

# DIAGNOSTIC FUNCTION TEST REPRODUCTION

## INDEXING AND STORE STARS

### A. PURPOSE

TO TEST THE INDEXING AND STORE A AND B STAR CIRCUITRIES BY MODIFYING THE A AND B ADDRESSES OF AN INSTRUCTION BY INDEX FACTORS PUNCHED IN THE DETAIL CARDS AND STORED IN INDEX LOCATIONS 1, 2, AND 3. THE PROGRAM IS DESIGNED FOR ANY STORAGE SIZE FROM 1.4K TO 16K.

### B. LOADING PROCEDURES

PLACE TEST IN 1402 READ HOPPER AND DEPRESS LOAD KEY.

WHEN RUNNING TEST FROM TAPE ENTER A 1 IN 1257.

### C. PROGRAM CONTROL

#### I. SENSE SWITCHES

- B. ON FOR SCOPING LOOP  
OFF TO CONTINUE
- C. ON TO PRINT CORRECT RESULTS  
OFF TO CONTINUE
- D. ON TO REPEAT USING SAME FACTORS  
OFF TO READ NEW INFORMATION
- E. ON TO STOP ON ERROR  
OFF TO PRINT ERROR

### D. TEST PROCEDURE

THE PROGRAM IS EXECUTED IN THE FOLLOWING MANNER:

FIRST, THE PRINTOUT INFORMATION IS LOADED INTO THE PRINT AREA. SECOND, THE INDEXED INSTRUCTION (DIFFERENT FOR EACH DETAIL CARD) IS LOADED INTO THE PROGRAM. THIRD, THE INDEX FACTORS ARE LOADED INTO INDEX LOCATIONS 1 (087-089), 2 (092-094), AND 3 (097-099).

THE NEXT INSTRUCTION CLEARS LOCATION 000 TO CAUSE WRAP-AROUND TO 15999, 11999, 7999, 3999, OR 1999 TO DETERMINE STORAGE SIZE OF THE MACHINE BEING TESTED. THE HIGHEST ADDRESS IS THEN TRANSFERRED TO LOCATIONS 793-795 BY A STORE B STAR INSTRUCTION. LOCATION 795 IS THEN TESTED FOR ZONES TO DETERMINE WHETHER STORAGE SIZE IS 16K, 12K, OR 8K. IF NONE OF THESE, A TEST IS MADE FOR ZONES IN LOCATION 793 TO DETERMINE WHETHER THE MACHINE BEING TESTED IS 4K, 2K OR 1.4K. HAVING DETERMINED THE STORAGE SIZE, THE PROGRAM THEN MOVES THE PROPER INSTRUCTION INTO LOCATIONS 500-507. THIS INSTRUCTION, WHEN EXECUTED, COMPARES THE D-CHARACTER WITH THE SELECTION CODES (114826) PUNCHED IN COLUMNS 63-68 OF THE DETAIL CARD. THIS COMPARISON DETERMINES WHETHER THE DETAIL CARD IS TO BE BY-PASSED OR PROCESSED. FOR EXAMPLE, A DETAIL CARD PUNCHED 114826 WILL BE PROCESSED ON ANY MACHINE, BUT A DETAIL CARD PUNCHED 4826 WILL BE BY-PASSED ON A 1.4 OR 2K MACHINE AND PROCESSED ON A 4K, 8K, 12K, OR 16K MACHINE. A CARD PUNCHED 6 CAN ONLY BE PROCESSED ON A 16K MACHINE.

DATE	2-2-61	2-15-61	4-27-61	7-1-63	17. 10. 63			
NG. CHG. NO.	110378	110378A	110378C	117628	TA 1976			

# DIAGNOSTIC FUNCTION TEST REPRODUCTION

DETAIL CARDS PUNCHED WITH SELECTION CODES (114826) IN COLUMNS 63-68 TO PROCESS OR BY-PASS RECORDS AS FOLLOWS:

SELECTION CODES	PROCESS ON	CARD NUMBER
114826	ALL MACHINES	25-32
14826	2K, 4K, 8K, 12K, 16K	33-34
4826	4K, 8K, 12K, 16K	35-37
826	8K, 12K, 16K	38-41
26	12K, 16K	42-45
6	16K	46-48

IF THE DETAIL CARD IS TO BE PROCESSED, THE PROGRAM BRANCHES TO LOCATION 600 TO SET UP A SINGLE CHARACTER A OR B FIELD IN A LOCATION SPECIFIED BY COLUMNS 10-12 OF THE DETAIL CARD. THIS IS DONE TO PROVIDE A WORD MARK IN THE A OR B FIELD TO END THE EXECUTION PHASE OF THE INDEXED INSTRUCTION.

THE PROGRAM BRANCHES TO ADDRESS 512 TO EXECUTE THE INDEXED INSTRUCTION PUNCHED IN COLUMNS 1-7 OF THE CARD BY ADDING THE INDEX FACTORS TO THE A AND B ADDRESS OF THE INSTRUCTION, EXECUTE THE INSTRUCTION AND STORE THE RESULT OF A STAR IN LOCATIONS 261-263 AND THE RESULT OF B STAR IN LOCATIONS 264-266. THESE TWO RESULTS ARE THEN COMPARED WITH THE PRE-DETERMINED RESULT PUNCHED IN COLUMNS 41-46 AND STORED IN LOCATIONS 241-246.

**E. STOPS**

920 - ERROR STOP WITH E ON.  
AFTER STOP CONTINUE BY PUSHING START.

**F. PRINTOUTS**

**1. WITHOUT ERRORS**

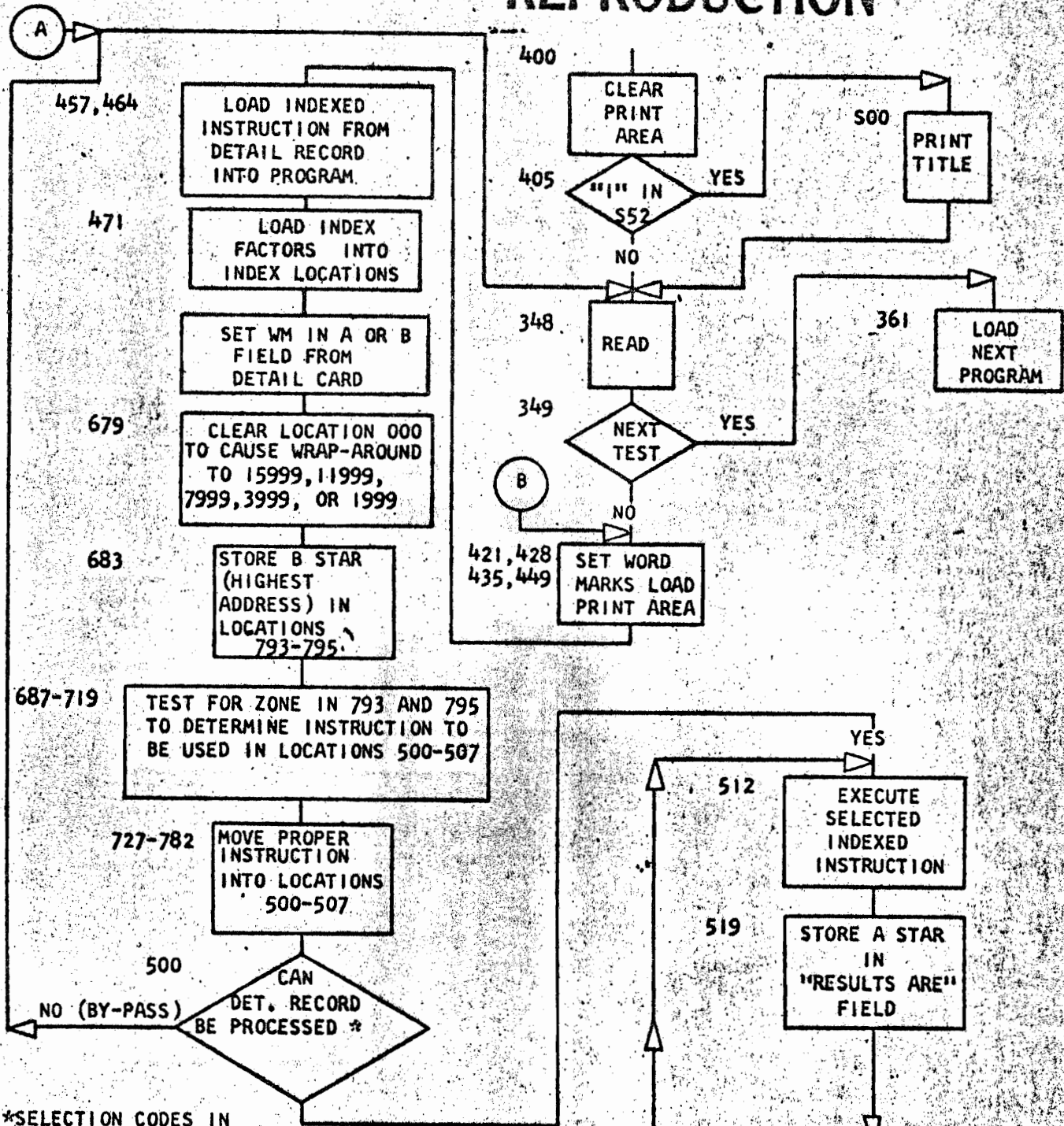
INSTR.	INDEX REG.	RESULTS SHOULD BE	RESULTS ARE	PROC. ON
AIR85G7	<del>143</del> 143 422	A340998	A340998	114826
TT4W07	V67 S34 <del>143</del>	R00R00	R00R00	4826
LPX7EN6	N5W X7X <del>143</del>	LT3KT3K	LT3KT3K	26

**2. WITH ERRORS**

INSTR.	INDEX REG.	RESULTS SHOULD BE	RESULTS ARE	PROC. ON	
AIR85G7	<del>143</del> 143 422	A340998	A340576	114826	ERROR
TT4W07	V67 S34 <del>143</del>	R00R00	N67R00	4826	ERROR
LPX7EN6	N5W X7X <del>143</del>	LT3KT3K	LT3KJIS	26	ERROR

DATE	2-2-61	2-15-61	4-27-61	7-1-63	17 10 63		
ENG. CHG. NO.	110378	110378A	110378C	117628	TA 1976		

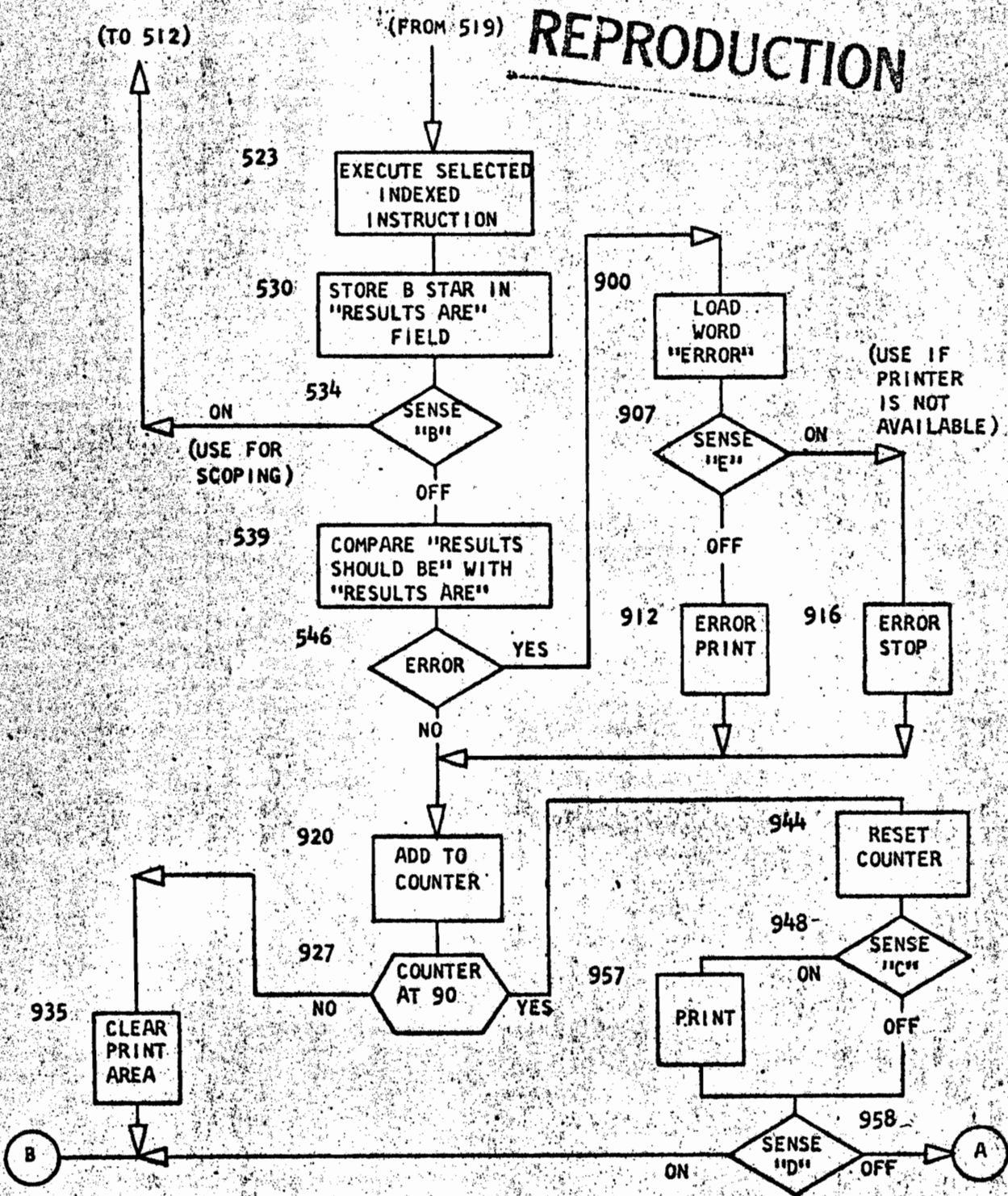
REPRODUCTION



\*SELECTION CODES IN  
 DETAIL CARD COLUMNS  
 63-68 COMPARED WITH  
 D-CHARACTER IN LOC.507.

(FROM NEXT PAGE) (TO NEXT PAGE)

DATE	2-2-61	2-15-61	4-27-61	7-1-63	17. 10.63		
ENG. CHG. NO.	110378	110378A	110378C	117628	TA 1976		



DATE	2-2-61	2-15-61	4-27-61	7-1-63	17.10.63		
ENG. CHG. NO.	110378	110378A	110378C	117628	TA 1976		

**REPRODUCTION**  
PROGRAM LISTING FOR USE WITH FLOW CHART

INDEXING + STORE STARS 3100D

INSTRUCTION ADDRESS	OP	A	B	REMARKS
377	377	B	389 S571	USE WHEN TESTS ARE RUN FROM TAPE
385	385	B	S88	"
389	389	N	000	"
393	393	M	360 392	"
400	400	/	332	START TEST
404	404	/		"
405	405	B	S00 S521	BR TO TITLE PRINT ROUTINE IF 1 IN S52
413	413	/	080	CLEAR READ AREA
417	417	B	348	BRANCH TO PROGRAM CHAINING ROUTINE
421	421	,	001 021	LOAD PRINT AREA
428	428	,	062 078	"
435	435	L	080 299	"
442	442	L	068 278	"
449	449	L	050 250	"
456	456	N		*AN ASTERISK MEANS INSTRUCTION CHANGES
457	457	L	007 518	LOAD INDEXED INSTRUCTION FROM DETAIL
464	464	L	007 529	CARD INTO PROGRAM
471	471	L	033 099	LOAD INDEX FACTORS INTO INDEX LOCATIONS
478	478	,	099 240	SET WORD MARKS
485	485	B	679	BRANCH TO DETERMINE STORAGE SIZE
500	500	B	600 06XX	*IF 06XX BR TO PROCESS DETAIL RECORD
508	508	B	417	IF NOT 06XX BR TO BY-PASS DETAIL RECORD
512	512	X	XXX XXX	*INDEXED INSTRUCTION
519	519	Q	263	STORE A STAR IN -RESULTS ARE- FIELD
523	523	X	XXX XXX	*INDEXED INSTRUCTION
530	530	H	266	STORE B STAR IN -RESULTS ARE- FIELD
534	534	B	512 B	B ON TO SCOPE SS
539	539	M	512 260	MOVE OP CODE TO RESULTS FIELD
546	546	C	268 248	TEST FOR ERROR
553	553	B	900 /	BR TO ERROR PRINT ROUTINE IF UNEQUAL
558	558	B	920	BR TO CORRECT PRINT ROUTINE
600	600	,	010	SET A OR B FIELD WM
604	604	M	012 617	ALTER INSTRUCTION 611
611	611	L	971 XXX	*LOAD BLANK INTO A OR B FIELD
618	618	L	007 207	LOAD PRINT AREA
625	625	B	512	BRANCH TO CONTINUE
679	679	/	000	CLEAR 000 TO CAUSE WRAP AROUND
683	683	H	795	STORE HIGHEST ADDR IN B STAR
687	687	V	782 795B	BR IF HIGHEST ADDR IS 15999
695	695	V	771 795K	BR IF HIGHEST ADDR IS 11999
703	703	V	760 795S	BR IF HIGHEST ADDR IS 7999
711	711	V	749 793B	BR IF HIGHEST ADDR IS 3999
719	719	V	738 793Z	BR IF HIGHEST ADDR IS 1999

DATE	2-2-61	2-15-61	4-27-61	7-1-63	17.10.63		
ING. CHG. NO.	110378	110378A	110378C	117628	TA 1976		

1401 DATA PROCESSING SYSTEM  
DIAGNOSTIC FUNCTION TEST

# REPRODUCTION

727	727	M	803	507	MOVE TEST FOR 1.4K INTO PROG	
734	734	B	500		BR TO PROCESS OR BY-PASS	
738	738	M	811	507	MOVE TEST FOR 2K INTO PROG	
745	745	B	500		BR TO PROCESS OR BY-PASS	
749	749	M	819	507	MOVE TEST FOR 4K INTO PROG	
756	756	B	500		BR TO PROCESS OR BY-PASS	
760	760	M	827	507	MOVE TEST FOR 8K INTO PROG	
767	767	B	500		BR TO PROCESS OR BY-PASS	
771	771	M	835	507	MOVE TEST FOR 12K INTO PROG	
778	778	B	500		BR TO PROCESS OR BY-PASS	
782	782	M	843	507	MOVE TEST FOR 16K INTO PROG	
789	789	B	500		BR TO PROCESS OR BY-PASS	
793	793	X	XX		HIGHEST ADDR STORED BY STORE B STAR INST	
796	796	B	600	0631	INSTRUC USED BY PROG IF 1.4K STOR	
804	804	B	600	0641	INSTRUC USED BY PROG IF 2K STOR	
812	812	B	600	0654	INSTRUC USED BY PROG IF 4 K STOR	
820	820	B	600	0668	INSTRUC USED BY PROG IF 8 K STOR	
828	828	B	600	0672	INSTRUC USED BY PROG IF 12 K STOR	
836	836	B	600	0686	INSTRUC USED BY PROG IF 16 K STOR	
900	900	L	/14	285	BEGIN ERROR PRINT ROUTINE	
907	907	B	916	E	E ON TO ERROR STOP	SS
912	912	2	920		ERROR PRINT	
916	916	.	920		ERROR STOP	
920	920	A	920	970	ADD ONE TO OPERATION COUNTER	
927	927	B	944	9699	BRANCH AFTER 90 OPERATIONS	C FOR TA
935	935	/	332		CLEAR PRINT AREA	
939	939	/				
940	940	B	421		BRANCH TO REPEAT	
944	944	S	970		RESET OPERATION COUNTER	
948	948	B	957	C	C ON FOR CORRECT PRINT	SS
953	953	B	958		BRANCH TO SENSE D	
957	957	2			PRINT CORRECT RESULTS	
958	958	B	421	D	D ON TO REPEAT	SS
963	963	B	348		BRANCH TO PROG. CHAINING ROUTINE	
967	967	0	00+		OPERATION COUNTER	
971	971				A OR B FIELD	
1110	/10	E	RRO	R	CONSTANTS	
1115	/15				..	
1120	/20	I	NDE	XED INSTRUC.	..	
1140	/40	I	NDE	X REGISTERS	..	
1160	/60	R	ESU	LTS SHOULD BE	..	
1180	/80	R	ESU	LTS ARE PROC. ON	..	

DATE	2-2-61	2-15-61	4-27-61	7-1-63	17. 10. 63		
ENG. CHG. NO.	110378	110378A	110378C	117628	TA 1976		

# REPRODUCTION

## TABLE OF UNPRINTABLE CHARACTERS

LP-LEFT PARENTHESIS	12 5 8	SE-SEMICOLON	11 6 8	DE-DELTA	11 7 8
WS-WORD SEPARATOR	0 5 8	LT-LESS THAN	12 6 8	PZ-PLUS ZERO	12 0
TS-TAPE SEGMENT MARK	0 7 8	GT-GREATER THAN	6 8	TM-TAPE MARK	7 8
GM-GROUP MARK	12 7 8	MZ-MINUS ZERO	11 0	CO-COLON	5 8
RP-RIGHT PARENTHESIS	11 5 8	AP-APOSTROPHE	0 6 8		

,008015,022029,033033N	1001	INDEXING + STORE STARS	3100D	CA
,008015,022029,033033N	1001	SET WORDMARK CARD	3100D	02
L067367,340344,348349,3573611001,008012,00110011B361080A8421/340080			3100D	03
L069404,377385,389393,4004041001		B3895571BS88N000M360392/332/	3100D	04
L069441,413417,421428,4354421001BS00S521/080B348,001021,062078L080299			3100D	05
L068477,449456,457464,4714781001L068278L050250NL007518L007529L033099			3100D	06
L066511,485500,508512,5125121001,099240B679		B60006XXB417	3100D	07
L066545,519523,530534,5395461001XXXXXXQ263XXXXXXH266B5128M512260			3100D	08
L072585,553558,558558,5585581001C268248B900/B920			3100D	09
L072639,604611,618625,6256251001,010M012617L971XXXL007207B512			3100D	10
L0707020665665,679683,6876951001		/000H795V782795BV771795K	3100D	11
L067737,711719,727734,7387381001V760795SV749793BV738793ZM803507B500			3100D	12
L072777,745749,756760,7677711001M811507B500M819507B500M827507B500M835507			3100D	13
L066811,782789,793796,8048121001B500M843507B500XXX86000631B6000641			3100D	14
L072851,820828,836836,8368361001B600065486000668B6000672B6000686			3100D	15
L0609190892892,900907,9129161001		L/14285B916E2920.920	3100D	16
L065952,927935,939940,9449481001A920970B9449699/332/B421S970B957C			3100D	17
L072992,957958,963967,9719711001B9582B421DB348000P			3100D	18
		Z		
L072/39,/10/15,/20/40,/40/401001		ERROR INDEXED INSTRU.	3100D	19
L072/79,/60/80,/80/80,/80/801001INDEX REGISTERS		RESULTS SHOULD BE	3100D	20
L070S17,S00S01,S05S12,S13S171001RESULTS ARE PROC. ON2,049L0772772/2772			3100D	21
L059S44,S25S29,S36S37,S41S4510010/40/600/80L/992802/2802413			3100D	22
/333080N		CLEAR WORDMARK CARD	3100D	23
,019027,031,0380428031T98GB400L046352BW04BS88		INDEXING + STORE STARS	3100D	24

M

### DETAIL CARDS

S013012	091	***	***	I91	S091090	114826	3100D	25
S/B10R2	091	***	I91	I91	S/19090	114826	3100D	26
S0Y20H3	082	I91	***	I91	S080081	114826	3100D	27
S/S10Q2	081	I91	I91	***	S/19080	114826	3100D	28
A0#0082	082	/20	***	***	A/19081	114826	3100D	29
A/200M0	082	***	082	***	A/19081	114826	3100D	30
Z								
D0#00P0	082	/20	***	082	D/19081	114826	3100D	31
Z								
A1R85G7	999	***	143	422	A340998	114826	3100D	32
H089002	091	***	***	***	H086002	114826	3100D	33
H0890#2	091	099	***	***	H086103	114826	3100D	34
H094002	091	***	***	***	H091002	114826	3100D	35
H0940M2	091	***	099	***	H091103	114826	3100D	36
Z								

DATE	2-2-61	2-15-61	4-27-61	7-1-63	17.10.63		
G. CHG NO.	110378	110378A	110378C	117628	TA 1976		

1401 DATA PROCESSING SYSTEM  
DIAGNOSTIC FUNCTION TEST

REPRODUCTION

H099002	091	***	***	***	H096002	114826	31000	3
H0990P2	091	***	***	099	H096103	114826	31000	38
Z								
□5P09#0	X99	899	***	S99	□X98X98	14826	31000	39
Z								
CSM48Y5	Z96	/11	752	***	CZ95Z95	14826	31000	40
,TT4W07	R01	V67	S34	***	,R00R00	4826	31000	41
M/F24U4	P89	L45	***	/34	MK95P88	4826	31000	42
L259JW7	W61	U32	***	***	LW60E98	4826	31000	43
A1P3QZ0	S6X	W77	***	934	A#3656W	826	31000	44
Z								
DST4PQ7	U3S	344	L45	***	DV77U3/	826	31000	45
Z								
,ZHYZHX	P8Z	***	***	802	,P8YP8Y	826	31000	46
□2KSI19	A1/	***	Q89	A12	□A1#A1#	826	31000	47
MW93YHY	22K	***	***	L34	MW9222J	26	31000	48
LPX7EN6	T3L	N5W	X7X	***	LT3KT3K	26	31000	49
,EE5YQ9	M4M	***	55N	Q8Z	,M4LM4L	26	31000	50
□CC33TL	F60	C33	***	33L	□F6NF6N	26	31000	51
YOMP3TT	76E	43K	765	***	Y76D76D	6	31000	52
ZZ								
M//14EF	Z91	88H	***	V43	MZ9HZ9H	6	31000	53
ABCDEF	Y94	***	***	L27	AV60Y93	6	31000	51

DATE	2-2-61	2-15-61	4-27-61	7-1-63	17. 10. 63		
ENG. CHG. NO.	110378	110378A	110378C	117628	TA 1976		