

C. FRANKLIN

CIRCUIT NEWS

Field Engineering Division

CONFIDENTIAL MATERIAL FOR THE EXCLUSIVE USE OF NCR

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NEW MANAGERIAL APPOINTMENTS ANNOUNCED

Farewell Jim



Following the retirement of Jim Wallace the appointment of Charles Green to Divisional Director FED was made, effective 1st September. In addition to his United Kingdom & Ireland responsibilities Charles also provides the technical support back-up for Gibraltar, Malta, and West Africa.

Subsequently, further Management appointments have been made to assist the Divisional Director, and it gives us great pleasure to announce the following Managerial positions.

Welcome Charles



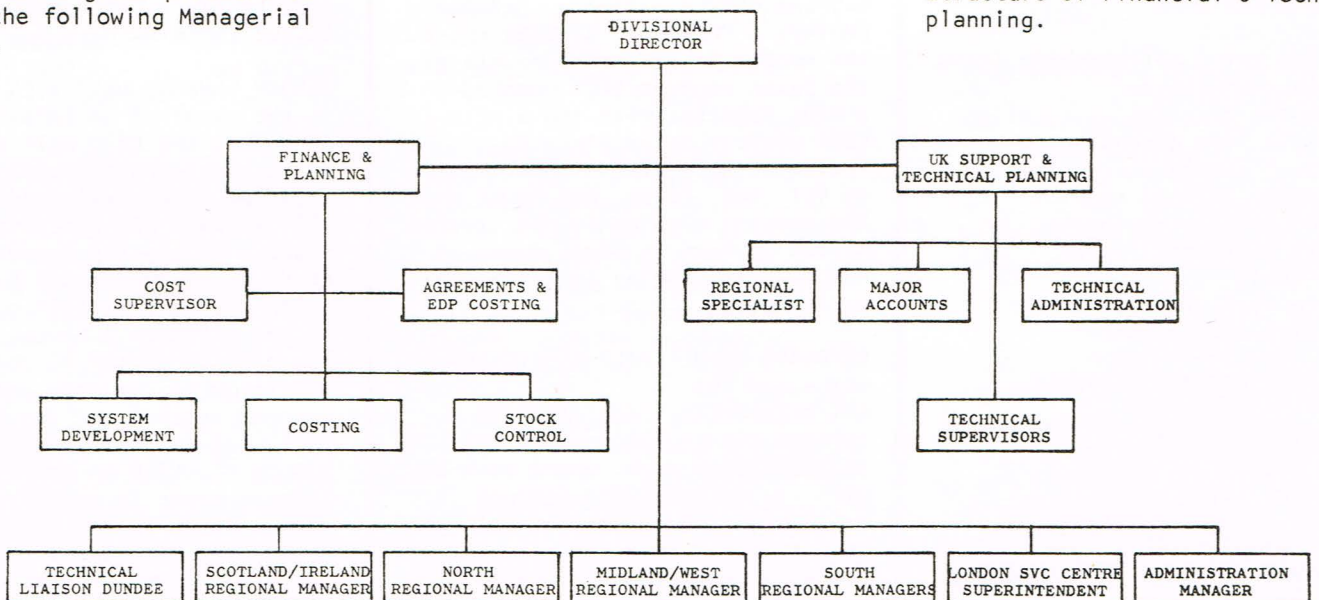
Group and this Group has since taken responsibility for Quantor, 399, 8200 etc. His new position has the responsibility for the complete range of products.

I am sure you will wish to join us in extending our sincere best wishes to them in their new appointments.

The chart outlines the new Divisional Management Organisation, and the structure of Financial & Technical planning.

A E BARDEN - APPOINTED MANAGER FINANCE & PLANNING.
Albert is a qualified Management Accountant, who joined NCR in 1968 as Divisional Cost Accountant. His responsibilities, apart from his involvement in Divisional finance, include the development of the Division's computerisation systems. His new appointment will cover all aspects of costing and financial planning.

B BEAUMONT - APPOINTED MANAGER U K SUPPORT & TECHNICAL PLANNING
Brian joined NCR in 1959 as a Technical Officer working on 405 systems. He was appointed in 1963 to Senior Engineer Northern Region and, with the introduction of the Century range accepted total responsibility for installation and operation in this region. In 1970 he was appointed Superintendent to set up the Century Support



NCR

C 210

ECR



PAPER FEED	CLEAR	MO	VOID	REC'D O ACCOUNT
DISCOUNT MODIFIER	QTY X	SINGLE ITEM	4	PAID OUT
CHARGE	7	8	9	3
DISCOUNT	4	5	6	2
TOTAL	1	2	3	
AMT. TEND NO SALE	0	00	1	

The Discount key can be programmed as compulsory or non-compulsory as a field option.

The Discount Modifier key has two functions.

1 When the C210 is programmed for compulsory discount operation the Discount Modifier key overrides the compulsory function.

2 When it is programmed for NON-compulsory discount the Discount Modifier key overrides the non-compulsory function.

The Paper Feed key can be used to advance the Journal and receipt rolls (but not individually) at all times except when printing is taking place.

The Money Key is a motorized key for cash declaration. It is compulsory prior to auto read and reset operations.

PRINTER M143-10-210-000

The printer is a SEIKO model 102 and is a two-station drum printer. It provides the ability to have original print on both the receipt and journal which are side by side. A two colour ribbon, Red and Black is used for both printers. Void, Refund, Paid Out and negative totals are printed in red, all other printing is black. The receipt printer has eight digit capacity and the journal printer nine digit capacity with a printing speed of two lines per second and paper feed of 5.7 lines per second. The porous rubber electro has a life of 20,000 to 40,000 impressions.

MEMORY SUPPORT BATTERIES

In the event of an interruption of AC power, the C210 will automatically, under program control switch to a low power drain mode which will support RAM contents for 25 hours. Should the Operator elect to do so, a switch can be actuated which will enable full operation of the C210 for 3 hours. Upon restoration of the AC power normal operation is resumed, again by program control and the battery pack will start to recharge. Should the C210 be operated by battery power in excess of the design support time minimum, a point will be reached beyond which the micro-computer operation becomes unreliable. At this point

The NCR 210 ECR is a low cost free standing cash register which has been developed around a micro computer system using the INTEL MCS4 logic with a single chip Central Processor Unit. This CPU together with 3 ROMS and 4 RAMS and 3 shift registers each on single plug-in chips provides a small powerful electronic unit contained on one board that can be compared with the TCU, Memory Clock and TIC modules required to perform a similar function on the C280 or C250.

The C210 is modular in concept, each module having been assigned a number similar to those already used on the TCU family of machines.

It is available in the following basic models:

1. 210-1121 - 2 totals both resettable.
2. 210-1221 - 10 totals plus 2 calculated totals (Gross Group non resettable).
3. 210-1321 - 15 totals plus 2 calculated totals (Gross Group non resettable)

FEATURES AUTOMATIC FEATURES

- * Add and total all purchase items
- * Change computation
- * Automatic Discount calculation
- * Multiple item extension
- * Optional change dispensing
- * Customers printed receipt
- * Refund credit (optional)
- * Remote customer display (optional)
- * Single item transaction
- * Quantity extension

MANAGEMENT CONTROL FEATURES

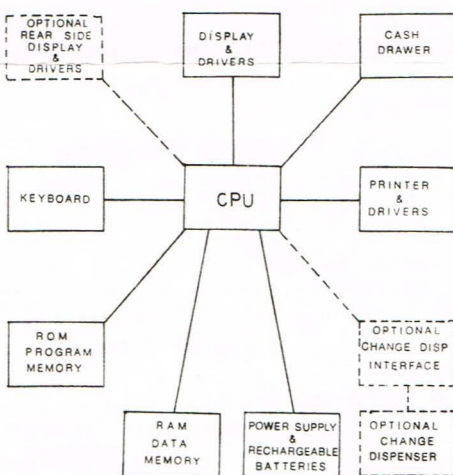
- * Department totals
- * Void total
- * Discount total
- * Forced cash declaration
- * Gross group total
- * Automatic reading and resetting of totals

- * Keylock control of void, read and reset
- * Audible error tone
- * Consecutive number
- * Printed sales journal
- * Reset counter

MAIN PLUG IN BOARD CPU M15-03-210-000

This contains the CPU ROMS and RAMS. The CPU interprets and executes all commands and communicates with the various modules. The ROMS store the firmware program, the RAMS store the data totals.

DIAGRAM OF SYSTEM CONFIGURATION



DISPLAY MODULE M190-07-210-000

Employs a "holding" display where the amount is indicated on six of the seven segment LEDS mounted on a PIB, together with ten single LEDS used as descriptors to indicate the status of the machine eg Bal. Due, Power, Aux Power etc. The amounts display is deactivated whilst in Read in Reset mode. A Remote rear display is available as an option.

KEYBOARD MODULE M101-06-210-001-002 - and 003

All transactions are recorded through the keyboard which has feather-touch keys, where each key with its switches and springs is contained in a replaceable plastic unit soldered to a PCB. The layout illustrated is the 1221 10 Total Department model.

MICRO COMPUTER SET

MCS4 SYSTEM

totals and other data stored in the RAMS will be reset to zero (lost) and further operation will be inhibited until AC power is restored and the program re-entered. This is to protect the user from possible unreliable operation or altered totals.

Batteries are guaranteed for 18 months and replacements are at customer expense. The life of the battery is 5 years or 300 discharges.

FIELD PROGRAMMABILITY

The C210 can be easily upgraded in the field from Model 1121 to 1221 or 1321 by adding additional keys to the keyboard cover plate, alteration in signal routing on the PIB, and the insertion of program plugs and ROM packs into the IC sockets.

DIAGNOSTIC TEST SET

A diagnostic test set is available as a special tool to test the RAMS, ROMS and all operations of the printer keyboard and display.

TRAINING

Course duration will be one week, and the initial courses will be undertaken in London. Subsequent courses will be undertaken in IEC Dundee or Local Centre Training. Pre-requisites are BETA.

In the C210 write-up reference was made to Intel MCS4 logic with a single chip CPU. As this is a comparatively new technique used in our products, for your information we outline the subject in greater depth.

The MCS4 micro computer set consists of the following 4 chips each packaged in a 16 pin DIP package.

- 1 A Central Processor Unit Chip - CPU-4004
- 2 A Read Only Memory Chip - ROM-4001
- 3 A Random Access Memory Chip - RAM-4002
- 4 A Shift Register Chip SR-4003

The MCS4 system communicates with circuits and devices outside the family through "ports" provided on each RAM and ROM. With the addition of a few gates up to 48 ROMS and RAMS combined and 192 I/O lines can be controlled by one CPU.

Features of the MCS4

- * 4-bit parallel CPU with 45 instructions
- * Decimal and binary arithmetic modes
- * 10.8 us instruction cycle
- * Addition of Two 8-digit numbers in 850 usec.
- * Sixteen 4-bit general purpose registers
- * Nesting of subroutines up to 3 levels
- * Instruction Set includes conditional branching, jump to subroutine and indirect fetching
- * 2-phase dynamic operation
- * Synchronous operation with memories
- * Direct compatibility with 4001, 4002 and 4003
- * No interface circuitry to memory and I/O required
- * Directly drives up to:
 - 4K by 8 ROM (16 4001's)
 - 1280 by 4 RAM (16 4002's)
 - 128 I/O lines (without 4003)
 - Unlimited I/O (with 4003's)
- * Memory capacity expandable through bank switching

CORRECTION

In a previous issue we incorrectly quoted the telephone number of Oxford F E C. The Service number which should be used is Oxford 724228.

- * 16-pin DIP package
- * P-channel Silicon Gate MOS
- * Minimum system: CPU and one ROM

The CPU performs all control and data processing functions. It has a powerful and versatile instruction set which allows the system to perform a wide variety of arithmetic, control and decision functions.

The CPU communicates with the other members of the set through a four line data bus with the peripheral devices through the RAM, ROM or SR I/O parts. It contains 5 command control lines, 4 of which are used to control the RAM chips (each line can control up to 4 RAMS chips for a total system capacity of 16 RAMS) and one which is used to control a bank of up to 16 ROMS.

- * 4001 The ROM is a 2048 bit metal mask programmable ROM providing custom micro programming capability for the MCS4 micro computer set. Each chip is organised as 256x8 bit words which can be used for storing programs on data tables. Each chip also has a 4 bit input-output (I/O) port which is used to route information to and from the data bus lines in and out of the system.
- * 4002 The RAM performs two functions. As a RAM it stores 320 bits arranged as 4 registers of twenty 4-bit characters each. As a vehicle of communication with peripheral devices, it is provided with 4 output lines and associated control logic to perform output operations.
- * 4003 The Shift Register is 10 bit serial in/parallel out, serial-out shift register. Its function is to increase the number of output lines to interface with I/O devices such as keyboards, displays printers.

DUNDEE NEWS

We understand that Gerry Rushton Instructor Business Machines, IEC is at present undertaking training on the Class 225 E C R in Dayton. Training will commence at Dundee around October/November subject to the arrival of training machines from Japan. Pre requisites are C230 or 280/250 training.

Further F-E-D Appointments

MR W G SMITH, APPOINTED MANAGER
F E D NIGERIA.

Gordon joined NCR in June 1954 as a Technician; in 1968 he was promoted to Assistant Supervisor for the North of England and Scotland covering 446, 500 and 399 systems. He will undergo further management training at Head Office prior to his departure to Lagos in October.

MR F JANE, APPOINTED MANAGER -
COMPUTER TECHNICAL EDUCATION IEC
DUNDEE.

Fred joined NCR in 1961 as a well established C405 site engineer and was based at Reckitt Col man, his previous employers. He was later promoted to Senior Engineer - Northern Area and in 1964 gained further promotion as Superintendent CMS Northern Area, a position he successfully held until his present appointment. Fred's wealth of experience and knowledge will undoubtedly be a great asset and improvement in the training given at the EDP IEC Dundee.

Model Update No. 2

During last year one of our editions included a model update showing the class number and a brief description of the equipment. To keep you fully conversant on the subject we have updated the listing to include the more recent models.

CLASS DESCRIPTION

105	Mag Tape to Microfiche Processor (Quantor)
210	Electronic Cash Register
220	Electronic Cash Register
225	Data Capture ECR
230	Electronic Cash Register
240	Check Out Terminal
250	Electronic Cash Register
255	Retail Terminal
260	Thermal Printer
270	Financial Terminal
275	Financial Terminal
279	Financial Terminal
280	Retail Terminal
299	Electronic Accounting Machine
314	Ledger Card Reader
349	Line Printer
366	Paper Tape Reader
367	Paper Tape Punch
368	Punch Card Reader
378	Card Punch

399	Electronic Accounting Machine
455	PCMI Reader
456	Microfiche Reader
459	Microfiche Reader Printer
479	Magnetic Ledger Transport
487	Paper Tape/EPC Reader
488	Paper Tape/EPC Printer
499	Electronic Accounting Machine
605	General Purpose Mini Computer
633	Tape Handlers
634	Low Cost Tape Handler
636	Cascent Unit
640	Line Printer
646	Chain Printer
649	Line Print
651	Fast Access Drum
655	Disc Unit
656	Disc Unit
657	Disc Unit
658	Disc Unit
662	Console Tape Reader
680	Card Reader (High Speed)
682	Card Reader (Integrated)
686	Card Reader/Punch
700	Data Entry Terminal
705	Enquiry Terminal
710	Coin Dispenser Interface
715	Coin Dispenser Interface
716	Remote Transaction Programmes
717	Paper Tape Reader

723	Data Collector
725	Store Level Controller
726	Terminal Controller
734	Cassette to Tape Recorder
747	Colour Coded Tag Printer
748	Colour Coded Credit Card Printer
750	Auxiliary Communication Equipment
751	Digital Concentrator
752	Freestanding V-23 Modem
754	Multiplexor
757	Communication Bridge
758	Digital Bridge
761	Remote Cassette Recorder
770	Automatic Teller Terminal
773	Low Volume Mag Card Encoder
774	Desk Top Proof Encoder
775	Electronic Proof Encoder
782	Slot Scanner (Laser)
785	Colour Bar Code Reader (Light Pen)
786	OCR Wand Reader
790	Remote Display
796	CRT Display Terminal
904	Continuous Forms Feeder
2250	Modular Checkout System
7200	Data Entry and Enquiry Terminal
8200	Century System

Battle Of The Poe

Sunday August 3rd will certainly go down in the FED History books as a day to remember for it was the day our two giant "A" Centres, Birmingham and North/West London, challenged each other to a game resembling cricket in the delightful setting of Shenley Cricket Club just north of London.

The Midlanders arrived with their families after high noon brandishing the trophy they donated for the winners of the occasion. This was in the form of a copper pot which would normally be sited under the bed, and from what was to follow it can only be described as the "Battle of the Poe".

N/W London strategy immediately came into force when they took advantage of their opponents by inviting them into the bar for some pre match practice. With the temperature in the nineties and a thirst generated from their journey, Birmingham fell straight into the trap.

The Londoners won the toss and opted to bat first, and on the stroke of two the teams settled down to the purpose of the meeting. N/W batted steadily and achieved a score of 142. This was not without incident as during their

innings Norman Bowen slammed a ball to the boundary for a four, a stroke any cricketer would have been proud of, however, when the ball was returned to the wicket it struck him on the head causing a wound which required 4 stitches at the local hospital. We are not sure whether it was the success which went to his head, lapse in thought as to which game they were playing, or the Birmingham fielder had decided enough was enough, but it would certainly have been a great header in football. After the tea interval Birmingham went into bat making a disastrous start with 4 wickets falling for eight runs but some good defensive batting by the middle men brought the score to the more respectable total of 64. The Midlanders took their defeat like true sportsmen but they pointed out N/W London did have two guests playing, and it has since been proved by filmed evidence that at one stage they were fielding twelve men.

Full marks must go to the umpires, in particular Pat Teeling who with two orange squashes inside him and his immense wealth of knowledge in Gaelic football, added to the highlights. Needless to say the day was pleasantly rounded off in the Clubhouse bar.

I understand the Birmingham lads have thrown down the gauntlet and have challenged N/W London to a return vendetta on their own patch. The choice of sport has not yet been decided but lets hope for our customers' sake it is not fencing or archery.

If any other Centre fancies their chances let Alf or Norman know as the trophy is an ongoing thing!

REMEMBER! It's Contest Time

SEPTEMBER - OCTOBER - NOVEMBER
10% COMMISSION PAID ON ESTIMATES
DATED AND ACCEPTED DURING THE
CONTEST PERIOD.

£ £ £ £

JULY - NOVEMBER M R C CONTEST.
EACH MONTH FINE SETS OF EXQUISITE
GLASSES AWARDED TO ENGINEERS AND
CENTRE MANAGERS WHO ACHIEVE THE
HIGHEST SCORE IN THEIR REGION.

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