

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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ABST

1.

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	TYPEOUT 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 COMPLETED.
NC (NOT COMPLETED).
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.

5.3 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

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 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 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 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 EXT D 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

TESTING AND RELOCATION CYCLE IS THEN REPEATED. THE CONTENT OF THE ADDRESS FIELD ARE RELOCATED WHICH ENABLES ANY OTHER INFORMATION (RIM-BIN) TO BE CARRIED WITH THE PROGRAM.

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

L I N E S M A D L T H R U M A S L

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-----
10 1 1 1 1
11 1 1 1 1
-----
76 0 0 0 0
77 0 0 0 0
-----
176 0 0 0 0
177 0 0 0 0
-----

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EMA2L USED IF AN 8K MEMORY

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 DISCRIBED 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 AVAILBLE 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 0, R OR C. THIS IS A NONPRINTING CHARACTER.

CONTROL 0

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

10.5
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.

10.6
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

10.7
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 COUNT 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. THE PROGRAM WILL NOW RUN UNTILL AN ERROR IS ENCOUNTERED OR A SWITCH REGISTER OPTION IS SELECTED CAUSE THE PROGRAM TO HALT

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 DATA FIELD AT THE
TIME OF THE PARITY ERROR.

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 6 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 POP8 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 HCW1 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 HCW1. (WILL BE USED IF HCW1 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	SPO=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	SKON=6000	/SKIP IF INTERRUPT ON, & TURN OFF
6007	CAF=6007	/CLEAR ALL FLAGS

0000	*0			
0200	0303	"C		/INTERRUPT ADDRESS
0201	3064	DCA	SAC	/SAVE AC
0202	7701	ACL		
0203	3065	DCA	SMQ	/SAVE MQ
0204	5777	JMP	INTR0U	

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

0220 *20

0020	0000	PSR, 0	/APT/
0021	4000	HCW1, 4000	/APT/
0022	0000	HCW2, 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)
0034	0000	TS, 0	/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
0035	0000	FS, 0	/FIELD STATUS
			/BITS 0-7 COINCIDE WITH FIELDS
			/0-7, FOR EACH FIELD NOT IN
			/THE SYSTEM THE EQUIVALENT BIT
			/IS SET.
0036	0000	RS, 0	/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	/PROGRAM IN FIELD 00X0
0041	0000	TSTFLO, 0	/TESTING FIELD 00X0
0042	0000	COUNT, 0	/MOVE ERROR COUNTER
0043	0000	MOVE, 0	/MOVE ADDRESS COUNTER
0044	0000	HEAD1, 0	/7777 MEANS TYPEOUT ERROR HEADING
0045	0000	TEMP, 0	/TEMP STORAGE LOCATION
0046	0000	TSTAD, 0	/TEST ADDRESS COUNTER

```

0047 0000 FIVE, 0 /5 MINUTE COUNTER
0050 7510 MINS, -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 IN$AME, 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)

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

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

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

4405 LAS=JMS I IAPTSR /APT/REDEFINE LAS.
0200 *200
CB$TRT, /CB/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.
APT$00, /APT/

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

/APT/ IF UNDER APT CONTROL THE NEXT LOC WILL = NOP.
APT$05, /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 T$TAD /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 [6201
0237 3240 DCA ,+1
0240 6201 CDF 0
0241 5632 JMP I DFEIF

```

```

/NO PROGRAM RELOCATION AND TEST ONLY 1 FIELD
/

```



```

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 Z1 OR SR
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      HCW2    /GO START WITHOUT TITLE
0343 0365      AND      (7377   /GET HARDWARE WORD 2
0344 3022      DCA      HCW2    /MASK OUT CL8 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      CMA
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      PROFLD  /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      I70
0425 5260      JMP      CSAME
0426 4775*     SETR6, JMS      TRS6
0427 5232      JMP      ,+3
0430 1174      TAD      I60
0431 5260      JMP      CSAME
0432 4774*     SETR5, JMS      TRS5
0433 5236      JMP      ,+3
0434 1173      TAD      I50
0435 5260      JMP      CSAME
0436 4773*     SETR4, JMS      TRS4
0437 5242      JMP      ,+3
0440 1172      TAD      I40
0441 5260      JMP      CSAME
0442 4772*     SETR3, JMS      TRS3
0443 5246      JMP      ,+3
0444 1171      TAD      I30
0445 5260      JMP      CSAME
0446 4771*     SETR2, JMS      TRS2
0447 5252      JMP      ,+3
0450 1170      TAD      I20
0451 5260      JMP      CSAME
0452 4770*     SETR1, JMS      TRS1
0453 5256      JMP      ,+3
0454 1167      TAD      I10
0455 5260      JMP      CSAME
0456 4767*     SETR0, JMS      TRS0
0457 5222      JMP      SETR7

0460 3041      CSAME, DCA      TSTFLD
0461 4766*     JMS      SAME
0462 5600      JMP      I      /PROFLD = TSTFLD?
0463 4765*     JMS      RELO   /YES
0464 6224      RIF      /NO = RELOCATE PROGRAM
0465 3040      DCA      PROFLD
0466 5600      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
/TEST, 0
0600 0000
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
0700 5306 JMP .+6
0701 1171 TAD [30
0702 3041 DCA TSTFLD
0703 4767* JMS SAME
0704 7410 SKP
0705 4766* JMS WRFLD /WRITE FIELD 3
0706 4762* JMS TFS4
0707 5315 JMP .+6
0710 1172 TAD [40
0711 3041 DCA TSTFLD
0712 4767* JMS SAME
0713 7410 SKP
0714 4766* JMS WRFLD /WRITE FIELD 4
0715 4761* JMS TFS5
0716 5324 JMP .+6
0717 1173 TAD [50
0720 3041 DCA TSTFLD
0721 4767* JMS SAME
0722 7410 SKP
0723 4766* JMS WRFLD /WRITE FIELD 5
0724 4760* JMS TFS6
0725 5333 JMP .+6
0726 1174 TAD [60
0727 3041 DCA TSTFLD
0730 4767* JMS SAME
0731 7410 SKP
0732 4766* JMS WRFLD /WRITE FIELD 6
0733 4757* JMS TFS7
0734 5342 JMP .+6
0735 1175 TAD [70
0736 3041 DCA TSTFLD
0737 4767* JMS SAME
0740 7410 SKP
0741 4766* JMS WRFLD /WRITE FIELD 7
NPAGE
    
```

```

0742 5756      JMP I  (,+20087600
0756 1000
0757 4063
0760 4054
0761 4044
0762 4034
0763 4024
0764 4015
0765 4006
0766 1200
0767 2000
0770 4000
0771 3501
0772 3474
0773 3470
0774 3463
0775 3457
0776 3453
0777 4470
          1000
    
```

PAGE

```

1000 4777*     JMS   TFS0
1001 5212     JMP   TEST1
1002 3041     DCA   TSTFLD
1003 3042     DCA   COUNT
1004 4776*     JMS   SAME
1005 5212     JMP   TEST1
1006 4775*     JMS   RDFLD /READ FIELD 0
1007 1042     TAD   COUNT
1010 7640     SZA  CLA
1011 4774*     JMS   SRS0 /ERROR FIELD 0
1012 4773*     TEST1, JMS   TFS1
1013 5225     JMP   TEST2
1014 1167     TAD   I10
1015 3041     DCA   TSTFLD
1016 3042     DCA   COUNT
1017 4776*     JMS   SAME
1020 5225     JMP   TEST2
1021 4775*     JMS   RDFLD /READ FIELD 1
1022 1042     TAD   COUNT
1023 7640     SZA  CLA
1024 4772*     JMS   SRS1 /ERROR FIELD 1
1025 4771*     TEST2, JMS   TFS2
1026 5240     JMP   TEST3
1027 1170     TAD   I20
1030 3041     DCA   TSTFLD
1031 3042     DCA   COUNT
1032 4776*     JMS   SAME
1033 5240     JMP   TEST3
1034 4775*     JMS   RDFLD /READ FIELD 2
1035 1042     TAD   COUNT
1036 7640     SZA  CLA
1037 4770*     JMS   SRS2 /ERROR FIELD 2
    
```

```

1040 4767*     TEST3, JMS   TFS3
1041 5253     JMP   TEST4
1042 1171     TAD   I30
1043 3041     DCA   TSTFLD
1044 3042     DCA   COUNT
1045 4776*     JMS   SAME
1046 5253     JMP   TEST4
1047 4775*     JMS   RDFLD /READ FIELD 3
1050 1042     TAD   COUNT
1051 7640     SZA  CLA
1052 4766*     JMS   SRS3 /ERROR FIELD 3
1053 4765*     TEST4, JMS   TFS4
1054 5266     JMP   TEST5
1055 1172     TAD   I40
1056 3041     DCA   TSTFLD
1057 3042     DCA   COUNT
1060 4776*     JMS   SAME
1061 5266     JMP   TEST5
1062 4775*     JMS   RDFLD /READ FIELD 4
1063 1042     TAD   COUNT
1064 7640     SZA  CLA
1065 4764*     JMS   SRS4 /ERROR FIELD 4

1066 4763*     TEST5, JMS   TFS5
1067 5301     JMP   TEST6
1070 1173     TAD   I50
1071 3041     DCA   TSTFLD
1072 3042     DCA   COUNT
1073 4776*     JMS   SAME
1074 5301     JMP   TEST6
1075 4775*     JMS   RDFLD /READ FIELD 5
1076 1042     TAD   COUNT
1077 7640     SZA  CLA
1100 4762*     JMS   SRS5 /ERROR FIELD 5
1101 4761*     TEST6, JMS   TFS6
1102 5314     JMP   TEST7
1103 1174     TAD   I60
1104 3041     DCA   TSTFLD
1105 3042     DCA   COUNT
1106 4776*     JMS   SAME
1107 5314     JMP   TEST7
1110 4775*     JMS   RDFLD /READ FIELD 6
1111 1042     TAD   COUNT
1112 7640     SZA  CLA
1113 4760*     JMS   SRS6 /ERROR FIELD 6
1114 4757*     TEST7, JMS   TFS7
1115 5327     JMP   TEST8
1116 1175     TAD   I70
1117 3041     DCA   TSTFLD
1120 3042     DCA   COUNT
1121 4776*     JMS   SAME
1122 5327     JMP   TEST8
1123 4775*     JMS   RDFLD /READ FIELD 7
1124 1042     TAD   COUNT
    
```

```

1125 7640      SZA CLA
1126 4756*     JMS      SR37      /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     WRFLD, 0
1201 7200     CLA
1202 1164     TAD      [-40
1203 3060     DCA      P2      /WRITE 2 PAGES
1204 4236     JMS      WRA      /WRITE 4 WORDS FROM A REG
1205 4260     JMS      WRB      /WRITE 4 WORDS FROM B REG
1206 2060     ISZ      P2
1207 5204     JMP      .-3
1210 1164     TAD      [-40
1211 3060     DCA      P2
1212 4260     JMS      WRB
1213 4236     JMS      WRA
1214 2060     ISZ      P2
1215 5212     JMP      .-3

```

```

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

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

APTN06,      /APT/

1221 2047     ISZ      FIVE      /INC 5 MIN COUNTER
1222 5600     JMP I   WRFLD      /END OF MEM REACHED
1223 1250     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   WRFLD      /NO-ABORT THE FIVE MINUTE TYPEOUT

1230 4466     C8PASS      /C8/
1231 7000     NOP          /C8/

1232 4777*     JMS      MES
1233 4543     4543
1234 6500     6500      /TYPE A 5
1235 5600     JMP I   WRFLD      /END OF MEMORY REACHED
1236 0000     WRA,      0
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 2246     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

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1276 1176      TAD  [6201
1277 3300      DCA  .+1
1300 6201      CDF  0          /PROGRAM DF
1301 5660      JMP I  WRB

1377 2440
1400 1400      PAGE

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

1401 4407      JMS I  IAPTOK          /APT/

1402 7200      CLA
1403 1041      TAD  TSTFLD
1404 1176      TAD  [6201
1405 3210      DCA  RDA2
1406 1210      TAD  RDA2
1407 3263      DCA  RDB2
1410 6201      RDA2, CDF  0          /TEST DF
1411 1162      TAD  [-100
1412 3060      DCA  P2          /READ & TEST 2 PAGES
1413 1163      RDFLDA, TAD  [-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      TAD  A
1421 7440      SZA

/APT/ IF UNDER APT CONTROL THE NEXT LOC WILL = JMS I IAPTER.
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  SCS1          /1 COMPLEMENT
1427 4327      JMS  READ
1430 7001      IAC
1431 1056      TAD  A
1432 7440      SZA

/APT/ IF UNDER APT CONTROL THE NEXT LOC WILL = JMS I IAPTER.
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  SCS2          /2 COMPLEMENTS
1440 4327      JMS  READ

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1441 7041      CIA
1442 1056      TAD  A
1443 7440      SZA

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

1444 4777*     JMS  ERRA          /A REG ERROR = 2C
1445 2046      ISZ  TSTAD
1446 7000      NDP
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      TAD  PROFLO
1454 1176      TAD  [6201
1455 3256      DCA  .+1
1456 6201      CDF  0          /PROGRAM DF
1457 1046      TAD  TSTAD
1460 7640      SZA CLA
1461 5210      JMP  RDA2          /READ ANOTHER 2 PAGES
1462 5600      JMP I  RDFLO          /END OF MEMORY REACHED

1463 6201      RDB2, CDF  0          /TEST DF
1464 1162      TAD  [-100
1465 3060      DCA  P2          /READ & TEST 2 PAGES
1466 1163      RDFLDB, TAD  [-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      TAD  B
1474 7440      SZA

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

1475 4773*     JMS  ERRB          /B REG ERROR = NC
1476 4327      JMS  READ
1477 7040      CMA
1480 3446      DCA I  TSTAD
1481 4776*     JMS  SCS1          /1 COMPLEMENT
1482 4327      JMS  READ
1483 7001      IAC
1484 1057      TAD  B
1485 7440      SZA

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

1506 4772*     JMS  ERRB1          /B REG ERROR = 1C
1507 4327      JMS  READ
1510 7040      CMA
1511 3446      DCA I  TSTAD
1512 4774*     JMS  SCS2          /2 COMPLEMENTS

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```

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

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

APTE05,
1517 4773*     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  R0B2

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

1572 1637
1573 1626
1574 3511
1575 1611
1576 3505
1577 1600
1600      PAGE

```

```

1600 0000      ERR4,  0
1601 7041      CIA
1602 1056      TAD  A
1603 3063      DCA  BDATA    /DATA READ
1604 1056      TAD  A
1605 4254      JMS  GERRC    /GO TO ERRC SETUP ROUTINE
1606 1056      TAD  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      TAD  A

```

```

1614 7040      CMA
1615 1045      TAD  TEMP
1616 3063      DCA  BDATA    /DATA READ
1617 1056      TAD  A
1620 7040      CMA
1621 4254      JMS  GERRC    /GO TO ERRC SETUP ROUTINE
1622 1056      TAD  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      TAD  B
1631 3063      DCA  BDATA    /DATA READ
1632 1057      TAD  B
1633 4254      JMS  GERRC    /GO TO ERRC SETUP ROUTINE
1634 1057      TAD  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      TAD  B
1642 7040      CMA
1643 1045      TAD  TEMP
1644 3063      DCA  BDATA    /DATA READ
1645 1057      TAD  B
1646 7040      CMA
1647 4254      JMS  GERRC    /GO TO ERRC SETUP ROUTINE
1650 1057      TAD  B
1651 7040      CMA
1652 3446      DCA I  TSTAD   /RE-WRITE BAD LOCATION
1653 5637      JMP I  ENRB1
1654 0000      GERRC,  0
1655 3062      DCA  GDATA    /GO TO ERRC
1656 1040      TAD  PROFLO   /DATA WRITTEN
1657 1176      TAD  [6201
1660 3261      DCA  .+1
1661 6201      CDF  0
1662 4777*     JMS  ERRC      /PROGRAM DF
1663 1041      TAD  TSTFLD   /DATA OR CHKBD ERROR
1664 1176      TAD  [6201
1665 3266      DCA  .+1
1666 6201      CDF  0
1667 5654      JMP I  GERRC

/
/CHECK FOR LEGAL FIELD SELECTION
/
1670 0000      LEGAL,  0
1671 7300      CLA  CLL
1672 3054      DCA  INSAFE   /SAME FIELD CONTROL
1673 1161      TAD  [=-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 110
1702 3041      DCA TSTFLD
1703 4775      JMS TFS1
1704 7410      SKP
1705 4353      JMS LEGALA
1706 1170      TAD 120
1707 3041      DCA TSTFLD
1710 4774      JMS TFS2
1711 7410      SKP
1712 4353      JMS LEGALA
1713 1171      TAD 130
1714 3041      DCA TSTFLD
1715 4773      JMS TFS3
1716 7410      SKP
1717 4353      JMS LEGALA
1720 1172      TAD 140
1721 3041      DCA TSTFLD
1722 4772      JMS TFS4
1723 7410      SKP
1724 4353      JMS LEGALA
1725 1173      TAD 150
1726 3041      DCA TSTFLD
1727 4771      JMS TFS5
1730 7410      SKP
1731 4353      JMS LEGALA
1732 1174      TAD 160
1733 3041      DCA TSTFLD
1734 4770      JMS TFS6
1735 7410      SKP
1736 4353      JMS LEGALA
1737 1175      TAD 170
1740 3041      DCA TSTFLD
1741 4767      JMS TFS7
1742 7410      SKP
1743 4353      JMS LEGALA
1744 2055      ISZ LEGAL0
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      LEGAL, 0
1754 2055      ISZ LEGAL0 /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      I200
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 1040
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 4000
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      I6201
2204 3212      DCA      CFP0
2205 1157      TAD      I-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      CFP4      /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      CFP1      /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      CFP1      /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

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```

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
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          /STORE CONVERTED DIGITS
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          TAD    HCW2        /APT/
2443 7700          SMA CLA          /APT/UNDER APT CONTROL?
2444 5250          JMP    APT000     /APT/SKP IF YES.
2445 1240          TAD    MES        /APT/
2446 3777*        DCA    APTER      /APT/FORCE AN ERROR CALL TO APT.
2447 5776*        JMP    APTER+1    /APT/
AP000,           /APT/

2450 7240          STA
2451 1240          TAD    MES        /FIRST WORD =1
2452 3010          DCA    10

AP001,

2453 1410          TAD I  10
2454 3316          DCA    M0
2455 1316          TAD    M0
2456 7002          BSW
2457 4263          JMS    TYPCH     /TYPEOUT FIRST CHARACTER
2460 1316          TAD    M0
2461 4263          JMS    TYPCH     /TYPEOUT SECOND CHARACTER
/*APT*/ JMP    MES+4             /CONTINUE

2462 5253          JMP    APT001     /APT/CONTINUE.

2463 0000          TYPCH, 0
2464 0147          AND    [77
2465 7450          SNA
2466 5410          JMP I  10
2467 1144          TAD    [-34     /END OF MESSAGE RETURN
2470 7440          SZA
2471 5274          JMP    ,+3
2472 1143          TAD    [207     /CODE IS BELL
2473 5314          JMP    MTP
2474 1163          TAD    [-4
2475 7500          SMA
2476 5301          JMP    ,+3
2477 1142          TAD    [340     /CODE LESS THAN 40?
2500 5314          JMP    MTP     /NO
2501 1141          TAD    [-3
2502 7440          SZA
2503 5306          JMP    ,+3

```

```

2504 1140          TAD    [212     /CODE IS LINE FEED
2505 5314          JMP    MTP
2506 1161          TAD    [-2
2507 7440          SZA
2510 5313          JMP    ,+3
2511 1137          TAD    [215     /CODE IS CR
2512 7410          SKP
2513 1136          TAD    [245     /ADD 200 TO OTHERS > 40
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          /GO TYPE THE MESSAGE
2523 6007          CAF
2524 6001          IDN
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          TAD    [240
2535 4317          JMS    TYPE
2536 5732          JMP I  TYPSP

2576 7276          PAGE
2577 7275
2600 0024          PAGE

/
/ERROR ROUTINE (BELL ON ERROR HAS PRIORITY)
/
2600 0000          RETURN, 0        /PROGRAM RETURN ADDRESS
2601 4405          CODERR, LAS
2602 0025          AND    SR02     /BELL ON ERROR?
2603 7650          SNA CLA
2604 5213          JMP    ,+7
2605 1104          RBELL, TAD    NOTTY /GET TTY FLAG
2606 7710          SPA    CLA
2607 5600          JMP I  RETURN    /NO TELETYPE AVILABLE DO NOT RING BELL
2610 1143          TAD    [207
2611 4777*        JMS    TYPE     /RING BELL
2612 5600          JMP I  RETURN
2613 4405          LAS
2614 0024          AND    SR01

```

```

2615 7640      SZA CLA
2616 5247      JMP      STOP      /INHIBIT TYPEOUT
2617 6224      RIF
2620 7012      RTR
2621 7010      RAR
2622 0134      AND      I7
2623 1133      TAD      I4060
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      NOTTY
2634 7710      SPA      CLA
2635 5646      JMP I   ADDER
2636 4775      JMS      MES
2637 4543      4543
2640 0000      ERROR0, 0
2641 0000      ERROR1, 0
2642 0000      0
2643 4040      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      CBERR
2656 4475      /*CB*/ HLT
2657 0027      LIMIT, LAS
2660 7640      AND      SR04
2661 5774      SZA CLA
2662 5600      JMP I   PATA
2662 5600      JMP I   RETURN

```

```

/RELOCATION MOVE ERROR
2663 0000      /ERRM, 0
/APT/ IF UNDER APT CONTROL NEXT LOC WILL = JMS I IAPTER.
APTE06,
2664 2042      ISZ      COUNT
2665 7410      SKP
2666 5264      JMP      .-2

```

```

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      I4060
2701 3321      DCA      Z10
2702 4776      JMS      SIXTY
2703 0043      MOVE
2704 2722      Z11
2705 1104      TAD      NOTTY
2706 7710      SPA      CLA
2707 5330      JMP      ERRMM
2710 4775      JMS      MES
2711 2205      TEXT      "RELO ERR AT "
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      C7
2732 7402      HLT
2733 7240      CLA      CMA
2734 1200      TAD      RETURN
2735 7402      HLT
2736 7200      CLA
2737 1321      TAD      Z10
2740 0372      AND      C7
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
2772 0007

```

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
3010 3775 DCA ADDER /ERROR TYPEOUT ADDRESS
3011 4405 LAS
3012 0025 AND SR02 /BELL ON ERROR
3013 7640 SZA CLA
3014 5774 JMP RBELL /RING BELL
3015 4405 LAS
3016 0024 AND SR01
3017 7640 SZA CLA
3020 5773 JMP STOP /INHIBIT TYPEOUT
3021 2044 ISZ HEAD1
3022 7410 SKP
3023 4772 JMS ERRHD /TYPEOUT ERROR HEADING
3024 5771 JMP CODERR

3025 1041 PERRC, TAD TSTFLD
3026 7112 CLL RTR
3027 7010 RAR
3030 1133 TAD {4060
3031 3247 DCA Z1
3032 0770 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 0 /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*     PARORC, JMS TTS
3063 4341      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 7240      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 GDATA /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

```

/ /TYPEDOUT 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

```

```

3200 0000      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
/
PARINT, CLA
3300 7200 TAD (INTR
3301 1376 DCA RETURN
3302 3775' JMS SIXTY
3303 4774' 0
3304 0000 Z20
3305 3331 JMS SIXTY
3306 4774' TSTAD
3307 0046 Z21
3310 3345 TAD NOTTY /GET TTY FLAG
3311 1104 SPA /IS THERE A TELETYPE AVAILABLE
3312 7710 JMP PARERR /NO, GO HALT WITH ERROR INFO IN AC
3313 5354 JMS /PRINT HEADER
3314 4777' TEXT "X*PARITY ERR, LOC 0="
3315 4543
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 3046 DCA
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 PAGE
3400 3400

```

/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 5000 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 WORLD 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 HAR
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 SFS3, 0 /SET FS3 (DON'T TEST FIELD 3)
3602 1035 CLA
3603 0127 TAD FS
3604 1126 AND [7360]
3605 3035 TAD [400]
3606 5600 DCA FS
3607 0000 JMP I SFS3
3610 7200 SRS3, 0 /SET RS3 (DON'T RELO TO FIELD 3)
3611 1036 CLA
3612 0127 TAD RS
3613 1126 AND [7360]
3614 3036 TAD [400]
3615 5607 DCA RS
3616 0000 JMP I SRS3
3617 7200 SFS4, 0 /SET FS4 (DON'T TEST FIELD 4)
3620 1035 CLA
3621 0125 TAD FS
3622 1124 AND [7560]
3623 3035 TAD [200]
3624 5616 DCA FS
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 SFS5, 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 SFS6, 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 SFS7, 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 IAPTER.
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 2523 = 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 PAGE
4000

```

```

/
/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 /FIELD 0
4077 2273 ISZ TRS0
4100 5673 JMP I TRS0

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

4110 0000 TRS2, 0
4111 7200 CLA
4112 1036 TAD RS
4113 7006 RTL
4114 7700 SMA CLA /FIELD 2
4115 2310 ISZ TRS2
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 /FIELD 3
4125 2317 ISZ TRS3
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 /FIELD 4
4135 2327 ISZ TRS4
4136 5727 JMP I TRS4

/*C6*/ PAGE

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

4147 0000 TRS6, 0

```

```

4150 7200 CLA
4151 1036 TAD RS
4152 7002 BSW
4153 7700 SMA CLA /FIELD 6
4154 2347 ISZ TRS6
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 /FIELD 7
4164 2356 ISZ TRS7
4165 5756 JMP I TRS7

4200 PAGE /C8/

/
/TYPEOUT ERROR HEADING
/
4200 0000 ERRHD, 0
4201 1104 TAD NOTTY /GET TTY FLAG
4202 7710 SPA CLA
4203 5600 JMP I ERRHD /NO TELETYPE AVAILABLE DON'T PRINT
4204 4777 JMS MES
4205 4543 TEXT "X#PR LOC FAIL ADR 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 ERRHD

/
/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  "X##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

/*CB*/        CRPAUS           /CB/
4300 4473      HLT  CB$HIT
4301 5660      JMP I  SETSW        /GO GET VALUE OF S.R. IF ON CLB

/
/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
4330 7106      RIF
4331 7004      CLL RTL
4332 1117      RAL
4333 3335      TAD  I6000
4334 4777      DCA  Z8
4335 0000      JMS  MES
4336 7240      Z8, 0
4337 3044      STA
4340 5702      DCA  HEAD1
4340 5702      JMP I  PNOREL

/*CB*/        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

```

```

/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 I6201
4415 1040 TAD PROFLO
4416 3227 DCA RELO2
4417 1176 TAD I6201
4420 1041 TAD TSTFLD
4421 3231 DCA RELO3
4422 1227 TAD RELO2
4423 3234 DCA RELO4
4424 1116 TAD I6203
4425 1041 TAD TSTFLD
4426 3245 DCA RELO5
4427 6201 RELO2, CDF 0 /MOVE FROM DF
4430 1443 TAD I MOVE
4431 6201 RELO3, CDF 0 /MOVE TO DF
4432 3443 DCA I MOVE
4433 1443 TAD I MOVE
4434 6201 RELO4, CDF 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, CDF 0 /NEW PROGRAM FIELD
4446 5610 JMP I RELO

```

```

/
/INTERRUPT ROUTINE
/
4447 4301 INTROU, JMS SAVINT
4450 6107 SPD /SKIP IF PARITY OPTION
4451 5254 JMP .+3
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 SPD /SKIP ON PARITY OPTION
4474 5670 JMP I PAR
4475 6224 RIF
4476 7650 SNA CLA /SKIP IF NOT FIELD 0
4477 6201 ION
4480 5670 JMP I PAR
/*C8*/
4501 0000 SAVINT, 0
4502 7200 CLA
4503 1770* TAD SIXTY
4504 3336 DCA A1
4505 1767* TAD CNV
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	/C0/
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	TCS	
4623	3326	DCA	A23	
4624	1765*	TAD	TTS	
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	A1	
4635	3762*	DCA	SIXTY	
4636	1761*	TAD	A2	
4637	3760*	DCA	CNV	
4640	1757*	TAD	A3	
4641	3756*	DCA	S0	
4642	1755*	TAD	A4	
4643	3754*	DCA	S1	
4644	1753*	TAD	A5	
4645	3752*	DCA	S2	
4646	1751*	TAD	A6	
4647	3750*	DCA	MES	
4650	1747*	TAD	A7	
4651	3746*	DCA	TYPCH	
4652	1745*	TAD	A8	
4653	3744*	DCA	M0	
4654	1743*	TAD	A9	
4655	3742*	DCA	TYPE	
4656	1741*	TAD	A10	
4657	3740*	DCA	TYPSP	
4660	1737*	TAD	A11	
4661	3736*	DCA	RETURN	
4662	1735*	TAD	A12	
4663	3734*	DCA	ERROR0	
4664	1733*	TAD	A13	
4665	3732*	DCA	ERROR1	
4666	1315	TAD	A14	
4667	3777*	DCA	ERROR1+1	
4670	1316	TAD	A15	
4671	3776*	DCA	ADDER	
4672	1317	TAD	A16	
4673	3775*	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 T18
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 3264
4770 3250
4771 3234
4772 3220
4773 3210
4774 3200
4775 3141
4776 2646
4777 2642
        *6200 /C8/
        6200

/*C8*/*6000
6200 4777 LOOP1, JMS SAVDF
6201 1104 TAD NOTTY /GET THE TELETYPE FLAG
6202 7710 SPA CLA /IS THERE 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 LOOP1A, JMS RESDF
6224 4405 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

```

/C6/ ROUTINE TO SAVE PAGE 37 OF FIELD 7

```

6261 0000 C8SM, 0
6262 7200 CLA
6263 6224 RIF /GET THE INSTRUCTION FIELD
6264 1373 TAD (6201 /ADD CDF TO IT
6265 3274 DCA C8SM0 /SAVE IT
6266 1372 TAD (7577
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 SZL 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/

```

/*C8*/ HLT
        LAS
        OCA FIRST
        TAD NOTTY /GET FLAG STATUS AGAIN
        SPA CLA /TELETYPE AVAILABLE?
        JMP FIRST-4 /NO-ABORT MESSAGE AND HALT FOR INFO
        JMS MES
        TEXT "#SET SR TO SECOND ADDRESS & CONT"
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

```

6523 4503

C8PAUS

/C8/

```

/*C8*/ HLT
        LAS
        DCA SECOND
        JMP I INI2
        FIRST, 0
        SECOND, 0
6524 4405
6525 1330
6526 5645
6527 0000
6530 0000
6575 7075
6576 2440
6577 7063
        6600

```

*6600

/C8/

```

/*C8*/#6400
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 "#LOOP FROM FIRST ADDRESS THRU SECOND ADDRESS"
6600 4777*
6601 1104
6602 7710
6603 5254
6604 4776*
6605 543
6606 1417

```

6607 1720
6610 4006
6611 2217
6612 1540
6613 0611
6614 2225
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 INI2
        TAD FIRST
        OCA SRL1
        TAD SECOND
        DCA SRL2
        JMS RESDF
LOOP3A, TAD SRL1
        DCA SRL
LOOP3B, TAD I SRL
        CMA
        DCA I SRL
        TAD I SRL
        CMA
        DCA I SRL
        TAD SRL
        CIA
        TAD SRL2
        SNA CLA
        JMP LOOP3A
        ISZ SRL
        JMP LOOP3B

```

6661 4500

C8ERR

/C8/

```

/*C8*/ HLT
        JMP LOOP3 /HALT RESULTED FROM ILLEGAL LIMITS
6662 5200
6663 0000
        SRL, 0
6664 0000
        SRL1, 0
6665 0000
        SRL2, 0
        6700

```

/C8/

```

/*C8*/#7000
LOOP3, JMS SAVDF
        TAD NOTTY /GET TTY FLAG
6700 4777*
6701 1104

```



```

6702 7710 SPA CLA /IS THERE A TELETYPE AVAILABLE
6703 5336 JMP LOOPS5A-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 DCA SR5A
6741 1773 TAD SECOND
6742 3364 DCA SR5B
6743 4772 JMS RESDF
6744 1363 LOOP5A, TAD SR5A
6745 3365 DCA SR5C
6746 4405 LOOP5B, LAS
6747 3765 DCA I SR5C
6750 1765 TAD I SR5C
6751 3765 DCA I SR5C
6752 1365 TAD SR5C
6753 7041 CIA
6754 1364 TAD SR5B
6755 7650 SNA CLA
6756 5344 JMP LOOPS5A /START AGAIN WITH FIRST ADDRESS
6757 2365 ISZ SR5C
6760 5346 JMP LOOP5B /DO NEXT ADDRESS
6761 4500 CBERR /CB/

/*CB*/ HLT /HALT RESULTED FROM ILLEGAL LIMITS
6762 5300 JMP LOOPS
6763 0000 SR5A, 0 /FIRST ADDRESS OF GROUP
6764 0000 SR5B, 0 /LAST ADDRESS OF GROUP
6765 0000 SR5C, 0 /ADDRESS COUNTER

```

```

6772 7075
6773 6530
6774 6527
6775 6445
6776 2440
6777 7063
7000 *7000 /CB/

/*CB*/ *6600
7000 4263 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
7058 1662 DCA I SR4
7060 1662 TAD I SR4
7061 5256 JMP LOOP4A
7062 0000 SR4, 0
7063 0000 SAVDF, 0
7064 7200 CLA
7065 0214 RDF
7066 3274 DCA SAVE
7067 6224 RIF
7070 1176 TAD I6201
7071 3272 DCA .+1
7072 6201 CDF 00 /PROGRAM DF
7073 5663 JMP I SAVDF
7074 0000 SAVE, 0

7075 0000 RESDF, 0
7076 1274 TAD SAVE
7077 1176 TAD I6201
7100 3301 DCA .+1
7101 6201 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 SECOND
/*C8*/ DCA SR5B
/*C8*/ JMS RESDF
/*C8*/LOOPS5A, TAD SR5A
/*C8*/ DCA SR5C
/*C8*/LOOPS5B, 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 LOOPS5A /START AGAIN WITH FIRST ADDRESS
/*C8*/ ISZ SR5C
/*C8*/ JMP LOOPS5B /DO NEXT ADDRESS
/*C8*/ HLT /HALT RESULTED FROM ILLEGAL LIMITS
/*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 HCH2 /APT/RUN UNDER APT CONTROL?
7206 7700 SMA CLA /APT/SKP IF YES.
7207 5274 JMP APTIZ0 /APT/
7210 1375 TAD I7000 /APT/MODIFY SOME LOCS TO: NOP.
7211 3774 DCA APTNB0 /APT/
7212 1375 TAD I7000 /APT/
7213 3773 DCA APTNB2 /APT/
7214 1375 TAD I7000 /APT/
7215 3772 DCA APTNB3 /APT/
7216 1375 TAD I7000 /APT/
7217 3771 DCA APTNB4 /APT/
7220 1375 TAD I7000 /APT/
7221 3770 DCA APTNB5 /APT/
7222 1375 TAD I7000 /APT/
7223 3767 DCA APTNB6 /APT/
7224 1366 TAD APTJ50 /APT/MODIFY SOME LOCS TO: JMP .+N.
7225 0365 AND I177 /APT/
7226 1364 TAD I5200 /APT/
7227 3763 DCA APTJ00 /APT/
7230 1362 TAD APTJ51 /APT/
7231 0365 AND I177 /APT/
7232 1364 TAD I5200 /APT/
7233 3761 DCA APTJ01 /APT/
7234 1360 TAD APTJ52 /APT/
7235 0365 AND I177 /APT/
7236 1364 TAD I5200 /APT/
7237 3757 DCA APTJ02 /APT/
7240 1356 TAD APTJ53 /APT/
7241 0365 AND I177 /APT/
7242 1364 TAD I5200 /APT/
7243 3755 DCA APTJ03 /APT/
7244 1354 TAD APTJ54 /APT/
7245 0365 AND I177 /APT/
7246 1364 TAD I5200 /APT/
7247 3753 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 CDF /APT/(MODIFIED CDF) 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 0000 PAGE /APT/
7401 6002 /APT/ ROUTINE TO INITIALIZE FOR RUNNING UNDER APT CONTROL
7402 4777* /CB/ OR UNDER CLASSIC 8 CONTROL.

7403 0000 APTIZ, 0 /APT/
7404 6002 IOF /APT/
7402 4777* JMS DFEIF /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 C8CF /CB/SET CLASSIC 8 CONTROL FLAG.

```

```

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

```

```

7411 4775* JMS C8SM /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 C8CF, 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 C8CF /CB/UNDER CLASSIC 8 CONTROL?
7421 7700 SMA CLA /CB/SKP IF YES.
7422 5225 JMP ,+3 /CB/

```

```

7423 4467      C8CKSW      /CB/
7424 5616      JMP I   APTSR      /CB/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     /CB/UNDER CLASSIC 8 CONTROL?
7467 7710      SPA CLA      /CB/SKP IF NO.
7470 4771      JMS      XC8CKP /CB/GD CHECK FOR CONTROL CHARS.
7471 7000      NOP              /CB/
7472 5634      JMP I   APTOK    /APT/RTN TO CALL+1.

```

/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      CHA              /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=FLD 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      (7       /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     /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 X00SW 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.
CONSOL=0
0000
6601      PSKF= 6661
6602      PCLF= 6662
6603      PSKE= 6663
6604      PSTB= 6664
6605      PSIE= 6665
6004      GTF= 6004
7701      ACL= 7701
6007      CAF= 6007
    
```

```

7421      MQL= 7421
7501      MQA= 7501
2066      *66

0066 4466      C0PASS= JMS I      .
5000          XC0PAS      /C0 PASS COMPLETION ROUTINE
4467          C0CKSW= JMS I      .
5067          XC0SW      /CHECK SW REG SETTING
5070          C0TTYI= JMS I      .
4471          XC0TTY      /FETCH CONSOL CHAR
0071          C0CNTR= 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          C0OCTA= JMS I      .
5600          XC0OCT      /CONVERT TO ASCII AND PRINT
4475          C0CHLF= JMS I      .
5623          XC0CRL      /OO 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          XC0INQ      /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  XC8PAS /GO TO HALT

5004 5216  JMP  C8BY1 /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  /
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*/ C8INQU /STOP PROGRAM EXECUTION=LOOK FOR INPUT
C8BY1, ISZ  XC8PAS /BUMP RETURN
          JMP I  XC8PAS

CKCOUT, 0
          TAD  DOSET /CHECK IF SET UP NEEDED
          SZA CLA /DO SET UP C8PASS COUNT VALUE
          /1=C8PASS COUNT VALUE OK
          /C8PASS COUNT VALUE ON
          /GET COUNT VALUE FOR THIS PROG
          /SET TO NEGATIVE
          /STUPE IN HERE
          /INDICATE VALUE SET UP
          /COUNT THE NUMBER OF PASSES
          /EXIT FOR ANOTHER PASS
          /SET TO C8PRNT C8PASS
          /BUMP RETURN FOR
          /C8PASS C8TYPE OUT

5023 5216  JMP  NOSET
5024 1240  TAD  CNTVAL
5025 7140  CMA
5026 5215  DCA  DOCNT
5027 2237  ISZ  DOSET
5028 2237  ISZ  DOCNT
5029 5216  NOSET, JMP  C8BY1
5031 5216  JMP  DOSET
5032 7217  DCA  DOSET
5033 2236  ISZ  CKCOUT
5034 5210  JMP I  CKCOUT
5035 5000  DOCNT, 0
5036 5000  PASCNT, 0
5037 5000  DOSET, 0
5040 5000  CNTVAL, 0
MESPAS, TEXT "UMKMAC PASS "
5112 5215
5113 5217
5114 5000
5115 5000
5116 5000
5117 5000
5118 5000
5119 5000
5120 5000

```

```

/*****
/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
5053 1021  /#1  TAD  21 /GET WD FOR INDICATOR
5054 7710  SPA CLA /CHECK IF FROM PANEL 4000
5055 7614  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  KR8 /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 5660  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 ADDR3 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 C8001, 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 SMA /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 /CHECK IF 00 TERMINATOR
5114 5671 JMP I XC8PNT //EXIT
5115 1370 TAD (3740 /ADD FUDGE FACTOR TO DETERMINE IF 200
5116 7500 SMA /OR 300 IS TO BE ADD TO CHAR
5117 1367 TAD (100 /ADD 100
5120 1366 TAD (240 /ADD 200
5121 4477 C8TYPE /C8TYPE ONLY BITS 4-11
5122 2324 ISZ PTSTOR /BUMP POINTER FOR NEXT WORD
5123 5276 JMP C8001 /DO AGAIN
5124 0000 PTSTOR, 0 /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 ADDR3
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   /GET AC FOR RETURN
5205 5600   JMP I  XC8CNT   /EXIT NOT ON ACTIVE CONSOLE
5206 6004   GTF
5207 3775*   DCA   FLSAVE
5210 7501   MQA
5211 3774*   DCA   MQSAVE   /SAVE THE MQ
5212 3255   DCA   INDEXA   /SET DISPLACEMENT INTO TABLE B
5213 1257   TAD   XTABLA   /GET ADDR8 OF TABLE A
5214 3256   DCA   GETDAT   /CONTAINS POINTER TO CONTROL CHAR
5215 1656   REDDA, TAD I  GETDAT   /GET CONTROL CHAR FROM TABLE
5216 7450   SNA
5217 5226   JMP   DONEA   /CHECK FOR A 0 END OF TABLE
5220 1773*   TAD   CHAR     /END OF TABLE NO CONTROL CHAR
5221 7650   SNA CLA     /COMPARE CHAR TO CONTROL CHAR
5222 5243   JMP   GOITA   /0 IF MATCH
5223 2255   ISZ   GOITA   /MATCH
5224 2256   ISZ   INDEXA  /NO MATCH NOT END OF TABLE REDD
5225 5215   JMP   REDDA   /BUMP INDEX FOR EXIT WHEN CONTROL FOUND
5226 1772*   DONEA, TAD   INMODE /BUMP GETDAT FOR COMPARE OF NEXT CNTRL CHAR.
5227 7640   SZA CLA     /CHECK IF PROGRAM EXPECTS CHAR
5230 5240   JMP   EXITA   /1=CHAR EXPECTED 0= NO CHAR EXPECTED
5231 1773*   TAD   CHAR     /CHAR EXPECTED
5232 4477   C8TYPE     /GET CHAR = NOT CONTROL + NOT EXPECTED
5233 1371   TAD   (277    /CBPRNT CHAR
5234 4477   C8TYPE     /GET CODE FOR "?"
5235 4475   C8CRLF
5236 2200   ISZ   XC8CNT   /BUMP RETURN
5237 5600   JMP I  XC8CNT   /EXIT CALL+2
/
5240 2200   EXITA, ISZ   XC8CNT   /BUMP RETURN FOR MAIN PROGRAM CHECK OF CHAR
5241 1773*   TAD   CHAR     /PUT CHAR IN AC.
5242 5600   JMP I  XC8CNT   /EXIT
5243 1773*   GOITA, TAD   CHAR     /GET THE CONTENTS OF CHAR
5244 1370   TAD   (100    /ADD 100 TO FORM A GOOD ASCII CHARACTER
5245 3773*   DCA   CHAR     /RESTORE COFFECT CHAR
5246 1260   TAD   XTABLB   /GET START OF TABLE B
5247 1255   TAD   INDEXA  /GET NOW FAR INTO TABLE
5250 3254   DCA   GTOA    /STORE IT
5251 1654   TAD I  GTOA    /GET THE ROUTINE STARTTING ADDRESS
5252 3254   DCA   GTOA    /STORE IT IN HERE
5253 5654   JMP I  GTOA    /GOTO CONTROL CHAR ROUTINE
5254 0000   GTOA, 0000    /ADD OF CNTRL ROUTINE TO EXECUTE
5255 0000   INDEXA, 0000 /DISPLACEMENT INTO CNTRL TABLE
5256 0000   GETDAT, 0000 /LOCATION OF ADDR8 OF CONTROL CHAR.
5257 5261   XTABLA, TABLA /ADDR8 OF TABLEA
5260 5271   XTABLB, TABLB /ADDR8 OF TABLEB
5261 7575   TABLA, 7575  /CNTRL C BACK TO MONITOR 203
5262 7564   7564      /CNTRL L SWITCH ERROR PRINTTING DEVICE 214
5263 7557   7557      /CNTRL Q START DISPLAYING CHAR. AGAIN 221
5264 7556   7556      /CNTRL R BACK TO BEGINNING OF PROGRAM 222
5265 7555   7555      /CNTRL S STOP SENDING CHAR TO DISPLAY WAIT FOR CNTRL D 223
5266 7573   7573      /CNTRL E CONTINUE WITH PROGRAM 205
5267 7574   7574      /CONTROL D CHANGE SWITCH REGISTER ON FLY
5270 0000   0000

```

```

5271 5300   TABLB, CNTRLC
5272 5345   CNTRLL
5273 5307   CNTRLQ
5274 5320   CNTRLR
5275 5327   CNTRLS
5276 5353   CNTRLE
5277 5400   CNTRLD
/
/RETURN TO MONITOR
/##
5300 3767*   CNTRLC, DCA   TTYLPT   /CLEAR SOFT FLAG FOR TERMINAL PRINTING
5301 3766*   DCA   CBSWST
5302 4765*   JMS   UPAROW   /CBPRNT "A" AND LETTER IN CHAR
5303 4764*   JMS   C8RM     /C8/GO RESTORE PG 37 IN FIELDS 0 & 1.
5304 6203   CDF CIF     /GO TO 0 FLD
5305 6007   CAF
5306 5763   JMP I  (7600   /CLEAR THE WORLD
/GO TO DIAGNOSTIC MONITOR
/
/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  XC8CNT
5315 3343   BYRETR, DCA  C8SETS
5316 4762*   JMS   C8GET
5317 5744   JMP I  C8RETR
/
/
/GO TO THE QUESTION C8SWIT
/
/
5320 3767*   CNTRLR, DCA   TTYLPT   /CLEAR LINE PRINTER FLAG
5321 3343   DCA   C8SETS   /CLEAR SOFT FLAG FOR CNTRL S
5322 3772*   DCA   INMODE
5323 4765*   JMS   UPAROW   /GO PRINT CHARACTER
5324 3766*   C8BY4, DCA   CBSWST  /CLEAR FLAG FOR CNTRL D OR R
5325 5726   JMP I  X00SW   /GO TO ADDR8 OF C8SWIT
5326 0200   X00SW, C8STRT /X00SW IS LABEL FOR C8SWIT QUESTION
/
/
/STOP SENDING CHAR. TO DISPLAY UNTIL A "Q" IS RECEIVED
/
/
5327 1343   CNTRLS, TAD   C8SETS   /IF1 DO NOT STORE IN C8RETR
5328 7640   SZA   CLA
5329 5335   JMP   C8D07   /DONT SET UP C8RETR
5330 7001   IAC
5331 1200   TAD   XC8CNT   /MAKE RETURN CALL PLUS 2
/GET RETURN FOR THIS CALL

```



```

5334 3344          DCA   C0RETR  /STORE IT HERE FOR USE BE .CNTRL Q
5335 2343          ISZ   C0SETS  /SET FLAG TO SAVE CALL
5336 4470          C0TTYI  /LOOK FOR THE INPUT
5337 4762'         JMS   C0GET   /GET REGISTERS
5340 4471          C0CNTR  /CHECK FOR THE CONTROL CHAR
5341 7200          CLA   C0RETR  /CHECK FOR THE CONTROL CHAR
5342 5327          JMP   CNTRLS  /IF NOT A CNTRL Q R C REASK

5343 0000          C0SETS, 0
5344 0000          C0RETR, 0
/
/SWITCH OUTPUT FROM ONE OUTPUT DEVICE TO ANOTHER - THE TWO OUTPUTS ARE THE
/CONSOLE AND THE PRINTER WITH DEVICE CODE 66.
/
/
5345 1767'        CNTRLL, TAD   TTYLPT  /GET PRESENT C0SWIT INDICATOR
5346 7040          CMA   C0RETR  /COMPLEMENT IT
5347 3767'        DCA   TTYLPT  /STOR NEW C0SWIT
5350 4765'        JMS   UPAROW  /C0PRNT " AND CHAR ON NEW DEVICE
5351 4762'        JMS   C0GET   /RESTORE THE REGISTERS
5352 5600          JMP I  XC0CNT  /EXIT

/
/
/CONTROL E
/CONTINUE RUNNING FROM A INQUIRE OR ERROR
/
/
5353 4765'        CNTRLE, JMS   UPAROW  /PRINT THE CONTROL CHAR
5354 4762'        JMS   C0GET   /GET TME REGISTERS
5355 5600          JMP I  XC0CNT  /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   C0SETD  /CHECK IF THE RETURN ADDR8 IS SAFE
5402 7640          SZA  CLA
5403 5207          JMP   C0D011  /DO NOT CHANGE THE RETURN ADDR8
5404 1777'        TAD   XC0CNT  /GET THE RETURN ADDR8 AND SAVE IT
5405 3214          DCA   C0RETD  /SAVE THE RETURN HERE
5406 2213          ISZ   C0SETD  /INDICATE RETURN SAVED DONT DISTROY
5407 4473          C0SWIT  /GO CHANGE THE SWITCH REGISTER
5410 3213          DCA   C0SETD  /CLEAR THE FLAG
5411 4224          JMS   C0GET   /RESTORE THE AC MQ LINK ETC
5412 5614          JMP I  C0RETD  /RETURN TO THE PROGRAM

5413 0000          C0SETD, 0
5414 0000          C0RETD, 0
/

5415 0000          UPAROW, 0
5416 1376          TAD   (336    /C0PRNT THE "" AND THE CHAR C0TYPED IN
5417 4477          C0TYPE  /CODE FOR "
5420 1775'        TAD   CHAR    /C0TYPE THE CHAR
5421 4477          C0TYPE
5422 4475          C0CRLF
5423 5615          JMP I  UPAROW  /ISSUE A CR AND LF
/EXIT

/*****

5424 0000          C0GET, 0
5425 7200          CLA
5426 1774'        TAD   MQSAVE
5427 7421          MQL
5430 1773'        TAD   FLSAVE  /RESTORE MQ
5431 7004          RAL
5432 7200          CLA
5433 1772'        TAD   ACSAVE  /RESTORE THE AC
5434 5624          JMP I  C0GET   /GET THE REGISTERS

/*****

/CBINQU
/CBINQU 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 XC8ING
/EX    C8INQU          /CB WILL PRINT A WAITINGAND WAIT FOR INPUT
/      DO ANYTHING    /RETURN IS CALL PLUS ONE AC =0 CONTINUE

5435 0000  XC8ING, 0
5436 7300  CLA CLL
5437 4771' JMS   CHKCLA      /CHECK FOR CONSOLE ACTIVE
5440 7410  SKP
5441 5635  JMP I  XC8ING          /NOT CONSOLE LEAVE
5442 4475  C8CRLF
5443 4472  C8PRNT
5444 5452  WATMES          /INQUIR WAITING
5445 4470  C8TTYI          /GET CHARACTER
5446 4224  JMS   C8GET
5447 4471  C8CNTR          /CHECK IF CONTROL CHARACTER
5450 5635  JMP I  XC8ING          /EXIT AND CONTINUE
5451 5236  JMP   XC8ING+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
/DF 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
5460 4771' JMS   CHKCLA      /CHECK FOR CONSOLE ACTIVE
5461 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  C8RDPS, 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 C8SWR 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
5520 1364  TAD   (215      /CMPL CHAR IN AC
5521 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
5530 1362  TAD   (-270     /GET CHAR
5531 7700  SMA 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
                          /STORE IN CHAR
                          /GET CHAR IN AC
5536 5716  JMP I  TSTCHA          /EXIT
5537 1360  ERR1, TAD   (277  /C8PRNT
5540 4477  C8TYPE          /?
5541 4475  C8CRLF
5542 5267  JMP   C8RDPS      /
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
/*****
/CBOCTA
/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
/
CBOCTA= JMS XCBOCT
/
/EX. CBOCTA /AC CONTAINS NUMBER TO BE CHANGE
/

```

```

5600 0000 XCBOCT, 0
5601 7106 CLL RTL
5602 7006 RTL /POSITION THE FIRST CHAR FOR PRINTING
5603 3221 DCA C8TMP1 /SAVE CORRECT POSITIONED WORD HERE
5604 1377 TAO (-4
5605 3222 DCA C8CKP /STORE COUNTER IN HERE
5606 1221 C8D04, TAO C8TMP1 /GET FIRST NUMBER
5607 0376 AND (0007 /MASK
5610 1375 TAO (260 /ADD THE PRINT CONSTANT
5611 4477 C8TYPE /TYPE THE NUMBER
5612 1221 TAO 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 XCBOCT /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 /C8PRNT A CR AND LF WITH FILL
/RETURN TO CALL PLUS ONE AC #0
/

```

```

5623 0000 XC8CRL, 0
5624 7300 CLA CLL
5625 1374 TAO (215 /GET CODE FOR CR
5626 4477 C8TYPE
5627 1237 TAO FILLER
5630 7040 CMA
5631 3240 DCA FILCNT /STORE FILLER IN HERE
5632 1373 TAO (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/#2
5637 0004 FILLER, 0004 /FILLER SET FOR 4 CHAR
/1/#2
5640 0000 FILCNT, 0 /COUNTER FOR FILL

```

```

/*****
/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=O=L=O= IT WILL DO
/THE CONTROL FUNCTION AND RETURN TO CALL PLUS 2.
/IF A NON CONTROL CHARACTER WILL BE PRINTED AND A "?" 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      MGA          /PUT MQ IN AC
5646 3770*    DCA      MQSAVE  /SAVE THE MQ
5647 6031      K8F          /CHECK THE KEYBOARD FLAG
5650 5261      JMP      C8BY3  /EXIT TO CALL PLUS 1
5651 4767*    JMS      CHKCLA /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
5667 4471      C8CNTR     /GO CHECK IF IT IS A CONTROL CHAR
5670 5663      JMP I    XC8ECH  /WAS A CONTROL CHAR = CONTINUE RUNNING
5671 4477      C8TYPE     /NOT A CONTROL CHAR C8PRNT IT
5672 3276      DCA      INMODE /CLEAR FLAG THAT CHAR EXPECTED
5673 1275      TAD      CHAR   /GET CHAR IN AC
5674 5663      JMP I    XC8ECH  /EXIT
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 O=TTY 7777=LPT
5702 7640      SZA      CLA

```

```

5703 5312      JMP      XDOLPT  /OO OUT PUT ON LPT
5704 1320      TAD      PNTBUF
5705 6046      TLS
5706 6041      TSF
5707 5306      JMP      =-1
5710 6042      TCF
5711 5316      JMP      C8BYS
5712 1320      XDOLPT, TAD PNTBUF  /GET CHAR
5713 6666      PSTB     PCLF     /C8PRNT IT
5714 4322      JMS      C8HANG  /CHECK KEYBOARD IF HUNG
5715 6662      PCLF
5716 7600      C8BYS, 7600 /CLEAR THE AC
5717 5677      JMP I    XC8TYP  /EXIT
5720 0000      PNTBUF, 0
5721 0000      TTYLPT, 0

```

```

5722 0000      C8HANG, 0      /WILL CHECK KEYBOARD FOR CNTRL CHAR
5723 7200      CLA
5724 1316      TAD      C8BYS  /GET CONSTANT 7600
5725 3320      DCA      PNTBUF
5726 6661      PSKF
5727 7410      SKP
5730 5722      JMP I    C8HANG
5731 2346      ISZ      C8CONT
5732 5326      JMP      =-4
5733 2320      ISZ      PNTBUF
5734 5331      JMP      =-3
5735 1765*    TAD      XC8CNTR
5736 3322      DCA      C8HANG
5737 3321      DCA      TTYLPT
5740 4475      C8CRLF     /ISSUE A CR AND LF
5741 4472      C8PRNT
5742 5747      MESHANG
5743 4475      C8CRLF
5744 4501      C8INQU
5745 5722      JMP I    C8HANG
5746 0000      C8CONT, 0
5747 1420      MESHANG, 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 CBSWIT 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 5264 JMP NTCLAS /NOT CLASSIC SYSTEM
6024 4776 JMS CBGET
6025 4775 JMS XCBSW
6026 0374 SETUP1, AND (0000
6027 7640 SZA CLA
6030 5255 JMP C00010 /DO NOT PRINT
6031 4475 CBCLRF
6032 4472 CBPRNT
6033 6077 ERRMES /PRINT THE ERROR MESSAGE
6034 4472 CBPRNT
6035 6107 MESPC /PRINT THE PC STATEMENT
6036 1323 TAD
6037 4474 CBOCTA /CONVERT 4 DIGIT PC TO ASCII
6040 4472 CBPRNT
6041 6112 MESAC /PRINT THE AC MESS
6042 1324 TAD ACSAVE
6043 4474 CBOCTA
6044 4472 CBPRNT
6045 6115 MESMQ /PRINT MQ
6046 1325 TAD MQSAVE

6047 4474 CBOCTA
6050 4472 CBPRNT
6051 6120 MESFL /PRINT FL
6052 1326 TAD FLSAVE
6053 4474 CROCTA
6054 4475 CBCLRF
6055 4776 C00010, JMS CBGET /RESTORE AC MQ AND FLAFS
6056 4467 CBCKSW /CHECK SWITCH REGISTER
6057 7040 CMA /CB/
6060 7710 SPA CLA /SKIP IF BIT 0 SET
6061 5275 JMP CBBY2 /LEAVE
6062 4501 CBINQU /GO TO THE INQUIRE ROUTINE
6063 5275 JMP CBBY2 /LEAVE
6064 4776 NTCLAS, JMS CBGET /RESTORE AC, MQ AND FLAGS
6065 4467 CBCKSW /CHECK PSEUDO SWITCH REGISTER
/CHECK THE CBSWIT REGISTER
/CB/
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 CBGET
6074 5723 JMP I PCSAVE /EXIT TO CALL AND HALT
6075 4776 CBBY2, JMS CBGET /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

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

6127 0000 CBRM, 0 /CB/
6130 7200 CLA /CB/
6131 6224 RIF /CB/CREATE A COP 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	7040	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	MQL		/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

A	0056	APTJ03	1127	C0PRNT	4472	DOSET	5037
A1	4536	APTJ04	2064	C0RDP3	5467	ENDF	0053
A10	4547	APTJ50	0201	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	APTNO0	0204	C0SETO	5413	ERR01	1637
A16	4717	APTNO2	0244	C0SET3	5343	ERRC	3000
A17	4720	APTNO3	0264	C0SM	6261	ERRCC	3110
A18	4721	APTNO4	0310	C0SM0	6274	ERRHO	4200
A19	4722	APTNO5	0206	C0SM1	6272	ERRM	2663
A2	4537	APTNO6	1221	C0STR1	0200	ERRMES	6077
A20	4723	APTOK	7434	C0SWIT	4473	ERRMM	2730
A21	4724	APTOK0	7465	C0SWST	5546	ERROR0	2640
A22	4725	APT8R	7416	C0TMP1	5621	ERROR1	2641
A23	4726	APT8R0	7432	C0TTYI	4470	EXITA	5240
A24	4727	B	0057	C0TYPE	4477	FCNT	0051
A3	4540	BDINT	3422	CAF	6007	FILCNT	5640
A4	4541	BDATA	0063	COI	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	GTF	6004
APTCTY	7464	C0CKP	5622	CMP	6104	HCW1	0021
APTE00	1422	C0CKPA	4502	CNTRLC	5300	HCW2	0022
APTE01	1433	C0CK8W	4467	CNTRLD	5400	HEAD1	0044
APTE02	1444	C0CNTR	4471	CNTRLE	5353	IAPTER	0006
APTE03	1475	C0CONT	5746	CNTRLL	5345	IAPTOK	0007
APTE04	1506	C0CRLF	4475	CNTRLQ	5307	IAPTSR	0005
APTE05	1517	C0DD1	5076	CNTRLR	5320	IN12	6445
APTE06	2664	C0DD10	6055	CNTRLS	5327	INDEXA	5255
APTE07	3001	C0DD11	5407	CNTVAL	5040	INMODE	5676
APTE08	3722	C0DD2	5633	CNV	2422	INSAME	0054
APTR	7275	C0DD3	5136	CODERR	2601	INTR	4457
APTFL	7473	C0DD4	5606	CONSOL	0008	INTROU	4447
APTFL0	7521	C0DD7	5335	COUNT	0042	KBINT	3400
APTIXM	7461	C0ECHO	4476	CRELO	0037	KBINTC	3416
APTIXY	7462	C0ERR	4500	CS	0033	KTEST	0051
APTIZ	7400	C0GET	5424	CSAME	0460	LAS	4405
APTIZ0	7274	C0HANG	5722	CSR03	2007	LEGAL	1670
APTIZ1	7200	C0INQU	4501	OFEIF	0232	LEGAL0	0055
APTJ00	0246	C0OCTA	4474	DOCNT	5035	LEGALA	1753
APTJ01	0266	C0PASS	4466	DONEA	5226	LIMIT	2656
APTJ02	0312	C0PAUS	4503	DOPACK	5005	LOOP1	6200

LOOP1A	6224	PNTBUF	5720	SETUP1	6026	T52	3264
LOOP2	6400	PREL	4341	SFS0	3516	T70	3234
LOOP2A	6436	PROFLD	0040	SF81	3534	TABLA	5261
LOOP3	6600	PSIE	6665	SF82	3552	TABL8	5271
LOOP3A	6642	PSKE	6663	SF85	3600	TCS	3706
LOOP3B	6640	PSKF	6661	SF84	3616	TEMP	0045
LOOP4	7000	PSR	0020	SF85	3634	TEST	0000
LOOP4A	7056	PSTB	6664	SF86	3652	TEST0	0052
LOOP5	6700	PTSTOR	5124	SF87	3670	TEST1	1012
LOOP5A	6744	RBELL	2605	SIXTY	2400	TEST2	1025
LOOP5B	6746	RDA2	1410	SKON	6000	TEST3	1040
NO	2516	RDAC	1415	SMP	6101	TEST4	1053
NES	2440	RDB2	1463	SMQ	0065	TEST5	1066
NESA	5550	RDBC	1470	SPO	6107	TEST6	1101
NESAC	6112	RDFLD	1400	SR	6235	TEST7	1114
NESFL	6120	RDFLDA	1413	SR00	0023	TEST8	1127
NESHAN	5747	RDFLDB	1466	SR01	0024	TFS0	4000
NESHQ	6115	READ	1527	SR02	0025	TFS1	4006
NESPAS	5041	REDDA	5215	SR03	0026	TFS2	4015
NESPC	6107	RELO	4410	SR04	0027	TFS3	4024
NINS	0050	RELO2	4427	SR05	0030	TFS4	4034
MOVE	0043	RELO3	4431	SR4	7062	TFS5	4044
MOA	7501	RELO4	4434	SR5A	6763	TFS6	4054
MQL	7421	RELO5	4445	SR50	6764	TFS7	4063
MOSAVE	6125	RE0DF	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	TOSEL	2263
NOTAPT	7552	RTF	6005	SRL1	6664	TRS0	4073
NOTTY	0104	S0	2435	SRL2	6665	TRS1	4101
NTCLAS	6064	S1	2436	SRS0	3525	TRS2	4110
P2	0060	S2	2437	SRS1	3543	TRS3	4117
PAR	4470	SAC	0064	SRS2	3563	TRS4	4127
PARERR	3354	SAME	2000	SRS3	3607	TRS5	4137
PARINT	3300	SAVDF	7063	SRS4	3625	TRS6	4147
PARORC	3062	SAVE	7074	SRS5	3643	TRS7	4156
PASCNT	5036	SAVINT	4501	SRS6	3661	TS	0034
PATA	0205	SCS1	3505	SRS7	3677	TSNUM	3750
PATERR	3135	SCS2	3511	STAYT	0332	TSTAD	0046
PATM	0242	SECND0	6530	STARTF	0052	TSTCHA	5516
PATM0	0245	SETFS	2015	STOP	2647	TSTFLD	0041
PATN	0262	SETR0	0456	ST80	3453	TS	3725
PATN0	0265	SETR1	0452	ST81	3457	TS0	3737
PATO	0304	SETR2	0446	ST82	3463	TTYCHK	3751
PAT00	0311	SETR3	0442	ST83	3470	TTYLPT	5721
PCLF	6662	SETR4	0436	ST84	3474	TYPCH	2463
PCSAVE	6123	SETR5	0432	ST85	3501	TYPE	2517
PERRC	3025	SETR6	0426	SNP	7521	TYPOFF	2527
PERRC0	3100	SETR7	0422	T0	3200	TYSP	2532
PERRM	2675	SETREL	0400	T07	3220	UPAROW	5415
PINF	6236	SETRP	0412	T1	3210	W4	0061
PNOREL	4302	SETSW	4260	T25	3250	WATHES	5452

WRA	1236
WRA1	1245
WRB	1260
WRB1	1267
WRFLD	1280
XC8CKP	5641
XC8CNT	5200
XC8CRL	5623
XC8ECH	5663
XC8ERR	6007
XC8INQ	5435
XC8OCT	5600
XC8PAS	5000
XC8PAU	5125
XC8PNT	5071
XC8PSW	5457
XC8SW	5050
XC8TTY	5060
XC8TYP	5677
XD8LPT	5712
XD8SW	5326
XT8BLA	5257
XT8BLB	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

