

IDENTIFICATION

SEO 0001

PRODUCT CODE: MAINDEC-08-DHKMA-C-0
PRODUCT NAME: POP-08 EXTENDED MEMORY DATA & CHECKERBOARD TEST
RELEASE DATE: FEBRUARY 1976
MAINTAINER: DIAGNOSTIC ENGINEERING
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MODIFIED TO RUN ON APT SYSTEMS, APRIL 1975.
SEE NOTES AT END OF DOCUMENT.

MODIFIED TO RUN ON CLASSIC 8 SYSTEMS (CONSOLE PACKAGE).
SEE SECTION 10.

MODIFIED TO RUN ON SYSTEMS WITH NO CONSOLE TERMINAL.
REFER TO SECTIONS STARTING AT SECTION 11 FOR PROGRAM INITIALIZATION,
OPERATING PROCEDURES, SWITCH REGISTER SETTINGS AND ERROR REPORTING.

THE PDP-8E EXTENDED MEMORY DATA & CHECKERBOARD TEST IS
DESIGNED TO DETECT MEMORY FAILURE DUE TO SENSE-LINE
NOISE UNDER WORST CASE CONDITIONS. THE FOUR WORST CASE
PATTERNS PROVIDED WILL GENERATE WORST CASE
NOISE CONDITIONS IN ALL STANDARD AND SPECIALLY PURCHASED
PDP-8E CORE STACKS, AND WILL TEST SYSTEMS EQUIPPED WITH
FROM 8K TO 32K WORDS OF CORE MEMORY. THE ALL 0'S AND ALL
1'S PATTERNS ARE PROVIDED TO IDENTIFY BASIC MEMORY FAILURES.
AUTOMATIC PROGRAM RELOCATION IS PROVIDED IN ORDER TO TEST
ALL MEMORY FIELDS FROM EACH MEMORY FIELD. TELETYPE PRINTOUTS
ARE PROVIDED FOR ERROR IDENTIFICATION, AND THE OPERATOR
IS GIVEN A DEGREE OF CONTROL OVER THE PROGRAM BY VARIOUS
SWITCH REGISTER SETTINGS.

2. REQUIREMENTS -----

2.1 EQUIPMENT -----

A PDP-8E COMPUTER EQUIPPED WITH AT LEAST 8K OF CORE MEMORY.

2.2 STORAGE -----

THE PROGRAM OCCUPIES CORE LOCATIONS 0000 TO 7577 IN THE PRESENT FIELD.

2.3 PRELIMINARY PROGRAMS -----

THE BINARY LOADER MUST BE IN MEMORY. ALSO, ALL DIAGNOSTICS
FOR A BASIC 4K PDP-8E MUST HAVE BEEN PREVIOUSLY RUN
SUCCESSFULLY.

3. LOADING PROCEDURE -----

LOAD THE PROGRAM WITH THE BINARY LOADER (BIN). THE PROGRAM
MAY BE LOADED INTO ANY FIELD.

4. OPERATING PROCEDURE -----

TO START THE PROGRAM:

- A. SET THE SR TO IF AND OF OF THE FIELD THAT CONTAINS
THE PROGRAM.

- B. PRESS KEY EXT0 ADDR LOAD.
- C. SET THE SR EQUAL TO 0200.
- D. PRESS KEYS ADDR LOAD, CLEAR, AND CONT. A SETUP SR MESSAGE WILL BE PRINTED.
- E. SET THE SR FOR DESIRED OPERATION ACCORDING TO THE FOLLOWING TABLE.

SWITCH	0 (DOWN)	1 (UP)
SR00	CONTINUE AFTER ERROR	HALT AFTER ERROR
SR01	TIMEOUT ERRORS	INHIBIT ERROR TYPEOUTS
SR02	NORMAL	TTY BELL ON ERROR
SR03	RELOCATE PROGRAM	INHIBIT PROGRAM RELOCATION
SR04	NORMAL	CHANGE FIELD LIMITS
SR05	NORMAL	HALT AFTER CURRENT TEST
SR06-08	STARTING FIELD LIMIT (0-7)	
SR09-11	ENDING FIELD LIMIT (0-7)	

F. PRESS KEY CONT.

4.1
DETAILED SR EXPLANATION

- SR00-02 SR02, IF SET, WILL RING THE TTY BELL ONCE FOR EACH ERROR. SR00 AND SR01 HAVE NO EFFECT WITH SR02 SET.
- SR03 SR03 MAY BE SET OR RESET AT ANY TIME AND THE PROGRAM WILL ACT ACCORDINGLY.
- SR04 SR04 ALLOWS THE OPERATOR TO CHANGE THE FIELD LIMITS AS DEFINED BY SR06-11.
- SR05 SR05 IS NORMAL HALT FOR PROGRAM.
- SR06-08 THESE SWITCHES DEFINE THE STARTING FIELD LIMIT (NORMALLY 0).
- SR09-11 THESE SWITCHES DEFINE THE ENDING FIELD LIMIT (NORMALLY 7).

4.2
EXAMPLE OF SELECTING FIELDS FOR TEST

- EXAMPLE 1: SR = 0007, 28K SYSTEM
FIELDS SELECTED FOR TESTING ARE 6, 5, 4, 3, 2, 1, 0.
- EXAMPLE 2: SR = 0004, 28K SYSTEM
FIELDS SELECTED FOR TESTING ARE 4, 3, 2, 1, 0.
- EXAMPLE 3: SR = 0022, 28K SYSTEM
FIELDS SELECTED FOR TESTING ARE 2 (NO RELOCATION WILL OCCUR).
- EXAMPLE 4: SR = 0041, 28K SYSTEM
FIELDS SELECTED FOR TESTING ARE 6, 5, 4, 1, 0.

NOTE 1: FIELDS NOT IN THE SYSTEM ARE AUTOMATICALLY DESELECTED AS IN EXAMPLE 1. FIELD 7 IS NOT PRESENT, THEREFORE, NOT SELECTED.

NOTE 2: DO NOT SELECT A FIELD THAT CONTAINS A ROM.

NOTE 3: A SINGLE FIELD CAN BE SELECTED FOR TESTING PROVIDING THE PROGRAM IS NOT IN THAT FIELD AS IN EXAMPLE 3.

NOTE 4: ANY FIELD OR GROUP OF FIELDS CAN BE BY-PASSED AS IN EXAMPLE 4. FIELDS 2 AND 3 ARE NOT SELECTED, FIELD 7 IS NOT PRESENT.

5.

ERRORS

A TEST ERROR WILL OCCUR ANYTIME THE DATA WRITTEN DOES NOT MATCH THE DATA READ. A RELOCATION ERROR WILL OCCUR IF THE RELOCATION COMPARISON CHECK FAILS.

5.1

TEST ERROR TYPEOUTS

FOR THE FIRST ERROR ENCOUNTERED A HEADER WILL BE TYPED OUT FOLLOWED BY THE PERTINENT DATA. FOR ALL SUBSEQUENT ERRORS, ONLY THE PERTINENT DATA WILL BE TYPED. THE FORMAT IS AS FOLLOWS:

PR.LOC.. FAIL. ADR..GOOD..BAD..PATTERN

PR LOC = THE PROGRAM ADDRESS WHERE THE ERROR JMS OCCURRED.
(INCLUDES FIELD).

FAIL ADR = THE ADDRESS OF THE LOCATION IN ERROR.
(INCLUDES FIELD).

GOOD = THE DATA THAT WAS WRITTEN.

BAD = THE DATA THAT WAS READ.

PATTERN= THE PRESENT TEST PATTERN AND THE NUMBER OF TIMES IT WAS COMPLEMENTED.
NC (NOT COMPLEMENTED).
1C (ONE COMPLEMENT).
2C (TWO COMPLEMENTS).

5.2

RELOCATION ERROR TYPEOUTS

ALL RELOCATION ERRORS ARE IN THE FOLLOWING FORMAT:

XXXXX RELOCATION ERROR AT LOCATION YYYY

XXXXX = THE PROGRAM ADDRESS WHERE THE ERROR JMS OCCURRED.
(INCLUDES FIELD).

YYYYY = THE ADDRESS OF THE LOCATION IN ERROR.
(INCLUDES FIELD).

NOTE: AFTER EACH ERROR PRINT-OUT THE PROGRAM CONTINUES ON WITH THE NEXT SEQUENTIAL MEMORY LOCATION.

PARITY ERROR TYPEOUTS

IF THE 8E SYSTEM CONTAINS A PARITY OPTION THE INTERRUPT WILL BE TURNED ON TO ALLOW PARITY ERRORS WHEN THE PROGRAM IS EXECUTING FROM FIELD 0. THE FOLLOWING 3 TYPEOUTS CAN OCCUR WITH A PARITY OPTION:

- A. PARITY ERROR, LOC 0=XXXX TSTAD=XXXX (PRESENT PATTERN)
- B. INTERRUPT FROM KEYBOARD
- C. UNWANTED INTERRUPT OCCURRED

6.

RESTRICTIONS

6.1

STARTING RESTRICTIONS

THE PROGRAM MAY BE RESTARTED AT ANY TIME FROM LOCATION 0200 OR 0202 OF THE FIELD THE PROGRAM IS PRESENTLY IN.

6.2

OPERATING RESTRICTIONS

THE PARITY ERROR TYPEOUT CAN NOT BE INHIBITED.

7.

EXECUTION TIME

THE TIME TO WRITE AND READ ALL SIX PATTERNS IN ONE FIELD IS APPROXIMATELY 6 SECONDS.

DURING PROGRAM EXECUTION A 5 WILL BE TYPED ON THE TTY APPROXIMATELY EVERY 5 MINUTES OF PROGRAM RUN TIME. THIS ALLOWS THE OPERATOR TO DETERMINE APPROXIMATE RUN TIME BEFORE A FAILURE OCCURRED.

8.

SCOPE LOOPS

8.1

SCOPE LOOP 1

THIS SCOPE LOOP DOES A READ, COMPLEMENT, WRITE ON THE ADDRESS SPECIFIED BY THE SR. THE ADDRESS BEING LOOPED ON CAN BE CHANGED SIMPLY BY CHANGING THE SWITCH SETTING. THE PREVIOUS ADDRESS WILL BE LEFT WITH ITS ORIGINAL CONTENT.

- A. SET THE SR TO THE INSTRUCTION FIELD THAT THE PROGRAM IS IN AND THE DATA FIELD WANTED TO TEST.
- B. PRESS KEY EXT0 ADDR LOAD.

- C. SET THE SR EQUAL TO 6200.

- D. PRESS KEY ADDR LOAD.

- E. S THE SR EQUAL TO THE ADDRESS TO ST.

F. PRESS KEYS CLEAR, AND CONT.

8.2

SCOPE LOOP 2

THIS SCOPE LOOP DOES A READ, COMPLEMENT, WRITE ON THE TWO ADDRESSES INPUT VIA THE SR. TO CHANGE THE ADDRESSES, THE LOOP MUST BE RESTARTED.

- A. SET THE SR TO THE INSTRUCTION FIELD THAT THE PROGRAM IS IN THE DATA FIELD WANTED TO TEST.
- B. PRESS KEY EXT0 ADDR LOAD.
- C. SET THE SR EQUAL TO 6400.
- D. PRESS KEYS ADDR LOAD, CLEAR, AND CONT.
- E. FOLLOW DIRECTIONS THAT ARE TYPED OUT.

8.3

SCOPE LOOP 3

THIS SCOPE LOOP DOES A READ, COMPLEMENT, WRITE ON THE GROUP OF ADDRESSES INPUT VIA THE SR. THE STARTING ADDRESS SPECIFIED MUST BE LESS THAN THE ENDING ADDRESS SPECIFIED.

- A. SET THE SR TO THE INSTRUCTION FIELD THAT THE PROGRAM IS IN AND THE DATA FIELD WANTED TO TEST.
- B. PRESS KEY EXT0 ADDR LOAD.
- C. SET THE SR EQUAL TO 6600.
- D. PRESS KEYS ADDR LOAD, CLEAR, AND CONT.
- E. FOLLOW DIRECTIONS THAT ARE TYPED OUT.

8.4

SCOPE LOOP 4

THIS SCOPE LOOP DOES A READ, COMPLEMENT, WRITE ON THE ADDRESS INPUT VIA THE SR USING THE DATA SPECIFIED BY THE SR. THE DATA CAN BE CHANGED SIMPLY BY CHANGING THE SWITCH SETTING.

- A. SET THE SR TO THE INSTRUCTION FIELD THAT THE PROGRAM IS IN AND THE DATA FIELD WANTED TO TEST.
- B. PRESS KEY EXT0 ADDR LOAD.
- C. SET THE SR EQUAL TO 7000.
- D. PRESS KEYS ADDR LOAD, CLEAR, AND CONT.
- E. A MESSAGE WILL BE TYPED OUT TO SET THE SR TO THE SELECTED ADDRESS.
- F. SET SR TO THE SELECTED ADDRESS AND DEPRESS CONT.

G. SET SR TO SELECTED DATA (SCOPE LOOP IS CYCLING).

8.5

SCOPE LOOP 5

THIS SCOPE LOOP DOES A READ, COMPLEMENT, WRITE ON THE GROUP OF ADDRESSES INPUT VIA THE SR USING THE DATA SPECIFIED BY THE SR. THE STARTING ADDRESS SPECIFIED MUST BE LESS THAN THE ENDING ADDRESS SPECIFIED.

- A. SET THE SR TO THE INSTRUCTION FIELD THAT THE PROGRAM IS IN AND THE DATA FIELD WANTED TO TEST.
- B. PRESS KEY EXT0 ADDR LOAD.
- C. SET THE SR EQUAL TO 6700.
- D. PRESS KEYS ADDR LOAD, CLEAR, AND CONT.
- E. FOLLOW THE TYPED OUT MESSAGE THAT INPUTS THE ADDRESS SELECTIONS.
- F. SET SR TO SELECTED DATA (SCOPE LOOP IS CYCLING).

NOTE 1: THE ADDRESS(S) SPECIFIED WILL BE LOOPED UNTIL STOPPED BY THE OPERATOR WITH KEY HALT. NO ERROR CHECKING IS DONE. TO RESUME NORMAL OPERATION, RESTART PROGRAM AT ADDRESS 0200 OR 0202 OF THE CURRENT INSTRUCTION FIELD.

9.

PROGRAM DESCRIPTION

9.1

TEST PATTERNS

THE FOLLOWING TEST PATTERNS ARE EMPLOYED BY THE PROGRAM:

- A. BASIC ALL 0'S PATTERN.
- B. BASIC ALL 1'S PATTERN.
- C. 0000-7777 WORST CASE CHECKERBOARD PATTERN.
- D. 7777-0000 WORST CASE CHECKERBOARD PATTERN.
- E. 2525-5252 WORST CASE CHECKERBOARD PATTERN.
- F. 5252-2525 WORST CASE CHECKERBOARD PATTERN.

9.2

PROGRAM RELOCATION

PROGRAM RELOCATION IS GOVERNED BY THE STATUS OF SR BIT 3 OR BY THE FACT THAT ONLY ONE FIELD IS SELECTED FOR TESTING. WITH SR BIT 3 DOWN (0 POSITION) PROGRAM RELOCATION OCCURS EACH TIME THE TEST PATTERN AND ITS COMPLEMENT HAVE BEEN COMPLETELY TESTED IN EACH SELECTED FIELD. THE PROGRAM FIRST RELOCATES TO THE HIGHEST ORDER 4K FIELD UNDER TEST. THE PROGRAM KEEPS RELOCATING TO THE NEXT LOWER FIELD UNDER TEST UNTIL IT REACHES THE LOWEST ORDER FIELD UNDER TEST. THE

THE PROGRAM PROVIDES A DEGREE OF PROTECTION FOR ITSELF BY REMEMBERING ALL FIELDS WHERE ERRORS OCCUR. WHEN A FAULTY FIELD IS NEXT IN SEQUENCE TO CONTAIN THE PROGRAM, THE PROGRAM WILL SKIP THE FAULTY FIELD AND RELOCATE TO THE FIRST LOWER ORDER FIELD WHICH IS ERROR FREE. IF ALL OTHER SELECTED FIELDS ARE FAULTY, PROGRAM RELOCATION WILL NOT TAKE PLACE.

DURING RELOCATION A COMPARISON CHECK IS MADE TO INSURE NO PROGRAM LOSS.

9.3

TEST PROCEDURE

- A. WRITE THE PATTERN IN ALL SELECTED FIELDS (EACH LOCATION IS THEN TREATED AS FOLLOWS):
 - B. READ-WRITE THE LOCATION 11 TIMES.
 - C. READ-WRITE-TEST THE LOCATION (NC).
 - D. READ-WRITE THE LOCATION 11 TIMES.
 - E. READ-COMPLEMENT-WRITE THE LOCATION.
 - F. READ-WRITE THE LOCATION 11 TIMES.
 - G. READ-WRITE-TEST THE LOCATION (1C).
 - H. READ-WRITE THE LOCATION 11 TIMES.
 - I. READ-COMPLEMENT-WRITE THE LOCATION.
 - J. READ-WRITE THE LOCATION 11 TIMES.
 - K. READ-WRITE-TEST THE LOCATION (2C).
 - L. GO ON TO NEXT LOCATION REPEATING B-K.
 - M. GO ON TO NEXT PATTERN REPEATING A-L WHEN ALL LOCATIONS OF ALL SELECTED FIELDS ARE COMPLETED.

FOR FURTHER UNDERSTANDING OF HOW THE TEST IS PERFORMED, REFER TO THE LISTING.

THE WORST CASE CHECKERBOARD PATTERN CONSISTS OF ALTERNATING 4 MEMORY CORES CONTAINING 0000 AND 4 MEMORY CORES CONTAINING 1111 ON A MEMORY PLANE. THIS PATTERN IS REVERSED EVERY 400 OCTAL LOCATIONS. (THIS TEST PATTERN IS GENERATED ACCORDING TO THE STRINGING OF THE STACK AND THE WIRING OF THE MEMORY SYSTEM. IT IS THE SAME PATTERN FOR ALL 8E STACKS).

--

Y LINES (MA6L THRU MA11L)

ADDRESS BIT 3 HIGH	ADDRESS BIT 9 HIGH		ADDRESS BIT 9 LOW		
	00	01	02	03	
00	1	1	1	1	04 05 06 07 10 11 --> 76 77
01	1	1	1	1	0 0 0 0 1 1 0 0
02	1	1	1	1	0 0 0 0 1 1 0 0
03	1	1	1	1	0 0 0 0 1 1 0 0

04	0	0	0	0	1 1 1 1
05	0	0	0	0	1 1 1 1
06	0	0	0	0	1 1 1 1
07	0	0	0	0	1 1 1 1

ADDRESS BIT 3 LOW	04	05	06	07	10 11 1 1

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[illegible]

76	0	0	0	0	0
77	0	0	0	0	0

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-----
176 0 0 0 0
177 0 0 0 0
EMA2L USED IF AN 8K MEMORY

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THE ABOVE REPRESENTS ONE MEMORY PLANE.

10. CONSOLE PACKAGE ADDENDUM -----

10.1. DESCRIPTION -----

THE CONSOLE PACKAGE HAS BEEN ADDED TO THIS DIAGNOSTIC TO ALLOW THE PROGRAM TO RUN WITH NO HARDWARE SWITCH REGISTER AND TO HAVE COMMUNICATIONS WITH THE DIAGNOSTIC VIA A TERMINAL. THE DIAGNOSTIC CAN BE RUN IN TWO MODES WITH THE CONSOLE PACKAGE. 1) RUNNING WITH THE CONSOLE PACKAGE ACTIVE - THIS ALLOWS THE OPERATOR CONTROL OF THE DIAGNOSTIC THROUGH THE TERMINAL. THE DIAGNOSTIC WILL ASK FOR THE VALUE OF THE PSEUDO SWITCH REGISTER, BEFORE CONTINUING WITH EXECUTION OF THE DIAGNOSTIC. ALL ERRORS AND PASS COMPLETES WILL BE PRINTED AT THE TERMINAL. NO HALTS WILL BE EXECUTED.

2) CONSOLE PACKAGE NOT ACTIVE-THIS WILL RESULT IN THE NORMAL STANDALONE OPERATION OF THE PROGRAM AS DESCRIBED IN SECTIONS 1 THROUGH 9 OF THIS DOCUMENT.

10.2 RESTRICTIONS -----

- 1) WHEN RUNNING THE CONSOLE PACKAGE SOME SUBTESTS MAY NOT BE EXECUTED.
- 2) RUNNING THE CONSOLE PACKAGE REQUIRES THAT THE PSEUDO SWITCH REGISTER BE USED.
- 3) ONCE RUNNING THE CONSOLE PACKAGE NONACTIVE AND NOW DESIRE TO RUN IT ACTIVE. ONE MUST RELOAD THE DIAGNOSTIC AND INITILIZE FOR A ACTIVE CONSOLE PACKAGE.

10.3 INITIALIZATION -----

FOR A ACTIVE CONSOLE PACKAGE

- 1.) SET LOCATION 21 BIT0=0 TO INDICATE USE PSEUDO SWITCH REGISTER.
- 2.) SET LOCATION 22 BIT3=1 TO INDICATE CONSOLE PACKAGE ACTIVE.

FOR A NON ACTIVE CONSOLE PACKAGE

- 1.) SET LOCATION 21 BIT0=1 TO INDICATE NOT TO USE PSEUDO SWITCH REGISTER, BUT TO USE HARDWARE SWITCHES.
- 2.) SET LOCATION 22 BIT3=0 TO INDICATE CONSOLE PACKAGE NOT ACTIVE.

10.4

CONTROL CHARACTERS

CONTROL CHARACTERS ARE USED TO GIVE THE OPERATOR THE ABILITY TO PERFORM THE FOLLOWING FUNCTIONS.
NOTE: THE PROGRAM WILL RESPOND TO THE CONTROL CHARACTER IN FIVE (5) SECONDS OR LESS.

CONTROL C

THIS RESTORES THE LOADER (PGS 37 OF FLD 0 & 1) AND STARTS IT AT LOC 7600 OF FLD 0.

CONTROL R

THIS WILL RESTART THE PROGRAM AND REASK THE SWITCH REGISTER QUESTION AS DESCRIBED IN SECTION 10.6.

CONTROL E

THIS WILL CONTINUE THE PROGRAM FROM AN ERROR IF ALLOWED BY THE DIAGNOSTIC OR FROM A WAITING STATEMENT.

CONTROL L

THIS WILL SWITCH THE TERMINAL MESSAGES FROM THE DISPLAY TO A LINE PRINTER.
TO RESTORE THE MESSAGES ON THE TERMINAL CONTROL L MUST BE TYPED AGAIN. IF NO PRINTER IS AVAILABLE AND CONTROL L IS TYPED THE RESULT WILL BE THAT THE CONSOLE PACKAGE WILL WAIT FOR CONTROL C OR R. THE CONTROL L WILL OUTPUT TO THE LINE PRINTER AND THE PROGRAM WILL ATTEMPT TO CONTINUE AS IF A CONTROL E WAS TYPED IN.

CONTROL D

THIS WILL ALLOW THE ABILITY TO CHANGE THE SWITCH REGISTER DURING PROGRAM OPERATION. TYPING THIS CHARACTER WILL RESULT IN AN INTERIGATION OF THE SWITCH REGISTER QUESTION AS DESCRIBED IN SECTION 10.6.

CONTROL S

THIS WILL STOP PROGRAM EXECUTION AND WAIT IN A LOOP FOR A CONTINUE. THE ONLY WAY TO CONTINUE WILL BE TO TYPE A CONTROL Q, R OR C. THIS IS A NONPRINTING CHARACTER.

CONTROL Q

THIS IS TO CONTINUE A PROGRAM AFTER A CONTROL S IS TYPED. THIS IS A NONPRINTING CHARACTER.

WAITING MESSAGE

THE WAITING MESSAGE IS USED TO ALLOW THE OPERATOR TIME TO MAKE A DECISION AS TO WHAT CONTROL CHARACTER TO TYPE. THIS MESSAGE MAY APPEAR AT THE END OF PASS MESSAGE IF THE HALT ON PASS BIT IS SET. THE CONTROL CHARACTERS MAY NOW BE USED TO PERFORM THE NEEDED FUNCTION.

THE WAITING MESSAGE MAY BE PRINTED AFTER A ERROR MESSAGE IF THE HALT ON ERROR BIT IS SET. HERE AGAIN THE CONTROL CHARACTERS MAY BE USED.
THE WAITING MESSAGE MAY BE PRINTED IF OPERATOR INTERVENTION IS REQUIRED.

SWITCH REGISTER MESSAGE

THIS MESSAGE IS USED TO SETUP THE PSEUDO SWITCH REGISTER BEFORE PROGRAM EXECUTION TAKES PLACE. THE SWITCH REGISTER IS SETUP WHEN THE FOURTH CHARACTER IS ENTERED OR A CARRIAGE RETURN IS TYPED

SR=0000 4000

UNDER SCORING INDICATES OPERATOR RESPONSE

END OF PASS

AN INDICATION WILL BE GIVEN WHEN THE DIAGNOSTIC HAS MADE A SUCCESSFULL PASS. THE PRINT OUT WILL INDICATE THE DIAGNOSTIC MAINDEC NUMBER THE WORD PASS AND A FOUR DIGIT PASS NUMBER. A PASS WILL BE A TIME PERIOD RATHER THAN A PROGRAM PASS OF THE DIAGNOSTIC. THE TIME PERIOD WILL BE IN THE RANGE OF ONE (1) TO FIVE (5) MINUTES. IF THE DIAGNOSTIC MAKES A PROGRAM PASS IN THE 1 TO 5 MINUTE RANGE THEN THE PASS COUNT WILL BE THE SAME AS THE NUMBER OF PROGRAM PASSES. IF THE PROGRAM MAKES A PROGRAM PASS IN LESS THEN ONE MINUTE THEN THE PASS COUNT WILL NOT BE THE SAME AS THE PASS COUNTER THE PASS COUNTER WILL REFLECT MORE THEN ON PROGRAM PASS.

IF HALT AT END OF PASS IS SET THEN THE PASS MESSAGE WILL BE
 PRINTED AND A WAITING STATEMENT WILL ALSO BE PRINTED.
 A CONTROL CHARACTER IS NEEDED TO CONTINUE FROM THIS MESSAGE.
 THE FORMAT OF THE END OF PASS MESSAGE IS

NAME PASS 0001

10.8

ERRORS

THE STANDARD ERROR REPORTS AS DESCRIBED IN SECTION 6
 OF THIS DOCUMENT WILL BE USED.

10.9

SWITCH REGISTER SETTINGS

THE STANDARD SWITCH SETTINGS AS DESCRIBED IN SECTION 5
 OF THIS DOCUMENT WILL BE USED.

10.10

PARAMETER CONTROL WORDS

THE CONSOLE PACKAGE USES THE LOCATIONS 20 21 22 FOR THE
 FOLLOWING PURPOSES.

LOCATION 20
 PSEUDO SWITCH REGISTER

LOCATION 21
 HARDWARE IDENTIFIER 1

LOCATION 22
 HARDWARE IDENTIFIER 2

LOCATION 0021

BIT	OCTAL VALUE	FUNCTION WHEN 0	FUNCTION WHEN 1
---	-----	-----	-----
0	4000	USE PSEUDO SWITCHES	USE HARDWARE SWITCHES
1	2000	NO OPTION 1	HAS OPTION 1
2	1000	NO OPTION 2	HAS OPTION 2
3	400	NO 8A SIMULATOR	HAS 8A SIMULATOR
4	200	NO OPTION SIMULATOR	HAS OPTION SIMULATOR
5	100	NOT ON 8A XOR	ON 8A XOR
6	40	NOT PDP8-E TYPE CPU	PDP8-E TYPE CPU

7-11 8A MEMORY SIZE EX, 1K=00
2K=01
7K=06
32K=31

LOCATION 0022

BIT	OCTAL VALUE	FUNCTION WHEN 0	FUNCTION WHEN 1
---	-----	-----	-----
0	4000	NOT ON ACT8A LINE	ON ACT 8A LINE
1	2000	NOT ON ACT 8E LINE	ON ACT 8E LINE
2	1000	NOT YET DEFINED	
3	400	DEACTIVE CONSOLE PACKAGE	ACTIVE CONSOLE PACKAGE

0.11 LOCATION CHANGES

THE FOLLOWING LOCATIONS CAN BE CHANGED TO MEET THE SPECIFIC NEED FOR MODIFICATION OF THE DIAGNOSTIC.

5040 IS THE LOCATION FOR THE VALUE OF THE
NUMBER OF PROGRAM PASSES NEED TO
PRINT THE END OF PASS MESSAGE.

5637 IS THE LOCATION SET FOR THE NUMBER OF
FILLER CHARACTERS AFTER A CRLF SET TO FOUR (4)

1.0. NON CONSOLE TERMINAL SYSTEM ADDENDUM

1.1. DESCRIPTION

THE PROGRAM HAS BEEN MODIFIED TO RUN WITHOUT A CONSOLE TERMINAL

BY MEANS OF A SPECIAL STARTING ADDRESS AND OPERATING PROCEDURES. THIS ALLOWS THE DIAGNOSTIC TO BE RUN ON THOSE SYSTEMS WITHOUT A CONSOLE TERMINAL. ALL ERRORS AND FIELD LIMIT CHANGES WILL RESULT IN A HALT OR HALTS INSTEAD OF TYPEOUTS ON THE CONSOLE TERMINAL.

1.2. RESTRICTIONS

1. IF THE CONSOLE PACKAGE WAS ENABLED, THE PROGRAM WILL DISABLE IT AT THE START OF THE PROGRAM.
2. FIELD LIMITS MUST BE SET AT PROGRAM START, OTHERWISE, THE PROGRAM WILL HALT TO ALLOW THE OPERATOR TO SET THE FIELD LIMITS IN THE SWITCH REGISTER.
3. TO RUN THIS PROGRAM, A MINIMUM OF 8K OF MEMORY IS REQUIRED.
4. MEMORIES TO BE TESTED MUST BE IN SEQUENTIAL ORDER STARTING AT FIELD 0.

1.3 INITIALIZATION

THE PROGRAM WHEN LOADED IS INITIALIZED TO USE THE HARDWARE SWITCH REGISTER. IF NO HARDWARE SWITCH REGISTER IS AVAILABLE, DO THE FOLLOWING TO DISABLE THE SWITCH REGISTER SELECTION FROM HARDWARE TO A SOFTWARE PSEUDO SWITCH REGISTER (LOCATION 0020).

1. SET BIT 0 EQUAL TO A 0 IN LOCATION 21 TO INDICATE TO THE PROGRAM THAT LOCATION 20 WILL BE USED AS THE PSEUDO SWITCH REGISTER. THE PROGRAM WHEN STARTED WILL THEN SET THE PSEUDO SWITCH REGISTER TO FIELD LIMITS FOR A NORMAL SYSTEM STARTUP. PSEUDO SWITCH REGISTER WILL EQUAL XX07 WHERE XX EQUALS SWITCH REGISTER BITS, PREVIOUSLY SET, 0 EQUALS STARTING FIELD LIMIT AND 7 EQUALS ENDING FIELD LIMITS.

IF IT IS DESIRED TO INITIALIZE THE FIELD LIMITS TO OTHER THAN THE ABOVE DO THE NEXT STEP.

2. SET LOCATION 0021 TO 00XX WHERE XX IS THE MEMORY SIZE. XX=07=8K; XX=13=12K; XX=17=16K; XX=37=32K. THE PROGRAM WHEN STARTED WILL THEN ADJUST THE PSEUDO SWITCH REGISTER TO THE APPROPRIATE FIELD LIMITS SELECTED.

1.4 OPERATING PROCEDURES

TO START THE PROGRAM:

- A. SET THE IF AND OF TO THE FIELD THAT CONTAINS THE PROGRAM
- B. LOAD ADDRESS TO 0201
- C. IF THE HARDWARE SWITCH REGISTER IS USED, SET THE SWITCH REGISTER TO 0007.
- D. PRESS "INIT" AND THEN "RUN".
- E. IF PROGRAM WILL NOW RUN UNTILL AN ERROR IS ENCOUNTERED OR A S)H REGISTER OPTION IS SELECTED) CAUSE THE PROGRA

H. REFER TO LISTING FOR ALL HAL

- F. SETTING THE SWITCH REGISTER TO 0100, WILL CAUSE THE PROGRAM TO HALT AFTER THE CURRENT TEST-REFER TO LISTING FOR HALT.
- G. SETTING THE SWITCH REGISTER TO 0200 WILL CAUSE THE PROGRAM TO HALT FOR FIELD LIMIT CHANGES VIA THE SWITCH REGISTER. REFER TO LISTING FOR ADDRESS OF THE HALT.

11.5 SWITCH REGISTER SETTINGS -----

SR0=1 HALT AFTER ERROR
SR1=1 INHIBIT ERROR HALTS EXCEPT HALT AFTER ERROR SWITCH
SR2=1 INHIBIT OPERATION OF SR0 AND SR1
SR3=1 INHIBIT PROGRAM RELOCATION
SR4=1 HALT PROGRAM FOR FIELD LIMIT CHANGES VIA SR 6-11.
SR5=1 HALT AFTER CURRENT TEST
SR6=8 STARTING FIELD LIMIT (0-7)-NORMALLY=0
SR9=11 ENDING FIELD LIMIT (0-7)-NORMALLY=7

11.6 ERRORS -----

ALL ERRORS ENCOUNTERED WILL RESULT IN A ERROR HALT WITH ERROR INFORMATION IN THE AC. REFER TO THE LISTING FOR THE TYPE OF ERROR HALT AND GO TO THE APPROPRIATE PARAGRAPH BELOW.

A TEST ERROR WILL OCCUR ANYTIME THE DATA WRITTEN DOES NOT MATCH THE DATA READ. A RELOCATION ERROR WILL OCCUR IF THE RELOCATION COMPARISON CHECK FAILS.

11.7 TEST ERROR HALTS -----

FOR ERRORS ENCOUNTERED TESTING MEMORIES, THE PROGRAM WILL HALT WITH PERTINENT INFORMATION IN THE AC. REFER TO THE STEPS BELOW FOR THE TEST ERROR INFORMATION

- A. THE PROGRAM WILL HALT AT ADDRESS 3112 WITH THE CONTENTS OF AC BITS 9,10 AND 11 EQUAL TO THE PROGRAM FIELD.
- B. PRESS "CONT". THE PROGRAM WILL HALT AT 3115 WITH THE AC EQUAL TO THE PROGRAM ADDRESS OF THE ERROR JMS.
- C. PRESS "CONT". THE PROGRAM WILL HALT AT 3121 WITH THE CONTENTS OF AC BITS 9,10 AND 11 EQUAL TO THE FIELD BEING TESTED.
- D. PRESS "CONT". THE PROGRAM WILL HALT AT 3124 WITH THE AC EQUAL TO THE FAILING ADDRESS IN THE FIELD BEING TESTED.
- E. PRESS "CONT". THE PROGRAM WILL HALT AT 3127 WITH THE AC EQUAL TO THE EXPECTED DATA THAT WAS PUT INTO THE FAILING ADDRESS.
- F. PRESS "CONT". THE PROGRAM WILL HALT AT 3132 WITH THE AC EQUAL TO THE ACTUAL DATA THAT WAS READ FROM THE FAILING ADDRESS.
- G. PRESS "CONT". THE PROGRAM WILL HALT AT ADDRESS 3136

WITH THE PATTERN NUMBER IN THE AC. THE PATTERN NUMBER
CORRESPONDS TO THE PATTERNS BELOW.

- AC=0 - NO TEST PATTERN
- AC=1 - BASIC ALL 0'S PATTERN
- AC=2 - BASIC ALL 1'S PATTERN
- AC=3 - 0000-7777 WCP PATTERN
- AC=4 - 7777-0000 WCP PATTERN
- AC=5 - 2525-5252 WCP PATTERN
- AC=6 - 5252-2525 WCP PATTERN

H. PRESS "CONT" TO CONTINUE THE PROGRAM ON TO THE NEXT
SEQUENTIAL TEST MEMORY ADDRESS.

I. ERROR HALTS MAY BE INHIBITED BY SETTING SRI TO A 1

11.8
RELOCATION ERROR HALTS

ALL RELOCATION ERRORS WILL RESULT IN A HALT WITH
PERTINENT INFORMATION IN THE AC. REFER TO THE STEPS
BELOW FOR THE ERROR INFORMATION.

- A. THE PROGRAM WILL HALT AT ADDRESS 2732 WITH THE CONTENTS
OF AC BITS 9,10 AND 11 EQUAL TO THE PROGRAM FIELD.
- B. PRESS "CONT". THE PROGRAM WILL HALT AT ADDRESS 2735 WITH
THE CONTENTS OF THE AC EQUAL TO THE PROGRAM LOCATION
OF THE ERROR JMS.
- C. PRESS "CONT". THE PROGRAM WILL HALT AT ADDRESS 2741 WITH
THE CONTENTS OF AC BITS 9,10, AND 11 EQUAL TO THE
FIELD THAT PROGRAM TRIED TO PUT THE INSTRUCTION INTO.
- D. PRESS "CONT". THE PROGRAM WILL HALT AT ADDRESS 2744 WITH
THE CONTENTS OF AC EQUAL TO THE LOCATION IN THE FAILING
FIELD IN ERROR.
- E. PRESSING "CONTINUE" AGAIN WILL RESULT IN THE PROGRAM CONTINUING
WITH THE NEXT SEQUENTIAL MEMORY LOCATION.

11.9
PARITY ERROR HALTS

IF THE SYSTEM CONTAINS A PARITY OPTION, THE INTERRUPT WILL BE
TURNED ON TO ALLOW PARITY ERRORS WHEN THE PROGRAM IS EXECUTING
FROM FIELD 0. THERE ARE 3 TYPES OF FAILURES UNDER THIS ERROR,
REFER TO THE APPROPRIATE PARAGRAPH BELOW FOR THE FAILING ADDRESS.

11.9.1
PARITY ERROR

- A. THE PROGRAM WILL HALT AT ADDRESS 3355 WITH THE CONTENTS
OF THE AC EQUAL TO THE INTERRUPTED PC.
- B. PRESS "CONT". THE PROGRAM WILL HALT AT ADDRESS 3361 WITH
THE CONTENTS OF THE AC EQUAL TO THE DATA FIELD AT THE
TIME OF THE PARITY ERROR.
- C. PRESS "CONT". THE PROGRAM WILL HALT AT ADDRESS 3364 WITH

THE CONTENTS OF THE AC EQUAL TO THE ADDRESS IN THE TEST
FIELD BEING TESTED.

D. PRESS "CONT". THE PROGRAM WILL HALT AT ADDRESS 3136 WITH
THE CONTENTS OF THE AC EQUAL TO THE PATTERN NUMBER. REFER
TO STEP G FOR PATTERN BEING EXECUTED IN SECTION 11.7.

E. PRESS "CONT". THE PROGRAM WILL CONTINUE UNTIL ANOTHER
ERROR IS ENCOUNTERED OR THE PROGRAM IS STOPPED.

11.9.2 INTERRUPT FROM KEYBOARD -----

THE PROGRAM WILL HALT AT ADDRESS 3404. THIS SIGNIFIES THAT
THE PROGRAM DETECTED A PARITY OPTION AND TURNED THE
INTERRUPT ON. UPON TURNING THE INTERRUPT ON, A INTERRUPT
WAS RECEIVED FROM THE CONSOLE TERMINAL. TO RECOVER FROM
THIS ERROR PRESS CONTINUE.

11.9.3 UNWANTED INTERRUPT OCCURRED -----

THE PROGRAM WILL HALT AT ADDRESS 3425 FOR THIS ERROR. THIS
ERROR SIGNIFIES THAT A INTERRUPT OCCURED FROM SOME
OTHER DEVICE THAN THE PARITY OPTION OR THE CONSOLE
KEYBOARD. PRESS "CONTINUE" TO RECOVER FROM THIS ERROR.

APT NOTES

ALL OF THE FOLLOWING NOTES APPLY ONLY WHEN THE PROGRAM IS BEING RUN ON AN APT SYSTEM.

1. FOR MORE INFORMATION SEE THE FOLLOWING DOCUMENTS.
 - A. STANDARD APT SYSTEM TO PDP8 DIAGNOSTIC INTERFACE.
 - B. APT SYSTEM MANAGERS GUIDE.
2. FOR ANY DIFFERENCES BETWEEN THESE NOTES AND THE REST OF THE DOCUMENT, THESE NOTES WILL PREVAIL. (SEE THE LISTING ALSO.)
3. ALL CODE THAT HAS BEEN ADDED (INSERTED) FOR APT WILL CONTAIN THE EXPRESSION: /APT/
 ANY ORIGINAL CODE NEGATED FOR APT HAS BEEN 'REMOVED' BY PRECEDING IT WITH THE EXPRESSION: /*APT*/
4. IF BIT 0 OF HCM1 IS A '1' THEN THE HARDWARE SWITCH REGISTER WILL BE USED, REGARDLESS OF LOAD METHOD (SCRIPT OR DUMP).

THE FOLLOWING NOTES APPLY ONLY WHEN THE LOAD METHOD WAS SCRIPT LOAD.

5. SWITCHES:
 SR3, SR6-8 & SR9-11 ARE USED AS DESCRIBED IN THE DOCUMENT.
 SR6-8 & SR9-11 MAY BE USED TO SPECIFY FIELD LIMITS INSTEAD OF HCM1. (WILL BE USED IF HCM1 BITS 7-11 = 0.)
 FIELD 7 CANNOT BE SPECIFIED.
6. ERRORS:
 ALL ERRORS CALL APT.

LISTING

/PDP-8E EXTENDED MEMORY DATA AND CHECKERBOARD TEST

/
/MAINDEC=08-DHKMA-C-L
//COPYRIGHT (C) 1972, 1975, 1976 DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS. 01754
/PROGRAMMER, VERNON FREY

/APT/ MODIFIED FOR APT APRIL 1975 D. MACOMBER

/
/SR00=1 HALT AFTER ERROR
/SR01=1 INHIBIT ERROR TYPEOUT
/SR02=1 BELL ON ERROR (USEFUL FOR MAINTENANCE)
/SR03=1 INHIBIT PROGRAM RELOCATION
/SR04=1 CHANGE FIELD LIMITS
/SR05=1 HALT AFTER CURRENT TEST
/SR06=08 STARTING FIELD (0-7)
/SR09=11 ENDING FIELD (0-7)
/

/PROGRAM STARTING ADDRESS

/0200

/

/MACRO

/

/DEFINE NPAGE

< JMP I (, +200\$7600>

/
/PDP-8E IOT COMMANDS & MICRO INSTRUCTIONS

6203	CDI=6203	/CHANGE TO DF & IF 0
6107	SPD=6107	/SKIP ON PARITY OPTION
6101	SMP=6101	/SKIP IF NO PARITY ERROR
6104	CMP=6104	/CLEAR PARITY ERROR FLAG
6004	GTF=6004	/GET INTERRUPT FLAGS
6005	RTF=6005	/RESTORE INTERRUPT FLAGS
7701	ACL=7701	/LOAD MQ INTO AC
7002	BSW=7002	/SWAP BYTES IN AC
7421	MQL=7421	/LOAD MQ FROM AC THEN CLR AC
7521	SWP=7521	/SWAP AC AND MQ
6000	SKDN=6000	/SKIP IF INTERRUPT ON, & TURN OFF
6007	CAF=6007	/CLEAR ALL FLAGS

0000	0000	*0			/INTERRUPT ADDRESS
0000	0303	"C			/SAVE AC
0001	3064	DCA	SAC		
0002	7701	ACL			
0003	3065	DCA	SMQ		/SAVE MQ
0004	5777	JMP	INTROU		

/PDP-8E EXTENDED MEMORY DATA AND CHECKERBOARD TEST

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SEQ 0021

0005	7416	IAPTSR, APTSR	/APT/
0006	7275	IAPTER, APTER	/APT/
0007	7434	IAPTOK, APTOK	/APT/

0020 *20

0020	0000	PSR, 0	/APT/
0021	4000	HCM1, 4000	/APT/
0022	0000	HCM2, 0	/APT/

/
/PAGE 0 CONSTANTS AND POINTERS

0023	4000	SR00, 4000	/HALT AFTER ERROR
0024	2000	SR01, 2000	/INHIBIT ERROR TYPEOUT
0025	1000	SR02, 1000	/BELL ON ERROR
0026	0400	SR03, 400	/INHIBIT PROGRAM RELOCATION
0027	0200	SR04, 200	/CHANGE FIELD LIMITS
0030	0100	SR05, 100	/HALT AFTER CURRENT TEST
0031	0070	SR06, 70	/STARTING FIELD (0-7)
0032	0007	SR09, 7	/ENDING FIELD (0-7)
0033	0000	CS, 0	/COMPLEMENT STATUS
			/0000=NC (NO COMPLEMENT)
			/BIT 1=1C (ONE COMPLEMENT)
			/BIT 2=2C (TWO COMPLEMENTS)
			/TEST STATUS
			/0000=NO TEST
			/BIT 0=ALL ZEROS TEST
			/BIT 1=ALL ONES TEST
			/BIT 2 = 0000-7777 WCP TEST
			/BIT 3 = 7777-0000 WCP TEST
			/BIT 4 = 2525-5252 WCP TEST
			/BIT 5 = 5252-2525 WCP TEST
			/FIELD STATUS
			/BITS 0-7 COINCIDE WITH FIELDS
			/0-7, FOR EACH FIELD NOT IN
			/THE SYSTEM THE EQUIVALENT BIT
			/IS SET.
			/RELOCATION STATUS
			/BITS 0-7 COINCIDE WITH FIELDS
			/0-7, FS IS XFERRED INTO RS.
			/EACH FIELD THAT FAILS SETS THE
			/EQUIVALENT BIT SO THAT PROGRAM
			/WILL NOT RELOCATE TO A FAILING FIELD.
			/0 = INHIBIT PROGRAM RELOCATION
0037	0000	CRELO, 0	/PROGRAM IN FIELD 00X0
0040	0000	PROFLD, 0	/TESTING FIELD 00X0
0041	0000	TSTFLO, 0	/MOVE ERROR COUNTER
0042	0000	COUNT, 0	/MOVE ADDRESS COUNTER
0043	0000	MOVE, 0	/7777 MEANS TYPEOUT ERROR HEADING
0044	0000	HEAD1, 0	/TEMP STORAGE LOCATION
0045	0000	TEMP, 0	/TEST ADDRESS COUNTER
0046	0000	TSTAD, 0	

```

0047 0000 FIVE, 0 /5 MINUTE COUNTER
0050 7510 MIN5, -270 /5 MINUTE CONSTANT
0051 0000 FCNT, 0 /COUNT # OF FIELDS PRESENT
0052 0000 STARTF, 0 /STARTING FIELD 00X0
0053 0000 ENDF, 0 /ENDING FIELD 00X0
0054 0000 INAME, 0 /PROGRAM IN SELECTED FIELD
0055 0000 LEGAL0, 0 /LEGAL FIELD SELECTION CONTROL
0056 0000 A, 0 /A REG TO WRITE/READ
0057 0000 B, 0 /B REG TO WRITE/READ
0060 0000 P2, 0 /CONTROLS 2 PAGES
0061 0000 W4, 0 /CONTROLS 4 WORDS
0062 0000 GDATA, 0 /GOOD DATA = DATA WRITTEN
0063 0000 BDATA, 0 /BAD DATA = DATA READ
0064 0000 SAC, 0 /SAVE AC (INT)
0065 0000 SMQ, 0 /SAVE MQ (INT)

/*C8*/A1, 0
/*C8*/A2, 0
/*C8*/A3, 0
/*C8*/A4, 0
/*C8*/A5, 0
/*C8*/A6, 0
/*C8*/A7, 0
/*C8*/A8, 0
/*C8*/A9, 0
/*C8*/A10, 0
/*C8*/A11, 0
/*C8*/A12, 0
/*C8*/A13, 0
/*C8*/A14, 0
/*C8*/A15, 0
/*C8*/A16, 0
/*C8*/A17, 0
/*C8*/A18, 0
/*C8*/A19, 0
/*C8*/A20, 0
/*C8*/A21, 0
/*C8*/A22, 0
/*C8*/A23, 0
/*C8*/A24, 0

0066 *66 /C8/PG 0 LOC5 66-103 ARE USED BY THE CONSOLE PKG (C8).
0104 *104 /C8/

0104 0000 NOTTY, 0 /PROGRAM FLAG FOR NO TELETYPE TO ABORT PRINTOUTS

4405 LAS=JMS I IAPTSR /APT/REDEFINE LAS.
0200 *200
C8STRT, /C8/RESTART ADDRESS FOR CONTROL R.

```

```

0200 5333 JMP START+1 /APT/200 = START ADDRESS.
0201 5332 JMP START /STARTING ADDRESS IF NO TTY AVAILABLE

0202 4232 JMS DFEIF /202 = RESTART ADDRESS
0203 7410 SKP

/APT/ IF UNDER APT CONTROL THE NEXT LOC WILL = NOP.
APTN00, /APT/

0204 4777* JMS TITLE /TYPEOUT PROG TITLE
0205 6002 PATA, IOF

/APT/ IF UNDER APT CONTROL THE NEXT LOC WILL = NOP.
APTN05, /APT/

0206 4776* JMS SETSW /SETUP SR
0207 3033 DCA CS
0210 3034 DCA TS
0211 3035 DCA FS
0212 3036 DCA RS
0213 7240 STA
0214 3037 DCA CRELO /CLEAR INH RELO
0215 3046 DCA TSTAD /CLEAR TEST ADDRESS COUNTER
0216 7240 STA
0217 3044 DCA HEAD1 /RESET ERROR HEADING
0220 1050 TAD MINS
0221 3047 DCA FIVE /SETUP 5 MINUTE COUNTER
0222 4775* JMS SETFS /SET FIELD STATUS & TYPE SELECTION
0223 4774* JMS LEGAL /CHECK FOR LEGAL FIELD SELECTION
0224 1037 TAD CRELO
0225 7650 SNA CLA
0226 5242 JMP PATM /NO RELOCATE & TEST ONLY 1 FIELD
0227 4773* JMS CSR03
0230 5304 JMP PATO /RELOCATION PROGRAM
0231 5262 JMP PATN /INHIBIT PROGRAM RELOCATION

/MAKE DF = IF
/
0232 0000 DFEIF, 0
0233 6002 IOF
0234 7300 CLA CLL
0235 6224 RIF
0236 1176 TAD 16201
0237 3240 DCA .+1
0240 6201 CDF 0
0241 5632 JMP I DFEIF

```

```

/NO PROGRAM RELOCATION AND TEST ONLY 1 FIELD
/

```

```
0242 6224  PATH,  RIF
0243 3040      DCA    PROFLO

/APT/  IF UNDER APT CONTROL THE NEXT LOC WILL = NOP.

APTN02,                                /APT/

0244 4772*  JMS     PNOREL             /TYPEOUT NO RELOCATION
0245 4771*  PATM0, JMS     TEST

/APT/  IF UNDER APT CONTROL THE NEXT LOC WILL = JMP APTJ50.

APTJ00,                                /APT/

0246 4405      LAS
0247 0030      AND    SR05             /HALT AFTER TEST
0250 7640      SZA CLA

0251 7410      SKP
0252 5255      JMP    .+3             /CB/
0253 4503      CBPAUS                 /CB/
0254 4501      CBINQU                 /CB/

/*CB*/  HLT
0255 4405      LAS
0256 0027      AND    SR04             /CHANGE FIELD LIMITS
0257 7640      SZA CLA
0260 5205      JMP    PATA             /YES

APTJ50,                                /APT/

0261 5245      JMP    PATM0            /NO
```

/NO PROGRAM RELOCATION BUT TEST ALL SELECTED FIELDS

```
0262 6224  PATH,  RIF
0263 3040      DCA    PROFLO

/APT/  IF UNDER APT CONTROL THE NEXT LOC WILL = NOP.

APTN03,                                /APT/

0264 4772*  JMS     PNOREL             /TYPEOUT NO RELOCATION
0265 4771*  PATN0, JMS     TEST

/APT/  IF UNDER APT CONTROL THE NEXT LOC WILL = JMP APTJ51.

APTJ01,                                /APT/

0266 4405      LAS
0267 0030      AND    SR05             /HALT AFTER TEST
0270 7640      SZA CLA
```

```
0271 7410      SKP
0272 5275      JMP    .+3             /CB/
0273 4503      CBPAUS                 /CB/
0274 4501      CBINQU                 /CB/

/*CB*/  HLT
0275 4405      LAS
0276 0027      AND    SR04             /CHANGE FIELD LIMITS
0277 7640      SZA CLA
0300 5205      JMP    PATA             /YES

APTJ51,                                /APT/

0301 4773*  JMS     CSR03              /NO
0302 5304      JMP    PAT0             /RELOCATE PROGRAM
0303 5265      JMP    PATN0            /CONTINUE

/
/CHECK ALL SELECTED FIELDS FROM EACH SELECTED FIELD
/

0304 6224  PAT0,  RIF
0305 3040      DCA    PROFLO
0306 1035      TAO    FS
0307 3036      DCA    RS              /SETUP RELO STATUS

/APT/  IF UNDER APT CONTROL THE NEXT LOC WILL = NOP.

APTN04,                                /APT/

0310 4770*  JMS     PREL               /TYPEOUT RELOCATION
0311 4771*  PAT00, JMS     TEST

/APT/  IF UNDER APT CONTROL THE NEXT LOC WILL = JMP APTJ52.

APTJ02,                                /APT/

0312 4405      LAS
0313 0030      AND    SR05             /HALT AFTER TEST
0314 7640      SZA CLA

0315 7410      SKP
0316 5321      JMP    .+3             /CB/
0317 4503      CBPAUS                 /CB/
0320 4501      CBINQU                 /CB/

/*CB*/  HLT
0321 4405      LAS
0322 0027      AND    SR04             /CHANGE FIELD LIMITS
0323 7640      SZA CLA
0324 5205      JMP    PATA             /YES

APTJ52,                                /APT/

0325 4773*  JMS     CSR03              /NO
```

```
0326 7410      SKP
0327 5262      JMP      PATN      /INHIBIT PROGRAM RELOCATION
0330 4767'     JMS      SETREL   /RELOCATE THE PROGRAM
0331 5311      JMP      PAT00    /CONTINUE

0332 5342      START, JMP      ,+10
0333 3104      DCA      NOTTY     /SAVE TTY FLAG STATUS
0334 4766'     JMS      APT12     /GO SETUP MEMORY SIZE FROM 21 OR 3R
0335 1104      TAD      NOTTY     /GET TTY FLAG
0336 7650      SNA      CLA       /TTY AVAILABLE
0337 5204      JMP      APTN00    /YES GO PRINT TITLE
0340 6002      IOF
0341 5207      JMP      APTN00+3  /NO, TURN THE INTERRUPT OFF
0342 1022      TAD      HCH2      /GO START WITHOUT TITLE
0343 0365      AND      (7377    /GET HARDWARE WORD 2
0344 3022      DCA      HCH2      /MASK OUT CL6 BIT
0345 1020      TAD      PSR
0346 0364      AND      (7700    /GET THE PSEUDO SWITCH REGISTER
0347 1363      TAD      (7       /SAVE PREVIOUS SET BITS
0350 3020      DCA      PSR      /ADD IN LOW AND HIGH FIELDS
0351 7240      CLA      CHA       /SAVE THE NEW PROCESSOR SWITCH REGISTER
0352 5333      JMP      START+1   /GO SET FLAG FOR NO TELETYPE

0363 0007
0364 7700
0365 7377
0366 7400
0367 0400
0370 4341
0371 0600
0372 4302
0373 2007
0374 1670
0375 2015
0376 4260
0377 4232
0400
```

PAGE

```
/
/SETUP TO RELOCATE THE PROGRAM
/
0400 0000      SETREL, 0
0401 7200      CLA
0402 6224      RIF
0403 3040      DCA      PROFLO    /MOVE FROM FIELD
0404 6224      RIF
0405 7112      CLL      RTR
0406 7010      RAR
0407 1377      TAD      (SETRP
0410 3045      DCA      TEMP
0411 5445      JMP      I      TEMP
0412 222      SETRP, JMP      SETR7 /POINTERS TO SETUP FOR RELOCATION
0413 5256      JMP      SETR0
```

```
0414 5252      JMP      SETR1
0415 5246      JMP      SETR2
0416 5242      JMP      SETR3
0417 5236      JMP      SETR4
0420 5232      JMP      SETR5
0421 5226      JMP      SETR6
0422 4776'     SETR7, JMS      TRS7
0423 5226      JMP      ,+3
0424 1175      TAD      (70
0425 5260      JMP      CSAME
0426 4775'     SETR6, JMS      TRS6
0427 5232      JMP      ,+3
0430 1174      TAD      (60
0431 5260      JMP      CSAME
0432 4774'     SETR5, JMS      TRS5
0433 5236      JMP      ,+3
0434 1173      TAD      (50
0435 5260      JMP      CSAME
0436 4773'     SETR4, JMS      TRS4
0437 5242      JMP      ,+3
0440 1172      TAD      (40
0441 5260      JMP      CSAME
0442 4772'     SETR3, JMS      TRS3
0443 5246      JMP      ,+3
0444 1171      TAD      (30
0445 5260      JMP      CSAME
0446 4771'     SETR2, JMS      TRS2
0447 5252      JMP      ,+3
0450 1170      TAD      (20
0451 5260      JMP      CSAME
0452 4770'     SETR1, JMS      TRS1
0453 5256      JMP      ,+3
0454 1167      TAD      (10
0455 5260      JMP      CSAME
0456 4767'     SETR0, JMS      TRS0
0457 5222      JMP      SETR7

0460 3041      CSAME, DCA      TSTFLD
0461 4766'     JMS      SAME
0462 5000      JMP      I      SETREL /PROFLD = TSTFLD?
0463 4765'     JMS      RELO     /YES
0464 6224      RIF              /NO = RELOCATE PROGRAM
0465 3040      DCA      PROFLO
0466 5000      JMP      I      SETREL
```

```
0565 4410
0566 2000
0567 4073
0570 4101
0571 4110
0572 4117
0573 4127
0574 4137
0575 4147
0576 4156
```


0577 0412
0600

PAGE

/
/TEST PATTERN CONTROL

```
0600 0000      TEST, 0
0601 4777      JMS   PAR
0602 7200      CLA
0603 3056      DCA   A
0604 3057      DCA   B
0605 4776      JMS   STS0      /ALL ZEROS TEST
0606 4252      JMS   TEST0
0607 7240      STA
0610 3056      DCA   A
0611 7240      STA
0612 3057      DCA   B
0613 4775      JMS   STS1      /ALL ONES TEST
0614 4252      JMS   TEST0
0615 7240      STA
0616 3057      DCA   B
0617 3056      DCA   A
0620 4774      JMS   STS2      /0000-7777 WCP TEST
0621 4252      JMS   TEST0
0622 7240      STA
0623 3056      DCA   A
0624 3057      DCA   B
0625 4773      JMS   STS3      /7777-0000 WCP TEST
0626 4252      JMS   TEST0
0627 7200      CLA
0630 1166      TAD   (2525
0631 3056      DCA   A
0632 1165      TAD   (5252
0633 3057      DCA   B
0634 4772      JMS   STS4      /2525-5252 WCP TEST
0635 4252      JMS   TEST0
0636 7200      CLA
0637 1165      TAD   (5252
0640 3056      DCA   A
0641 1166      TAD   (2525
0642 3057      DCA   B
0643 4771      JMS   STS5      /5252-2525 WCP TEST
0644 4252      JMS   TEST0
0645 7200      CLA
0646 3034      DCA   TS      /CLEAR TEST STATUS
0647 6002      IOF
0650 5600      JMP I   TEST
```

/
/TEST ALL FIELDS SELECTED FOR TEST

```
0651 5652      KTEST, JMP I   TEST0
0652 0000      TEST0, 0
0653 4770      JMS   TFS0
```

```
0654 5261      JMP   ,+5
0655 3041      DCA   TSTFLD
0656 4767      JMS   SAME
0657 7410      SKP
0660 4766      JMS   WRFLD      /WRITE FIELD 0
0661 4765      JMS   TFS1
0662 5270      JMP   ,+6
0663 1167      TAD   (10
0664 3041      DCA   TSTFLD
0665 4767      JMS   SAME
0666 7410      SKP
0667 4766      JMS   WRFLD      /WRITE FIELD 1
0670 4764      JMS   TFS2
0671 5277      JMP   ,+6
0672 1170      TAD   (20
0673 3041      DCA   TSTFLD
0674 4767      JMS   SAME
0675 7410      SKP
0676 4766      JMS   WRFLD      /WRITE FIELD 2
0677 4763      JMS   TFS3
0678 5306      JMP   ,+6
0679 1171      TAD   (30
0680 3041      DCA   TSTFLD
0681 4767      JMS   SAME
0682 7410      SKP
0683 4766      JMS   WRFLD      /WRITE FIELD 3
0684 4762      JMS   TFS4
0685 5315      JMP   ,+6
0686 1172      TAD   (40
0687 3041      DCA   TSTFLD
0688 4767      JMS   SAME
0689 7410      SKP
0690 4766      JMS   WRFLD      /WRITE FIELD 4
0691 4761      JMS   TFS5
0692 5324      JMP   ,+6
0693 1173      TAD   (50
0694 3041      DCA   TSTFLD
0695 4767      JMS   SAME
0696 7410      SKP
0697 4766      JMS   WRFLD      /WRITE FIELD 5
0698 4760      JMS   TFS6
0699 5333      JMP   ,+6
0700 1174      TAD   (60
0701 3041      DCA   TSTFLD
0702 4767      JMS   SAME
0703 7410      SKP
0704 4766      JMS   WRFLD      /WRITE FIELD 6
0705 4757      JMS   TFS7
0706 5342      JMP   ,+6
0707 1175      TAD   (70
0708 3041      DCA   TSTFLD
0709 4767      JMS   SAME
0710 7410      SKP
0711 4766      JMS   WRFLD      /WRITE FIELD 7
0712 4757      JMS   TFS7
0713 5342      JMP   ,+6
0714 1175      TAD   (70
0715 3041      DCA   TSTFLD
0716 4767      JMS   SAME
0717 7410      SKP
0718 4766      JMS   WRFLD
0719 4757      JMS   TFS7
0720 5342      JMP   ,+6
0721 1175      TAD   (70
0722 3041      DCA   TSTFLD
0723 4767      JMS   SAME
0724 7410      SKP
0725 4766      JMS   WRFLD
0726 4757      JMS   TFS7
0727 5342      JMP   ,+6
0728 1175      TAD   (70
0729 3041      DCA   TSTFLD
0730 4767      JMS   SAME
0731 7410      SKP
0732 4766      JMS   WRFLD
0733 4757      JMS   TFS7
0734 5342      JMP   ,+6
0735 1175      TAD   (70
0736 3041      DCA   TSTFLD
0737 4767      JMS   SAME
0738 7410      SKP
0739 4766      JMS   WRFLD
0740 4757      JMS   TFS7
0741 5342      JMP   ,+6
0742 1175      TAD   (70
0743 3041      DCA   TSTFLD
0744 4767      JMS   SAME
0745 7410      SKP
0746 4766      JMS   WRFLD
0747 4757      JMS   TFS7
0748 5342      JMP   ,+6
0749 1175      TAD   (70
0750 3041      DCA   TSTFLD
0751 4767      JMS   SAME
0752 7410      SKP
0753 4766      JMS   WRFLD
0754 4757      JMS   TFS7
0755 5342      JMP   ,+6
0756 1175      TAD   (70
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1099 4776*      JMS      SAME
1100 5327      JMP      TEST8
1101 4775*      JMS      RDFLD
1102 1042      TAD      COUNT
1103 7640*      SZA      CLA
1104 4760*      JMS      SRS6
1105 4757*      TEST7, JMS      TFS7
1106 5327      JMP      TEST8
1107 1175      TAD      I70
1108 3041      DCA      TSTFLD
1109 3042      DCA      COUNT
1110 4776*      JMS      SAME
1111 5327      JMP      TEST8
1112 4775*      JMS      RDFLD
1113 1042      TAD      COUNT
1114 7640*      SZA      CLA
1115 4760*      JMS      SRS6
1116 4757*      TEST7, JMS      TFS7
1117 5327      JMP      TEST8
1118 1175      TAD      I70
1119 3041      DCA      TSTFLD
1120 3042      DCA      COUNT
1121 4776*      JMS      SAME
1122 5327      JMP      TEST8
1123 4775*      JMS      RDFLD
1124 1042      TAD      COUNT

```

/READ FIELD 5

/ERROR FIELD 5

/READ FIELD 6

/ERROR FIELD 6

/READ FIELD 7

```

1125 7640      SZA CLA
1126 4756'     JMS      SRS7      /ERROR FIELD 7

/APT/  IF UNDER APT CONTROL THE NEXT LOC WILL = JMP APTJ53.

APTJ03,                      /APT/

1127 4405     TEST0, LAS
1130 0027      AND      SR04      /CHANGE FIELD LIMITS?
1131 7640      SZA CLA
1132 5755'     JMP      PATA      /YES

APTJ53,                      /APT/

1133 5754'     JMP      KTEST

1154 0651
1155 0205
1156 3677
1157 4063
1160 3661
1161 4054
1162 3643
1163 4044
1164 3625
1165 4034
1166 3607
1167 4024
1170 3563
1171 4015
1172 3543
1173 4006
1174 3525
1175 1400
1176 2000
1177 4000
1200

```

PAGE

/WRITE A & B REG PATTERN INTO SELECTED FIELD

```

1200 0000      /
1201 7200      WRFLO, 0
1202 1164      CLA
1203 3060      TAD      [-40
1204 4236      DCA      P2      /WRITE 2 PAGES
1205 4260      JMS      WRA      /WRITE 4 WORDS FROM A REG
1206 2060      JMS      WRB      /WRITE 4 WORDS FROM B REG
1207 5204      ISZ      P2
1210 1164      JMP      .-3
1211 3060      TAD      [-40
1212 4260      DCA      P2
1213 4236      JMS      WRB
1214 2060      JMS      WRA
1215 5212      ISZ      P2
1216 5212      JMP      .-3

```

```

1216 1046      TAD      TSTAD
1217 7640      SZA CLA
1220 5202      JMP      WRFLO+2

/APT/  IF UNDER APT CONTROL NEXT LOC WILL = NOP.

APTN06,                      /APT/

1221 2047      ISZ      FIVE      /INC 5 MIN COUNTER
1222 5600      JMP I     WRFLO     /END OF MEM REACHED
1223 1050      TAD      MINS      /5 MINUTES REACHED
1224 3047      DCA      FIVE      /RESTORE COUNTER
1225 1104      TAD      NOTTY     /GET THE TELETYPE FLAG
1226 7710      SPA      CLA      /IS THERE ONE AVAILABLE
1227 5600      JMP I     WRFLO     /NO-ABORT THE FIVE MINUTE TIMEOUT

1230 4466      CBPASS
1231 7000      NOP      /CB/

1232 4777'     JMS      MES
1233 4543      4543
1234 6500      6500
1235 5600      JMP I     WRFLO     /TYPE A 5
1236 0000      WRA,      0      /END OF MEMORY REACHED
1237 1163      TAD      [-4
1240 3061      DCA      W4      //WRITE 4 WORDS FROM A REG
1241 1041      TAD      TSTFLD
1242 1176      TAD      [6201
1243 3244      DCA      .+1
1244 6201      CDF      0      /TEST OF
1245 1056      WRA1,     TAD      A
1246 3446      DCA I     TSTAD
1247 2046      ISZ      TSTAD
1250 7000      NOP
1251 2061      ISZ      W4
1252 5245      JMP      WRA1
1253 1040      TAD      PROFLD     /4 WORDS ARE WRITTEN
1254 1176      TAD      [6201
1255 3256      DCA      .+1
1256 6201      CDF      0      /PROGRAM DF
1257 5636      JMP I     WRA
1260 0000      WRB,      0
1261 1163      TAD      [-4
1262 3061      DCA      W4      /WRITE 4 WORDS FROM B REG
1263 1041      TAD      TSTFLD
1264 1176      TAD      [6201
1265 3266      DCA      .+1
1266 6201      CDF      0      /TEST OF
1267 1057      WRB1,     TAD      0
1270 3446      DCA I     TSTAD
1271 2046      ISZ      TSTAD
1272 7000      NOP
1273 2061      ISZ      W4
1274 5267      JMP      WRB1
1275 1040      TAD      PROFLD     /4 WORDS ARE WRITTEN

```

```

1276 1176      TAO      16201
1277 3300      DCA      .+1
1300 6201      CDF      0          /PROGRAM OF
1301 5660      JMP I     WR0

1377 2440
1400 1400      PAGE

/
/READ & TEST A & B REG PATTERN FROM SELECTED FIELD
/
1400 0000      RDFLD, 0

1401 4407      JMS I     IAPTRK      /APT/

1402 7200      CLA
1403 1041      TAO      TSTFLD
1404 1176      TAO      16201
1405 3210      DCA      RDA2
1406 1210      TAO      RDA2
1407 3263      DCA      R0B2
1410 6201      RDA2, CDF      0          /TEST OF
1411 1162      TAO      [-100
1412 3060      DCA      P2          /READ & TEST 2 PAGES
1413 1163      RDFLDA, TAO      [-4
1414 3061      DCA      W4          /READ & TEST 4 WORDS
1415 3033      RDAC, DCA      CS          /NO COMPLEMENT
1416 4327      JMS      READ
1417 7041      CIA
1420 1056      TAO      A
1421 7440      SZA

/APT/ IF UNDER APT CONTROL THE NEXT LOC WILL = JMS I IAPTR.
APTE00,      /APT/

1422 4777*     JMS      ERRA          /A REG ERROR = NC
1423 4327      JMS      READ
1424 7040      CMA
1425 3446      DCA I     TSTAD
1426 4776*     JMS      SC$1          /1 COMPLEMENT
1427 4327      JMS      READ
1430 7001      IAC      A
1431 1056      TAO
1432 7440      SZA

/APT/ IF UNDER APT CONTROL THE NEXT LOC WILL = JMS I IAPTR.
APTE01,      /APT/

1433 4775*     JMS      ERRA1         /A REG ERROR = 1C
1434 4327      JMS      READ
1435 7040      CMA
1436 3446      DCA I     TSTAD
1437 4774*     JMS      SC$2          /2 COMPLEMENTS
1440 4327      JMS      READ

```

```

1441 7041      CIA      A
1442 1056      TAO
1443 7440      SZA

/APT/ IF UNDER APT CONTROL THE NEXT LOC WILL = JMS I IAPTR.
APTE02,      /APT/

1444 4777*     JMS      ERRA          /A REG ERROR = 2C
1445 2046      ISZ      TSTAD
1446 7000      NOP
1447 2061      ISZ      W4
1450 5215      JMP      RDAC          /COMPLETE 4 WORDS
1451 2060      ISZ      P2
1452 5266      JMP      RDFLDB       /COMPLETE CURRENT 2 PAGES
1453 1040      TAO      PROFLD
1454 1176      TAO      16201
1455 3256      DCA      .+1
1456 6201      CDF      0          /PROGRAM OF
1457 1046      TAO      TSTAD
1460 7640      SZA CLA
1461 5210      JMP      RDA2          /READ ANOTHER 2 PAGES
1462 5600      JMP I     RDFLD       /END OF MEMORY REACHED

1463 6201      RDB2, CDF      0          /TEST OF
1464 1162      TAO      [-100
1465 3060      DCA      P2          /READ & TEST 2 PAGES
1466 1163      RDFLDB, TAO      [-4
1467 3061      DCA      W4          /READ & TEST 4 WORDS
1470 3033      RDB2, DCA      CS          /NO COMPLEMENT
1471 4327      JMS      READ
1472 7041      CIA
1473 1057      TAO      B
1474 7440      SZA

/APT/ IF UNDER APT CONTROL THE NEXT LOC WILL = JMS I IAPTR.
APTE03,      /APT/

1475 4773*     JMS      ERRA          /B REG ERROR = NC
1476 4327      JMS      READ
1477 7040      CMA
1480 3446      DCA I     TSTAD
1481 4776*     JMS      SC$1          /1 COMPLEMENT
1482 4327      JMS      READ
1483 7001      IAC
1484 1057      TAO      B
1485 7440      SZA

/APT/ IF UNDER APT CONTROL THE NEXT LOC WILL = JMS I IAPTR.
APTE04,      /APT/

1486 4772*     JMS      ERRA1         /B REG ERROR = 1C
1487 4327      JMS      READ
1490 7040      CMA
1491 3446      DCA I     TSTAD
1492 4774*     JMS      SC$2          /2 COMPLEMENTS

```

```
1513 4327      JMS  READ
1514 7041      CIA
1515 1057      TAO  B
1516 7440      SZA

/APT/ IF UNDER APT CONTROL THE NEXT LOC WILL = JMS I IAPTER.

APTE05, JMS  ERRB      /APT/
1520 2046      ISZ  TSTAD /B REG ERROR = 2C
1521 7000      NOP
1522 2061      ISZ  W4
1523 5270      JMP  ROBC   /COMPLETE 4 WORDS
1524 2060      ISZ  P2
1525 5213      JMP  RDFLDA /COMPLETE CURRENT 2 PAGES
1526 5263      JMP  RDB2

/
/READ TEST ADDRESS SUBROUTINE
/
1527 0000      READ, 0
1530 1446      TAO I  TSTAD
1531 1446      TAO I  TSTAD
1532 1446      TAO I  TSTAD
1533 1446      TAO I  TSTAD
1534 1446      TAO I  TSTAD
1535 1446      TAO I  TSTAD
1536 1446      TAO I  TSTAD
1537 1446      TAO I  TSTAD
1540 1446      TAO I  TSTAD
1541 1446      TAO I  TSTAD
1542 1446      TAO I  TSTAD
1543 7200      CLA
1544 1446      TAO I  TSTAD
1545 5727      JMP I  READ

1572 1637
1573 1626
1574 3511
1575 1611
1576 3505
1577 1600
1600      PAGE
1600 2000      ERRA, 0
1601 7041      CIA
1602 1056      TAO  A
1603 3063      DCA  BDATA /DATA READ
1604 1056      TAO  A
1605 4254      JMS  GERRC /GO TO ERRC SETUP ROUTINE
1606 1056      TAO  A
1607 3446      DCA I  TSTAD /RE-WRITE BAD LOCATION
1610 5600      JMP I  ERRA
1611 0000      ERRA1, 0
1612 3045      DCA  TEMP
1613 1256      TAO  A
```

```
1614 7040      CMA
1615 1045      TAO  TEMP
1616 3063      DCA  BDATA /DATA READ
1617 1056      TAO  A
1620 7040      CMA
1621 4254      JMS  GERRC /GO TO ERRC SETUP ROUTINE
1622 1056      TAO  A
1623 7040      CMA
1624 3446      DCA I  TSTAD /RE-WRITE BAD LOCATION
1625 5611      JMP I  ERRA1
1626 0000      ENRB, 0
1627 7041      CIA
1630 1057      TAO  B
1631 3063      DCA  BDATA /DATA READ
1632 1057      TAO  B
1633 4254      JMS  GERRC /GO TO ERRC SETUP ROUTINE
1634 1057      TAO  B
1635 3446      DCA I  TSTAD /RE-WRITE BAD LOCATION
1636 5626      JMP I  ENRB
1637 7000      ENRB1, 0
1640 3045      DCA  TEMP
1641 1057      TAO  B
1642 7040      CMA
1643 1045      TAO  TEMP
1644 3063      DCA  BDATA /DATA READ
1645 1057      TAO  B
1646 7040      CMA
1647 4254      JMS  GERRC /GO TO ERRC SETUP ROUTINE
1650 1057      TAO  B
1651 7040      CMA
1652 3446      DCA I  TSTAD
1653 5637      JMP I  ENRB1
1654 0000      GERRC, 0
1655 3062      DCA  GDATA /GO TO ERRC
1656 1040      TAO  PROFLO /DATA WRITTEN
1657 1176      TAO  16201
1660 3261      DCA  .+1
1661 6201      CDF  0 /PROGRAM DF
1662 4777      JMS  ERRC /DATA OR CHKBD ERROR
1663 1041      TAO  TSTFLD
1664 1176      TAO  16201
1665 3266      DCA  .+1
1666 6201      CDF  0 /TEST DF
1667 5654      JMP I  GERRC

/
/CHECK FOR LEGAL FIELD SELECTION
/
1670 0000      LEGAL, 0
1671 7300      CLA CLL
1672 3054      DCA  INSAME /SAME FIELD CONTROL
1673 1161      TAO  1-2
1674 3055      DCA  LEGAL0 /LEGAL SELECTION CONTROL
1675 3041      DCA  TSTFLD
1676 4776      JMS  TFS0
```

```
1677 7410      SKP
1700 4353      JMS      LEGALA
1701 1167      TAD      I10
1702 3041      DCA      TSTFLD
1703 4775      JMS      TFS1
1704 7410      SKP
1705 4353      JMS      LEGALA
1706 1170      TAD      I20
1707 3041      DCA      TSTFLD
1710 4774      JMS      TFS2
1711 7410      SKP
1712 4353      JMS      LEGALA
1713 1171      TAD      I30
1714 3041      DCA      TSTFLD
1715 4773      JMS      TFS3
1716 7410      SKP
1717 4353      JMS      LEGALA
1720 1172      TAD      I40
1721 3041      DCA      TSTFLD
1722 4772      JMS      TFS4
1723 7410      SKP
1724 4353      JMS      LEGALA
1725 1173      TAD      I50
1726 3041      DCA      TSTFLD
1727 4771      JMS      TFS5
1730 7410      SKP
1731 4353      JMS      LEGALA
1732 1174      TAD      I60
1733 3041      DCA      TSTFLD
1734 4770      JMS      TFS6
1735 7410      SKP
1736 4353      JMS      LEGALA
1737 1175      TAD      I70
1740 3041      DCA      TSTFLD
1741 4767      JMS      TFS7
1742 7410      SKP
1743 4353      JMS      LEGALA
1744 2055      ISZ      LEGALO
1745 5766      JMP      NOFLD      /NO FIELD SELECTION
1746 1054      TAD      INSAME
1747 7640      SZA      CLA
1750 5765      JMP      PINF      /PROG IN SELECTED FIELD
1751 3037      DCA      CRELO      /ONLY 1 FIELD SELECTED
1752 5670      JMP      I      LEGAL
```

```
/
/LEGAL FIELD SELECTION SUBROUTINE
```

```
1753 0000      LEGALA, 0
1754 2055      ISZ      LEGALO      /FIELD SELECTED
1755 7410      SKP
1756 5670      JMP      I      LEGAL      /AT LEAST 2 FIELDS SELECTED
1757 6224      RIF
1760 3040      DCA      PROFLO
```

```
1761 4764      JMS      SAME      /PROGRAM IN SELECTED FIELD?
1762 2054      ISZ      INSAME      /YES
1763 5753      JMP      I      LEGALA
```

```
1764 2000
1765 6236
1766 4400
1767 4063
1770 4054
1771 4044
1772 4034
1773 4024
1774 4015
1775 4006
1776 4000
1777 3000
2000
```

PAGE

```
/
/RETURN IF PROGRAM IN SELECTED FIELD
/RETURN +1 IF PROGRAM NOT IN SELECTED FIELD
```

```
2000 0000      SAME, 0
2001 1040      TAD      PROFLO
2002 7041      CIA
2003 1041      TAD      TSTFLO
2004 7640      SZA      CLA
2005 2200      ISZ      SAME      /PROG NOT IN SEL FIELD
2006 5600      JMP      I      SAME
```

```
/
/RETURN IF SR03=0, RETURN +1 IF SR03=1
```

```
2007 0000      CSR03, 0
2010 4405      LAS
2011 0026      AND      SR03
2012 7640      SZA      CLA
2013 2207      ISZ      CSR03      /INHIBIT PROGRAM RELOCATION
2014 5607      JMP      I      CSR03
```

```
/
/SETUP FIELD STATUS (FS)
/INC FIELDS NOT PRESENT OR NOT SELECTED
/STORE NUMBER OF FIELDS PRESENT IN FCNT
```

```
2015 0000      SETFS, 0
2016 7200      CLA
2017 3035      DCA      FS      /CLEAR FIELD STATUS
2020 3051      DCA      FCNT      /CLEAR FIELD COUNT
2021 4405      LAS
2022 0031      AND      SR60      /STARTING FIELD
2023 3052      DCA      STARTF
2024 4405      LAS
2025 0032      AND      SR911      /ENDING FIELD
2026 7106      CLL      RTL
2027 7004      RAL
```

```
2030 3053      DCA      ENDF
2031 6271      CDF      70
2032 4777'     JMS      CFP      /CHECK FIELD PRESENT
2033 4776'     JMS      SFS3    /SET FIELD STATUS BIT 7
2034 6261      CDF      60
2035 4777'     JMS      CFP
2036 4775'     JMS      SFS6
2037 6251      CDF      50
2040 4777'     JMS      CFP
2041 4774'     JMS      SFS5
2042 6241      CDF      40
2043 4777'     JMS      CFP
2044 4773'     JMS      SFS4
2045 6231      CDF      30
2046 4777'     JMS      CFP
2047 4772'     JMS      SFS3
2050 6221      CDF      20
2051 4777'     JMS      CFP
2052 4771'     JMS      SFS2
2053 6211      CDF      10
2054 4777'     JMS      CFP
2055 4770'     JMS      SFS1
2056 6201      CDF      00
2057 4777'     JMS      CFP
2060 4767'     JMS      SFS0

2061 1104      TAD      NOTTY    /GET TTY FLAG
2062 7710      SPA      CLA      /IS TTY AVAILABLE
2063 5615      JMP      I SETFS   /NO, ABORT TTY MESSAGE AND RETURN
```

/APT/ IF UNDER APT CONTROL NEXT LOC WILL = JMP APTJ54.

APTJ04, /APT/

```
2064 4766'     JMS      MES
2065 4543      4543
2066 0000      0
2067 1051      TAD      FCNT
2070 1160      TAD      [260
2071 4765'     JMS      TYPSP    /TYPEOUT # OF FIELDS IN THIS SYSTEM
2072 4766'     JMS      MES
2073 0611      TEXT      "FIELDS IN THIS SYSTEM"
2074 0514
2075 0423
2076 4011
2077 1640
2100 2410
2101 1123
2102 4023
2103 3123
2104 2405
2105 1500
2106 4766'     JMS      MES
2107 4543      TEXT      "%#FIELDS SEL'D ARE "
2110 0611
```

```
2111 0514
2112 0423
2113 4023
2114 0514
2115 4704
2116 4001
2117 2205
2120 0000
2121 4764'     JMS      TOSEL

APTJ54, /APT/

2122 5615      JMP      I SETFS

2164 2263
2165 2532
2166 2440
2167 3516
2170 3534
2171 3552
2172 3600
2173 3616
2174 3634
2175 3652
2176 3670
2177 2200      PAGE

/
/RETURN+1 IF FIELD PRESENT IN SYSTEM & IS SELECTED
/
2200 0000      CFP,      0
2201 7300      CLA      CLL
2202 6224      RIF
2203 1176      TAD      [6201
2204 3212      DCA      CFP0
2205 1157      TAD      [-1
2206 3661      DCA      I CHECK
2207 1661      TAD      I CHECK
2210 7640      SZA      CLA      /SKIP IF NOT PRESENT
2211 5214      JMP      .+3
2212 6201      CDF      0      /PROGRAM DF
2213 5600      JMP      I CFP
2214 2051      ISZ      FCNT    /FIELD IS PRESENT
2215 1053      TAD      ENDF
2216 7041      CIA
2217 1052      TAD      STARTF
2220 7440      SZA
2221 5230      JMP      CFP2
2222 6214      RDF
2223 7041      CIA      /STARTF = ENDF
2224 1052      TAD      STARTF
2225 7650      SNA      CLA
2226 2200      CFP1,      ISZ      CFP      /FIELD IS PRESENT & SELECTED
```

```
2227 5212      JMP      CFP0
2230 7710      CFP2, SPA CLA
2231 5251      JMP      CFP4      /STARTF < ENDF
2232 6214      RDF              /STARTF > ENDF
2233 7041      CIA
2234 1052      TAD      STARTF
2235 7450      SNA
2236 5226      JMP      CFP1      /DF = STARTF (SELECTED)
2237 7710      SPA CLA
2240 5226      JMP      CFP1      /DF > STARTF (SELECTED)
2241 6214      CFP3, RDF         /DF < STARTF ***
2242 7041      CIA
2243 1053      TAD      ENDF
2244 7450      SNA
2245 5226      JMP      CFP1      /DF = ENDF (SELECTED)
2246 7710      SPA CLA
2247 5212      JMP      CFP0      /DF > ENDF (NOT SELECTED)
2250 5226      JMP      CFP1      /DF < ENDF (SELECTED)
2251 6214      CFP4, RDF         /STARTF < ENDF
2252 7041      CIA
2253 1052      TAD      STARTF
2254 7450      SNA
2255 5226      JMP      CFP1      /DF = STARTF (SELECTED)
2256 7710      SPA CLA
2257 5241      JMP      CFP3      /DF > STARTF THIS TIME ***
2260 5212      JMP      CFP0      /DF < STARTF (NOT SELECTED)
2261 2262      CHECK, CHECK0
2262 0000      CHECK0, 0
```

/
/TYPEOUT FIELDS SELECTED FOR TESTING
/

```
2263 0000      TOSEL, 0
2264 4777      JMS      TFS7
2265 5270      JMP      .+3
2266 1156      TAD      [267
2267 4776      JMS      TYPSP      /FIELD 7
2270 4775      JMS      TFS6
2271 5274      JMP      .+3
2272 1155      TAD      [266
2273 4776      JMS      TYPSP      /FIELD 6
2274 4774      JMS      TFS5
2275 5300      JMP      .+3
2276 1154      TAD      [265
2277 4776      JMS      TYPSP      /FIELD 5
2300 4773      JMS      TFS4
2301 5304      JMP      .+3
2302 1153      TAD      [264
2303 4776      JMS      TYPSP      /FIELD 4
2304 4772      JMS      TFS3
2305 5310      JMP      .+3
2306 1152      TAD      [263
2307 4776      JMS      TYPSP      /FIELD 3
2310 4771      JMS      TFS2
```

```
2311 5314      JMP      .+3
2312 1151      TAD      [262
2313 4776      JMS      TYPSP      /FIELD 2
2314 4770      JMS      TFS1
2315 5320      JMP      .+3
2316 1150      TAD      [261
2317 4776      JMS      TYPSP      /FIELD 1
2320 4767      JMS      TFS0
2321 5324      JMP      .+3
2322 1160      TAD      [260
2323 4776      JMS      TYPSP      /FIELD 0
2324 5663      JMP I TOSEL

2367 4000
2370 4006
2371 4015
2372 4024
2373 4034
2374 4044
2375 4054
2376 2532
2377 4063
2400
```

PAGE

/
/CONVERT OCTAL NUMBERS FOR TYPEOUT
/

```
2400 0000      SIXTY, 0
2401 7300      CLA CLL
2402 1600      TAD I SIXTY      /ADDRESS OF OPERAND
2403 3235      DCA      S0
2404 2200      ISZ      SIXTY
2405 1600      TAD I SIXTY      /STORAGE ADDRESS
2406 3236      DCA      S1
2407 2200      ISZ      SIXTY
2410 1147      TAD      [77
2411 7040      CMA
2412 0635      AND I S0      /AC=7700
2413 7002      BSW      /FIRST 2 DIGITS OF OPERAND
2414 4222      JMS      CNV      /CONVERT DIGITS FOR TYPEOUT
2415 2236      ISZ      S1      /INC STORAGE ADDRESS
2416 1147      TAD      [77
2417 0635      AND I S0      /SECOND 2 DIGITS OF OPERAND
2420 4222      JMS      CNV
2421 5600      JMP I SIXTY      /DONE
2422 0000      CNV, 0
2423 3237      DCA      S2
2424 1237      TAD      S2
2425 7106      CLL RTL
2426 7004      RAL
2427 0146      AND      [707      /LEFT DIGIT
2430 1237      TAD      S2
2431 0146      AND      [707      /RIGHT DIGIT
2432 1145      TAD      [6060
```



```

2433 3636      DCA I  S1
2434 5622      JMP I  CNV
2435 0000      S0,    0
2436 0000      S1,    0
2437 0000      S2,    0
/
/TELETYPE OUTPUT WITH BELL
/
2440 0000      MES,    0

2441 7200      CLA
2442 1022      TAO      HCW2
2443 7700      SMA CLA
2444 5250      JMP      APT000
2445 1240      TAO      MES
2446 3777'     DCA      APTER
2447 5776'     JMP      APTER+1
                APT000,

2450 7240      STA
2451 1240      TAO      MES
2452 3010      DCA      10
                APT001,

2453 1410      TAO I   10
2454 3316      DCA     M0
2455 1316      TAO     M0
2456 7002      BSW
2457 4263      JMS     TYPCH
2458 1316      TAO     M0
2461 4263      JMS     TYPCH
                /*APT*/ JMP     MES+4

2462 5253      JMP      APT001

2463 0000      TYPCH, 0
2464 0147      AND     [77
2465 7450      SNA
2466 5410      JMP I   10
2467 1144      TAO     [-34
2470 7440      SZA
2471 5274      JMP     .+3
2472 1143      TAO     [207
2473 5314      JMP     MTP
2474 1163      TAO     [-4
2475 7500      SMA
2476 5301      JMP     .+3
2477 1142      TAO     [340
2500 5314      JMP     MTP
2501 1141      TAO     [-3
2502 7440      SZA
2503 5306      JMP     .+3

```

/STORE CONVERTED DIGITS

/APT/

/APT/UNDER APT CONTROL?

/APT/SKP IF YES.

/APT/

/APT/FORCE AN ERROR CALL TO APT.

/APT/

/APT/

/APT/

/FIRST WORD -1

/TYPEOUT FIRST CHARACTER

/TYPEOUT SECOND CHARACTER

/CONTINUE

/APT/CONTINUE.

/END OF MESSAGE RETURN

/CODE IS BELL

/CODE LESS THAN 40?

/NO

/YES, ADD 300, CODE IS ALPHA

```

2504 1140      TAO     [212
2505 5314      JMP     MTP
2506 1161      TAO     [-2
2507 7440      SZA
2510 5313      JMP     .+3
2511 1137      TAO     [215
2512 7410      SKP
2513 1136      TAO     [245
2514 4317      MTP,    JMS     TYPE
2515 5663      JMP I   TYPCH
2516 0000      M0,    0
/
/TYPEOUT CHARACTER IN AC
/
2517 0000      TYPE, 0
2520 6000      SKON
2521 5327      JMP     TYPOFF
2522 4477      C8TYPE
2523 6007      CAF
2524 6001      ION
2525 7200      CLA
2526 5717      JMP I   TYPE
2527 4477      TYPOFF, C8TYPE
2530 7200      CLA
2531 5717      JMP I   TYPE
/
/TYPEOUT CHARACTER IN AC AND A SPACE
/
2532 0000      TYPSP, 0
2533 4317      JMS     TYPE
2534 1135      TAO     [240
2535 4317      JMS     TYPE
2536 5732      JMP I   TYPSP

2576 7276
2577 7275
2600 2600      PAGE

/
/ERROR ROUTINE (BELL ON ERROR HAS PRIORITY)
/
2600 0000      RETURN, 0
2601 4405      CODERR, LAS
2602 0025      AND     SR02
2603 7650      SNA CLA
2604 5213      JMP     .+7
2605 1104      TAO     NOTTY
2606 7710      SPA     CLA
2607 5600      JMP I   RETURN
2610 1143      TAO     [207
2611 4777'     JMS     TYPE
2612 5600      JMP I   RETURN
2613 4405      LAS
2614 0024      AND     SR01

```

/CODE IS LINE FEED

/CODE IS CR

/ADD 200 TO OTHERS > 40

/GO TYPE THE MESSAGE

/PROGRAM RETURN ADDRESS

/BELL ON ERROR?

/GET TTY FLAG

/NO TELETYPE AVAILABLE DO NOT RING BELL

/RING BELL

```
2615 7640      SZA CLA
2616 5247      JMP STOP
2617 6224      RIF
2620 7012      RTR
2621 7010      RAR
2622 0134      AND 17
2623 1133      TAD 14060
2624 3240      DCA ERROR0
2625 1200      TAD RETURN
2626 1157      TAD [-1
2627 3045      DCA TEMP
2630 4776      JMS SIXTY
2631 0045      TEMP
2632 2641      ERROR1
2633 1104      TAD
2634 7710      SPA NTTY
2635 5646      JMP I CLA
2636 4775      JMS ADDER
2637 4543      MES
2640 0000      ERROR0, 0
2641 0000      ERROR1, 0
2642 0000      0
2643 4440      4040
2644 0000      0
2645 5646      JMP I .+1
2646 0000      ADDER, 0
2647 4405      STOP, LAS
2650 0023      AND SR00
2651 7650      SNA CLA
2652 5256      JMP LIMIT
2653 1200      TAD RETURN
2654 1157      TAD [-1
2655 4500      C0ERR
2656 4405      /*C0*/ HLT
2657 0027      LIMIT, LAS
2660 7640      AND SR04
2661 5774      SZA CLA
2662 5600      JMP I PATA
2663 0000      JMP I RETURN
2664 2042      ISZ COUNT
2665 7410      SKP
2666 5264      JMP .-2
```

/RELOCATION MOVE ERROR
ERRM, 0

/APT/ IF UNDER APT CONTROL NEXT LOC WILL = JMS I IAPTR.
APTE06,

/MOVE ERROR OCCURRED

```
2667 7200      CLA
2670 1263      TAD ERRM
2671 3200      DCA RETURN
2672 1373      TAD (PERRM
2673 3246      DCA ADDER
2674 5201      JMP CODERR
2675 1041      PERRM, TAD TSTFLD
2676 7112      CLL RTR
2677 7010      RAR
2700 1133      TAD 14060
2701 3321      DCA Z10
2702 4776      JMS SIXTY
2703 0043      MOVE
2704 2722      Z11
2705 1104      TAO NTTY
2706 7710      SPA CLA
2707 5330      JMP ERRMM
2710 4775      JMS MES
2711 2205      TEXT
2712 1417
2713 4005
2714 2222
2715 4001
2716 2440
2717 0000
2720 4775      JMS MES
2721 0000      Z10, 0
2722 0000      Z11, 0
2723 0000      0
2724 0000      0
2725 7240      STA
2726 3044      DCA HEAD1
2727 5247      JMP STOP
```

//RELOCATION ERROR ROUTINE ON A SYSTEM WITHOUT A TELETYPE

```
2730 1240      ERRMM, TAD ERROR0
2731 0372      AND 17
2732 7402      HLT
2733 7240      CLA CMA
2734 1200      TAD RETURN
2735 7402      HLT
2736 7200      CLA
2737 1321      TAD Z10
2740 0372      AND 17
2741 7402      HLT
2742 7200      CLA
2743 1043      TAD MOVE
2744 7402      HLT
2745 7240      CLA CMA
2746 3044      DCA HEAD1
2747 5247      JMP STOP
```

/GET PROGRAM FIELD
/MASK TO THE FIELD BITS
/AC=PROGRAM FIELD IN BITS 9-11

/

/AC=PROGRAM LOCATION OF ERROR JMS

/GET TEST FIELD
/MASK TO FIELD BITS
/AC=FIELD BEING TESTED IN BITS 9-11

/AC=ADDRESS OF LOCATION IN ERROR

/GO CHECK FOR HALT AFTER ERROR SWITCH

2773 2675
2774 0205
2775 2440
2776 2400
2777 2517

3000 PAGE

```

- /
- /DATA OR CHECKERBOARD ERROR OCCURRED
/
3000 0000  ERRC, 0

/ APT/ IF UNDER APT CONTROL THE NEXT LOC WILL = JMS I IAPTER.
APTE07, / APT/

3001 2042  ISZ  COUNT  /ERROR OCCURRED
3002 7410  SKP
3003 5201  JMP  =-2
3004 7200  CLA
3005 1200  TAD  ERRC
3006 3777  DCA  RETURN /RETURN ADDRESS
3007 1376  TAD  (PERRC
3008 3775  DCA  ADDR  /ERROR TYPEOUT ADDRESS
3009 4405  LAS
3010 0025  AND  SR02  /BELL ON ERROR
3011 7640  SZA  CLA
3012 5774  JMP  RBELL  /RING BELL
3013 4405  LAS
3014 0024  AND  SR01
3015 7640  SZA  CLA
3016 5773  JMP  STOP  /INHIBIT TYPEOUT
3017 2044  ISZ  HEAD1
3018 7410  SKP
3019 4772  JMS  ERRHD  /TYPEOUT ERROR HEADING
3020 5771  JMP  CODERR

3025 1041  PERRC, TAD  TSTFLD
3026 7112  CLL  RTR
3027 7010  RAR
3030 1133  TAO  [4060
3031 3247  DCA  Z1
3032 4770  JMS  SIXTY
3033 0046  TSTAD
3034 3050  Z2
3035 4770  JMS  SIXTY
3036 0062  GDATA
3037 3054  Z3
3040 4770  JMS  SIXTY
3041 0063  BDATA
3042 3057  Z4
3043 1104  TAD  NOTTY  /GET TTY FLAG
3044 7710  SPA  CLA  /IS THERE A TELETYPE AVAILABLE
3045 5310  JMP  ERRCC  /NO GO HALT ON ERRORS INSTEAD
3046 4767  JMS  MES
3047 0000  Z1, 0
3050 0000  Z2, 0
3051 0000  /FAIL ADR
3052 4040  4040
```

```
3053 4040      4040
3054 0000      Z3, 0
3055 0000      0 /GOOD

3056 4040      4040
3057 0000      Z4, 0
3060 0000      0 /BAD
3061 4000      4000
3062 4766* PARQRC, JMS TTS
3063 4301      JMS TN /NONE
3064 5773*      JMP STOP
3065 4765*      JMS T0 /ALL 0
3066 5300      JMP PERRC0
3067 4764*      JMS T1 /ALL 1
3070 5300      JMP PERRC0
3071 4763*      JMS T07 /0000 - 7777 WCP
3072 5300      JMP PERRC0
3073 4762*      JMS T70 /7777 - 0000 WCP
3074 5300      JMP .+4
3075 4761*      JMS T25 /2525 - 5252 WCP
3076 7410      SKP
3077 4760*      JMS T52 /5252 - 2525 WCP
3100 4757* PERRC0, JMS TCS
3101 1132      TAD [35 /NC
3102 1157      TAD [-1 /1C
3103 1151      TAD [262 /2C
3104 4756*      JMS TYPE
3105 1131      TAD [303
3106 4756*      JMS TYPE
3107 5773*      JMP STOP
```

/DATA OR CHECKERBOARD ERROR ON A NON TTY SYSTEM- ERROR INFO IN AC FOR HALTS

```
3110 1755* ERRCC, TAD ERROR0 /GET THE PROGRAM FIELD
3111 0354      AND [7 /MASK OUT FIELD BITS
3112 7402      HLT /AC=PROGRAM FIELD
3113 7200      CLA CMA
3114 1777*      TAD RETURN /GET JMS ERROR ADDRESS
3115 7402      HLT /AC=PROGRAM LOCATION OF ERROR JMS
3116 7200      CLA
3117 1247      TAD Z1 /GET FIELD BEING TESTED
3120 0354      AND [7 /MASK OUT FIELD BITS
3121 7402      HLT /AC=FIELD BEING TESTED BITS 9-11
3122 7200      CLA
3123 1046      TAD TSTAD
3124 7402      HLT /AC=FAILING ADDRESS IN FIELD BEING TESTED
3125 7200      CLA
3126 1042      TAD GOATA /GET THE GOOD DATA
3127 7402      HLT /AC=THE GOOD DATA
3130 7200      CLA
3131 1063      TAD BDATA /GET THE DATA READ
3132 7402      HLT /AC=THE BAD DATA
3133 7200      CLA
```

```
3134 4766* JMS TTS /GET THE PATTERN BEING TESTED
3135 1753* PATERR, TAD TSNUM /GET THE PATTERN
3136 7402      HLT /AC=PATTERN NUMBER
3137 7200      CLA
3140 5773*      JMP STOP /GO CHECK FOR HALT AFTER ERROR
```

/ /
/TYPEOUT TEST BEING EXECUTED

```
3141 0000      TN, 0
3142 4767*      JMS MES
3143 1617      TEXT "NO PATTERN"
3144 4020
3145 0124
3146 2405
3147 2216
3150 0000
3151 5741      JMP I TN
```

```
3153 3750
3154 0007
3155 2640
3156 2517
3157 3706
3160 3264
3161 3250
3162 3234
3163 3220
3164 3210
3165 3200
3166 3725
3167 2440
3170 2400
3171 2601
3172 4200
3173 2647
3174 2605
3175 2646
3176 3025
3177 2600
3200      PAGE
```

```
3200 0020      T0, 0
3201 4777*      JMS MES
3202 0114      TEXT "ALL 0 - "
3203 1440
3204 6040
3205 5540
3206 0000
3207 5600      JMP I T0
```

```
3210 0000 T1, 0
3211 4777' JMS MES
3212 0114 TEXT "ALL 1 - "
3213 1440
3214 6140
3215 5540
3216 0000
3217 5610 JMP I T1

3220 0000 T07, 0
3221 4777' JMS MES
3222 6060 TEXT "0000-7777 WCP - "
3223 6060
3224 5567
3225 6767
3226 6740
3227 2703
3230 2040
3231 5540
3232 0000
3233 5620 JMP I T07
3234 0000 T70, 0
3235 4777' JMS MES
3236 6767 TEXT "7777-0000 WCP - "
3237 6767
3240 5560
3241 6060
3242 6040
3243 2703
3244 2040
3245 5540
3246 0000
3247 5634 JMP I T70

3250 0000 T25, 0
3251 4777' JMS MES
3252 6265 TEXT "2525-5252 WCP - "
3253 6265
3254 5565
3255 6265
3256 6240
3257 2703
3260 2040
3261 5540
3262 0000
3263 5650 JMP I T25

3264 0000 T52, 0
3265 4777' JMS MES
3266 6562 TEXT "5252-2525 WCP - "
3267 6562
3270 5562
3271 6562
3272 6540
3273 2703
```

```
3274 2040
3275 5540
3276 0000
3277 5664 JMP I T52

/
/PARITY ERROR
/
3300 7200 PARINT, CLA
3301 1376 TAD (INTR
3302 3775' DCA RETURN
3303 4774' JMS SIXTY
3304 0000 0
3305 3331 Z20
3306 4774' JMS SIXTY
3307 0046 TSTAD
3310 3345 Z21
3311 1104 TAD NOTTY /GET TTY FLAG
3312 7710 SPA /IS THERE A TELETYPE AVAILABLE
3313 5354 JMP PARERR /NO, GO HALT WITH ERROR INFO IN AC
3314 4777' JMS MES /PRINT HEADER
3315 4543 TEXT "X*PARITY ERR, LOC 0="
3316 2001
3317 2211
3320 2431
3321 4005
3322 2222
3323 5440
3324 1417
3325 0340
3326 6075
3327 0000
3330 4777' JMS MES
3331 0000 Z20, 0
3332 0000 0 /CONTENT OF LOC 0
3333 4040 4040
3334 2423 2423
3335 2401 2401
3336 0475 0475 /TSTAD=
3337 0000 0000
3340 6004 GTF
3341 0134 AND (7
3342 1160 TAD (260
3343 4773' JMS TYPE /TYPE DATA FIELD
3344 4777' JMS MES
3345 0000 Z21, 0
3346 0000 0 /CONTENT OF TSTAD
3347 4000 4000
3350 6104 CMP
3351 7240 STA
3352 3040 DCA HEAD1
3353 5772' JMP PARORC /TYPE PRESENT TEST
```

/PARITY ERROR ON A NON TTY SYSTEM- ERROR INFO IN THE AC FOR EACH HALT

```
3354 1000 PARERR, TAD 0 /GET THE INTERRUPTED PAC
3355 7402 HLT /AC=INTERRUPTED PC (LOCATION 0)
3356 7200 CLA
3357 6004 GTF /GET THE FLAGS
3360 0371 AND (7 /MASK TO DATA FIELD
3361 7402 HLT /AC=DATA FIELD AT TIME OF PARITY ERROR
3362 7200 CLA
3363 1046 TAD TSTAD
3364 7402 HLT /AC=ADDRESS IN FIELD BEING TESTED
3365 7200 CLA
3366 6104 CMP /CLEAR MEMORY PARITY ERROR BIT
3367 5772 JMP PARORC /GO GET PATTERN BEING TESTED
```

```
3371 0007
3372 3062
3373 2517
3374 2400
3375 2600
3376 4457
3377 2440
3400 3400
```

PAGE

/KEYBOARD INTERRUPT OCCURRED

```
3400 0000 KBINT, 0
3401 1104 TAD NOTTY /GET THE TELETYPE FLAG
3402 7700 SMA CLA /IS THERE A TELTYPE AVAILABLE
3403 5206 JMP .+3 /YES GO PRINT THE ERROR
3404 7402 HLT /NO, HLT- INTERRUPTED FROM THE KEY BOARD
3405 5216 JMP KBINTC /GO CLEAR FLAG AND CONTINUE
3406 4777 JMS MES
3407 4543 TEXT "%#INT FROM KB"
3410 1116
3411 2440
3412 0622
3413 1715
3414 4013
3415 0200
3416 6032 KBINTC, KCC
3417 7240 STA
3420 3044 DCA HEAD1
3421 5600 JMP I KBINT
```

/UNWANTED INTERRUPT OCCURRED

```
3422 1104 BADINT, TAD NOTTY /GET THE TELETYPE FLAG
3423 7700 SMA CLA /IS THERE A TELETYPE ON THE SYSTEM
3424 5227 JMP .+3 /YES GO PRINT THE MESSAGE
3425 7402 HLT /UNWANTED INTERRUPT OCCURED
3426 5247 JMP BINTC /GO CLEAR THE WORD AND CONTINUE
3427 4777 JMS MES
3430 4543 TEXT "%#UNWANTED INTERRUPT OCCURRED"
```

```
3431 2516
3432 2701
3433 1624
3434 0504
3435 4011
3436 1624
3437 0522
3440 2225
3441 2024
3442 4017
3443 0303
3444 2522
3445 2205
3446 0400
3447 6007 BINTC, CAF
3450 7240 STA
3451 3044 DCA HEAD1
3452 5776 JMP INTR
```

/SET ONLY STATUS BIT SPECIFIED

```
3453 0000 STS0, 0 /SET TS0 (ALL 0 TEST)
3454 7330 CLA STL RAR
3455 3034 DCA TS
3456 5653 JMP I STS0
3457 0000 STS1, 0 /SET TS1 (ALL 1 TEST)
3460 7332 CLA STL RTR
3461 3034 DCA TS
3462 5657 JMP I STS1
3463 0000 STS2, 0 /SET TS2 (0000 = 7777 WCP TEST)
3464 7332 CLA STL RTR
3465 7010 RAR
3466 3034 DCA TS
3467 5663 JMP I STS2

3470 0000 STS3, 0 /SET TS3 (7777 = 0000 WCP TEST)
3471 7332 CLA STL RTR
3472 7036 RTR DCA TS
3473 5670 JMP I STS3
3474 0000 STS4, 0 /SET TS4 (2525 = 5252 WCP TEST)
3475 7203 CLA IAC BSW
3476 7104 CLL RAL
3477 3034 DCA TS
3500 5674 JMP I STS4
3501 0000 STS5, 0 /SET TS5 (5252 = 2525 WCP TEST)
3502 7203 CLA IAC BSW
3503 3034 DCA TS
3504 5701 JMP I STS5

3505 0000 SCS1, 0 /SET CS1 (1 COMPLEMENT)
3506 7332 CLA STL RTR
3507 3033 DCA CS
3510 5705 JMP I SCS1
3511 0000 SCS2, 0 /SET CS2 (2 COMPLEMENTS)
```

```
3512 7332      CLA STL RTR
3513 7010      RAR
3514 3033      DCA CS
3515 5711      JMP I SCS2

/
/SET ALSO STATUS BIT SPECIFIED
/
3516 0000      SFS0, 0 /SET FS0 (DON'T TEST FIELD 0)
3517 7200      CLA
3520 1035      TAD FS
3521 7004      RAL
3522 7130      STL RAR
3523 3035      DCA FS
3524 5716      JMP I SFS0
3525 0000      SRS0, 0 /SET RS0 (DON'T RELO TO FIELD 0)
3526 7200      CLA
3527 1036      TAD RS
3530 7004      RAL
3531 7130      STL RAR
3532 3036      DCA RS
3533 5725      JMP I SRS0
3534 0000      SFS1, 0 /SET FS1 (DON'T TEST FIELD 1)
3535 7200      CLA
3536 1035      TAD FS
3537 7006      RTL
3540 7132      STL RTR
3541 3035      DCA FS

3542 5734      JMP I SFS1
3543 0000      SRS1, 0 /SET RS1 (DON'T RELO TO FIELD 1)
3544 7200      CLA
3545 1036      TAD RS
3546 7006      RTL
3547 7132      STL RTR
3550 3036      DCA RS
3551 5743      JMP I SRS1
3552 0000      SFS2, 0 /SET FS2 (DON'T TEST FIELD 2)
3553 7200      CLA
3554 1035      TAD FS
3555 7006      RTL
3556 7500      SMA
3557 1130      TAD [4000]
3560 7012      RTR
3561 3035      DCA FS
3562 5752      JMP I SFS2
3563 0000      SRS2, 0 /SET RS2 (DON'T RELO TO FIELD 2)
3564 7200      CLA
3565 1036      TAD RS
3566 7006      RTL
3567 7500      SMA
3570 1130      TAD [4000]
3571 7012      RTR
3572 3036      DCA RS
3573 5763      JMP I SRS2
3576 4457
```

3577 2440

```

3600 0000 PAGE
3601 7200 SF53, 0 /SET FS3 (DON'T TEST FIELD 3)
3602 1035 TAD FS
3603 0127 AND [7360
3604 1126 TAD [400
3605 3035 DCA FS
3606 5600 JMP I SF53
3607 0000 SRS3, 0 /SET RS3 (DON'T RELO TO FIELD 3)
3610 7200 CLA
3611 1036 TAD RS
3612 0127 AND [7360
3613 1126 TAD [400
3614 3036 DCA RS
3615 5607 JMP I SRS3
3616 0000 SF54, 0 /SET FS4 (DON'T TEST FIELD 4)
3617 7200 CLA
3620 1035 TAD FS
3621 0125 AND [7560
3622 1124 TAD [200
3623 3035 DCA FS
3624 5616 JMP I SFS4

3625 0000 SRS4, 0 /SET RS4 (DON'T RELO TO FIELD 4)
3626 7200 CLA
3627 1036 TAD RS
3630 0125 AND [7560
3631 1124 TAD [200
3632 3036 DCA RS
3633 5625 JMP I SRS4
3634 0000 SF55, 0 /SET FS5 (DON'T TEST FIELD 5)
3635 7200 CLA
3636 1035 TAD FS
3637 0123 AND [7660
3640 1122 TAD [100
3641 3035 DCA FS
3642 5634 JMP I SFS5
3643 0000 SRS5, 0 /SET RS5 (DON'T RELO TO FIELD 5)
3644 7200 CLA
3645 1036 TAD RS
3646 0123 AND [7660
3647 1122 TAD [100
3650 3036 DCA RS
3651 5643 JMP I SRS5
3652 0000 SF56, 0 /SET FS6 (DON'T TEST FIELD 6)
3653 7200 CLA
3654 1035 TAD FS
3655 0121 AND [7720
3656 1172 TAD [40
3657 3035 DCA FS
3660 5552 JMP I SFS6
3661 0000 SRS6, 0 /SET RS6 (DON'T RELO TO FIELD 6)
3662 7200 CLA

```

```

3663 1036 TAD RS
3664 0121 AND [7720
3665 1172 TAD [40
3666 3036 DCA RS
3667 5661 JMP I SRS6
3670 0000 SF57, 0 /SET FS7 (DON'T TEST FIELD 7)
3671 7200 CLA
3672 1035 TAD FS
3673 0164 AND [7740
3674 1170 TAD [20
3675 3035 DCA FS
3676 5670 JMP I SFS7
3677 0000 SRS7, 0 /SET RS7 (DON'T RELO TO FIELD 7)
3700 7200 CLA
3701 1036 TAD RS

3702 0164 AND [7740
3703 1170 TAD [20
3704 3036 DCA RS
3705 5677 JMP I SRS7

/TEST COMPLEMENT STATUS
/RETURN IF NC, RETURN+1 IF 1C, RETURN+2 IF 2C
/
3706 0000 TCS, 0
3707 7200 CLA
3710 1033 TAD CS
3711 7450 SNA
3712 5706 JMP I TCS /NC
3713 2306 ISZ TCS
3714 7106 CLL RTL
3715 7430 SZL
3716 5706 JMP I TCS /1C
3717 2306 ISZ TCS
3720 7710 SPA CLA
3721 5706 JMP I TCS /2C

/APT/ IF UNDER APT CONTROL THE NEXT LOC WILL = JMS I IAPTR.
3722 7000 APTE00, NOP /APT/
3723 4500 CBERR /CB/

/*C0*/ HLT /ERRONEOUS STATUS BITS SET
3724 5323 JMP ,=1

/TEST TEST STATUS
/RETURN IF NO TEST
/RETURN +2 IF ALL 0 TEST
/RETURN +4 IF ALL 1 TEST
/RETURN +6 IF 0000 = 7777 WCP
/RETURN +8 IF 7777 = 0000 WCP
/RETURN +10 IF 2525 = 5252 WCP
/RETURN +12 IF 5252 = 2525 WCP

```



```
3725 0000 / TTS, 0
3726 7200 CLA
3727 3350 DCA TSNUM /CLEAR PATTERN NUM FOR NON TTY SYSTEMS
3730 1034 TAD TS
3731 0120 AND I7760
3732 7450 SNA
3733 5351 JMP TTYCHK /NO TEST
3734 2350 ISZ TSNUM
3735 2325 ISZ TTS
3736 2325 ISZ TTS
3737 7104 TTS0, CLL RAL
3740 7421 MQL
3741 7430 SZL /CHECK THIS TEST BIT
3742 5351 JMP TTYCHK
3743 2350 ISZ TSNUM
3744 2325 ISZ TTS
3745 2325 ISZ TTS
3746 7521 SWP
3747 5337 JMP TTS0 /CHECK NEXT TEST BIT

3750 0000 TSNUM, 0

3751 7200 TTYCHK, CLA
3752 1104 TAD NOTTY /GET PROGRAM FLAG
3753 7710 SPA CLA /WAS THERE A TELETYPE AVAILABLE
3754 5777 JMP PATERR /NO, GO HALT ON ERROR
3755 5725 JMP I TTS /RETURN TO ERROR PRINTOUT

3777 3135
4000 PAGE
```

```
/
/TEST FIELD STATUS
/RETURN IF FIELD STATUS BIT SET (DON'T TEST FIELD)
/RETURN +1 IF FIELD STATUS BIT RESET (TEST THIS FIELD)
/
```

```
4000 0000 TFS0, 0
4001 7200 CLA
4002 1035 TAD FS
4003 7700 SMA CLA /FIELD 0
4004 2200 ISZ TFS0
4005 5600 JMP I TFS0

4006 0000 TFS1, 0
4007 7200 CLA
4010 1035 TAD FS
4011 7004 RAL
4012 7700 SMA CLA /FIELD 1
4013 2200 ISZ TFS1
4014 5600 JMP I TFS1

4015 0000 TFS2, 0
```

```
4016 7200 CLA
4017 1035 TAD FS
4020 7006 RTL
4021 7700 SMA CLA /FIELD 2
4022 2215 ISZ TFS2
4023 5615 JMP I TFS2

4024 0000 TFS3, 0
4025 7200 CLA
4026 1035 TAD FS
4027 7006 RTL
4030 7004 RAL
4031 7700 SMA CLA /FIELD 3
4032 2224 ISZ TFS3
4033 5624 JMP I TFS3

4034 0000 TFS4, 0
4035 7200 CLA
4036 1035 TAD FS
4037 7006 RTL
4040 7006 RTL
4041 7700 SMA CLA /FIELD 4
4042 2234 ISZ TFS4
4043 5634 JMP I TFS4
4044 0000 TFS5, 0
4045 7200 CLA
4046 1035 TAD FS
4047 7002 BSW
4050 7010 RAR
4051 7620 SNL CLA /FIELD 5
4052 2244 ISZ TFS5
4053 5644 JMP I TFS5

4054 0000 TFS6, 0
4055 7200 CLA
4056 1035 TAD FS
4057 7002 BSW
4060 7700 SMA CLA /FIELD 6
4061 2254 ISZ TFS6
4062 5654 JMP I TFS6

4063 0000 TFS7, 0
4064 7200 CLA
4065 1035 TAD FS
4066 7002 BSW
4067 7004 RAL
4070 7700 SMA CLA /FIELD 7
4071 2263 ISZ TFS7
4072 5663 JMP I TFS7
```

```
/
/TEST RELOCATION STATUS
/RETURN IF RELO STATUS BIT SET (DON'T RELO TO FIELD)
/RETURN+1 IF RELO STATUS BIT RESET (RELO TO THIS FIELD)
```

```

/
4073 0000   TRS0, 0
4074 7200     CLA
4075 1036     TAD      RS
4076 7700     SMA CLA
4077 2273     ISZ      TRS0   /FIELD 0
4100 5673     JMP I      TRS0

4101 0000   TRS1, 0
4102 7200     CLA
4103 1036     TAD      RS
4104 7004     RAL
4105 7700     SMA CLA
4106 2301     ISZ      TRS1   /FIELD 1
4107 5701     JMP I      TRS1

4110 0000   TRS2, 0
4111 7200     CLA
4112 1036     TAD      RS
4113 7006     RTL
4114 7700     SMA CLA
4115 2310     ISZ      TRS2   /FIELD 2
4116 5710     JMP I      TRS2

4117 0000   TRS3, 0
4120 7200     CLA
4121 1036     TAD      RS
4122 7004     RAL
4123 7006     RTL
4124 7700     SMA CLA
4125 2317     ISZ      TRS3   /FIELD 3
4126 5717     JMP I      TRS3

4127 0000   TRS4, 0
4130 7200     CLA
4131 1036     TAD      RS
4132 7006     RTL
4133 7006     RTL
4134 7700     SMA CLA
4135 2327     ISZ      TRS4   /FIELD 4
4136 5727     JMP I      TRS4

/*C0*/ PAGE

4137 0000   TRS5, 0
4140 7200     CLA
4141 1036     TAD      RS
4142 7002     BSW
4143 7010     RAR
4144 7620     SNL CLA
4145 2337     ISZ      TRS5   /FIELD 5
4146 5737     JMP I      TRS5

4147 0000   TRS6, 0

```

```

4150 7200     CLA
4151 1036     TAD      RS
4152 7002     BSW
4153 7700     SMA CLA
4154 2347     ISZ      TRS6   /FIELD 6
4155 5747     JMP I      TRS6

4156 0000   TRS7, 0
4157 7200     CLA
4160 1036     TAD      RS
4161 7002     BSW
4162 7004     RAL
4163 7700     SMA CLA
4164 2356     ISZ      TRS7   /FIELD 7
4165 5756     JMP I      TRS7

4200 PAGE   /C0/

/
/TYPEOUT ERROR HEADING
/
4200 0000   ERRMD, 0
4201 1104     TAD      NOTTY   /GET TTY FLAG
4202 7710     SPA      CLA
4203 5600     JMP I      ERRMD   /NO TELETYPE AVAILABLE DON'T PRINT
4204 4777     JMS      MES
4205 4543     TEXT      "XPR LOC FAIL AOR GOOD BAD PATTERN"
4206 2022
4207 4014
4210 1703
4211 4040
4212 0601
4213 1114
4214 4001
4215 0422
4216 4040
4217 0717
4220 1704
4221 4040
4222 0201
4223 0440
4224 4020
4225 0124
4226 2405
4227 2216
4230 0000
4231 5600     JMP I      ERRMD

/
/TYPEOUT PROGRAM TITLE
/
4232 0000   TITLE, 0
4233 1104     TAD      NOTTY   /GET TTY FLAG
4234 7710     SPA      CLA      /TTY AVAILABLE ?

```

```
4235 5632      JMP I  TITLE      /NO, ABORT MESSAGE
4236 4777'     JMS  MES
4237 4543      TEXT  "###PDP-8E EXT MEM DATA & CHKBD#"
4240 4320
4241 0420
4242 5570
4243 0540
4244 0530
4245 2440
4246 1505
4247 1540
4250 0401
4251 2401
4252 4046
4253 4003
4254 1013
4255 0204
4256 4300
4257 5632      JMP I  TITLE

/
/TYPEOUT TO SET SWITCHES
/
4260 0000      SETSW, 0
4261 1104      TAD  NOTTY      /GET TTY FLAG
4262 7710      SPA  CLA        /IS THERE A TTY AVAILABLE
4263 5277      JMP  PNOREL-3    /NO GO CHECK FOR HALT FOR SR SETTING
4264 4777'     JMS  MES
4265 4543      TEXT  "X#SETUP SR & CONTX#"
4266 2305
4267 2425
4270 2040
4271 2322
4272 4046
4273 4003
4274 1716
4275 2445
4276 4300
4277 4503      /*C8*/ C8PAUS      /C8/
                     HLT
4300 4473      C8SWIT      /GO GET VALUE OF S.R. IF ON CLB
4301 5660      JMP I  SETSW

/
/TYPEOUT "NO RELOCATION"
/
4302 0000      PNOREL, 0
4303 1104      TAD  NOTTY      /GET TTY FLAG
4304 7710      SPA  CLA        /IS THERE A TTY ON SYSTEM
4305 5702      JMP  I  PNOREL    /NO, GO RUN TEST
4306 4777'     JMS  MES
4307 4543      TEXT  "X#NO RELOCATION, PROG IN FIELD "
4310 1617
```

```
4311 4022
4312 0514
4313 1703
4314 0124
4315 1117
4316 1654
4317 4020
4320 2217
4321 0740
4322 1116
4323 4006
4324 1105
4325 1404
4326 4000
4327 6224      RIF
4330 7106      CLL RTL
4331 7004      RAL
4332 1117      TAD  I6000
4333 3335      DCA  Z8
4334 4777'     JMS  MES
4335 0000      Z8, 0
4336 7240      STA
4337 3044      OCA  HEAD1
4340 5702      JMP I  PNOREL

/*C8*/ PAGE
/
/TYPEOUT "RELOCATION"
/
4341 0000      PREL, 0
4342 1104      TAD  NOTTY      /GET TELETYPE FLAG
4343 7710      SPA  CLA        /PRINT MESSAGE ?
4344 5741      JMP  I  PREL      /NO TTY - DO NOT PRINT
4345 4777'     JMS  MES
4346 4543      TEXT  "X#PROG WILL RELOCATE"
4347 2022
4350 1707
4351 4027
4352 1114
4353 1440
4354 2205
4355 1417
4356 0301
4357 2405
4360 0000
4361 7240      STA
4362 3044      DCA  HEAD1
4363 5741      JMP I  PREL

4377 2440
4400 4400      PAGE

/C8/
/
```

```

/TYPEOUT "NONE" FOR NO LEGAL FIELD SELECTION
/
4400 1104 NOFLD, TAD NOTTY /GET THE TTY FLAG
4401 7710 SPA CLA /WAS IT SET
4402 5777* JMP PATA /YES NO TELETYPE DO NOT PRINT
4403 4776* JMS MES
4404 1617 TEXT "NONE"
4405 1605
4406 0000
4407 5777* JMP PATA /SETUP SWITCHES AGAIN

```

```

/RELOCATE THE PROGRAM
/
4410 0000 RELO, 0
4411 7200 CLA
4412 3042 DCA COUNT /CLEAR ERROR COUNTER
4413 3043 DCA MOVE /CLEAR MOVE COUNTER
4414 1176 TAD [6201
4415 1040 TAD PROFLO
4416 3227 DCA RELO2
4417 1176 TAD [6201
4420 1041 TAD TSTFLD
4421 3231 DCA RELO3
4422 1227 TAD RELO2
4423 3234 DCA RELO4
4424 1116 TAD [6203
4425 1041 TAD TSTFLD
4426 3245 DCA RELO5
4427 6201 RELO2, COF 0 /MOVE FROM DF
4430 1443 TAD I MOVE /MOVE TO DF
4431 6201 RELO3, COF 0
4432 3443 DCA I MOVE
4433 1443 TAD I MOVE
4434 6201 RELO4, COF 0 /MOVE FROM DF
4435 7041 CIA
4436 1443 TAD I MOVE
4437 7640 SZA CLA
4440 4775* JMS ERRM /MOVE ERROR
4441 2043 ISZ MOVE
4442 5227 JMP RELO2
4443 1042 TAD COUNT
4444 7650 SNA CLA /SKIP IF MOVE ERROR
4445 6203 RELO5, COI 0 /NEW PROGRAM FIELD
4446 5610 JMP I RELO

```

```

/INTERRUPT ROUTINE
/
4447 4301 INTROU, JMS SAVINT
4450 6107 SPO
4451 5254 JMP .+3 /SKIP IF PARITY OPTION
4452 6101 SMP

```

```

4453 5774* JMP PARINT /PARITY ERROR
4454 6031 KSF
4455 5773* JMP BADINT /UNWANTED INTERRUPT
4456 4772* JMS KBINT /KEYBOARD INTERRUPT
4457 4771* INTR, JMS RESINT
4460 7200 CLA
4461 1065 TAD SMQ
4462 7421 MQL /RESTORE MQ
4463 6004 GTF
4464 6005 RTF
4465 7200 CLA
4466 1064 TAD SAC /RESTORE AC
4467 5400 JMP I 0

```

```

/TURN INTERRUPT ON IF FIELD 0 AND PARITY OPTION INSTALLED
/
4470 0000 PAR, 0
4471 7300 CLA CLL
4472 6007 CAF
4473 6107 SPO /SKIP ON PARITY OPTION
4474 5670 JMP I PAR
4475 6224 RIF
4476 7650 SNA CLA /SKIP IF NOT FIELD 0
4477 6001 ION
4480 5670 JMP I PAR
4501 0000 /*CB*/ PAGE
4502 7200 SAVINT, 0
4503 1770* CLA
4504 3336 TAD SIXTY
4505 1767* DCA A1
4506 3337 DCA A2
4507 1766* TAD S0
4510 3340 DCA A3
4511 1765* TAD S1
4512 3341 DCA A4
4513 1764* TAD S2
4514 3342 DCA A5
4515 1776* TAD MES
4516 3343 DCA A6
4517 1763* TAD TYPCH
4520 3344 DCA A7
4521 1762* TAD M0
4522 3345 DCA A8
4523 1761* TAD TYPE
4524 3346 DCA A9
4525 1760* TAD TYPSP
4526 3347 DCA A10
4527 1757* TAD RETURN
4530 3350 DCA A11
4531 1756* TAD ERROR0
4532 3351 DCA A12
4533 1755* TAD ERROR1

```

4534	3352	DCA	A13	
4535	5754	JMP	C00000	/C0/
4536	0000	A1,	0	/C0/
4537	0000	A2,	0	/C0/
4540	0000	A3,	0	/C0/
4541	0000	A4,	0	/C0/
4542	0000	A5,	0	/C0/
4543	0000	A6,	0	/C0/
4544	0000	A7,	0	/C0/
4545	0000	A8,	0	/C0/
4546	0000	A9,	0	/C0/
4547	0000	A10,	0	/C0/
4550	0000	A11,	0	/C0/
4551	0000	A12,	0	/C0/
4552	0000	A13,	0	/C0/
4554	4600			
4555	2641			
4556	2640			
4557	2600			
4560	2532			
4561	2517			
4562	2516			
4563	2463			
4564	2437			
4565	2436			
4566	2435			
4567	2422			
4570	2400			
4571	4632			
4572	3400			
4573	3422			
4574	3300			
4575	2663			
4576	2440			
4577	0205			
	4600	PAGE		/C0/
		C00000,		/C0/
4600	1777	TAD	ERROR1+1	
4601	3315	DCA	A14	
4602	1776	TAD	ADDER	
4603	3316	DCA	A15	
4604	1775	TAD	TN	
4605	3317	DCA	A16	
4606	1774	TAD	T0	
4607	3520	DCA	A17	
4610	1773	TAD	T1	
4611	3321	DCA	A18	
4612	1772	TAD	T07	
4613	3322	DCA	A19	

4614	1771	TAD	T70	
4615	3323	DCA	A20	
4616	1770	TAD	T25	
4617	3324	DCA	A21	
4620	1767	TAD	T52	
4621	3325	DCA	A22	
4622	1766	TAD	T05	
4623	3326	DCA	A23	
4624	1765	TAD	T73	
4625	3327	DCA	A24	
4626	1764	TAD	SAVINT	/C0/
4627	3231	DCA	C00001	/C0/
4630	5631	JMP I	C00001	/C0/
4631	0000	C00001, 0		/C0/
4632	0000	/*C0*/	JMP I	SAVINT
4633	7200	RESINT,	0	
4634	1763	CLA		
4635	3762	TAD	A1	
4636	1761	DCA	SIXTY	
4637	3760	TAD	A2	
4640	1757	DCA	CNV	
4641	3756	TAD	A3	
4642	1755	DCA	S0	
4643	3754	TAD	A4	
4644	1753	DCA	S1	
4645	3752	TAD	A5	
4646	1751	DCA	S2	
4647	3750	TAD	A6	
4650	1747	DCA	MES	
4651	3746	TAD	A7	
4652	1745	DCA	TYPCH	
4653	3744	TAD	A8	
4654	1743	DCA	M0	
4655	3742	TAD	A9	
4656	1741	DCA	TYPE	
4657	3740	TAD	A10	
4660	1737	DCA	TYPSP	
4661	3736	TAD	A11	
4662	1735	DCA	RETURN	
4663	3734	TAD	A12	
4664	1733	DCA	ERROR0	
4665	3732	TAD	A13	
4666	1315	DCA	ERROR1	
4667	3777	TAD	A14	
4670	1316	DCA	ERROR1+1	
4671	3776	TAD	A15	
4672	1317	DCA	ADDER	
4673	3775	TAD	A16	
		DCA	TN	

```
4674 1320      TAD      A17
4675 3774      DCA      T0
4676 1321      TAD      A18
4677 3773      DCA      T1
4700 1322      TAD      A19
4701 3772      DCA      T07
4702 1323      TAD      A20
4703 3771      DCA      T70
4704 1324      TAD      A21
4705 3770      DCA      T25
4706 1325      TAD      A22
4707 3767      DCA      T52
4710 1326      TAD      A23
4711 3766      DCA      TCS
4712 1327      TAD      A24
4713 3765      DCA      TTS
4714 5632      JMP I    RESINT

4715 0000      A14,    0      /C8/
4716 0000      A15,    0      /C8/
4717 0000      A16,    0      /C8/
4720 0000      A17,    0      /C8/
4721 0000      A18,    0      /C8/
4722 0000      A19,    0      /C8/
4723 0000      A20,    0      /C8/
4724 0000      A21,    0      /C8/
4725 0000      A22,    0      /C8/
4726 0000      A23,    0      /C8/
4727 0000      A24,    0      /C8/
```

```
4732 2641
4733 4552
4734 2640
4735 4551
4736 2600
4737 4550
4740 2532
4741 4547
4742 2517
4743 4546
4744 2516
4745 4545
4746 2463
4747 4544
4750 2440
4751 4543
4752 2437
4753 4542
4754 2436
4755 4541
4756 2435
4757 4540
4760 2422
4761 4537
```

```
4762 2400
4763 4536
4764 4501
4765 3725
4766 3706
4767 3244
4770 3250
4771 3234
4772 3220
4773 3210
4774 3200
4775 3141
4776 2646
4777 2642
6200          *6200          /C8/

/*C8*/*6000
6200 4777      LOOP1, JMS      SAVDF
6201 1104      TAD          NOTTY      /GET THE TELETYPE FLAG
6202 7710      SPA          CLA          /IS THERE ON ON THE SYSTEM
6203 5223      JMP          LOOP1A-1    /NO ABORT MESSAGE AND GALT
6204 4776      JMS          MES
6205 4543      TEXT        "%LOOP ON ADDRESS SET IN SR"
6206 1417
6207 1720
6210 4017
6211 1640
6212 0104
6213 0422
6214 0523
6215 2340
6216 2305
6217 2440
6220 1116
6221 4023
6222 2200
6223 4775      JMS          RESDF
6224 4405      LOOP1A, LAS
6225 3235      DCA          SR
6226 1635      TAD I       SR
6227 7040      CMA
6230 3635      DCA I       SR
6231 1635      TAD I       SR
6232 7040      CMA
6233 3635      DCA I       SR
6234 5224      JMP          LOOP1A
6235 0000      SR,        0

/
/TYPEOUT "PROGRAM IN SELECTED FIELD"
/

6236 1104      PINF,      TAD          NOTTY      /GET THE TELETYPE PROGRAM FLAG
6237 7710      SPA          CLA          /IS THERE A TELETYPE AVAILABLE
```

```
6240 5774'      JMP      PATA      /NO TTY- DO NOT PRINT
6241 4776'      JMS      MES        /GO PRINT MESSAGE
6242 4543      TEXT      "%PROGRAM IN SELECTED FIELD"
6243 2022
6244 1707
6245 2201
6246 1540
6247 1116
6250 4023
6251 0514
6252 0503
6253 2405
6254 0440
6255 0611
6256 0514
6257 0400
6260 5774'      JMP      PATA      /GO SETUP SWITCHES AGAIN

      /C8/      ROUTINE TO SAVE PAGE 37 OF FIELD 7

6261 0000      C8SM, 0
6262 7200      CLA
6263 6224      RIF
6264 1373      TAD      (6201      /GET THE INSTRUCTION FIELD
6265 3274      DCA      C8SM0      /ADD CDF TO IT
6266 1372      TAD      (7577      /SAVE IT
6267 3010      DCA      10
6270 1371      TAD      (C8SA-1
6271 3011      DCA      11
6272 6211      C8SM1, CDF      10
6273 1410      TAD      I      10
6274 6201      C8SM0, CDF
6275 3411      DCA      I      11
6276 1010      TAD      10
6277 7040      CMA
6300 7640      STA      CLA
6301 5272      JMP      C8SM1
6302 1020      TAD      PSR
6303 0370      AND      (7700
6304 1367      TAD      (7
6305 3020      DCA      PSR
6306 5601      JMP      I      C8SM

6367 0007
6370 7700
6371 7177
6372 7577
6373 6201
6374 0205
6375 7075
6376 2440
6377 7063
6400          *6400          /C8/
```

```
      /*C8*/ *6200
6400 4777'      LOOP2, JMS      SAVDF
6401 1104      TAD      NOTTY      /GET TELETYPE STATUS
6402 7710      SPA      CLA        /IS THERE ONE ON THE SYSTEM
6403 5234      JMP      LOOP2A-2    /NO ABORT MESSAGE AND HALT FOR INFO
6404 4776'      JMS      MES
6405 4543      TEXT      "%LOOP ONLY THE 2 ADDRESSES INPUT FROM THE SR"
6406 1417
6407 1720
6410 4017
6411 1614
6412 3140
6413 2410
6414 0540
6415 6240
6416 0104
6417 0422
6420 0523
6421 2305
6422 2340
6423 1116
6424 2025
6425 2440
6426 0622
6427 1715
6430 4024
6431 1005
6432 4023
6433 2200
6434 4245      JMS      IN12
6435 4775      JMS      RESDF
6436 1727      LOOP2A, TAD      I      FIRST
6437 7040      CMA
6440 3727      DCA      I      FIRST
6441 1730      TAD      I      SECOND
6442 7040      CMA
6443 3730      DCA      I      SECOND
6444 5236      JMP      LOOP2A
6445 0000      IN12, 0
6446 1104      TAD      NOTTY      /GET TELETYPE FLAG
6447 7710      SPA      CLA        /IS THERE ONE ON THE SYSTEM
6450 5273      JMP      ,+23      /NO-ABORT MESSAGE AND HALT FOR INFO
6451 4776'      JMS      MES
6452 4543      TEXT      "%SET SR TO FIRST ADDRESS & CONT"
6453 2305
6454 2440
6455 2322
6456 4024
6457 1740
6460 0611
6461 2223
6462 2440
6463 0104
6464 0422
6465 0523
```

6466 2340
6467 4640
6470 0317
6471 1624
6472 0000

6473 4503

C8PAUS

/C8/

6474 4405
6475 3327
6476 1104
6477 7710
6500 5323
6501 4776*
6502 4543
6503 2305
6504 2440
6505 2322
6506 4024
6507 1740
6510 2305
6511 0317
6512 1604
6513 4001
6514 0404
6515 2205
6516 2323
6517 4046
6520 4003
6521 1716
6522 2420

/*C8*/

HLT
LAS
DCA FIRST
TAD NOTTY /GET FLAG STATUS AGAIN
SPA CLA /TELETYPE AVAILABLE?
JMP FIRST-4 /NO-ABORT MESSAGE AND HALT FOR INFO
JMS MES
TEXT "X#SET SR TO SECOND ADDRESS & CONT"

6523 4503

C8PAUS

/C8/

6524 4405
6525 1330
6526 5645
6527 0000
6530 0000

/*C8*/

HLT
LAS
DCA SECOND
JMP I IN12
FIRST, 0
SECOND, 0

6575 7075
6576 2440
6577 7063
6600

*6600

/C8/

6600 4777*
6601 1104
6602 7710
6603 5234
6604 4776*
6605 4543
6606 1417

/*C8*/

LOOP3, JMS SAVDF
TAD NOTTY /GET THE TELETYPE STATUS
SPA CLA /IS THERE A TELETYPE AVAILABLE?
JMP LOOP3A-6 /NO-ABORT MESSAGE AND HALT FOR INFO
JMS MES
TEXT "X*LOOP FROM FIRST ADDRESS THRU SECOND ADDRESS"

6607 1720
6610 4006
6611 2217
6612 1540
6613 0611
6614 2223
6615 2440
6616 0104
6617 0422
6620 0523
6621 2340
6622 2410
6623 2225
6624 4023
6625 0503
6626 1716
6627 0440
6630 0104
6631 0422
6632 0523
6633 2300
6634 4775*
6635 1774*
6636 3264
6637 1773*
6640 3265
6641 4772*
6642 1264
6643 3263
6644 1663
6645 7040
6646 3663
6647 1663
6650 7040
6651 3663
6652 1263
6653 7041
6654 1265
6655 7650
6656 5242
6657 2263
6660 5244

JMS

IN12

TAD

FIRST

DCA

SRL1

TAD

SECOND

DCA

SRL2

JMS

RESOF

LOOP3A, TAD

SRL1

DCA

SRL

LOOP3B, TAD I

SRL

CMA

SRL

DCA I

SRL

TAD I

SRL

CMA

SRL

DCA I

SRL

TAD

SRL

CIA

SRL2

TAD

SRL2

SNA CLA

LOOP3A

JMP

SRL

ISZ

LOOP3B

JMP

LOOP3B

6661 4500

C8ERR

/C8/

6662 5200
6663 0000
6664 0000
6665 0000
6700

/*C8*/

HLT
JMP LOOP3
SRL, 0
SRL1, 0
SRL2, 0
*6700

/C8/

6700 4777*
6701 1104

/*C8*/

LOOP5, JMS SAVDF
TAD NOTTY

/HALT RESULTED FROM ILLEGAL LIMITS
/GET TTY FLAG


```
6702 7710 SPA CLA /IS THERE A TELETYPE AVAILABLE
6703 5336 JMP LOOP5A-6 /NO-ABORT MESSAGE AND HALT FOR INFO
6704 4776 JMS MES
6705 4543 TEXT "X#LOOP DATA IN THE SR THRU THE ADDRESS SELECTION"
6706 1417
6707 1720
6710 4004
6711 0124
6712 0140
6713 1116
6714 4024
6715 1005
6716 4023
6717 2240
6720 2410
6721 2225
6722 4024
6723 1005
6724 4001
6725 0404
6726 2205
6727 2323
6730 4023
6731 0514
6732 0503
6733 2411
6734 1716
6735 0000
6736 4775 JMS IN12
6737 1774 TAD FIRST
6740 3363 OCA SR5A
6741 1773 TAD SECOND
6742 3364 OCA SR5B
6743 4772 JMS RESDF
6744 1363 LOOP5A, TAD SR5A
6745 3365 OCA SR5C
6746 4405 LOOP5B, LAS
6747 3765 OCA I SR5C
6750 1765 TAD I SR5C
6751 3765 OCA I SR5C
6752 1365 TAD SR5C
6753 7041 CIA
6754 1364 TAD SR5B
6755 7650 SNA CLA
6756 5344 JMP LOOP5A /START AGAIN WITH FIRST ADDRESS
6757 2365 ISZ SR5C
6760 5346 JMP LOOP5B /DO NEXT ADDRESS
6761 4500 CBERR /CB/
6762 5300 /*CB*/ HLT /HALT RESULTED FROM ILLEGAL LIMITS
6763 0000 SR5A, 0 JMP LOOP5
6764 0000 SR5B, 0
6765 0000 SR5C, 0 /FIRST ADDRESS OF GROUP
/ LAST ADDRESS OF GROUP
/ ADDRESS COUNTER
```

```
6772 7075
6773 6530
6774 6527
6775 6445
6776 2440
6777 7063
7000 7000 *7000 /CB/
/*CB*/ /*6600
LOOP4, JMS SAVDF
7001 1104 TAD NOTTY /GET TTY STATUS
7002 7710 SPA CLA /IS THERE ONE ON THE SYSTEM
7003 5252 JMP LOOP4A-4 /NO-ABORT MESSAGE AND HALT FOR INFO
7004 4777 JMS MES
7005 4543 TEXT "X#LOOP DATA IN THE SR ON THE INPUT ADDRESS"
7006 1417
7007 1720
7010 4004
7011 0124
7012 0140
7013 1116
7014 4024
7015 1005
7016 4023
7017 2240
7020 1716
7021 4024
7022 1005
7023 4011
7024 1620
7025 2524
7026 4001
7027 0404
7030 2205
7031 2323
7032 0000
7033 4777 JMS MES
7034 4543 TEXT "X#SET SR TO ADDRESS & CONT"
7035 2305
7036 2440
7037 2322
7040 4024
7041 1740
7042 0104
7043 0422
7044 0523
7045 2340
7046 4640
7047 0317
7050 1624
7051 0000
7052 4503 CBPAUS /CB/
```

```

7053 4405 /*C8*/ HLT
7054 3262 LAS
7055 4275 DCA SR4
7056 4405 JMS RESDF /*RESTORE DATA FIELD TO NEW
7057 3662 LOOP4A, LAS
7060 1662 DCA I SR4
7061 5256 TAD I SR4
7062 0000 JMP LOOP4A
7063 0000 SR4, 0
7064 7200 SAVDF, 0
7065 6214 CLA
7066 3274 RDF
7067 6224 DCA SAVE
7070 1176 RIF
7071 3272 TAD [6201
7072 6201 DCA .+1
7073 5663 CDF 00 /*PROGRAM DF
7074 0000 JMP I SAVDF
7075 0000 SAVE, 0
7076 1274 RESDF, 0
7077 1176 TAD SAVE
7100 3301 TAD [6201
7101 6201 DCA .+1
7102 5675 CDF 00 /*LOOP DF
7102 5675 JMP I RESDF

/*C8*/*7000
/*C8*/LOOPS, JMS SAVDF
/*C8*/ JMS MES
/*C8*/ TEXT "%LOOP DATA IN THE SR THRU THE ADDRESS SELECTION"
/*C8*/ JMS IN12
/*C8*/ TAD FIRST
/*C8*/ DCA SR5A
/*C8*/ TAD SECONO
/*C8*/ DCA SR5B
/*C8*/ JMS RESDF
/*C8*/LOOPS, TAD SR5A
/*C8*/ DCA SR5C
/*C8*/LOOPS, LAS
/*C8*/ DCA I SR5C
/*C8*/ TAD I SR5C
/*C8*/ DCA I SR5C
/*C8*/ TAD SR5C
/*C8*/ CIA
/*C8*/ TAD SR5B
/*C8*/ SNA CLA
/*C8*/ JMP LOOPS
/*C8*/ ISZ SR5C
/*C8*/ JMP LOOPS
/*C8*/ HLT
/*C8*/ JMP LOOPS
/*C8*/SR5A, 0 /*FIRST ADDRESS OF GROUP
/*C8*/SR5B, 0 /*LAST ADDRESS OF GROUP
/*C8*/SR5C, 0 /*ADDRESS COUNTER

```

```

7177 2440
7200 7200 *7200 /*APT/

/C8/ IF THE PROGRAM IS RUN UNDER CLASSIC 8 CONTROL THEN THIS PAGE
/C8/ WILL BE USED TO STORE THE CONTENTS OF PAGE 37, FIELD 1.

C8SA, /*C8/

/APT/ ROUTINE TO INITIALIZE FOR RUNNING UNDER APT CONTROL.

7200 0000 APTIZ1, 0 /*APT/
7201 1777* TAD APTIZ /*APT/PRESERVE RETURN POINTER.
7202 3200 DCA APTIZ1 /*APT/
7203 4776* JMS APTFL /*APT/GO GET FIELD LIMITS.
7204 7200 CLA /*APT/
7205 1022 TAD HCN2 /*APT/RUN UNDER APT CONTROL?
7206 7700 SNA CLA /*APT/SKP IF YES.
7207 5274 JMP APTIZ0 /*APT/
7210 1375 TAD [7000 /*APT/MODIFY SOME LOCS TO: NOP.
7211 3770* DCA APTN00 /*APT/
7212 1375 TAD [7000 /*APT/
7213 3773* DCA APTN02 /*APT/
7214 1375 TAD [7000 /*APT/
7215 3772* DCA APTN03 /*APT/
7216 1375 TAD [7000 /*APT/
7217 3771* DCA APTN04 /*APT/
7220 1375 TAD [7000 /*APT/
7221 3770* DCA APTN05 /*APT/
7222 1375 TAD [7000 /*APT/
7223 3767* DCA APTN06 /*APT/
7224 1366 TAD (APTJ50 /*APT/MODIFY SOME LOCS TO: JMP .+N.
7225 0365 AND [177 /*APT/
7226 1364 TAD [5200 /*APT/
7227 3763* DCA APTJ00 /*APT/
7230 1362 TAD (APTJ51 /*APT/
7231 0365 AND [177 /*APT/
7232 1364 TAD [5200 /*APT/
7233 3761* DCA APTJ01 /*APT/
7234 1360 TAD (APTJ52 /*APT/
7235 0365 AND [177 /*APT/
7236 1364 TAD [5200 /*APT/
7237 3737* DCA APTJ02 /*APT/
7240 1356 TAD (APTJ53 /*APT/
7241 0365 AND [177 /*APT/
7242 1364 TAD [5200 /*APT/
7243 3735* DCA APTJ03 /*APT/
7244 1354 TAD (APTJ54 /*APT/
7245 0365 AND [177 /*APT/
7246 1364 TAD [5200 /*APT/
7247 3733* DCA APTJ04 /*APT/

```

7250	1352	TAD	(IAPTER	/APT/MODIFY SOME LOCS TO: JMS I IAPTER.
7251	0365	AND	(177	/APT/
7252	1351	TAD	(4400	/APT/
7253	3750*	DCA	APTE00	/APT/
7254	1750*	TAD	APTE00	/APT/
7255	3747*	DCA	APTE01	/APT/
7256	1750*	TAD	APTE00	/APT/
7257	3746*	DCA	APTE02	/APT/
7260	1750*	TAD	APTE00	/APT/
7261	3745*	DCA	APTE03	/APT/
7262	1750*	TAD	APTE00	/APT/
7263	3744*	DCA	APTE04	/APT/
7264	1750*	TAD	APTE00	/APT/
7265	3743*	DCA	APTE05	/APT/
7266	1750*	TAD	APTE00	/APT/
7267	3742*	DCA	APTE06	/APT/
7270	1750*	TAD	APTE00	/APT/
7271	3741*	DCA	APTE07	/APT/
7272	1750*	TAD	APTE00	/APT/
7273	3740*	DCA	APTE08	/APT/

7274 5600 APTIZ0, JMP I APTIZ1 /APT/RTN TO CALL+1.
 /APT/ ROUTINE TO HANDLE ERRORS UNDER APT CONTROL.

7275	0000	APTER,	0	/APT/
7276	6002	IOF		/APT/
7277	7200	CLA		/APT/
7300	6224	RIF		/APT/
7301	1337	TAD	(6201	/APT/CREATE A CDF INST.
7302	3305	DCA	,+3	/APT/MODIFY NEXT CDF INST.
7303	7240	CLA	CMA	/APT/
7304	1275	TAD	APTER	/APT/AC=ERROR PC.
7305	6201	COF		/APT/(MODIFIED COF) DF=IF.
7306	6272	CIF	70	/APT/IF=FIELD 7.
7307	5736*	JMP	6520	/APT/CALL APT = 'ERROR'.

7336 6520
 7337 6201
 7340 3722
 7341 3001
 7342 2664
 7343 1517
 7344 1506
 7345 1475
 7346 1444
 7347 1433
 7350 1422
 7351 4400
 7352 0006
 7353 2064
 7354 2122
 7355 1127

7356	1133			
7357	0312			
7360	0325			
7361	0266			
7362	0301			
7363	0246			
7364	5200			
7365	0177			
7366	0261			
7367	1221			
7370	0206			
7371	0310			
7372	0264			
7373	0244			
7374	0204			
7375	7000			
7376	7473			
7377	7400			
	7400	PAGE		/APT/
		/APT/		ROUTINE TO INITIALIZE FOR RUNNING UNDER APT CONTROL
		/CB/		OR UNDER CLASSIC 8 CONTROL.
7400	0000	APTIZ,	0	/APT/
7401	6002	IOF		/APT/
7402	4777*	JMS	DFFIF	/APT/GO MAKE DF=IF.
7403	1022	TAD	HCW2	/CB/UNDER CLASSIC 8 CONTROL?
7404	7006	RTL		/CB/
7405	7004	RAL		/CB/
7406	7500	SMA		/CB/SKP IF YES.
7407	5776*	JMP	APTIZ1+1	/CB/
7410	3215	DCA	CBCF	/CB/SET CLASSIC 8 CONTROL FLAG.

/CB/ THE NEXT LOC WILL = NOP AFTER BEING USED ONCE.

7411	4775*	JMS	CBSM	/CB/GO SAVE PG 37, FLD 1.
7412	1374	TAD	(7000	/CB/MODIFY ABOVE LOC TO: NOP.
7413	3211	DCA	,+2	/CB/
7414	5600	JMP I	APTIZ	/CB/RTN TO CALL+1.
7415	0000	CBCF,	0	/CB/

/APT/ ROUTINE TO GET SWITCHES INTO THE AC (EITHER PSR OR HARD SR).
 /APT/ (THIS ROUTINE IS ALSO USED BY CLASSIC 8.)

7416	0000	APTSR,	0	/APT/
7417	7200	CLA		/APT/
7420	1215	TAD	CBCF	/CB/UNDER CLASSIC 8 CONTROL?
7421	7700	SMA	CLA	/CB/SKP IF YES.
7422	5225	JMP	,+3	/CB/

```

7423 4467      C8CKSW      /C8/
7424 5616      JMP I      APTSR      /C8/RTN TO CALL+1.

7425 1021      TAD      HCW1      /APT/USE PSR?
7426 7710      SPA CLA      /APT/SKP IF YES.
7427 5232      JMP      APTSR0     /APT/
7430 1020      TAD      PSR      /APT/AC=PSR.
7431 7410      SKP      /APT/
7432 7604      APTSR0, 7604      /APT/([LAS] AC=HARD SR.
7433 5616      JMP I      APTSR      /APT/RTN TO CALL+1.

/APT/ ROUTINE TO 'NOTIFY' APT THAT THE PROGRAM IS RUNNING OK.

7434 0000      APTOK, 0      /APT/
7435 7200      CLA      /APT/
7436 1022      TAD      HCW2      /APT/UNDER APT CONTROL?
7437 7700      SMA CLA      /APT/SKP IF YES.
7440 5265      JMP      APTOK0     /APT/
7441 6002      IOF      /APT/
7442 1261      TAD      APTIMX     /APT/DELAY 100MS.
7443 3263      DCA      APTCTX     /APT/
7444 1262      TAD      APTIMY     /APT/
7445 3264      DCA      APTCTY     /APT/
7446 2264      ISZ      APTCTY     /APT/
7447 5246      JMP      .+1        /APT/
7450 2263      ISZ      APTCTX     /APT/
7451 5244      JMP      .+5        /APT/
7452 6224      RIF      /APT/AC=IF.
7453 1373      TAD      (6201      /APT/CREATE A CDF INST.
7454 3255      DCA      .+1        /APT/MODIFY NEXT LOC.
7455 6201      CDF      /APT/([MODIFIED CDF) DF=CURRENT IF.
7456 6272      CIF      70      /APT/IF=FIELD 7.
7457 4772      JMS      6500      /APT/CALL APT = 'PROG OK'.
7460 5634      JMP I      APTOK     /APT/RTN FROM APT = RTN TO CALL+1.

7461 7771      APTIMX, -7      /APT/
7462 0000      APTIMY, 0      /APT/
7463 0000      APTCTX, 0      /APT/
7464 0000      APTCTY, 0      /APT/

7465 7000      APTOK0, NOP      /APT/

7466 1215      TAD      C8CF      /C8/UNDER CLASSIC B CONTROL?
7467 7710      SPA CLA      /C8/SKP IF NO.
7470 4771      JMS      XC8CKP     /C8/GO CHECK FOR CONTROL CHARS.
7471 7000      NOP      /C8/

7472 5634      JMP I      APTOK     /APT/RTN TO CALL+1.

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/APT/ ROUTINE TO GET THE SPECIFICATIONS OF THE FIELDS TO BE TESTED
/APT/ (FIELD LIMITS). FIRST ATTEMPT IS FROM HCW1. IF THERE IS

```

```

/APT/ NO SPEC THERE THEN SPECS WILL BE TAKEN FROM THE SWITCH REGISTER
/APT/ (PSR OR HARD SR). IN EITHER CASE THE RESULT IS PRESERVED
/APT/ IN THE PSR. IF FIELD 7 IS SPECIFIED THEN FIELD 6 WILL BE
/APT/ FORCED.

7473 0000      APTFL, 0      /APT/
7474 7200      CLA      /APT/
7475 1021      TAD      HCW1      /APT/GET MEM SIZE FROM HCW1.
7476 0370      AND      (37      /APT/
7477 7012      RTR      /APT/CONVERT TO HI FIELD LIMIT.
7500 0370      AND      (37      /APT/
7501 7450      SNA      /APT/SKP IF VALID MEM SIZE WAS IN HCW1.
7502 5321      JMP      APTFL0     /APT/GO TRY SW REG FOR FIELD LIMITS.
7503 3263      DCA      APTCTX     /APT/FIELD 7 SPEC'D?
7504 1022      TAD      HCW2      /CHECK FOR APT
7505 7710      SPA CLA      /IF APT CHECK FOR FIELD 7 AND SUBTRACT
7506 1263      TAD      APTCTX     /APT/
7507 1367      TAD      (7771      /APT/
7510 7650      SNA CLA      /APT/SKP IF NO.
7511 7040      CMA      /APT/FORCE FIELD 6 AS HI FIELD LIMIT.
7512 1263      TAD      APTCTX     /APT/
7513 3263      DCA      APTCTX     /APT/
7514 1020      TAD      PSR      /APT/
7515 0366      AND      (7700      /APT/
7516 1263      TAD      APTCTX     /APT/
7517 3020      DCA      PSR      /APT/PSR=FLO 0 LO LIM, SPEC'D FLD HI LIM.
7520 5673      JMP I      APTFL     /APT/RTN TO CALL+1.

7521 7200      APTFL0, CLA      /APT/
7522 4216      JMS      APTSR      /APT/GET FIELD LIMITS FROM SWITCH REG.
7523 0365      AND      (77      /APT/
7524 3263      DCA      APTCTX     /APT/SEPARATE & TEMP STORE LO & HI LIMITS.
7525 1263      TAD      APTCTX     /APT/
7526 0364      AND      (77      /APT/
7527 3264      DCA      APTCTY     /APT/TEMP STORE HI LIMIT.
7530 1263      TAD      APTCTX     /APT/
7531 0363      AND      (70      /APT/
7532 3263      DCA      APTCTX     /APT/TEMP STROE LO LIMIT.
7533 1022      TAD      HCW2      /APT/
7534 7700      SMA CLA      /APT/
7535 5352      JMP      NOTAPT     /NOT APT DO NOT CHECK FOR FIELD 7
7536 1263      TAD      APTCTX     /APT/FIELD 7 SPEC'D AS LO LIMIT?
7537 1362      TAD      (7710      /APT/
7540 7640      SZA CLA      /APT/SKP IF YES.
7541 5344      JMP      .+3        /APT/
7542 1361      TAD      (60      /APT/FORCE FIELD 6 AS LO LIMIT.
7543 3263      DCA      APTCTX     /APT/
7544 1264      TAD      APTCTY     /APT/FIELD 7 SPEC'D AS HI LIMIT?
7545 1367      TAD      (7771      /APT/
7546 7640      SZA CLA      /APT/SKP IF YES,,
7547 5352      JMP      .+3        /APT/
7550 1360      TAD      (6        /APT/FORCE FIELD 6 AS HI LIMIT.
7551 3264      DCA      APTCTY     /APT/
7552 1020      NOTAPT, TAD      PSR      /APT/
7553 0366      AND      (7700      /APT/

```

```

7554 1263 TAD APTCTX /APT/
7555 1264 TAD APTCTY /APT/
7556 3020 DCA PSR /APT/PSR=SPEC'D FLD LO LIM, SPEC'D FLD HI LIM,
7557 5673 JMP I APTFL /APT/RTN TO CALL+1.

7560 0006
7561 0060
7562 7710
7563 0070
7564 0007
7565 0077
7566 7700
7567 7771
7570 0037
7571 5641
7572 6500
7573 6201
7574 7000
7575 6261
7576 7201
7577 0232
7600

```

PAGE

/APT/

/SET UP A LAS TO BE EQUAL TO THE CALL C0CKSW

/PROGRAM SHOULD CHECK FOR A CONTROL CHARACTER FROM THE CONSOL
/EVERY FIVE SECONDS OR LESS

/SETUP CNTVAL FOR A RANGE OF 1 TO 4 MINUTES FOR C0PASS TO PRINT PASS
/SETUP OF CNTVAL WILL BE FOUND IN C0PASS
/THIS VALUE SHOULD BE A POSITIVE NUMBER.

/SET UP XD0SW AS THE VALUE NEEDED FOR A RETURN FOR CONTROL R
/RETURN TO ASK THE SWITCH REGISTER QUESTION.

/THE CALL TABLE IS A CONDITIONAL ASSEMBLY.
/ TO ASSEMBLE THE CALL REMOVE THE / BEFORE CONSOL =0.
/IN COMBINING THE CONSOL PACKAGE TO A DIAGNOSTIC.
/ THE CALL TABLE IS TO BE AT THE BEGINNING OF A PROGRAM.

```

0000 CONSOL=0
6661 PSKF= 6661
6662 PCLF= 6662
6663 PSKE= 6663
6664 PSTB= 6664
6665 PSIE= 6665
6004 GTF= 6004
7701 ACL= 7701
6007 CAF= 6007

```

```

7421 MDL= 7421
7501 MGA= 7501
2066 *66

0066 4466 C0PASS= JMS I .
5000 XC0PAS /C0 PASS COMPLETION ROUTINE
4467 C0CKSW= JMS I .
5050 XC0SW /CHECK SW REG SETTING
4470 C0TTYI= JMS I .
5060 XC0TTY /FETCH CONSOL CHAR
4471 C0CNTX= JMS I .
5200 XC0CNT /CHECK FOR CONTROL CHAR
4472 C0PRNT= JMS I .
5071 XC0PNT /C0 PRINT A BUFFER
4473 C0SWIT= JMS I .
5457 XC0PSW /SET UP PSEUDO SW. REG
4474 CHOCTA= JMS I .
5600 XC0OCT /CONVERT TO ASCII AND PRINT
4475 C0CHLF= JMS I .
5623 XC0CRL /DO A CARRIGE RETUR + LINE FEED
4476 C0ECHO= JMS I .
5663 XC0ECH /CHECK INPUT CHAR
4477 C0TYPE= JMS I .
5677 XC0TYP /C0 PRINT ONE CHAR
4500 C0ERR= JMS I .
6007 XC0ERR /C0 ERROR HANDLER
4501 C0INQU= JMS I .
5435 XC0ING /LOOK FOR OPERATOR INTERVENTION
4502 C0CKPA= JMS I .
5641 XC0CKP /CHECK IF CONTROL CHAR
4503 C0PAUS= JMS I .
5125 XC0PAU /IF CONSOL PACKAGE RETURN CALL PLUS ONE
/IF NOT USING CONSOL REPLACE CALL WITH
/ A HLT AND THEN GO TO THE HALT

/*20 /PSEUDO SWITCH REGISTER
/4000=DO NOT HALT OR PRINT WAITING
/2000=LOOP ON ERROR
/1000=LOOP ON TEST IN SR 4-11
/400=AT END OF PASS PRINT WAITING OR HLT

/*21 /HARDWARE INDICATORS
/4000=USE FRONT PANEL SWITCH REGISTER
/*22 /SYSTEM CONFIGURATION
/400=CONSOL PACKAGE SET ACTIVE
/*23 /RESERVED FOR FUTURE USE

5000 *5000
/*****
/C0PASS
/THIS IS CALLED AT THE END OF EACH PROGRAM COMPLETION
/THE VALUE OF** CNTVAL** WILL BE DETERMINED BY THE TIME IT TAKES
/THE PROGRAM TO COMPLETE THIS MANY C0PASS TO BE IN THE 1 TO 4 MINUTE
/RANGE
/ C0PASS=JMS XC0PAS
/EX. C0PASS

```

```

/
/      HLT          /HALT IF NON CONSOL PACKAGE
/      JMP.         /CONTINUE RUNNING THIS PROGRAM
/RETURN TO LOCATION CALL PLUS ONE WITH THE AC=0 IF NON CONSOL PACKAGE AND HLT
/IF CONTINUE TO RUN THEN RETURN TO CALL PLUS2 AC=0

5000 0000  XC8PAS, 0
5001 4777  JMS      CHKCLA      /CHECK FOR CONSOLE
5002 5205  JMP      DOPACK      /IS CLASSIC
5003 4776  JMS      C8GET

/*C8*/ C8CKSW      /CHECK SR SETTING
/*C8*/ AND      (400      /FOR HALT ON END OF C8PASS
/*C8*/ SZA CLA      /1= HALT 0 CONTINUE
/*C8*/ JMP I      /GO TO HALT
5004 5216  JMP      XC8PAS      /CONTINUE ON RUNNING PROGRAM
5005 4220  DOPACK, JMS      CKCOUT /CLASS CHECK C8PASS COUNT
5006 5216  JMP      C8BY1      /C8PASS COUNT NOT DONE REDO PROGRAM
5007 2236  ISZ      PASCNT      /C8PASS COUNT DONE SET C8PASS COUNT
5010 4475  C8CRLF
5011 4472  C8PRNT      /C8PRNT BUFFER
5012 5041  MESPAS
5013 1236  TAD      PASCNT      /GET NUMBER
5014 4474  C8OCTA      /CONVERT IT TO ASCII
5015 4475  C8CRLF      /DO A CARRIAGE RETURN
/*C8*/ C8CKSW      /CHECK A HALT AT END OF C8PASS
/*C8*/ AND      (400      /MASK BIT
/*C8*/ SZA CLA      /HALT =1 NO SKIP CONTINUE =0
/*C8*/ CBINGU      /STOP PROGRAM EXECUTION-LOOK FOR INPUT
5016 2200  C8BY1, ISZ      XC8PAS /BUMP RETURN
5017 5600  JMP I      XC8PAS
5020 0000  CKCOUT, 0
5021 1407  TAD      D0SET      /CHECK IF SET UP NEEDED
5022 7000  SZA CLA      /D0SET UP C8PASS COUNT VALUE
                        /1=C8PASS COUNT VALUE OK
                        /C8PASS COUNT VALUE ON
                        /GET COUNT VALUE FOR THIS PROG
                        /SET TO NEGATIVE
                        /STORE IN HERE
5023 0000  JMP      NOSET      /INDICATE VALUE SET UP
5024 1200  TAD      CNTVAL      /COUNT THE NUMBER OF PASSES
5025 7000  CMA
5026 0000  DCA      D0CNT      /EXIT FOR ANOTHER PASS
5027 0000  ISZ      D0SET      /SET TO C8PRNT C8PASS
5028 0000  ISZ      D0CNT      /BUMP RETURN FOR
5029 0000  JMP      CKCOUT      /C8PASS C8TYPE OUT
5030 0000  D0CNT, 0
5031 0000  PASCNT, 0
5032 0000  D0SET, 0
5033 0000  CNTVAL, 0
5034 0000  MESPAS, TEXT "JMKMAC PASS "
5035 0000
5036 0000
5037 0000

```

```

/*****
/C8CKSW
/ROUTINE THAT WILL CHECK WHERE TO READ THE
/C8 SWITCHES FROM IE, FROM PANEL OR PSEUDO C8SWIT REGISTER
/      C8CKSW= JMS XC8SW
/EX      C8CKSW      /READ THE C8SWIT REGISTER
                        /RETURN WITH THE CONTENTS OF SWITCH REGISTER

/RETURN TO NEXT LOCATION FOLLOWING CALL WITH THE AC= TO VALUE OF C8SWIT SETTING

5050 0000  XC8SW, 0
5051 4502  /#1      C8CKPA      /GO CHECK THE IF ANY CONTRL
5052 7000  /#2      NOP
                        /#2
                        /#1
5053 1021  TAD      21          /GET WD FOR INDICATOR
5054 7710  SPA CLA      /CHECK IF FROM PANEL 4000
5055 7614  TAD      7614      /DO LAS AND SKIPGET FROM PANEL WITH LAS
5056 1020  TAD      20          /PSEUDO SW
5057 5650  JMP I      XC8SW      /EXIT WITH STATUS BIT IN AC.

/*****
/C8TTYI
/THIS ROUTINE WILL LOOK FOR A INPUT FROM THE CONSOL
/      C8TTYI= JMS XC8TTY
/EX.      C8TTYI      /READ CHAR FROM THE CONSOL DEVICE
/                        /RETURN TO CALL PLUS ONE AC CONTAINS THE CHAR
/
/
5060 0000  XC8TTY, 0
5061 6031  KSF          /LOOK FOR KEYBOARD FLAG
5062 5261  JMP      , -1
5063 6036  KRB          /GET CHAR
5064 0375  AND      (177      /MASK FOR 7 BITS
5065 1374  TAD      (200      /ADD THE EIGHTH BIT
5066 3773  DCA      CHAR      /STORE IT
5067 1773  TAD      CHAR
5070 5600  JMP I      XC8TTY      /EXIT

/*****
/C8PRNT
/THIS ROUTINE WILL TYPE THE CONTENTS OF THE C8 PRINT BUFFER, THE LOCATION

```

/OF THE BUFFER WILL BE IN THE ADDRS FOLLOWING THE CALL. C8 PRINTING OF THE BUFFER
/WILL STOP WHEN A 00 CHAR IS DETECTED. CHARACTERS ARE PACKED 2 PER WORD.

/ C8PRNT= JMS XC8PNT

/EX. C8PRNT /C8PRNT THE CONTENTS OF THE FOLLOWING BUFFER
/ MESS77 /LOCATION OF C8PRNT BUFFER
/C8PRNT WILL USE THE LOCATION FOLLOWING THE CALL AS THE POINTER FOR THE
/C8PRNT ROUTINE. RETURN TO CALL PLUS TWO WITH AC= 0

5071	0000	XC8PNT, 0		
5072	7300	CLA CLL		
5073	1671	TAD I XC8PNT	/GET C8PRNT BUFFERS STARTING LOCATION	
5074	3324	DCA PTSTOR	/STORE IN PTSTOR	
5075	2271	ISZ XC8PNT	/BUMP RETURN	
5076	1724	TAD I PTSTOR	/GET DATA WORD	
5077	0372	AND (7700	/MASK FOR LEFT BYTE	
5100	7450	SNA	/CHECK IF 00 TERMINATE	
5101	5671	JMP I XC8PNT	/EXIT	
5102	7500	SNA	/IS AC MINUS	
5103	7020	CML	/MAKE CHAR A 300 AFTER ROTATE	
5104	7001	IAC	/MAKE CHAR A 200 AFTER ROTATE	
5105	7012	RTR		
5106	7012	RTR		
5107	7012	RTR		
5110	4477	C8TYPE	/PUT CHAR IN BITS 4-11 MAKE IT 8 BIT ASCII	
5111	1724	TAD I PTSTOR	/C8PRNT IT ON CONSOLE	
5112	0371	AND (0077	/GET DATA WORD	
5113	7450	SNA	/MASK FOR RIGHT BYTE	
5114	5671	JMP I XC8PNT	/CHECK IF 00 TERMINATOR	
5115	1370	TAD (3740	//EXIT	
5116	7500	SNA	/ADD FUDGE FACTOR TO DETERMINE IF 200	
5117	1367	TAD (100	/OR 300 IS TO BE ADD TO CHAR	
5120	1366	TAD (240	/ADD 100	
5121	4477	C8TYPE	/ADD 200	
5122	2324	ISZ PTSTOR	/C8TYPE ONLY BITS 4-11	
5123	5276	JMP C8001	/BUMP POINTER FOR NEXT WORD	
5124	0000	PTSTOR, 0	/DO AGAIN	
			/STOR FOR C8PRNT BUFFER	

/*****

/C8PAUS
/THIS ROUTINE WILL CHECK IF THE CONSOL PACKAGE IS ACTIVE, IF ACTIVE
/IT WILL RETURN TO CALL PLUS ONE AC= 0. AND DO THAT INSTRUCTION.
/IF THE CONSOL PACKAGE IS NOT ACTIVE THE CALL WILL BE REPLACED
/WITH A7402 HALT AND THEN RETURN TO THE HALT.

/ C8PAUS= JMS XC8PAU

/

/EX. C8PAUS /CHECK IF ON ACTIVE CONSOL IF NOT HALT HERE
/ ANYTHING /RETURN HERE IF ON ACTIVE CONSOL
/
/

5125	0000	XC8PAU, 0	
5126	7300	CLA CLL	
5127	4777	JMS CHKCLA	/CHECK FOR CONSOL
5130	5336	JMP C8003	/GO DO CONSOL PART RETURN CALL +1
5131	7040	CMA	/PUT HLT IN CALL
5132	1325	TAD XC8PAU	/GET CORRECT RETURN ADDRS
5133	3325	DCA XC8PAU	/SET UP RETURN
5134	1365	TAD (7402	/GET CODE FOR HLT
5135	3725	DCA I XC8PAU	/PUT HALT IN CALL LOCATION
5136	5725	C8003, JMP I XC8PAU	/GO TO HALT OR RETURN TO NEXT LOCATION

5165 7402
5166 0240
5167 0100
5170 3740
5171 0077
5172 7700
5173 5675
5174 0200
5175 0177
5176 5424
5177 6000
5200

PAGE

/*****

/C8CNTR
/THIS ROUTINE WILL CHECK FOR THE PRESENCE OF CONTROL CHARACTERS
/IT WILL CHECK FOR THE FOLLOWING CHAR C-R-Q-O-L-S
/ C8CNTR= JMS XC8CNT

/EX. C8CNTR /CHECK FOR CONTROL CHARACTER
/ JMP ANYTHING /LOC FOLLOWING CALL IS FOR CONTINUING THE PROGRAM
/ JMP ANYTHING /LOC. IS FOR RETURN IF INMODE SET AND NOT CNTRL CHAR
/

/RETURN IS TO CALL PLUS ONE IF CONTINUE
/RETURN IS TO CALL PLUS TWO IF INMODE SET AND NOT CONTROL CHAR
/

/RETURN IS TO CALL PLUS TWO IF INMODE IS NOT SET AND NO
/CONTROL CHAR. THIS WILL PRINT THE CHARACTER AND A ?
/CLEAR THE AC AND RETURN CALL+2.

5200	0000	XC8CNT, 0	
5201	3777	DCA ACSAVE	/SAVE THE AC
5202	4776	JMS CHKCLA	/CHECK FOR CONSOL ACTIVE
5203	5206	JMP .+3	/ON ACTIVE CONSOL

```

5204 1777* TAD ACSAVE
5205 5600 JMP I XC8CNT
5206 6004 GTF
5207 3775* DCA FLSAVE
5210 7501 MGA
5211 3774* DCA MQSAVE
5212 3255 DCA INDEXA
5213 1257 TAD XTABLA
5214 3256 DCA GETDAT
5215 1656 REDOA, TAD I GETDAT
5216 7450 SNA
5217 5226 JMP DONEA
5220 1773* TAD CHAR
5221 7650 SNA CLA
5222 5243 JMP GOITA
5223 2255 ISZ INDEXA
5224 2256 ISZ GETDAT
5225 5215 JMP REDOA
5226 1772* DONEA, TAD INMODE
5227 7640 SZA CLA
5230 5240 JMP EXITA
5231 1773* TAD CHAR
5232 4477 C8TYPE
5233 1371 TAD (277
5234 4477 C8TYPE
5235 4475 C8CRLF
5236 2200 ISZ XC8CNT
5237 5600 JMP I XC8CNT

5240 2200 EXITA, ISZ XC8CNT
5241 1773* TAD CHAR
5242 5600 JMP I XC8CNT
5243 1773* GOITA, TAD CHAR
5244 1370 TAD (100
5245 3773* DCA CHAR
5246 1260 TAD XTABLB
5247 1255 TAD INDEXA
5250 3254 DCA GOTOA
5251 1654 TAD I GOTOA
5252 3254 DCA GOTOA
5253 5654 JMP I GOTOA
5254 0000 GOTOA, 0000
5255 0000 INDEXA, 0000
5256 0000 GETDAT, 0000
5257 5261 XTABLA, TABLA
5260 5271 XTABLB, TABLB
5261 7575 TABLA, 7575
5262 7564 7564
5263 7557 7557
5264 7556 7556
5265 7555 7555
5266 7573 7573
5267 7574 7574
5270 0000 0000

```

/GET AC FOR RETURN
/EXIT NOT ON ACTIVE CONSOLE

/SAVE THE MQ
/SET DISPLACEMENT INTO TABLE B
/GET ADDR OF TABLE A
/CONTAINS POINTER TO CONTROL CHAR
/GET CONTROL CHAR FROM TABLE
/CHECK FOR A 0 END OF TABLE
/END OF TABLE NO CONTROL CHAR
/COMPARE CHAR TO CONTROL CHAR
/0 IF MATCH
/MATCH
/NO MATCH NOT END OF TABLE REDO
/BUMP INDEX FOR EXIT WHEN CONTROL FOUND
/BUMP GETDAT FOR COMPARE OF NEXT CNTRL CHAR.
/CHECK IF PROGRAM EXPECTS CHAR
/1=CHAR EXPECTED 0= NO CHAR EXPECTED
/CHAR EXPECTED
/GET CHAR - NOT CONTROL + NOT EXPECTED
/C8PRNT CHAR
/GET CODE FOR "2"

/BUMP RETURN
/EXIT CALL+2

/BUMP RETURN FOR MAIN PROGRAM CHECK OF CHAR
/PUT CHAR IN AC.
/EXIT
/GET THE CONTENTS OF CHAR
/ADD 100 TO FORM A GOOD ASCII CHARACTER
/RESTORE COFFECT CHAR
/GET START OF TABLE B
/GET NOW FAR INTO TABLE
/STORE IT
/GET THE ROUTINE STARTTING ADDRESS
/STORE IT IN HERE
/GOTO CONTROL CHAR ROUTINE
/ADD OF CNTRL ROUTINE TO EXECUTE
/DISPLACEMENT INTO CNTRL TABLE
/LOCATION OF ADDRS OF CONTROL CHAR.
/ADDRS OF TABLEA
/ADDRS OF TABLER
/CNTRL C BACK TO MONITOR 203
/CNTRL L SWITCH ERROR PRINTTING DEVICE 214
/CNTRL Q START DISPLAYING CHAR. AGAIN 221
/CNTRL R BACK TO BEGINNING OF PROGRAM 222
/CNTRL S STOP SENDING CHAR TO DISPLAY WAIT FOR CNTRL Q 223
/CNTRL E CONTINUE WITH PROGRAM 205
/CONTROL D CHANGE SWITCH REGISTER ON FLY

```

5271 5300 TABLB, CNTRLQ
5272 5345 CNTRLQ
5273 5307 CNTRLQ
5274 5320 CNTRLR
5275 5327 CNTRLR
5276 5353 CNTRLR
5277 5400 CNTRLR

/RETURN TO MONITOR
/7
5300 3767* CNTRLR, DCA TTYLPT
5301 3766* DCA C8SWST
5302 4765* JMS UPAROW
5303 4764* JMS C8RM
5304 6203 CDF CIF
5305 6007 CAF
5306 5763 JMP I (7600

/
/START SENDING CHAR. TO THE DISPLAY
/THIS WILL RETURN CONTROL TO CALL THAT WAS SET BY
/THE CALL FOR CONTROL S.
/

5307 3772* CNTRLQ, DCA INMODE
5310 1343 TAD C8SETS
5311 7640 SZA CLA
5312 5315 JMP BYRETR
5313 4762* JMS C8GET
5314 5600 JMP I XC8CNTR
5315 3343 BYRETR, DCA C8SETS
5316 4762* JMS C8GET
5317 5744 JMP I C8RETR

/
/GO TO THE QUESTION C8SWIT
/

5320 3767* CNTRLR, DCA TTYLPT
5321 3343 DCA C8SETS
5322 3772* DCA INMODE
5323 4765* JMS UPAROW
5324 3766* C8BY4, DCA C8SWST
5325 5726 JMP I XDOSW
5326 0200 XDOSW, C8STRT

/
/STOP SENDING CHAR. TO DISPLAY UNTIL A "Q" IS RECEIVED
/

5327 1343 CNTRLR, TAD C8SETS
5330 7640 SZA CLA
5331 5335 JMP C8DO7
5332 7001 IAC
5333 1200 TAD XC8CNT

```

/CLEAR SOFT FLAG FOR TERMINAL PRINTING

/C8PRNT A* AND LETTER IN CHAR
/C8/GO RESTORE PG 37 IN FIELDS 0 & 1.
/GO TO 0 FLD
/CLEAR THE WORLD
/GO TO DIAGNOSTIC MONITOR

/CLEAR LINE PRINTER FLAG
/CLEAR SOFT FLAG FOR CNTRL S

/GO PRINT CHARACTER
/CLEAR FLAG FOR CNTRL D OR R
/GO TO ADDRS OF C8SWIT
/DOSW IS LABEL FOR C8SWIT QUESTION

/IF1 DO NOT STORE IN C8RETR
/DOONT SET UP C8RETR
/MAKE RETURN CALL PLUS 2
/GET RETURN FOR THIS CALL


```
5334 3344      DCA      C8RETR      /STORE IT HERE FOR USE BE CNTRL Q
5335 2343      C8D07,  ISZ      C8SETS      /SET FLAG TO SAVE CALL
5336 4470              C8TTYI      /LOOK FOR THE INPUT
5337 4762'      JMS      C8GET      /GET REGISTERS
5340 4471              C8CNTR      /CHECK FOR THE CONTROL CHAR
5341 7200              CLA
5342 5327              JMP      CNTRLS      /IF NOT A CNTRL Q R C REASK

5343 0000              C8SETS, 0
5344 0000              C8RETR, 0

/
/
/ SWITCH OUTPUT FROM ONE OUTPUT DEVICE TO ANOTHER - THE TWO OUTPUTS ARE THE
/ CONSOLE AND THE PRINTER WITH DEVICE CODE 66.
/
/
5345 1767'      CNTRL,  TAD      TTYLPT      /GET PRESENT C8SWIT INDICATOR
5346 7040              CMA
5347 3767'      DCA      TTYLPT      /COMPLEMENT IT
5350 4765'      JMS      UPAROW      /STOR NEW C8SWIT
5351 4762'      JMS      C8GET      /C8PRNT ~ AND CHAR ON NEW DEVICE
5352 5600              JMP I      XC8CNT      /RESTORE THE REGISTERS
/
/
/
/
/ CONTROL E
/ CONTINUE RUNNING FROM A INQUIRE OR ERROR
/
5353 4765'      CNTRL,  JMS      UPAROW      /PRINT THE CONTROL CHAR
5354 4762'      JMS      C8GET      /GET THE REGISTERS
5355 5600              JMP I      XC8CNT      /RETURN TO CALL PLUS ONE
/
/
/
5362 5424
5363 7600
5364 6127
5365 5415
5366 5546
5367 5721
5370 0100
5371 0277
5372 5676
5373 5675
5374 6125
5375 6126
5376 6000
5377 6124      PAGE
5400
```

```
/CONTROL D
/CHANGE THE SWITCH REGISTER ANYTIME CNTRL D AND RETURN TO
/THE PROGRAM RUNNING.

5400 4215      CNTRLD, JMS      UPAROW
5401 1213      TAD      C8SETD      /CHECK IF THE RETURN ADDR IS SAFE
5402 7640              SZA CLA
5403 5207              JMP      C8D011      /DO NOT CHANGE THE RETURN ADDR
5404 1777'      TAD      XC8CNT      /GET THE RETURN ADDR AND SAVE IT
5405 3214      DCA      C8RETO      /SAVE THE RETURN HERE
5406 2213      ISZ      C8SETD      /INDICATE RETURN SAVED DONT DESTROY
5407 4473      C8D011, C8SWIT      /GO CHANGE THE SWITCH REGISTER
5410 3213      DCA      C8SETD      /CLEAR THE FLAG
5411 4224      JMS      C8GET      /RESTORE THE AC MQ LINK ETC
5412 5614      JMP I      C8RETO      /RETURN TO THE PROGRAM

5413 0000              C8SETD, 0
5414 0000              C8RETO, 0
/
/
5415 0000      UPAROW, 0
5416 1376      TAD      (336      /C8PRNT THE "" AND THE CHAR C8TYPED IN
5417 4477      C8TYPE      /CODE FOR ~
5420 1775'      TAD      CHAR      /C8TYPE THE CHAR
5421 4477      C8TYPE
5422 4475      C8CNLF
5423 5615      JMP I      UPAROW      /ISSUE A CR AND LF
/EXIT

/*****

5424 0000      C8GET, 0
5425 7200      CLA
5426 1774'      TAD      M8SAVE
5427 7421      MOL      /RESTORE MQ
5430 1773'      TAD      FLSAVE
5431 7004      RAL      /RESTORE THE LINK
5432 7200      CLA
5433 1772'      TAD      ACSAVE      /RESTORE THE AC
5434 5624      JMP I      C8GET      /GET THE REGISTERS

/*****

/C8INQU
/C8INQU ROUTINE WILL PRINT A WAITING
/AND THE PROGRAM IS EXPECTING A CONTROL CHAR INPUT
/IF CONTINUE FROM CONTROL CHAR RETURN IS CALL PLUS ONE
/IF NO CONTROL CHAR ENTERED THEN WAITING IS REPRINTED
/AND PROGRAM WAITS FOR A CONTROL CHAR AGAIN
```

```

//
/      C8INQU= JMS XC8INQ
/EX    C8INQU          /C8 WILL PRINT A WAITINGAND WAIT FOR INPUT
/      DD ANYTHING    /RETURN IS CALL PLUS ONE AC =0 CONTINUE

5435 0000      XC8INQ, 0
5436 7300          CLA CLL
5437 4771'      JMS      CHKCLA          /CHECK FOR CONSOLE ACTIVE
5440 7410          SKP
5441 5635          JMP I   XC8INQ        /NOT CONSOLE LEAVE
5442 4475          C8CRLF
5443 4472          C8PRNT
5444 5452          WATMES                /INQUIR WAITTING
5445 4470          C8TTYI                /GET CHARACTER
5446 4224          JMS      C8GET
5447 4471          C8CNTR                /CHECK IF CONTROL CHARACTER
5450 5635          JMP I   XC8INQ        /EXIT AND CONTINUE
5451 5236          JMP      XC8INQ+1    /REASK
5452 2701      WATMES, TEXT  "WAITING "
5453 1124
5454 1116
5455 0740
5456 0000

```

```

/C8SWIT
/ROUTINE WILL CHECK IF CONSOL IS ACTIVE IF IT IS ACTIVE DISPLAY
/SW QUESTION. IN NOT ACTIVE IT WILL NOT PRINT THE SW QUESTIONBUT
/RETURN TO CALL PLUS ONE AC=0.
/C8SWIT WILL SET UP THE PSEUDO C8SWIT
/REGISTER WITH THE NEW DATA ENTERED
/THE TAG C8DOR AT THE START OF THE CALL IS FOR THE RETURN OF CONTROL R
/CHAR. THIS MAY BE CHANGED IF THIS IS NOT WHERE A GOOD RESTART
/OF PROGRAM IS.
/
/      C8SWIT= JMS XC8PSW
/EX.    C8DOR,  C8SWIT          /SET UP PSEUDO C8SWIT REGISTER IF
                                /ON THE CONSOL PACKAGE. RETURN IS CALL PLUS ONE AC = 0

```

```

5457 0000      XC8PSW, 0
5458 4771'      JMS      CHKCLA          /CHECK FOR CONSOLE ACTIVE
5459 7410          SKP
5462 5657          JMP I   XC8PSW        /RETURN WITHOUT ASKING PSEUDO SWITCH
5463 1346          TAD      C8SWST      /IS THE SOFT FLAG SET FOR SWITCH?
5464 7640          SZA CLA              /SKIP IF ONE ENTRY AT ATIME OK

```

```

5465 5770'      JMP      C8BY4          /SECOND ENTRY WITH OUT A EXIT GO TO SW QUESTION
5466 2346          ISZ      C8SWST      /FIRST ENTRY SET FLAG
5467 4472      C8ROPS, C8PRNT          /C8PRNT SR=XXX
5470 5550          MESA
5471 1020          TAD      20          /GET CONTENTS OF SW
5472 4474          C8OCTA              /CONVERT IT TO ASCII
5473 1367          TAD      (40        /GET SPACE
5474 4477          C8TYPE
5475 2766'      ISZ      INMODE        /SET FLAG FOR CHAR EXECTED
5476 4476          C8ECHO              /LOOK FOR INPUT
5477 4316          JMS      TSTCHA      /NOT CONTROL TEST IT IS LEGAL
5500 1775'      TAD      CHAR          /STORE NEW CHAR IN SW REG
5501 3020          DCA      20

5502 1365          TAD      (-3        /GET A MINUS 3
5503 3347          DCA      TMPCNT      /STORE IN TEMP COUNT
5504 4476      GETCH1, C8ECHO          /GET NEXT CHAR
5505 4316          JMS      TSTCHA      /CHECK IF CR + GOOD CHAR
5506 1020          TAD      20          /GET C8SWIT REGISTER
5507 7106          RTL CLL              /ROTATE IT LEFT 3 PLACES
5510 7004          RAL
5511 1775'      TAD      CHAR          /GET CHAR + ADD IT TO PREVIOUS CONTENTS
5512 3020          DCA      20          /SAVE NEW CONTENTS
5513 2347          ISZ      TMPCNT      /BUMP COUNT
5514 5304          JMP      GETCH1      /JMP BACK + GET NEXT CHAR
5515 5343          JMP      ENDIT      /END 4 CHAR C8TYPED IN
5516 0000      TSTCHA, 0
5517 7041          CIA
5518 1364          TAD      (215        /CMPL CHAR IN AC
5519 7650          SNA CLA              /TEST IF IT IS A CARRIAGE RETURN
5522 5343          JMP      ENDIT      /SKIP IN NOT CR.
5523 1775'      TAD      CHAR          /WAS CARRIAGE RETURN
5524 1363          TAD      (-260      /NOT CR. GET CHAR
5525 7710          SPA CLA              /CHECK IF IT IS IN RANGE
5526 5337          JMP      ERR1        /IF NOT POSITIVE C8ERR CHAR SMALLER THEN 260
5527 1775'      TAD      CHAR          /C8ERR - CHAR TOO SMALL
5528 1362          TAD      (-270      /GET CHAR
5529 7700          SNA CLA              /GET A -270 + CHECK IF IT IS LARGER THEN 7
5532 5337          JMP      ERR1        /SKIP IF LESS THEN 7
5533 1775'      TAD      CHAR          /C8ERR ON CHAR NOT IN RANGE
5534 0361          AND      (7          /GET CHAR
5535 3775'      DCA      CHAR          /MASK FOR RIGHT BYTE
5536 5716          JMP I   TSTCHA      /STORE IN CHAR
5537 1360      ERR1, TAD      (277      /GET CHAR IN AC
5540 4477          C8TYPE              /EXIT
5541 4475          C8CRLF              /C8PRNT
5542 5267          JMP      C8ROPS      /?
5543 4475      ENDIT, C8CRLF          /
                                /EXIT + ASK AGAIN
                                /DO A CR LF
5544 3346          DCA      C8SWST      /CLEAR THE PSW ENTRY FLAG
5545 5657          JMP I   XC8PSW      /EXIT ROUTINE
5546 0000      C8SWST, 0
                                /#3

```

```

5547 0000 TMFCNT, 0
5550 2322 MESA, TEXT "SR= "
5551 7540
5552 0000

```

```

5560 0277
5561 0007
5562 7510
5563 7520
5564 0215
5565 7775
5566 5676
5567 0040
5570 5324
5571 6000
5572 6124
5573 6126
5574 6125
5575 5675
5576 0336
5577 5200
5600

```

```

PAGE
/*****
/C8OCTA
/OCTAL TO ASCII CONVERSION
/THIS ROUTINE WILL TAKE THE OCTAL NUMBER IN THE AC AND CONVERT IT TO ASCII
/THE RESULT WILL BE PRINTED ON THE CONSOL DISPLAY
/      C8OCTA= JMS XC8OCT
/
/EX.      C8OCTA      /AC CONTAINS NUMBER TO BE CHANGE
/

```

```

5600 0000 XC8OCT, 0
5601 7106 CLL RTL
5602 7006 RTL
5603 3221 DCA C8TMP1 /POSITION THE FIRST CHAR FOR PRINTING
5604 1377 TAD (-4 /SAVE CORRECT POSITIONED WORD HERE
5605 3222 DCA C8CKP /STORE COUNTER IN HERE
5606 1221 TAD C8TMP1 /GET FIRST NUMBER
5607 0376 AND (0007 /MASK
5610 1375 TAD (260 /ADD THE PRINT CONSTANT
5611 4477 C8TYPE /TYPE THE NUMBER
5612 1221 TAD C8TMP1 /
5613 7006 RTL
5614 7004 RAL /PUT NEXT NUMBER IN POSITION
5615 3221 DCA C8TMP1 /STORE IT
5616 2222 ISZ C8CKP /DONE YET WITH FOUR NUMBERS
5617 5206 JMP C8D04 /NOT YET DO MORE
5620 5600 JMP I XC8OCT /DONE WITH FOUR
5621 0000 C8TMP1, 0
5622 0000 C8CKP, 0

```

```

/*****

```

```

/C8CRLF
/C8TYPE CR AND LF WITH FILLERS FOLLOWING EACH LF AND CR
/
/      C8CRLF= JMS XC8CRL
/
/EX.      C8CRLF      /CAPRNT A CR AND LF WITH FILL
/              /RETURN TO CALL PLUS ONE AC =0

```

```

5623 0000 XC8CRL, 0
5624 7300 CLA CLL
5625 1374 TAD (215 /GET CODE FOR CR
5626 4477 C8TYPE
5627 1237 TAD FILLER
5630 7040 CMA
5631 3240 DCA FILCNT /STORE FILLER IN HERE
5632 1373 TAD (212 /GET CODE FOR LF
5633 4477 C8D02, C8TYPE
5634 2240 ISZ FILCNT /CHECK ON FILLER CHAR
5635 5233 JMP C8D02 /TYPE A NON PRINTING CHAR
5636 5623 JMP I XC8CRL /EXIT
/
/1/12 FILLER, 0004 /FILLER SET FOR 4 CHAR
/1/12 FILCNT, 0 /COUNTER FOR FILL
5640 0000

```

```

/*****
/1
/C8CKPA
/THIS ROUTINE WILL CHECK IF A CHARACTER WAS ENTERED FROM THE
/TERMINAL, IF THE FLAG IS SET AND THE CONSOLE PACKAGE IS
/ACTIVE A CHECK IS MADE TO DETERMINE IF IT IS A CONTROL CHAR.
/IF IT WAS A CONTROL CHAR THEN ITS CONTROL FUNCTION IS PERFORMED.
/IF NOT A CONTROL CHARACTER OR A CONTROL E=D=L-O- IT WILL DO
/THE CONTROL FUNCTION AND RETURN TO CALL PLUS 2.
/IF A NON CONTROL CHARACTER WILL BE PRINTED AND A "2" IT WILL RETURN TO
/CALL PLUS 2.
/IF NO FLAG IS SET OR THE CONSOL IS NOT ACTIVE THE RETURN IS TO
/CALL PLUS 1.

```

```

/      C8CKPA= JMS XC9CKP

```

```

/EX.      C8CKPA      /CALL TO CHECK IF CONTROL CHAR SET
/      ANYTHING(SKIP) /RETURN IF NOT FLAG OR NOT CONSOLE ACTIVE
/      ANYTHING(JMP EXIT SKIP CHAIN) /RETURN IF NOT CONTROL OR CONTINUE CONTROL

```

```

5641 0000 XC8CKP, 0
5642 3772 DCA ACSAVE /SAVE THE AC
5643 6004 GTF /SAVE THE FLAGS
5644 3771 DCA FLSAVE /SAVE THE FLAGS

```

```

5645 7501      MQA                /PUT MQ IN AC
5646 3770'     DCA      MQSAVE    /SPACE THE MQ
5647 6031      KSF                /CHECK THE KEYBOARD FLAG
5650 5261      JMP      C8BY3     /EXIT TO CALL PLUS 1
5651 4767'     JMS      CMKCLA    /CHECK FOR ACTIVE CONSOLE
5652 7410      SKP                /
5653 5261      JMP      C8BY3     /EXIT TO CALL PLUS 1
5654 4470      C8TTYI            /GET THE CHAR
5655 4766'     JMS      C8GET     /GET THE FLAGS
5656 4471      C8CNTR            /CHECK IF CONTROL CHAR.
5657 7000      NOP                /RETURN IF A CONTINUE CHAR.
5660 2241      ISZ      XC8CKP    /BUMP RETURN FOR CALL PLUS 2
5661 4766'     C8BY3, JMS      C8GET /GET REGISTERS
5662 5641      JMP I      XC8CKP   /SAY GOOD BY

```

```

/C8ECHO
/THIS ROUTINE WILL LOOK FOR A CHAR FROM THE KEYBOARD. STORE IT IN LOCATION CHAR
/CHECK IF IT WAS A C8CNTR CHARACTER - SET INMODE - C8PRNT CHARACTER
/      C8ECHO= JMS XC8ECH
/EX.   C8ECHO      /LOOK FOR CONSOL CHAR C8PRNT IT
                        /RETURN CALL PLUS ONE AC = CHAR C8TYPED IN

```

```

/
5663 0000      XC8ECH, 0
5664 4470      C8TTYI            /WAIT FOR CHAR FROM KEYBOARD
5665 4766'     JMS      C8GET     /SET INMODE IDENTIFYING THIS AS A EXPECTED CHAR
5666 2276      ISZ      INMODE    /GO CHECK IF IT IS A CONTROL CHAR
5667 4471      C8CNTR            /WAS A CONTROL CHAR = CONTINUE RUNNING
5670 5663      JMP I      XC8ECH  /NOT A CONTROL CHAR C8PRNT IT
5671 4477      C8TYPE            /CLEAR FLAG THAT CHAR EXPECTED
5672 3276      DCA      INMODE    /GET CHAR IN AC
5673 1275      TAD      CHAR      /EXIT
5674 5663      JMP I      XC8ECH
5675 0000      CHAR, 0
5676 0000      INMODE, 0

```

```

/C8TYPE
/THIS ROUTINE WILL C8PRNT ON THE CONSOLE OR THE LPT WITH DEVICE CODE 66.
/
/      C8TYPE= JMS XC8TYP
/EX.   C8TYPE      /C8PRNT THE CHAR IN THE AC.
/                        /RETURN CALL PLUS ONE AC =0000
/                        /DO NOT CLEAR THE LINK IN THIS ROUTINE NEEDED BYC8OCT

```

```

5677 0000      XC8TYP, 0
5700 3320      DCA      PNTBUF    /STORE CHAR
5701 1321      TAD      TTYLPT    /CHECK 0=TTY 7777=LPT
5702 7640      SZA      CLA

```

```

5703 5312      JMP      XDOLPT    /DO OUT PUT ON LPT
5704 1320      TAD      PNTBUF
5705 6046      TLS
5706 6041      TSF
5707 5306      JMP      .-1
5710 6042      TCF
5711 5316      JMP      C8BY5
5712 1320      XDOLPT, TAD      PNTBUF /GET CHAR
5713 6666      PSTB      PCLF      /C8PRNT IT
5714 4322      JMS      CMHANG    /CHECK KEYBOARD IF HUNG
5715 6662      PCLF
5716 7600      C8BY5, 7600      /CLEAR THE AC
5717 5677      JMP I      XC8TYP  /EXIT
5720 0000      PNTBUF, 0
5721 0000      TTYLPT, 0

```

```

5722 0000      CMHANG, 0          /WILL CHECK KEYBOARD FOR CNTRL CHAR
5723 7200      CLA
5724 1316      TAD      C8BY5     /GET CONSTANT 7600
5725 3320      DCA      PNTBUF
5726 6661      PSKF
5727 7410      SKP
5730 5722      JMP I      CMHANG
5731 2346      ISZ      C8CONT    /
5732 5326      JMP      .-4
5733 2320      ISZ      PNTBUF
5734 5331      JMP      .-3
5735 1765'     TAD      XC8CNTR
5736 3322      DCA      CMHANG
5737 3321      DCA      TTYLPT
5740 4475      C8CRLF            /ISSUE A CR AND LF
5741 4472      C8PRNT
5742 5747      MESMANG
5743 4475      C8CRLF
5744 4501      C8INQU
5745 5722      JMP I      CMHANG
5746 0000      C8CONT, 0
5747 1420      MESMANG, TEXT      "LPT ERROR"
5750 2440
5751 0522
5752 2217
5753 2200

```

```

5765 5200
5766 5424
5767 6000
5770 6125
5771 6126
5772 6124
5773 0212
5774 0215
5775 0260

```

```

5776 0007
5777 7774
6000 PAGE

6000 0000 CHKCLA, 0
6001 7200 CLA
6002 1022 TAD 22
6003 0377 AND (400
6004 7650 SNA CLA
6005 2200 ISZ CHKCLA
6006 5600 JMP I CHKCLA /RETURN

/*****
/CBERR
/THIS ROUTINE WILL DETERMINE WHAT TO DO WHEN A CBERR IS ENCOUNTERED
/WILL CHECK IF CLASSIC SYSTEM, WILL CHECK C8SWIT REGISTERS.
/ CBERR= JMS XCBERR
/EX. CBERR /GO TO CBERR CALL IF NOT CONSOL /0/
/ /RETURN IS CALL PLUS ONE AC =0000

6007 0000 XCBERR, 0
6010 6002 IOF
6011 3324 DCA ACSAVE /SAVE AC
6012 6004 GTF
6013 3326 DCA FLSAVE /SAVE THE FLAGS
6014 7501 MQA
6015 3325 DCA MQSAVE /SAVE THE MQ
6016 7340 CLA CLL CMA /SUBTRACT A 1 FOR TRUE LOCATION
6017 1207 TAD XCBERR /GET RETURN LOCATION
6020 3323 DCA PCSAVE /SAVE ADD OF CBERR CALL
6021 4200 JMS CHKCLA
6022 7410 SKP
6023 5204 JMP NTCLAS /NOT CLASSIC SYSTEM
6024 4776 JMS C8GET
6025 4775 JMS XCB8W
6026 0374 SETUP1, AND (0000
6027 7640 SZA CLA
6030 5255 JMP C8D010 /DO NOT PRINT
6031 4475 C8CRLF
6032 4472 C8PRNT
6033 6077 ERRMES /PRINT THE ERROR MESSAGE
6034 4472 C8PRNT
6035 6107 MESPC /PRINT THE PC STATEMENT
6036 1323 TAD PCSAVE
6037 4474 C8OCTA /CONVERT 4 DIGIT PC TO ASCII
6040 4472 C8PRNT
6041 6112 MESAC /PRINT THE AC MESS
6042 1324 TAD ACSAVE
6043 4474 C8OCTA
6044 4472 C8PRNT
6045 6115 MESMQ /PRINT MQ
6046 1325 TAD MQSAVE

```

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6047 4474 C8OCTA
6050 4472 C8PRNT
6051 6120 MESFL /PRINT FL
6052 1326 TAD FLSAVE
6053 4474 C8OCTA
6054 4475 C8CRLF
6055 4776 C8D010, JMS C8GET /RESTORE AC MQ AND FLA5
6056 4467 C8CKSW /CHECK SWITCH REGISTER
6057 7040 CMA /C8/
6060 7710 SPA CLA /SKIP IF BIT 0 SET
6061 5275 JMP C8BY2 /LEAVE
6062 4501 C8INQU /GO TO THE INQUIRE ROUTINE
6063 5275 JMP C8BY2 /LEAVE
6064 4776 NTCLAS, JMS C8GET /RESTORE AC, MQ AND FLAGS
6065 4467 C8CKSW /CHECK PSEUDO SWITCH REGISTER
/CHECK THE C8SWIT REGISTER
/ C8/
6066 7040 CMA /SKIP IF HALT
6067 7710 SPA CLA /NO HALT CONTINUE
6070 5607 JMP I XCBERR /CODE FOR HLT
6071 1373 TAD (7402 /PUT IT IN CALL LOC.
6072 3723 DCA I PCSAVE
6073 4776 JMS C8GET
6074 5723 JMP I PCSAVE /EXIT TO CALL AND HALT
6075 4776 C8BY2, JMS C8GET /GET THE REGISTERS
6076 5607 JMP I XCBERR
6077 0410 ERRMES, TEXT "DNKMAC FAILED "
6100 1315
6101 0103
6102 4040
6103 0601
6104 1114
6105 0504
6106 4000
6107 4040 MESPC, TEXT " PC:"
6110 2003
6111 7200
6112 4040 MESAC, TEXT " AC:"
6113 0103
6114 7200
6115 4040 MESMQ, TEXT " MQ:"
6116 1521
6117 7200
6120 4040 MESFL, TEXT " FL:"
6121 0614
6122 7200
6123 7777 PCSAVE, 7777
6124 7777 ACSAVE, 7777
6125 7777 MQSAVE, 7777
6126 7777 FLSAVE, 7777

/C8/ ROUTINE TO RESTORE PG 37 OF BOTH FIELD 0 & 1.

6127 0000 C8RM, 0 /C8/
6130 7200 CLA /C8/
6131 6224 RIF /C8/CREATE A COF TO CURRENT FIELD.

```

6132	1372	TAD	(6201	/C8/
6133	3344	DCA	C8RM0	/C8/MODIFY NEXT CDF INST.
6134	1371	TAD	(7577	/C8/SET UP 'FROM' (FLD 0) PTR.
6135	3010	DCA	10	/C8/
6136	1370	TAD	(C8SA-1	/C8/SET UP 'FROM' (FLD 1) PTR.
6137	3011	DCA	11	/C8/
6140	1371	TAD	(7577	/C8/SET UP 'TO' (FLD 0) PTR.
6141	3012	DCA	12	/C8/
6142	1371	TAD	(7577	/C8/SET UP 'TO' (FLD 1) PTR.
6143	3013	DCA	13	/C8/
6144	6201	C8RM0, CDF		/C8/(MODIFIED CDF) DF=CURRENT FIELD.
6145	1010	TAD	10	/C8/
6146	7000	CMA		/C8/RESTORATION DONE?
6147	7650	SNA CLA		/C8/SKP IF NO.
6150	5727	JMP I	C8RM	/C8/RTN TO CALL+1.
6151	7621	7621		/C8/(CAM)
6152	1410	TAD I	10	/C8/
6153	7421	MGL		/C8/
6154	1411	TAD I	11	/C8/
6155	6211	CDF	10	/C8/DF=FIELD 1.
6156	3413	DCA I	13	/C8/
6157	7521	SWP		/C8/
6160	6201	CDF	00	/C8/DF=FIELD 0.
6161	3412	DCA I	12	/C8/
6162	5344	JMP	C8RM0	/C8/

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6170 7177
6171 7577
6172 6201
6173 7402
6174 0000
6175 5050
6176 5424
6177 0400
0116 6203
0117 6000
0120 7760
0121 7720
0122 0100
0123 7660
0124 0200
0125 7560
0126 0400
0127 7360
0130 4000
0131 0303
0132 0035
0133 4060
0134 0007
0135 0240
0136 0245

0137 0215
0140 0212
0141 7775
0142 0340
0143 0207
0144 7744
0145 6060
0146 0707
0147 0077
0150 0261
0151 0262
0152 0263
0153 0264
0154 0265
0155 0266
0156 0267
0157 7777
0160 0260
0161 7776
0162 7700
0163 7774
0164 7740
0165 5252
0166 2525
0167 0010
0170 0020
0171 0030
0172 0040
0173 0050
0174 0060
0175 0070
0176 6201
0177 4447

[illegible][illegible]

A	0056	APTJ03	1127	C0PRNT	4472	D0SET	5037
A1	4536	APTJ04	2064	C0RDP8	5467	ENDP	0053
A10	4547	APTJ50	0261	C0RETD	5414	ENDIT	5543
A11	4550	APTJ51	0301	C0RETR	5344	ERR1	5537
A12	4551	APTJ52	0325	C0RM	6127	ERRA	1600
A13	4552	APTJ53	1133	C0RM0	6144	ERRA1	1611
A14	4715	APTJ54	2122	C0SA	7200	ERRB	1626
A15	4716	APTN00	0204	C0SETO	5413	ERRB1	1637
A16	4717	APTN02	0244	C0SEY3	5343	ERRC	3000
A17	4720	APTN03	0264	C0SM	6261	ERRCC	3110
A18	4721	APTN04	0310	C0SM0	6274	ERRHD	4200
A19	4722	APTN05	0206	C0SM1	6272	ERRH	2663
A2	4537	APTN06	1221	C0STRT	0200	ERRMES	6077
A20	4723	APTOK	7434	C0SWIT	4473	ERRMH	2730
A21	4724	APTOK0	7465	C0SWST	5546	ERROR0	2640
A22	4725	APTSR	7416	C0TMP1	5621	ERROR1	2641
A23	4726	APTSR0	7432	C0TTYI	4470	EXITA	5240
A24	4727	B	0057	C0TYPE	4477	FCNT	0051
A3	4540	BADINT	3422	CAF	6007	FILCNT	5640
A4	4541	B0DATA	0063	CDI	6203	FILLER	5637
A5	4542	BINTC	3447	CFP	2200	FIRST	6527
A6	4543	B0W	7002	CFP0	2212	FIVE	0047
A7	4544	BYRETR	5315	CFP1	2226	FLSAVE	6126
A8	4545	C00000	4600	CFP2	2230	FS	0035
A9	4546	C00001	4631	CFP3	2241	GDATA	0062
ACL	7701	C0BY1	5016	CFP4	2251	GERRC	1654
ACSAVE	6124	C0BY2	6075	CHAR	5675	GETCH1	5504
ADDER	2646	C0BY3	5661	CHECK	2261	GETDAT	5256
APT000	2450	C0BY4	5324	CHECK0	2262	GOITA	5243
APT001	2453	C0BY5	5716	CHKCLA	6000	GOTOA	5254
APTCTX	7463	C0CF	7415	CKCOUT	5020	GT	6004
APTCTY	7464	C0CKP	5622	CMP	6104	HCW1	0021
APTE00	1422	C0CKPA	4502	CNTRLC	5300	HCW2	0022
APTE01	1433	C0CKSW	4467	CNTRLO	5400	HEAD1	0044
APTE02	1444	C0CNTR	4471	CNTRLE	5353	IAPTER	0006
APTE03	1475	C0CONT	3746	CNTRLL	5345	IAPTOK	0007
APTE04	1506	C0CRLF	4475	CNTRLQ	5307	IAPTSR	0005
APTE05	1517	C0DO1	5076	CNTRLR	5320	IN12	6445
APTE06	2664	C0DO10	6055	CNTRLS	5327	INDEXA	5255
APTE07	3001	C0DO11	5407	CNTVAL	5040	INMODE	5676
APTE08	3722	C0DO2	5633	CNV	2422	INSAME	0054
APTER	7275	C0DO3	5136	CODERR	2601	INTR	4457
PTFL	7473	C0DO4	5606	CONSOL	0000	INTRDU	4447
PTFL0	7521	C0DO7	5335	COUNT	0042	K0INT	3400
PTIMX	7461	C0ECHO	4476	CRELO	0037	K0INTC	3416
PTIMY	7462	C0ERR	4500	CS	0033	KTEST	0051
PTIZ	7400	C0GET	5424	CSAME	0460	LAS	4405
PTIZ0	7274	C0HANG	5722	CSR03	2007	LEGAL	1670
PTIZ1	7200	C0INQU	4501	OFEIF	0232	LEGAL0	0055
PTJ00	0246	C0OCTA	4474	OOCNT	5035	LEGALA	1753
PTJ01	0266	C0PASS	4466	QONEA	5226	LIMIT	2656
PTJ02	0312	C0PAUS	4503	DOPACK	5005	LOOP1	6200

LOOP1A	6224	PNTBUF	5720	SETUP1	6026	T52	3264
LOOP2	6400	PREL	4341	SF80	3516	T70	3234
LOOP2A	6436	PROFLD	0040	SF81	3534	TABLA	5261
LOOP3	6600	PSIE	6665	SF82	3552	TABLB	5271
LOOP3A	6642	PSKE	6663	SF83	3600	TCS	3706
LOOP3B	6644	PSKF	6661	SF84	3616	TEMP	0045
LOOP4	7000	PSR	0020	SF85	3634	TEST	0000
LOOP4A	7056	PSRB	6664	SF86	3652	TEST0	0052
LOOP5	6700	PSSTOR	5124	SF87	3670	TEST1	1012
LOOP5A	6744	RBELL	2605	SIXTY	2400	TEST2	1025
LOOP5B	6746	ROA2	1410	SKON	6000	TEST3	1040
M0	2516	ROAC	1415	SMP	6101	TEST4	1053
M0S	2440	ROB2	1463	SMQ	0065	TEST5	1066
M0SA	5550	ROBC	1470	SPO	6107	TEST6	1101
M0SAC	6112	ROFLD	1400	SR	6235	TEST7	1114
M0SFL	6120	ROFLDA	1413	SR00	0023	TEST8	1127
M0SHAN	5747	ROFLDB	1466	SR01	0024	TF80	4000
M0SMQ	6115	READ	1527	SR02	0025	TF81	4006
M0SPAS	5041	REDDA	5215	SR03	0026	TF82	4015
M0SPC	6107	RELO	4410	SR04	0027	TF83	4024
MINS	0050	RELO2	4427	SR05	0030	TF84	4034
MOVE	0043	RELO3	4431	SR4	7062	TF85	4044
MQA	7501	RELO4	4434	SR5A	6763	TF86	4054
MQL	7421	RELO5	4445	SR5B	6764	TF87	4063
MQSAVE	6125	RESDF	7075	SR5C	6765	TITLE	4232
MTP	2514	RESINT	4632	SR60	0031	TMPCNT	5547
NOFLD	4400	RETURN	2600	SR911	0032	TN	3141
NOSET	5030	RS	0036	SRL	6663	T0SEL	2263
NOTAPT	7552	RTF	6005	SRL1	6664	TR80	4073
NOTTY	0104	S0	2435	SRL2	6665	TR81	4101
NTCLAS	6064	S1	2436	SR30	3525	TR82	4110
P2	0060	S2	2437	SR31	3543	TR83	4117
PAR	4470	SAC	0064	SR32	3563	TR84	4127
PARERR	3354	SAME	2000	SR33	3607	TR85	4137
PARINT	3300	SAVDF	7063	SR34	3625	TR86	4147
PARORC	3062	SAVE	7074	SR35	3643	TR87	4156
PASCNT	5036	SAVINT	4501	SR36	3661	TS	0034
PATA	0205	SC81	3505	SR37	3677	TSNUM	3750
PATERR	3135	SC82	3511	STANT	0332	TSTAD	0046
PATM	0242	SECONO	6530	STANTF	0052	TSTCHA	5516
PATM0	0245	SEYF8	2015	STOP	2647	TSTFLD	0041
PATN	0262	SEYR0	0456	ST00	3433	TS	3725
PATN0	0265	SEYR1	0452	ST01	3437	TS0	3737
PAT0	0304	SEYR2	0446	ST02	3463	TTYCHK	3751
PAT00	0311	SEYR3	0442	ST03	3470	TTYLPT	5721
PCLF	6662	SEYR4	0436	ST04	3474	TYPCH	2463
PCSAVE	6123	SEYR5	0432	ST05	3501	TYPE	2517
PERRC	3025	SEYR6	0426	SWP	7521	TYPOFF	2527
PERRC0	3100	SEYR7	0422	T0	3200	TYPSP	2532
PERRM	2675	SEYREL	0400	T07	3220	UPAROW	5415
PINF	6236	SEYTRP	0412	T1	3210	W4	0061
PNOREL	4302	SEYTSW	4260	T25	3250	WATMES	5452

WRA	1236
WRA1	1245
WRB	1260
WRB1	1267
WRFLD	1280
XC8CKP	5641
XC8CNT	5280
XC8CRL	5623
XC8ECH	5663
XC8ERR	6087
XC8INQ	5435
XC8OCT	5600
XC8PAS	5080
XC8PAU	5125
XC8PNT	5071
XC8PSW	5457
XC8SW	5050
XC8TTY	5060
XC8TYP	5677
XDOLPT	5712
XDDSW	5326
XTABLA	5257
XTABLB	5260
Z1	3047
Z10	2721
Z11	2722
Z2	3050
Z20	3331
Z21	3345
Z3	3054
Z4	3057
Z8	4335

ERRORS DETECTED: 0

LINKS GENERATED: 408

RUN-TIME: 18 SECONDS

3K CORE USED

