills of Fife in the distance. F.E.D. arranged for his wife to join him over Whitsun and Mr. Shingleton sent along a basket of fruit. We are pleased to report John has fully recovered and has now rejoined his course.

My apologies to Jim Lavery the I.E.C. Driver for incorrectly quoting his name as Jim Smith in the previous issue.

REPORTERS WANTED

In our lead article of our opening edition we explained in some detail the philosophy for introducing "Circuit News" to you. Our feed-back to date shows it has been well accepted by you and we certainly hope this will continue. However, you will remember the key factors for its success are YOUR INTEREST and YOUR PARTICIPATION. We now know we have your interest but we require more PARTICIPATION.

Whilst we have no problems in obtaining Technical write-ups with the continued release of new products, we are anxious to ensure "Circuit News" carries personal items to achieve a balanced content. So come on Lads and Lassies, hold a local election and advise us by return of your nomination as correspondent. They do not need to be literary experts or Oxford Dons, for all we need is a few facts on local items of interest, any humourous incidents, or content for a Post bag column, and we will take over from there.

CL 299 INFORMATION

Since the release of the Class 299 over 200 units have been received in the UK. Most have already been installed or in the process of being installed in customers' offices.

Like many new NCR products an improvement in quality is already noticeable, the analysis of all failures during the first three months shows that on average we are experiencing six calls per year on each machine. This compares favourably with other new products and shows a considerable improvement on earlier machines.

The first of the phase two C299 systems are now being delivered. These incorporate a number of firmware changes and now include Check Digit Verification and the capability of having a Continuous Forms Feeder and Paper Tape Punch retrofitted to them.

Update training on these new features will be shortly carried out locally by Senior Engineers however, to ensure Engineers are aware of these features a description is enclosed with the Field Print Package within the machines.

THE C399 SYSTEM

The C399 is an Electronic Accounting Computer introduced by N.C.R. to fulfil the requirements of Customers between the C299 and Century Systems. The Basic System can be expanded by the addition of peripherals into various Data Processing configurations. The Basic System consists of the C605 Processor to which is connected the Magnetic Tape Cassette Handler, Serial Ball Printer, Keyboard, and the Basic Forms Handler.

THE BASIC SYSTEM
THE C605 GENERAL PURPOSE MINI COMPUTER

The C605 is used with the C399 System and is composed of a processor, a Memory Module, and a Power Supply., It is constructed on 11 x 14 inch P.I.B.s of medium scale integrated logic. It is built into a system by plugging in an interface logic board into one of its eight ports. A peripheral device, and in some cases more than one, is connected to that port.

THE MEMORY MODULE

The Memory Interface has seven Direct Memory Access (DMA) points and transfers Data via one of these on a priority basis between a device and the Core Memory Board. The Processor uses one of these DMA points. The others can be used by peripherals which have the DMA capability. These peripherals can transfer Data to the Memory via the Processor, or by DMA which gives a higher Transfer Rate, and in the case of the Cassette to initially load the Program.

The Memory Capacity, for the C399, is 8K 16 Bit words. This is also spoken of a 16K 8 Bit Bytes although one word is addressed during each Memory cycle. The Memory cycle is 1.1 Micro Seconds in duration.

THE MAGNETIC TAPE CASSETTE

The Magnetic Tape Cassette is used to load the Program into the Memory. It can also be used as a Data Input or Output Device. A second Cassette Transport may be added using the same interface Board and Port as the first.

The recording is in the Manchester Mode at a density of 800 Bits per inch. Speed is 7.5 inches per second giving a Transfer Rate of 6KH2. The Dual Head allows a read after write check to be made, and has two recording tracks, Sides A and B.

THE SERIAL PRINTER

The Serial Ball Printer is comprised of 88 characters, providing a standard type line of 265 columns at 12 to the inch. Average Print Rate for Alpha/Numeric is 20 characters per second, and for numeric 24 characters per second.

THE KEYBOARD

The Keyboard contains numeric and Alpha/Numeric Keyboards, and the System Status Indicators. The Numeric Keyboard is of the familiar ten key type and also contains the Branch Keys. Program 1 and 2 Keys provide the Operator with 22 Program options. The Alpha/Numeric Keyboard contains 48 Keys, some with a shift character, and a space bar. It also contains some peripheral function and Program Keys. The Keyboard generates ASC11 Codes which are stored in a Memory Buffer or function pulses to peripherals. The System Status Indicators are visual Outputs from the System to the Operator or Engineer.

THE BASIC FORMS HANDLER

The Basic Forms are aligned and fed to the Print Line by the Platen and the Compression Rolls. The Platen Length is 23 inches and can be split or Normal. The split is optional and can handle forms from 4 to 23 inches wide. A Journal inserted from the rear is held in alignment whilst a form is inserted from the front. The Platen split forms on the left and right can be line fed independent.

OPTIONAL DEVICES

THE CONTINUOUS FORMS FEEDER

Two such devices can be added to the Basic Forms Handler to feed Fan-Fold Form. These forms can be line fed or fed to a Field or Home Position. They can handle multiple copies and feed them independently of the Journal.

AUTOMATIC LINE FINDER

This Device can drive a Ledger Card up or down to any Print Line independently of a Journal.

MAGNETIC LEDGER

This Module can be added to the right A.L.F. Module. Data is recorded onto a Magnetic Stripe on the back of the Ledger Card. The recording is in the Manchester Mode and is in two channels on the Stripe. A Dual Head is used and so a Read After Write Check is made. The capacity of the card depends upon its length. With the maximum 16 inch Card 761 8 Bit Bytes of User Data can be recorded.

THE REAR EJECT FEATURE

This Feature can be added to eject the Ledger Card into a Rear Basket.

THE C314 LEDGER FEEDER READER

This Free Standing Unit can be added to the Magnetic Ledger Device. It automatically feeds Cards and ejects them when they have been read. The Handling Speed is 47 x 11 inch Cards per minute.

THE CARTRIDGE DISC

The Cartridge Disc Drive Unit is interfaced to the Processor via a Port. The interface has direct Memory Access Capability. It is used as a High Speed Random Access Storage Device. The Drive Unit drives a removable cartridge Disc and an optional fixed Disc. Each Disc uses the two surfaces for recording and have a capacity of 50 million Bits. The average access time is 35 mill. secs.

COMMUNICATIONS

The System can be put on Line to a Central Processor by a Synchronous or Asynchronous Adaptor interfacing the telephone line, via a Port to the 399 Processor.

THE TEST PANEL

The Test Panel is the Engineers Peripheral. It is a Console interfaced by Diagnostic Logic via a Port to the Processor and has DMA Capability. By it the Engineer can access the internal registers of the Processor and the Memory. The Input is from switches and the Output is to L.E.D. Indicators. Short Test Programs can be written into Memory manually. Its main feature is in the Micro-Diagnostic Mode. The Micro-Diagnostic Program is loaded from the Cassette. This Program tests the Internal Logic, and the commands of the Processor, giving a visual indication on detecting an error condition.

COMMON TRUNK AND PERIPHERALS

THE COMMON TRUNK

The Trunk Interface connects the Processor via one of its Ports to a maximum of eight Peripherals, connected in daisy chain, on the Common Trunk. The Trunk allows two way Data Transfer between the Processor and a Peripheral in eight Bit Bytes.

C349 LINE PRINTER

There are three Models, one which prints at 125 Lines per minute and a second at 200 Lines per minute. Each has 132 columns per Line and 63 Characters per column. The Type Drum has 44 Characters, and one Line is printed in three Phases, shifting the paper for each Phase. The third prints 300 Lines per minutes and has 66 Characters per column, printing one line in two Phases.

C367 PAPER TAPE PUNCH

The Tape Punch uses 8 channel 1 inch Tape and punches a maximum of 75 Characters per second. Software Conversion Tables are used on applications using 5, 6 or 7 Channel Codes.

C366 PAPER TAPE READER

The Paper Tape Reader reads 8 Channel Tape Photo-Electrically at the rate of 125 Characters per second. Software Conversion Tables are used for applications using 5, 6 or 7 Channel Codes.

C378 CARD PUNCH

The Cards are punched from Column 1 through to 80 at the rate of 26 Cards per minute in the Punch Only Mode, or 13 Cards per minute in the Punch and Print Mode. It translates the 8 Bit ASC11 Code into the 12 Bit Hollerith Code.

C368 CARD READER

The Cards are Photo-Electrically read at the rate of 300 Cards per minute. It reads from Column 1 through to 80 as one Field. The 12 Bit Hollerith Code is translated to 8 Bit ASC11 Code for transmission to the Processor on the Trunk.

PROGRAMMING

In common with other Computers in the N.C.R. Range, the Application Programmer writes Programs in a symbolic language, known in this case as 399 NEAT. An Application Program, written in 399 NEAT, has to be assembled (i.e. translated) before it can be run on the System. This Assembly Process may be done on the N.C.R. Century or on the 399. When the Application Program has been assembled on the Magnetic Tape Cassette it can be run on the System by loading it into Memory accompanied by a Software Executive called the Interpreter. **The** functions of the Interpreter are: To decode the more complex Commands of the Application Program into 605 Hardware Commands, to handle the required, but routine Peripheral functions.

TRAINING

Candidates for formal training will firstly be required to attend a three day seminar in London. One of the purposes is to present an overall view of the 399 and another is to inform Engineers about significant characteristics of the system. The Basic 399 course is twelve weeks duration and is undertaken at I.E.C. Dundee.

Suggestion Awards

IAN ORMEROD and CLIVE COSGRIF, Field Engineers at Burnley were awarded £10 each for their suggestion to improve the performance of the Tape Punch by using the Tape Interlock Switch SC1B1 to control the Punch Clutch Solenoids. It will ensure all the latch magnets are energised simultaneously with the clutch solenoid overcoming a parity check. Full information covering all styles of punch for field modification will shortly be released.

PATRICK HUGHES, Field Engineer, Canterbury, awarded £5 for his suggestion to provide a Roll Holder for the Class 446. His idea is to support items such as labels for Edge Punch Cards overspilling onto the floor. By the nature of the design the width of the roll holder is limited only by the platen length and is housed away from the printer on the underside of the Printer Desk. The feature is available through the Technical Department by special order.

Technical Jargon

ON-LINE SYSTEM

A System where at least part of the input data is entered at a remote location and conveyed by telephone lines, either public or private, to a Central Computer. Data can also be sent in the opposite direction i.e. from the central Computer to the remote location.

TERMINAL

The Unit used at the remote station of an on-line system provides a means of entering data for transmission to the central Computer. Frequently the entries are made using a manual keyboard. Any data sent to the terminal from central is displayed visually to the terminal operator.

VISUAL DISPLAY UNIT (VDU)

A terminal unit in which data is displayed to the operator on the face of a cathode ray tube. Very often a keyboard is an integral part of the unit to allow the operator to enter data to be processed.

READ ONLY MEMORY (ROM)

A component which behaves similar to a "normal" memory in as much as it holds data which may be read out. However, the contents of the memory are determined during manu-**facture** and **cannot** subsequently be altered. Such a memory is commonly used to hold a firmware program.

RANDOM ACCESS MEMORY (RAM)

A memory built usually of magnetic cores or integrated circuits, and constructed in such a way that data may be retrieved from any location in it, with the minimum of delay regardless of which location was previously accessed.

BYTE

A unit of data eight binary bits long. This is a sufficiently large unit to allow the allocation of separate configurations for letters of the alphabet, numerals and a range of special symbols. The "byte" has been accepted generally in the Computer world as a unit by which to specify the sizes of memories, capacities of magnetic tapes etc.

RESCUE/RESTART

"Rescue" points may be established periodically during a computer run by capturing key information on disc or tape. If something goes wrong during a run a "restart" may be made from the last established rescue point, saving wasted time in doing the whole run again.

Appointments

MR. J.R.MACLAREN, Appointed Area Supervisor, E.D.P. Scotland. Jim joined NCR Edinburgh in June 1949 progressing through the varied grades of equipment both Retail and A/AMD. He transferred to EDP in October 1959 and became responsible for the C315 at Proctor & Gamble, Newcastle. Jim later moved to Glasgow covering the C315 and more recently Century Systems sited at Clydesdale Bank Data Centre.

MR. D.WALKER. Appointed Senior Field Engineer (EDP) Scottish Area. David commenced with NCR in June 1954 as an A/AMD Technician based in Glasgow. His flair for electronic equipment resulted in him transferring to EDP in April 1965 where he has continued to maintain the C315 and Century equipment at Clydesdale Bank.

Due to the amalgamation of London and City Field Engineering Centres the following alterations in the management structure have been made:
MR. R.POST. Appointed Manager Central London .F.E. Centre covering Accounting and Adding machines.
MR. F.SHARE. Promoted to Manager Central London F.E. Centre covering Cash Register equipment.
MR. E.L.SCOTT. Area Supervisor London continues to have overall responsibility for the Centre.

The Central London F.E. Centre will continue to operate from Bonhill Street.

We extend our congratulations to them on their new appointments.

Emergency Parts Service

Effective immediately, the emergency parts service provided by the Stores Department at 1000 for Computer installations has been extended to cover all Electronic equipment including 395-400-446-500-230-250-280-299-399.
This service is available after normal working hours upto midnight including weekends,and is provided specifically to cover systems or machines which are down. Under no circumstances should the service be used where the situation could be held over until the following day. The telephone number to use is (01) 450 6382.
Upon receiving your request the Stores Department will ship the required part by Passenger Train or if this is not possible,arrange to rendezvous with you at a given point on the Motorway.

Well Done

BELFAST

From time to time many of us are inclined to have a good old moan and groan about one thing or another, but I'm sure we do not realize how well off we are when we compare the additional hazards Ronnie McGowan and the Belfast lads endure when carrying out their duties during the present situation.
Following a recent bomb incident at a F.W.Woolworth store in Belfast, an Engineer called to establish the extent of the damage to the Cash Registers and found 24 machines required workshop attention. With the reopening scheduled for 48 hours later, as many engineers as possible were given the task of making good the damage sustained, and entailed late night working on two evenings to gain as many working hours in the time available.
Through their dedicated efforts all deadlines were met resulting in the Board of Directors of F.W.Woolworth expressing their appreciation of the first class service provided by the Belfast team.

BRIGHTON

We learn from Robin Shannon, Sales Representative at Brighton and Eastbourne that keeness and persistence shown by Doug Meadows and Alf Collingham of the Brighton FEC assisted in obtaining orders for E.C.R.'s from Speedicopy Ltd. of East Grinstead.
Doug, who had been called to repair a Class 6000 found the work required would be costly. Instead of leaving a message for the owner he insisted that his Staff locate him in order that the information could be conveyed first hand. During the discussion which followed Doug recognised the potential of the Class 230 for this customer and quickly arranged an appointment via Alf for Robin. This resulted in a sale of two Class 230-101's within three working hours and once again proves the point that Team effort pays off.

GREENFORD

Our congratulations to Dave Ratcliffe for his dedication when carrying out repairs to a Class 160 at Messrs.Dalesbrook, London, W.12.
To ensure the customer experienced a minimum of downtime Dave removed the machine to his home in order that repairs could be continued after the premises closed. Despite having to wait for certain parts the machine was returned by lunchtime of the following day. His action undoubtedly established customer confidence in F.E.D.

Farewell McBroadway

Canterbury Centre held a social function at the end of April to say their farewells to Ron Broadway, who recently took up his new position as Supervisor in the Scottish Area after fourteen years as Centre Manager.

The occasion, organised by the illustrious Pete (alias Fireball) Morgan was attended by some sixty colleagues from both F.E.D. and Marketing Divisions of the South East Area, and judging by the favourable comments we have received, Pete certainly made it a night to remember. The catering was organised by the wives and demonstrators who should be complimented on their excellent Buffet arrangements. During the evening Ron was presented with a Desk Set, Document Case, Painting, and a Wet Suit, whilst Mrs. Broadway received a bouquet of flowers. I understand from one of the Engineers the reason they selected a Wet Suit was their concern on the number of times Ron fell into the water during his sailing expeditions, and taking into account his age, felt "the old chap" should be suitably protected.

VAT

From a random check of vehicle expense returns for petrol, oil, etc., we found a number of Engineers are still not showing the VAT content separately.

We request your assistance to ensure the procedure outlined in Circular letter 3024 dated the 19th April is implemented, as the VAT could be overlooked resulting in a loss of Divisional Revenue.

Water Stop

Man's best friend must surely be his dog after hearing of an incident concerning Man and his Horse. Ian Mackenzie, who prints our circular letters and bulletins, is somewhat of a keen horse riding enthusiast and often nips along to the local stables for a canter in Richmond Park. A standing wager exists between his friends that the last one back to the stables buys the beer but on this occasion Mac didn't realise he was on a loser from the start, for "Paddy" his mount, also enjoys wetting his appetite and right in the middle of the course is a pond. Unfortunately Paddy stopped in his tracks, dropped his head, and our Harvey Smith left the saddle for an unscheduled bath. Alas, no more can Mac boast of his expertise in bronco handling.