

NTDS UNIT COMPUTER

REPERTOIRE OF INSTRUCTIONS

01 SHIFT Q RIGHT.....	SHIFT (Q) RIGHT BY (Y)
02 SHIFT A RIGHT.....	SHIFT (A) RIGHT BY (Y)
03 SHIFT AQ RIGHT.....	SHIFT (AQ) RIGHT BY (Y)
04 COMPARE.....	SENSE (j). $(A)_i = (A)_j^x$
05 SHIFT Q LEFT.....	SHIFT (Q) LEFT BY (Y)
06 SHIFT A LEFT.....	SHIFT (A) LEFT BY (Y)
07 SHIFT AQ LEFT.....	SHIFT (AQ) LEFT BY (Y)
10 ENTER Q.....	(Y) \rightarrow Q
11 ENTER ACCUMULATOR.....	(Y) \rightarrow A
12 ENTER B REGISTER.....	(Y) \rightarrow (B) _j
13 ENTER C REGISTER.....	(Y) \rightarrow (C) _j
14 STORE Q.....	(Q) \rightarrow Y
15 STORE ACCUMULATOR.....	(A) \rightarrow Y
16 STORE B REGISTER.....	(B) _j \rightarrow Y
17 STORE C REGISTER.....	(C) _j \rightarrow Y
20 ADD.....	(A) + (Y) \rightarrow A
21 SUBTRACT.....	(A) - (Y) \rightarrow A
22 MULTIPLY.....	(Q)(Y) \rightarrow AQ
23 DIVIDE.....	(AQ) / (Y) \rightarrow Q, R \rightarrow A _f
24 ADD REPLACE.....	(A) + (Y) \rightarrow YBA
25 SUBTRACT REPLACE.....	(A) - (Y) \rightarrow YBA
26 Q ADD.....	(Q) + (Y) \rightarrow Q. $(A)_i = (A)_f$
27 Q SUBTRACT.....	(Q) - (Y) \rightarrow Q. $(A)_i = (A)_f$
30 LOAD A ADD Q.....	(Y) + (Q) \rightarrow A
31 LOAD A SUBTRACT Q.....	(Y) - (Q) \rightarrow A
32 ADD Q AND STORE.....	(A) + (Q) \rightarrow YBA
33 SUBTRACT Q AND STORE.....	(A) - (Q) \rightarrow YBA
34 REPLACE ADD Q.....	(Y) + (Q) \rightarrow YBA
35 REPLACE SUBTRACT Q.....	(Y) - (Q) \rightarrow YBA
36 REPLACE ADD ONE.....	(Y) + 1 \rightarrow YBA
37 REPLACE SUBTRACT ONE.....	(Y) - 1 \rightarrow YBA
40 ENTER LOGICAL PRODUCT.....	L(Y)(Q) \rightarrow A
41 ADD LOGICAL PRODUCT.....	L(Y)(Q) + (A) \rightarrow A
42 SUBTRACT LOGICAL PRODUCT.....	(A) - L(Y)(Q) \rightarrow A
43 MASKED COMPARISON.....	(A) - L(Y)(Q), SENSE (j), $(A) + L(Y)(Q)$ $(A)_i = (A)_f$
44 REPLACE LOGICAL PRODUCT.....	L(Y)(Q) \rightarrow YBA
45 REPLACE ADD LOGICAL PRODUCT.....	L(Y)(Q) + (A) \rightarrow YBA
46 REPLACE SUBTRACT LOGICAL PRODUCT.....	(A) - L(Y)(Q) \rightarrow YBA
47 STORE LOGICAL PRODUCT.....	L(A)(Q) \rightarrow Y. $(A)_i = (A)_f$
50 SELECTIVE SET.....	SET $(A)_n$ FOR $(Y)_n = 1$
51 SELECTIVE COMPLEMENT.....	COMPLEMENT $(A)_n$ FOR $(Y)_n = 1$
52 SELECTIVE CLEAR.....	CLEAR $(A)_n$ FOR $(Y)_n = 1$
53 SUBSTITUTE.....	$(Y)_n \rightarrow (A)_n$ FOR $(Q)_n = 1$
54 REPLACE SELECTIVE SET.....	SET $(A)_n$ FOR $(Y)_n = 1, \rightarrow$ YBA
55 REPLACE SELECTIVE COMPLEMENT.....	COMPLEMENT $(A)_n$ FOR $(Y)_n = 1, \rightarrow$ YBA
56 REPLACE SELECTIVE CLEAR.....	CLEAR $(A)_n$ FOR $(Y)_n = 1, \rightarrow$ YBA

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57	REPLACE SUBSTITUTE(Y) → (A) _n FOR (Q) _n =1, → Y
60	ARITHMETIC JUMPj=0, NO JUMP; j≠0, JUMP ^x
61	MANUAL JUMPJUMP ^x
62	INPUT JUMP	.....(C); FULL JUMP TO ADDRESS (Y)
63	OUTPUT JUMP	.....(C); EMPTY JUMP TO ADDRESS (Y)
64	ARITHMETIC RETURN JUMP	.....j=0 NO JUMP; j≠0 JUMP TO Y+1, P → Y ^x
65	MANUAL RETURN JUMP	.....RETURN JUMP, STOP IF KEY SET ^x
66	INPUT RETURN JUMP	.....(C); FULL RETURN JUMP TO ADDRESS (Y)
67	OUTPUT RETURN JUMP	.....(C); EMPTY RETURN JUMP TO ADDRESS (Y)
70	INITIATE REPEAT	.....EXECUTE NI (Y) TIMES ^x
71	INDEX SKIP	.....(B) _j =(Y) SKIP NI, CLEAR B _j ; (B) _j ≠(Y) ADV B _j , RNI
72	INDEX JUMP	.....(B) _j =0 READNI; (B) _j ≠0 (B) _j -1, JUMP TO ADDRESS (Y)
73	INITIATE INPUT TRANSFER	.....(Y) → B ⁶ , SET (d) TO 4. INITIATE (C) _j → Y
74	INITIATE OUTPUT TRANSFER	.....(Y) → B ⁶ , SET (d) TO 6. INITIATE (Y) → C _j
75	INITIATE INPUT BUFFER	.....k=3, (Y) → 0000 _j ; k≠3, (Y) _L → (0000) _L , SET (d) TO 4
76	INITIATE OUTPUT BUFFER	.....k=3, (Y) → 0000 _j ; k≠3, (Y) _L → (0000) _L , SET (d) TO 6.

J DESIGNATORS FOR * COMMANDS

j	04	60	61	64	65	70
0	NO SKIP	NO JUMP	JUMP	NO JUMP	RET JUMP	NOTE 1
1	SKIP	JUMP	JUMP KEY 1	RET JUMP	JUMP KEY 1	" 2
2	SKIP (Y) ≤ (Q)	JUMP Q POS	JUMP KEY 2	JUMP Q POS	JUMP KEY 2	" 3
3	SKIP (Y) > (Q)	JUMP Q NEG	JUMP KEY 3	JUMP Q NEG	JUMP KEY 3	" 4
4	SKIP (Q) ≥ (Y) AND (Y) > (A)	JUMP A * 0	JUMP, STOP	JUMP A * 0	JUMP, STOP	NOTE 1
5	SKIP (Q) < (Y) OR (Y) ≤ (A)	JUMP A ≠ 0	JUMP, STOP KEY 5	JUMP A ≠ 0	JUMP, STOP KEY 5	" 2
6	SKIP (Y) ≤ (A)	JUMP A POS	JUMP, STOP KEY 6	JUMP A POS	JUMP, STOP KEY 6	" 3
7	SKIP (Y) > (A)	JUMP A NEG	JUMP, STOP KEY 7	JUMP A NEG	JUMP, STOP KEY 7	" 4

NOTE 1: REPEATED INSTR UNMODIFIED

NOTE 3: BACK EXC ADDRESS EACH EXC

NOTE 2: ADV EXC ADDRESS EACH EXC

NOTE 4: ADD (B)₆ EACH EXC

DESIGNATORS

j	k	k		
		READ	STORE	
		READ	STORE	
0	NO SKIP	(U) _L → X _L , 0 → X _U	(X) → Q	NOT USED
1	SKIP	(Z) _L → X _L , 0 → X _U	(X) _L → Y _L	(Z) _L → X _L
2	SKIP Q POS	(Z) _U → X _L , 0 → X _U	(X) _L → Y _U	(Z) _U → X _L
3	SKIP Q NEG	(Z) → X	(X) → Y	(Z) → X
4	SKIP A = 0	(U) _L → X _L , (U) _U → X _U	(X) → A	NOT USED
5	SKIP A ≠ 0	(Z) _L → X _L , (Z) _U → X _U	(X) _L → Y _L	(Z) _L → X _L , (Z) _U → X _U
6	SKIP A POS	(Z) _U → X _L , (Z) _L → X _U	(X) _L → Y _U	(Z) _U → X _L , (Z) _L → X _U
7	SKIP A NEG	(A) → X	(X) _L → Y	NOT USED