INSTRUCTION LIST

Mnemonic Code	Octal Code	Operation	Oper. Time (usec.)
add Y	40	Add C(Y) to C(AC)	10
and Y	02	Logical AND of C(Y) with C(AC)	10
cal	16	Equals jda 100	10
dac Y	24	Deposit C(AC) in Y	10
dap Y	26	Deposit contents of address part of AC in Y	10
dio Y	32	Deposit C(IO) in Y	10
dip Y	30	Deposit instruction part of AC in Y	10
dis Y	56	Divide step	10
dzm Y	34	Make C(Y) zero	10
idx Y	44	Index (add one to)C(Y) Leave in Y & AC	10
ior Y	04	Inclusive OR of C(Y) with C(AC)	10
iot	72	See In-Out Transfer Group	—
isp Y	46	Index and skip if result is positive	10
jda Y	17	Equals dac Y plus jsp Y + 1	10
jfd Y	12	Jump memory field according to C(Y)	10
jmp Y	60	Take next instruction from Y	5
jsp Y	62	Jump to Y and save Program Counter in AC	5
lac Y	20	Load AC with C(Y)	10
law N	70	Load AC with the number N	5
law —N	71	Load AC with the number —N	5
lio Y	22	Load IO with C(Y)	10
mus Y	54	Multiply step	10
opr	76	See Operate Group	5
sad Y	50	Skip next instruction if C(AC) differs from C(Y)	10
sas Y	52	Skip next instruction if C(AC) is same as C(Y)	10
shift	66	See Shift Group	5
skp	64	See Skip Group	5
sub Y	42	Subtract C(Y) from C(AC)	10
xct Y	10	Perform instruction in Y	5+
xor Y	06	Exclusive OR of C(AC) with C(Y)	10

SKIP GROUP

The intent of any skip instruction can be reversed by making Bit 5 equal to ONE.

sma	640400	Skip on minus AC
spa	640200	Skip on plus AC
spi	640000	Skip on plus IO
sza	640100	Skip on ZERO (+0) AC
szf	64000f	Skip on ZERO flag (f=Flag #)
szo	641000	Skip on ZERO overflow (and clear overflow)
szs	6400S0	Skip on ZERO sense switch (S = Switch #)

OPERATE GROUP

This is a micro program set of instructions. Thus cla + cli + clf = 764207 (5 microsec.)

cla	760200	Clear AC
clf	760001-7	Clear selected program flag
cli	764000	Clear IO
cma	761000	Complement AC
hlt	760400	Halt
lat	762200	Load AC from test word switches
nop	760000	No operation
stf	760011-7	Set selected program flag

IN-OUT TRANSFER GROUP (BASIC LIST)

The number of variations in this group may be greatly increased for optional or special in-out equipment.

Dummy WAIT 730000

cdf	720X74	Change data field
cfd	72XX74	Change fields
cks	730033	Check status
dpy	730007	Display one point on CRT
esm	720055	Enter Sequence Break Mode
lsm	720054	Leave Sequence Break Mode
ppa	730005	Punch punched tape alphanumeric
ppb	730006	Punch punched tape binary
rpa	730001	Read punched tape alphanumeric
rpb	730002	Read punched tape binary
rrb	720030	Read reader buffer
tyi	720004	Read typewriter input switches
tyo	730003	Type out

SHIFT ROTATE GROUP

Shift is an arithmetic operation. The sign bit is left unchanged and vacated bits are filled with the sign. Rotate is a logical operation and cycles the bits (including sign) in a closed ring. The number of steps is the number of ONE's in bits 9-17 of the instruction (9 max).

ral	661	Rotate AC left
rar	671	Rotate AC right
rcl	663	Rotate combined AC and IO left
rcr	673	Rotate combined AC and IO right
ril	662	Rotate IO left
rir	672	Rotate IO right
sal	665	Shift AC left
sar	675	Shift AC right
scl	667	Shift combined AC and IO left
scr	677	Shift combined AC and IO right
sil	666	Shift IO left
sir	676	Shift IO right

ALPHANUMERIC CODES

Character		FIO-DEC Code	Concise Code	Character	FIO-DEC Code	Concise Code
a	A	61	61	0	20	20
b	B	62	62	1	01	01
c	C	263	63	2	02	02
d	D	64	64	3 ~	203	03
e	E	265	65	4 ⊃	04	04
f	F	266	66	5 ∨	205	05
g	G	67	67	6 ∧	206	06
h	H	70	70	7 <	07	07
i	I	271	71	8 >	10	10
j	J	241	41	9 ↑	211	11
k	K	242	42	([	57	57
l	L	43	43	)]	255	55
m	M	244	44	— ↑	256	56
n	N	45	45	— +	54	54
o	O	46	46	. —	40	40
p	P	247	47	, =	233	33
q	Q	250	50	· X	73	73
r	R	51	51	/ ?	221	21
s	S	222	22	Lower Case	272	72
t	T	23	23	Upper Case	274	74
u	U	224	24	Space	200	00
v	V	25	25	BK. SP.	75	75
w	W	26	26	Tab	236	36
x	X	227	27	Carr. Ret.	277	77
y	Y	230	30	Tape Feed	00	00
z	Z	31	31	RED*	—	35
				BLK*	—	34
				Stop Code	13	—
				Delete	100	—

*Used on type-out only, not on keyboard.

digital EQUIPMENT CORPORATION
MAYNARD·MASSACHUSETTS

F-16 Printed in U.S.A. 9-61