

INSTRUCTION REPERTOIRE

INPUT-OUTPUT INSTRUCTION WORD FORMAT

FUNCTION	CHANNEL	*	B-Reg.	CONTROL WORD ADDRESS
29	24	23	20 19 18 17 15 14	00

$K = 0 (00): \bar{Y}$ Buffer Address $(001 \times 10^i)_{10}$
 $K = 1 (01): Y_L$ Buffer Address $(001 \times 10^i)_{10}$
 $K = 3 (11): Y_M$ Buffer Address $(001 \times 10^i)_{10}$

MAGNETIC DRUM FUNCTION WORD

FC	BEGINNING DRUM ADDRESS
29	24 22 00

DRUM FUNCTIONS

MNEM	OC	DESCRIPTION	FC
WRITE	0	CONTINUOUS WRITE: START AT SPECIFIED ADDRESS	02
READ	1	CONTINUOUS READ: START AT SPECIFIED ADDRESS	42
BREAD	2	BLOCK READ: READ TILL EOB; TERMINATE	52
LOCATE	3	SEARCH: SEARCH TILL FIND; TERMINATE	45
BLOCATE	4	BLOCK SEARCH: SEARCH TILL FIND/EOB; TERMINATE	55
SEARCH	5	SEARCH-READ: SEARCH TILL FIND, THEN CONT. READ	46
BSEARCH	6	BLOCK SEARCH-READ: SEARCH; FIND; READ TILL EOB	56
BOOTSTRAP: REFERENCE ADDRESS 000000			40/50
TERMINATE: TERMINATE OPERATION			23/33

STATUS WORDS

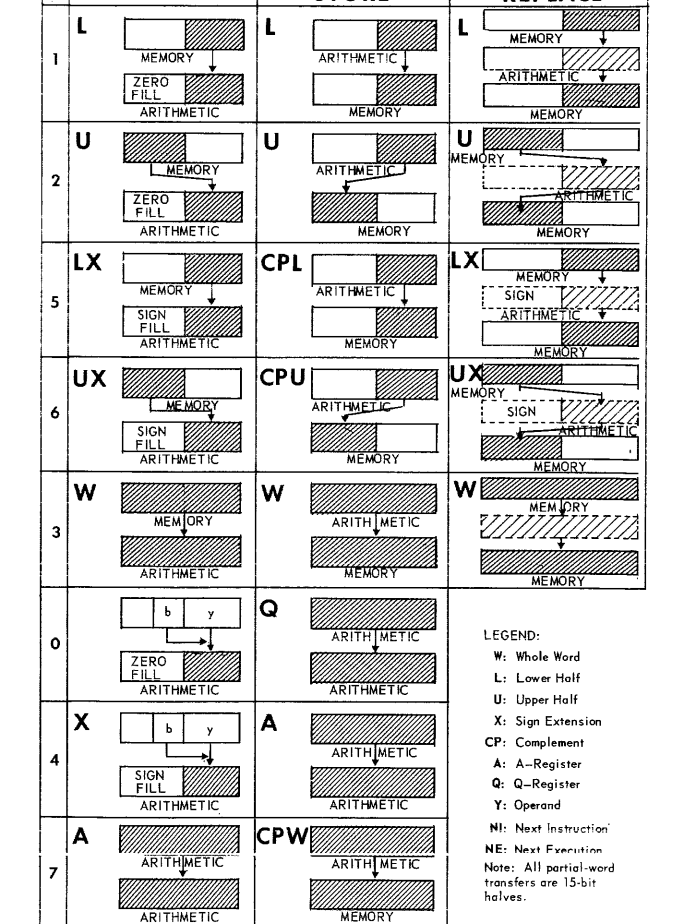
DRUM SUBSYSTEM INTERRUPT CODE	REX STATUS CODES $\rightarrow A_{05}-A_{00}$	CONSOLE PRINTOUT
SEARCH FIND	05 00	OPERATION NOT COMPLETE
NORMAL COMPLETION	40 * 01	OPERATION COMPLETE
END OF FILE	34 02	END OF FILE WITHOUT FIND
END OF BLOCK	04 * 03	END OF BLOCK WITHOUT FIND
	04	BUFFER FILLED BEFORE EOB
	* 05	END OF FILE BEFORE COMPLETE TRANSFER
	07	ILLEGAL ERROR
OVERFLOW PARITY ERROR	06 * 14	OVERFLOW ERROR AFTER READ
PARITY ERROR, NON-CONT READ	60 * 12	READ ERROR
CHARACTER COUNT ERROR	30 * 12	READ ERROR
SEQUENCE ERROR	60 * 12	READ ERROR
WRITE FAULT	14 * 13	WRITE ERROR
OVERFLOW PARITY ERROR	06 * 14	OVERFLOW ERROR AFTER READ
PARITY ERROR, NON-CONT READ	07 * 15	OVERFLOW ERROR BEFORE READ
WRITE CHAR COUNT ERROR	70 17	DRUM DOWN
	16	ILLEGAL PARAMETER

NORMAL j-DESIGNATOR				SPECIAL ADDRESSES			
SKIP	j = 0	NEXT INSTRUCTION	00000	FAULT, MS TIMEOUT, INTERRUPT			
QPOS	j = 1	Skip NI	00017	Δ CLOCK INCREMENT			
QNEG	j = 2	Skip NI if (Q) Pos.	00020-00035	EXTERNAL INTERRUPT			
AZERO	j = 3	Skip NI if (A) = 0	00040-00055	INPUT MONITOR INTERRUPT			
ANOT	j = 4	Skip NI if (A) \neq 0	00060-00075	OUTPUT MONITOR INTERRUPT			
APOS	j = 5	Skip NI if (A) \neq 0	00100-00115	INPUT BUFFER CONTROL			
ANEQ	j = 6	Skip NI if (A) Pos.	00120-00135	OUTPUT BUFFER CONTROL			
	j = 7	Skip NI if (A) Neg.	00036	Δ CLOCK INTERRUPT			

SPECIAL j-DESIGNATOR INTERPRETATION											
0	CMMA#A#Q#A	ADD#Q#SUB#Q	ENT#L#P	RPL#L#P	DIV.	RPT	JP#R#P	JP#(Q)#R#P#(A)	RIL#SIL	Release/Set	Release/Set
1	NO skip	No skip	No skip	No skip	No skip	NE: $y \neq 1$	Always jump	Always jump	RIL/SIL	Release/Set	Release/Set
2	SKIP Always skip	SKIP Always skip	SKIP Always skip	SKIP Always skip	SKIP Always skip	ADV NE: $y \neq 1$	KEY 1 Jump Key 1	RIL/SIL	RIL/SIL	Release/Set	Release/Set
3	YLESS Y \leq Q	APOS Skip (A) Pos.	EVEN Skip (A) even	NOOF Skip, no overflow	BACK NE: $y \neq 1$	KEY 2 Jump Key 2	QPOS	QPOS	QPOS	Jump (Q) Pos.	
4	YMORE Y $>$ Q	ANEQ Skip (A) Neg.	ODD Skip (A) odd	OF Skip overflow	ADD NE: $y \neq 1$	KEY 3 Jump Key 3	QNEG	QNEG	QNEG	Jump (Q) Neg.	
5	YOUT Q $<$ Y or Y \leq A	QZERO Skip (Q) = 0	AZERO Skip (A) = 0	R NE: $y \neq 1$	STOP	Always stop	AZERO	AZERO	AZERO	Jump (A) = 0	
6	YLESS Y \leq A	QNOT Skip (Q) \neq 0	ANOT Skip (A) \neq 0	ANOT Skip (A) \neq 0	ADYR NE: $y \neq 1$	STOP 5 Stop Key 5	ANOT	ANOT	ANOT	Jump (A) \neq 0	
7	YMORE Y $>$ A	QPOS Skip (Q) Pos.	APOS Skip (A) Pos.	APOS Skip (A) Pos.	BACKRNE: $y \neq 1$	STOP 6 Stop Key 6	APOS	APOS	APOS	Jump (A) Pos.	
		QNEG Skip (Q) Neg.	ANEQ Skip (A) Neg.	ANEQ Skip (A) Neg.	ADDRNE: $y \neq 1$	STOP 7 Stop Key 7	ANEQ	ANEQ	ANEQ	Jump (A) Neg.	

* (B_j) increment if RPL CLASS

OPERAND INTERPRETATION-NORMAL k-DESIGNATOR



INPUT-OUTPUT OPERATOR (SPURT)	
CARD#PUNCH#(BCW)	TYPE#*(ADDRESS)
CARD#PUNCH#(BCW)	TYPE#*(TEXT)
CARD#PMODE#FD	TYPE#*(ADDRESS)
CARD#PMODE#CBIN	CTAPE#HIBCD#(NAME)
CARD#PMODE#RBIN	CTAPE#LOBCD#(NAME)
CARD#RMODE#FD	CTAPE#HIBIN#(NAME)
CARD#RMODE#CBIN	CTAPE#LOBIN#(NAME)
CARD#STACK 1	CTAPE#WRITE#(NAME)#(BCW)
CARD#STACK 2	CTAPE#ENDFILE#(NAME)
CARD#READ#(BCW)	CTAPE#READ#(NAME)#(BCW)
CARD#TRANS#(BCW)	CTAPE#SEARCH#(NAME)#(BCW)#(ID)
CARD#MRREAD#(BCW)	CTAPE#REWIND#(NAME)
	CTAPE#MOVE#(NAME)#(N)
	CTAPE#MOVE#(NAME)#(N)
	CTAPE#BACKFILE#(NAME)
	CTAPE#RWI#(NAME)
DRUM#(NAME)#WRITE#(BCW)#(ADDRESS)	MTAPE#WRITE#(NAME)#(BCW)
DRUM#(NAME)#READ#(BCW)#(ADDRESS)	MTAPE#READ#(NAME)#(BCW)
DRUM#(NAME)#BREAD#(BCW)#(ADDRESS)	MTAPE#READ#(NAME)#(BCW)
DRUM#(NAME)#BREAD#(BCW)#(ADDRESS)	MTAPE#SEARCH#(NAME)#(BCW)#(ID)
DRUM#(NAME)#LOCATE#(ADDRESS)#(ID)	MTAPE#SEARCH#(NAME)#(BCW)#(ID)
DRUM#(NAME)#BLOCATE#(ADDRESS)#(ID)	MTAPE#SEARCH#(NAME)#(BCW)#(ID)
DRUM#(NAME)#SEARCH#(BCW)#(ADDRESS)#(ID)	MTAPE#SEARCH#(NAME)#(BCW)#(ID)#(MASK)
DRUM#(NAME)#SEARCH#(BCW)#(ADDRESS)#(ID)	MTAPE#REWIND#(NAME)
	MTAPE#RWI#(NAME)
	MTAPE#ENDFILE#(NAME)
	MTAPE#MOVE#(NAME)#(N)
	MTAPE#MOVE#(NAME)#(N)
PIN#(NAME)#(LINES#PAGE)#(TOP)#(BOT MARGIN)	
PRINT#(NAME)#(BUFF BASE ADD)#(LINES ADV)	
CONSOLE#HOLD	ACCEPT#(CHAR)#(BUFFER)
CONSOLE#RELEASE	LOAD#(SEGMENT NAME)

COMPUTER INSTRUCTION WORD FORMAT					
FUNCTION	SPECIAL	OPERAND INTERPRET	MODIFIER	OPERAND-OPERAND ADDRESS	
29	f	i	k	6	y
	24	23	21 20	18 17	15 14

* REGISTER, SKIP/JUMP, OR REPEAT MODIFICATION DESIGNATOR

TYPE	MNEM CODE	OC	INSTRUCTION	OPERATION	CLASS	EXECUTION TIMES*				
TRANSFER	ENT#Q	10	Enter Q	Y \rightarrow Q	Rd	8.4	6.0	7.2	4.8	12
	ENT#A	11	Enter Accumulator	Y \rightarrow A	Rd	6.0	6.0	7.2	4.8	12
	ENT#B _n	12	Enter B-Register	Y \rightarrow B _n ; NoOp	Rd	6.0	3.6	7.2	4.8	12
	STR#Q	14	Store Q	(Q) \rightarrow Y	Sr	8.4	4.8	12	7.2	
SHIFTS	RSR#Q	01	Shift Q Right	Shift Q right by Y ₀₅₋₀₀ , Sign Fill	Rd	8.4	9.6	13.2		
	RSR#A	02	Shift A Right	Shift A right by Y ₀₅₋₀₀ , Sign Fill	Rd	8.4	9.6	13.2		
	RSR#AQ	03	Shift AQ Right	Shift AQ right by Y ₀₅₋₀₀ , Sign fill	Rd	8.4	9.6	13.2		
	LSR#Q	05	Shift Q Left	Shift Q left by Y ₀₅₋₀₀ , circularly	Rd	8.4	9.6	13.2		
COM	COM#A#Q#A	04	Compare	A:Y or Q:Y or AQ:Y, and sense j	Rd	9.6	8.4	12	8.4	
	COM#A#Q#A	04	Compare	(A)-L (Y (Q)); sense j	Rd	8.4	7.2	12	8.4	
	COM#A#Q#A	04	Compare	A and Q Unchanged	Rd	8.4	6.0	12	8.4	
	COM#A#Q#A	04	Compare	A and Q Unchanged	Rd	8.4	6.0	12	8.4	
JUMPS	JP	61	Arithmetic Jump (Normal)	Y \rightarrow P, per j; Y: 15 bits maximum	Rd	6.0	7.2	12		
	JP	61	Arithmetic Jump (Normal)	Y \rightarrow P, per j; Y: 15 bits maximum	Rd	6.0	7.2	12		
	RJP	64	Manual Return Jump	P \rightarrow Y ₁₄₋₀₀ ; Y \rightarrow P if j is met	Rd	13.2	14.4	18		
	RJP	64	Manual Return Jump	P \rightarrow Y ₁₄₋₀₀ ; Y \rightarrow P if j is met	Rd	13.2	14.4	18		
MODIFY	RPT	70	Repeat	NI (Y) times per j; B _n =NE	Rd	7.2	8.4			
	BSK#B _n	71	Index Skip	If (B _n)=Y, skip NI, and CL (B _n)	Rd	7.2	8.4			
	BJP#B _n	72	Index Jump	If (B _n)=Y, take NI, B _n =B+1	Rd	6.0	7.2			
	BJP#B _n	72	Index Jump	If (B _n)=0, jump to Y; B _n =B-1	Rd	6.0	7.2			

* NOTE: LOWER TIME IN EACH BRACKET IS FOR REPEAT MODE TIMES