

O-CODE INSTRUCTIONS

- C (A) = content of the Accumulator *AFTER* Instruction is obeyed.
 c (a) = content of the Accumulator *BEFORE* Instruction is obeyed.
 c (n) = content of the location whose address is specified in the Instruction.

Instruction	Function	Effect on Accumulator of Instruction	Effect of c(n)
0	Add	$C(A) = c(a) + c(n)$	Unchanged
2	Subtract	$C(A) = c(a) - c(n)$	Unchanged
4	Fast Multiply	$C(A) = c(a) \times n = 0, 2, 4, 8, 10, 12$	Not used
6	Multiply	$C(A) = c(a) \times c(n)$ Loc. n > 3	Unchanged
7	Divide	$C(A) = c(a) \div c(n)$ Loc. n > 3	Unchanged
5	Left Shift - Double	$C(A) = c(a) \rightarrow n$ (n \leq 16)	Not used
13	Right Shift - Halve	$C(A) = c(a) \rightarrow n$ (n \leq 16)	Not used
10	Exchange	$C(A) = c(n), c(a) \leftrightarrow c(n)$	c(a)
11	Replace (clear and add)	$C(A) = c(n)$	Unchanged
1	Collate - Extract	$C(A) = c(a) + c(n)$ where $1+1=1$ $1+0=0$	Unchanged
3	Negate and Add	$C(A) = c(n) - c(a)$	Unchanged

Jump
 8 Unconditionally on C(A)
 9 Conditionally on C(A)
 Count
 12 Conditionally on C (IASD)

Test of Accumulator

OBEY Instruction in Location n (specified)
 IF NEGATIVE obey Instruction in Location n(")
Test Immediate Access Store 1 (IASI)
 IF Zero obey instructions sequentially
 IF NOT Zero obey Instruction in Location n.

LINE TRANSFERS N1; N2=Line numbers in instruction

14 Transfer 16 words from 1st half of Working Store { Replace contents of line number N2
 with contents of line number N1

15 Transfer 16 words from 2nd half of Working Store { Replace contents of line number N2
 with contents of line number N1 + 16

The National Cash Register Company Ltd · 206-216 Marylebone Rd · London NW1

Tel: Paddington 7070

**Basic
Information**



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INPUT

PAPER TAPE

150-180 characters/second
10 characters/inch

PUNCHED CARDS

400-500 cards/minute
533-666 characters/second
(fully punched 80 column)

OUTPUT- On Line

PAPER TAPE

20 characters/second

FILM OUTPUT FOR LINE PRINTER

1,800 characters/second
30 inches/second
1,000 foot reel
Start/Stop time 30 m.s.
Recording time 13 minutes

FILM OUTPUT - Serial Characters

300 characters/second
30 inches/second
1,000 foot reel
8 tracks
Start/stop time 30 m.s.
Recording time 55 minutes
Capacity 960,000 characters

OUTPUT- Off Line

MAGNETIC FILM TO TAPE PERFORATORS - 4 channel

4x20 characters/second
2 inches/second
Output time 3h.20m /film

OUTPUT- Off Line—continued

MAGNETIC FILM TO TAPE PERFORATORS - 2 channel

2x20 characters/second
2 inches/second
Output time 6h.40m /film

LINE PRINTER

300 lines/minute
140 characters/line

DRUM & DISC

Diameter
Width
R.P.M.
Tracks
Sectors
Words
1 Rev.
Packing Density

dru.n	disc
8½ in.	19½ ins.
1½ in.	½ in.
4,600	2,300
32	64
64	256
4,096	16,384
13.2ms	26.4ms
166 digits/inch	

TIME TO READ/WRITE 64 WORDS

Relay Switching	13.0m.s.	13.0m.s.
Maximum Read/Write	32.5m.s.	45.5m.s.
Minimum Read/Write	19.5m.s.	19.5m.s.
Average Read/Write	26.0m.s.	32.5m.s.

MAGNETIC FILM

Length	1,000 feet
Width	35 mm
Channels	9
Packing	140 bits/inch
Speed	30 ins/second
Rate	15 kc/s
Words/Block	64+2 Dummy
Bits/Word	32+1 Parity
Blocks/Film	4,400
Length/Block	approx. 5 inches
Words/Film	282,000

MAGNETIC FILM—continued

READ/WRITE A 64 WORD BLOCK

a Intermittent Working	
Acceleration	30 m.s.
Transfer 64 words	144 m.s.
To next Block Marker	25 m.s.
Decelerate	30 m.s.
Back to Block Marker	30 m.s.
Come to rest	30 m.s.

approx. 289 m.s.

(or 4 Blocks/sec.)

b Continuous Working

To reach Block Marker	25 m.s.
Transfer 64 words	144 m.s.

approx. 169 m.s.

(or 6 Blocks/sec.)

READ/WRITE 1 FILM

Intermittent Working	22 mins
Continuous Working	13 mins

FAST READ/WRITE WITH 2 FILM UNITS

Allows approx. 1,000 word times between Blocks

READ/WRITE ALPHA/NUMERIC CHARACTERS

1,800 characters/second (5 bits)

SYSTEM CENTRE

Pulse Rate	333 Kc/s
Word Length	32 bits+2 gap
Word Time	102 microseconds
Digit Time	3 microseconds