IBM POUGHKEEPSIE
April 23, 1964

Diagnostic Engineering Publications

001

1410/7010

Subject: Diagnostic Program — M014B-1410/7010-1401 TOPSY Compatibility

Sequence Number 291

Replaces M014A

I. System and Channel One Cards — 2 Cards 001-002

II. Program also includes an 86 card reader test deck for 1402 reader tests. This deck is not punched with a sequence number field. Description of the deck is provided in Section 2.00.08.0 of the program write-up.

III This program corrects certain errors that existed in the previous level

a. The previous level tested a second tape on channel 1 only when loc 1292 contained a 1. Since loc. 1292 is not a standard 1410/7010 control to indicate the availability of a second drive on channel 1 a modification has been made to test only loc. 1291 to determine the availability of channel 1 tapes. The second drive will be tested if found to be ready after loading while program is still in 1410/7010 mode.

b. The previous level failed to reset an index register within Routine 20 allowing tape to write continuously when tape was the only I/O attachment being tested.

Enclosures: 62 Pages

Card Deck for CARD ONLY SYSTEMS (as punched by UP51)

8	Cards - Card Loader (1-7) and 1 Core Clear	
147	Cards No. 001-147	Data Cards
1	Card	Execute Card

Distribution:

X 1410

X 7010

Other

002
M014

M014B

TOPSY PROGRAM

FOR

1410/7010 - 1401 COMPATIBILITY

4/14/64

CONTENTS OF M014 WRITE-UP AND LISTING

2.00.00.0 TEST DESCRIPTION

00.1 MODIFICATIONS

This is a new program.

00.2 DESCRIPTION

This program is designed to test the reliability of 1410/7010 while operating in 1401 mode. Routines included within this program provide tests of both CPU and I/O to supplement tests made in previous 1410/7010 - 1401 compatibility programs. Routines are executed in the following sequence:

Routines 1 - 8	CPU Tests
Routines 9 - 13	Printer Tests
Routines 14 - 15	Punch Tests
Routines 16 - 19	Routines to test card-tape, tape-tape, tape-punch and tape-print operations.
Routines 20 - 46	Scramble overlap I/O tests.

Note: An 86 card reader test deck is required for reader tests. See Section 2.00.08.0 for list of reader test cards.

As with all 1410/7010 - 1401 compatibility programs, the system is assumed to be functioning properly while in 1410/7010 mode. The program therefore tests only those areas affected by 1401 compatibility circuits. The following programs should be run before testing with M014.

M011 - 1410/7010-1401 CPU Compatibility
M012 - 1410/7010-1401 I/O Compatibility

All test routines communicate with two common control routines to test for inquiry and to test TAD locations for looping routines, indicating errors and halting on error. Errors will normally be indicated by a six character typeout as follows:

ERR XXX *

* XXX indicates the three-digit representation of the five-digit error address.

Reference to the error address in the program listing will provide an explanation for the error.

00.2 DESCRIPTION (continued)

The program will normally make one complete pass of all CPU routines and all I/O routines for which ready units have been indicated as available in control set up before typing PASS and testing TAD3 for repeat of entire program. If TAD3 is not 1, the program will halt to change mode back to 1410/7010. Pressing computer reset and start will call in the next program. If TAD3 is a 1, program will halt to allow set up of I/O for next pass. Pressing computer reset and start will begin execution of the next pass.

Note: Immediately after the loading of the program and while the system is still in 1410/7010 mode, the units indicated as available in control area will be tested for ready status. The control area will be modified to bypass tests for non-ready devices. If tapes are to be tested, the two lowest numbered ready drives, excluding drive 0, will be used.

00.3 EQUIPMENT REQUIRED

CPU, console printer; optional units are 1402 Reader-Punch, 1403 Printer and 729 or 7330 tapes.

00.4 CARD DECK

7	Cards	Load Program
1	Card	Core Clear Card
	Cards numbered 001-147	Program
	Card numbered 001	Is Standard system control card
	Card numbered 002	Is Standard Channel 1 contrcl card
1	Card	Execute Card (Branch to 02000)

00.5 MACHINE E.C. LEVEL

00.6 PASS LENGTH

Approximately 1/2 min. assuming a full system with bypass of manual routines.

2.00.01.0 LOADING PROCEDURE

01.1 FROM CARDS

A. 7010 - 1410 without Load Button

1. Clear memory
2. Display memory location 00000
3. Alter to.

```
vv         v
RL%1100011$.      for channel 1 reader

vv         v
XL⌑1100011$.      for channel 2 reader
```

4. Set to Run, Computer Reset, Start.

B. 7010 with Load Button

1. Clear memory
2. Computer reset
3. Depress Load button

01.2 FROM TAPE (80 Character Master or Memory Dump Tape)

A. 7010 - 1410 without Load Button

1. Clear memory
2. Display memory location 00000
3. Alter to -

```
vv         v
RL%B000011$.      for channel 1 tape drive

vv         v
XL⌑B000011$.      for channel 2 tape drive
```

4. Set to Run, Computer Reset, Start.

B. 7010 with Load Button

1. Clear memory
2. Computer reset
3. Depress tape Load button

2.00.02.0 OPERATING PROCEDURE

Load Program.

Program will type the following:

M014B
SET SENSE SW A ON
SET I/O CK STOP SW OFF
SET COMPATIBILITY SW TO 1401
PRESS START

A normal program halt will occur at 02008 to allow the operator to set switches as indicated in the typeout. The control area specifying units to be tested and/or TAD locations may also be modified at this time if desired. The control area will already have been modified at this point to bypass tests for non-ready devices indicated as available. To include a previously non-ready device, make it ready and alter control area accordingly before pressing Start. To include tapes, it will be necessary to alter locations 7991 and/or 7992 to the numbered drives to be used along with altering 1291 to 1.

Note: An 86 card reader test deck is required for reader tests. See Section 02.00.08.0 for list of reader test cards.

The following are control locations that are tested by the program:

Location 1291 Test 729 or 7330 tape unit specified in location 7991 if this location is at 1 (used as read tape).

Location 7992 Test 729 or 7330 tape unit specified in loc. 7992 if this location is non blank (used as write tape).

Location 1301 Test 1402 reader if this location is an R.

Location 1303 Test 1402 punch if this location is a P.

Location 1305 Test 1403 printer if this location is a P.

2.00.02.0 OPERATING PROCEDURE (continued)

Location 1306 — If N, print only numeric data for numeric chain. If A, print data for alpha chain.

Location 1257 — Program tests this location for 0 to determine 10K memory. If not 0, greater than 10K memory is assumed.

Under normal conditions (all TADS 0 and no errors encountered) program will make one complete pass without stopping and then test TAD3 for repeat or continue. If it is desired to execute the manual routines along with the normal routines, it will be necessary to alter TAD4 (location 1004) to a 1. Manual routines are those that require manual intervention for proper execution such as disabling of print hammer, setting of switches, etc. Required steps of manual intervention will be indicated by a console printer typeout.

Normal program operations may be altered by using the Console Printer Inquiry routine to set one or several of the following TAD locations to "1."

TAD	Address	If Not 1 (Normal)	If Set to 1
0	01000 (+00)	Normal typeouts	Bypass all typeouts for scoping
1	01001 (+01)	No loops	Loop on present routine
2	01002 (+02)	No halts	Halt on error
3	01003 (+03)	1 pass only	Cycle program indefinitely
4	01004 (+04)	Bypass manual routines	Execute manual routines
5	01005 (+05)	No loops on same data	Loop routine using same data

The Console Printer Inquiry routine mentioned above may be used to alter TADS. To alter TADS do the following:

2.00.02.0 OPERATING PROCEDURE (continued)

Depress Inquiry Request Key

Note: If program is stopped when this key is depressed, it will be necessary to press computer start to branch on inquiry. Machine should type an I, make a space and unlock the keyboard for insertion of characters (1's or 0's) beginning at location 01000.

Key in the six numbers (0's and 1's) for desired set up of TAD0 - TAD5 (location 01000 - 01005).

Note: The program requires that the six digits always be altered even though it may be desired to change only TAD3 (location 01003). If an error is made during the key-in, the inquiry cancel key may be depressed to terminate the inquiry and branch program back to the same read console printer instruction.

Depress the inquiry release key to resume running.

2.00.03.0 OPERATING HINTS AND COMMENTS

1. Post restart for all routines is contained in locations 1901 - 1904. Locations 0001 - 0004 will contain a branch to 1901 to allow restart of any routine by depressing computer reset and start.

2. If a routine is causing an alarm failure and it is desired to loop the routine for scoping, do the following:

   a. Alter TAD1 to 1 to loop the routine.

   b. Turn the check control switch to RESET and RESTART mode.

   c. If failure is occurring within a reader test, it may be desirable to duplicate the cards being used with the failing routine to allow for continuous looping.

   Note: Altering TAD1 to 1 is desired for intermittent alarm failures to insure that the program will stay in the failing routine.

2.00.03.0 OPERATING HINTS AND COMMENTS (continued)

3. Normal print output for print test routines will include three types as follows:

Type 1	100 positions containing all 64 characters and beginning with BZ01
Type 2	26 lines of 20 positions (F-Z & 0-4)
Type 3	132 positions of PRBUSYTEST or PRTERRTEST

If printer chain is numeric, types 1 and 3 above will appear as 0123456789 and only 0-4 will print in type 2. Any standard carriage tape may be used. The program will call for a skip to one during test for ready units while in 1410/7010 mode.

4. The routine to force punch errors allows ten cards to be punched and then reinserted in the punch feed, 9 edge first face down, to cause hole count checks. Almost any prepunched cards may be used for this test. Mention of this is made to allow for the processing of a larger card deck for the purpose of looping this routine.

5. Normal tape operations with tapes of sufficient lengths will not cause the encountering of end of reel with tape write instructions. Tape rewinds within the program are never bypassed, so that only several feet of tape will be used. If end of reel is encountered during tape writes, the program may rewind the tape prematurely or "END OF REEL" may type without rewinding. Either of these results may cause errors to occur such as non-compares when checking the data written, etc. They merely provide indication that End of Reel was encountered and it is suggested that longer reels of tape be used unless the branch on EOR appears to be erroneous.

6. Tape errors resulting in other than scramble overlap routines (21-46) will be indicated only after ten successive retries have been made. Within routines 21-46, however, a single read or write tape error will cause an error typeout. Within these routines a check for tape error is not made until the tape operation along with the associated I/O operation is completed. A few tape errors, therefore, may be tolerated during a pass of the program but should not be consistent.

2.00.03.0 OPERATING HINTS AND COMMENTS (continued)

7. If printouts are not inhibited, routine No. 4 to cause system check error with move of location containing no bits will result in two error printouts, one for channel A error and one for channel B error before typing message to restore CK control switch to normal.

2.00.04.0 PROGRAM STOPS AND RESTARTS

N	02008	Normal halt while in 1410/7010 mode following typeout of program ID and instructions for setting switches. Set switches and press Start.
N	02223	Normal halt following instruction message for altering location 7800. Alter this location to no bits (hold shift, depress 8 key), set CK control switch to restart and press Start..
N	02261	Normal halt following message to restore CK control switch to normal. Set switch to normal and press Start.
N	02772	Normal halt following message to disable print hammer. Disable print hammer and press Start.
N	02990	Normal halt following message to restore print hammer. After restoring the print hammer, press Start..
N	03070	Normal halt following message to insert cards in punch hopper. Insert last ten cards punched 9 edge first face down followed by blank cards in punch and press Start.
N	05951	Normal halt following message to set compatibility switch to 1410/7010. Set switch and press computer reset and start to continue.

2.00.04.0 PROGRAM STOPS AND RESTARTS (continued)

N	05961	Normal halt following completion of one program pass when TAD3 is set to 1. Depress computer reset and start for next pass.
	06544	Halt following typeout indicating tape write error when TAD2 is set to 1. Press Start to attempt write again.
	06689	Tape Read Error halt - occurs following typeout of tape read error message when TAD2 is set to 1. Press Start to continue.
	06823	Halt following typeout indicating false TP EOF when TAD2 is set to 1. Press start to continue.
	06907	Error halt - occurs following error typeout when TAD2 is set to 1. Press start to continue.

2.00.05.0 TYPEOUTS

05.1 NON-ERROR TYPEOUTS

M014B
SET SENSE SW A ON
SET I/O CK STOP SW OFF
SET COMPATIBILITY SW TO 1401
PRESS START

This typeout occurs after program is loaded while system is still in 1410/7010 mode.

ALTER LOC 7800 TO NO BITS SET CK CONTROL SW TO RESTART AND PRESS START

SET CK CONTROL SW TO NORMAL PRESS START

These typeouts occur in routine 4 to force system check error with move of location containing no bits (will occur only when TAD4 is set to 1).

2.00.05.0 TYPEOUTS (continued)

DISABLE 1403 PRINT HAMMER PRESS START

RESTORE 1403 PRINT HAMMER TO NORMAL STATUS
PRESS START

These typeouts occur in routine to force printer error (will occur only when TAD4 is set to 1).

READY 10 CARDS JUST PUNCHED IN
PUNCH 9 EDGE FIRST FACE DOWN
FOLLOWED BY BLANK CARDS PRESS START

This typeout occurs following punching of ten cards to be used in force punch error routines (will occur only when TAD 4 is set to 1).

SET COMPATIBILITY SW TO 1410/7010 PRESS COMPUTER RESET AND START

This typeout occurs at end of program pass if TAD3 is not 1.

PASS

Occurs after one complete pass of the program.

05.2 ERROR TYPEOUTS

TP WR ERR XXX
TP RD ERR XXX

These typeouts will occur when ten successive tries to read or write a record on tape in other than scramble overlap routines have failed. XXX will be the three-digit representation of the five-position error address. See address conversion chart. (These typeouts can occur only when TAD0 does not contain a 1.)

END OF REEL

This typeout occurs whenever END OF REEL is sensed when writing tape in other than scramble overlap routines. (Can occur only when TAD0 does not contain a 1.)

05.2 ERROR TYPEOUTS (continued)

FALSE TP EOF XXX

This typeout occurs whenever a false end of file is detected when reading tape. XXX is the three-digit representation of the five-position error address; occurs only when TAD0 does not contain a 1.

ERR XXX

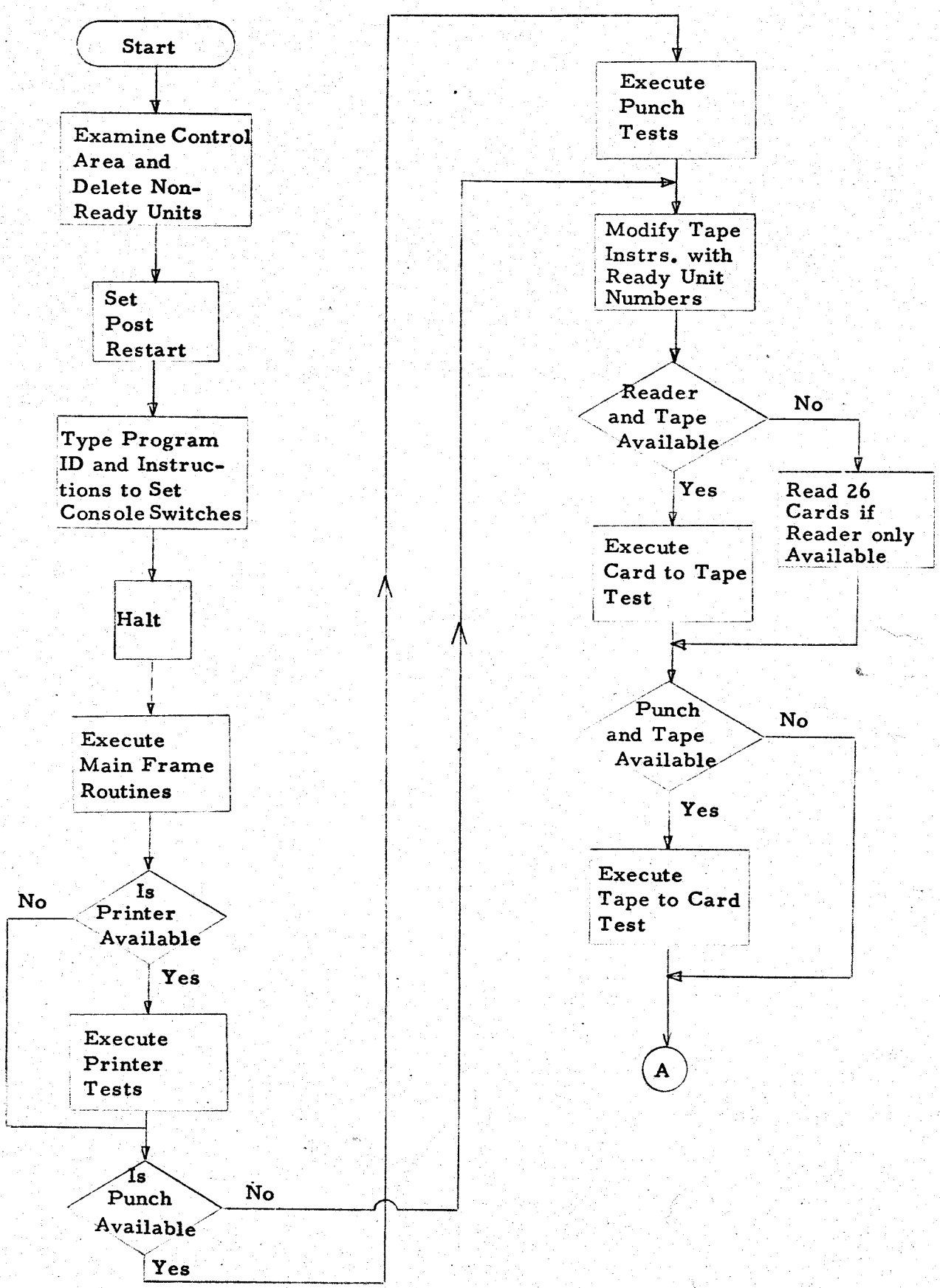
This typeout occurs whenever an error is detected within a test routine and TAD0 does not contain a 1. XXX is the three-digit representation of the five-position error address. Error addresses may be deciphered as follows:

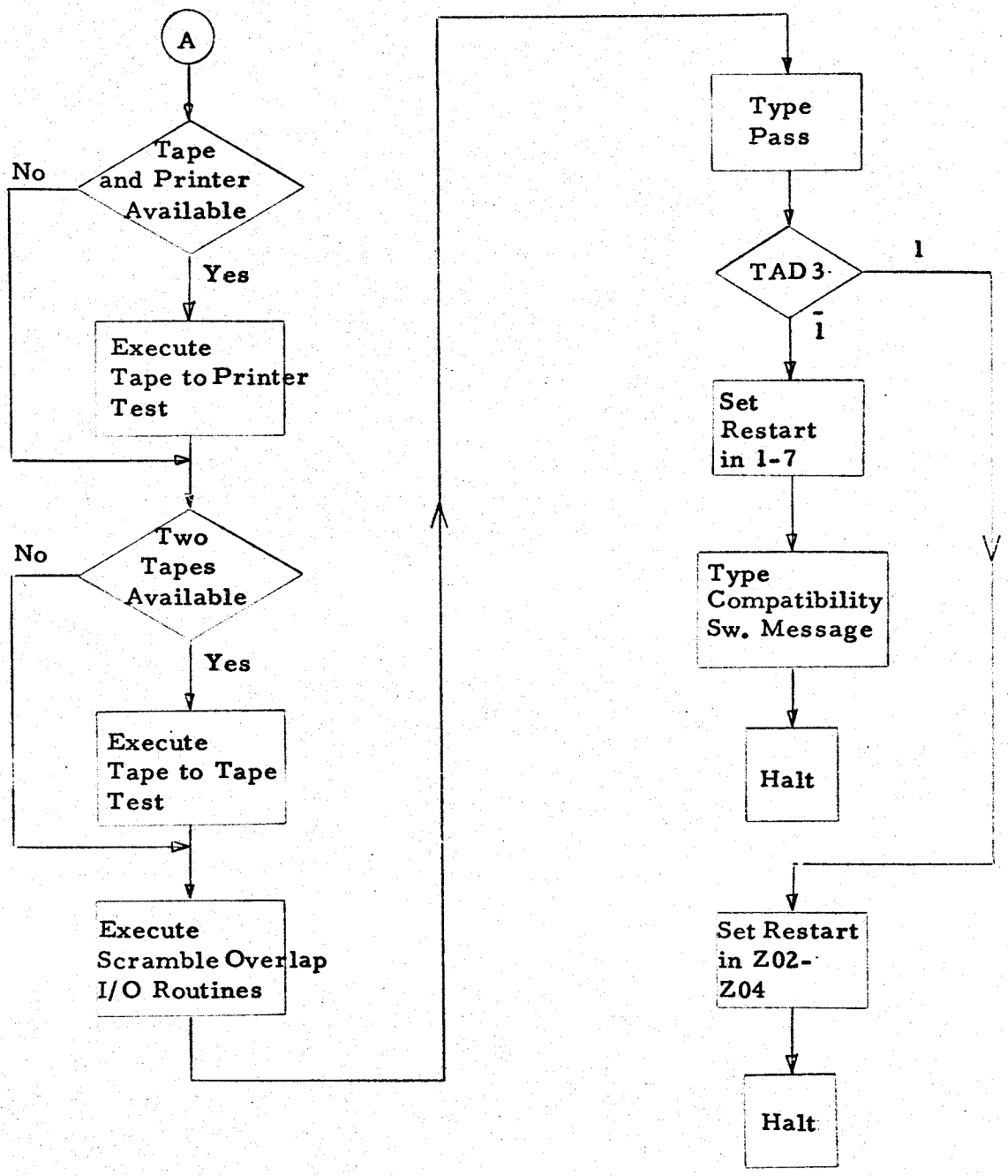
B = 2	B = 8
A = 1	A = 4
0 . 0	0
Hundredths	Units

EX. ERR P2S

B A
P2S = 722 = 06722

M014 GENERAL PROGRAM FLOW




A
Tape and Printer Available
No
Yes
Execute Tape to Printer Test
Two Tapes Available
No
Yes
Execute Tape to Tape Test
Execute Scramble Overlap I/O Routines
Type Pass
TAD 3
1
1
Set Restart in 1-7
Type Compatibility Sw. Message
Halt
Set Restart in Z02-Z04
Halt

ACTUAL ADDRESSES	ZONE BITS OVER HUNDREDS POSITION	ZONE BITS OVER UNITS POSITION	3-CHARACTER ADDRESSES
0000 to 0999 1000 to 1999 2000 to 2999 3000 to 3999	No Zine Bits A-Bit (Zero-Zone) B-Bit (11-Zone) AB-Bits (12-Zone)	No Zone Bits No Zone Bits No Zone Bits No Zone Bits	000 to 999 ‡00 to Z99 !00 to R99 ?00 to I99
4000 to 4999 5000 to 5999 6000 to 6999 7000 to 7999	No Zone Bits A-Bit (Zero-Zone) B-Bit (11-Zone AB-Bits (12-Zone)	A-Bit (Zero-Zone) A-Bit (Zero-Zone) A-Bit (Zero-Zone) A-Bit (Zero-Zone)	00‡ to 99Z ‡0‡ to Z9Z ‡0‡ to R9Z ?0‡ to I9Z
8000 to 8999 9000 to 9999 10000 to 10999 11000 to 11999	No Zone Bits A-Bit (Zero-Zone) B-Bit (11-Zone) AB-Bits (12-Zone)	B-Bit (11-Zone) B-Bit (11-Zone) B-Bit (11-Zone) B-Bit (11-Zone)	00! to 99R ‡0! to Z9R !0! to R9R ?0! to I9R
12000 to 12999 13000 to 13999 14000 to 14999 15000 to 15999	No Zone Bits A-Bit (Zero-Zone) B-Bit (11-Zone) AB-Bits (12-Zone)	AB-Bits (12-Zone) AB-Bits (12-Zone) AB-Bits (12-Zone) AB-Bits (12-Zone)	00? to 99I ‡0? to Z9I !0? to R9I ?0? to I9I

2.00.08.0 READER TEST DECK

M014 READER TEST DECK

```
0         1         2         3         4         5         6         7         8
1.........0.........0.........0.........0.........0.........0.........0.........0

BZ01 AAAAAAAAAAAAAAAAAAA
BZ01 BBBBBBBBBBBBBBBBBBB
BZ01 CCCCCCCCCCCCCCCCCCC
BZ01 DDDDDDDDDDDDDDDDDDD
BZ01 EEEEEEEEEEEEEEEEEEE
BZ01 FFFFFFFFFFFFFFFFFFF
BZ01 GGGGGGGGGGGGGGGGGGG
BZ01 HHHHHHHHHHHHHHHHHHH
BZ01 IIIIIIIIIIIIIIIIIII
BZ01 JJJJJJJJJJJJJJJJJJJ
BZ01 KKKKKKKKKKKKKKKKKKK
BZ01 LLLLLLLLLLLLLLLLLLL
BZ01 MMMMMMMMMMMMMMMMMMM
BZ01 NNNNNNNNNNNNNNNNNNN
BZ01 OOOOOOOOOOOOOOOOOOO
BZ01 PPPPPPPPPPPPPPPPPPP
BZ01 QQQQQQQQQQQQQQQQQQQ
BZ01 RRRRRRRRRRRRRRRRRRR
BZ01 SSSSSSSSSSSSSSSSSSS
BZ01 TTTTTTTTTTTTTTTTTTT
BZ01 UUUUUUUUUUUUUUUUUUU
BZ01 VVVVVVVVVVVVVVVVVVV
BZ01 WWWWWWWWWWWWWWWWWWW
BZ01 XXXXXXXXXXXXXXXXXXX
BZ01 YYYYYYYYYYYYYYYYYYY
BZ01 ZZZZZZZZZZZZZZZZZZZ
```

CARDS 27-36 PUNCHED AS FOLLOWS

```
                                        +++++ -----   0000       0
                                        34567 34567   456734567+-2
BZ01 FGHIJKLMNOPQRSTUVWX*Z012345678988888+88888-/*888888888008 ABCDEFGHIJK*MNOPQ
* IN COLS 25, 50 AND 75 INDICATE 3, 4, 5, 7, AND 8 PUNCHES
```

CARDS 37-86 PUNCHED AS FOLLOWS

```
                                        +++++ -----  00000       0
                                        34567 34567  3456734567+-2
BZ01 FGHIJKLMNOPQRSTUVWXYZ012345678988888+88888-/8888888888008 ABCDEFGHIJKLMNOPQ
```

020
M014

```
SEQ PG LIN  LABEL  OP   OPERANDS                                  SFX CT  LOCN  INSTRUCTION
101 AA 00   000    JOB  1410/7010-1401 TOPSY COMPATIBILITY TEST
102 AA 01           CTL  461111
103 AA 03
104 AA 04                * * * * * * * * * * * * * * * * * *
105 AA 06                          1410/7010 -1401
106 AA 07                        COMPATIBILITY TEST
107 AA 08                * * * * * * * * * * * * * * * * * *
108 AA 09
109 AA 10   TAD0   EQU  1000                                            1000
110 AA 11   TAD1   EQU  1001                                            1001
111 AA 12   TAD2   EQU  1002                                            1002
112 AA 13   TAD3   EQU  1003                                            1003
113 AA 14   TAD4   EQU  1004                                            1004
114 AA 15   TAD5   EQU  1005                                            1005
115 AA 16   SYSI   EQU  1256                                            1256
116 AA 17   CHN1   EQU  1289                                            1289
117 AA 18   START  EQU  2000                                            2000
118 AA 19
119 AA 20
120 AA 21          ORG  SYSI                                                    1256
121 AA 22          DC   @                              @          32  1287
122 AA 23          DC   @ @                                        1  1288
123 AA 24
124 AA 25          ORG  1239                                                    1239
125 AA 26          DCW  @1J8X&0291-9@                             11  1249
126 AA 27          DCW  @M014B@                                    5  1254
127 AA 28          DCW  @ @                                        1  1255
128 AA 29
129 AA 30          ORG  1000                                                    1000
130 AA 31          DC   @0000000@                                 6  1005
131 AA 32          DCW  @ @                                        1  1006
132 AA 33
133 AA 34          ORG  CHN1                                                    1289
134 AA 35          DC   @                              @          32  1320
135 AA 36          DC   @                        @                25  1345
```

```
SEQ PG LIN  LABEL    OP    OPERANDS                                SFX CT  LOCN  INSTRUCTION

136 AA 38            JOB   1410/7010-1401 TOPSY COMPATIBILITY TEST
137 AA 40
138 AA 41            ORG   1439                                                1439
139 AA 42
140 AA 43
141 AA 44                        LOOP CHECK ROUTINE
142 AA 45                        THIS ROUTINE IS ENTERED AT
143 AA 46                        COMPLETION OF TEST ROUTINE
144 AA 47                        TO CK FOR INQUIRY AND LOOP
145 AA 48
146 AA 49  LOOPCK    SBR   LPEX&003                  SET ROUTINE EXIT    4  1439  4 J59
147 AA 50            BIN   ALTER,Q                   CK FOR INQUIRY      5  1443  B J68 Q
148 AA 51            BCE   POST-003,TAD1,1           TEST FOR LOOP       8  1448  B Z01 #01 1
149 AA 52  LPEX      B     0000                      ROUTINE EXIT        4  1456  B 000
150 AA 53  ERRLOC    DCW   @ERR    @                                     7  1466
151 AA 54            DCW   @ @                                           1  1467
152 AA 55
153 AA 56
154 AA 57                        CONSOLE PRINTER INQUIRY ROUTINE
155 AA 58
156 AA 59  ALTER     SBR   ALTEX&003                 SET ROUTINE EXIT    4  1468  4 U88
157 AA 60            MCW   &TO,1000,R                READ CON. PRTR.     8  1472  M &TO #00 R
158 AA 61                                            TO ALTER TADS
159 AA 62            BIN   *-012,*                   CK FOR INQ ERR      5  1480  B J72 *
160 AA 63  ALTEX     B     0000                      ROUTINE EXIT        4  1485  B 000
161 AA 64
162 AA 65
163 AA 66                        ROUTINE TO TEST TAD5 FOR
164 AA 67                        LOOP ON SAME DATA AND
165 AA 68                        TO TEST FOR INQUIRY
166 AA 69
167 AA 70  TAD5CK    SBR   TD5EX&003                 SET ROUTINE EXIT    4  1489  4 V09
168 AA 71            BIN   ALTER,Q                   CK FOR INQUIRY      5  1493  B J68 Q
169 AA 72            BCE   0001,TAD5,1               TEST FOR LOOP       8  1498  B 001 #05 1
170 AA 73  TD5EX     B     0000                      ROUTINE EXIT        4  1506  B 000
```

SEQ	PG	LIN	LABEL	OP	OPERANDS		SFK	CT	LOCN	INSTRUCTION
171	AA	75		JOB	1410/7010-1401 TOPSY COMPATIBILITY TEST					
172	AA	77		ORG	2000					2000
173	AA	78								
174	AA	79		DCW	@J08500 @			7	2006	
175	AA	80				GO TO 8500 TO				
176	AA	81				DELETE NON READY				
177	AA	82				DEVICES				
178	AA	83				SET RESTART AND				
179	AA	84				TYPE PROGRAM ID				
180	AA	85		DCW	@.@			1	2007	
181	AA	86				HALT TO SET COMP				
182	AA	87				SW TO 1401				
183	AA	88				PRESS START				
184	AA	89		LCA	RESTA&004,0005	SET RESTART		7	2008	L &1K 005
185	AA	90								
186	AA	91								
187	AA	92			ROUTINE NO. 1					
188	AA	93								
189	AA	94			EXECUTE BRANCH IF CHAR EQUAL					
190	AA	95			INSTRUCTION WITH INSTRUCTION					
191	AA	96			LENGTHS GREATER THAN 8					
192	AA	97			EXECUTE ROUTINE 5 TIMES					
193	AA	98								
194	AA	99		NOP	*&005	SET ROUT. START		4	2015	N -23
195	AB	00		SAR	POST	ADDR IN Z02-Z04		4	2019	Q Z04
196	AB	01		BCE	BCE,TAD5,1	BYPASS RESET		8	2023	B -64 &05 1
197	AB	02		LCA	DMS,BCE&015	SET EXTENSION OF		7	2031	L &2Y -79
198	AB	03		CW	BCE&008	BCE INSTR		4	2038	¤ -72
199	AB	04		LCA	ZER3,0089	RESET XR1		7	2042	L &3/ 089
200	AB	05	NX	SW	BCE&008&X1	SET WM		4	2049	. -X2
201	AB	06		CW	BCE&006&X1	CLEAR WM		4	2053	¤ -X0
202	AB	07		MCW	BCE&007&X1,CHTEST	SET CHARACTER		7	2057	M -X1 &3S
203	AB	08	BCE	BCE	BROK,CHTEST,A	EXEC BCE INSTR		8	2064	B -84 &3S A
204	AB	09		DCW	@NBNCNDNE@			8	2079	
205	AB	10		B	TYP1-031	BR CH EQ INST		4	2080	B Q1Y
206	AB	11				FAILED TO BRANCH				
207	AB	12	BROK	B	TAD5CK	CK FOR LOOP ON		4	2084	B 089
208	AB	13				SAME LEN INSTR				
209	AB	14		A	TWO,0089	ADD 2 TO XR1		7	2088	A &3T 089
210	AB	15		C	0089,Z10	CK FOR 5 PASSES		7	2095	C 089 &3W
211	AB	16		BU	NX	EXEC NEXT INST		5	2102	B -49 /
212	AB	17		B	LOOPCK	CK FOR LOOP		4	2107	B 039
213	AB	18								
214	AB	19								
215	AB	20			ROUTINE NO. 2					
216	AB	21								
217	AB	22			EXECUTE TWO ADDRESS SBR INSTR					
218	AB	23			H XXX YYY					
219	AB	24								
220	AB	25		NOP	*&005	SET ROUT. START		4	2111	N J19

```
SEQ PG LIN  LABEL  OP    OPERANDS                                  SFK CT  LOCN  INSTRUCTION
221 AB 26          SAR   POST                                      ADDR IN Z02-Z04     4  2115  Q Z04
222 AB 27          LCA   ZER3,0089                                 RESET XR1           7  2119  L &3/ 089
223 AB 28          LCA   XXX,TSBR                                  AND B FLD           7  2126  L &4S &3Z
224 AB 29          SBR   0089,TSBR                                 2 ADDR SBR          7  2133  H 089 &3Z
225 AB 30          C     0089,TSBRAN                               CK RESULT           7  2140  C 089 &4V
226 AB 31          BU    TYP1                                      CONTENTS OF XR1     5  2147  B Q4Z /
227 AB 32                                                          IS INCORRECT
228 AB 33          C     TSBR,XXX                                  CK B FLD            7  2152  C &3Z &4S
229 AB 34          BU    TYP1                                      B FIELD CHANGED     5  2159  B Q4Z /
230 AB 35                                                          SHOULD BE XXX
231 AB 36          B     LOOPCK                                    CK FOR LOOP         4  2154  B J39
232 AB 37
233 AB 38
234 AB 39                      ROUTINE NO. 3
235 AB 40                      EXECUTE INDEXED NOP INSTRUCTION
236 AB 41
237 AB 42          NOP   *&005                                     SET ROUT START      4  2158  N J75
238 AB 43          SAR   POST                                      ADDR IN Z02-Z04     4  2172  Q Z04
239 AB 44          LCA   8KCYC,0089                                LOAD XR1 - 19E      7  2176  L Z8S 089
240 AB 45          NOP   1000&X1,1000&X1                           EXECUTE NOP         7  2183  N ##0 ##0
241 AB 46          B     LOOPCK                                                        4  2190  B J39
242 AB 47
243 AB 48
244 AB 49                      ROUTINE NO. 4
245 AB 50                      FORCE SYSTEM CHECK ERROR
246 AB 51                      WITH MOVE OF LOC. CONTAINING
247 AB 52                      EVEN NUMBER OF BITS
248 AB 53                      TEST BRANCH ON PROCESS ERROR
249 AB 54                      %LOC ALTERED TO EVEN BITS
250 AB 55                      FROM CONSOLE TYPEWRITER¤
251 AB 56          BCE   EX8,TA04,1                                CK FOR MANL TEST    8  2194  B K06 #04 1
252 AB 57          B     RN5                                       BYPASS ROUTINE      4  2202  B K65
253 AB 58  EX8     NOP   MKSTP                                     SET ROUT START      4  2206  N K27
254 AB 59          SAR   POST                                      ADDR IN Z02-Z04     4  2210  Q Z04
255 AB 60          MCW   %TO,PROCMS-031,W                          TYPE MESSAGE        8  2214  M %TO C4S M
256 AB 61          H                                               HALT TO ALTER       1  2222  .
257 AB 62                                                          LOC 7800
258 AB 63                                                          HOLD SHIFT AND
259 AB 64                                                          DEPRESS KEY 8
260 AB 65          SW    7801                                      SET WM              4  2223  , H0/
261 AB 66  MKSTP   MCW   7800,7801                                 EXEC MOVE OP        7  2227  M H0# H0/
262 AB 67          BIN   ROK8,%                                    CK FOR PROC ERR     5  2234  B K43 %
263 AB 68          B     TYP1-031                                  PROGRAM FAILED      4  2239  B Q1Y
264 AB 69                                                          TO BR ON PROCESS
265 AB 70                                                          ERROR
266 AB 71  ROK8    BIN   TYP1,%                                    ERR LATCH DID       5  2243  B Q4Z %
267 AB 72                                                          NOT RESET
268 AB 73          B     LOOPCK                                    CK FOR LOOP         4  2248  B J39
269 AB 74          MCW   %TO,RESCK-031,W                           TYPE MESSAGE        8  2252  M %TO A1X M
270 AB 75          H                                               HALT TO RESTORE     1  2260  .
```

SEQ	PG	LIN	LABEL	OP	OPERANDS		SFX	CT	LOCN	INSTRUCTION
271	AB	76				CK CONTROL SW				
272	AB	77		CS	7801	CLEAR WORK AREA		4	2261	/ H07
273	AB	78								
274	AB	79								
275	AB	80			ROUTINE NO. 5					
276	AB	81			ADD 99 TO 11 AND CHECK					
277	AB	82			FOR /0 RESULT WITH OVERFLOW					
278	AB	83								
279	AB	84	RN5	NOP	*&005	SET ROUT START		4	2255	N K73
280	AB	85		SAR	POST	ADDR IN Z02-Z04		4	2259	Q Z04
281	AB	86		LCA	AA1,ADAREA			7	2273	L B4S B5Y
282	AB	87		A	NINT9,ADAREA	EXECUTE ADD		7	2280	A B6# B5Y
283	AB	88		C	ADAREA,ADAN	CK RESULT		7	2287	C B5Y B5#
284	AB	89		BU	TYP1	RESULT OF ADD IS INCORRECT		5	2294	B Q4Z /
285	AB	90				CK FOR OVERFLOW		5	2299	B L08 Z
286	AB	91		BAV	*&005	DID NOT GET OVFL		4	2304	B Q1Y
287	AB	92		B	TYP1-031	CK FOR LOOP		4	2308	B U39
288	AB	93		B	LOOPCK					
289	AB	94								
290	AB	95								
291	AB	96			ROUTINE NO. 6					
292	AB	97			ADD 99 TO /1 AND CHECK					
293	AB	98			FOR J0 RESULT WITH OVERFLOW					
294	AB	99								
295	AC	00		NOP	*&005	SET ROUT START		4	2312	N L20
296	AC	01		SAR	POST	ADDR IN Z02-Z04		4	2316	Q Z04
297	AC	02		LCA	AA1&002,ADAREA			7	2320	L B4U B5Y
298	AC	03		A	NINT9,ADAREA,E	XECUTE ADD		8	2327	A B6# B5Y E
299	AC	04		C	ADAREA,ADAN&002	CK RESULT		7	2335	C B5Y B5S
300	AC	05		BU	TYP1	RESULT OF ADD IS INCORRECT		5	2342	B Q4Z /
301	AC	06				CK FOR OVERFLOW		5	2347	B L55 Z
302	AC	07		BAV	*&005	DID NOT GET OVFL		4	2352	B Q1Y
303	AC	08		B	TYP1-031	CK FOR LOOP		4	2356	B U39
304	AC	09		B	LOOPCK					
305	AC	10								
306	AC	11								
307	AC	12			ROUTINE NO. 7					
308	AC	13			ADD 99 TO J1 AND CHECK					
309	AC	14			FOR A0 RESULT WITH OVERFLOW					
310	AC	15								
311	AC	16		NOP	*&005	SET ROUT START		4	2350	N L68
312	AC	17		SAR	POST	ADDR IN Z02-Z04		4	2354	Q Z04
313	AC	18		LCA	AA1&004,ADAREA			7	2358	L B4W B5Y
314	AC	19		A	NINT9,ADAREA	EXECUTE ADD		7	2375	A B6# B5Y
315	AC	20		C	ADAREA,ADAN&004	CK RESULT		7	2382	C B5Y B5U
316	AC	21		BU	TYP1	RESULT OF ADD IS INCORRECT		5	2389	B Q4Z /
317	AC	22				CK FOR OVERFLOW		5	2394	B M03 Z
318	AC	23		BAV	*&005	DID NOT GET OVFL		4	2399	B Q1Y
319	AC	24		B	TYP1-031	CK FOR LOOP		4	2403	B U39
320	AC	25		B	LOOPCK					

```
SEQ PG LIN  LABEL  OP    OPERANDS                                SFK CT  LOCN  INSTRUCTION

321 AC 26
322 AC 27
323 AC 28                          ROUTINE NO. 8
324 AC 29                          ADD 99 TO A1 AND CHECK
325 AC 30                          FOR 10 RESULT WITH OVERFLOW
326 AC 31
327 AC 32          NOP   *&005     SET ROUT START           4  2407  N M15
328 AC 33          SAR   POST      ADDR IN Z02-Z04          4  2411  Q Z04
329 AC 34          LCA   AA1&006,ADAREA                     7  2415  L B4Y 35Y
330 AC 35          A     NINT9,ADAREA  EXECUTE ADD           7  2422  A B6# 35Y
331 AC 36          C     ADAREA,ADAN&006  CK RESULT           7  2429  C B5Y 35W
332 AC 37          BU    TYP1      RESULT OF ADD            5  2436  B Q4Z /
333 AC 38                          IS INCORRECT
334 AC 39          BAV   *&005     CK FOR OVERFLOW          5  2441  B M5D Z
335 AC 40          B     TYP1-031  DID NOT GET OVFL         4  2446  B Q1Y
336 AC 41          B     LOOPCK    CK FOR LOOP              4  2450  B U39
337 AC 42          CS    0332      CLEAR                    4  2454  / 332
338 AC 43          CS                PRINT AREA             1  2458  /
339 AC 44
340 AC 45                          ROUTINE NO. 9
341 AC 46                          PRINT 10 LINES AND
342 AC 47                          TEST BRANCH ON PRINTER BUSY
343 AC 48
344 AC 49          BCE   EX9,1305,P  CK FOR PRINTER           8  2459  B M71 T05 P
345 AC 50          B     RN14      BYPASS PRT TESTS         4  2467  B R95
346 AC 51  EX9     NOP   *&005     SET ROUT. START          4  2471  N M79
347 AC 52          SAR   POST      ADDR IN Z02-Z04          4  2475  Q Z04
348 AC 53          BCE   *&012,1306,N  CK FOR NUM CHAIN      8  2479  B M98 T05 N
349 AC 54          MCW   PRBSEG,0332  MV DATA               7  2487  M B2W 332
350 AC 55          B     *&008                              4  2494  B N05
351 AC 56          MCW   PRBNSG,0332  MV DATA               7  2498  M &9J 332
352 AC 57          SW    0201        TO PRINT AND           4  2505  , 201
353 AC 58          MCW   0332,0322     SPREAD IT OUT        7  2509  M 332 322
354 AC 59          LCA   ZZZ,0089    RESET XR 1             7  2516  L 33K 089
355 AC 60  PT2     LCA   ZZZZ,CYCNT  RESET COUNTER          7  2523  L B3J B3#
356 AC 61          W                 PRINT LINE             1  2530  2
357 AC 62          BPB   CKBUSY      CK FOR PRNT BSY        5  2531  B Z5Y P
358 AC 63          C     CYCNT,ZZZZ  CK CNTR                7  2536  C 33# 33J
359 AC 64          BE    TYP1        PROG FAILED TO         5  2543  B Q4Z S
360 AC 65                          BR ON BUSY
361 AC 66          BIN   TYP1,*      CK FOR PRINT ERR       5  2548  B Q4Z *
362 AC 67          A     ONE,0089    UP XR 1                7  2553  A A0V 089
363 AC 68          C     0089,Z10    CK FOR 10 LINES        7  2560  C 089 &3W
364 AC 69          BU    PT2         PRINT NEXT LINE        5  2567  B N23 /
365 AC 70          B     LOOPCK      CK FOR LOOP            4  2572  B U39
366 AC 71          CS    0332        CLEAR                  4  2576  / 332
367 AC 72          CS                PRINT AREA             1  2580  /
368 AC 73
369 AC 74                          ROUTINE NO. 10
370 AC 75                          PRINT 10 LINES AND TEST
```

SEQ	PG	LIN	LABEL	OP	OPERANDS	SFX	CT	LOCN	INSTRUCTION
371	AC	76			FOR SYSTEM INTERLOCK EXECUTING				
372	AC	77			BR ON PRINT ERROR BEFORE				
373	AC	78			BR ON PRINT BUSY				
374	AC	79							
375	AC	80		NOP	*&005				
376	AC	81		SAR	POST				
377	AC	82		BCE	*&012,1306,N				
378	AC	83		MCW	PRBSEG,0332				
379	AC	84		B	*&008				
380	AC	85		MCW	PRBNSG,0332				
381	AC	86		SW	0201				
382	AC	87		MCW	0332,0322				
383	AC	88		LCA	ZZZ,0089				
384	AC	89	PT3	LCA	ZZZZ,CYCNT				
385	AC	90		W					
386	AC	91		BIN	TYP1,*				
387	AC	92		BPB	TYP1				
388	AC	93							
389	AC	94							
390	AC	95							
391	AC	96		A	ONE,0089				
392	AC	97		C	0089,Z10				
393	AC	98		BU	PT3				
394	AC	99		B	LOOPCK				
395	AD	00		CS	0332				
396	AD	01		CS					
397	AD	02							
398	AD	03			ROUTINE NO. 11				
399	AD	04			EXECUTE CARRIAGE CONTROL				
400	AD	05			OPS AND TEST FOR				
401	AD	06			PRINTER CARRIAGE BUSY				
402	AD	07							
403	AD	08		NOP	*&005				
404	AD	09		SAR	POST				
405	AD	10		LCA	ZZZ,0089				
406	AD	11	PT4	LCA	ZZZZ,CYCNT				
407	AD	12		CC	L				
408	AD	13		BPCB	CKBUSY				
409	AD	14		C	CYCNT,ZZZZ				
410	AD	15		BE	TYP1				
411	AD	16							
412	AD	17							
413	AD	18		A	ONE,0089				
414	AD	19		C	0089,ZZ5				
415	AD	20		BU	PT4				
416	AD	21		B	LOOPCK				
417	AD	22							
418	AD	23							
419	AD	24			ROUTINE NO 12				
420	AD	25							

SET ROUT START 4 2581 N N89
ADDR IN Z02-Z04 4 2585 Q Z04
CK FOR NUM CHAIN 8 2589 B 308 T05 N
MV DATA 7 2597 M 32N 332
4 2604 B 315
MV DATA 7 2608 M &9J 332
TO PRINT AND 4 2615 , 201
SPREAD IT OUT 7 2619 M 332 322
RESET XR 1 7 2626 L B3X 089
RESET CNTR 7 2633 L B3J B3#
PRINT LINE 1 2640 2
PRINT ERROR 5 2641 B Q4Z #
PROG BRANCHED ON 5 2646 B Q4Z P
BUSY BR ON PRT
ERR DID NOT
CAUSE INTERLOCK
UP XR 1 7 2651 A A0V 089
CK FOR 10 LINES 7 2658 C 089 83W
PRINT NEXT LINE 5 2665 B 333 /
CK FOR LOOP 4 2670 B 039
CLEAR 4 2674 / 332
PRINT AREA 1 2678 /

SET ROUT. START 4 2679 N 087
ADDR IN Z02-Z04 4 2683 Q Z04
RESET XR 1 7 2687 L B3X 089
RESET CNTR 7 2694 L B3J B3#
2 2701 F L
CK FOR BUSY 5 2703 B Z5Y 3
CK COUNTER 7 2708 C B3# B3J
PROG DID NOT 5 2715 B Q4Z S
BRANCH BUSY
AFTER CARR SPACE
UP XR 1 7 2720 A A0V 089
CK FOR 5 SPACES 7 2727 C 089 81W
SPACE AGAIN 5 2734 B 394 /
CK FOR LOOP 4 2739 B 039

```
SEQ PG LIN  LABEL  OP    OPERANDS                                  SFX CT  LOCN  INSTRUCTION

421 AD 26                        FORCE PRINTER ERROR
422 AD 27                        HALT TO DISABLE PRINT HAMMER
423 AD 28                        PRINT 10 LINES AND TEST
424 AD 29                        BRANCH ON PRINT ERROR
425 AD 30
426 AD 31          NOP   EXX12&0009                    SET ROUT. START    4  2743  N P72
427 AD 32          SAR   POST                          ADDR IN Z02-Z04    4  2747  Q Z04
428 AD 33          BCE   EXX12,TAD4,1                  CK FOR MANL TEST   8  2751  B P63 #04 1
429 AD 34          B     RN13                          GO TO NEXT ROUT.   4  2759  B Q54
430 AD 35  EXX12   MCW   &TO,PRTHAM-031,W               PRINT MESSAGE      8  2753  M &TO &4W M
431 AD 36          H                                   HALT TO DISABLE    1  2771  .
                                                       PRINT HAMMER
432 AD 37                                              RESET XR 1         7  2772  L B3X 089
433 AD 38          LCA   ZZZ,0089                      CK FOR NUM CHAIN   8  2779  B P98 T06 N
434 AD 39          BCE   *&012,1306,N                  MV IN IMAGE SEGM   7  2787  M A0J 332
435 AD 40          MCW   IMSEG,0332                                       4  2794  B Q05
436 AD 41          B     *&008                         MV DATA            7  2798  M &9J 332
437 AD 42          MCW   PRBNSG,0332                   SET WM             4  2805  , 201
438 AD 43          SW    0201                          SPREAD RECORD      7  2809  M 332 322
439 AD 44          MCW   0332,0322                     PRINT LINE         1  2816  2
440 AD 45  PT      W                                   CK FOR PRINT ERR   5  2817  B Q25 #
441 AD 46          BIN   CKER,*                        FAILED TO BRANCH   4  2822  B Q1Y
442 AD 47          B     TYP1-031                      ON PRINT ERROR
443 AD 48                                              CK FOR RESET       5  2826  B Q4Z #
444 AD 49  CKER    BIN   TYP1,*                        UP XR 1            7  2831  A A0V 089
445 AD 50          A     ONE,0089                      CK FOR 10 LINES    7  2838  C 089 &3W
446 AD 51          C     0089,Z10                      PRINT NEXT LINE    5  2845  B Q15 /
447 AD 52          BU    PT                            CK FOR LOOP        4  2850  B J39
448 AD 53          B     LOOPCK
449 AD 54
450 AD 55
451 AD 56                        ROUTINE NO. 13
452 AD 57
453 AD 58                        WITH PRINT HAMMER DISABLED
454 AD 59                        FROM PREVIOUS ROUTINE CHECK
455 AD 60                        FOR NO RESET OF PRINT ERROR
456 AD 61                        LATCH WITH BRANCH INSTR HAVING
457 AD 62                        REC MARK IN UNITS PSN OF ADDRESS
458 AD 63
459 AD 64  RN13    NOP   PT1                           SET ROUT. START    4  2854  N Q99
460 AD 65          SAR   POST                          ADDR IN Z02-Z04    4  2858  Q Z04
461 AD 66          BCE   EXX13,TAD4,1                  CK FOR MANL TEST   8  2862  B Q74 #04 1
462 AD 67          B     RN14                          BYPASS ROUTINE     4  2870  B R95
463 AD 68  EXX13   LCA   FRTHOU,0094                   SAVE               7  2874  L A0Y 094
464 AD 69          LCA   SVLOC,0099                     4000 AREA         7  2881  L A1W 099
465 AD 70          B     SVRES                         SAVE 4000 AREA     4  2888  B R0X
466 AD 71          LCA   BRBK&004,4004                 LOAD BR INSTR      7  2892  L E1Y 00U
467 AD 72  PT1     LCA   ZZZ,0089                      RESET XR 1         7  2899  L B3X 089
468 AD 73  PR1     W                                   PRINT LINE         1  2906  2
469 AD 74          B     4000                          BRANCH TO 4000     4  2907  B 00#
470 AD 75  BCK     BIN   CKER1,*                       CK FOR PRINT ERR   5  2911  B R20 #
```

```
SEQ PG LIN  LABEL  OP    OPERANDS                    SFX CT  LOCN  INSTRUCTION
471 AD 76          B     TYP1-031                                  BRANCH INSTR          4  2916  B Q1Y
472 AD 77                                                          CAUSED PRT ERROR
473 AD 78                                                          LATCH TO RESET
474 AD 79  CKER1   BIN   TYP1,*                                    PREVIOUS BR ON        5  2920  B Q4Z *
475 AD 80                                                          PRT ERR DID NOT
476 AD 81                                                          RESET ERROR LAT
477 AD 82          A     ONE,0089                                  UP XR 1               7  2925  A A0V 089
478 AD 83          C     0089,Z10                                  CK FOR 10 LINES       7  2932  C 089 &3W
479 AD 84          BU    PR1                                       PRINT NEXT LINE       5  2939  B R06 /
480 AD 85          B     LOOPCK                                    CK FOR LOOP           4  2944  B J39
481 AD 86          LCA   FRTHOU,0099                               RESTORE               7  2948  L A0Y 099
482 AD 87          LCA   SVLOC,0094                                 4000                 7  2955  L A1W 094
483 AD 88          CW    4000                                      CLEAR WM              4  2962  @ 00*
484 AD 89          B     SVRES                                       AREA                4  2966  B R0X
485 AD 90          LCA   PRBSEG-005,SAVA                           RESTORE               7  2970  L 32/ A1T
486 AD 91          CW    SAVA-004                                   SAVE AREA            4  2977  @ A0Z
487 AD 92          MCW   &TO,RESHAM-031,W                         TYPE MESSAGE          8  2981  M &TO A5Y M
488 AD 93          H                                               HALT TO RESTORE       1  2989  .
489 AD 94                                                           PRINT HAMMER
490 AD 95          CS    0332                                      CLEAR                 4  2990  / 332
491 AD 96          CS                                              PRINT AREA            1  2994  /
492 AD 97
493 AD 98                          ROUTINE NO. 14
494 AD 99
495 AE 00                          PUNCH 10 CARDS TO BE USED
496 AE 01                          IN BR ON PUNCH ERROR TEST
497 AE 02                          READY THESE CARDS IN PUNCH
498 AE 03                          FEED AND FORCE BRANCH ON
499 AE 04                          PUNCH ERR BY PUNCHING INTO
500 AE 05                          PRE PUNCHED CARDS
501 AE 06
502 AE 07
503 AE 08  RN14    BCE   EXB,1303,P                               CK FOR PUNCH          8  2995  B &07 T03 P
504 AE 09          B     TESTP                                                         4  3003  B B54
505 AE 10  EXB     BCE   EX14,TAD4,1                             CK FOR MANUAL TS      8  3007  B &19 *04 1
506 AE 11          B     TESTP                                                         4  3015  B B54
507 AE 12  EX14    NOP   PN14                                     SET ROUT START        4  3019  N &70
508 AE 13          SAR   POST                                    ADDR IN Z02-Z04       4  3023  Q Z04
509 AE 14          LCA   ZZZ,0089                                                      7  3027  L B3X 089
510 AE 15          LCA   RDCOMP&003,0180                         LOAD DATA             7  3034  L C4* 180
511 AE 16  PNDK1   P                                             PUNCH                 1  3041  4
512 AE 17          A     ONE,0089                                UP XR 1               7  3042  A A0V 089
513 AE 18          C     0089,Z10                                PUNCH                 7  3049  C 089 &3W
514 AE 19          BU    PNDK1                                     10 CARDS            5  3056  B &41 /
515 AE 20          MCW   &TO,PNERMS-031,W                        TYPE MESSAGE          8  3061  M &TO D1J M
516 AE 21          H                                             HALT TO READY         1  3069  .
517 AE 22                                                        PUNCHED CARDS
518 AE 23                                                        IN PUNCH HOPPER
519 AE 24  PN14    LCA   ZZZ,0089                                RESET XR 1            7  3070  L B3X 089
520 AE 25          CS    0180                                    CLEAR PUNCH AREA      4  3077  / 180
```

SEQ	PG	LIN	LABEL	OP	OPERANDS		SFX	CT	LOCN	INSTRUCTION
521	AE	26		P		CYCLE PUNCH		1	3081	4
522	AE	27	PNDK2	P		PUNCH		1	3082	4
523	AE	28		BIN	*&005,-	CK FOR PUN ERROR		5	3083	B &92 -
524	AE	29		B	TYP1-031	FAILED TO BRANCH ON PUNCH ERROR		4	3088	B Q1Y
525	AE	30				CK FOR RESET		5	3092	B Q4Z -
526	AE	31		BIN	TYP1,-	UP XR 1		7	3097	A A0V 089
527	AE	32		A	ONE,0089	PUNCH		7	3104	C 089 B1W
528	AE	33		C	0089,ZZ5	5 CARDS		5	3111	B &82 /
529	AE	34		BU	PNDK2	CK FOR LOOP		4	3116	B U39
530	AE	35		B	LOOPCK					
531	AE	36								
532	AE	37								
533	AE	38			ROUTINE NO. 15					
534	AE	39								
535	AE	40			PUNCH INTO PRE PUNCHED CARDS					
536	AE	41			AND TEST FOR NO RESET OF PUNCH					
537	AE	42			ERR LATCH WITH BRANCH INSTR					
538	AE	43			HAVING - IN UNITS PSN OF ADDRESS					
539	AE	44								
540	AE	45		NOP	*&005	SET ROUT START		4	3120	N A28
541	AE	46		SAR	POST	ADDR IN Z02-Z04		4	3124	Q Z04
542	AE	47		BCE	EX2,1257,0	CK FOR 10K MEM		8	3128	B A61 S57 0
543	AE	48		LCA	ETHOU,0094	SAVE		7	3136	L E1T 094
544	AE	49		LCA	SVLOC,0099	8000		7	3143	L A1W 099
545	AE	50		B	SVRES	AREA		4	3150	B R0X
546	AE	51		LCA	BRBK1&004,8004	LOAD BR INSTR		7	3154	L E2T 00M
547	AE	52	EX2	LCA	ZZZ,0089	RESET XR 1		7	3161	L B3X 089
548	AE	53		P		PUNCH CARD		1	3168	4
549	AE	54		BCE	EX3,1257,0	CK FOR 10K MEM		8	3169	B A90 S57 0
550	AE	55		B	8000	GO TO 8000		4	3177	B 00-
551	AE	56	BCKX	BIN	*&005,-	CK FOR PUN ERR		5	3181	B A90 -
552	AE	57		B	TYP1-031	BR INST CAUSED ERR LAT TO RESET		4	3186	B Q1Y
553	AE	58								
554	AE	59	EX3	A	ONE,0089	UP XR 1		7	3190	A A0V 089
555	AE	60		C	0089,ZZ5	PUNCH		7	3197	C 089 B1W
556	AE	61		BU	EX2&007	5 CARDS		5	3204	B A68 /
557	AE	62		BCE	EN,1257,0	CK FOR 10K MEM		8	3209	B B50 S57 0
558	AE	63		LCA	SVLOC,0094	RESTORE		7	3217	L A1W 094
559	AE	64		LCA	ETHOU,0099	8000		7	3224	L E1T 099
560	AE	65		CW	8000	CLEAR WM		4	3231	¤ 00-
561	AE	66		B	SVRES	AREA		4	3235	B R0X
562	AE	67		LCA	PRBSEG-005,SAVA	RESTORE		7	3239	L B2/ A1T
563	AE	68		CW	SAVA-004	SAVE AREA		4	3246	¤ A0Z
564	AE	69	EN	B	LOOPCK	CK FOR LOOP		4	3250	B U39
565	AE	70								
566	AE	71	TESTP	SW	0087,0092			7	3254	, 087 092
567	AE	72		NOP	RN16			4	3261	N D20
568	AE	73		SAR	0089			4	3265	Q 089
569	AE	74		NOP	DVLPM			4	3269	N P0U
570	AE	75		SAR	0094			4	3273	Q 094

```
SEQ PG LIN  LABEL   OP    OPERANDS                    SFX CT  LOCN  INSTRUCTION

571 AE 76   OPCK    BWZ   CKPERU,0000&X1,1             8  3277  V C08 D#D 1
572 AE 77   GOO     MA    ZZ1,0089                     7  3285  # &2# D89
573 AE 78           C     0089,0094                    7  3292  C D89 D94
574 AE 79           BU    OPCK                         5  3299  B B77 /
575 AE 80           B     RESTPX                       4  3304  B D02
576 AE 81   CKPERU  BCE   CKTT,0000&X1,M               8  3308  B C36 D#D M
577 AE 82           BCE   CKTT,0000&X1,L               8  3316  B C36 D#D L
578 AE 83           BCE   CKTT,0000&X1,U               8  3324  B C36 D#D J
579 AE 84           B     GOO                          4  3332  B B85
580 AE 85   CKTT    C     0002&X1,TPINS1               7  3336  C D#2 R8W
581 AE 86           BE    CKN1                         5  3343  B C64 S
582 AE 87           C     0002&X1,TPINS2               7  3348  C D#2 R8Y
583 AE 88           BE    CKN1                         5  3355  B C64 S
584 AE 89           B     GOO                          4  3350  B B85
585 AE 90   CKN1    BCE   FIX1,0003&X1,1               8  3364  B C80 D#3 1
586 AE 91   CKN2    BCE   FIX2,0003&X1,2               8  3372  B C91 D#3 2
587 AE 92   FIX1    MN    RTX,0003&X1                  7  3380  D I9/ D#3
588 AE 93           B     GOO                          4  3387  B B85
589 AE 94   FIX2    MN    WTX,0003&X1                  7  3391  D I9S D#3
590 AE 95           B     GOO                          4  3398  B B85
591 AE 96   RESTPX  MN    RTX,CKN1&007                 7  3402  D I9/ C71
592 AE 97           MN    WTX,CKN2&007                 7  3409  D I9S C79
593 AE 98           B     RN16                         4  3416  B D20
594 AE 99
595 AF 00                       ROUTINE NO. 16
596 AF 01                       CARD TO TAPE TEST
597 AF 02                       READ 26 CARDS AND WRITE
598 AF 03                       CARD DATA ON TAPE 1
599 AF 04                       BACKSPACE TP1 AND READ
600 AF 05                       RECORDS TO CHECK DATA WRITTEN
601 AF 06
602 AF 07   RN16    BCE   EX16,1301,R     CK FOR READER          8  3420  B D32 T01 R
603 AF 08           B     RN17            BYPASS ROUTINE         4  3428  B E97
604 AF 09   EX16    NOP   *&005           SET ROUT. START        4  3432  N D40
605 AF 10           SAR   POST            ADDR IN Z02-Z04        4  3436  Q Z04
606 AF 11           LCA   ZZZ,0089        RESET XR 1             7  3440  L B3X D89
607 AF 12           BLC   TYP1            CK FOR LAST CARD       5  3447  B Q4Z A
608 AF 13                                 ERR TYPE HERE
609 AF 14                                 INDS FALSE EOF
610 AF 15           R                     READ CARD              1  3452  1
611 AF 16           BIN   TYP1,&          INVALID READ           5  3453  B Q4Z &
612 AF 17           LCA   GMWM,0025       SET GMWM               7  3458  L &8U 025
613 AF 18           BCE   *&005,1291,1    CK FOR TAPE            8  3465  B D77 S91 1
614 AF 19           B     ROK16                                  4  3473  B E74
615 AF 20           B     WTAP3           GO TO WRITE TAPE       4  3477  B D91
616 AF 21           CU    %U1,B           BACKSPACE              5  3481  J %U1 B
617 AF 22           CU    %U1,E            AND SKIP              5  3486  U %U1 E
618 AF 23   WTAP3   MCW   %U1,0001,W       WRITE TAPE             8  3491  M %U1 001 W
619 AF 24           NOP   0000            EXTRA INSTR            4  3499  N 000
620 AF 25           BEF   ENREEL          CK FOR EOR             5  3503  B P2S K
```

```
SEQ PG LIN  LABEL  OP    OPERANDS                                  SFX CT  LOCN  INSTRUCTION
621 AF 26          BER   TPWRER                 CK FOR WR ERROR    5  3508  B M4V L
622 AF 27                                       ERR TYPE HERE
623 AF 28                                       INDS THAT 10
624 AF 29                                       TRYS USING BKSP-
625 AF 30                                       SKIP HAVE BEEN
626 AF 31                                       MADE TO WR REC
627 AF 32          LCA   ZZ,WRCNT               RESET ERR CNTR     7  3513  L E2V E2X
628 AF 33          CU    %U1,B                  BACKSPACE REC      5  3520  J %U1 B
629 AF 34          CS    WKAREA&025                                4  3525  / H2V
630 AF 35          MCW   %U1,WKAREA,R           READ REC           8  3529  M %U1 HD# R
631 AF 36          NOP   0000                   EXTRA INSTR        4  3537  N 000
632 AF 37          BEF   EOF1                   CK FOR EOF  ERR    5  3541  B P4V K
633 AF 38                                       TYPE HERE INDS
634 AF 39                                       FALSE EOF
635 AF 40          BER   TPRDER                 CK FOR READ ERR    5  3546  B N9T L
636 AF 41                                       ERR TYPE HERE
637 AF 42                                       INDS THAT 10
638 AF 43                                       TRYS HAVE BEEN
639 AF 44                                       MADE TO READ REC
640 AF 45          LCA   ZZ,RDCNT               RESET ERR CNTR     7  3551  L E2V E2Z
641 AF 46          C     WKAREA&023,0024        CK                 7  3558  C H2T 024
642 AF 47          BE    ROK16                   RECORD            5  3565  B E74 S
643 AF 48          B     TYP1-031               TP1 REC RD DOES    4  3570  B Q1Y
644 AF 49                                       NOT COMP. WITH
645 AF 50                                       CARD REC READ
646 AF 51  ROK16   A     ONE,0089               UP XR 1            7  3574  A A0V 089
647 AF 52          C     0089,Z26               CK FOR 26 RECS     7  3581  C 089 E3S
648 AF 53          BU    EX16&015               GET NEXT REC       5  3588  B D47 /
649 AF 54          B     LOOPCK                 CK FOR LOOP        4  3593  B J39
650 AF 55
651 AF 56
652 AF 57                        ROUTINE NO. 17
653 AF 58                        TAPE TO CARD TEST
654 AF 59                        WRITE 26 RECS ON TAPE 1
655 AF 60                        REWIND TAPE - READ AND
656 AF 61                        PUNCH THE 26 RECORDS
657 AF 62
658 AF 63  RN17    BCE   CKT2,1303,P            CK FOR PUNCH       8  3597  B F09 T03 P
659 AF 64          B     RN18                   BYPASS ROUTINE     4  3605  B G07
660 AF 65  CKT2    BCE   EX17,1291,1            CK FOR TAPE        8  3609  B F21 S91 1
661 AF 66          B     RN18                   BYPASS ROUTINE     4  3617  B G07
662 AF 67  EX17    B     PRETP1                 WRITE TP 1         4  3621  B L0#
663 AF 68          NOP   *&005                  SET ROUT START     4  3625  N F33
664 AF 69          SAR   POST                   ADDR IN Z02-Z04    4  3629  Q Z04
665 AF 70          CU    %U1,R                  REWIND TAPE        5  3633  J %U1 R
666 AF 71          LCA   ZZZ,0089               RESET XR 1         7  3638  L B3X 089
667 AF 72  NX17    CS    0180                   CLEAR PUNCH        4  3645  / 180
668 AF 73          MCW   %U1,0101,R             READ TAPE REC      8  3649  M %U1 101 R
669 AF 74          NOP   0000                   EXTRA INSTR        4  3657  N 000
670 AF 75          BEF   EOF1                   CK FOR EOF         5  3661  B P4V K
```

```
SEQ PG LIN  LABEL   OP     OPERANDS                                      SFX CT  LOCN  INSTRUCTION

671 AF 76                                        ERR TYPE HERE
672 AF 77                                        INDS FALSE EOF
673 AF 78           BER    TPRDER                CK FOR READ ERR        5   3656  B N9T L
674 AF 79                                        ERR TYPE HERE
675 AF 80                                        INDS THAT 10
676 AF 81                                        TRYS HAVE BEEN M
677 AF 82                                        MADE TO READ REC
678 AF 83           LCA    ZZ,RDCNT              RESET ERR CNTR         7   3671  L E2V E2Z
679 AF 84           P                            PUNCH CARD             1   3678  4
680 AF 85           BIN    TYP1,-                PUNCH ERR              5   3679  B Q4Z -
681 AF 86           A      ONE,0089              UP XR 1                7   3684  A AOV 089
682 AF 87           C      0089,Z26              CK FOR 26 RECS         7   3691  C 089 E3S
683 AF 88           BU     NX17                  READ NEXT REC          5   3698  B F45 /
684 AF 89           B      LOOPCK                CK FOR LOOP            4   3703  B U39
685 AF 90
686 AF 91
687 AF 92                        ROUTINE NO. 18
688 AF 93                        TAPE TO PRINTER TEST
689 AF 94                        WRITE 26 RECS ON TAPE 1
690 AF 95                        REWIND TAPE - READ AND
691 AF 96                        PRINT THE 26 RECORDS
692 AF 97
693 AF 98   RN18    BCE    CKT3,1305,P           CK FOR PRINTER         8   3707  B G19 T05 P
694 AF 99           B      RN19                  BYPASS ROUTINE         4   3715  B H41
695 AG 00   CKT3    BCE    EX18,1291,1           CK FOR TAPES           8   3719  B G31 S91 1
696 AG 01           B      RN19                  BYPASS ROUTINE         4   3727  B H41
697 AG 02   EX18    B      PRETP1                WRITE TP 1             4   3731  B LO‡
698 AG 03           NOP    *&005                 SET ROUT START         4   3735  N G43
699 AG 04           SAR    POST                  ADDR IN Z02-Z04        4   3739  Q Z04
700 AG 05           CU     %U1,R                 REWIND TAPE 1          5   3743  U %U1 R
701 AG 06           LCA    ZZZ,0089              RESET XR 1             7   3748  L B3X 089
702 AG 07   NX18    CS     0299                  CLEAR PUNCH            4   3755  / 299
703 AG 08           MCW    %U1,0201,R            READ TAPE REC          8   3759  M %U1 201 R
704 AG 09           NOP    0000                  EXTRA INSTR            4   3767  N 000
705 AG 10           BEF    EOF1                  CK FOR EOF             5   3771  B P4V K
706 AG 11                                        ERR TYPE HERE
707 AG 12                                        INDS FALSE EOF
708 AG 13           BER    TPRDER                CK FOR READ ERR        5   3776  B N9T L
709 AG 14                                        ERR TYPE HERE
710 AG 15                                        INDS THAT 10
711 AG 16                                        TRYS HAVE BEEN
712 AG 17                                        MADE TO READ REC
713 AG 18           LCA    ZZ,RDCNT              RESET ERR CNTR         7   3781  L E2V E2Z
714 AG 19           BCE    CKZN18,1306,N         CK FOR NUM CHAIN       8   3788  B H01 T06 N
715 AG 20   PR18    W                            PRINT                  1   3796  2
716 AG 21           B      CK18                  GO TO CHECK            4   3797  B H13
717 AG 22   CKZN18  BWZ    PR18,0201,2           CK FOR NO ZONE         8   3801  V G96 201 2
718 AG 23           B      CK18&005              BYPASS RECORD          4   3809  B H18
719 AG 24   CK18    BIN    TYP1,‡                PRINT ERROR            5   3813  B Q4Z ‡
720 AG 25           A      ONE,0089              UP XR 1                7   3818  A AOV 089
```

```
SEQ PG LIN  LABEL   OP    OPERANDS                                SFX CT  LOCN  INSTRUCTION

721 AG 26           C     0089,Z26                 CK FOR 26 RECS      7  3825  C 089 E3S
722 AG 27           BU    NX18                     READ NEXT REC       5  3832  B G55 /
723 AG 28           B     LOOPCK                   CK FOR LOOP         4  3837  B U39
724 AG 29
725 AG 30
726 AG 31                       ROUTINE NO. 19
727 AG 32
728 AG 33                       TAPE TO TAPE TEST
729 AG 34                       WRITE 26 TWENTY CHAR RECORDS
730 AG 35                       ON TAPE 1 - REWIND TAPE 1 AND
731 AG 36                       TRANSFER RECS TO TAPE 2
732 AG 37
733 AG 38   RN19    BCE   TESNUM,1291,1               CK FOR TAPES        8  3841  B 453 S91 1
734 AG 39           B     RN20                     BYPASS TEST         4  3849  B 05#
735 AG 40   TESNUM  BCE   RN20,7992,                CK FOR 2 TAPES      8  3853  B 05# I9S
736 AG 41           NOP                                               1  3861  N
737 AG 42   EX19    B     PRETP1                   WRITE TAPE 1        4  3862  B L0#
738 AG 43           NOP   *&005                    SET ROUT START      4  3866  N 474
739 AG 44           SAR   POST                     ADDR IN Z02-Z04     4  3870  Q Z04
740 AG 45           CU    %U1,R                    REWIND TAPE 1       5  3874  U %U1 R
741 AG 46           LCA   ZZZ,0089                 RESET XR 1          7  3879  L B3X 089
742 AG 47   NXR     LCA   GMWM,WKAREA&051          LOAD GMWM           7  3886  L &8J H5/
743 AG 48           CS    WKAREA&050                                  4  3893  / H5#
744 AG 49           MCW   %U1,WKAREA&021,R         READ RECORD         8  3897  M %U1 H2/ R
745 AG 50           SW    WKAREA&041               SET WM              4  3905  , H4/
746 AG 51           BEF   EOF1                     CK FOR EOF  ERR     5  3909  B P4V K
747 AG 52                                          TYPE HERE INDS
748 AG 53                                          FALSE EOF
749 AG 54           BER   TPRDER                   CK FOR RD ERROR     5  3914  B N9T L
750 AG 55                                          ERR TYPE HERE
751 AG 56                                          INDS THAT 10
752 AG 57                                          TRYS HAVE BEEN
753 AG 58                                          MADE TO READ REC
754 AG 59           LCA   ZZ,RDCNT                 RESET ERR CNTR      7  3919  L E2V E2Z
755 AG 60           B     WTAP2                    GO TO WRITE TP2     4  3926  B I4D
756 AG 61           CU    %U2,B                    BACKSPACE           5  3930  U %U2 B
757 AG 62           CU    %U2,E                     & SKIP             5  3935  U %U2 E
758 AG 63   WTAP2   MCW   %U2,WKAREA&021,W         WRITE TAPE          8  3940  M %U2 H2/ W
759 AG 64           NOP   0000                     EXTRA INSTR         4  3948  N 000
760 AG 65           BEF   ENREEL                   CK FOR EOR          5  3952  B P2S K
761 AG 66           BER   TPWRER                   CK FOR WRITE ERR    5  3957  B M4Y L
762 AG 67                                          ERR TYPE HERE
763 AG 68                                          INDS THAT 10
764 AG 69                                          TRYS USING BKSP-
765 AG 70                                          SKIP HAVE BEEN
766 AG 71                                          MADE TO WR REC
767 AG 72           LCA   ZZ,WRCNT                 RESET ERR CNTR      7  3962  L E2V E2X
768 AG 73           CU    %U2,B                    BACKSPACE TP 2      5  3969  U %U2 B
769 AG 74           CS    WKAREA&020               CLEAR STORAGE       4  3974  / H2#
770 AG 75           MCW   %U2,WKAREA,R            READ RECORD         8  3978  M %U2 H0# R
```

```
SEQ PG LIN  LABEL  OP    OPERANDS                          SFX CT  LOCN  INSTRUCTION
771 AG 76          NOP   0000                EXTRA INSTR      4  3986  N 000
772 AG 77          BEF   EOF1                CK FOR EOF       5  3990  B P4V K
773 AG 78                                    ERR TYPE HERE
774 AG 79                                    INDS FALSE EOF
775 AG 80          BER   TPRDER              CK FOR READ ERR  5  3995  B N9T L
776 AG 81                                    ERR TYPE HERE
777 AG 82                                    INDS THAT 10
778 AG 83                                    TRYS HAVE BEEN
779 AG 84                                    MADE TO READ REC
780 AG 85          LCA   ZZ,RDCNT            RESET ERR CNTR   7  4000  L E2V E2Z
781 AG 86          SW    WKAREA                             4  4007  , H0#
782 AG 87          C     WKAREA&040,WKAREA&019 COMPARE          7  4011  C H4# H1Z
783 AG 88          BE    GNXT                   RECORDS         5  4018  B 02X S
784 AG 89          B     TYP1-031              REC READ FROM TP 4  4023  B Q1Y
785 AG 90                                    2 DOES NOT COMP.
786 AG 91                                    WITH REC WRITTEN
787 AG 92                                    ON TAPE 1
788 AG 93  GNXT    A     ONE,0089              UP XR 1          7  4027  A A0V 089
789 AG 94          C     0089,Z26              CK FOR 26 RECS   7  4034  C 089 E3S
790 AG 95          BU    NXR                   GET NEXT REC     5  4041  B H86 /
791 AG 96          B     LOOPCK                CK FOR LOOP      4  4046  B U39
792 AG 97
793 AG 98                      ROUTINE NO. 20
794 AG 99                      ROUTINE TO WRITE 100 80 CHAR
795 AH 00                      RECORDS ON TAPE 1 TO BE USED
796 AH 01                      AS INPUT IN SCRAMBLE OVLP ROUTINES
797 AH 02
798 AH 03  RN20    BCE   GOG,1291,1            TEST FOR TAPE    8  4050  B 06S S91 1
799 AH 04          B     SPP                   BYPASS ROUTINE   4  4058  B 15/
800 AH 05  GOG     NOP   *&005                 SET ROUT START   4  4062  N 07#
801 AH 06          SAR   POST                  ADDR IN Z02-Z04  4  4066  Q Z04
802 AH 07          CU    %U1,R                 REWIND TAPE      5  4070  J %U1 R
803 AH 08          B     SETXX                 SET XR 1         4  4075  B F8#
804 AH 09          CU    %U1,B                 BACKSPACE        5  4079  J %U1 B
805 AH 10          CU    %U1,E                  & SKIP          5  4084  J %U1 E
806 AH 11  WTTT    MCW   %U1,RDCOMP-076,W      WRITE RECORD     8  4089  M %U1 B5/ W
807 AH 12          NOP   0000                  EXTRA INSTR      4  4097  N 000
808 AH 13          BEF   WTMRW                 CK FOR EOR       5  4101  B 13X K
809 AH 14          BER   TPWRER                CK FOR WRITE ERR 5  4106  B M4Y L
810 AH 15                                    ERR TYPE HERE
811 AH 16                                    INDS THAT 10
812 AH 17                                    TRYS USING BKSP-
813 AH 18                                    SKIP HAVE BEEN
814 AH 19                                    MADE TO WR REC
815 AH 20          LCA   ZZ,RDCNT            RESET ERR CNTR   7  4111  L E2V E2Z
816 AH 21          A     ONE,0089              CK FOR           7  4118  A A0V 089
817 AH 22          C     0089,ONHUND            100 RECS        7  4125  C 089 E3V
818 AH 23          BU    WTTT                  WRITE NEXT REC   5  4132  B 08Z /
819 AH 24  WTMRW   CU    %U1,M                 WRITE EOF        5  4137  U %U1 M
820 AH 25          CU    %U1,R                 REWIND TAPE      5  4142  U %U1 R
```

```
SEQ PG LIN  LABEL   OP    OPERANDS                                  SFX CT  LOCN  INSTRUCTION
821 AH 26           B     LOOPCK                          CK FOR LOOP     4  4147  B J39
822 AH 27   SPP     BCE   NUMC2,1306,N                   CK FOR NUM CHAIN 8  4151  B 17# T06 N
823 AH 28           LCA   RDCOMP&003,0280                               7  4159  L C4# 230
824 AH 29           B     *&019                                         4  4166  B 18Y
825 AH 30   NUMC2   MCW   PRBNSG,0280                                  7  4170  M &9J 280
826 AH 31           SW    0201                                          4  4177  . 201
827 AH 32           MCW   0280,0270                                    7  4181  M 280 270
828 AH 33           LCA   GMWM,0281                                    7  4188  L &8J 281
829 AH 34           LCA   RDCOMP&003,0180            PRINT AREAS       7  4195  L C4# 180
830 AH 35           LCA   GMWM,0181                                    7  4202  L &8J 181
831 AH 36           LCA   RDCOMP&003,WKAREA&079      LOAD WRITE AREA   7  4209  L C4# 47Z
832 AH 37           LCA   GMWM,WKAREA&080                             7  4216  L &8J H8#
833 AH 38           LCA   RDCOMP&003,0080                            7  4223  L C4# 080
834 AH 39           LCA   GMWM,0081               LOAD GMWM           7  4230  L &8J 081
835 AH 40
836 AH 41
837 AH 42                 ROUTINE NO. 21
838 AH 43                 TEST BRANCH ON READ ERROR
839 AH 44                 WITH NORMAL READ INV CARD
840 AH 45                 FOLLOWED BY OVLP TAPE READ
841 AH 46                 AND THEN B%I¤&
842 AH 47
843 AH 48           BCE   EXAA,1301,R                 CK FOR READER   8  4237  B 24Z T01 R
844 AH 49           B     RN23                        BYPASS ROUTINE  4  4245  B 36S
845 AH 50   EXAA    NOP   *&005                       SET ROUT. START 4  4249  N 25K
846 AH 51           SAR   POST                        ADDR IN Z02-Z04 4  4253  Q Z04
847 AH 52           LCA   ZZZ,0089                    RESET XR 1      7  4257  L B3X 089
848 AH 53           MCW   TPRINA,GORT&006             ALTER TP RD INST 7  4254  M R9/ -5V
849 AH 54   TRES2   SS    .                                           2  4271  K .
850 AH 55           R                                 READ CARD       1  4273  1
851 AH 56           BCE   *&005,1291,1                                8  4274  B 28W S91 1
852 AH 57           B     *&005                                       4  4282  B 29#
853 AH 58           B     TROX                        READ TAPE       4  4286  B -4T
854 AH 59           BIN   ERO2,&                      CK FOR CD BD ERR 5 4290  B 29Z &
855 AH 60           B     TYP1-031                    FAILED TO BR ON 4  4295  B Q1Y
856 AH 61                                             READ ERROR
857 AH 62   ERO2    B     UPX1                        UP XR 1         4  4299  B Z8T
858 AH 63           B     TRES2                       EXECUTE AGAIN   4  4303  B 27/
859 AH 64           B     LOOPCK                      CK FOR LOOP     4  4307  B J39
860 AH 65
861 AH 66
862 AH 67                 ROUTINE NO. 22
863 AH 68                 TEST BRANCH ON READ ERROR
864 AH 69                 WITH OVLP READ INV CARD FOLLOWED
865 AH 70                 BY OVERLAP TAPE READ
866 AH 71                 AND THEN B%I¤&
867 AH 72
868 AH 73           NOP   *&005                       SET ROUT START  4  4311  N 31Z
869 AH 74           SAR   POST                        ADDR IN Z02-Z04 4  4315  Q Z04
870 AH 75           LCA   ZZZ,0089                    RESET XR 1      7  4319  L B3X 089
```

```
SEQ PG LIN  LABEL  OP    OPERANDS
871 AH 76          MCW   TPRINA,GORT&006
872 AH 77  TRES1   B     CROX
873 AH 78          B     TROX
874 AH 79          BIN   ERO1,&
875 AH 80          B     TYP1-031
876 AH 81
877 AH 82  ERO1    B     UPX1
878 AH 83          B     TRES1
879 AH 84          B     LOOPCK
880 AH 85
881 AH 86
```

	SEK CT	LOCN	INSTRUCTION
ALTER TP RD INST	7	4326	M R9/ -5V
READ CARD	4	4333	B JOW
READ TAPE	4	4337	B -4T
CK FOR CD RD ERR	5	4341	B 35¢ &
FAILED TO BR ON READ ERROR	4	4346	B Q1Y
UP XR 1	4	4350	B Z8T
EXECUTE AGAIN	4	4354	B 33T
CK FOR LOOP	4	4358	B J39

```
SEQ PG LIN  LABEL  OP    OPERANDS                                SFX CT  LOCN  INSTRUCTION

882 AH 88          JOB   1410/7010-1401 TOPSY COMPATIBILITY TEST
883 AH 90                      ROUTINE NO. 23
884 AH 91                      TEST OVERLAP TAPE WRITE
885 AH 92                      FOLLOWED BY OVERLAP TAPE READ
886 AH 93
887 AH 94  RN23    NOP   *&005                                   SET ROUT START      4  4352  N 37#
888 AH 95          SAR   POST                                    ADDR IN Z02-Z04     4  4356  Q Z04
889 AH 96          LCA   ZZZ,0089                                RESET XR 1          7  4370  L B3X 089
890 AH 97          MCW   CC2,GOCKTR&003                          ALTER CK INSTR      7  4377  M &0T <4/
891 AH 98          MCW   CC1,GORT&006                            ALTER TP RD INST    7  4384  M &0# -5V
892 AH 99          MCW   CC1,GOUT&006                            ALTER TP WR INST    7  4391  M &0# -9V
893 AI 00          MCW   CC2,GOCKTW&019                                              7  4398  M &0T KOV
894 AI 01  TWTR    B     TWOX                                    GO TO WRITE TAPE    4  4405  B -7W
895 AI 02          B     TROX                                    GO TO READ TAPE     4  4409  B -4T
896 AI 03          BER   TYP1                                    CK FOR TAPE ERR     5  4413  B Q4Z L
897 AI 04                                                        ERR TYPE HERE
898 AI 05                                                        WILL NORMALLY
899 AI 06                                                        IND TAPE RD ERR
900 AI 07                                                        THIS WILL BE TP
901 AI 08                                                        WR ERR IF READ
902 AI 09                                                        TP IS NOT AVAIL.
903 AI 10          B     CKTW                                    CK WRITE            4  4418  B J7T
904 AI 11          B     TYP1-031                                REC WRITTEN DOES    4  4422  B Q1Y
905 AI 12                                                        NOT COMPARE
906 AI 13          B     CKTR                                    CK READ             4  4426  B K2S
907 AI 14          B     TYP1-031                                INCORRECT READ      4  4430  B Q1Y
908 AI 15          B     UPX1                                    UP XR 1             4  4434  B Z8T
909 AI 16          B     TWTR                                    EXECUTE AGAIN       4  4438  B 40V
910 AI 17          B     LOOPCK                                  CK FOR LOOP         4  4442  B U39
911 AI 18
912 AI 19
913 AI 20                      ROUTINE NO. 24
914 AI 21                      TEST OVERLAP TAPE WRITE
915 AI 22                      FOLLOWED BY OVERLAP CARD READ
916 AI 23
917 AI 24          NOP   *&005                                   SET ROUT START      4  4446  N 45U
918 AI 25          SAR   POST                                    ADDR IN Z02-Z04     4  4450  Q Z04
919 AI 26          LCA   ZZZ,0089                                RESET XR 1          7  4454  L B3X 089
920 AI 27          MCW   TPRINA,GOUT&006                         ALTER TP WR INST    7  4461  M R9/ -9V
921 AI 28          MCW   CC2,GOCKTW&019                                              7  4468  M &0T KOV
922 AI 29  TWCR    B     TWOX                                    WRITE TAPE          4  4475  B -7W
923 AI 30          B     CROX                                    READ CARD           4  4479  B JOW
924 AI 31          BER   TYP1                                    TAPE WRITE ERR      5  4483  B Q4Z L
925 AI 32          BIN   TYP1,&                                  CD READ ERR         5  4488  B Q4Z &
926 AI 33          B     CKTW                                    CK WRITE            4  4493  B J7T
927 AI 34          B     TYP1-031                                REC WRITTEN DOES    4  4497  B Q1Y
928 AI 35                                                        NOT COMPARE
929 AI 36          B     CKCR                                    CK CARD READ        4  4501  B K6/
930 AI 37          B     TYP1-031                                INCORRECT READ      4  4505  B Q1Y
931 AI 38          B     UPX1                                    UP XR 1             4  4509  B Z8T
```

```
SEQ PG LIN  LABEL  OP    OPERANDS                                  SFX CT  LOCN  INSTRUCTION

932 AI 39          B     TWCR                    EXECUTE AGAIN      4  4513  B 47V
933 AI 40          B     LOOPCK                  CK FOR LOOP        4  4517  B U39
934 AI 41
935 AI 42
936 AI 43                      ROUTINE NO. 25
937 AI 44                      TEST OVERLAP TAPE WRITE
938 AI 45                      FOLLOWED BY OVERLAP CARD PUNCH
939 AI 46
940 AI 47          NOP   *&005               SET ROUT START      4  4521  N 52Z
941 AI 48          SAR   POST                ADDR IN Z02-Z04     4  4525  Q Z04
942 AI 49          LCA   ZZZ,0089            RESET XR 1          7  4529  L B3X 089
943 AI 50          MCW   TPRINB,GOUT&006     ALTER TP WR INST    7  4536  M R9U -9V
944 AI 51          MCW   TPOTB,GOCKTW&019                        7  4543  M &0Z K0V
945 AI 52  TWPC    B     TWOX                WRITE TAPE          4  4550  B -7W
946 AI 53          B     PCOX                PUNCH CARD          4  4554  B J2Z
947 AI 54          BER   TYP1                TAPE WRITE ERR      5  4558  B Q4Z L
948 AI 55          BIN   TYP1,-              PUNCH ERROR         5  4553  B Q4Z -
949 AI 56          B     CKTW                CK WRITE            4  4568  B J7T
950 AI 57          B     TYP1-031            REC WRITTEN DOES    4  4572  B Q1Y
951 AI 58                                    NOT COMPARE
952 AI 59          B     UPX1                UP XR 1             4  4576  B Z8T
953 AI 60          B     TWPC                EXECUTE AGAIN       4  4580  B 55#
954 AI 61          B     LOOPCK              CK FOR LOOP         4  4584  B U39
955 AI 62
956 AI 63                      ROUTINE NO. 26
957 AI 64                      TEST OVERLAP TAPE WRITE
958 AI 65                      FOLLOWED BY PRINT
959 AI 66
960 AI 67
961 AI 68          NOP   *&005               SET ROUT START      4  4588  N 59W
962 AI 69          SAR   POST                ADDR IN Z02-Z04     4  4592  Q Z04
963 AI 70          LCA   ZZZ,0089            RESET XR 1          7  4596  L B3X 089
964 AI 71          MCW   TPRINC,GOUT&006     ALTER TP WR INST    7  4603  M R9X -9V
965 AI 72          MCW   TPOTC,GOCKTW&019                        7  4610  M &1S K0V
966 AI 73  TWPF    B     TWOX                WRITE TAPE          4  4617  B -7W
967 AI 74          B     PFOX                PRINT               4  4621  B J5S
968 AI 75          BER   TYP1                TAPE WRITE ERR      5  4625  B Q4Z L
969 AI 76          BIN   TYP1,#              PRINT ERROR         5  4630  B Q4Z #
970 AI 77          B     CKTW                CK WRITE            4  4635  B J7T
971 AI 78          B     TYP1-031            REC WRITTEN DOES    4  4639  B Q1Y
972 AI 79                                    NOT COMPARE
973 AI 80          B     UPX1                UP XR 1             4  4643  B Z8T
974 AI 81          B     TWPF                EXECUTE AGAIN       4  4647  B 51X
975 AI 82          B     LOOPCK              CK FOR LOOP         4  4651  B U39
976 AI 83
977 AI 84
978 AI 85                      ROUTINE NO. 27
979 AI 86                      TEST OVERLAP TAPE WRITE
980 AI 87                      FOLLOWED BY OVERLAP TAPE WRITE
981 AI 88
```

SEQ PG LIN	LABEL	OP	OPERANDS		SFX	CT	LOCN	INSTRUCTION
982 AI 89		NOP	*&005	SET ROUT START		4	4655	N 56T
983 AI 90		SAR	POST	ADDR IN Z02-Z04		4	4659	Q Z04
984 AI 91		LCA	ZZZ,0089	RESET XR 1		7	4663	L B3X 089
985 AI 92		MCW	CC1,GOUT&006	ALTER TP WR INST		7	4670	M &0# -9V
986 AI 93		MCW	CC2,GOCKTW&019			7	4677	M &0T KDV
987 AI 94	TWTW	B	TWOX	WRITE TAPE		4	4684	B -7W
988 AI 95		B	TWOX	WRITE TAPE		4	4688	B -7W
989 AI 96		BER	TYP1	TAPE WRITE ERR		5	4692	B Q4Z L
990 AI 97		B	CKTW	CK WRITE		4	4697	B J7T
991 AI 98		B	TYP1-031	2ND REC WRITTEN DOES NOT COMPARE		4	4701	B Q1Y
992 AI 99								
993 AJ 00		B	UPX1	UP XR 1		4	4705	B Z8T
994 AJ 01		B	TWTW	EXECUTE AGAIN		4	4709	B 58J
995 AJ 02		B	LOOPCK	CK FOR LOOP		4	4713	B J39
996 AJ 03								
997 AJ 04								
998 AJ 05			ROUTINE NO. 28					
999 AJ 06			TEST OVERLAP TAPE READ					
1000 AJ 07			FOLLOWED BY OVERLAP TAPE WRITE					
1001 AJ 08								
1002 AJ 09		NOP	*&005	SET ROUT. START		4	4717	N 72V
1003 AJ 10		SAR	POST	ADDR IN Z02-Z04		4	4721	Q Z04
1004 AJ 11		LCA	ZZZ,0089	RESET XR 1		7	4725	L B3X 089
1005 AJ 12		MCW	CC1,GORT&006	ALTER TP RD INST		7	4732	M &0# -5V
1006 AJ 13		MCW	CC1,GOUT&006	ALTER TP WR INST		7	4739	M &0# -9V
1007 AJ 14		MCW	CC2,GOCKTR&003	ALTER CK INSTR		7	4746	M &0T K4/
1008 AJ 15		MCW	CC2,GOCKTW&019			7	4753	M &0T KDV
1009 AJ 16	TRTW	B	TROX	READ TAPE		4	4760	B -4T
1010 AJ 17		B	TWOX	WRITE TAPE		4	4764	B -7W
1011 AJ 18		BER	TYP1	CK FOR TAPE ERR ERR TYPE HERE WILL NORMALLY IND TP WR ERROR THIS WILL BE TP RD ERR IF WRITE TP IS NOT AVAIL		5	4768	B Q4Z L
1012 AJ 19								
1013 AJ 20								
1014 AJ 21								
1015 AJ 22								
1016 AJ 23								
1017 AJ 24								
1018 AJ 25		B	CKTR	CK READ		4	4773	B K2S
1019 AJ 26		B	TYP1-031	INCORRECT READ		4	4777	B Q1Y
1020 AJ 27		B	CKTW	CK WRITE		4	4781	B J7T
1021 AJ 28		B	TYP1-031	REC WRITTEN DOES NOT COMPARE		4	4785	B Q1Y
1022 AJ 29								
1023 AJ 30		B	UPX1	UP XR 1		4	4789	B Z8T
1024 AJ 31		B	TRTW	EXECUTE AGAIN		4	4793	B 76#
1025 AJ 32		B	LOOPCK	CK FOR LOOP		4	4797	B J39
1026 AJ 33								
1027 AJ 34								
1028 AJ 35			ROUTINE NO. 29					
1029 AJ 36			TEST OVERLAP TAPE READ					
1030 AJ 37			FOLLOWED BY OVERLAP CARD READ					
1031 AJ 38								

```
SEQ PG LIN  LABEL  OP    OPERANDS                                SFX CT  LOCN  INSTRUCTION
1032 AJ 39         NOP   *&005                    SET ROUT. START   4  4801  N 80Z
1033 AJ 40         SAR   POST                     ADDR IN Z02-Z04   4  4805  Q Z04
1034 AJ 41         LCA   ZZZ,0089                 RESET XR 1        7  4809  L B3X 089
1035 AJ 42         MCW   TPRINA,GORT&006          ALTER TP RD INST  7  4816  M R9/ -5V
1036 AJ 43  TRCR   B     TROX                     READ TAPE         4  4823  B -4T
1037 AJ 44         B     CROX                     READ CARD         4  4827  B J0W
1038 AJ 45         BER   TYP1                     TAPE READ ERR     5  4831  B Q4Z L
1039 AJ 46         BIN   TYP1,&                   CD READ ERR       5  4836  B Q4Z &
1040 AJ 47         B     CKCR                     CK CD READ        4  4841  B K6/
1041 AJ 48         B     TYP1-031                 INCORRECT CD RD   4  4845  B Q1Y
1042 AJ 49         B     UPX1                     UP XR 1           4  4849  B Z8T
1043 AJ 50         B     TRCR                     EXECUTE AGAIN     4  4853  B B2T
1044 AJ 51         B     LOOPCK                   CK FOR LOOP       4  4857  B U39
1045 AJ 52
1046 AJ 53
1047 AJ 54                     ROUTINE NO. 30
1048 AJ 55                     TEST OVERLAP TAPE READ
1049 AJ 56                     FOLLOWED BY OVERLAP CARD PUNCH
1050 AJ 57         NOP   *&005                    SET ROUT. START   4  4851  N B6Z
1051 AJ 58         SAR   POST                     ADDR IN Z02-Z04   4  4855  Q Z04
1052 AJ 59         LCA   ZZZ,0089                 RESET XR 1        7  4859  L B3X 089
1053 AJ 60         MCW   TPRINB,GORT&006          ALTER TP RD INST  7  4876  M R9U -5V
1054 AJ 61         MCW   TPOTB,GOCKTR&003         ALTER CK INSTR    7  4883  M &0Z K4/
1055 AJ 62  TRPC   B     TROX                     READ TAPE         4  4890  B -4T
1056 AJ 63         B     PCOX                     PUNCH CARD        4  4894  B J2Z
1057 AJ 64         BER   TYP1                     TAPE READ ERR     5  4898  B Q4Z L
1058 AJ 65         B     CKTR                     CK TP READ        4  4903  B K2S
1059 AJ 66         B     TYP1-031                 INCORRECT TP RD   4  4907  B Q1Y
1060 AJ 67         B     UPX1                     UP XR 1           4  4911  B Z8T
1061 AJ 68         B     TRPC                     EXECUTE AGAIN     4  4915  B B9#
1062 AJ 69         B     LOOPCK                   CK FOR LOOP       4  4919  B U39
1063 AJ 70
1064 AJ 71
1065 AJ 72                     ROUTINE NO. 31
1066 AJ 73                     TEST OVERLAP TAPE READ
1067 AJ 74                     FOLLOWED BY PRINT
1068 AJ 75
1069 AJ 76         NOP   *&005                    SET ROUT. START   4  4923  N 93/
1070 AJ 77         SAR   POST                     ADDR IN Z02-Z04   4  4927  Q Z04
1071 AJ 78         LCA   ZZZ,0089                 RESET XR 1        7  4931  L B3X 089
1072 AJ 79         BCE   NUMC1,1306,N             CK FOR NUM CHAIN  8  4938  B 96U T06 N
1073 AJ 80         MCW   TPRINC,GORT&006          ALTER TP RD INST  7  4946  M R9X -5V
1074 AJ 81         MCW   TPOTC,GOCKTR&003         ALTER CK INSTR    7  4953  M &1S K4/
1075 AJ 82         B     TRPF                                       4  4960  B 97Y
1076 AJ 83  NUMC1  MCW   CC1,GORT&006            ALTER TP RD INST  7  4954  M &0# -5V
1077 AJ 84         MCW   CC2,GOCKTR&003           ALTER CK INSTR    7  4971  M &0T K4/
1078 AJ 85  TRPF   B     TROX                     READ TAPE         4  4978  B -4T
1079 AJ 86         B     PFOX                     PRINT             4  4982  B J5S
1080 AJ 87         BER   TYP1                     TAPE READ ERR     5  4986  B Q4Z L
1081 AJ 88         B     CKTR                     CK TP READ        4  4991  B K2S
```

SEQ	PG	LIN	LABEL	OP	OPERANDS		SFX	CT	LOCN	INSTRUCTION
1082	AJ	89		B	TYP1-031	INCORRECT TP RD		4	4995	B Q1Y
1083	AJ	90		B	UPX1	UP XR 1		4	4999	B Z8T
1084	AJ	91		B	TRPF	EXECUTE AGAIN		4	5003	B 97Y
1085	AJ	92		B	LOOPCK	CK FOR LOOP		4	5007	B J39
1086	AJ	93								
1087	AJ	94								
1088	AJ	95			ROUTINE NO. 32					
1089	AJ	96			TEST OVERLAP TAPE READ					
1090	AJ	97			FOLLOWED BY OVERLAP TAPE READ					
1091	AJ	98								
1092	AJ	99		NOP	*&005	SET ROUT. START		4	5011	N #1Z
1093	AK	00		SAR	POST	ADDR IN Z02-Z04		4	5015	Q Z04
1094	AK	01		LCA	ZZZ,0089	RESET XR 1		7	5019	L B3X 089
1095	AK	02		MCW	CC1,GORT&006	ALTER TP RD INST		7	5026	M &0# -5V
1096	AK	03		MCW	CC2,GOCKTR&003	ALTER CK INSTR		7	5033	M &0T K4/
1097	AK	04	TRTR	B	TROX	READ TAPE		4	5040	B -4T
1098	AK	05		B	TROX	READ TAPE		4	5044	B -4T
1099	AK	06		BER	TYP1	RD ERR ON 2ND RD		5	5048	B Q4Z L
1100	AK	07		B	CKTR	CK READ		4	5053	B K2S
1101	AK	08		B	TYP1-031	INCORRECT READ		4	5057	B Q1Y
1102	AK	09				ON 2ND TAPE READ				
1103	AK	10		B	UPX1	UP XR 1		4	5061	B Z8T
1104	AK	11		B	TRTR	EXECUTE AGAIN		4	5065	B #4#
1105	AK	12		B	LOOPCK	CK FOR LOOP		4	5069	B J39
1106	AK	13								
1107	AK	14								
1108	AK	15			ROUTINE NO. 33					
1109	AK	16			TEST OVERLAP CARD READ					
1110	AK	17			FOLLOWED BY OVERLAP TAPE WRITE					
1111	AK	18								
1112	AK	19		NOP	*&005	SET ROUT. START		4	5073	N #8/
1113	AK	20		SAR	POST	ADDR IN Z02-Z04		4	5077	Q Z04
1114	AK	21		MCW	TPRINA,GOUT&006	ALTER TP WR INST		7	5081	M R9/ -9V
1115	AK	22		MCW	TPOTA,GOCKTW&019	ALTER CK INSTR		7	5088	M &0W K0V
1116	AK	23		LCA	ZZZ,0089	RESET XR 1		7	5095	L B3X 089
1117	AK	24	CRTW	B	CROX	READ CARD		4	5102	B J0W
1118	AK	25		B	TWOX	WRITE TAPE		4	5106	B -7W
1119	AK	26		BIN	TYP1,&	CD READ ERROR		5	5110	B Q4Z &
1120	AK	27		BER	TYP1	TP WRITE ERROR		5	5115	B Q4Z L
1121	AK	28		B	CKCR	CK CD READ		4	5120	B K6/
1122	AK	29		B	TYP1-031	INCORRECT CD RD		4	5124	B Q1Y
1123	AK	30		B	CKTW	CK TP WRITE		4	5128	B J7T
1124	AK	31		B	TYP1-031	REC WRITTEN DOES		4	5132	B Q1Y
1125	AK	32				NOT COMPARE				
1126	AK	33		B	UPX1	UP XR 1		4	5136	B Z8T
1127	AK	34		B	CRTW	EXECUTE AGAIN		4	5140	B /0S
1128	AK	35		B	LOOPCK	CK FOR LOOP		4	5144	B J39
1129	AK	36								
1130	AK	37								
1131	AK	38			ROUTINE NO. 34					

```
SEQ PG LIN  LABEL  OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION

1132 AK 39                      TEST OVERLAP CARD READ
1133 AK 40                      FOLLOWED BY OVERLAP TAPE READ
1134 AK 41
1135 AK 42         NOP   *&005                  SET ROUT. START            4  5148  V /5W
1136 AK 43         SAR   POST                   ADDR IN Z02-Z04            4  5152  Q Z04
1137 AK 44         LCA   ZZZ,0089               RESET XR 1                 7  5156  L B3X 089
1138 AK 45         MCW   TPRINA,GORT&006        ALTER TP RD INST           7  5153  M R9/ -6V
1139 AK 46         MCW   TPOTA,GOCKTR&003       ALTER CK INSTR             7  5170  M &OW K4/
1140 AK 47  CRTR   B     CROX                   READ CARD                  4  5177  B JOW
1141 AK 48         B     TROX                   READ TAPE                  4  5181  B -4T
1142 AK 49         BIN   TYP1,&                 CD READ ERROR              5  5185  B Q4Z &
1143 AK 50         BER   TYP1                   TP READ ERROR              5  5190  B Q4Z L
1144 AK 51         B     CKTR                   CK TP READ                 4  5195  B K2S
1145 AK 52         B     TYP1-031               INCORRECT TP RD            4  5199  B Q1Y
1146 AK 53         B     UPX1                   UP XR 1                    4  5203  B Z8T
1147 AK 54         B     CRTR                   EXECUTE AGAIN              4  5207  B /7X
1148 AK 55         B     LOOPCK                 CK FOR LOOP                4  5211  B U39
1149 AK 56
1150 AK 57                      ROUTINE NO. 35
1151 AK 58                      TEST OVERLAP CARD READ
1152 AK 59                      FOLLOWED BY OVERLAP CARD PUNCH
1153 AK 60
1154 AK 61
1155 AK 62         NOP   *&005                  SET ROUT. START            4  5215  V S2T
1156 AK 63         SAR   POST                   ADDR IN Z02-Z04            4  5219  Q Z04
1157 AK 64         LCA   ZZZ,0089               RESET XR 1                 7  5223  L B3X 089
1158 AK 65  CRPC   B     CROX                   READ CARD                  4  5230  B JOW
1159 AK 66         B     PCOX                   PUNCH CARD                 4  5234  B J2Z
1160 AK 67         BIN   TYP1,&                 CD READ ERR                5  5238  B Q4Z &
1161 AK 68         BIN   TYP1,-                 PD                         5  5243  B Q4Z -
1162 AK 69         BIN   TYP1,-                 PUNCH ERROR                5  5248  B Q4Z -
1163 AK 70         B     CKCR                   CK READ                    4  5253  B K6/
1164 AK 71         B     TYP1-031               INCORRECT CD RD            4  5257  B Q1Y
1165 AK 72         B     UPX1                   UP XR 1                    4  5251  B Z8T
1166 AK 73         B     CRPC                   EXECUTE AGAIN              4  5255  B S3*
1167 AK 74         B     LOOPCK                 CK FOR LOOP                4  5259  B U39
1168 AK 75
1169 AK 76
1170 AK 77                      ROUTINE NO. 36
1171 AK 78                      TEST OVERLAP CARD READ
1172 AK 79                      FOLLOWED BY PRINT
1173 AK 80
1174 AK 81         NOP   *&005                  SET ROUT. START            4  5273  V S8/
1175 AK 82         SAR   POST                   ADDR IN Z02-Z04            4  5277  Q Z04
1176 AK 83         LCA   ZZZ,0089               RESET XR 1                 7  5281  L B3X 089
1177 AK 84  CRPF   B     CROX                   READ CARD                  4  5288  B JOW
1178 AK 85         B     PFOX                   PRINT                      4  5292  B J5S
1179 AK 86         BIN   TYP1,&                 CD RD ERROR                5  5296  B Q4Z &
1180 AK 87         BIN   TYP1,*                 PRINT ERROR                5  5301  B Q4Z *
1181 AK 88         B     CKCR                   CK CD READ                 4  5306  B K6/
```

```
SEQ PG LIN  LABEL  OP    OPERANDS                                  SFX CT  LOCN  INSTRUCTION
1182 AK 89         B     TYP1-031                  INCORRECT CD RD  4  5310  B Q1Y
1183 AK 90         B     UPX1                      UP XR 1          4  5314  B Z8T
1184 AK 91         B     CRPF                      EXECUTE AGAIN    4  5318  B S8Y
1185 AK 92         B     LOOPCK                    CK FOR LOOP      4  5322  B J39
1186 AK 93
1187 AK 94
1188 AK 95                     ROUTINE NO. 37
1189 AK 96                     TEST OVERLAP CARD READ
1190 AK 97                     FOLLOWED BY OVERLAP CARD READ
1191 AK 98
1192 AK 99         NOP   *&005                     SET ROUT. START  4  5326  N T3J
1193 AL 00         SAR   POST                      ADDR IN Z02-Z04  4  5330  Q Z04
1194 AL 01         LCA   ZZZ,0089                  RESET XR 1       7  5334  L B3X 089
1195 AL 02   CRCR  B     CROX                      READ CARD        4  5341  B J0W
1196 AL 03         B     CROX                      READ CARD        4  5345  B J0W
1197 AL 04         BIN   TYP1,&                    RD ERR ON 2ND RD 5  5349  B Q4Z &
1198 AL 05         B     CKCR                      CK READ          4  5354  B K6/
1199 AL 06         B     TYP1-031                  INCORRECT READ   4  5358  B Q1Y
1200 AL 07                                         ON 2ND CARD READ
1201 AL 08         B     UPX1                      UP XR 1          4  5362  B Z8T
1202 AL 09         B     CRCR                      EXECUTE AGAIN    4  5366  B T4/
1203 AL 10         B     LOOPCK                    CK FOR LOOP      4  5370  B U39
1204 AL 11
1205 AL 12
1206 AL 13                     ROUTINE NO. 38
1207 AL 14                     TEST OVERLAP CARD PUNCH
1208 AL 15                     FOLLOWED BY OVERLAP TAPE WRITE
1209 AL 16
1210 AL 17         NOP   *&005                     SET ROUT. START  4  5374  N T8S
1211 AL 18         SAR   POST                      ADDR IN Z02-Z04  4  5378  Q Z04
1212 AL 19         LCA   ZZZ,0089                  RESET XR 1       7  5382  L B3X 089
1213 AL 20         MCW   TPDTB,GOCKTW&019          ALTER CK INSTR   7  5389  M &0Z K0V
1214 AL 21         MCW   TPRINB,GOUT&006           ALTER TP WR INST 7  5396  M R9U -9V
1215 AL 22   PCTW  B     PCOX                      PUNCH CARD       4  5403  B J2Z
1216 AL 23         B     TWOX                      WRITE TAPE       4  5407  B -7W
1217 AL 24         BIN   TYP1,-                    PUNCH ERROR      5  5411  B Q4Z -
1218 AL 25         BER   TYP1                      TAPE WRITE ERR   5  5416  B Q4Z L
1219 AL 26         B     CKTW                      CK TP WRITE      4  5421  B J7T
1220 AL 27         B     TYP1-031                  REC WRITTEN DOES 4  5425  B Q1Y
1221 AL 28                                         NOT COMPARE
1222 AL 29         B     UPX1                      UP XR 1          4  5429  B Z8T
1223 AL 30         B     PCTW                      EXECUTE AGAIN    4  5433  B U0T
1224 AL 31         B     LOOPCK                    CK FOR LOOP      4  5437  B J39
1225 AL 32
1226 AL 33
1227 AL 34                     ROUTINE NO. 39
1228 AL 35                     TEST OVERLAP CARD PUNCH
1229 AL 36                     FOLLOWED BY OVERLAP TAPE READ
1230 AL 37
1231 AL 38         NOP   *&005                     SET ROUT. START  4  5441  N U4Z
```

SEQ	PG	LIN	LABEL	OP	OPERANDS		SFX	CT	LOCN	INSTRUCTION
1232	AL	39		SAR	POST	ADDR IN Z02-Z04		4	5445	Q Z04
1233	AL	40		LCA	ZZZ,0089	RESET XR 1		7	5449	L B3X 089
1234	AL	41		MCW	TPRINB,GORT&006	ALTER TP RD INST		7	5456	M R9U -5V
1235	AL	42		MCW	TPOTB,GOCKTR&003	ALTER CK INSTR		7	5463	M &0Z K4/
1236	AL	43	PCTR	B	PCOX	PUNCH CARD		4	5470	B J2Z
1237	AL	44		B	TROX	READ TAPE		4	5474	B -4T
1238	AL	45		BIN	TYP1,-	PUNCH ERROR		5	5478	B Q4Z -
1239	AL	46		BER	TYP1	TAPE READ ERROR		5	5483	B Q4Z L
1240	AL	47		B	CKTR	CK TP READ		4	5488	B K2S
1241	AL	48		B	TYP1-031	INCORRECT TP RD		4	5492	B Q1Y
1242	AL	49		B	UPX1	UP XR 1		4	5496	B Z8T
1243	AL	50		B	PCTR	EXECUTE AGAIN		4	5500	B J7#
1244	AL	51		B	LOOPCK	CK FOR LOOP		4	5504	B J39
1245	AL	52								
1246	AL	53								
1247	AL	54			ROUTINE NO. 40					
1248	AL	55			TEST OVERLAP CARD PUNCH					
1249	AL	56			FOLLOWED BY OVERLAP CARD READ					
1250	AL	57								
1251	AL	58		NOP	*&005	SET ROUT. START		4	5508	N V1W
1252	AL	59		SAR	POST	ADDR IN Z02-Z04		4	5512	Q Z04
1253	AL	60		LCA	ZZZ,0089	RESET XR 1		7	5516	L B3X 089
1254	AL	61	PCCR	B	PCOX	PUNCH CARD		4	5523	B J2Z
1255	AL	62		B	CROX	READ CARD		4	5527	B J0W
1256	AL	63		BIN	TYP1,-	PUNCH ERROR		5	5531	B Q4Z -
1257	AL	64		BIN	TYP1,&	CD READ ERROR		5	5536	B Q4Z &
1258	AL	65		B	CKCR	CK CD READ		4	5541	B K6/
1259	AL	66		B	TYP1-031	INCORRECT CD RD		4	5545	B Q1Y
1260	AL	67		B	UPX1	UP XR 1		4	5549	B Z8T
1261	AL	68		B	PCCR	EXECUTE AGAIN		4	5553	B V2T
1262	AL	69		B	LOOPCK	CK FOR LOOP		4	5557	B J39
1263	AL	70								
1264	AL	71								
1265	AL	72			ROUTINE NO. 41					
1266	AL	73			TEST OVERLAP CARD PUNCH					
1267	AL	74			FOLLOWED BY PRINT					
1268	AL	75								
1269	AL	76		NOP	*&005	SET ROUT. START		4	5551	N V6Z
1270	AL	77		SAR	POST	ADDR IN Z02-Z04		4	5555	Q Z04
1271	AL	78		LCA	ZZZ,0089	RESET XR 1		7	5559	L B3X 089
1272	AL	79	PCPF	B	PCOX	PUNCH CARD		4	5576	B J2Z
1273	AL	80		B	PFOX	PRINT		4	5580	B J5S
1274	AL	81		BIN	TYP1,-	PUNCH ERROR		5	5584	B Q4Z -
1275	AL	82		BIN	TYP1,#	PRINT ERROR		5	5589	B Q4Z #
1276	AL	83		B	UPX1	UP XR 1		4	5594	B Z8T
1277	AL	84		B	PCPF	EXECUTE AGAIN		4	5598	B V7W
1278	AL	85		B	LOOPCK	CK FOR LOOP		4	5602	B J39
1279	AL	86								
1280	AL	87								
1281	AL	88			ROUTINE NO. 42					

```
SEQ PG LIN  LABEL  OP    OPERANDS                                  SFX CT  LOCN  INSTRUCTION

1282 AL 89                        TEST OVERLAP CARD PUNCH
1283 AL 90                        FOLLOWED BY OVERLAP CARD PUNCH
1284 AL 91
1285 AL 92         NOP   *&005                          SET ROUT. START     4  5606  N W1J
1286 AL 93         SAR   POST                           ADDR IN Z02-Z04     4  5610  Q Z04
1287 AL 94         LCA   ZZZ,0089                       RESET XR 1          7  5614  L B3X 089
1288 AL 95  PCPC   B     PCOX                           PUNCH CARD          4  5621  B J2Z
1289 AL 96         B     PCOX                           PUNCH CARD          4  5625  B J2Z
1290 AL 97         BIN   TYP1,-                         PUN ERR-2ND CD      5  5629  B Q4Z -
1291 AL 98         B     UPX1                           UP XR 1             4  5634  B Z8T
1292 AL 99         B     PCPC                           EXECUTE AGAIN       4  5638  B W2/
1293 AM 00         B     LOOPCK                         CK FOR LOOP         4  5642  B U39
1294 AM 01
1295 AM 02
1296 AM 03                        ROUTINE NO. 43
1297 AM 04                        TEST PRINT
1298 AM 05                        FOLLOWED BY OVERLAP TAPE WRITE
1299 AM 06
1300 AM 07         NOP   *&005                          SET ROUT. START     4  5646  N W5U
1301 AM 08         SAR   POST                           ADDR IN Z02-Z04     4  5650  Q Z04
1302 AM 09         LCA   ZZZ,0089                       RESET XR 1          7  5654  L B3X 089
1303 AM 10         MCW   TPRINC,GOUT&006                ALTER TP WR INST    7  5661  M R9X -9V
1304 AM 11         MCW   TPOTC,GOCKTW&019               ALTER CK INSTR      7  5668  M &1S KOV
1305 AM 12  PFTW   B     PFOX                           PRINT               4  5675  B J5S
1306 AM 13         B     TWOX                           WRITE TAPE          4  5679  B -7W
1307 AM 14         BIN   TYP1,*                         PRINT ERR           5  5683  B Q4Z *
1308 AM 15         BER   TYP1                           TP WR ERR           5  5688  B Q4Z L
1309 AM 16         B     CKTW                           CK TP WRITE         4  5693  B J7T
1310 AM 17         B     TYP1-031                       REC WRITTEN DOES    4  5697  B Q1Y
1311 AM 18                                              NOT COMPARE
1312 AM 19         B     UPX1                           UP XR 1             4  5701  B Z8T
1313 AM 20         B     PFTW                           EXECUTE AGAIN       4  5705  B W7V
1314 AM 21         B     LOOPCK                         CK FOR LOOP         4  5709  B U39
1315 AM 22
1316 AM 23
1317 AM 24                        ROUTINE NO. 44
1318 AM 25                        TEST PRINT
1319 AM 26                        FOLLOWED BY OVERLAP TAPE READ
1320 AM 27
1321 AM 28         NOP   *&005                          SET ROUT. START     4  5713  N X2/
1322 AM 29         SAR   POST                           ADDR IN Z02-Z04     4  5717  Q Z04
1323 AM 30         LCA   ZZZ,0089                       RESET XR 1          7  5721  L B3X 089
1324 AM 31         BCE   NUMC3,1306,N                   CK FOR NUM CHAIN    8  5728  B X5U T06 N
1325 AM 32         MCW   TPRINC,GORT&006                ALTER TP RD INST    7  5736  M R9X -5V
1326 AM 33         MCW   TPOTC,GOCKTR&003                ALTER CK INSTR      7  5743  M &1S K4/
1327 AM 34         B     PFTR                                                 4  5750  B X6Y
1328 AM 35  NUMC3  MCW   CC1,GORT&006                   ALTER TP RD INST    7  5754  M &0* -5V
1329 AM 36         MCW   CC2,GOCKTR&003                ALTER CK INSTR      7  5761  M &0T K4/
1330 AM 37  PFTR   B     PFOX                           PRINT               4  5768  B J5S
1331 AM 38         B     TROX                           READ TAPE           4  5772  B -4T
```

```
SEQ PG LIN  LABEL  OP    OPERANDS                                  SFX CT  LOCN  INSTRUCTION
1332 AM 39         BIN   TYP1,*                    PRINT ERROR      5  5776  B Q4Z *
1333 AM 40         BER   TYP1                      TP READ ERROR    5  5781  B Q4Z L
1334 AM 41         B     CKTR                      CK TAPE READ     4  5786  B K2S
1335 AM 42         B     TYP1-031                  INCORRECT TP RD  4  5790  B Q1Y
1336 AM 43         B     UPX1                      UP XR 1          4  5794  B Z8T
1337 AM 44         B     PFTR                      EXECUTE AGAIN    4  5798  B X6Y
1338 AM 45         B     LOOPCK                    CK FOR LOOP      4  5802  B U39
1339 AM 46
1340 AM 47
1341 AM 48                     ROUTINE NO. 45
1342 AM 49                     TEST PRINT
1343 AM 50                     FOLLOWED BY OVERLAP CARD READ
1344 AM 51
1345 AM 52         NOP   *&005                     SET ROUT. START  4  5806  N Y1U
1346 AM 53         SAR   POST                      ADDR IN Z02-Z04  4  5810  Q Z04
1347 AM 54         LCA   ZZZ,0089                  RESET XR 1       7  5814  L B3X 089
1348 AM 55  PFCR   B     PFOX                      PRINT            4  5821  B J5S
1349 AM 56         B     CROX                      READ CARD        4  5825  B J0W
1350 AM 57         BIN   TYP1,*                    PUNCH ERROR      5  5829  B Q4Z *
1351 AM 58         BIN   TYP1,&                    CD RD ERROR      5  5834  B Q4Z &
1352 AM 59         B     CKCR                      CK CD READ       4  5839  B K6/
1353 AM 60         B     TYP1-031                  INCORRECT CD RD  4  5843  B Q1Y
1354 AM 61         B     UPX1                      UP XR 1          4  5847  B Z8T
1355 AM 62         B     PFCR                      EXECUTE AGAIN    4  5851  B Y2/
1356 AM 63         B     LOOPCK                    CK FOR LOOP      4  5855  B U39
1357 AM 64
1358 AM 65
1359 AM 66                     ROUTINE NO. 46
1360 AM 67                     TEST PRINT
1361 AM 68                     FOLLOWED BY OVERLAP CARD PUNCH
1362 AM 69
1363 AM 70         NOP   *&005                     SET ROUT. START  4  5859  N Y6X
1364 AM 71         SAR   POST                      ADDR IN Z02-Z04  4  5863  Q Z04
1365 AM 72         LCA   ZZZ,0089                  RESET XR 1       7  5867  L B3X 089
1366 AM 73  PFPC   B     PFOX                      PRINT            4  5874  B J5S
1367 AM 74         B     PCOX                      PUNCH            4  5878  B J2Z
1368 AM 75         BIN   TYP1,*                    PRINT ERROR      5  5882  B Q4Z *
1369 AM 76         BIN   TYP1,-                    PUNCH ERROR      5  5887  B Q4Z -
1370 AM 77         B     UPX1                      UP XR 1          4  5892  B Z8T
1371 AM 78         B     PFPC                      EXECUTE AGAIN    4  5896  B Y7U
1372 AM 79         SS    .                                          2  5900  K .
1373 AM 80         B     LOOPCK                    CK FOR LOOP      4  5902  B U39
1374 AM 81
1375 AM 82                     ROUTINE TO TYPE PASS AND TEST
1376 AM 83                     TAD3 FOR REPEAT  IF TAD3 IS 1
1377 AM 84                     HALT BEFORE RETURNING TO ROUTINE 1
1378 AM 85                     IF 0 TYPE COMP SW MESSAGE AND
1379 AM 86                     HALT BEFORE CALLING IN NEXT PROGRAM
1380 AM 87
1381 AM 88         MCW   &TO,PAS-003,W             TYPE PASS        8  5906  N &TO E3W N
```

SEQ	PG	LIN	LABEL	OP	OPERANDS		SFX	CT	LOCN	INSTRUCTION
1382	AM	89		BCE	REPEAT,TAD3,1	TEST FOR REPEAT		8	5914	B Z4Z ŧ03 1
1383	AM	90		LCA	BIGM,0007			7	5922	L Z4Y 007
1384	AM	91		SW	0008			4	5929	, 008
1385	AM	92		MCW	ŧTO,MD1410-031,W	TYPE MESSAGE		8	5933	M ŧTO E4/ M
1386	AM	93		H		HALT TO SET COMP		1	5941	.
1387	AM	94				SW TO 1410/7010				
1388	AM	95	BIGM	DCW	@J00400 @			7	5948	
1389	AM	96	REPEAT	NOP	2008	SET FOR		4	5949	N -08
1390	AM	97		SAR	POST	RESTART		4	5953	@ Z04
1391	AM	98		H		HALT PRESS COMP		1	5957	.
1392	AM	99				RESET AND START				
1393	AN	00				FOR NEXT PASS				
1394	AN	01								

SEQ	PG	LIN	LABEL	OP	OPERANDS		SFX	CT	LOCN	INSTRUCTION
1395	AN	03		JOB	1410/7010-1401 TOPSY COMPATIBILITY TEST					
1396	AN	05	CKBUSY	SBR	CYCLEX&003	SET EXIT		4	5958	H Z7Z
1397	AN	06		A	ONE,CYCNT	UP CYCNT BY 1		7	5962	A AOV B3#
1398	AN	07		MA	BKCYC,CYCLEX&003	MOD ADDR		7	5969	# Z8S Z7Z
1399	AN	08	CYCLEX	B	0000	EXIT		4	5976	B 000
1400	AN	09	BKCYC	DCW	@19E@			3	5982	
1401	AN	10								
1402	AN	11	UPX1	SBR	UPXEX&003	SET EXIT		4	5983	H -1W
1403	AN	12		A	ONE,0089	UP XR 1		7	5987	A AOV 089
1404	AN	13		C	0089,ZZ5	CK FOR 5		7	5994	C 089 B1W
1405	AN	14		BU	UPXEX	GO TO EXIT		5	6001	B -1T /
1406	AN	15		MA	ZZ4,UPXEX&003	MODIFY ADDRESS		7	6006	# B4# -1W
1407	AN	16	UPXEX	B	0000	EXIT		4	6013	B 000
1408	AN	17								
1409	AN	18	EOFF	SBR	EOFFEX&003	SET EXIT		4	6017	H -2Z
1410	AN	19		CU	%U1,R	REWIND TP 1		5	6021	J %U1 R
1411	AN	20	EOFFEX	B	0000	EXIT		4	6026	B 000
1412	AN	21								
1413	AN	22	EORR	SBR	EORREX&003	SET EXIT		4	6030	H -4S
1414	AN	23		CU	%U2,R	REWIND TP 2		5	6034	J %U2 R
1415	AN	24	EORREX	B	0000	EXIT		4	6039	B 000
1416	AN	25								
1417	AN	26								
1418	AN	27	TROX	SBR	TROEX&003	SET EXIT		4	6043	H -7V
1419	AN	28		BCE	GORT,1291,1	CK FOR TAPE		8	6047	B -5Z S91 1
1420	AN	29		B	TROEX	BYPASS READ		4	6055	B -7S
1421	AN	30	GORT	MCW	$$,WKAREA,R	READ TAPE		8	6059	M @U1 HD# R
1422	AN	31		BEF	EOFF	CK FOR EOF		5	6057	B -1X K
1423	AN	32	TROEX	B	0000	EXIT		4	6072	B 000
1424	AN	33								
1425	AN	34								
1426	AN	35	TWOX	SBR	TWOEX&003	SET EXIT		4	6076	H J0V
1427	AN	36		BCE	TWOEX,7992,	CK FOR TAPE		8	6080	B J0S I9S
1428	AN	37		NOP				1	6088	N
1429	AN	38	GOUT	MCW	$$,WKAREA,W	WRITE TAPE		8	6089	M @U2 HD# W
1430	AN	39		BEF	EORR	CK FOR EOR		5	6097	B -3# K
1431	AN	40	TWOEX	B	0000	EXIT		4	6102	B 000
1432	AN	41								
1433	AN	42								
1434	AN	43	CROX	SBR	CROEX&003	SET EXIT		4	6106	H J2Y
1435	AN	44		BCE	GORC,1301,R	CK FOR READER		8	6110	B J2S T01 R
1436	AN	45		B	CROEX	BYPASS READ		4	6118	B J2V
1437	AN	46	GORC	SS	$			2	6122	K $
1438	AN	47		R		READ CARD		1	6124	1
1439	AN	48	CROEX	B	0000	EXIT		4	6125	B 000
1440	AN	49								
1441	AN	50								
1442	AN	51	PCOX	SBR	PCOEX&003	SET EXIT		4	6129	H J5/
1443	AN	52		BCE	GOPC,1303,P	CK FOR PUNCH		8	6133	B J4V T03 P
1444	AN	53		B	PCOEX	BYPASS PUNCH		4	6141	B J4Y

```
SEQ PG LIN  LABEL   OP    OPERANDS                          SFX CT  LOCN  INSTRUCTION

1445 AN 54  GOPC    SS    $                                   2  6145  K $
1446 AN 55          P                       PUNCH CARD          1  6147  4
1447 AN 56  PCOEX   B     0000              EXIT              4  6148  B 000
1448 AN 57
1449 AN 58
1450 AN 59  PFOX    SBR   PFOEX&003         SET EXIT          4  6152  H J7S
1451 AN 60          BCE   GOPF,1305,P       CK FOR PRINTER    8  6156  B J6Y T05 P
1452 AN 61          B     PFOEX             BYPASS PRINT      4  6164  B J6Z
1453 AN 62  GOPF    W                       PRINT LINE        1  6168  2
1454 AN 63  PFOEX   B     0000              EXIT              4  6169  B 000
1455 AN 64
1456 AN 65
1457 AN 66  CKTW    SBR   CKTWEX&003        SET EXIT          4  6173  H K2/
1458 AN 67          BCE   CKTWEX-007,7992,  CK FOR WRITE TP   8  6177  B K1/ I9S
1459 AN 68          NOP                                       1  6185  N
1460 AN 69  GOCKTW  CU    %U2,B             BACKSPACE TAPE    5  6186  J %U2 B
1461 AN 70          MCW   %U2,WKAREA&100,R  READ REC          8  6191  M %U2 I0# R
1462 AN 71          C     WKAREA&179,WKAREA&079  CK REC       7  6199  C I7Z H7Z
1463 AN 72          BU    CKTWEX            WRITTEN           5  6206  B K1Y /
1464 AN 73          MA    ZZ4,CKTWEX&003    MODIFY EXIT       7  6211  # B4# K2/
1465 AN 74  CKTWEX  B     0000              EXIT              4  6218  B 000
1466 AN 75  CKTR    SBR   CKTREX&003        SET EXIT          4  6222  H K6#
1467 AN 76          BCE   GOCKTR,1291,1     CK FOR TAPE       8  6226  B K3Y S91 1
1468 AN 77          B     CKTREX-007        BYPASS CHECK      4  6234  B K5#
1469 AN 78  GOCKTR  C     WKAREA&079,RDCOMP&003  CK REC       7  6238  C H7Z C4#
1470 AN 79          BU    CKTREX             READ             5  6245  B K5X /
1471 AN 80          MA    ZZ4,CKTREX&003    MODIFY EXIT       7  6250  # B4# K5#
1472 AN 81  CKTREX  B     0000              EXIT              4  6257  B 000
1473 AN 82
1474 AN 83
1475 AN 84  CKCR    SBR   CKCREX&003        SET EXIT          4  6261  H K9Z
1476 AN 85          BCE   GOCKCR,1301,R     CK FOR READER     8  6265  B K7X T01 R
1477 AN 86          B     CKCREX-007        BYPASS EXIT       4  6273  B K8Z
1478 AN 87  GOCKCR  C     0080,RDCOMP&003   CK CARD           7  6277  C 080 C4#
1479 AN 88          BU    CKCREX             READ             5  6284  B K9W /
1480 AN 89          MA    ZZ4,CKCREX&003    MODIFY EXIT       7  6289  # B4# K9Z
1481 AN 90  CKCREX  B     0000              EXIT              4  6296  B 000
1482 AN 91
1483 AN 92
1484 AN 93                      ROUTINE TO WRITE TAPE 1
1485 AN 94                      FOR USE AS INPUT WITH TEST
1486 AN 95                      ROUTINES CALLING FOR TAPE INPUT
1487 AN 96
1488 AN 97
1489 AN 98  PRETP1  SBR   PRETEX&003        SET EXIT          4  6300  H M2Y
1490 AN 99          NOP   *&005             SET ROUT START    4  6304  N L1S
1491 AO 00          SAR   0084              ADDR IN 82-84     4  6308  2 084
1492 AO 01          LCA   ZZZ,0089          RESET XR 1        7  6312  L B3X 089
1493 AO 02          CU    %U1,R             REWIND TAPE 1     5  6319  J %U1 R
1494 AO 03  NXA     CS    WKAREA&019        CLEAR WR AREA     4  6324  / H1Z
```

```
SEQ PG LIN  LABEL   OP    OPERANDS                                SFX CT  LOCN  INSTRUCTION

1495 A0 04          SW    WKAREA                  SET WM           4  6328  , H0#
1496 A0 05          MCW   RDCOMP-071&X1,WKAREA&019 SET RECORD     7  6332  M BWW H1Z
1497 A0 06          MCW   WKAREA&019,WKAREA&018   FOR WRITING     7  6339  M H1Z H1Y
1498 A0 07          LCA   GMWM,WKAREA&020         LOAD GM WM       7  6346  L &8J H2#
1499 A0 08          B     WTAPA                   GO TO WRITE TAPE 4  6353  B L6X
1500 A0 09          CU    %U1,B                   BACKSPACE        5  6357  U %U1 B
1501 A0 10          CU    %U1,E                   & SKIP           5  6362  J %U1 E
1502 A0 11  WTAPA   MCW   %U1,WKAREA,W            WRITE RECORD     8  6367  M %U1 H0# W
1503 A0 12          NOP   0000                    EXTRA INSTR      4  6375  N 000
1504 A0 13          BEF   ENREEL                  CK FOR EOR       5  6379  B P2S K
1505 A0 14          BER   TPWRER                  CK FOR WRITE ERR 5  6384  B M4Y L
1506 A0 15                                        ERR TYPE HERE
1507 A0 16                                        INDS THAT 10
1508 A0 17                                        TRYS USING BKSP-
1509 A0 18                                        SKIP HAVE BEEN
1510 A0 19                                        MADE TO WR REC
1511 A0 20          LCA   ZZ,WRCNT                RESET ERR CNTR   7  6389  L E2V E2X
1512 A0 21          A     ONE,0089                UP XR 1          7  6396  A A0V 089
1513 A0 22          C     0089,Z26                CK FOR 26 RECS   7  6403  C 089 E3S
1514 A0 23          BU    NXA                     WR NEXT REC      5  6410  B L2U /
1515 A0 24          CU    %U1,M                   WRITE EOF        5  6415  U %U1 M
1516 A0 25          CU    %U1,R                   REWIND TAPE      5  6420  J %U1 R
1517 A0 26  PRETEX  B     0000                    ROUTINE EXIT     4  6425  B 000
1518 A0 27
1519 A0 28
1520 A0 29                      TAPE WRITE ERROR ROUTINE
1521 A0 30                      THIS ROUTINE IS ENTERED WHENEVER
1522 A0 31                      A TAPE WRITE ERROR IS
1523 A0 32                      ENCOUNTERED WITHIN TEST ROUTINE
1524 A0 33
1525 A0 34          SBR   TWREX&003               SET EXIT AND     4  6429  H N6X
1526 A0 35          SBR   REDA&003                 REDUCE INSTR    4  6433  H N0V
1527 A0 36          LCA   BRANCH,MODIFY           SET SW TO BR     7  6437  L F0V N3V
1528 A0 37          B     *&009                                    4  6444  B M5W
1529 A0 38  TPWRER  SBR   TWREX&003               SET ROUTINE EXIT 4  6448  H N6X
1530 A0 39          SBR   REDA&003                SET REDUCE INSTR 4  6452  H N0V
1531 A0 40          BIN   ALTER,Q                 CK FOR INQUIRY   5  6456  B U68 Q
1532 A0 41          A     ONE,TWRCNT              ADD 1            7  6461  A A0V F1#
1533 A0 42          A     ONE,WRCNT                TO ERROR CNTRS  7  6468  A A0V E2X
1534 A0 43          C     WRCNT,TEN               CK FOR 10 TRYS   7  6475  C E2X F1S
1535 A0 44          BU    MODIFY                  NOT 10 TRY AGAIN 5  6482  B N3V /
1536 A0 45          LCA   ZZ,WRCNT                RESET ERR CNTR   7  6487  L E2V E2X
1537 A0 46          BCE   MODIFY,TADD,1           BYPASS ERR IND   8  6494  B N3V #00 1
1538 A0 47  REDA    SW    0000                    REDUCE           4  6502  , 000
1539 A0 48          CW                             ADDRESS         1  6506  ¤
1540 A0 49          CW                              AND            1  6507  ¤
1541 A0 50          CW                               STORE         1  6508  ¤
1542 A0 51          CW                                IN           1  6509  ¤
1543 A0 52          SAR   ERRLO                        ERRLO       4  6510  Q F2V
1544 A0 53          MCW   %TO,ERRLO-012,W           TYPE ERR LOC     8  6514  M %TO F1T W
```

```
 SEQ PG LIN  LABEL  OP    OPERANDS                                                    SFX CT  LOCN  INSTRUCTION

1545 AO 54          BCE   ERHA,TAD2,1                             CK FOR ERR HALT         8  6522  B V3U #02 1
1546 AO 55          B     MODIFY                                                          4  6530  B V3V
1547 AO 56   ERHA   H                                             ERROR HALT              1  6534  .
1548 AO 57   MODIFY NOP   OVLPMD                                  BR-NOP SW  THIS         4  6535  V V5#
1549 AO 58                                                        WILL BE A BR FOR
1550 AO 59                                                        TP OPS IN OVLP
1551 AO 60          MA    BK32,TWREX&003                          DEC ADDR BY 32          7  6539  # V7# V5X
1552 AO 61          B     TWREX                                   GO TO EXIT              4  6546  B V6J
1553 AO 62   OVLPMD LCA   NOP,MODIFY                              SET SW TO NOP           7  6550  L FOW V3V
1554 AO 63          MA    BK56,TWREX&003                          DEC ADDR BY 56          7  6557  # N7T N5X
1555 AO 64   TWREX  B     0000                                    ROUTINE EXIT            4  6564  B 000
1556 AO 65
1557 AO 66   BK32   DCW   @I6H@                                                           3  6570
1558 AO 67   BK56   DCW   @I4D@                                                           3  6573
1559 AO 68
1560 AO 69
1561 AO 70                          TAPE READ ERROR ROUTINE
1562 AO 71                          THIS ROUTINE IS ENTERED WHENEVER
1563 AO 72                          A TAPE READ ERROR IS
1564 AO 73                          ENCOUNTERED WITHIN TEST ROUTINE
1565 AO 74
1566 AO 75          SBR   TRREX&003                               SET EXIT AND            4  6574  H O8T
1567 AO 76          SBR   REDAD&003                                REDUCE INSTR           4  6578  H O5#
1568 AO 77          LCA   BRANCH,MODIF                            SET SW TO BR            7  6582  L FOV O8U
1569 AO 78          B     *&009                                                           4  6589  B OO/
1570 AO 79   TPRDER SBR   TRREX&003                               SET ROUTINE EXIT        4  6593  H O8T
1571 AO 80          SBR   REDAD&003                               SET REDUCE INSTR        4  6597  H O5#
1572 AO 81          BIN   ALTER,Q                                 CK FOR INQUIRY          5  6601  B J68 Q
1573 AO 82          A     ONE,TRDCNT                              ADD 1                   7  6606  A AOV F4U
1574 AO 83          A     ONE,RDCNT                                TO ERROR CNTRS         7  6613  A AOV E2Z
1575 AO 84          C     RDCNT,TEN                               CK FOR 10 TRYS          7  6620  C E2Z F1S
1576 AO 85          BU    MODIF                                   NOT 10 TRY AGAIN        5  6627  B O8J /
1577 AO 86          LCA   ZZ,RDCNT                                RESET ERR CNTR          7  6632  L E2V E2Z
1578 AO 87          BCE   TRREX,TADO,1                            BYPASS ERR IND          8  6639  B O8# #00 1
1579 AO 88   REDAD  SW    0000                                    REDUCE                  4  6647  , 000
1580 AO 89          CW                                             ADDRESS                1  6651  □
1581 AO 90          CW                                              AND                   1  6652  □
1582 AO 91          CW                                               STORE                1  6653  □
1583 AO 92          CW                                                IN                  1  6654  □
1584 AO 93          SAR   ERRL                                              ERRL          4  6655  Q F3Z
1585 AO 94          MCW   %TO,ERRL-012,W                          TYPE ERR LOC            8  6659  M %TO F2X W
1586 AO 95          BCE   ERH,TAD2,1                              CK FOR ERR HALT         8  6667  B O7Z #02 1
1587 AO 96          B     TRREX                                   GO TO EXIT              4  6675  B O8#
1588 AO 97   ERH    H                                             ERROR HALT              1  6679  .
1589 AO 98   TRREX  B     0000                                    ROUTINE EXIT            4  6680  B OOO
1590 AO 99   MODIF  CU    %U1,B                                   BACKSPACE TAPE          5  6684  U %U1 B
1591 AP 00          NOP   OVLPM                                   BR-NOP SW  THIS         4  6689  V POJ
1592 AP 01                                                        WILL BE A BR FOR
1593 AP 02                                                        TP OPS IN OVLP
1594 AP 03          MA    BK26,TRREX&003                          DEC ADDR BY 26          7  6693  # F4X O8T
```

```
SEQ PG LIN  LABEL   OP    OPERANDS                                  SFX CT  LOCN  INSTRUCTION

1595 AP 04          B     TRREX                          GO TO EXIT      4  6700  B D8#
1596 AP 05  OVLPM   LCA   NOP,MODIF&005                 SET SW TO NOP   7  6704  L FOW D8Z
1597 AP 06          MA    BK50,TRREX&003                 DEC ADDR BY 43  7  6711  # F5# D8T
1598 AP 07          B     TRREX                          GO TO EXIT      4  6718  B D8#
1599 AP 08
1600 AP 09
1601 AP 10                      TAPE END OF REEL ROUTINE
1602 AP 11                      THIS ROUTINE IS ENTERED WHENEVER
1603 AP 12                      END OF REEL IS ENCOUNTERED
1604 AP 13                      DURING TAPE WRITE OPERATION
1605 AP 14
1606 AP 15  ENREEL  SBR   ENREX&003                      SET ROUTINE EXIT  4  6722  H P4U
1607 AP 16          LCA   NOP,EOFSW                      SET EOF SW        7  6726  L FOW P5T
1608 AP 17          MCW   %TO,REELEN-010,W               TYPE MESSAGE      8  6733  M %TO F5/ W
1609 AP 18  ENREX   B     0000                           ROUTINE EXIT      4  6741  B 000
1610 AP 19
1611 AP 20
1612 AP 21                      TAPE END OF FILE ROUTINE
1613 AP 22                      THIS ROUTINE IS ENTERED WHENEVER
1614 AP 23                      END OF REEL OR END OF FILE
1615 AP 24                      IS ENCOUNTERED DURING A
1616 AP 25                      TAPE READ OPERATION
1617 AP 26
1618 AP 27  EOF1    SBR   EOFEX&003                      SET ROUTINE EXIT  4  6745  H Q1X
1619 AP 28          SBR   INDEOF&003                     SET REDUCE INSTR  4  6749  H P7W
1620 AP 29  EOFSW   B     INDEOF                         THIS WILL BE A    4  6753  B P7T
1621 AP 30                                               BR TO IND ERR IF
1622 AP 31                                               EOR WAS NOT
1623 AP 32                                               ENCTRD ON WRITE
1624 AP 33          CU    %U1,R                          REWIND TAPE       5  6757  J %U1 %
1625 AP 34          LCA   BRANCH,EOFSW                   RESTORE SW        7  6762  L FOW P5T
1626 AP 35          B     0001                           RETRY ROUTINE     4  6769  B 001
1627 AP 36  INDEOF  BCE   EOFEX,TAD0,1                   BYPASS ERR IND    8  6773  B Q1J #00 1
1628 AP 37          SW    0000                           REDUCE            4  6781  , 000
1629 AP 38          CW                                    ADDRESS          1  6785  ¤
1630 AP 39          CW                                      AND            1  6786  ¤
1631 AP 40          CW                                        STORE        1  6787  ¤
1632 AP 41          CW                                          IN         1  6788  ¤
1633 AP 42          SAR   EOFIN                               EOFIN        4  6789  Q F7Y
1634 AP 43          MCW   %TO,EOFIN-015,W                WRITE MESSAGE     8  6793  M %TO F5T W
1635 AP 44          BCE   EOFH,TAD2,1                    CK FOR ERR HALT   8  6801  B Q1T #02 1
1636 AP 45          B     EOFEX                          GO TO EXIT        4  6809  B Q1J
1637 AP 46  EOFH    H                                    ERROR HALT        1  6813  .
1638 AP 47  EOFEX   B     0000                           ROUTINE EXIT      4  6814  B 000
1639 AP 48                      ERROR ROUTINE
1640 AP 49                      THIS ROUTINE IS ENTERED WHEN AN ERROR
1641 AP 50                      IS ENCOUNTERED WITHIN TEST ROUTINE
1642 AP 51                      TEST TADO
1643 AP 52                      IF 1 BYPASS ERR IND AND CK INQUIRY
1644 AP 53                      IF 0 TYPE ERROR ADDRESS AND TEST
```

SEQ	PG	LIN	LABEL	OP	OPERANDS	SFX	CT	LOCN	INSTRUCTION
1645	AP	54							
1646	AP	55			TAD2 IF 1 HALT BEFORE INQUIRY TEST				
1647	AP	56			IF 0 PROCEED TO TEST FOR INQUIRY				
1648	AP	57		SBR	TPEXIT&003				
1649	AP	58		SBR	REDD&003				
1650	AP	59		BCE	LPC,TAD0,1				
1651	AP	60	REDD	SW	0000				
1652	AP	61		CW					
1653	AP	62		CW					
1654	AP	63		CW					
1655	AP	64		SAR	ERRLOC				
1656	AP	65		B	TYPER				
1657	AP	66	TYP1	SBR	TPEXIT&003				
1658	AP	67		SBR	REDADD&003				
1659	AP	68		BCE	LPC,TAD0,1				
1660	AP	69	REDADD	SW	0000				
1661	AP	70		CW					
1662	AP	71		CW					
1663	AP	72		CW					
1664	AP	73		CW					
1665	AP	74		SAR	ERRLOC				
1666	AP	75	TYPER	MCW	&TO,ERRLOC-006,W				
1667	AP	76		BCE	ERHALT,TAD2,1				
1668	AP	77		B	LPC				
1669	AP	78	ERHALT	H					
1670	AP	79	LPC	BIN	ALTER,Q				
1671	AP	80	TPEXIT	B	0000				
1672	AP	81							
1673	AP	82							
1674	AP	83							
1675	AP	84			ROUTINES TO SAVE AND RESTORE				
1676	AP	85			STORAGE AREAS TO BE REPLACED				
1677	AP	86			WITH UNCOND. BR INSTRS USED				
1678	AP	87			WITH CERTAIN TEST ROUTINES				
1679	AP	88							
1680	AP	89	SVRES	SBR	SVRSEX&003				
1681	AP	90		LCA	ZZZ,0089				
1682	AP	91	MVIT	MN	0000&X2,0000&X3				
1683	AP	92		MZ	0000&X2,0000&X3				
1684	AP	93		BWZ	WM,0000&X2,1				
1685	AP	94	UPXR	A	ONE,0089				
1686	AP	95		MA	ZZ1,0094				
1687	AP	96		MA	ZZ1,0099				
1688	AP	97		C	0089,ZZ5				
1689	AP	98		BU	MVIT				
1690	AP	99	SVRSEX	B	0000				
1691	AQ	00	WM	SW	0000&X3				
1692	AQ	01		B	UPXR				

SET ROUTINE EXIT	4	6818	H	ROW
SET REDUCE INSTR	4	6822	H	Q3X
BYPASS ERR IND	8	6826	B	Q9Y #00 1
REDUCE ADDRESS	4	6834	.	000
TO INDICATE	1	6838	¤	
ERROR	1	6839	¤	
LOCATION	1	6840	¤	
STORE FOR TYPING	4	6841	Q	J65
GO TO TYPE	4	6845	B	Q7X
SET ROUTINE EXIT	4	6849	H	ROW
SET REDUCE INSTR	4	6853	H	Q6Y
BYPASS ERR IND	8	6857	B	Q9Y #00 1
REDUCE ADDRESS	4	6865	.	000
TO INDICATE	1	6869	¤	
ERROR	1	6870	¤	
LOCATION	1	6871	¤	
	1	6872	¤	
STORE FOR TYPING	4	6873	Q	U66
TYPE ERROR LOC	8	6877	H	&TO U60 W
CK FOR ERR HALT	8	6885	B	Q9X #02 1
CK FOR INQ.	4	6893	B	Q9Y
ERROR HALT	1	6897	.	
CK FOR INQUIRY	5	6898	B	U68 Q
ROUTINE EXIT	4	6903	B	000

SET EXIT	4	6907	H	R7W
RESET XR 1	7	6911	L	B3X 089
MOVE NUM BITS	7	6918	D	0-0 0&0
MOVE ZN BITS	7	6925	Y	0-0 0&0
CK FOR WM	8	6932	V	R7X 0-0 1
UP	7	6940	A	A0V 089
	7	6947	#	&2# 094
	7	6954	#	&2# 099
CK FOR 5 MOVES	7	6951	C	089 B1W
MOVE NEXT DIGIT	5	6958	B	R1Y /
ROUTINE EXIT	4	6973	B	000
SET WM	4	6977	.	0&0
UP XRS	4	6981	B	R4#

SEQ	PG	LIN	LABEL	OP	OPERANDS	SFX	CT	LOCN	INSTRUCTION
1693	AQ	03		JOB	1410/7010-1401 TOPSY COMPATIBILITY TEST				
1694	AQ	05	TPINS1	DCW	@%U@		2	6986	
1695	AQ	06	TPINS2	DCW	@@U@		2	6988	
1696	AQ	07	TPRINA	DCW	@001@		3	6991	
1697	AQ	08	TPRINB	DCW	@101@		3	6994	
1698	AQ	09	TPRINC	DCW	@201@		3	6997	
1699	AQ	10	CC1	DSA	&WKAREA		3	7000	4D#
1700	AQ	11	CC2	DSA	&WKAREA&079		3	7003	47Z
1701	AQ	12	TPOTA	DSA	&0080		3	7006	080
1702	AQ	13	TPOTB	DSA	&0180		3	7009	180
1703	AQ	14	TPOTC	DSA	&0280		3	7012	280
1704	AQ	15	RESTA	B	1901		4	7013	B Z01
1705	AQ	16		DC	@ @		1	7017	
1706	AQ	17	POST	EQU	1904			1904	
1707	AQ	18		EQU	1905			1905	
1708	AQ	18	1905	DCW	@B000 @		5	1905	
1709	AQ	19	ZZ1	DCW	@001@		3	7020	
1710	AQ	20	DMS	DCW	@NBNCNDNE@		8	7028	
1711	AQ	21	ZER3	DCW	@000@		3	7031	
1712	AQ	22	CHTEST	DCW	@ @		1	7032	
1713	AQ	23	TWO	DCW	@2@		1	7033	
1714	AQ	24	Z10	DCW	@010@		3	7036	
1715	AQ	25	TSBR	DCW	@XXX@		3	7039	
1716	AQ	26	XXX	DCW	@XXX@		3	7042	
1717	AQ	27	TSBRAN	DSA	&TSBR		3	7045	&3Z
1718	AQ	28	PRTHAM	DCW	@DISABLE 1403 PRINT HAMMER PRESS@		32	7077	
1719	AQ	29		DC	@ START@		6	7083	
1720	AQ	30	GMWM	DCW	@ @		1	7084	
1721	AQ	31	PRBNSG	DCW	@01234567890@		10	7094	
1722	AQ	32	IMSEG	DCW	@PRTERRTEST@		10	7104	
1723	AQ	33	ONE	DCW	@1@		1	7105	
1724	AQ	34	FRTHOU	DCW	@00#@		3	7108	
1725	AQ	35	SAVA	DC	@ @		5	7113	
1726	AQ	36	SVLOC	DSA	&SAVA-004		3	7116	A0Z
1727	AQ	37	RESCK	DCW	@SET CK CONTROL SW TO NORMAL PRE@		32	7148	
1728	AQ	38		DC	@SS START@		8	7156	
1729	AQ	39		DCW	@ @		1	7157	
1730	AQ	40	RESHAM	DCW	@RESTORE 1403 PRINT HAMMER TO NOR@		32	7189	
1731	AQ	41		DC	@MAL STATUS PRESS START@		23	7212	
1732	AQ	42		DCW	@ @		1	7213	
1733	AQ	43	ZZ5	DCW	@005@		3	7216	
1734	AQ	44	PRBSEG	DCW	@PRBUSYTEST@		10	7226	
1735	AQ	45	CYCNT	DCW	@0000@		4	7230	
1736	AQ	46	ZZZZ	DCW	@0000@		4	7234	
1737	AQ	47	ZZZ	DCW	@000@		3	7237	
1738	AQ	48	ZZ4	DCW	@004@		3	7240	
1739	AQ	49	AA1	DCW	@11@		2	7242	
1740	AQ	50		DCW	@/1@		2	7244	
1741	AQ	51		DCW	@J1@		2	7246	
1742	AQ	52		DCW	@A1@		2	7248	

SEQ	PG	LIN	LABEL	OP	OPERANDS	SFX	CT	LOCN	INSTRUCTION
1743	AQ	53	ADAN	DCW	@/0@		2	7250	
1744	AQ	54		DCW	@J0@		2	7252	
1745	AQ	55		DCW	@A0@		2	7254	
1746	AQ	56		DCW	@10@		2	7256	
1747	AQ	57	ADAREA	DCW	@ @		2	7258	
1748	AQ	58	NINT9	DCW	@99@		2	7260	
1749	AQ	59		DCW	@BZ01 FGHIJKLMNOPQRSTUVWXYZ012345@		32	7292	
1750	AQ	60		DC	@6789.¤ &$* -/,% #@ &-¢ A@		32	7324	
1751	AQ	61	RDCOMP	DC	@BCDEFGHIJKLMN@		13	7337	
1752	AQ	62		DC	@OPQ@		3	7340	
1753	AQ	63		DCW	@ @		1	7341	
1754	AQ	64	PROCMS	DCW	@ALTER LOC 7800 TO NO BITS SET C@		32	7373	
1755	AQ	65		DC	@K CONTROL SW TO RESTART AND PRES@		32	7405	
1756	AQ	66		DC	@S START@		7	7412	
1757	AQ	67		DCW	@ @		1	7413	
1758	AQ	68	PNERMS	DCW	@READY 10 CARDS JUST PUNCHED IN P@		32	7445	
1759	AQ	69		DC	@UNCH 9 EDGE FIRST FACE DOWN FOLL@		32	7477	
1760	AQ	70		DC	@OWED BY BLANK CARDS PRESS START@		32	7509	
1761	AQ	71		DCW	@ @		1	7510	
1762	AQ	72	ETHOU	DCW	@00-@		3	7513	
1763	AQ	73	BRBK	B	BCK		4	7514	B R11
1764	AQ	74		DC	@ @		1	7518	
1765	AQ	75	BRBK1	B	BCKX		4	7519	B A81
1766	AQ	76		DC	@ @		1	7523	
1767	AQ	77	ZZ	DCW	@00@		2	7525	
1768	AQ	78	WRCNT	DCW	@00@		2	7527	
1769	AQ	79	WKAREA	EQU	7800			7800	
1770	AQ	80	RDCNT	DCW	@ @		2	7529	
1771	AQ	81	Z26	DCW	@026@		3	7532	
1772	AQ	82	ONHUND	DCW	@100@		3	7535	
1773	AQ	83	PAS	DCW	@PASS@		4	7539	
1774	AQ	84		DCW	@ @		1	7540	
1775	AQ	85	MD1410	DCW	@SET COMPATIBILITY SW TO 1410/701@		32	7572	
1776	AQ	86		DC	@0 PRESS COMPUTER RESET & START@		31	7603	
1777	AQ	87		DCW	@ @		1	7604	
1778	AQ	88	BRANCH	DCW	@B@		1	7605	
1779	AQ	89	NOP	DCW	@N@		1	7606	
1780	AQ	90	TWRCNT	DCW	@0000@		4	7610	
1781	AQ	91	TEN	DCW	@10@		2	7612	
1782	AQ	92	ERRLO	DCW	@TP WR ERR @		13	7625	
1783	AQ	93		DCW	@ @		1	7626	
1784	AQ	94	ERRL	DCW	@TP RD ERR @		13	7639	
1785	AQ	95		DCW	@ @		1	7640	
1786	AQ	96	TRDCNT	DCW	@0000@		4	7644	
1787	AQ	97	BK26	DCW	@I7D@		3	7647	
1788	AQ	98	BK50	DCW	@I5¢@		3	7650	
1789	AQ	99	REELEN	DCW	@END OF REEL@		11	7661	
1790	AR	00		DCW	@ @		1	7662	
1791	AR	01	EOFIN	DCW	@FALSE TP EOF @		16	7678	
1792	AR	02		DCW	@ @		1	7679	

SEQ	PG	LIN	LABEL	OP	OPERANDS		SFX	CT	LOCN	INSTRUCTION
1793	AR	03	SETXX	LCA	ZZZ,0089	SET XR 1 TO 0		7	7680	L 83X 089
1794	AR	04		B	WTTT	GO TO WRITE TP		4	7687	B 08Z
1795	AR	05		DCW	@ @			1	7691	
1796	AR	06	RTX	EQU	7991				7991	
1797	AR	06	7991	DCW	@ @			1	7991	
1798	AR	07	WTX	EQU	7992				7992	
1799	AR	07	7992	DCW	@ @			1	7992	

```
SEQ PG LIN  LABEL  OP   OPERANDS                                  SFX CT  LOCN  INSTRUCTION

1800 AR 09         JOB  1410/7010-1401 TOPSY COMPATIBILITY TEST
1801 AR 11         ORG  8000                                                   8000
1802 AR 12
1803 AR 13                    1410 ROUTINE TO SET UP POST
1804 AR 14                    RESTART,TYPE PROGRAM ID AND
1805 AR 15                    SET UP INSTRUCTIONS
1806 AR 16
1807 AR 17         DCW  @D0802800004X@                              12  8011
1808 AR 18         DCW  @,00005@                                     6  8017
1809 AR 19         DCW  @J08029 @                                    7  8024
1810 AR 20         DCW  @B-08@                                       4  8028
1811 AR 21         DCW  @M%T001250W@                                10  8038
1812 AR 22         DCW  @R08029 @                                    7  8045
1813 AR 23         DCW  @M%T008167W@                                10  8055
1814 AR 24         DCW  @R08046 @                                    7  8062
1815 AR 25         DCW  @M%T008185W@                                10  8072
1816 AR 26         DCW  @R08063 @                                    7  8079
1817 AR 27         DCW  @N%T008208W@                                10  8089
1818 AR 28         DCW  @N08080 @                                    7  8096
1819 AR 29         DCW  @M%T008138W@                                10  8106
1820 AR 30         DCW  @R08097 @                                    7  8113
1821 AR 31         DCW  @M%T008228W@                                10  8123
1822 AR 32         DCW  @R08114 @                                    7  8130
1823 AR 33         DCW  @J08240 @                                    7  8137
1824 AR 34         DCW  @SET COMPATIBILITY SW TO 1401@              28  8155
1825 AR 35         DCW  @ @                                          1  8156
1826 AR 36         DCW  @SET SENSE SW A ON@                         17  8173
1827 AR 37         DCW  @ @                                          1  8174
1828 AR 38         DCW  @SET I/O CK STOP SW OFF@                    22  8206
1829 AR 39         DCW  @ @                                          1  8207
1830 AR 40         DCW  @READY ALL I/O UNITS@                       19  8226
1831 AR 41         DCW  @ @                                          1  8227
1832 AR 42         DCW  @PRESS START@                               11  8238
1833 AR 43         DCW  @ @                                          1  8239
1834 AR 44         DCW  @D0802800084X@                              12  8251
1835 AR 45         DCW  @,00085@                                     6  8257
1836 AR 46         DCW  @J02007 @                                    7  8264
1837 AR 47         DCW  @.@                                          1  8265
1838 AR 48         ORG  8500                                                   8500
1839 AR 49         DCW  @B0851901301R@                              12  8511
1840 AR 50         DCW  @J08569 @                                    7  8518
1841 AR 51         DCW  @M%1909000R@                                10  8528
1842 AR 52         DCW  @R085192@                                    7  8535
1843 AR 53         DCW  @R08543 @                                    7  8542
1844 AR 54         DCW  @R085571@                                    7  8549
1845 AR 55         DCW  @J08569 @                                    7  8556
1846 AR 56         DCW  @D090020130l3@                              12  8568
1847 AR 57         DCW  @B0858801303P@                              12  8580
1848 AR 58         DCW  @J08638 @                                    7  8587
1849 AR 59         DCW  @M%4909000W@                                10  8597
```

SEQ	PG	LIN	LABEL	OP	OPERANDS	SFX	CT	LOCN	INSTRUCTION
1850	AR	60		DCW	@R085882@		7	8603	
1851	AR	61		DCW	@R08612 @		7	8611	
1852	AR	62		DCW	@R086261@		7	8618	
1853	AR	63		DCW	@J08638 @		7	8625	
1854	AR	64		DCW	@D090020130330@		12	8637	
1855	AR	65		DCW	@B0865701305P@		12	8649	
1856	AR	66		DCW	@J08699 @		7	8656	
1857	AR	67		DCW	@F1@		2	8658	
1858	AR	68		DCW	@R086572@		7	8665	
1859	AR	69		DCW	@R08673 @		7	8672	
1860	AR	70		DCW	@R086871@		7	8679	
1861	AR	71		DCW	@J08699 @		7	8686	
1862	AR	72		DCW	@D090020130530@		12	8698	
1863	AR	73		DCW	@N@		1	8699	
1864	AR	74		DCW	@D087100799110@		12	8711	
1865	AR	75		DCW	@B087430129110@		12	8723	
1866	AR	76		DCW	@N089190129210@		12	8735	
1867	AR	77		DCW	@J08000 @		7	8742	
1868	AR	78		DCW	@D079910875810@		12	8754	
1869	AR	79		DCW	@U%U R@		5	8759	
1870	AR	80		DCW	@R087552@		7	8766	
1871	AR	81		DCW	@R08774 @		7	8773	
1872	AR	82		DCW	@R087881@		7	8780	
1873	AR	83		DCW	@J08844 @		7	8787	
1874	AR	84		DCW	@A08710079910@		11	8798	
1875	AR	85		DCW	@J08813Z@		7	8805	
1876	AR	86		DCW	@J08743 @		7	8812	
1877	AR	87		DCW	@D090020129130@		12	8824	
1878	AR	88		DCW	@D090020799230@		12	8836	
1879	AR	89		DCW	@J08000 @		7	8843	
1880	AR	90		DCW	@D079910799210@		12	8855	
1881	AR	91		DCW	@A08710079920@		11	8866	
1882	AR	92		DCW	@J08825Z@		7	8873	
1883	AR	93		DCW	@D079920888910@		12	8885	
1884	AR	94		DCW	@U%U R@		5	8890	
1885	AR	95		DCW	@R088862@		7	8897	
1886	AR	96		DCW	@R08905 @		7	8904	
1887	AR	97		DCW	@R088561@		7	8911	
1888	AR	98		DCW	@J08000 @		7	8918	
1889	AR	99		DCW	@D079910799210@		12	8930	
1890	AS	00		DCW	@J08874 @		7	8937	
1891	AS	01		DCW	@N088440129210@		12	8949	
1892	AS	02		DCW	@J08000 @		7	8956	
1893	AS	03		DCW	@.@		1	8957	
1894	AS	04		ORG	9000				9000
1895	AS	05		DC	@ @		1	9000	
1896	AS	06		DCW	@ @		1	9001	
1897	AS	07		DC	@ @		1	9002	
1898	AS	08		END	START				/ -00 080

060
M014