

PERMANENT MEMORANDUM NO. M-1114

SUBJECT: Specifications for The Multiply
and Divide Instructions in The
Multiply/Divide Option, Type 10

DATE: June 29, 1961

TO: PDP Distribution List

FROM: Ben Gurley

Multiply (14 to 25 usec)
MUL Y Operation Code 54

The product of C(AC) and C(Y) is formed in the AC and IO registers. The sign of the product is in AC₀ (the AC sign bit). IO₁₇ also contains the sign of the product. The magnitude of the product is the 34 bit string from AC₁ through IO₁₆. The C(Y) are not affected by this instruction.

Divide (30 to 40 usec, except on overflow, 12 usec)
DIV Y Operation Code 56

The dividend must be in the AC and IO registers in the form indicated in the instruction, Multiply. IO₁₇ is ignored. The divisor is the C(Y). At the completion of the instruction, the C(AC) are the quotient and the C(IO) are the remainder. The sign of the remainder is the sign of the dividend. If an overflow were to occur, the division does not take place, the C(AC) and C(IO) are unchanged, and the overflow indicator is set. The C(Y) are not affected by this instruction.

CENTRAL PROCESSOR:

<u>Type</u>	<u>Quantity</u>
1103	80
1104	49
1105	82
1110	6
1111	11
1150	9
1201	32
1204	19
1209	17
1304	1
1310	10
1311	3
1410	1
1607	27
1684	11
1685	10
1703	2
4105	2
4106	3
4112	1
4113	13
4129	10
4301	1
4410	10
4603	10

4096 WORD MEMORY MODULE:

1103	6
1104	1
1213	1
1310	1
1540	18
1607	1
1972	32
1973	2
1976	16
1978	3
1982	5

READER, PUNCH, TYPEWRITER:

<u>Type</u>	<u>Quantity</u>
1669	5
1703	2
4105	6
4106	2
4110	6
4111	1
4113R	3
4126	1
4128	7
4201	2
4209	3
4214	9
4301	7
4410	4
4603	4
4680	6
4681	3

MULTIPLY & DIVIDE TYPE 10:

1105	10
1111	2
1201	5
1310	3
1311	6
1607	10
4113	2

SEQUENCE BREAK SYSTEM TYPE 20:

1103	8
1104	2
1105	1
1111	8
4106	2
4113	9
4128	16
4214	8
4603	7

JUMP FIELD TYPE 14:

<u>Type</u>	<u>Quantity</u>
1103	11
1105	3
1110	10
1111	8
1209	5
1607	17
1684	13

HIGH SPEED CHANNEL CONTROL:

1103	3
1104	1
1105	3
1209	2
1607	6
4105	3
4129	18
4603	11

TAPE CONTROL TYPE 52:

1684	7
4105	13
4106	10
4111	4
4112	3
4113	16
4126	6
4127	13
4128	14
4202	9
4209	2
4213	5
4214	11
4215	2
4301	16
4303	3
4407	1
4410	1
4603	12

LOCAL TAPE CONTROL TYPE 50:

<u>Type</u>	<u>Quantity</u>
1542	3
1549	4
1684	1
4105	5
4106	1
4112	3
4113	2
4301	2
4514	4

TAPE CONTROL TYPE 51:

1539	4
4105	2
4106R	1
4111	1
4113	4
4127	2
4128	2
4214	4
4215	2
4301	2
4603	1

32-CHANNEL SEQUENCE BREAK SYSTEM:

1103	8
1104	2
1105	1
1111	8
1669	9
1684	2
4106	27
4110	3
4111	2
4112	4
4113	14
4127	2
4128	8
4129	3
4213	4
4214	14
4603	32