IDENTIFICATION

PRODUCT CODE: MAINDEC-08-DHKMA-C-D

PRODUCT NAME: POP-8E EXTENDED MEMORY DATA & CHECKERBOARD TEST

RELEASE DATE: FEBRUARY 1976

MAINTAINER: DIAGNOSTIC ENGINEERING

AUTHOR: VERNON FREY
D. MACOMBER
BRUCE HANSEN

1. ABST

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 DF OF THE FIELD THAT CONTAINS
   THE PROGRAM.

B. PRESS KEY EXTD 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 EXPLAINATION

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 LECTED.

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

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

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

5. ERRORS

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

5.1 TEST ERROR TYPEOUTS

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

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

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

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

GOOD = THE DATA THAT WAS WRITTEN.

BAD = THE DATA THAT WAS READ.

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

5.2 RELOCATION ERROR TYPEOUTS

ALL RELOCATION ERRORS ARE IN THE FOLLOWING FORMAT:

XXXXX RELOCATION ERROR AT LOCATION YYYYY

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 TSTA0=XXXXX (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 EXTD ADDR LOAD.

C. SET THE SR EQUAL TO 6200.

D. PRESS KEY ADDR LOAD.

E. S THE SR EQUAL TO THE ADDRESS TO T.

F. PRESS KEYS CLEAR, AND CONT.

8.2 SCOPE LOOP 2

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

A. SET THE SR TO THE INSTRUCTION FIELD THAT THE PROGRAM IS IN THE DATA FIELD WANTED TO TEST.

B. PRESS KEY EXTD ADDR LOAD.

C. SET THE SR EQUAL TO 6400.

D. PRESS KEYS ADDR LOAD, CLEAR, AND CONT.

E. FOLLOW DIRECTIONS THAT ARE TYPED OUT.

8.3 SCOPE LOOP 3

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

A. SET THE SR TO THE INSTRUCTION FIELD THAT THE PROGRAM IS IN AND THE DATA FIELD WANTED TO TEST.

B. PRESS KEY EXTD ADDR LOAD.

C. SET THE SR EQUAL TO 6600.

D. PRESS KEYS ADDR LOAD, CLEAR, AND CONT.

E. FOLLOW DIRECTIONS THAT ARE TYPED OUT.

8.4 SCOPE LOOP 4

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

A. SET THE SR TO THE INSTRUCTION FIELD THAT THE PROGRAM IS IN AND THE DATA FIELD WANTED TO TEST.

B. PRESS KEY EXTD 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).

SEQ 0007

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 EXTD 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 REACHES THE LOWEST ORDER FIELD UNDER TEST. THE

TESTI ND RELOCATION CYCLE IS THEN RE TED. THE CONTENT
OF THE ..NTIRE 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 (0C).
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 9 HIGH				ADDRESS BIT 9 LOW							
		00	01	02	03	04	05	06	07	10	11	-> 76	77
	00	1	1	1	1	0	0	0	0	1	1	0	0
ADDRESS	01	1	1	1	1	0	0	0	0	1	1	0	0
BIT 3 HIGH	02	1	1	1	1	0	0	0	0	1	1	0	0
	03	1	1	1	1	0	0	0	0	1	1	0	0
	04	0	0	0	0	1	1	1	1				
ADDRESS	05	0	0	0	0	1	1	1	1				
X BIT 3 LOW	06	0	0	0	0	1	1	1	1				
	07	0	0	0	0	1	1	1	1				

LINES MA0L THRU MASL

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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     EMA2L USED IF AN 8K MEMORY
              177 0  0  0  0
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THE ABOVE REPRESENTS ONE MEMORY PLANE.

10. CONSOLE PACKAGE ADDENDUM

10.1. DESCRIPTION

THE CONSOLE PACKAGE HAS BEEN ADDED TO THIS DIAGNOSTIC TO ALLOW THE PROGRAM TO RUN WITH NO HARDWARE SWITCH REGISTER AND TO HAVE COMMUNICATIONS WITH THE DIAGNOSTIC VIA A TERMINAL. THE DIAGNOSTIC CAN BE RUN IN TWO MODES WITH THE CONSOLE PACKAGE . 1) RUNNING WITH THE CONSOLE PACKAGE ACTIVE - THIS ALLOWS THE OPERATOR CONTROL OF THE DIAGNOSTIC THROUGH THE TERMINAL. THE DIAGNOSTIC WILL ASK FOR THE VALUE OF THE PSEUDO SWITCH REGISTER,BEFORE CONTINUING WITH EXECUTION OF THE DIAGNOSTIC. ALL ERRORS AND PASS COMPLETES WILL BE PRINTED AT THE TERMINAL. NO HALTS WILL BE EXECUTED.
2) CONSOLE PACKAGE NOT ACTIVE-THIS WILL RESULT IN THE NORMAL STANDALONE OPERATION OF THE PROGRAM AS 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 SETION 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 AVAIBLE 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 EXECTUION AND WAIT IN A
LOOP FOR A CONTINUE. THE ONLY WAY TO CONTINUE
WILL BE TO TYPE A CONTROL Q, R OR C .
THIS IS A NONPRINTING CHARACTER.

CONTROL Q

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

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

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**************************************************************
SR=0000 4000
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UNDER SCORING INDICATES OPERATOR RESPONSE

10.7 END OF PASS

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

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

NAME PASS 0001

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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 DF TO THE FIELD THAT CONTAINS THE PROGRAM

B. LOAD ADDRESS TO 0201

C. IF THE HARDWAE SWITCH REGISTER IS USED, SET THE SWITCH REGISTER TO 0007.

D. PRESS "INIT" AND THEN "RUN".

E. TH[illegible] PROGRAM WILL NOW RUN UNTILL AN [illegible]ROR IS ENCOUNTERED [illegible]R A
S [illegible]H REGISTER OPTION IS SELECTED [illegible]CAUSE THE PROGRA[illegible]

H.) REFER TO LISTING FOR ALL HAL))) BEQ 0016

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

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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
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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 SR1 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 ADDRESSS 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 . A

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

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

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

11.9.2 INTERRUPT FROM KEYBOARD

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

11.9.3 UNWANTED INTERRUPT OCCURRED

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

APT NOTES

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

1. FOR MORE INFORMATION SEE THE FOLLOWING DOCUMENTS.

   A. STANDARD APT SYSTEM TO PDP8 DIAGNOSTIC INTERFACE.

   B. APT SYSTEM MANAGERS GUIDE.

2. FOR ANY DIFFERENCES BETWEEN THESE NOTES AND THE REST OF THE DOCUMENT, THESE NOTES WILL PREVAIL. (SEE THE LISTING ALSO.)

3. ALL CODE THAT HAS BEEN ADDED (INSERTED) FOR APT WILL CONTAIN THE EXPRESSION: /APT/

   ANY ORIGINAL CODE NEGATED FOR APT HAS BEEN 'REMOVED' BY PRECEDING IT WITH THE EXPRESSION: /*APT*/

4. IF BIT 0 OF 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 ASED 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 SPECIFED.

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
0000    0303            *C                      /INTERRUPT ADDRESS
0001    3760            DCA     SAC             /SAVE AC
0002    7701            ACL
0003    3765            DCA     SMQ             /SAVE MQ
0004    5777*           JMP     INTROU
```



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


            0020    *20


0020    0000    PSR,    0                       /APT/
0021    4000    MCW1,   4000                    /APT/
0022    0000    MCW2,   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    SR911,  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.
0037    0000    CRELO,  0                       /0 = INHIBIT PROGRAM RELOCATION
0040    0000    PROFLD, 0                       /PROGRAM IN FIELD 00X0
0041    0000    TSTFLD, 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    MIN5,   -270                    /5 MINUTE CONSTANT
0051  0000    FCNT,   0                       /COUNT # OF FIELDS PRESENT
0052  0000    STARTF, 0                       /STARTING FIELD 00X0
0053  0000    ENDF,   0                       /ENDING FIELD 00X0
0054  0000    INSAME, 0                       /PROGRAM IN SELECTED FIELD
0055  0000    LEGALB, 0                       /LEGAL FIELD SELECTION CONTROL
0056  0000    A,      0                       /A REG TO WRITE/READ
0057  0000    B,      0                       /B REG TO WRITE/READ
0060  0000    P2,     0                       /CONTROLS 2 PAGES
0061  0000    W4,     0                       /CONTROLS 4 WORDS
0062  0000    GDATA,  0                       /GOOD DATA = DATA WRITTEN
0063  0000    BDATA,  0                       /BAD DATA = DATA READ
0064  0000    SAC,    0                       /SAVE AC (INT)
0065  0000    SMQ,    0                       /SAVE MQ (INT)
                /=C8=/A1,       0
                /=C8=/A2,       0
                /=C8=/A3,       0
                /=C8=/A4,       0
                /=C8=/A5,       0
                /=C8=/A6,       0
                /=C8=/A7,       0
                /=C8=/A8,       0
                /=C8=/A9,       0
                /=C8=/A10,      0
                /=C8=/A11,      0
                /=C8=/A12,      0
                /=C8=/A13,      0
                /=C8=/A14,      0
                /=C8=/A15,      0
                /=C8=/A16,      0
                /=C8=/A17,      0
                /=C8=/A18,      0
                /=C8=/A19,      0
                /=C8=/A20,      0
                /=C8=/A21,      0
                /=C8=/A22,      0
                /=C8=/A23,      0
                /=C8=/A24,      0

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

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


      4405    LAS=JMS I IAPTSR        /APT/REDEFINE LAS.

      0200    *200

              C8STRT,                 /C8/RESTART ADDRESS FOR CONTROL R.
```



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

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

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

              APTN00,                         /APT/

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

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

              APTN05,                         /APT/

0206  4776'          JMS     SETSW           /SETUP SR
0207  3033            DCA     CS
0210  3030            DCA     TS
0211  3035            DCA     FS
0212  3036            DCA     RS
0213  7240            STA
0214  3037            DCA     CRELO           /CLEAR INH RELO
0215  3046            DCA     TSTAD           /CLEAR TEST ADDRESS COUNTER
0216  7240            STA
0217  3044            DCA     HEAD1           /RESET ERROR HEADING
0220  1050            TAD     MIN5
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  5300            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     I6201
0237  3240            DCA     .+1
0240  6201            CDF     0
0241  5632            JMP I   DFEIF


              /
              /NO PROGRAM RELOCATION AND TEST ONLY 1 FIELD
              /
```

```
0242  6224    PATM,   RIF
0243  3040            DCA     PROFLD

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

                APTN02,                         /APT/

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

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

                APTJ00,                         /APT/

0246  0405            LAS
0247  0030            AND     SR05            /HALT AFTER TEST
0250  7640            SZA CLA

0251  7410            SKP                     /C8/
0252  5255            JMP     .+3             /C8/
0253  4503            C8PAUS                  /C8/
0254  4501            C8INQU                  /C8/

                /*C84/  HLT
0255  0405            LAS
0256  0027            AND     SR04            /CHANGE FIELD LIMITS
0257  7640            SZA CLA
0260  5205            JMP     PATA            /YES

                APTJ50,                         /APT/

0261  5245            JMP     PATM0           /NO


                /
                /NO PROGRAM RELOCATION BUT TEST ALL SELECTED FIELDS
                /
0262  6224    PATN,   RIF
0263  3040            DCA     PROFLD

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

                APTN03,                         /APT/

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

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

                APTJ01,                         /APT/

0266  0405            LAS
0267  0030            AND     SR05            /HALT AFTER TEST
0270  7640            SZA CLA
```



```
0271  7410            SKP                     /C8/
0272  5275            JMP     .+3             /C8/
0273  4503            C8PAUS                  /C8/
0274  4501            C8INQU                  /C8/

                /*C8*/  HLT
0275  0405            LAS
0276  0027            AND     SR04            /CHANGE FIELD LIMITS
0277  7640            SZA CLA
0300  5205            JMP     PATA            /YES

                APTJ51,                         /APT/

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


                /
                /CHECK ALL SELECTED FIELDS FROM EACH SELECTED FIELD
                /
0304  6224    PAT0,   RIF
0305  3040            DCA     PROFLD
0306  1035            TAD     FS
0307  3036            DCA     RS              /SETUP RELO STATUS

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

                APTN04,                         /APT/

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

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

                APTJ02,                         /APT/

0312  0405            LAS
0313  0030            AND     SR05            /HALT AFTER TEST
0314  7640            SZA CLA

0315  7410            SKP                     /C8/
0316  5321            JMP     .+3             /C8/
0317  4503            C8PAUS                  /C8/
0320  4501            C8INQU                  /C8/

                /*C8*/  HLT
0321  0405            LAS
0322  0027            AND     SR04            /CHANGE FIELD LIMITS
0323  7640            SZA CLA
0324  5205            JMP     PATA            /YES

                APTJ52,                         /APT/

0325  4773*             JMS     C8R03           /NO
```

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


0332  5342    START,  JMP     .+10
0333  3104          DCA     NOTTY           /SAVE TTY FLAG STATUS
0334  4766*         JMS     APTIZ           /GO SETUP MEMORY SIZE FROM 21 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                     /NO, TURN THE INTERRUPT OFF
0341  5207          JMP     APTN00+3                /GO START WITHOUT TITLE
0342  1022          TAD     HCW2            /GET HARDWARE WORD 2
0343  0365          AND     (7377           /MASK OUT CLR BIT
0344  3022          DCA     HCW2
0345  1020          TAD     PSR             /GET THE PSEUDO SWITCH REGISTER
0346  0364          AND     (7700           /SAVE PREVIOUS SET BITS
0347  1363          TAD     (7              /ADD IN LOW AND HIGH FIELDS
0350  3020          DCA     PSR             /SAVE THE NEW PROCESSOR SWITCH REGISTER
0351  7240          CLA     CMA
0352  5333          JMP     START+1         /GO SET FLAG FOR NO TELETYPE

0353  0007
0354  7700
0355  7377
0356  7400
0357  0400
0360  0341
0361  0600
0362  0302
0363  2007
0364  1670
0365  2015
0366  4260
0367  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    ±22   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     TRST
0423  5226          JMP     .+3
0424  1175          TAD     [70
0425  5260          JMP     CSAME
0426  4775*   SETR6,  JMS     TRS6
0427  5232          JMP     .+3
0430  1174          TAD     [60
0431  5260          JMP     CSAME
0432  4774*   SETR5,  JMS     TRS5
0433  5236          JMP     .+3
0434  1173          TAD     [50
0435  5260          JMP     CSAME
0436  4773*   SETR4,  JMS     TRS4
0437  5242          JMP     .+3
0440  1172          TAD     [40
0441  5260          JMP     CSAME
0442  4772*   SETR3,  JMS     TRS3
0443  5246          JMP     .+3
0444  1171          TAD     [30
0445  5260          JMP     CSAME
0446  4771*   SETR2,  JMS     TRS2
0447  5252          JMP     .+3
0450  1170          TAD     [20
0451  5260          JMP     CSAME
0452  4770*   SETR1,  JMS     TRS1
0453  5256          JMP     .+3
0454  1167          TAD     [10
0455  5260          JMP     CSAME
0456  4767*   SETR0,  JMS     TRS0
0457  5222          JMP     SETR7

0460  3041    CSAME,  DCA     TSTFLD
0461  4766*         JMS     SAME            /PROFLD = TSTFLD?
0462  5600          JMP I   SETREL          /YES
0463  4765*         JMS     RELO            /NO - RELOCATE PROGRAM
0464  6224          RIF
0465  3040          DCA     PROFLD
0466  5600          JMP I   SETREL

0565  4410
0566  2000
0567  4073
0570  4101
0571  4110
0572  4117
0573  0127
0574  0137
0575  4147
0576  4156
```

```
0577  0412
      0600            PAGE


                      /
                      /TEST PATTERN CONTROL
                      /
0600  0000    TEST,   0
0601  4777*           JMS     PAR
0602  7200            CLA
0603  3056            DCA     A
0604  3057            DCA     B
0605  4776*           JMS     ST$0            /ALL ZEROS TEST
0606  4252            JMS     TEST0
0607  7240            STA
0610  3056            DCA     A
0611  7200            STA
0612  3057            DCA     B
0613  4775*           JMS     ST$1            /ALL ONES TEST
0614  4252            JMS     TEST0
0615  7240            STA
0616  3057            DCA     B
0617  3056            DCA     A
0620  4774*           JMS     ST$2            /0000-7777 WCP TEST
0621  4252            JMS     TEST0
0622  7240            STA
0623  3056            DCA     A
0624  3057            DCA     B
0625  4773*           JMS     ST$3            /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     ST$4            /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     ST$5            /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
```

```
0752  5756            JMP I   (.+200&7600
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  5248            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     SR57            /ERROR FIELD 7

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

                APTJ03,                         /APT/

1127  4005      TEST8,  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  4020
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     I=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     I=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.

                APTN04,                         /APT/

1221  2047          ISZ     FIVE            /INC 5 MIN COUNTER
1222  5600          JMP I   WRFLD           /END OF MEM REACHED
1223  1050          TAD     MIN5            /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          CBPASS                  /CB/
1231  7000          NOP                     /CB/

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     I=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 DF
1245  1056      WRA1,   TAD     A
1246  3446          DCA I   TSTAD
1247  2046          ISZ     TSTAD
1250  7000          NOP
1251  2061          ISZ     W4
1252  5245          JMP     WRA1
1253  1040          TAD     PROFLD          /4 WORDS ARE WRITTEN
1254  1176          TAD     [6201
1255  3256          DCA     .+1
1256  6201          CDF     0               /PROGRAM DF
1257  5636          JMP I   WRA
1260  0000      WRB,    0
1261  1163          TAD     I=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 DF
1267  1057      WRB1,   TAD     B
1270  3446          DCA I   TSTAD
1271  2046          ISZ     TSTAD
1272  7000          NOP
1273  2061          ISZ     W4
1274  5267          JMP     WRB1
1275  1040          TAD     PROFLD          /4 WORDS ARE WRITTEN
```

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

1377  2048
      1000            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  3243            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  4770'           JMS     SCS2            /2 COMPLEMENTS
1440  4327            JMS     READ
```



```
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            NOP
1447  2061            ISZ     W4
1450  5215            JMP     RDAC            /COMPLETE 4 WORDS
1451  2060            ISZ     P2
1452  5266            JMP     RDFLDB          /COMPLETE CURRENT 2 PAGES
1453  1040            TAD     PRDFLD
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   RDFLD           /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    RDBC,   DCA     CS              /NO COMPLEMENT
1471  4327            JMS     READ
1472  7041            CIA
1473  1057            TAD     B
1474  7040            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
1500  3446            DCA I   TSTAD
1501  4776'           JMS     SCS1            /1 COMPLEMENT
1502  4327            JMS     READ
1503  7001            IAC
1504  1057            TAD     B
1505  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  4770'           JMS     SCS2            /2 COMPLEMENTS
```

```
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,

                    APTE0S,                         /APT/
1517  4773'         JMS     ERRB                    /0 REG ERROR = 2C
1520  2046          ISZ     TSTAD
1521  7000          NOP
1522  2061          ISZ     W4
1523  5270          JMP     RDBC                    /COMPLETE 4 WORDS
1524  2060          ISZ     P2
1525  5213          JMP     RDFLDA                  /COMPLETE CURRENT 2 PAGE0
1526  5263          JMP     RD02
                    /
                    /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  ERRA,   0
1601  7041          CIA
1602  1056          TAD     A
1603  3063          DCA     BDATA                   /DATA READ
1604  1056          TAD     A
1605  4250          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  1056          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  ERRB,   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   ERRB
1637  0000  ERRB1,  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
1653  5637          JMP I   ERRB1
1654  0000  GERRC,  0                               /GO TO ERRC
1655  3062          DCA     GDATA                   /DATA WRITTEN
1656  1040          TAD     PROFLD
1657  1176          TAD     I6201
1660  3261          DCA     .+1
1661  6201          CDF     0                       /PROGRAM DF
1662  4777'         JMS     ERRC                    /DATA OR CHKBD ERROR
1663  1041          TAD     TSTFLD
1664  1176          TAD     I6201
1665  3266          DCA     .+1
1666  6201          CDF     0                       /TEST DF
1667  5654          JMP I   GERRC

                    /
                    /CHECK FOR LEGAL FIELD SELECTION
                    /
1670  0000  LEGAL,  0
1671  7300          CLA CLL
1672  3050          DCA     INSAME                  /SAME FIELD CONTROL
1673  1161          TAD     I-2
1674  3055          DCA     LEGALB                  /LEGAL SELECTION CONTROL
1675  3041          DCA     TSTFLD
1676  4776'         JMS     TFSB
```

```
1677  7410            SKP
1700  4353            JMS     LEGALA
1701  1167            TAD     [10
1702  3041            DCA     TSTFLD
1703  4775'           JMS     TF81
1704  7410            SKP
1705  4353            JMS     LEGALA
1706  1170            TAD     [20
1707  3041            DCA     TSTFLD
1710  4770'           JMS     TF82
1711  7410            SKP
1712  4353            JMS     LEGALA
1713  1171            TAD     [30
1714  3041            DCA     TSTFLD
1715  4773'           JMS     TF83
1716  7410            SKP
1717  4353            JMS     LEGALA
1720  1172            TAD     [40
1721  3041            DCA     TSTFLD
1722  4772'           JMS     TF84
1723  7410            SKP
1724  4353            JMS     LEGALA
1725  1173            TAD     [50
1726  3041            DCA     TSTFLD
1727  4771'           JMS     TF85
1730  7410            SKP
1731  4353            JMS     LEGALA
1732  1174            TAD     [60
1733  3041            DCA     TSTFLD
1734  4770'           JMS     TF86
1735  7410            SKP
1736  4353            JMS     LEGALA
1737  1175            TAD     [70
1740  3041            DCA     TSTFLD
1741  4767'           JMS     TF87
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    LEGALA, 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     PROFLD
```



```
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  0024
1774  0015
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     PROFLD
2002  7041            CIA
2003  1041            TAD     TSTFLD
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     SR66            /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     SFS7            /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 MESAGE AND RETURN

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

              APTJ04,                       /APT/

2064  4766*         JMS     MES
2065  4503          4503
2066  0000          0
2067  1051          TAD     FCNT
2070  1160          TAD     [260
2071  4765*         JMS     TYPSP           /TYPEOUT # OF FIELDS IN THIS SYSTEM
2072  4766*         JMS     MES
2073  0611          TEXT            "FIELDS IN THIS SYSTEM"
2074  0514
2075  0423
2076  0411
2077  1640
2100  2410
2101  1123
2102  0423
2103  3123
2104  2405
2105  1500
2106  4766*         JMS     MES
2107  4503          TEXT            "%#FIELDS SEL'D ARE "
2110  0611
```



```
2111  0514
2112  0423
2113  0423
2114  0514
2115  0700
2116  0001
2117  2205
2120  0000
2121  4764*         JMS     TOSEL

              APTJ54,                       /APT/

2122  5615          JMP I   SETFS

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


              /
              /RETURN+1 IF FIELD PRESENT IN SYSTEM & IS SELECTED
              /
2200  0000    CFP,    0
2201  7300          CLA CLL
2202  6224          RIF
2203  1176          TAD     [6201
2204  5212          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  5210          JMP     .+3
2212  6201    CFP0,   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                     /STARTF = ENDF
2223  7041          CIA
2224  1052          TAD     STARTF
2225  7650          SNA CLA
2226  2200    CFP1,   ISZ     CFP             /FIELD IS PRESENT & SELECTED
```

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

                    /
                    /TYPEOUT FIELDS SELECTED FOR TESTING
                    /
2263  0000  TOSEL,  0
2264  4777* TFS7    JMS     TFS7
2265  5270          JMP     .+3
2266  1156          TAD     I267
2267  4776* TYPSP   JMS     TYPSP           /FIELD 7
2270  4775* TFS6    JMS     TFS6
2271  5274          JMP     .+3
2272  1155          TAD     I266
2273  4776* TYPSP   JMS     TYPSP           /FIELD 6
2274  4774* TFS5    JMS     TFS5
2275  5300          JMP     .+3
2276  1154          TAD     I265
2277  4776* TYPSP   JMS     TYPSP           /FIELD 5
2300  4773* TFS4    JMS     TFS4
2301  5304          JMP     .+3
2302  1153          TAD     I264
2303  4776* TYPSP   JMS     TYPSP           /FIELD 4
2304  4772* TFS3    JMS     TFS3
2305  5310          JMP     .+3
2306  1152          TAD     I263
2307  4776* TYPSP   JMS     TYPSP           /FIELD 3
2310  4771* TFS2    JMS     TFS2
```



```
2311  5314          JMP     .+3
2312  1151          TAD     I262
2313  4776* TYPSP   JMS     TYPSP           /FIELD 2
2314  4770* TFS1    JMS     TFS1
2315  5320          JMP     .+3
2316  1150          TAD     I261
2317  4776* TYPSP   JMS     TYPSP           /FIELD 1
2320  4767* TFS0    JMS     TFS0
2321  5324          JMP     .+3
2322  1160          TAD     I260
2323  4776* TYPSP   JMS     TYPSP           /FIELD 0
2324  5663          JMP I   TOSEL

2367  4000
2370  4006
2371  4015
2372  4020
2373  4034
2374  4044
2375  4050
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     I77
2411  7040          CMA                     /AC=7700
2412  0635          AND I   S0              /FIRST 2 DIGITS OF OPERAND
2413  7002          BSW
2414  4222          JMS     CNV             /CONVERT DIGITS FOR TYPEOUT
2415  2236          ISZ     S1              /INC STORAGE ADDRESS
2416  1147          TAD     I77
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     I707            /LEFT DIGIT
2430  1237          TAD     S2
2431  0146          AND     I707            /RIGHT DIGIT
2432  1145          TAD     I6060
```

```
2433  3636          DCA I   $1              /STORE CONVERTED DIGITS
2434  5622          JMP I   CNV
2435  0000    $0,   0
2436  0000    $1,   0
2437  0000    $2,   0
              /
              /TELETYPE OUTPUT WITH BELL
              /
2440  0000    MES,  0

2441  7200          CLA                     /APT/
2442  1022          TAD     HCM2            /APT/UNDER APT CONTROL?
2443  7700          SMA CLA                 /APT/SKP IF YES.
2444  5250          JMP     APT000          /APT/
2445  1240          TAD     MES             /APT/FORCE AN ERROR CALL TO APT.
2446  3777'         DCA     APTER           /APT/
2447  5776'         JMP     APTER+1         /APT/
              APT000,                       /APT/

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

              APT001,

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  7050          SNA
2466  5410          JMP I   10              /END OF MESSAGE RETURN
2467  1144          TAD     [-34
2470  7440          SZA
2471  5274          JMP     .+3
2472  1143          TAD     [207            /CODE IS BELL
2473  5314          JMP     MTP
2474  1143          TAD     [-4
2475  7500          SMA                     /CODE LESS THAN 407
2476  5301          JMP     .+3             /NO
2477  1142          TAD     [340            /YES, ADD 300, CODE IS ALPHA
2500  5314          JMP     MTP
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          CDTYPE                  /GO TYPE THE MESSAGE
2523  6007          CAF
2524  6001          ION
2525  7200          CLA
2526  5717          JMP I   TYPE
2527  4477    TYPOFF, CDTYPE
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
2577  7275
      2600          PAGE


              /
              /ERROR ROUTINE (BELL ON ERROR HAS PRIORITY)
              /
2600  0000    RETURN, 0                     /PROGRAM RETURN ADDRESS
2601  4005    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  4005          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     (7
2623  1133            TAD     (0060
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           /GET TTY FLAG
2634  7710            SPA     CLA             /IS THERE A TTY ON SYSTEM
2635  5646            JMP  I  ADDER           /NO, GO HALT ON ERRORS INSTEAD-INFO IN AC
2636  4775*           JMS     MES
2637  4543            4543
2640  0000    ERROR0, 0                       /FIELD
2641  0000    ERROR1, 0
2642  0000            0                       /PROGRAM LOCATION OF ERROR JMS
2643  4040            4040
2644  0000            0
2645  5646            JMP I   .+1             /TYPEOUT ERROR
2646  0000    ADDER,  0                       /ADDRESS OF ERROR TYPEOUT
2647  4005    STOP,   LAS
2650  0023            AND     SR00            /HALT AFTER ERROR?
2651  7650            SNA CLA
2652  5256            JMP     LIMIT           /INHIBIT ERROR HALT
2653  1200            TAD     RETURN
2654  1157            TAD     (-1

2655  4500            COERR                   /C8/

                /*C8*/  HLT                   /HALT WITH AC = ERROR JMS
2656  4005    LIMIT,  LAS
2657  0027            AND     SR04            /CHANGE FIELD LIMITS?
2660  7640            SZA CLA
2661  5774*           JMP     PAT4            /YES
2662  5600            JMP I   RETURN          /NO


                /
                /RELOCATION MOVE ERROR
                /
2663  0000    ERRM,   0

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

                APTER4,                         /APT/

2664  2042            ISZ     COUNT           /MOVE ERROR OCCURRED
2665  7410            SKP
2666  5264            JMP     .-2
```



```
2667  7200            CLA
2670  1263            TAD     ERRM
2671  3200            DCA     RETURN          /RETURN ADDRESS
2672  1373            TAD     (PERRM
2673  3246            DCA     ADDER           /ERROR TYPEOUT ADDRESS
2674  5201            JMP     CODERR
2675  1041    PERRM,  TAD     TSTFLD
2676  7112            CLL RTR
2677  7010            RAR
2700  1133            TAD     (4060
2701  3321            DCA     Z10
2702  4776*           JMS     SIXTY
2703  0043            MOVE
2704  2722            Z11
2705  1104            TAD     NOTTY           /GET TTY FLAG
2706  7710            SPA     CLA             /IS THERE A TELETYPE AVAILABLE?
2707  5330            JMP     ERRMM           /NO-HALT ON ERRORS INSTED-INFO IN AC
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          /GET PROGRAM FIELD
2731  0372            AND     (7              /MASK TO THE FIELD BITS
2732  7402            HLT                     /AC=PROGRAM FIELD IN BITS 9-11
2733  7240            CLA     CMA
2734  1200            TAD     RETURN          /
2735  7402            HLT                     /AC=PROGRAM LOCATION OF ERROR JMS
2736  7200            CLA
2737  1321            TAD     Z10             /GET TEST FIELD
2740  0372            AND     (7              /MASK TO FIELD BITS
2741  7402            HLT                     /AC=FIELD BEING TESTED IN BITS 9-11
2742  7200            CLA
2743  1043            TAD     MOVE
2744  7402            HLT                     /AC=ADDRESS OF LOCATION IN ERROR
2745  7240            CLA     CMA
2746  3044            DCA     HEAD1
2747  5247            JMP     STOP            /GO CHECK FOR HALT AFTER ERROR SWITCH

2772  0007
```

```
2773  2675
2774  0205
2775  2400
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  2002              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     TSTFLG
        3026  7112              CLL RTR
        3027  7010              RAR
        3030  1133              TAD     [4060
        3031  3247              DCA     Z1
        3032  4770'             JMS     SIXTY
        3033  0046              TSTAD
        3034  3050              Z2
        3035  4770'             JMS     SIXTY
        3036  0062              GDATA
        3037  3054              Z3
        3040  4770'             JMS     SIXTY
        3041  0063              BDATA
        3042  3057              Z4
        3043  1104              TAD     NOTTY           /GET TTY FLAG
        3044  7710              SPA     CLA             /IS THERE A TELETYPE AVAILABLE
        3045  5310              JMP     ERRCC           /NO GO HALT ON ERRORS INSTEAD
        3046  4767'             JMS     MES
        3047  0000      Z1,     0
        3050  0000      Z2,     0
        3051  0000              0               /FAIL ADR
        3052  4040              4040
```

```
3053  4040            4040
3054  0000    Z3,     0
3055  7000            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 MCP
3072  5300            JMP     PERRC0
3073  4762'           JMS     T70     /7777 - 0000 MCP
3074  5300            JMP     .+4
3075  4761'           JMS     T25     /2525 - 5252 MCP
3076  7410            SKP
3077  4760'           JMS     T52     /5252 - 2525 MCP
3100  4757'   PERRCR, JMS     TCS
3101  1132            TAD     [35     /NC
3102  1157            TAD     I-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  1062            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


                /
                /TYPEOUT TEST BEING EXECUTED
                /
3141  0000    TN,     0
3142  4767'           JMS     MES
3143  1617            TEXT            "NO PATTERN"
3144  4020
3145  0124
3146  2405
3147  2216
3150  0000
3151  5741            JMP I   TN


3153  3750
3154  0007
3155  2640
3156  2517
3157  3706
3160  3264
3161  325U
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  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  0110            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  563#            JMP I   T70

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

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



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


                      /
                      /PARITY ERROR
                      /
3300  7200    PARINT, CLA
3301  1376            TAD     (INTR
3302  3775'           DCA     RETURN
3303  4774'           JMS     SIXTY
3304  0000            0
3305  3331            Z20
3306  4774'           JMS     SIXTY
3307  0046            TSTAD
3310  3345            Z21
3311  1104            TAD     NOTTY           /GET TTY FLAG
3312  7710            SPA     CLA             /IS THERE A TELETYPE AVAILABLE
3313  5356            JMP     PARERR          /NO, GO HALT WITH ERROR INFO IN AC
3314  4777'           JMS     MES             /PRINT HEADER
3315  4543            TEXT    "X#PARITY ERR, LOC 0#"
3316  2001
3317  2211
3320  2431
3321  4005
3322  2222
3323  5640
3324  141T
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  3044            DCA     HEAD1
3353  5772'           JMP     PARDRC          /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
                    /
                    /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- INTTERRUPTED FROM THE KEY BOARD
3405  5216            JMP     KBINTC          /GO CLEAR FLAG AND CONTINUE
3406  4777*           JMS     MES
3407  4543            TEXT            "%=INT FROM KB"
3410  1116
3411  2440
3412  0622
3413  1715
3414  4013
3415  0200
3416  6032    KBINTC, KCC
3417  7240            STA
3420  3044            DCA     HEAD1
3421  5600            JMP I   KBINT

                    /
                    /UNWANTED INTERRUPT OCCURRED
                    /
3422  1104    BADINT, TAD     NOTTY           /GET THE TELETYPE FLAG
3423  7700            SMA     CLA             /IS THERE A TELETYPE ON THE SYSTEM
3424  5227            JMP     .+3             /YES GO PRINT THE MESSAGE
3425  7402            HLT                     /UNWANTED INTERRUPT OCCURED
3426  5241            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    ST50,   0                       /SET TS0 (ALL 0 TEST)
3454  7330            CLA STL RAR
3455  3034            DCA     TS
3456  5653            JMP I   ST50
3457  0000    ST51,   0                       /SET TS1 (ALL 1 TEST)
3460  7332            CLA STL RTR
3461  3034            DCA     TS
3462  5657            JMP I   ST51
3463  0000    ST52,   0                       /SET TS2 (0000 - 7777 MCP TEST)
3464  7332            CLA STL RTR
3465  7010            RAR
3466  3034            DCA     TS
3467  5663            JMP I   ST52

3470  0000    ST53,   0                       /SET TS3 (7777 - 0000 MCP TEST
3471  7332            CLA STL RTR
3472  7036            RTR     DCA     TS
3473  5670            JMP I   ST53
3474  0000    ST54,   0                       /SET TS4 (2525 - 5252 MCP TEST)
3475  7203            CLA IAC BSW
3476  7104            CLL RAL
3477  3034            DCA     TS
3500  5674            JMP I   ST54
3501  0000    ST55,   0                       /SET TS5 (5252 - 2525 MCP TEST)
3502  7203            CLA IAC BSW
3503  3034            DCA     TS
3504  5701            JMP I   ST55

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   $CS2
                    /
                    /SET ALSO STATUS BIT SPECIFIED
                    /
3516  0000    $FS0, 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   $FS0
3525  0000    $RS0, 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   $RS0
3534  0000    $FS1, 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   $FS1
3543  0000    $RS1, 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   $RS1
3552  0000    $FS2, 0                       /SET FS2 (DON'T TEST FIELD 2)
3553  7200          CLA
3554  1035          TAD     FS
3555  7006          RTL
3556  7500          SMA
3557  1130          TAD     I4000
3560  7012          RTR
3561  3035          DCA     FS
3562  5752          JMP I   $FS2
3563  0000    $RS2, 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     I4000
3571  7012          RTR
3572  3036          DCA     RS
3573  5763          JMP I   $RS2
3574  4457
```



```
3575  2440
```

```
                3600            PAGE
 3600  0000     SFS3,   0                       /SET FS3 (DON'T TEST FIELD 3)
 3601  7200             CLA
 3602  1035             TAD     FS
 3603  0127             AND     [7360
 3604  1126             TAD     [400
 3605  3035             DCA     FS
 3606  5600             JMP I   SFS3
 3607  0000     SRS3,   0                       /SET RS3 (DON'T RELO TO FIELD 3)
 3610  7200             CLA
 3611  1036             TAD     RS
 3612  0127             AND     [7360
 3613  1126             TAD     [400
 3614  3036             DCA     RS
 3615  5607             JMP I   SRS3
 3616  0000     SFS4,   0                       /SET FS4 (DON'T TEST FIELD 4)
 3617  7200             CLA
 3620  1035             TAD     FS
 3621  0125             AND     [7560
 3622  1124             TAD     [200
 3623  3035             DCA     FS
 3624  5616             JMP I   SFS4


 3625  0000     SRS4,   0                       /SET RS4 (DON'T RELO TO FIELD 4)
 3626  7200             CLA
 3627  1036             TAD     RS
 3630  0125             AND     [7560
 3631  1124             TAD     [200
 3632  3036             DCA     RS
 3633  5625             JMP I   SRS4
 3634  0000     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  5652             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     APTE08, NOP                     /APT/

 3723  4500             CBERR                   /CB/

                /*CB*/  HLT                     /ERRONEOUS STATUS BITS SET
 3724  5323             JMP     .-1
                /
                /TEST TEST STATUS
                /RETURN IF NO TEST
                /RETUN +2 IF ALL 0 TEST
                /RETURN +4 IF ALL 1 TEST
                /RETURN +6 IF 0000 - 7777 NCP
                /RETURN +8 IF 7777 - 0000 NCP
                /RETURN +10 IF 2525 - 5252 NCP
                /RETURN +12 IF 5252 - 2525 NCP
```

```
                        /
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     (7760
3732  7450          SNA
3733  5351          JMP     TTYCHK          /NO TEST
3734  2350          ISZ     TSNUM
3735  2325          ISZ     TTS
3736  2325          ISZ     TTS
3737  7104  TTS0,   CLL RAL
3740  7421          MQL
3741  7430          SZL                     /CHECK THIS TEST BIT
3742  5351          JMP     TTYCHK
3743  2350          ISZ     TSNUM
3744  2325          ISZ     TTS
3745  2325          ISZ     TTS
3746  7521          SWP
3747  5337          JMP     TTS0            /CHECK NEXT TEST BIT

3750  0000  TSNUM,  0

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

3777  3135
      4000          PAGE


                        /
                        /TEST FIELD STATUS
                        /RETURN IF FIELD STATUS BIT SET (DON'T TEST FIELD)
                        /RETURN +1 IF FIELD STATUS BIT RESET (TEST THIS FIELD)
                        /
4000  0000  TFS0,   0
4001  7200          CLA
4002  1035          TAD     FS
4003  7700          SMA CLA                 /FIELD 0
4004  2200          ISZ     TFS0
4005  5600          JMP I   TFS0

4006  0000  TFS1,   0
4007  7200          CLA
4010  1035          TAD     FS
4011  7004          RAL
4012  7700          SMA CLA         /FIELD 1
4013  2206          ISZ     TFS1
4014  5606          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  5650          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

                /*C8*/  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  0503            TEXT    "X#PR LOC  FAIL ADR  GOOD  BAD  PATTERN"
4206  2022
4207  0014
4210  1703
4211  0040
4212  0601
4213  1114
4214  0001
4215  0022
4216  0040
4217  0717
4220  1704
4221  0040
4222  0201
4223  0440
4224  0020
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 MESAGE
4236  4777*           JMS     MES
4237  4543            TEXT    "%#PDP-8E EXT MEM DATA & CHKBD#"
4240  4320
4241  0420
4242  5570
4243  0540
4244  0538
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 AVAILABE
4263  5277            JMP     PNOREL+3       /NO GO CHECK FOR HALT FOR SR SETTING
4264  4777*           JMS     MES
4265  4543            TEXT    "%#SETUP SR & CONT%#"
4266  2305
4267  2025
4270  2040
4271  2322
4272  4046
4273  4003
4274  1716
4275  2445
4276  4300
4277  4503            C8PAUS                 /C8/
                      /#C84/  MLT
4300  4473            C8SWIT                 /GO GET VALUE OF S.R. IF ON CLB
4301  5660            JMP I   SETSW


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



```
4311  4022
4312  0514
4313  1703
4314  0124
4315  1117
4316  1654
4317  4020
4320  7217
4321  0740
4322  1116
4323  4006
4324  1105
4325  1404
4326  4000
4327  6224            RIF
0330  7106            CLL RTL
4331  7004            RAL
4332  1117            TAD     I6000
4333  3335            DCA     Z8
4334  4777*           JMS     MES
4335  0000    Z8,     0
4336  7240            STA
4337  3044            DCA     HEAD1
4340  5702            JMP I   PNOREL

                      /#C8#/  PAGE
                      /
                      /TYPEOUT 'RELOCATION'
                      /
4341  0000    PREL,   0
4342  1104            TAD     NOTTY          /GET TELETYPE FLAG
4343  7710            SPA     CLA            /PRINT MESAGE ?
4344  5741            JMP  I  PREL           /NO TTY - DO NOT PRINT
4345  4777*           JMS     MES
4346  4543            TEXT    "%#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    PAGE                           /C8/

                      /
```

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


                    /
                    /RELOCATE THE PROGRAM
                    /
 4410  0000   RELO,   0
 4411  7200           CLA
 4412  3042           DCA     COUNT           /CLEAR ERROR COUNTER
 4413  3043           DCA     MOVE            /CLEAR MOVE COUNTER
 4414  1176           TAD     [6201
 4415  1040           TAD     PROFLD
 4416  3227           DCA     RELO2
 4417  1176           TAD     [6201
 4420  1041           TAD     TSTFLD
 4421  3231           DCA     RELO3
 4422  1227           TAD     RELO2
 4423  3234           DCA     RELO4
 4424  1176           TAD     [6203
 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,  CDI     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          /PANITY 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  6001           ION
 4500  5670           JMP I   PAR
               /*C8*/  PAGE
 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          /C8/

4536  0000    A1,     0                       /C8/
4537  0000    A2,     0                       /C8/
4540  0000    A3,     0                       /C8/
4541  0000    A4,     0                       /C8/
4542  0000    A5,     0                       /C8/
4543  0000    A6,     0                       /C8/
4544  0000    A7,     0                       /C8/
4545  0000    A8,     0                       /C8/
4546  0000    A9,     0                       /C8/
4547  0000    A10,    0                       /C8/
4550  0000    A11,    0                       /C8/
4551  0000    A12,    0                       /C8/
4552  0000    A13,    0                       /C8/

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                            /C8/

              C00000,                         /C8/


4600  1777'           TAD     ERROR1+1
4601  3315            DCA     A14
4602  1776'           TAD     ADDER
4603  3316            DCA     A15
4604  1775'           TAD     TN
4605  3317            DCA     A16
4606  1774'           TAD     T0
4607  3320            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     TC8
4623  3326            DCA     A23
4624  1765'           TAD     TTS
4625  3327            DCA     A24

4626  1764'           TAD     SAVINT          /C8/
4627  3231            DCA     C00001          /C8/
4630  5631            JMP I   C00001          /C8/

4631  0000    C00001, 0                       /C8/


              /*C8*/  JMP I   SAVINT
4632  0000    RESINT, 0
4633  7200            CLA
4634  1763'           TAD     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  3730'           DCA     ERRDR0
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     TTS
4714  5632            JMP I   RESINT

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


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



```
4762  2400
4763  4536
4764  4501
4765  3725
4766  3706
4767  3264
4770  3250
4771  3234
4772  3220
4773  3210
4774  3200
4775  3141
4776  2646
4777  2642
      6200    *6200                   /C8/

              /*C8*/*6000
6200  4777*   LOOP1,  JMS     SAVDF
6201  1184            TAD     NOTTY           /GET THE TELETYPE FLAG
6202  7710            SPA     CLA             /IS THERE ON ON THE SYSTEM
6203  5223            JMP     LOOP1A-1        /NO ABORT MESSAGE AND CALT
6204  4776*           JMS     MES
6205  4543            TEXT    "$$LOOP ON ADDRESS SET IN SR"
6206  1017
6207  1720
6210  4017
6211  1640
6212  0104
6213  0422
6214  0523
6215  2340
6216  2305
6217  2440
6220  1116
6221  4023
6222  2200
6223  4775*           JMS     RESDF
6224  4405    LOOP1A, LAS
6225  3235            DCA     SR
6226  1635            TAD I   SR
6227  7040            CMA
6230  3635            DCA I   SR
6231  1635            TAD I   SR
6232  7040            CMA
6233  3635            DCA I   SR
6234  5224            JMP     LOOP1A
6235  0000    SR,     0


              /
              /TYPEOUT 'PROGRAM IN SELECTED FIELD'
              /

6236  1184    PINP,   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    "X#PROGRAM IN SELECTED FIELD"
6243  2022
6244  1707
6245  2201
6246  1540
6247  1116
6250  4023
6251  0514
6252  0503
6253  2405
6254  0440
6255  0611
6256  0514
6257  0400
6260  5774*          JMP     PATA            /GO SETUP SWITCHES AGAIN

                /C8/    ROUTINE TO SAVE PAGE 37 OF FIELD 7

6261  0000    C8SM,   0
6262  7200            CLA
6263  6224            RIF                     /GET THE INSTRUCTION FIELD
6264  1373            TAD     (6201           /ADD CDF TO IT
6265  3270            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            SZA     CLA
6301  5272            JMP     C8SM1
6302  1020            TAD     PSR
6303  0370            AND     (7700
6304  1367            TAD     (7
6305  3020            DCA     PSR
6306  5661            JMP  I  C8SM
                /
6367  0007
6370  7700
6371  7177
6372  7577
6373  6201
6374  0205
6375  7075
6376  2440
6377  7063
      6400    *6400                   /C8/
```



```
                /*C84/*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    "X#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  2300
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    "X#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  1620
6472  0000

6473  4503            C8PAUS                  /C8/

                /*C8*/  HLT
6474  4405              LAS
6475  3327              DCA     FIRST
6476  1104              TAD     NOTTY         /GET FLAG STATUS AGAIN
6477  7710              SPA     CLA           /TELETYPE AVAILABLE?
6500  5323              JMP     FIRST+4       /NO-ABORT MESSAGE AND HALT FOR INFO
6501  4776*             JMS     MES
6502  4543              TEXT    "%#SET SR TO SECOND ADDRESS & CONT"
6503  2305
6504  2440
6505  2322
6506  4020
6507  1740
6510  2305
6511  0317
6512  1620
6513  4001
6514  0000
6515  2205
6516  2323
6517  4046
6520  4003
6521  1716
6522  2400

6523  4503            C8PAUS                  /C8/

                /*C8*/  HLT
6524  4405              LAS
6525  3330              DCA     SECOND
6526  5645              JMP I   IN12
6527  0000    FIRST,    0
6530  0000    SECOND,   0

6575  7075
6576  2440
6577  7063
      6600    *6600                   /C8/

                /*C8*/*6600
6600  4777*   LOOP3,    JMS     SAVDF
6601  1104              TAD     NOTTY         /GET THE TELETYPE STATUS
6602  7710              SPA     CLA           /IS THERE A TELETYPE AVAILABLE?
6603  5254              JMP     LOOP3A+6      /NO-ABORT MESSAGE AND HALT FOR INFO
6604  4776*             JMS     MES
6605  4543              TEXT    "%#LOOP FROM FIRST ADDRESS THRU SECOND ADDRESS"
6606  1417
```



```
6607  1720
6610  4006
6611  2217
6612  1540
6613  0611
6614  2223
6615  2440
6616  0104
6617  3422
6620  0523
6621  2340
6622  2410
6623  2225
6624  4023
6625  0503
6626  1716
6627  2440
6630  0104
6631  3422
6632  0523
6633  2300
6634  4775*             JMS     IN12
6635  1774*             TAD     FIRST
6636  3264              DCA     SRL1
6637  1773*             TAD     SECOND
6640  3265              DCA     SRL2
6641  4772*             JMS     RESDF
6642  1264    LOOP3A,   TAD     SRL1
6643  3263              DCA     SRL
6644  1663    LOOP3B,   TAD I   SRL
6645  7040              CMA
6646  3663              DCA I   SRL
6647  1663              TAD I   SRL
6650  7040              CMA
6651  3663              DCA I   SRL
6652  1263              TAD     SRL
6653  7041              CIA
6654  1265              TAD     SRL2
6655  7650              SNA CLA
6656  5242              JMP     LOOP3A
6657  2263              ISZ     SRL
6660  5244              JMP     LOOP3B

6661  4500            C8ERR                   /C8/

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

                /*C8*/*7000
6700  4777*   LOOP5,    JMS     SAVDF
6701  1104              TAD     NOTTY         /GET TTY FLAG
```

```
6702  7710            SPA     CLA             /IS THERE A TELETYPE AVAILABLE
6703  5336            JMP     LOOP5A+6        /NO-ABORT MESSAGE AND HALT FOR INFO
6704  4776'           JMS     MES
6705  0543            TEXT    "X#LOOP DATA IN THE SR THRU THE ADDRESS SELECTION"
6706  1417
6707  1720
6710  0004
6711  0124
6712  0140
6713  1116
6714  0024
6715  1005
6716  0023
6717  2240
6720  2410
6721  2225
6722  4020
6723  1005
6724  4001
6725  0400
6726  2205
6727  2323
6730  4023
6731  0514
6732  0503
6733  2011
6734  1716
6735  0000
6736  4775'           JMS     IN12
6737  1770'           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  4005    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     LOOP5A          /START AGAIN WITH FIRST ADDRESS
6757  2365            ISZ     SR5C
6760  5346            JMP     LOOP5B          /DO NEXT ADDRESS

6761  4500            C8ERR                   /C8/

                /*C8*/  HLT                   /HALT RESULTED FROM ILLEGAL LIMITS
6762  5300            JMP     LOOP5
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                   /C8/

                /*C8*//*6600
7000  0263    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  0543            TEXT    "X#LOOP DATA IN THE SR ON THE INPUT ADDRESS"
7006  1417
7007  1720
7010  0004
7011  0124
7012  0140
7013  1116
7014  0024
7015  1005
7016  0023
7017  2240
7020  1716
7021  0024
7022  1005
7023  4011
7024  1620
7025  2524
7026  4001
7027  0400
7030  2205
7031  2323
7032  0000
7033  4777'           JMS     MES
7034  0543            TEXT    "X#SET SR TO ADDRESS & CONT"
7035  2305
7036  2440
7037  2322
7040  0024
7041  1740
7042  0104
7043  0422
7044  0523
7045  2340
7046  4640
7047  0317
7050  1624
7051  0000

7052  4503            C8PAUS                  /C8/
```

```
                    /*C8*/  HLT
          7053  4485          LAS
          7054  3262          DCA     SR4
          7055  4275          JMS     RESDF           /RESTORE DATA FIELD TO NEW
          7056  4485    LOOP4A, LAS
          7057  3662          DCA I   SR4
          7060  1662          TAD I   SR4
          7061  5256          JMP     LOOP4A
          7062  0000    SR4,  0
          7063  0000    SAVDF, 0
          7064  7200          CLA
          7065  6214          RDF
          7066  3274          DCA     SAVE
          7067  6224          RIF
          7070  1176          TAD     (6201
          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     (6201
          7100  3301          DCA     .+1
          7101  6201          CDF     00              /LOOP DF
          7102  5675          JMP I   RESDF

                    /*C8*/*7000
                    /*C8*/LOOP5,    JMS     SAVDF
                    /*C8*/  JMS     MES
                    /*C8*/  TEXT    "I*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*/LOOP5A,   TAD     SR5A
                    /*C8*/  DCA     SR5C
                    /*C8*/LOOP5B,   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     LOOP5A          /START AGAIN WITH FIRST ADDRESS
                    /*C8*/  ISZ     SR5C
                    /*C8*/  JMP     LOOP5B          /DO NEXT ADDRESS
                    /*C8*/  HLT                     /HALT RESULTED FROM ILLEGAL LIMITS
                    /*C8*/  JMP     LOOP5
                    /*C8*/SR5A,     0                       /FIRST ADDRESS OF GROUP
                    /*C8*/SR5B,     0                       /LAST ADDRESS OF GROUP
                    /*C8*/SR5C,     0                       /ADDRESS COUNTER
```



```
          7177  2440
                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     HCW2            /APT/RUN UNDER APT CONTROL?
          7206  7700           SMA CLA                 /APT/SKP IF YES.
          7207  5270           JMP     APTIZ0          /APT/
          7210  1375           TAD     (7000           /APT/MODIFY SOME LOCS TO: NOP.
          7211  3774'          DCA     APTN00          /APT/
          7212  1375           TAD     (7000           /APT/
          7213  3773'          DCA     APTN02          /APT/
          7214  1375           TAD     (7000           /APT/
          7215  3772'          DCA     APTN03          /APT/
          7216  1375           TAD     (7000           /APT/
          7217  3771'          DCA     APTN04          /APT/
          7220  1375           TAD     (7000           /APT/
          7221  3770'          DCA     APTN05          /APT/
          7222  1375           TAD     (7000           /APT/
          7223  3767'          DCA     APTN06          /APT/
          7224  1366           TAD     (APTJ50         /APT/MODIFY SOME LOCS TO:  JMP .+N.
          7225  0365           AND     (177            /APT/
          7226  1364           TAD     (5200           /APT/
          7227  3763'          DCA     APTJ00          /APT/
          7230  1362           TAD     (APTJ51         /APT/
          7231  0365           AND     (177            /APT/
          7232  1364           TAD     (5200           /APT/
          7233  3761'          DCA     APTJ01          /APT/
          7234  1360           TAD     (APTJ52         /APT/
          7235  0365           AND     (177            /APT/
          7236  1360           TAD     (5200           /APT/
          7237  3757'          DCA     APTJ02          /APT/
          7240  1356           TAD     (APTJ53         /APT/
          7241  0365           AND     (177            /APT/
          7242  1364           TAD     (5200           /APT/
          7243  3755'          DCA     APTJ03          /APT/
          7244  1354           TAD     (APTJ54         /APT/
          7245  0365           AND     (177            /APT/
          7246  1364           TAD     (5200           /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  1357          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
```



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7356  1133
7357  0312
7360  0325
7361  0266
7362  0301
7363  0246
7364  5200
7365  0177
7366  0261
7367  1221
7370  0206
7371  0310
7372  0264
7373  0244
7374  0204
7375  7000
7376  7473
7377  7400
      7400    PAGE                            /APT/
              /APT/   ROUTINE TO INITIALIZE FOR RUNNING UNDER APT CONTROL
              /C8/    OR UNDER CLASSIC 8 CONTROL.

7400  0000    APTIZ,  0                       /APT/
7401  6002          IOF                       /APT/
7402  4777*         JMS     DFEIF             /APT/GO MAKE DF=IF.

7403  1022          TAD     HCW2              /C8/UNDER CLASSIC 8 CONTROL?
7404  7006          RTL                       /C8/
7405  7004          RAL                       /C8/
7406  7500          SMA                       /C8/SKP IF YES.
7407  5776*         JMP     APTIZ1+1          /C8/
7410  3215          DCA     C8CF              /C8/SET CLASSIC 8 CONTROL FLAG.

              /C8/    THE NEXT LOC WILL = NOP AFTER BEING USED ONCE.

7411  4775*         JMS     C8SM              /C8/GO SAVE PC ST, FLD 1.
7412  1374          TAD     (7000             /C8/MODIFY ABOVE LOC TO:  NOP.
7413  3211          DCA     .-2               /C8/
7414  5600          JMP I   APTIZ             /C8/RTN TO CALL+1.

7415  0000    C8CF,   0                       /C8/



              /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              /C8/UNDER CLASSIC 8 CONTROL?
7421  7700          SMA CLA                   /C8/SKP IF YES.
7422  5225          JMP     .+3               /C8/
```

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

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


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

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

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


7465  7000  APTOK0, NOP             /APT/

7466  1215          TAD     C8CF    /C8/UNDER CLASSIC 8 CONTROL?
7467  7710          SPA CLA         /C8/SKP IF NO.
7470  4771*         JMS     XC8CKP  /C8/GO CHECK FOR CONTROL CHARS.
7471  7000          NOP             /C8/

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


              /APT/   ROUTINE TO GET THE SPECIFICATIONS OF THE FIELDS TO BE TESTED
              /APT/   (FIELD LIMITS).  FIRST ATTEMPT IS FROM HCW1.  IF THERE IS
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              /APT/   NO SPEC THERE THEN SPECS WILL BE TAKEN FROM THE SWITCH REGISTER
              /APT/   (PSR OR HARD SR).  IN EITER CASE THE RESULT IS PRESERVED
              /APT/   IN THE PSR.  IF FIELD 7 IS SPECIFIED THEN FIELD 6 WILL BE
              /APT/   FORCED.

7473  0000  APTFL,  0               /APT/
7474  7200          CLA             /APT/
7475  1021          TAD     HCW1    /APT/GET MEM SIZE FROM HCW1.
7476  0370          AND     (37     /APT/
7477  7012          RTR             /APT/CONVERT TO HI FIELD LIMIT.
7500  0370          AND     (37     /APT/
7501  7450          SNA             /APT/SKP IF VALID MEM SIZE WAS IN HCW1.
7502  5321          JMP     APTFL0  /APT/GO TRY SW REG FOR FIELD LIMITS.
7503  3263          DCA     APTCTX  /APT/FIELD 7 SPEC'D?
7504  1022          TAD     HCW2    /CHECK FOR APT
7505  7710          SPA     CLA     /IF APT CHECK FOR FIELD 7 AND SUBTRACT
7506  1263          TAD     APTCTX  /APT/
7507  1367          TAD     (7771   /APT/
7510  7650          SNA CLA         /APT/SKP IF NO.
7511  7040          CMA             /APT/FORCE FIELD 6 AS HI FIELD LIMIT.
7512  1263          TAD     APTCTX  /APT/
7513  3263          DCA     APTCTX  /APT/
7514  1020          TAD     PSR     /APT/
7515  0366          AND     (7700   /APT/
7516  1263          TAD     APTCTX  /APT/
7517  3020          DCA     PSR     /APT/PSR=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  3260          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
7534  7700          SMA     CLA
7535  5352          JMP     NOTAPT  /NOT APT DO NOT CHECK FOR FIELD 7
7536  1263          TAD     APTCTX  /APT/FIELD 7 SPEC'D AS LO LIMIT?
7537  1362          TAD     (7710   /APT/
7540  7640          SZA CLA         /APT/SKP IF YES.
7541  5344          JMP     .+3     /APT/
7542  1361          TAD     (60     /APT/FORCE FIELD 6 AS LO LIMIT.
7543  3263          DCA     APTCTX  /APT/
7544  1264          TAD     APTCTY  /APT/FIELD 7 SPEC'D AS HI LIMIT?
7545  1367          TAD     (7771   /APT/
7546  7640          SZA CLA         /APT/SKP IF YES,,
7547  5352          JMP     .+3     /APT/
7550  1360          TAD     (6      /APT/FORCE FIELD 6 AS HI LIMIT.
7551  3264          DCA     APTCTY  /APT/
7552  1020  NOTAPT, TAD     PSR     /APT/
7553  0366          AND     (7700   /APT/
```

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

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


                /SET UP A LAS TO BE EQUALL TO THE CALL C8CKSW

                /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 C8PASS TO PRINT PASS
                /SETUP OF CNTVAL WILL BE FOUND IN C8PASS
                /THIS VALUE SHOULD BE A POSITIVE NUMBER.


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


                /THE CALL TABLE IS A CONDITIONAL ASSEMBLY.
                / TO ASSEMBLE THE CALL REMOVE THE / BEFORE CONSOL  =0,
                /IN COMBINING THE CONSOL PACKAGE TO A DIAGNOSTIC,
                / THE CALL TABLE IS TO BE AT THE BEGINNING OF A PROGRAM.
      0000      CONSOL=0
      6661              PSKF=   6661
      6662              PCLF=   6662
      6663              PSKE=   6663
      6664              PSTB=   6664
      6665              PSIE=   6665
      6004              GTF=    6004
      7701              ACL=    7701
      6007              CAF=    6007
```



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      7421              MQL=    7421
      7501              MQA=    7501
      0066      *66

      4466              C8PASS= JMS I   .
0066  5800                      XC8PAS          /C8 PASS COMPLETION ROUTINE
      4467              C8CKSW= JMS I   .
0067  5050                      XC8SW           /CHECK SW REG SETTING
      4470              C8TTYI= JMS I   .
0070  5060                      XC8TTY          /FETCH CONSOL CHAR
      4471              C8CNTR= JMS I   .
0071  5200                      XC8CNT          /CHECK FOR CONTROL CHAR
      4472              C8PRNT= JMS I   .
0072  5071                      XC8PNT          /C8 PRINT A BUFFER
      4473              C8SWIT= JMS I   .
0073  5457                      XC8PSW          /SET UP PSEUDO SW, REG
      4474              C8OCTA= JMS I   .
0074  5600                      XC8OCT          /CONVERT TO ASCII AND PRINT
      4475              C8CRLF= JMS I   .
0075  5623                      XC8CRL          /DO A CARRIGE RETUR + LINE FEED
      4476              C8ECHO= JMS I   .
0076  5663                      XC8ECH                  /CHECK INPUT CHAR
      4477              C8TYPE= JMS I   .
0077  5677                      XC8TYP          /C8 PRINT ONE CHAR
      4500              C8ERR=  JMS I   .
0100  6007                      XC8ERR          /C8 ERROR  HANDLER
      4501              C8INQU= JMS I   .
0101  5035                      XC8INQ          /LOOK FOR OPERATOR INTERVENTION
      4502              C8CKPA= JMS I   .
0102  5641                      XC8CKP          /CHECK IF CONTROL CHAR
      4503              C8PAUS= JMS I   .
0103  5125                      XC8PAU          /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
                /*************************************************************
                /C8PASS
                /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 COMPLEATE THIS MANY C8PASS TO BE IN THE 1 TO 4 MINUTE
                /RANGE
                /       C8PASS=JMS      XC8PAS
                /EX.            C8PASS
```

```
                    /               HLT                     /HALT IF NON CONSOL PACKAGE
                    /               JMP     START1          /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        MESPAS                  /
5013  1236        TAD     PASCNT          /GET NUMBER
5014  4470        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*/  C8INDU              /STOP PROGRAM EXECUTION-LOOK FOR INPUT
5016  2200  C8BY1,  ISZ     XC8PAS          /BUMP RETURN
5017  5600        JMP I   XC8PAS
5020  0000  CKCOUT, 0
5021  1447        TAD     DOSET           /CHECK IF SET UP NEEDED
5022  7040        SZA CLA                 /0=SET UP C8PASS COUNT VALUE
                                          /1=C8PASS COUNT VALUE OK
5023  5030        JMP     NOSET           /C8PASS COUNT VALUE ON
5024  1246        TAD     CNTVAL          /GET COUNT VALUE FOR THIS PROG
5025  7040        CMA                     /SET TO NEGATIVE
5026  3235        DCA     DOCNT           /STORE IN HERE
5027  2247        ISZ     DOSET           /INDICATE VALUE SET UP
5030  2235  NOSET,  ISZ     DOCNT           /COUNT THE NUMBER OF PASSES
5031  5220        JMP     C8BY1           /EXIT FOR ANOTHER PASS
5032  1247        DCA     DOSET           /SET TO C8PRNT C8PASS
5033  2220        ISZ     CKCOUT          /JUMP RETURN FOR
5034  5620        JMP I   CKCOUT          /C8PASS C8TYPE OUT
5035  0000  DOCNT,  0
5036  0000  PASCNT, 0                     /
5037  0000  DOSET,  0
5040  0000  CNTVAL, 0
5041  0000  MESPAS, TEXT    "CHKMAC  PASS "
5042  0000
5043  0000
5044  0000
5045  0000
5046  0000
5047  0000
```



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                    /*****************************************************************

                    /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
                    /*1
5051  4502        C8CKPA                  /GO CHECK THE IF ANY CONTRL
                    /*2
5052  7000        NOP
                    /*2
                    /*1
5053  1021        TAD     21              /GET NO 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        KRB                     /GET CHAR
5064  0375        AND     (177            /MASK FOR 7 BITS
5065  1374        TAD     (200            /ADD THE EIGTH 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 ADDRS FOLLOWING THE CALL.  C8 PRINTING OF THE BUFFER
                    /WILL STOP WHEN A 00 CHAR IS DETECTED. CHARACTERS ARE PACKED 2 PER WORD.

                    /       C8PRNT= JMS XC8PNT


                    /EX.    C8PRNT                  /C8PRNT THE CONTENTS OF THE FOLLOWING BUFFER
                    /       MES377                  /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     PTRTOR          /STORE IN PTRTOR
    5075  2271            ISZ     XC8PNT          /BUMP RETURN
    5076  1724    C8D01,  TAD I   PTRTOR          /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                     /PUT CHAR IN BITS 4-11 MAKE IT 6 BIT ASCII
    5110  4477            C8TYPE                  /C8PRNT IT ON CONSOLE
    5111  1724            TAD I   PTRTOR          /GET DATA WORD
    5112  0371            AND     (0077           /MASK FOR RIGHT BYTE
    5113  7450            SNA                     /CHECK IF 00 TERMINATOR
    5114  5671            JMP I   XC8PNT          //EXIT
    5115  1370            TAD     (3700           /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     PTRTOR          /BUMP POINTER FOR NEXT WORD
    5123  5276            JMP     C8D01           /DO AGAIN
    5124  0000    PTRTOR, 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 CONSOLE
    5130  5536            JMP     C8D03           /GO DO CONSOL PART RETURN CALL +1
    5131  7040            CMA                     /PUT HLT IN CALL
    5132  1325            TAD     XC8PAU          /GET CORRECT RETURN ADDRS
    5133  3325            DCA     XC8PAU          /SET UP RETURN
    5134  1365            TAD     (7402           /GET CODE FOR HLT
    5135  3725            DCA I   XC8PAU          /PUT HALT IN CALL LOCATION
    5136  5725    C8D03,  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-O-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 IFCONTINUE
                    /RETURN IS TO CALL PLUS TWO IF INMOD 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     AC8AVE          /SAVE THE AC
    5202  4776*           JMS     CHKCLA          /CHECK FOR CONSOLE ACTIVE
    5203  5206            JMP     .+3             /ON ACTIVE CONSOLE
```

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5284  1777'          TAD     ACSAVE          /GET AC FOR RETURN
5285  5600           JMP I   XC8CNT          /EXIT NOT ON ACTIVE CONSOLE
5286  6000           GTF
5287  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 ADDRS OF TABLE A
5214  3256           DCA     GETDAT          /CONTAINS POINTER TO CONTROL CHAR
5215  1656   REDOA,  TAD I   GETDAT          /GET CONTROL CHAR FROM TABLE
5216  7450           SNA                     /CHECK FOR A 0 END OF TABLE
5217  5226           JMP     DONEA           /END OF TABLE NO CONTROL CHAR
5220  1773'          TAD     CHAR            /COMPARE CHAR TO CONTROL CHAR
5221  7650           SNA CLA                 /0 IF MATCH
5222  5243           JMP     GOITA           /MATCH
5223  2255           ISZ     INDEXA          /NO MATCH NOT END OF TABLE REDO
5224  2256           ISZ     GETDAT          /BUMP INDEX FOR EXIT WHEN CONTROL FOUND
5225  5215           JMP     REDOA           /BUMP GETDAT FOR COMPARE OF NEXT CNTRL CHAR.
5226  1772'  DONEA,  TAD     INMODE          /CHECK IF PROGRAM EXPECTS CHAR
5227  7640           SZA CLA                 /1=CHAR EXPECTED  0= NO CHAR EXPECTED
5230  5240           JMP     EXITA           /CHAR EXPECTED
5231  1773'          TAD     CHAR            /GET CHAR - NOT CONTROL + NOT EXPECTED
5232  4477           C8TYPE                  /C8PRNT CHAR
5233  1371           TAD     (277            /GET CODE FOR "?"
5234  4477           C8TYPE
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 HOW FAR INTO TABLE
5250  3254           DCA     GOTOA           /STORE IT
5251  1654           TAD I   GOTOA           /GET THE ROUTINE STARTTING ADDRESS
5252  3250           DCA     GOTOA           /STORE IT IN HERE
5253  5654           JMP I   GOTOA           /GOTO CONTROL CHAR ROUTINE
5254  0000   GOTOA,  0000                    /ADD OF CNTRL ROUTINE TO EXECUTE
5255  0000   INDEXA, 0000                    /DISPLACEMENT INTO CNTRL TABLE
5256  0000   GETDAT, 0000                    /LOCATION OF ADDRS OF CONTROL CHAR.
5257  5261   XTABLA, TABLA                   /ADDRS OF TABLEA
5260  5271   XTABLB, TABLB                   /ADDRS 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 O 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 Q 223
5266  7573           7573                    /CNTRL E CONTINUE WITH PROGRAM 205
5267  7570           7570                    /CONTROL D CHANGE SWITCH REGISTER ON FLY
5270  0000           0000
```



```
5271  5300   TABLB,  CNTRLC
5272  5305           CNTRLL
5273  5307           CNTRLQ
5274  5320           CNTRLR
5275  5327           CNTRLS
5276  5353           CNTRLE
5277  5400           CNTRLD

                     /RETURN TO MONITOR
                     /#7
5300  3767'  CNTRLC, DCA     TTYLPT          /CLEAR SOFT FLAG FOR TERMINAL PRINTING
5301  3766'          DCA     C8SWST
5302  4765'          JMS     UPARROW         /C8PRNT A" AND LETTER IN CHAR
5303  4764'          JMS     C8RN            /C8/GO RESTORE PG 37 IN FIELDS 0 & 1.
5304  6203           CDF CIF                 /GO TO 0 FLD
5305  6007           CAF                     /CLEAR THE WORLD
5306  5763           JMP I   (7600           /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  XC8CNTR
5315  3343   BYRETR, DCA     C8SETS
5316  4762'          JMS     C8GET
5317  5704           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     UPARROW         /GO PRINT CHARACTER
5324  3766'  C8BY4,  DCA     C8SWST          /CLEAR FLAG FOR CNTRL D OR R
5325  5726           JMP I   XDOSW           /GO TO ADDRS OF C8SWIT
5326  0200   XDOSW,  C8STRT                 /DOSW 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
5330  7640           SZA CLA
5331  5335           JMP     C8DO7           /DONT SET UP C8RETR
5332  7001           IAC                     /MAKE RETURN CALL PLUS 2
5333  1200           TAD     XC8CNT          /GET RETURN FOR THIS CALL
```

```
5334  3340            DCA     C8RETR          /STORE IT HERE FOR USE BE CNTROL Q
5335  2343    C8DD7,  ISZ     C8SETS          /SET FLAG TO SAVE CALL
5336  4478            C8TTYI                  /LOOK FOR THE INPUT
5337  4762'           JMS     C8GET           /GET REGISTERS
5340  0471            C8CNTR                  /CHECK FOR THE CONTROL CHAR
5341  7200            CLA
5342  5327            JMP     CNTRLS          /IF NOT A CNTRL Q R C REASK
                      /
5343  0000    C8SETS, 0
5344  0000    C8RETR, 0
                      /
                      /SWITCH OUTPUT FROM ONE OUTPUT DEVICE TO ANOTHER - THE TWO OUTPUTS ARE THE
                      /CONSOLE AND THE PRINTER WITH DEVICE CODE 66.
                      /
                      /
5345  1767'   CNTRLL, TAD     TTYLPT          /GET PRESENT C8SWIT INDICATOR
5346  7040            CMA                     /COMPLEMENT IT
5347  3767'           DCA     TTYLPT          /STOR NEW C8SWIT
5350  4765'           JMS     UPAROW          /C8PRNT ^ AND CHAR ON NEW DEVICE
5351  4762'           JMS     C8GET           /RESTORE THE REGISTERS
5352  5600            JMP I   XC8CNT          /EXIT
                      /
                      /
                      /
                      /
                      /
                      /CONTROL E
                      /CONTINUE RUNNING FROM A INQUIRE OR ERROR
                      /
                      /
5353  4765'   CNTRLE, JMS     UPAROW          /PRINT THE CONTROL CHAR
5354  4762'           JMS     C8GET           /GET THE REGISTERS
5355  5600            JMP I   XC8CNT          /RETURN TO CALL PLUS ONE
                      /
                      /
                      /
5362  5424
5363  7600
5364  6127
5365  5415
5366  5546
5367  5721
5370  0100
5371  0277
5372  5676
5373  5675
5374  6125
5375  6126
5376  6000
5377  6124
      5400    PAGE
                      /
```



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


5400  4215    CNTRLO, JMS     UPAROW
5401  1213            TAD     C8SETO          /CHECK IF THE RETURN ADDRS IS SAFE
5402  7640            SZA CLA
5403  5207            JMP     C8DD11          /DO NOT CHANGE THE RETURN ADDRS
5404  1777'           TAD     XC8CNT          /GET THE RETURN ADDRS AND SAVE IT
5405  3214            DCA     C8RETD          /SAVE THE RETURN HERE
5406  2213            ISZ     C8SETO          /INDICATE RETURN SAVED DONT DISTROY
5407  4473    C8DD11, C8SWIT                  /GO CHANGE THE SWITCH REGISTER
5410  3213            DCA     C8SETO          /CLEAR THE FLAG
5411  4224            JMS     C8GET           /RESTORE THE AC MQ LINK ETC
5412  5614            JMP I   C8RETD          /RETURN TO THE PROGRAM
                      /
5413  0000    C8SETO, 0
5414  0000    C8RETO, 0
                      /



5415  0000    UPAROW, 0                       /C8PRNT THE "^" AND THE CHAR C8TYPED IN
5416  1376            TAD     (336            /CODE FOR ^
5417  4477            C8TYPE
5420  1775'           TAD     CHAR            /C8TYPE THE CHAR
5421  4477            C8TYPE
5422  4475            C8CRLF                  /ISSUE A CR AND LF
5423  5615            JMP I   UPAROW          /EXIT


                      /*****************************************************************

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


                      /*****************************************************************

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

```
                        //
                        /       C8INQU* JMS XC8INQ

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

5435  0000    XC8INQ, 0
5436  7300            CLA CLL
5437  4771'           JMS     CHKCLA          /CHECK FOR CONSOLE ACTIVE
5440  7410            SKP
5441  5635            JMP I   XC8INQ          /NOT CONSOLE LEAVE
5442  4475            C8CRLF
5443  4472            C8PRNT
5444  5452            WATMES                  /INQUIR WAITTING
5445  4470            C8TTYI                  /GET CHARACTER
5446  4224            JMS     C8GET
5447  4471            C8CNTR                  /CHECK IF CONTROL CHARACTER
5450  5635            JMP I   XC8INQ          /EXIT AND CONTINUE
5451  5234            JMP     XC8INQ+1        /REASK
5452  2701    WATMES, TEXT    "WAITING "
5453  1124
5454  1116
5455  0740
5456  0000



                        /*****************************************************************

                        /C8SWIT
                        /ROUTINE WILL CHECK IF CONSOL IS ACTIVE IF IT IS ACTIVE DISPLAY
                        /SW QUESTION, IN NOT ACTIVE IT WILL NOT PRINT THE SW QUESTIONBUT
                        /RETURN TO CALL PLUS ONE AC=0,
                        /C8SWIT WILL SET UP THE PSEUDO C8SWIT
                        /REGISTER WITH THE NEW DATA ENTERED
                        /THE TAG  C8OOR AT THE START OF THE CALL IS FOR THE RETURN OF CONTROL R
                        /CHAR, THIS MAY BE CHANGED IF THIS IS NOT WHERE A GOOD RESTART
                        /OF PROGRAM IS.
                        /
                        /       C8SWIT* JMS XC8PSW

                        /EX.    C8OOR,  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  1306            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  2306            ISZ     C8SWST          /FINST ENTRY SET FLAG
5467  4472    C8ROPS, C8PRNT                  /C8PRNT SR=XXX
5470  5550            MESA
5471  1020            TAD     20              /GET CONTENTS OF SW
5472  4474            C8OCTA                  /CONVERT IT TO ASCII
5473  1367            TAD     (40             /GET SPACE
5474  4477            C8TYPE
5475  2766'           ISZ     INMODE          /SET FLAG FOR CHAR EXECTED
5476  4476            C8ECHO                  /LOOK FOR INPUT
5477  4316            JMS     TSTCHA          /NOT CONTROL TEST IT IS LEGAL
5500  1775'           TAD     CHAR            /STORE NEW CHAR IN SW REG
5501  3020            DCA     20

5502  1365            TAD     (-3             /GET A MINUS 3
5503  3347            DCA     TMPCNT          /STORE IN TEMP COUNT
5504  4476    GETCH1, C8ECHO                  /GET NEXT CHAR
5505  4316            JMS     TSTCHA          /CHECK IF CR + GOOD CHAR
5506  1020            TAD     20              /GET C8SWIT REGISTER
5507  7106            RTL CLL                 /ROTATE IT LEFT 3 PLACES
5510  7004            RAL
5511  1775'           TAD     CHAR            /GET CHAR + ADD IT TO PREVIOUS CONTENTS
5512  3020            DCA     20              /SAVE NEW CONTENTS
5513  2347            ISZ     TMPCNT          /BUMP COUNT
5514  5304            JMP     GETCH1          /JMP BACK + GET NEXT CHAR
5515  5343            JMP     ENDIT           /END 4 CHAR C8TYPED IN
5516  0000    TSTCHA, 0
5517  7041            CIA                     /CMPL CHAR IN AC
5520  1364            TAD     (215            /TEST IF IT IS A CARRIAGE RETURN
5521  7650            SNA CLA                 /SKIP IN NOT CR,
5522  5343            JMP     ENDIT           /WAS CARRIAGE RETURN
5523  1775'           TAD     CHAR            /NOT CR, GET CHAR
5524  1363            TAD     (-260           /CHECK IF IT IS IN RANGE
5525  7710            SPA CLA                 /IF NOT POSITIVE C8ERR CHAR SMALLER THEN 260
5526  5337            JMP     ERR1            /C8ERR = CHAR TOO SMALL
5527  1775'           TAD     CHAR            /GET CHAR
5530  1362            TAD     (-270           /GET A -270 + CHECK IF IT IS LARGER THEN 7
5531  7700            SMA CLA                 /SKIP IF LESS THEN 7
5532  5337            JMP     ERR1            /C8ERR ON CHAR NOT IN RANGE
5533  1775'           TAD     CHAR            /GET CHAR
5534  0361            AND     (7              /MASK FOR RIGHT BYTE
5535  3775'           DCA     CHAR            /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     C8ROPS          /EXIT + ASK AGAIN
5543  4475    ENDIT,  C8CRLF                  /DO A CR LF
                        /#3
5544  3306            DCA     C8SWST          /CLEAR THE PSW ENTRY FLAG
5545  5657            JMP I   XC8PSW          /EXIT ROUTINE
5546  0000    C8SWST, 0
                        /#3
```

```
5547  0000    TMPCNT, 0
5550  2322    MESA,   TEXT    "SR0 "
5551  7540
5552  0000



5560  0277
5561  0007
5562  7510
5563  7520
5564  0215
5565  7775
5566  5676
5567  0040
5570  5324
5571  6000
5572  6124
5573  6126
5574  6125
5575  5675
5576  0336
5577  5200
      5600    PAGE
              /**********************************************************************
              /C8OCTA
              /OCTAL TO ASCII CONVERSION
              /THIS ROUTINE WILL TAKE THE OCTAL NUMBER IN THE AC AND CONVERT IT TO ASCII
              /THE RESULT WILL BE PRINTED ON THE CONSOL DISPLAY
              /       C8OCTA= JMS XC8OCT
              /
              /EX,    C8OCTA          /AC CONTAINS NUMBER TO BE CHANGE
              /

5600  0000    XC8OCT, 0
5601  7106            CLL RTL
5602  7006            RTL                     /POSITION THE FIRST CHAR FOR PRINTING
5603  3221            DCA     C8TMP1          /SAVE CORRECT POSITIONED WORD HERE
5604  1377            TAD     (-4
5605  3222            DCA     C8CKP           /STORE COUNTER IN HERE
5606  1221    C8OD04, TAD     C8TMP1          /GET FIRST NUMBER
5607  0376            AND     (0007           /MASK
5610  1375            TAD     (260            /ADD THE PRINT CONSTANT
5611  0477            C8TYPE                  /TYPE THE NUMBER
5612  1221            TAD     C8TMP1          /
5613  7006            RTL
5614  7004            RAL                     /PUT NEXT NUMBER IN POSITION
5615  3221            DCA     C8TMP1          /STORE IT
5616  2222            ISZ     C8CKP           /DONE YET WITH FOUR NUMBERS
5617  5206            JMP     C8OD04          /NOT YET DO MORE
5620  5600            JMP I   XC8OCT          /DONE WITH FOUR
5621  0000    C8TMP1, 0
5622  0000    C8CKP,  0

              /**********************************************************************
```



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

5623  0000    XC8CRL, 0
5624  7300            CLA CLL
5625  1374            TAD     (215            /GET CODE FOR CR
5626  0477            C8TYPE
5627  1237            TAD     FILLER
5630  7040            CMA
5631  3240            DCA     FILCNT          /STORE FILLER IN HERE
5632  1373            TAD     (212            /GET CODE FOR LF
5633  0477    C8OD02, C8TYPE
5634  2240            ISZ     FILCNT          /CHECK ON FILLER CHAR
5635  5233            JMP     C8OD02          /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. IFTHE 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.
              /A NON CONTROL CHARACTER WILL BE PRINTEDAND 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            MQA                     /PUT MQ IN AC
5646  3770'           DCA     MQSAVE          /SACE THE MQ
5647  6031            KSF                     /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  6470            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  6470            C8TTYI                  /WAIT FOR CHAR FROM KEYBOARD
5665  4766'           JMS     C8GET
5666  2276            ISZ     INMODE          /SET INMODE IDENTIFING THIS AS A EXPECTED CHAR
5667  4471            C8CNTR                  /GO CHECK IF IT IS A CONTROL CHAR
5670  5663            JMP I   XC8ECH          /WAS A CONTROL CHAR - CONTINUE RUNNING
5671  6477            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 0=TTY 7777=LPT
5702  7640            SZA CLA
```



```
5703  5312            JMP     XDOLPT          /DO OUT PUT ON LPT
5704  1320            TAD     PNTBUF
5705  6046            TLS
5706  6041            TSF
5707  5306            JMP     .-1
5710  6042            TCF
5711  5316            JMP     C8BY5
5712  1320    XDOLPT, TAD     PNTBUF          /GET CHAR
5713  6666            PSTB    PCLF            /C8PRNT IT
5714  0322            JMS     C8HANG          /CHECK KEYBOARD IF HUNG
5715  6662            PCLF
5716  7600    C8BY5,  7600                    /CLEAR THE AC
5717  5677            JMP I   XC8TYP          /EXIT
5720  0000    PNTBUF, 0
5721  0000    TTYLPT, 0


5722  0000    C8HANG, 0               /WILL CHECK KEYBOARD FOR CNTRL CHAR
5723  7200            CLA
5724  1316            TAD     C8BY5   /GET CONSTANT 7600
5725  3320            DCA     PNTBUF
5726  6661            PSKF
5727  7410            SKP
5730  5722            JMP  I  C8HANG
5731  2346            ISZ     C8CONT
5732  5326            JMP     .+4
5733  2320            ISZ     PNTBUF
5734  5331            JMP     .+5
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            C8INGU
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  0240
```

```
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
                /**********************************************************************

                /C8ERR
                /THIS ROUTINE WILL DETERMINE WHAT TO DO WHEN A C8ERR IS ENCOUNTERED
                /WILL CHECK IF CLASSIC SYSTEM, WILL CHECK C8SWIT REGISTERS.
                /       C8ERR=  JMS XC8ERR
                /EX,    C8ERR           /GO TO C8ERR CALL IF NOT CONSOL /0/
                /                       /RETURN IS CALL PLUS ONE AC =0000


6007  0000    XC8ERR, 0
6010  6002            IOF
6011  3324            DCA     AC3AVE          /SAVE AC
6012  6004            GTF
6013  3326            DCA     FL3AVE          /SAVE THE FLAGS
6014  7501            MQA
6015  3325            DCA     MQ3AVE          /SAVE THE MQ
6016  7340            CLA CLL CMA             /SUBTRACT A 1 FOR TRUE LOCATION
6017  1207            TAD     XC8ERR          /GET RETTURN LOCATION
6020  3323            DCA     PC3AVE          /SAVE ADD OF C8ERR CALL
6021  4200            JMS     CHKCLA
6022  7410            SKP
6023  5264            JMP     NTCLAS          /NOT CLASSIC SYSTEM
6024  4776'           JMS     C8GET
6025  4775'           JMS     XC8SW
6026  0374    SETUP1, AND     (0000
6027  7640            SZA CLA
6030  5255            JMP     C8D010          /DO NOT PRINT
6031  4475            C8CRLF
6032  4472            C8PRNT
6033  6077            ERRMES                  /PRINT THE ERROR MESSAGE
6034  4472            C8PRNT
6035  6107            MESPC                   /PRINT THE PC STSTEMENT
6036  1323            TAD     PC3AVE
6037  4476            C8OCTA                  /CONVERT 4 OIGIT PC TO ASCII
6040  4472            C8PRNT
6041  6112            MESAC                   /PRINT THE AC MESS
6042  1324            TAD     AC3AVE
6043  4474            C8OCTA
6044  4472            C8PRNT
6045  6115            MESMQ                   /PRINT MQ
6046  1325            TAD     MQ3AVE
```



```
6047  4476            C8OCTA
6050  4472            C8PRNT
6051  6120            MESFL                   /PRINT FL
6052  1326            TAD     FL3AVE
6053  4474            C8OCTA
6054  4475            C8CRLF
6055  4776'   C8D010, JMS     C8GET           /RESTORE AC MQ AND FLAFS
6056  4467            C8CK3W                  /CHECK SWITCH REGISTER
6057  7040            CMA                     /C8/
6060  7710            SPA CLA                 /SKIP IF BIT 0 SET
6061  5275            JMP     C8BY2           /LEAVE
6062  4501            C8INQU                  /GO TO THE INQUIRE ROUTINE
6063  5275            JMP     C8BY2           /LEAVE
6064  4776'   NTCLAS, JMS     C8GET           /RESTORE AC,MQ AND FLAGS
6065  4467            C8CK3W                  /CHECK PSEUDO SWITCH REGISTER
                                              /CHECK THE C8SWIT REGISTER
6066  7040            CMA                     /C8/
6067  7710            SPA CLA                 /SKIP IF HALT
6070  5607            JMP I   XC8ERR          /NO HALT CONTINUE
6071  1373            TAD     (7402           /CODE FOR HLT
6072  3723            DCA I   PC3AVE          /PUT IT IN CALL LOC.
6073  4776'           JMS     C8GET
6074  5723            JMP I   PC3AVE          /EXIT  TO CALL AND HALT
6075  4776'   C8BY2,  JMS     C8GET           /GET THE REGISTERS
6076  5607            JMP I   XC8ERR
6077  0410    ERRMES, TEXT    "DHKMAC  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    PC3AVE, 7777
6124  7777    AC3AVE, 7777
6125  7777    MQ3AVE, 7777
6126  7777    FL3AVE, 7777

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

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

```
6132  1372            TAD     (6201           /C8/
6133  3334            DCA     C8RM8           /C8/MODIFY NEXT CDF INST.
6134  1371            TAD     (7577           /C8/SET UP "FROM" (FLD 0) PTR.
6135  3010            DCA     10              /C8/
6136  1370            TAD     (C83A-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    C8RM8,  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     C8RM8           /C8/


                      $$$
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  7764
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
```

```
0000  11111111  00000000  11111111  11111111  11111111  11111111  11111111  11111111
0100  11111000  00000011  11111111  11111111  11111111  11111111  11111111  11111111

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  11100000  00011111  11111111

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111110  00000000
0500  00000000  00000000  00000000  00000000  00000000  00000000  00000111  11111111

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  11111111  11100000  00000011  11111111  11111111


1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11110000  00000000  00001111  11111111  11111111

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11000000  00000000  00000000  00000000  00000000  00000000  00000000  00000001

1400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1500  11111111  11111111  11111111  11111111  11111100  00000000  00000000  00111111

1600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111


2000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2100  11111111  11111111  11100000  00000000  00000000  00000000  00001111  11111111

2200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2300  11111111  11111111  11110000  00000000  00000000  00000000  00000001  11111111

2400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2500  11111111  11111111  11111111  11111110  00000000  00000000  00000000  00000011

2600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2700  11111111  11111111  11111111  11111111  11111111  00000000  00000000  00111111


3000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3100  11111111  11111111  11111111  11111111  11111111  11011111  11111111  11111111

3200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  01111111

3400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11110011

3600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3700  11111111  11111111  11111111  11111111  11111111  11111100  00000000  00000001
```



```
4000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4100  11111111  11111111  11111111  11111111  11111111  11111111  11111100  00000000

4200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4300  11111111  11111111  11111111  11111111  11111111  11111111  11110000  00000001

4400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4500  11111111  11111111  11111111  11111111  11111111  11101111  11111111  11111111

4600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4700  11111111  11111111  11111111  00111111  11111111  11111111  11111111  11111111


5000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5100  11111111  11111111  11111111  11111110  00000000  00000000  00000111  11111111

5200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5300  11111111  11111111  11111111  11111111  11111111  11111100  00111111  11111111

5400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5500  11111111  11111111  11111111  11111111  11111111  11100000  11111111  11111111

5600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5700  11111111  11111111  11111111  11111111  11111111  11110000  00000111  11111111


6000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6100  11111111  11111111  11111111  11111111  11111111  11111111  11100000  11111111

6200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6300  11111110  00000000  00000000  00000000  00000000  00000000  00000001  11111111

6400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6500  11111111  11111111  11111111  10000000  00000000  00000000  00000000  00000111

6600  11111111  11111111  11111111  11111111  11111111  11111111  11111100  00000000
6700  11111111  11111111  11111111  11111111  11111111  11111111  11111100  00111111


7000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
7100  11100000  00000000  00000000  00000000  00000000  00000000  00000000  00000001

7200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
7300  11111111  00000000  00000000  00000011  11111111  11111111  11111111  11111111

7400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
7500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

7600
7700
```

A	0056	APTJ03	1127	C8PRNT	4472	DO8ET	5037
A1	4536	APTJ04	2064	C8RDP8	5467	ENDF	0053
A10	4547	APTJ50	0261	C8RETD	5414	ENDIT	5543
A11	4550	APTJ51	0301	C8RETR	5344	ERR1	5537
A12	4551	APTJ52	0325	C8RM	6127	ERRA	1600
A13	4552	APTJ53	1133	C8RM8	6144	ERRA1	1611
A14	4715	APTJ54	2122	C8SA	7200	ERRB	1626
A15	4716	APTN00	0200	C8SETO	5413	ERRB1	1637
A16	4717	APTN02	0244	C8SETS	5343	ERRC	3000
A17	4720	APTN03	0264	C8SM	6261	ERRCC	3110
A18	4721	APTN04	0310	C8SM0	6270	ERRHD	0200
A19	4722	APTN05	0206	C8SM1	6272	ERRM	2663
A2	4537	APTN06	1221	C8STRT	0200	ERRME8	6077
A20	4723	APTOK	7434	C8SWIT	4473	ERRMM	2730
A21	4724	APTOK8	7465	C8SWST	5546	ERRORG	2640
A22	4725	APT8R	7416	C8TMP1	5621	ERROR1	2641
A23	4726	APT8R8	7432	C8TTYI	4470	EXITA	5240
A24	4727	B	0057	C8TYPE	4477	FCNT	0051
A3	4540	BADINT	3422	CAF	6007	FILCNT	5640
A4	4541	BDATA	0063	CDI	6203	FILLER	5637
A5	4542	BINTC	3447	CFP	2200	FIRBT	6527
A6	4543	B8M	7002	CFP0	2212	FIVE	0047
A7	4544	BYRETR	5315	CFP1	2226	FLSAVE	6126
A8	4545	C00000	4600	CFP2	2230	F8	0035
A9	4546	C00001	4631	CFP3	2241	GDATA	0062
ACL	7701	C8BY1	5016	CFP4	2251	GERRC	1654
AC8AVE	6124	C8BY2	6075	CHAR	5675	GETCH1	5504
ADDER	2646	C8BY3	5661	CHECK	2261	GETDAT	5256
APT000	2450	C8BY4	5324	CHECKB	2262	GOITA	5243
APT001	2453	C8BY5	5716	CHKCLA	6000	GOTOA	5254
APTCTX	7463	C8CF	7415	CKCOUT	5020	GTF	6004
APTCTY	7464	C8CKP	5622	CMP	6104	HCW1	0021
APTE00	1422	C8CKPA	4502	CNTRLC	5300	HCW2	0022
APTE01	1433	C8CK8M	4467	CNTRLO	5400	HEAD1	0044
APTE02	1444	C8CNTR	4471	CNTRLE	5353	IAPTER	0006
APTE03	1475	C8CONT	5746	CNTRLL	5345	IAPTOK	0007
APTE04	1506	C8CRLF	4475	CNTRLQ	5307	IAPT8R	0005
APTE05	1517	C8DO1	5076	CNTRLR	5320	IN12	6445
APTE06	2664	C8DO10	6055	CNTRLS	5327	INDEXA	5255
APTE07	3001	C8DO11	5407	CNTVAL	5040	INMODE	5676
APTE08	3722	C8DO2	5633	CNV	2422	INSAME	0054
APTER	7275	C8DO3	5136	CODERR	2601	INTR	4457
APTFL	7473	C8DO4	5606	CONSOL	0000	INTROU	4447
APTFL0	7521	C8DO7	5335	COUNT	0042	KBINT	3400
APTIMX	7461	C8ECHO	4476	CRELO	0037	KBINTC	3416
APTIMY	7462	C8ERR	4500	CS	0033	KTEST	0651
APTIZ	7400	C8GET	5424	C8AME	0460	LAS	4405
APTIZ0	7274	C8HANG	5722	C8R03	2007	LEGAL	1670
APTIZ1	7200	C8INOU	4501	OFEIF	0232	LEGAL0	0055
APTJ00	0246	C8OCTA	0474	OOCNT	5035	LEGALA	1753
APTJ01	0266	C8PASS	4466	OONEA	5226	LIMIT	2656
APTJ02	0312	C8PAUS	4503	OOPACK	5005	LOOP1	6200

LOOP1A	6224	PNTBUF	5720	SETUP1	6026	T52	3244
LOOP2	6400	PREL	4341	SFS0	3516	T70	3234
LOOP2A	6436	PROFLO	0040	SFS1	3534	TABLA	5261
LOOP3	6600	P8IE	6665	SFS2	3552	TABL8	5271
LOOP3A	6642	P8KE	6663	SFS3	3600	TCS	3706
LOOP3B	6644	P8KF	6661	SFS4	3616	TEMP	0045
LOOP4	7000	P8R	0020	SFS5	3634	TEST	0600
LOOP4A	7056	P8TB	6664	SFS6	3652	TEST0	0652
LOOP5	6700	PT8TOR	5124	SFS7	3670	TEST1	1012
LOOP5A	6744	RBELL	2605	SIXTY	2400	TEST2	1025
LOOP5B	6746	RDA2	1410	SKON	6000	TEST3	1040
M0	2516	RDAC	1415	SMP	6101	TEST4	1053
MES	2440	RDB2	1463	SMQ	0005	TEST5	1066
MESA	5550	RDBC	1470	SPO	6107	TEST6	1101
MESAC	6112	RDFLO	1400	SR	6235	TEST7	1114
MESFL	6120	RDFLDA	1413	SR00	0023	TEST8	1127
MESMAN	5747	RDFLDB	1466	SR01	0024	TFS0	4000
MESMQ	6115	READ	1527	SR02	0025	TFS1	4006
MESPAS	5041	REDDA	5215	SR03	0026	TFS2	4015
MESPC	6107	RELO	4410	SR04	0027	TFS3	4024
MIN5	0050	RELO2	4427	SR05	0030	TFS4	4030
MOVE	0043	RELO3	4431	SR4	7002	TFS5	4044
MQA	7501	RELO4	4436	SR5A	6763	TFS6	4054
MQL	7421	RELO5	4445	SR50	6764	TFS7	4063
MQSAVE	6125	RESDF	7079	SR5C	6765	TITLE	4232
MTP	2514	RESINT	4632	SR66	0031	TMPCNT	5507
NOFLO	4400	RETURN	2600	SR911	0032	TN	3141
NOSET	5030	RS	0036	SRL	6663	TOSEL	2263
NOTAPT	7552	RTF	6005	SRL1	6664	TR80	4073
NOTTY	0104	S0	2435	SRL2	6665	TR81	4101
NTCLAS	6064	S1	2436	SRS0	3525	TR82	4110
P2	0060	S2	2437	SRS1	3543	TR83	4117
PAR	4470	SAC	0064	SRS2	3563	TR84	4127
PARERR	3354	SAME	2000	SRS3	3607	TR85	4137
PARINT	3300	SAVDF	7063	SRS4	3625	TR86	4147
PARORC	3062	SAVE	7074	SRS5	3643	TR87	4156
PASCNT	5036	SAVINT	4501	SRS6	3661	TS	0034
PATA	0205	SCS1	3505	SRS7	3677	TSNUM	3750
PATERR	3135	SCS2	3511	START	0332	TSTAD	0046
PATM	0242	SECOND	6530	STARTF	0052	TSTCHA	5516
PATM0	0245	SETFS	2015	STOP	2647	TSTFLD	0041
PATN	0262	SETR0	0456	ST80	3453	TTS	3725
PATN0	0265	SETR1	0452	ST81	3457	TTS0	3737
PATO	0304	SETR2	0446	ST82	3463	TTYCHK	3751
PATO0	0311	SETR3	0442	ST83	3470	TTYLPT	3721
PCLF	6662	SETR4	0436	ST84	3474	TYPCH	2463
PCSAVE	6123	SETR5	0432	ST85	3501	TYPE	2517
PERRC	3025	SETR6	0426	SWP	7521	TYPOFF	2527
PERRC0	3100	SETR7	0422	T0	3200	TYPSP	2532
PERRM	2675	SETREL	0400	T07	3220	UPAROW	5415
PINF	6236	SETRP	0412	T1	3210	W4	0061
PNOREL	0302	SETSW	4260	T25	3250	WATME8	5452

```
        WRA     1236
        WRA1    1245
        WRB     1260
        WRB1    1267
        WRFLO   1288
        XC8CKP  5641
        XC8CNT  5288
        XC8CRL  5623
        XC8ECH  5663
        XC8ERR  6087
        XC8ING  5435
        XC8OCT  5600
        XC8PAS  5000
        XC8PAU  5125
        XC8PNT  5071
        XC8PSW  5457
        XC8SW   5050
        XC8TTY  5060
        XC8TYP  5677
        XDOLPT  5712
        XOOSW   5326
        XTA8LA  5257
        XTA8L9  5260
        Z1      3047
        Z10     2721
        Z11     2722
        Z2      3050
        Z20     3331
        Z21     3345
        Z3      3054
        Z4      3057
        Z6      4335


ERRORS DETECTED: 0

LINKS GENERATED: 408

RUN-TIME:  10 SECONDS

3K CORE USED
```