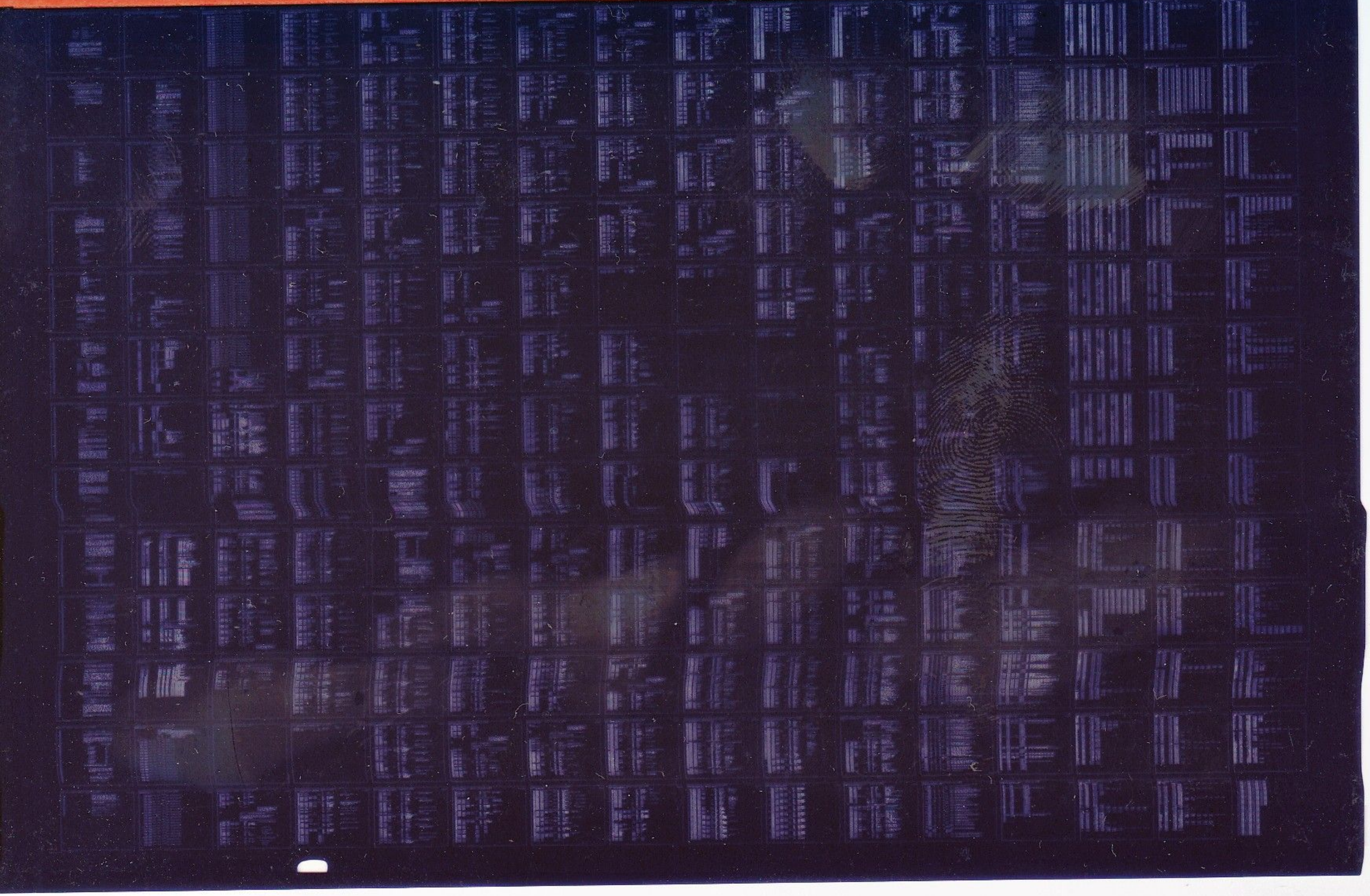
FP11-F

FP11F FLTG PNT A
CKFPAA0

AH-F632A-MC

FICHE 1 OF 2

JAN 1980
digital
MADE IN USA



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                                IDENTIFICATION

                PRODUCT CODE:   AC-F630A-MC
                PRODUCT NAME:   CKFPAA0 FP11F FLTG PNT PRT A
                DATE CREATED:   OCTOBER, 1979
                MAINTAINER:     DIAGNOSTIC ENGINEERING
                AUTHOR:         ANTHONY VEZZA

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47
48                                  HISTORY
49                                  -------
50          NO CHANGES TO THE 11/34 FLOATING POINT DIAGNOSTIC PART 'A' WERE
51          FOUND TO BE NEEDED TO ADAPT IT FOR USE ON THE 11/44.
52
53          THE FOLLOWING WAS ADDED TO THE 11/34 FLOATING POINT DIAGNOSTIC
54          TO MAKE THE 'B' VERSION COVER THE 11/44:
55
56                  1. TEST 22 - PROCESSOR  LOOKS  TO SEE IF APT IS CON-
57                     TROLLING  THE  TEST, AND  IF IT IS, CHECKS TO SEE
58                     IF THE USER  HAS  SELECTED  THIS TEST BY CHECKING
59                     BIT 7 IN THE SWITCH REGISTER.  IT  HAS  ALSO BEEN
60                     CHANGED SO THAT IF BIT 7 IS *ONE*, THE CODE  WILL
61                     SELECT THE TEST.
62
63          THE FOLLOWING WAS ADDED TO THE 11/34 FLOATING POINT DIAGNOSTIC
64          TO MAKE THE 'C' VERSION COVER THE 11/44:
65
66                  1. TEST 76 - CHECKS THAT FP PROCESSOR DOESN'T ACCESS
67                     D-SPACE UNTIL CONDITIONS WARRANT.
68
69                  2. TEST 77 - CHECKS  THAT  SR1 MATCHES WHAT ACTUALLY
70                     HAPPENED TO THE REGISTER  OF THE INSTRUCTION, AND
71                     THAT THE VALUE  OF  AUTO  INCREMENT/DECREMENT WAS
72                     PROPER.
73
74
```

CONTENTS

1. ABSTRACT

THE THREE PROGRAMS:

CKFPAA0 CKFPBA0 CKFPCA0

ARE DESIGN TO DETECT AND REPORT LOGIC FAULTS IN THE PDP 11/44 FP11-F FLOATING POINT PROCESSOR. THE DESIGN IS AN ATTEMPT TO REACH ALL ROM STATES, TAKE ALL BRANCH MICRO TESTS (BUT'S) AND VERIFY ALL THE LOGIC. THEY CONSIST OF 157 (OCT) INDIVIDUAL TESTS SEQUENCED TO DETECT AND ATTEMPT TO IDENTIFY FAULTS WITH A MINIMUM HARDWARE OR SOFTWARE LEVEL. THE TESTS ARE PARTIONED INTO THREE STAND-ALONE PROGRAMS DESCRIBED BELOW.

NOTE THAT ERROR REPORTS IN THESE PROGRAMS ARE BASED UPON THE KNOWLEDGE THAT ALL PREVIOUS TESTS HAVE BEEN RUN AND IN MOST CASE THAT THERE IS ONLY A SINGLE POINT FAULT IN THE FP11-F. IF THE PROGRAMS OR TESTS ARE NOT RUN IN ORDER THEN ERROR MESSAGES MAY NOT BE ACCURATE.

A. CKFPAA0

CKFPAA0 TESTS:

- LDFPS
- STFPS
- CFCC
- SETF, SETD, SETI AND SETL
- STST
- LDF AND LDD (ALL SOURCE MODES)
- STD (MODE 0 AND 1)
- ADDF, ADDD AND SUBD (MOST CONDITIONS)

B. CKFPBA0

CKFPBA0 TESTS:

- ADDF, ADDD AND SUBD (ALL CONDITIONS NOT TESTED IN CKFPAA0)
- CMPD AND CMPF
- DIVD AND DIVF
- MULD AND MULF
- MODD AND MODF

C. CKFPCA0

CKFPCA0 TESTS:

- STF AND STD (ALL MODES)
- STCFD AND STCDF
- CLRD AND CLRF

NEGF AND NEGD
ABSF AND ABSD
TSTF AND TSTD
NEGF, ABSF AND TSTF (ALL SOURCE MODES)
NEGF, ABSF AND TSTF (ALL SOURCE MODES)
LDFPS (ALL SOURCE MODES)
LDCIF AND LDCLF
LDCID AND LDCLD
LDEXP
STFPS (ALL DESTINATION MODES)
STCFL AND STCFI
STCDL AND STCDI
STEXP
STST

REQUIREMENTS

2.1 EQUIPMENT

A PDP 11/44 (WITH OR WITHOUT CONSOLE), LA30 (OR EQUIVALENT) AND AN FP11-F FLOATING POINT PROCESSOR. NOTE THAT A SPECIAL INTERRUPTS TEST MODULE IS BEING DESIGNED FOR USE IN THE MANUFACTURING ENVIRONMENT. WHEN THIS DEVICE IS PRESENT THE PROGRAM CKFPBA0 WILL MAKE USE OF IT TO TEST THE FPP INTERRUPT ON BUS REQUEST FUNCTIONS.

2.2 STORAGE

ALL THREE PROGRAM REQUIRE A MEMORY SYSTEM OF AT LEAST 16K TO LOAD AND RUN.

2.3 PRELIMINARY PROGRAMS

THESE THREE DIAGNOSTICS WILL ASSUME THAT THE PDP 11/44 CENTRAL PROCESSOR IS FAULTLESS, THEREFORE WHEN IN DOUBT RUN THE PDP 11/44 PROCESSOR DIAGNOSTICS BEFORE THESE FP11-F DIAGNOSTICS.

3. LOADING PROCEDURE

THE PROGRAMS WILL BE SUPPLIED ON THE 11/44 DIAGNOSTIC MEDIA. REFER TO THE XXDP OPERATING MANUAL FOR FURTHER INFORMATION.

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

SEE SECTION 5.1

4.2 PROGRAM AND OPERATOR ACTION

1. LOAD PROGRAM INTO MEMORY
2. LOAD ADDRESS 200
3. SET CONSOLE SWITCHES (IF CONSOLE IS PRESENT)
4. PRESS START
   ON FIRST PASS THE PROGRAM WILL IDENTIFY ITSELF. NOTE THAT IF THERE IS NO PHYSICAL CONSOLE THE PROGRAM WILL REQUEST THE OPERATOR FOR INITIAL VALUE FOR THE SOFTWARE SWITCH REGISTER (SEE SECTION 8.5). IF RUNNING UNDER ACT, APT OR CHAIN THIS DOES NOT APPLY.
5. THE PROGRAM WILL LOOP AND AN END OF PASS AND ERROR SUMMARY WILL BE TYPED AT THE END OF EVERY PASS.

5. OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

THE SWITCH SETTING ARE:

	OCTAL	
SW<15>=1...	100000	HALT ON ERROR
SW<14>=1...	40000	LOOP ON CURRENT TEST
SW<13>=1...	20000	INHIBIT ERROR TYPE OUTS
SW<12>=1...	10000	INHIBIT T-BIT TRAPPING
SW<11>=1...	4000	INHIBIT ITERATIONS
SW<10>=1...	2000	RING TTY BELL ON ERROR
SW<9>=1....	1000	LOOP ON ERROR
SW<8>=1....	400	LOOP ON TEST SPECIFIED IN SW<6> THROUGH SW<0>
SW<7>=1....	200	PRINT ERROR SUMMARY EVEN IF SW<13>=1, THIS APPLIES ONLY TO PROGRAM CKFPAA0.
SW<7>=1....	200	SELECT CORRECT INTERRUPT TEST IN PROGRAM CKFPBA0.

6. ERRORS

6.1 SUMMARIES

IN PROGRAM CKFPA0 TESTS 1 AND 11 HAVE A SPECIAL ERROR SUMMARY FEATURE. THESE TWO TEST RUN MANY TEST PATTERNS THROUGH THE LOGIC. AFTER AN ERROR IS ENCOUNTERED, ONLY THE FIRST FIVE ERRORS ARE REPORTED (TYPED ON THE TTY). EVERY ERROR THOUGH IS LOGGED AND AN ERROR SUMMARY IS PRINTED WHEN THE TEST IS COMPLETE. NOTE THAT IF SW<13>=1, THIS SUMMARY WILL NOT BE TYPED UNLESS SW<7>=1. IN OTHER WORDS TO GET JUST AN ERROR SUMMARY FROM EITHER OF THESE TWO TESTS 1 AND 11 IN PROGRAM CKFPAA0 BOTH SWITCHES 13 AND 7 MUST = 1.

```
                        6.2     ERROR RECOVERY

                                SW<15:9> 0...   MOST ERRORS WILL CAUSE EXECUTION TO
                                                GO TO THE START OF THE NEXT TEST
                                                AFTER THE MESSAGE IS TYPED.  A FEW
                                                TESTS ARE IN SECTIONS.  IN THESE
                                                TESTS AN ERROR WILL CAUSE EXECUTION
                                                TO GO TO THE NEXT SECTION AFTER THE
                                                MESSAGE IS TYPED.

                                SW<15>-1...     THE PROGRAM WILL HALT AFTER TYPING
                                                THE ERROR MESSAGE.  PRESSING THE
                                                CONSOLE CONTINUE WILL CAUSE THE
                                                PROGRAM TO CONTINUE AS IF SW<15>=0.

                        7.                      RESTRICTIONS
                                                ------------

                                NONE


                        8.                      MISCELLANEOUS
                                                -------------

                        8.1     EXECUTION TIMES

                                LESS THAN 10 SECONDS FOR EACH PROGRAM ON ANY PASS.

                        8.2     STACK POINTER

                                THE STACK POINTER IS INITIALIZED TO 1100 IN EACH OF
                                THE THREE PROGRAMS.

                        8.3     PASS COUNT

                                THE PROGRAM MAKES ONE PASS FOR EACH END OF PASS
                                MESSAGE TYPED.  THE END OF PASS MESSAGE DESCRIBES
                                THE TOTAL NUMBER OF PASSES COMPLETED AND THE TOTAL
                                NUMBER OF ERRORS SINCE THE LAST END OF PASS MESSAGE.

                        8.4     T-BIT TRAPPING

                                IF SW<12>=0 EACH PROGRAM WILL RUN WITH TRACE TRAPS
                                ON EVERY OTHER PASS.  FIRST PASS WILL NOT ENABLE
                                TRACE TRAPS.  NOTE SW<12>-1 DISABLES T-BIT TRAPS.

                        8.5     SOFTWARE SWITCH REGISTER

                                EACH OF THE THREE PROGRAMS WILL RUN WITH OR WITHOUT
                                A CONSOLE SWITCH REGISTER.  IF A PHYSICAL CONSOLE
                                SWITCH REGISTER IS PRESENT ON THE SYSTEM, THEN THESE
                                PROGRAMS WILL GO AHEAD AND USE IT FOR THE SWITCH
                                FUNCTIONS DESCRIBED IN 5.1 ABOVE.  IF HOWEVER THERE
                                IS NO CONSOLE SWITCH REGISTER ON THE SYSTEM A
                                SOFTWARE SWITCH REGISTER WILL BE USED.  THIS
                                SOFTWARE SWITCH REGISTER CAN BE EXAMINED OR MODIFIED
                                AT ANY TIME BY THE USER IF HE TYPES CONTROL G WHILE
```

THE PROGRAM IS RUNNING. THIS CONTROL G WILL CAUSE THE CONTENTS OF THE SOFTWARE SWITCH REGISTER TO BE TYPED ON THE TTY AND ASK THE USER FOR A NEW VALUE. WHEN THE USER TYPES A VALUE AND CARRIAGE RETURN THEN THE PROGRAM WILL RESUME TESTING AT THE SAME POINT AT WHICH IT LEFT OFF WHEN THE USER TYPED CONTROL G. NOTE THAT WHEN NOT RUNNING UNDER ACT, APT OR CHAIN THE USER WILL BE ASKED FOR A SOFTWARE SWITCH REGISTER VALUE AFTER LOADING ADDRESS 200 AND STARTING THE PROGRAM THE FIRST TIME THE PROGRAM IS RUN AFTER LOADING (ONLY IF NO CONSOLE SWITCH REGISTER IS ON THE SYSTEM).

8.6 INTERRUPTS TEST

IN PROGRAM CKFPBA0 THERE IS A SPECIAL TEST FOR CHECKING THE CORRECT FLOWS OF THE FPP. THIS TEST CAN BE RUN ONLY IF A SPECIAL TEST MODULE IS IN THE SYSTEM. THIS MODULE WILL PROBABLY ONLY BE USED IN MANUFACTURING. IF THIS MODULE IS NOT IN THE SYSTEM THIS TEST WILL AUTOMATICALLY BE DESELECTED. IF THIS TEST MODULE IS ON THE SYSTEM AND SW<7>=1 THIS TEST WILL BE RUN. IF SW<7> 0 THIS TEST WILL BE DESELECTED.

8.7 ACT, APT AND XXDP COMPATIBILITY

THESE PROGRAMS ARE FULLY COMPATIBLE WITH:
APT
ACT
XXDP MONITOR AND CHAIN PROGRAMS.

9. PROGRAM DESCRIPTION

TEST 1 LDFPS, STFPS AND DATA PATHS TEST

THIS IS A TEST OF THE LDFPS (LOAD FLOATING POINT STATUS) AND STFPS (STORE FLOATING POINT STATUS) INSTRUCTIONS. A COUNT PATTERN IS GENERATED AND RUN THROUGH THE FLOATING POINT STATUS REGISTER. THIS

WILL TEST THE 16-BIT TRI STATE BUS WHICH CONNECTS THE CPU WITH THE FPP AND ALSO RUNS INTERNALLY WITHIN THE FPP. ONLY DM0 AND SM0 ARE USED. NOTE THAT A MASK MUST BE USED BECAUSE SOME OF THE FPS BITS CANNOT BE SET.

ONLY THE FIRST FIVE ERRORS WILL BE REPORTED INDIVIDUALLY. THIS IS TO PREVENT LOCKING OUT THE COMPLETION OF THE TEST BECAUSE OF VIRTUALLY ENDLESS NUMBER OF ERRORS. ONLY FIVE INDIVIDUAL ERRORS WILL BE REPORTED THEN THE TEST WILL BE COMPLETED AND AN ERROR SUMMARY GIVEN (SEE NOTE BELOW).

NOTE THAT THIS TEST KEEPS A DYNAMIC RECORD OF THE LOGICAL 'AND' AND 'OR' OF THE FAILING DATA PATTERNS. THESE CAN BE VERY USEFUL IN DETERMINING STUCK BITS. IF THE USER HAS THE INHIBIT ERROR TYPE OUT SWITCH (SWR13) OFF, THEN THE USER WILL RECEIVE EACH INDIVIDUAL ERROR MESSAGE PLUS AN ERROR SUMMARY AT THE END OF THE TEST. INHIBITING ERROR PRINT OUT WILL INHIBIT ERROR SUMMARY PRINT OUT, EXCEPT IN THE CASE DESCRIBED BELOW. TO GET JUST THE ERROR SUMMARY WITH NO INDIVIDUAL ERROR REPORTS, SET SWITCH REGISTER BIT13 AND SWITCH REGISTER BIT7 BOTH ON.

TEST 2 CFCC TEST

THIS IS A TEST OF THE COPY CONDITION CODES INSTRUCTION, CFCC.

TEST 3 SETF, SETD, SETI AND SETL TEST

THIS IS A TEST OF THE SETF, SETD, SETI AND SETL INSTRUCTIONS. EACH INSTRUCTION IS EXECUTED WITH THE FPS CONTAINING ALL ONES AND ALSO WITH THE FPS CLEAR. THE RESULT OF EACH SITUATION IS CHECKED.

TEST 4 ILLEGAL FPP OP CODES AND STST TEST

THIS IS A TEST OF THE FPP OPERATION CODES:

170003
170004
:
170010
170013
170014
:
170077

THESE ARE ILLEGAL INSTRUCTIONS AND WITH INTERRUPTS ENABLED SHOULD CAUSE A TRAP TO 244. ALSO TESTED HERE IS THE INSTRUCTION: STST R1, WHICH SHOULD PUT

```
469                     THE FEC CODE 2 IN R1, AFTER ANY OF THE ABOVE OP
470                     CODES IS EXECUTED.
471
472             TEST 5          FID, INTERRUPT DISABLE, BIT TEST
473             ------          --------------------------------
474
475                     THIS IS A TEST OF FPS BIT 14 (FID) OR FLOATING
476                     INTERRUPT DISABLE.  AN ILLEGAL INSTRUCTION IS
477                     EXECUTED WITH FID=1.  NO INTERRUPT SHOULD OCCUR.
478
479             TEST 6          LDD AND STD, WITH SRC AND DST MODE 1, TEST
480             ------          ------------------------------------------
481
482                     THIS IS A TEST OF BOTH THE INSTRUCTION:
483                                     LDD     (R0),AC0
484                     AND THE INSTRUCTION:
485                                     STD     AC0,(R0)        MOST OF THE
486                     FAILURES ARE ISOLATED TO THE SRC OR DST FLOWS.  NOTE
487                     THAT THE INTEGRITY OF AC0 HAS NOT BEEN ASSURED.
488                     THIS MEANS THAT IN SOME CASES IT WILL BE IMPOSSIBLE
489                     TO ISOLATE CERTAIN DATA PATTERN FAILURES TO EITHER
490                     THE FLOWS OR THIS ACCUMULATOR.
491
492             TEST 7          FSRC MODE 0 TEST
493             ------          ----------------
494
495                     THIS IS A TEST OF FSRC MODE ZERO USING THE LDD AND
496                     LDF INSTRUCTIONS.
497
498
499             TEST 10         FDST MODE 0 TEST
500             -------         ----------------
501
502                     THIS IS A TEST OF THE STORE INSTRUCTIONS, STD AND
503                     STF, WITH FDST MODE 0.
504
505             TEST 11         ACCUMULATORS DATA PATTERNS TEST
506             -------         -------------------------------
507
508                     THIS IS A TEST OF THE FLOATING POINT PROCESSOR
509                     ACCUMULATORS.
510
511                     EACH ACCUMULATOR IS TESTED IN TWO WAYS:
512                             1       TEST PATTERN GENERATED BY FLOATING A
513                             ONE ACROSS A FIELD OF ZEROES.
514                             2       TEST PATTERN GENERATED BY FLOATING A
515                             ZERO ACROSS A FIELD OF ONES.
516                     EACH OF ACCUMULATORS AC0 THROUGH AC5 IS TESTED.
517
518                     NOTE THAT THIS TEST KEEPS A DYNAMIC RECORD OF THE
519                     LOGICAL 'AND' AND 'OR' OF THE FAILING DATA PATTERNS.
520                     THESE CAN BE VERY USEFUL IN DETERMINING STUCK BITS.
521                     IF THE USER HAS THE INHIBIT ERROR TYPE OUT SWITCH
522                     (SWR13) OFF, THEN THE USER WILL RECEIVE EACH
523                     INDIVIDUAL ERROR MESSAGE PLUS AN ERROR SUMMARY AT
524                     THE END OF THE TEST.  INHIBITING ERROR PRINT OUT
525                     WILL INHIBIT ERROR SUMMARY PRINT OUT, EXCEPT IN THE
```

```
526                     CASE DESCRIBED BELOW.  TO GET JUST THE ERROR SUMMARY
527                     WITH  NO  INDIVIDUAL  ERROR  REPORTS,  SET  SWITCH
528                     REGISTER BIT13 AND SWITCH REGISTER BIT7 BOTH ON.
529
530
531                     THE FOLLOWING PROCEDURE  IS  PRESENTED  TO  AID  THE
532                     TROUBLE  SHOOTER  IN  SITUATICNS  WHERE  AM2901 CHIP
533                     ISOLATION IS ATTEMPTED.
534
535                     WARNING:  THIS PROCEDURE ASSUMES THAT THE  FAULT  IS
536                     IN  ONE OF THE AM2901 CHIPS.  THIS ASSUMPTION IS NOT
537                     NECESSARILY VALID IN ALL SITUATIONS.  IT REMAINS  TO
538                     BE     SEEN     WHAT     NUMBER     OF     FAILURES    CAN
539                     PROBABLILISTICALLY ASSOCIATED WITH THEM.  NOTE  ALSO
540                     THAT    THIS  INFORMATION  SHOULD  NOT  BE  TAKEN  AS
541                     ABSOLUTE, THAT IS THIS INFORMATION IS  THE  AUTHOR'S
542                     SUGGESTION  FOR  ACHIEVING ISOLATION WHEN CHIP LEVEL
543                     REPAIR IS NECESSARY.
544
545                     WHEN THIS TEST HAS FINISHED RUNNING, IF ERRORS  HAVE
546                     OCCURRED,  AN  ERROR  SUMMARY  WILL  BE TYPED.  THUS
547                     SUMMARY WILL CONSIST OF TWO IMPORTANT QUANTITIES:
548                             A.      FOUR SIXTEEN BIT NUMBERS LABELED THE
549                                     LOGICAL  'AND'  ('*') OF THE FAILING
550                                     DATA PATTERNS.
551                             B.      FOUR SIXTEEN BIT NUMBERS LABELED THE
552                                     LOGICAL  'OR'  ('+')  OF THE FAILING
553                                     DATA PATTERNS.
554
555                     A BIT STUCK HIGH IN THE HARDWARE WILL SHOW UP AS A 0
556                     IN THAT BIT POSITION OF THE 'OR' OF THE FAILING DATA
557                     PATTERNS.
558
559                     A BIT STUCK LOW IN THE HARDWARE WILL SHOW UP AS A  1
560                     IN  THAT  BIT  POSITION  OF THE 'AND' OF THE FAILING
561                     DATA PATTERNS.
562
563                     THUS IF A FAILURE OCCURS:
564                             A.      STUCK HIGHS WILL SHOW AS 0'S IN  THE
565                             'OR' PATTERN.
566                             B.      STUCK LOWS WILL SHOW AS 1'S  IN  THE
567                             'AND' PATTERN.
568
569                     IF THE FAILURE IS  INTERMITTANT  THEN  THIS  PROCEDURE  WILL
570                     STILL  APPLY!!  IF THE FAILURE MOVES FROM ONE BIT TO
571                     ANOTHER, OR FROM ONE GROUP OF BITS TO ANOTHER  GROUP
572                     OF  BITS THEN THE FAULT WILL PROBABLY NOT SHOW UP IN
573                     THE 'AND' OR THE 'OR' PATTERNS;  IN  THIS  CASE  THE
574                     'AND'  PATTERN  WILL BE ALL 0'S AND THE 'OR' PATTERN
575                     WILL BE ALL 1'S.  WHEN THIS OCCURS SOME OTHER METHOD
576                     OF  REPAIR MUST BE FOUND (SUCH AS INSPECTION OF EACH
577                     INDIVIDUAL  ERROR  REPORT  RATHER  THAN  USING   THE
578                     SUMMARY).
579
580                     MAP THE FOLLOWING NOTATION ONTO EACH BIT POSITION IN
581                     THE  'AND'  AND THE 'OR' PATTERNS WHICH ARE TYPED IN
582                     THE ERROR SUMMARY.
```

```
583
584                          A15,A14,...A1,A0        B15,B14,...B1,B0
585                                C15,C14,...C1,C0          D15,D14,...C1,C0
586
587                          IN THIS NOTATION A15 THROUGH A0 IS THE FIRST OF  THE
588                          FOUR  16  BIT OCTAL NUMBERS TYPED, B15 THROUGH B0 IS
589                          THE SECOND, ETC.
590
591                          THIS TABLE SHOWS THE CORRESPONDING AM2901 CHIP  ('E'
592                          NUMBER)  WHICH  IS RESPONSIBLE FOR EACH BIT POSITION
593                          USING THE ABOVE NOTATION.  NOTE THAT  ECO'S  TO  THE
594                          HARDWARE MIGHT MAKE THIS TABLE OBSOLETE IF IT IS NOT
595                          UP DATED.  NOTE ALSO THAT THERE ARE  FOUR  BITS  FOR
596                          EACH AM2901 CHIP:
597
598                                  BITS                    AM2901 CHIP NUMBER
599                                  ----                    ------------------
600
601                                  A15,A14,A13,A12                 E37
602                                  A11,A10,A9,A8                   E45
603                                  A7,A6,A5,A4                     E34
604                                  A3,A2,A1,A0                     E42
605
606                                  B15,B14,B13,B12                 E33
607                                  B11,B10,B9,B8                   E41
608                                  B7,B6,B5,B4                     E36
609                                  B3,B2,B1,B0                     E44
610
611                                  C15,C14,C13,C12                 E35
612                                  C11,C10,C9,C8                   E43
613                                  C7,C6,C5,C4                     E38
614                                  C3,C2,C1,C0                     E46
615
616                                  D15,D14,D13,D12                 E39
617                                  D11,D10,D9,D8                   E47
618                                  D7,D6,D5,D4                     E40
619                                  D3,D2,D1,D0                     E48
620
621                          NOW FIVE IMPORTANT CASES WHICH WILL  ARRISE  WHEN  A
622                          FAULTY AM2901 IS PRESENT CAN BE DESCRIBED:
623
624
625                          1.)     IF ONLY ONE BIT OF THE 64 BITS IS  INCORRECT
626                                  THE  CHIP  INDICATED  IN  THE ABOVE TABLE IS
627                                  MOST PROBABLY AT FAULT.  BUT IF THAT CHIP IS
628                                  REPLACED AND THE ERROR PERSISTS THEN SUPPOSE
629                                  THAT BIT IS,
630
631                                          LN      WHERE 'L' IS A, B, C OR D
632                                                  AND N IS 15, 14, ... OR 0
633
634                                  THEN  IN  GENERAL  ANY  OF  THE  FOUR  CHIPS
635                                  RESPONSIBLE FOR AN, BN, CN OR DN COULD BE AT
636                                  FAULT, WITH LN BEING MOST PROBABLE.
637
638                                  FOR EXAMPLE IF BIT C12 IS FAULTY,
639                                  THEN CHIP E79  IS  THE  MOST
```

```
                        PROBABLE  SOURCE OF THE ERROR.  IF REPAIRING
                        THAT CHIP DOES NOT REMOVE THE FAULT THEN TRY
                        EACH  OF THE CHIPS ASSOCIATED WITH BITS A12,
                        B12 AND  D12  SHOULD  BE  TRIED  WITH  EQUAL
                        PROBABILITY OF THE FAULT BEING IN ANY ONE OF
                        THESE OTHER THREE CHIPS, TRY CHIPS E61, E86 AND E78.

                2.)     IF THERE ARE FOUR CONSECUTIVE BITS IN ERROR,
                        FOLLOWING THE PATTERN:

                        LN, LN+1, LN+2 AND LN+3    WHERE 'L' IS A, B, C OR D
                                                   N=0, 4, 8 OR 12

                        THEN  THE  ABOVE  TABLE  SHOULD  DIRECTLY
                        IDENTIFY THE FAILING CHIP.

                3.)     IF  FOUR  BITS  ARE  DROPPED  WHICH  FIT  THE
                        PATTERN:

                        AN, BN, CN AND DN      WHERE N=15, 14, ... OR 0
                        OR 0

                        THEN ANY ONE OF THE  FOUR  CHIPS  ASSOCIATED
```

```
664                                   WITH  EACH  OF  THE  BITS  AN, BN, CN AND DN
665                                   COULD BE AT FAULT WITH EQUAL PROBABILITY.
```

```
667
668                          4.)     IF  16  BITS  ARE  IN  ERROR,  FITTING   THE
669                                  PATTERN:
670
671                                  AN, AN+1, AN+2, AN+3    WHERE N=0, 4, 8 OR 12
672                                  BN, BN+1, BN+2, BN+3
673                                  CN, CN+1, CN+2, CN+3
674                                        AND
675                                  DN, DN+1, DN+2, AN+3
676
677                                  THEN ANY ONE OF THE  FOUR  CHIPS  ASSOCIATED
678                                  WITH THESE BITS COULD BE AT FAULT WITH EQUAL
679                                  PROBABILITY.
680
681                          5.)     IF THE FAILING BIT PATTERNS DISPLAYED IN THE
682                                  'AND' AND THE 'OR' DATA TYPED IN THE SUMMARY
683                                  DOES NOT CONFORM EXPLICITELY TO ANY  OF  THE
684                                  ABOVE  PATTERNS,  THEN  THE  TROUBLE SHOOTER
685                                  MUST INTUITIVELY TRY TO FIND  WHICH  OF  THE
686                                  ABOVE CASES (1 THROUGH 4) IS A 'BEST FIT' OF
687                                  THE SYMPTOMS.
688
689                  TEST 12         FPP ACCUMULATORS DUAL ADDRESS TEST
690                  -------         ---------------------------------
691
692                          THIS TEST PERFORMS A DUAL  ADDRESSING  TEST  ON  THE
693                          FLOATING  ACCUMULATORS.   NOTE THAT ACCUMULATOR ZERO
694                          IS USED TO ACCESS ALL THE OTHERS.
695
696                  TEST 13         FSRC MODE 0 WITH ILLEGAL ACCUMULATOR TEST
697                  -------         -----------------------------------------
698
699                          THIS IS A TEST OF FSRC MODE 0  WITH  ACCUMULATORS  6
700                          AND   7.    USE  OF  EITHER  OF  THESE  NON-EXISTENT
701                          ACCUMULATORS SHOULD RESULT IN A  TRAP  TO  244  WITH
702                          FEC=2 (ILLEGAL FPP INSTRUCTION).
703
704
705                  TEST 14         FSRC MODE 2 TEST
706                  -------         ----------------
707
708                          THIS IS A TEST OF FSRC MODE 2, AUTO INCREMENT MODE.
709
710                  TEST 15         FSRC MODE 4 TEST
711                  -------         ----------------
712
713                          THIS IS A TEST OF FSRC MODE 4, AUTO DECREMENT MODE.
714
715                  TEST 16         FSRC MODE 2, WITH FD-0, TEST
716                  -------         ----------------------------
717
718                          THIS IS A TEST OF FSRC  MODE  2  WITH  FD-0.    (AUTO
719                          INCREMENT)
720
721                  TEST 17         FSRC MODE 2 WITH GR7, IMMEDIATE MODE, TEST
722                  -------         ------------------------------------------
723
```

```
                        THIS IS A TEST OF FSRC MODE 2 USING  GR7  (THE  PC).
                        THIS IS IMMEDIATE MODE.

                TEST 20         FSRC MODE 3 TEST
                -------         ----------------

                        THIS IS A  TEST  OF  FSRC  MODE  3,  AUTO  INCREMENT
                        DEFERRED

                TEST 21         FSRC MODE 5 TEST
                -------         ----------------

                        THIS IS A  TEST  OF  FSRC  MODE  5,  AUTO  DECREMENT
                        DEFERRED.

                TEST 22         FSRC MODE 6 TEST
                -------         ----------------

                        THIS IS A TEST OF FSRC MODE 6, INDEX MODE

                TEST 23         FSRC MODE 7 TEST
                -------         ----------------

                        THIS IS A TEST OF FSRC MODE 7, INDEX DEFERRED MODE.

                TEST 24         (BUT EZBT Y8),(BUT ENBT) AND (BUT FIUV) TEST
                -------         ------------------------------------------

                        THIS IS A TEST OF THE (BUT EZBT Y8) FORK,  THE  (BUT
                        ENBT)  FORK  AND  (BUT  FIUV)  FORK  IN  THE  LOAD
                        INSTRUCTION FLOWS.
                        EACH OF THE PATTERNS:

                                        0
                                        +NUM
                                        -NUM
                                        -0

                        IS LOADED TWICE, ONCE  WITH  AC>0  THEN  WITH  AC=0.
                       AFTER  EACH  LOAD  THE  FPS  IS  CHECK TO INSURE THAT
                        CONTROL WAS PASSED THROUGH WITH THE FORKS PROPERLY.

        TEST 25         ADDF,ADDD,SUBF AND SUBD WITH FSRC=AC=0 TEST
        -------         -------------------------------------------

                        THIS IS A TEST OF ADD AND SUB WITH FSRC-AC=0

        TEST 26         ADDD AND SUB WITH FSRC=0
        -------         ------------------------

                        THIS IS A TEST OF ADD AND SUB WITH FSRC-0.

        TEST 27         SUBD WITH AC=0 TEST
        -------         -------------------

                        THIS IS A TEST OF SUBD WITH AC=0.  BOTH POSITIVE AND
                        NEGATIVE FSRC'S ARE TRIED.
```

```
781
782                     TEST 30         ADDD WITH AC=0 TEST
783                     -------         -------------------
784
785                         POSITIVE AND NEGATIVE FSRC'S ARE TRIED.
786
787                     TEST 31         ADDF AND ADDD WITH E(AC)=E(FSRC) AND (BUT FT) TEST
788                     -------         --------------------------------------------------
789
790                         THIS IS A TEST OF THE ADD INSTRUCTION WITH THE
791                         OPERANDS HAVING EQUAL EXPONENTS.  THE (BUF FT) FORK
792                         IN THE ROUND/TRUNK FLOWS IS ALSO TESTED.
793
794                     TEST 32         ADDF AND ADDD WITH E(AC) LESS THAN E(FSRC) TEST
795                     -------         ----------------------------------------------
796
797                         THIS IS ATEST OF THE ADDD AND ADDF INSTRUCTIONS AND
798                         THE ALIGN AC ALGORITHM FLOWS.  THE CONSTANT (25 FOR
799                         FLOATING, 57 FOR DOUBLE) USED IS CHECKED.  THEN
800                         SIMPLE AND WORST CASE ALIGNMENT SITUATIONS ARE
801                         TRIED.  NOTE E(AC) IS LESS THEN E(FSRC)
802
803
804                     TEST 33         ADDF AND ADDD WITH E(AC) GREATER THAN E(FSRC) TEST
805                     -------         -------------------------------------------------
806
807                         THIS IS A TEST OF THE ADDD AND ADDF INSTRUCTIONS AND
808                         THE ALIGN FSRC ALGORITHM FLOWS.  FIRST THE CONSTANT
809                         USED IS CHECKED.  THEN SIMPLE AND WORST CASE
810                         ALIGNMENT SITUATIONS ARE TRIED.  NOTE E(AC) IS
811                         GREATER THAN E(FSRC).
812
813                     TEST 34         ADDD WITH NEGATVE OPRANDS TEST
814                     -------         ------------------------------
815
816                         THIS IS A TEST OF THE ADDD INSTRUCTION WITH NEGATIVE
817                         OPERANDS.  EVERY COMBINATION OF OPERAND SIGNS IS
818                         TRIED.
819
820                     TEST 35         SUBD TEST
821                     -------         ---------
822
823                         THIS IS A TEST OF THE SUBD INSTRUCTION.  BOTH A
824                         POSITIVE AND A NEGATIVF NUMBER IS SUBTRACTED FROM IT
825                         SELF
826
827                     TEST 36         NORMALIZE ALGORITHM TEST
828                     -------         ------------------------
829
830                         THIS IS A TEST OF THE NORMALIZE FLOW ALGORITHM.  TWO
831                         PATTERNS ARE USED, FIRST THE MINIMUM SITUATION
832                         REQUIRING ONE LEFT SHIFT AND THEN THE MAXIMUM
833                         SITUATION REQUIRING 56 SHIFTS.
834
835
836
837
```

```
                              10.                   LISTING
                                                    -------

                              &

            000213            MNUMBER 213
            000001            PROGNUM-1

                                      .LIST   ME
                                      .NLIST  MD,MC,CND

     000000                           .ENABL  ABS
                                      .MCALL  .HEADER,.SWRHI,.EQUAT,.SETUP,.$CATCH,.$ACT11,.$CMTAG
                                      .MCALL  .$EOP,.$SCOPE,.$ERROR,.$SAVE,.$TYPE,.$TYPOCT
                                      .MCALL  .$TYPDEC,.$TRAP,.$POWER,.$APTHDR,.$APTBLS
                                      .MCALL  .$APTYPE,.$READ
                                      .MCALL  .EQUIV                 ;*REMOVE FOR ASSEMBLY ON PDP-10
                              .TITLE  CKFPAA0 FP11F FLTG PNT PRT A
                              ;*COPYRIGHT (C) 1979
                              ;*DIGITAL EQUIPMENT CORP.
                              ;*MAYNARD, MASS. 01754
                              ;*
                              ;*
                              ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                              ;*PACKAGE (MAINDEC-11-DZQAC-C3), JAN 19, 1977.
                              ;*
            000001            $TN=1
            160000            $SWR=160000      ;;HALT ON ERROR, LOOP ON TEST, INHIBIT ERROR TYPOUT

            000244            FPVECT-244
            177400            $SWR=177400
            000200            $SWRMSK-200
            000011            TAB-11
            000015            CRLF=15

                              .SBTTL  BASIC DEFINITIONS
                              ;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
            001100            STACK=  1100
            104000                    ERROR=EMT
            000004                    SCOPE=IOT
                              ;*MISCELLANEOUS DEFINITIONS
```

```
000011                  HT=     11              ;;CODE FOR HORIZONTAL TAB
000012                  LF      12              ;;CODE FOR LINE FEED
000015                  CR=     15              ;;CODE FOR CARRIAGE RETURN
000200                  CRLF=   200             ;;CODE FOR CARRIAGE RETURN-LINE FEED
177776                  PS=     177776          ;;PROCESSOR STATUS WORD
177776                          PSW=PS
177774                  STKLMT= 177774          ;;STACK LIMIT REGISTER
177772                  PIRQ-   177772          ;;PROGRAM INTERRUPT REQUEST REGISTER
177570                  DSWR=   177570          ;;HARDWARE SWITCH REGISTER
177570                  DDISP=  177570          ;;HARDWARE DISPLAY REGISTER
                        ;*GENERAL PURPOSE REGISTER DEFINITIONS
000000                  R0-     %0              ;;GENERAL REGISTER
000001                  R1=     %1              ;;GENERAL REGISTER
000002                  R2=     %2              ;;GENERAL REGISTER
000003                  R3-     %3              ;;GENERAL REGISTER
000004                  R4=     %4              ;;GENERAL REGISTER
000005                  R5=     %5              ;;GENERAL REGISTER
000006                  R6-     %6              ;;GENERAL REGISTER
000007                  R7-     %7              ;;GENERAL REGISTER
000006                  SP-     %6              ;;STACK POINTER
000007                  PC      %7              ;;PROGRAM COUNTER
                        ;*PRIORITY LEVEL DEFINITIONS
000000                  PR0-    0               ;;PRIORITY LEVEL 0
000040                  PR1=    40              ;;PRIORITY LEVEL 1
000100                  PR2-    100             ;;PRIORITY LEVEL 2
000140                  PR3     140             ;;PRIORITY LEVEL 3
000200                  PR4=    200             ;;PRIORITY LEVEL 4
000240                  PR5=    240             ;;PRIORITY LEVEL 5
000300                  PR6-    300             ;;PRIORITY LEVEL 6
000340                  PR7=    340             ;;PRIORITY LEVEL 7
                        ;*''SWITCH REGISTER'' SWITCH DEFINITIONS
100000                  SW15=   100000
040000                  SW14-   40000
020000                  SW13-   20000
010000                  SW12=   10000
004000                  SW11=   4000
002000                  SW10=   2000
001000                  SW09=   1000
000400                  SW08=   400
000200                  SW07-   200
000100                  SW06=   100
000040                  SW05-   40
000020                  SW04=   20
000010                  SW03=   10
000004                  SW02=   4
000002                  SW01    2
000001                  SW00    1
001000                          SW9=SW09
000400                          SW8=SW08
000200                          SW7=SW07
000100                          SW6=SW06
000040                          SW5=SW05
000020                          SW4=SW04
000010                          SW3=SW03
000004                          SW2=SW02
000002                          SW1=SW01
000001                          SW0 SW00
```

```
                        ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
100000                  BIT15=  100000
040000                  BIT14=  40000
020000                  BIT13=  20000
010000                  BIT12=  10000
004000                  BIT11=  4000
002000                  BIT10=  2000
001000                  BIT09=  1000
000400                  BIT08=  400
000200                  BIT07=  200
000100                  BIT06=  100
000040                  BIT05=  40
000020                  BIT04=  20
000010                  BIT03=  10
000004                  BIT02=  4
000002                  BIT01=  2
000001                  BIT00=  1
001000                          BIT9=BIT09
000400                          BIT8=BIT08
000200                          BIT7=BIT07
000100                          BIT6=BIT06
000040                          BIT5=BIT05
000020                          BIT4=BIT04
000010                          BIT3=BIT03
000004                          BIT2=BIT02
000002                          BIT1=BIT01
000001                          BIT0=BIT00
                        ;*BASIC ''CPU'' TRAP VECTOR ADDRESSES
000004                  ERRVEC= 4               ;;TIME OUT AND OTHER ERRORS
000010                  RESVEC= 10              ;;RESERVED AND ILLEGAL INSTRUCTIONS
000014                  TBITVEC=14              ;;''T'' BIT
000014                  TRTVEC= 14              ;;TRACE TRAP
000014                  BPTVEC= 14              ;;BREAKPOINT TRAP (BPT)
000020                  IOTVEC= 20              ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
000024                  PWRVEC= 24              ;;POWER FAIL
000030                  EMTVEC= 30              ;;EMULATOR TRAP (EMT) **ERROR**
000034                  TRAPVEC=34              ;;''TRAP'' TRAP
000060                  TKVEC=  60              ;;TTY KEYBOARD VECTOR
000064                  TPVEC=  64              ;;TTY PRINTER VECTOR
000240                  PIRQVEC=240             ;;PROGRAM INTERRUPT REQUEST VECTOR
1114                            .SBTTL  FPP REGISTER DEFINITIONS
1115    000000          AC0     =%0
1116    000001          AC1     =%1
1117    000002          AC2     =%2
1118    000003          AC3     =%3
1119    000004          AC4     =%4
1120    000005          AC5     =%5
1121    000006          AC6     =%6
1122    000007          AC7     =%7
1124
1125                    .SBTTL  TRAP CATCHER
000000                          .=0
                        ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ''.+2,HALT''
                        ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
                        ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
000174                          .=174
000174  000000          DISPREG: .WORD  0               ;;SOFTWARE DISPLAY REGISTER
```

```
000176  000000                  SWREG:   .WORD  0               ;;SOFTWARE SWITCH REGISTER
                                .SBTTL   STARTING ADDRESS(ES)
000200  000137  003606                   JMP     @#START ;;JUMP TO STARTING ADDRESS OF PROGRAM
```

```
1126                                .SBTTL  COMMON TAGS
                                    ;;*****************************************************************
                                    ;;*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
                                    ;;*USED IN THE PROGRAM.
            001100                          .=1100
      001100                        $CMTAG:                           ;;START OF COMMON TAGS
      001100  000000                        .WORD   0
      001102     000                $TSTNM: .BYTE   0                 ;;CONTAINS THE TEST NUMBER
      001103     000                $ERFLG: .BYTE   0                 ;;CONTAINS ERROR FLAG
      001104  000000                $ICNT:  .WORD   0                 ;;CONTAINS SUBTEST ITERATION COUNT
      001106  000000                $LPADR: .WORD   0                 ;;CONTAINS SCOPE LOOP ADDRESS
      001110  000000                $LPERR: .WORD   0                 ;;CONTAINS SCOPE RETURN FOR ERRORS
      001112  000000                $ERTTL: .WORD   0                 ;;CONTAINS TOTAL ERRORS DETECTED
      001114     000                $ITEMB: .BYTE   0                 ;;CONTAINS ITEM CONTROL BYTE
      001115     001                $ERMAX: .BYTE   1                 ;;CONTAINS MAX. ERRORS PER TEST
      001116  000000                $ERRPC: .WORD   0                 ;;CONTAINS PC OF LAST ERROR INSTRUCTION
      001120  000000                $GDADR: .WORD   0                 ;;CONTAINS ADDRESS OF 'GOOD' DATA
      001122  000000                $BDADR: .WORD   0                 ;;CONTAINS ADDRESS OF 'BAD' DATA
      001124  000000                $GDDAT: .WORD   0                 ;;CONTAINS 'GOOD' DATA
      001126  000000                $BDDAT: .WORD   0                 ;;CONTAINS 'BAD' DATA
      001130  000000                        .WORD   0                 ;;RESERVED--NOT TO BE USED
      001132  000000                        .WORD   0
      001134     000                $AUTOB: .BYTE   0                 ;;AUTOMATIC MODE INDICATOR
      001135     000                $INTAG: .BYTE   0                 ;;INTERRUPT MODE INDICATOR
      001136  000000                        .WORD   0
      001140  177570                SWR:    .WORD   DSWR              ;;ADDRESS OF SWITCH REGISTER
      001142  177570                DISPLAY: .WORD  DDISP             ;;ADDRESS OF DISPLAY REGISTER
      001144  177560                $TKS:   177560                    ;;TTY KBD STATUS
      001146  177562                $TKB:   177562                    ;;TTY KBD BUFFER
      001150  177564                $TPS:   177564                    ;;TTY PRINTER STATUS REG. ADDRESS
      001152  177566                $TPB:   177566                    ;;TTY PRINTER BUFFER REG. ADDRESS
      001154     000                $NULL:  .BYTE   0                 ;;CONTAINS NULL CHARACTER FOR FILLS
      001155     002                $FILLS: .BYTE   2                 ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
      001156     012                $FILLC: .BYTE   12                ;;INSERT FILL CHARS. AFTER A "LINE FEED"
      001157     000                $TPFLG: .BYTE   0                 ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
      001160  000000                $REGAD: .WORD   0                 ;;CONTAINS THE ADDRESS FROM
                                                                      ;;WHICH ($REG0) WAS OBTAINED
            000024                          .REPT   $CM3
      001162  000000                $REG0:  .WORD   0                 ;;CONTAINS (($REGAD)+0)
      001164  000000                $REG1:  .WORD   0                 ;;CONTAINS (($REGAD)+2)
      001166  000000                $REG2:  .WORD   0                 ;;CONTAINS (($REGAD)+4)
      001170  000000                $REG3:  .WORD   0                 ;;CONTAINS (($REGAD)+6)
      001172  000000                $REG4:  .WORD   0                 ;;CONTAINS (($REGAD)+10)
      001174  000000                $REG5:  .WORD   0                 ;;CONTAINS (($REGAD)+12)
      001176  000000                $REG6:  .WORD   0                 ;;CONTAINS (($REGAD)+14)
      001200  000000                $REG7:  .WORD   0                 ;;CONTAINS (($REGAD)+16)
      001202  000000                $REG10: .WORD   0                 ;;CONTAINS (($REGAD)+20)
      001204  000000                $REG11: .WORD   0                 ;;CONTAINS (($REGAD)+22)
      001206  000000                $REG12: .WORD   0                 ;;CONTAINS (($REGAD)+24)
      001210  000000                $REG13: .WORD   0                 ;;CONTAINS (($REGAD)+26)
      001212  000000                $REG14: .WORD   0                 ;;CONTAINS (($REGAD)+30)
      001214  000000                $REG15: .WORD   0                 ;;CONTAINS (($REGAD)+32)
      001216  000000                $REG16: .WORD   0                 ;;CONTAINS (($REGAD)+34)
      001220  000000                $REG17: .WORD   0                 ;;CONTAINS (($REGAD)+36)
      001222  000000                $REG20: .WORD   0                 ;;CONTAINS (($REGAD)+40)
      001224  000000                $REG21: .WORD   0                 ;;CONTAINS (($REGAD)+42)
      001226  000000                $REG22: .WORD   0                 ;;CONTAINS (($REGAD)+44)
```

```
001230  000000                  $REG23: .WORD   0               ;;CONTAINS ((SREGAD)+46)
        000024                  .REPT   24
001232  000000                  $TMP0:  .WORD   0               ;;USER DEFINED
001234  000000                  $TMP1:  .WORD   0               ;;USER DEFINED
001236  000000                  $TMP2:  .WORD   0               ;;USER DEFINED
001240  000000                  $TMP3:  .WORD   0               ;;USER DEFINED
001242  000000                  $TMP4:  .WORD   0               ;;USER DEFINED
001244  000000                  $TMP5:  .WORD   0               ;;USER DEFINED
001246  000000                  $TMP6:  .WORD   0               ;;USER DEFINED
001250  000000                  $TMP7:  .WORD   0               ;;USER DEFINED
001252  000000                  $TMP10: .WORD   0               ;;USER DEFINED
001254  000000                  $TMP11: .WORD   0               ;;USER DEFINED
001256  000000                  $TMP12: .WORD   0               ;;USER DEFINED
001260  000000                  $TMP13: .WORD   0               ;;USER DEFINED
001262  000000                  $TMP14: .WORD   0               ;;USER DEFINED
001264  000000                  $TMP15: .WORD   0               ;;USER DEFINED
001266  000000                  $TMP16: .WORD   0               ;;USER DEFINED
001270  000000                  $TMP17: .WORD   0               ;;USER DEFINED
001272  000000                  $TMP20: .WORD   0               ;;USER DEFINED
001274  000000                  $TMP21: .WORD   0               ;;USER DEFINED
001276  000000                  $TMP22: .WORD   0               ;;USER DEFINED
001300  000000                  $TMP23: .WORD   0               ;;USER DEFINED
001302  000000                  $TIMES: 0                       ;;MAX. NUMBER OF ITERATIONS
001304  000000                  $ESCAPE:0                       ;;ESCAPE ON ERROR ADDRESS
001306     207     377     377  $BELL:  .ASCIZ  <207><377><377> ;;CODE FOR BELL
001311     000
001312     077                  $QUES:  .ASCII  /?/             ;;QUESTION MARK
001313     015                  $CRLF:  .ASCII  <15>            ;;CARRIAGE RETURN
001314     012     000          $LF:    .ASCIZ  <12>            ;;LINE FEED
                                ;;*****************************************************************
                                .SBTTL  APT MAILBOX-ETABLE
                                ;;*****************************************************************
                                .EVEN
001316                          $MAIL:                          ;;APT MAILBOX
001316  000000                  $MSGTY: .WORD   AMSGTY          ;;MESSAGE TYPE CODE
001320  000000                  $FATAL: .WORD   AFATAL          ;;FATAL ERROR NUMBER
001322  000000                  $TESTN: .WORD   ATESTN          ;;TEST NUMBER
001324  000000                  $PASS:  .WORD   APASS           ;;PASS COUNT
001326  000000                  $DEVCT: .WORD   ADEVCT          ;;DEVICE COUNT
001330  000000                  $UNIT:  .WORD   AUNIT           ;;I/O UNIT NUMBER
001332  000000                  $MSGAD: .WORD   AMSGAD          ;;MESSAGE ADDRESS
001334  000000                  $MSGLG: .WORD   AMSGLG          ;;MESSAGE LENGTH
001336                          $ETABLE:                        ;;APT ENVIRONMENT TABLE
001336     000                  $ENV:   .BYTE   AENV            ;;ENVIRONMENT BYTE
001337     000                  $ENVM:  .BYTE   AENVM           ;;ENVIRONMENT MODE BITS
001340  000000                  $SWREG: .WORD   ASWREG          ;;APT SWITCH REGISTER
001342  000000                  $USWR:  .WORD   AUSWR           ;;USER SWITCHES
001344  000000                  $CPUOP: .WORD   ACPUOP          ;;CPU TYPE,OPTIONS
                                ;*                              BITS 15-11=CPU TYPE
                                ;*                                      11/04=01,11/05=02,11/20-03,11/40 04,11/45=05
                                ;*                                      11/70=06,PDQ=07,Q=10
                                ;*                              BIT 10=REAL TIME CLOCK
                                ;*                              BIT  9=FLOATING POINT PROCESSOR
                                ;*                              BIT  8=MEMORY MANAGEMENT
001346     000                  $MAMS1: .BYTE   AMAMS1          ;;HIGH ADDRESS,M.S. BYTE
001347     000                  $MTYP1: .BYTE   AMTYP1          ;;MEM. TYPE,BLK#1
                                ;*                              MEM.TYPE BYTE   --  (HIGH BYTE)
```

```
                                ;*                              900 NSEC CORE=001
                                ;*                              300 NSEC BIPOLAR=002
                                ;*                              500 NSEC MOS=003
001350  000000                  $MADR1: .WORD   AMADR1  ;;HIGH ADDRESS,BLK#1
                                ;*                        MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF ''TYPE'' ABOVE
001352      000                 $MAMS2: .BYTE   AMAMS2  ;;HIGH ADDRESS,M.S. BYTE
001353      000                 $MTYP2: .BYTE   AMTYP2  ;;MEM.TYPE,BLK#2
001354  000000                  $MADR2: .WORD   AMADR2  ;;MEM.LAST ADDRESS,BLK#2
001356      000                 $MAMS3: .BYTE   AMAMS3  ;;HIGH ADDRESS,M.S.BYTE
001357      000                 $MTYP3: .BYTE   AMTYP3  ;;MEM.TYPE,BLK#3
001360  000000                  $MADR3: .WORD   AMADR3  ;;MEM.LAST ADDRESS,BLK#3
001362      000                 $MAMS4: .BYTE   AMAMS4  ;;HIGH ADDRESS,M.S.BYTE
001363      000                 $MTYP4: .BYTE   AMTYP4  ;;MEM.TYPE,BLK#4
001364  000000                  $MADR4: .WORD   AMADR4  ;;MEM.LAST ADDRESS,BLK#4
001366  000000                  $VECT1: .WORD   AVECT1  ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
001370  000000                  $VECT2: .WORD   AVECT2  ;;INTERRUPT VECTOR#2BUS PRIORITY#2
001372  000000                  $BASE:  .WORD   ABASE   ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
001374  000000                  $DEVM:  .WORD   ADEVM   ;;DEVICE MAP
001376  000000                  $CDW1:  .WORD   ACDW1   ;;CONTROLLER DESCRIPTION WORD#1
001400  000000                  $CDW2:  .WORD   ACDW2   ;;CONTROLLER DESCRIPTION WORD#2
001402  000000                  $DDW0:  .WORD   ADDW0   ;;DEVICE DESCRIPTOR WORD#0
001404  000000                  $DDW1:  .WORD   ADDW1   ;;DEVICE DESCRIPTOR WORD#1
001406  000000                  $DDW2:  .WORD   ADDW2   ;;DEVICE DESCRIPTOR WORD#2
001410  000000                  $DDW3:  .WORD   ADDW3   ;;DEVICE DESCRIPTOR WORD#3
001412  000000                  $DDW4:  .WORD   ADDW4   ;;DEVICE DESCRIPTOR WORD#4
001414  000000                  $DDW5:  .WORD   ADDW5   ;;DEVICE DESCRIPTOR WORD#5
001416  000000                  $DDW6:  .WORD   ADDW6   ;;DEVICE DESCRIPTOR WORD#6
001420  000000                  $DDW7:  .WORD   ADDW7   ;;DEVICE DESCRIPTOR WORD#7
001422  000000                  $DDW8:  .WORD   ADDW8   ;;DEVICE DESCRIPTOR WORD#8
001424  000000                  $DDW9:  .WORD   ADDW9   ;;DEVICE DESCRIPTOR WORD#9
001426  000000                  $DDW10: .WORD   ADDW10  ;;DEVICE DESCRIPTOR WORD#10
001430  000000                  $DDW11: .WORD   ADDW11  ;;DEVICE DESCRIPTOR WORD#11
001432  000000                  $DDW12: .WORD   ADDW12  ;;DEVICE DESCRIPTOR WORD#12
001434  000000                  $DDW13: .WORD   ADDW13  ;;DEVICE DESCRIPTOR WORD#13
001436  000000                  $DDW14: .WORD   ADDW14  ;;DEVICE DESCRIPTOR WORD#14
001440  000000                  $DDW15: .WORD   ADDW15  ;;DEVICE DESCRIPTOR WORD#15
001442                          $ETEND:
```

```
                                        .SBTTL  ERROR POINTER TABLE
                                        ;*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
                                        ;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
                                        ;*LOCATION $ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
                                        ;*NOTE1:        IF $ITEMB IS 0 THE ONLY PERTINENT DATA IS ($ERRPC).
                                        ;*NOTE2:        F CH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:
                                        ;*      EM              ;;POINTS TO THE ERROR MESSAGE
                                        ;*      DH              ;;POINTS TO THE DATA HEADER
                                        ;*      DT              ;;POINTS TO THE DATA
                                        ;*      DF              ;;POINTS TO THE DATA FORMAT
     001442                             $ERRTB:
1130          000213                            .REPT   MNUMBER
1132                                    ;ITEM 1
     001442   043061  063304  067720            .WORD   EM1,DH1,DT1,DF1
     001450   066645
                                        ;ITEM 2
     001452   043116  063374  067742            .WORD   EM2,DH2,DT2,DF2
     001460   066655
                                        ;ITEM 3
     001462   043162  063467  067764            .WORD   EM3,DH3,DT3,DF3
     001470   066665
                                        ;ITEM 4
     001472   043227  063560  067764            .WORD   EM4,DH4,DT4,DF4
     001500   066665
                                        ;ITEM 5
     001502   043267  063654  070006            .WORD   EM5,DH5,DT5,DF5
     001510   066675
                                        ;ITEM 6
     001512   043323  063654  070040            .WORD   EM6,DH6,DT6,DF6
     001520   066675
                                        ;ITEM 7
     001522   043355  063654  070040            .WORD   EM7,DH7,DT7,DF7
     001530   066675
                                        ;ITEM 10
     001532   043267  063654  070040            .WORD   EM10,DH10,DT10,DF10
     001540   066675
                                        ;ITEM 11
     001542   043410  063654  070040            .WORD   EM11,DH11,DT11,DF11
     001550   066675
                                        ;ITEM 12
     001552   000000  000000  070062            .WORD   EM12,DH12,DT12,DF12
     001560   066711
                                        ;ITEM 13
     001562   000000  000000  070150            .WORD   EM13,DH13,DT13,DF13
     001570   066743
                                        ;ITEM 14
     001572   043471  063654  070040            .WORD   EM14,DH14,DT14,DF14
     001600   066675
                                        ;ITEM 15
     001602   043614  063654  070040            .WORD   EM15,DH15,DT15,DF15
     001610   066675
                                        ;ITEM 16
     001612   043737  063714  070202            .WORD   EM16,DH16,DT16,DF16
     001620   066757
                                        ;ITEM 17
     001622   044010  063774  067764            .WORD   EM17,DH17,DT17,DF17
     001630   066665
```

```
                                        ;ITEM 20
001632  044243  064064  070222                .WORD   EM20,DH20,DT20,DF20
001640  066766
                                        ;ITEM 21
001642  044421  063654  070244                .WORD   EM21,DH21,DT21,DF21
001650  066776
                                        ;ITEM 22
001652  044552  064152  070256                .WORD   EM22,DH22,DT22,DF22
001660  067002
                                        ;ITEM 23
001662  044552  064207  070304                .WORD   EM23,DH23,DT23,DF23
001670  067014
                                        ;ITEM 24
001672  044552  064345  070326                .WORD   EM24,DH24,DT24,DF24
001700  067024
                                        ;ITEM 25
001702  044637  064504  070352                .WORD   EM25,DH25,DT25,DF25
001710  067033
                                        ;ITEM 26
001712  044752  064546  070422                .WORD   EM26,DH26,DT26,DF26
001720  067057
                                        ;ITEM 27
001722  044752  064546  070476                .WORD   EM27,DH27,DT27,DF27
001730  067104
                                        ;ITEM 30
001732  045020  000000  070540                .WORD   EM30,DH30,DT30,DF30
001740  067124
                                        ;ITEM 31
001742  045072  064546  070422                .WORD   EM31,DH31,DT31,DF31
001750  067057
                                        ;ITEM 32
001752  045072  064546  070476                .WORD   EM32,DH32,DT32,DF32
001760  067104
                                        ;ITEM 33
001762  045140  064634  070572                .WORD   EM33,DH33,DT33,DF33
001770  067140
                                        ;ITEM 34
001772  045201  064634  070650                .WORD   EM34,DH34,DT34,DF34
002000  067166
                                        ;ITEM 35
002002  045303  064634  070650                .WORD   EM35,DH35,DT35,DF35
002010  067166
                                        ;ITEM 36
002012  045405  064634  070650                .WORD   EM36,DH36,DT36,DF36
002020  067166
                                        ;ITEM 37
002022  045506  064634  070650                .WORD   EM37,DH37,DT37,DF37
002030  067166
                                        ;ITEM 40
002032  045607  064634  070572                .WORD   EM40,DH40,DT40,DF40
002040  067212
                                        ;ITEM 41
002042  045760  000000  070722                .WORD   EM41,DH41,DT41,DF41
002050  067240
                                        ;ITEM 42
002052  046015  064737  070754                .WORD   EM42,DH42,DT42,DF42
002060  067254
```

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                                        ;ITEM 43
002062  046136  064737  070754                .WORD   EM43,DH43,DT43,DF43
002070  067254
                                        ;ITEM 44
002072  046257  000000  071032                .WORD   EM44,DH44,DT44,DF44
002100  067302
                                        ;ITEM 45
002102  046257  065041  071102                .WORD   EM45,DH45,DT45,DF45
002110  067325
                                        ;ITEM 46
002112  046322  065060  071156                .WORD   EM46,DH46,DT46,DF46
002120  067352
                                        ;ITEM 47
002122  046400  065041  071244                .WORD   EM47,DH47,DT47,DF47
002130  067404
                                        ;ITEM 50
002132  046516  065104  070650                .WORD   EM50,DH50,DT50,DF50
002140  067421
                                        ;ITEM 51
002142  046614  065104  071276                .WORD   EM51,DH51,DT51,DF51
002150  067445
                                        ;ITEM 52
002152  046655  063654  071244                .WORD   EM52,DH52,DT52,DF52
002160  067404
                                        ;ITEM 53
002162  046776  064546  071334                .WORD   EM53,DH53,DT53,DF53
002170  067463
                                        ;ITEM 54
002172  047173  065156  071354                .WORD   EM54,DH54,DT54,DF54
002200  067472
                                        ;ITEM 55
002202  047237  063654  071244                .WORD   EM55,DH55,DT55,DF55
002210  067404
                                        ;ITEM 56
002212  047360  064546  071334                .WORD   EM56,DH56,DT56,DF56
002220  067463
                                        ;ITEM 57
002222  047555  065156  071354                .WORD   EM57,DH57,DT57,DF57
002230  067472
                                        ;ITEM 60
002232  047621  064546  071334                .WORD   EM60,DH60,DT60,DF60
002240  067463
                                        ;ITEM 61
002242  050016  065156  071354                .WORD   EM61,DH61,DT61,DF61
002250  067472
                                        ;ITEM 62
002252  050062  065156  071354                .WORD   EM62,DH62,DT62,DF62
002260  067472
                                        ;ITEM 63
002262  050254  065156  071354                .WORD   EM63,DH63,DT63,DF63
002270  067472
                                        ;ITEM 64
002272  050446  065266  071412                .WORD   EM64,DH64,DT64,DF64
002300  067510
                                        ;ITEM 65
002302  050446  065217  071412                .WORD   EM65,DH65,DT65,DF65
002310  067510
```

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                                        ;ITEM 66
002312  050602  065156  071354                .WORD   EM66,DH66,DT66,DF66
002320  067472
                                        ;ITEM 67
002322  050645  063654  070244                .WORD   EM67,DH67,DT67,DF67
002330  066776
                                        ;ITEM 70
002332  051076  063654  071432                .WORD   EM70,DH70,DT70,DF70
002340  067517
                                        ;ITEM 71
002342  051221  064504  071432                .WORD   EM71,DH71,DT71,DF71
002350  067517
                                        ;ITEM 72
002352  051323  064546  071500                .WORD   EM72,DH72,DT72,DF72
002360  067541
                                        ;ITEM 73
002362  051377  065156  071354                .WORD   EM73,DH73,DT73,DF73
002370  067472
                                        ;ITEM 74
002372  051437  063654  070244                .WORD   EM74,DH74,DT74,DF74
002400  066776
                                        ;ITEM 75
002402  051670  063654  071432                .WORD   EM75,DH75,DT75,DF75
002410  067517
                                        ;ITEM 76
002412  052013  064504  071432                .WORD   EM76,DH76,DT76,DF76
002420  067517
                                        ;ITEM 77
002422  052115  064546  071500                .WORD   EM77,DH77,DT77,DF77
002430  067541
                                        ;ITEM 100
002432  052171  065156  071354                .WORD   EM100,DH100,DT100,DF100
002440  067472
                                        ;ITEM 101
002442  052231  063654  071432                .WORD   EM101,DH101,DT101,DF101
002450  067517
                                        ;ITEM 102
002452  052355  064546  071432                .WORD   EM102,DH102,DT102,DF102
002460  067541
                                        ;ITEM 103
002462  052427  064504  071432                .WORD   EM103,DH103,DT103,DF103
002470  067517
                                        ;ITEM 104
002472  052532  065156  071354                .WORD   EM104,DH104,DT104,DF104
002500  067472
                                        ;ITEM 105
002502  052573  063654  071432                .WORD   EM105,DH105,DT105,DF105
002510  067517
                                        ;ITEM 106
002512  052720  064546  071500                .WORD   EM106,DH106,DT106,DF106
002520  067541
                                        ;ITEM 107
002522  052773  064504  071432                .WORD   EM107,DH107,DT107,DF107
002530  067517
                                        ;ITEM 110
002532  053077  065156  071354                .WORD   EM110,DH110,DT110,DF110
002540  067472
```

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                                        ;ITEM 111
002542  053141  064504  071520                .WORD   EM111,DH111,DT111,DF111
002550  067550
                                        ;ITEM 112
002552  053141  065354  071520                .WORD   EM112,DH112,DT112,DF112
002560  067550
                                        ;ITEM 113
002562  053243  064504  071520                .WORD   EM113,DH113,DT113,DF113
002570  067550
                                        ;ITEM 114
002572  053243  065354  071520                .WORD   EM114,DH114,DT114,DF114
002600  067550
                                        ;ITEM 115
002602  053141  065573  071520                .WORD   EM115,DH115,DT115,DF115
002610  067550
                                        ;ITEM 116
002612  053243  065573  071520                .WORD   EM116,DH116,DT116,DF116
002620  067550
                                        ;ITEM 117
002622  053345  063774  067764                .WORD   EM117,DH117,DT117,DF117
002630  066665
                                        ;ITEM 120
002632  053501  066057  067764                .WORD   EM120,DH120,DT120,DF120
002640  066665
                                        ;ITEM 121
002642  053635  063654  071244                .WORD   EM121,DH121,DT121,DF121
002650  067404
                                        ;ITEM 122
002652  053754  065104  070650                .WORD   EM122,DH122,DT122,DF122
002660  067421
                                        ;ITEM 123
002662  054053  065104  071276                .WORD   EM123,DH123,DT123,DF123
002670  067445
                                        ;ITEM 124
002672  054114  063774  071532                .WORD   EM124,DH124,DT124,DF124
002700  067554
                                        ;ITEM 125
002702  054207  063774  071532                .WORD   EM125,DH125,DT125,DF125
002710  067554
                                        ;ITEM 126
002712  054277  063654  071520                .WORD   EM126,DH126,DT126,DF126
002720  067550
                                        ;ITEM 127
002722  054506  065156  071520                .WORD   EM127,DH127,DT127,DF127
002730  067550
                                        ;ITEM 130
002732  054721  066057  067764                .WORD   EM130,DH130,DT130,DF130
002740  066665
                                        ;ITEM 131
002742  055021  065156  071616                .WORD   EM131,DH131,DT131,DF131
002750  067605
                                        ;ITEM 132
002752  055061  065156  071616                .WORD   EM132,DH132,DT132,DF132
002760  067605
                                        ;ITEM 133
002762  055121  066147  071660                .WORD   EM133,DH133,DT133,DF133
002770  067625
```

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                                        ;ITEM 134
002772  055160  066147  071660                .WORD   EM134,DH134,DT134,DF134
003000  067625
                                        ;ITEM 135
003002  055217  066147  071660                .WORD   EM135,DH135,DT135,DF135
003010  067625
                                        ;ITEM 136
003012  055256  066147  071660                .WORD   EM136,DH136,DT136,DF136
003020  067625
                                        ;ITEM 137
003022  055121  066257  071732                .WORD   EM137,DH137,DT137,DF137
003030  067651
                                        ;ITEM 140
003032  055160  066257  071732                .WORD   EM140,DH140,DT140,DF140
003040  067651
                                        ;ITEM 141
003042  055217  066257  071732                .WORD   EM141,DH141,DT141,DF141
003050  067651
                                        ;ITEM 142
003052  055256  066257  071732                .WORD   EM142,DH142,DT142,DF142
003060  067651
                                        ;ITEM 143
003062  055315  066147  071660                .WORD   EM143,DH143,DT143,DF143
003070  067625
                                        ;ITEM 144
003072  055350  066147  071660                .WORD   EM144,DH144,DT144,DF144
003100  067625
                                        ;ITEM 145
003102  055315  066257  071732                .WORD   EM145 DH145,DT145,DF145
003110  067651
                                        ;ITEM 146
003112  055350  066257  071732                .WORD   EM146,DH146,DT146,DF146
003120  067651
                                        ;ITEM 147
003122  055403  065156  071660                .WORD   EM147,DH147,DT147,DF147
003130  067625
                                        ;ITEM 150
003132  055403  066447  071660                .WORD   EM150,DH150,DT150,DF150
003140  067625
                                        ;ITEM 151
003142  055403  066257  071732                .WORD   EM151,DH151,DT151,DF151
003150  067651
                                        ;ITEM 152
003152  055435  066147  071660                .WORD   EM152,DH152,DT152,DF152
003160  067625
                                        ;ITEM 153
003162  055435  066257  071732                .WORD   EM153,DH153,DT153,DF153
003170  067651
                                        ;ITEM 154
003172  055467  066540  071752                .WORD   EM154,DH154,DT154,DF154
003200  067661
                                        ;ITEM 155
003202  055721  066540  071752                .WORD   EM155,DH155,DT155,DF155
003210  067661
                                        ;ITEM 156
003212  056154  065156  071660                .WORD   EM156,DH156,DT156,DF156
003220  067625
```

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                                        ;ITEM 157
003222  056371  065156  071660                .WORD   EM157,DH157,DT157,DF157
003230  067625
                                        ;ITEM 160
003232  056610  065156  071660                .WORD   EM160,DH160,DT160,DF160
003240  067625
                                        ;ITEM 161
003242  057015  065156  071660                .WORD   EM161,DH161,DT161,DF161
003250  067665
                                        ;ITEM 162
003252  057222  065156  071660                .WORD   EM162,DH162,DT162,DF162
003260  067625
                                        ;ITEM 163
003262  057267  065156  071660                .WORD   EM163,DH163,DT163,DF163
003270  067665
                                        ;ITEM 164
003272  057334  063774  067764                .WORD   EM164,DH164,DT164,DF164
003300  066665
                                        ;ITEM 165
003302  057401  063774  067764                .WORD   EM165,DH165,DT165,DF165
003310  066665
                                        ;ITEM 166
003312  057446  065156  071660                .WORD   EM166,DH166,DT166,DF166
003320  067625
                                        ;ITEM 167
003322  057556  065156  071660                .WORD   EM167,DH167,DT167,DF167
003330  067625
                                        ;ITEM 170
003332  060015  065156  071660                .WORD   EM170,DH170,DT170,DF170
003340  067665
                                        ;ITEM 171
003342  060125  065156  071660                .WORD   EM171,DH171,DT171,DF171
003350  067665
                                        ;ITEM 172
003352  060364  065156  071660                .WORD   EM172,DH172,DT172,DF172
003360  067625
                                        ;ITEM 173
003362  060623  065156  071660                .WORD   EM173,DH173,DT173,DF173
003370  067625
                                        ;ITEM 174
003372  061062  065156  071660                .WORD   EM174,DH174,DT174,DF174
003400  067665
                                        ;ITEM 175
003402  061321  065156  071660                .WORD   EM175,DH175,DT175,DF175
003410  067665
                                        ;ITEM 176
003412  061560  065156  071660                .WORD   EM176,DH176,DT176,DF176
003420  067625
                                        ;ITEM 177
003422  061715  065156  071660                .WORD   EM177,DH177,DT177,DF177
003430  067625
                                        ;ITEM 200
003432  062052  065156  071660                .WORD   EM200,DH200,DT200,DF200
003440  067625
                                        ;ITEM 201
003442  062207  065156  071660                .WORD   EM201,DH201,DT201,DF201
003450  067625
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                                        ;ITEM 202
003452  062344  065156  071660                .WORD   EM202,DH202,DT202,DF202
003460  067625
                                        ;ITEM 203
003462  062501  065156  071660                .WORD   EM203,DH203,DT203,DF203
003470  067625
                                        ;ITEM 204
003472  062636  065156  071660                .WORD   EM204,DH204,DT204,DF204
003500  067625
                                        ;ITEM 205
003502  062773  063774  067764                .WORD   EM205,DH205,DT205,DF205
003510  066665
                                        ;ITEM 206
003512  063040  065156  071660                .WORD   EM206,DH206,DT206,DF206
003520  067625
                                        ;ITEM 207
003522  063105  065156  071660                .WORD   EM207,DH207,DT207,DF207
003530  067625
                                        ;ITEM 210
003532  063227  065156  071660                .WORD   EM210,DH210,DT210,DF210
003540  067625
                                        ;ITEM 211
003542  043267  066600  071764                .WORD   EM211,DH211,DT211,DF211
003550  067711
                                        ;ITEM 212
003552  043323  063654  072002                .WORD   EM212,DH212,DT212,DF212
003560  067711
                                        ;ITEM 213
003562  043355  063654  072002                .WORD   EM213,DH213,DT213,DF213
003570  067711
1133
1134
1135                                    .SBTTL  ACT11 HOOKS
                                        ;;******************************************************************
                                        ;HOOKS REQUIRED BY ACT11
                 003572                         $SVPC=.                 ;SAVE PC
                 000046                         .=46
000046  034754                          $ENDAD                          ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
                 000052                         .=52
000052  000000                          .WORD   0                       ;;2)SET LOC.52 TO ZERO
                 003572                         .=$SVPC                 ;; RESTORE PC
1136                                    .SBTTL  APT PARAMETER BLOCK
                                        ;;******************************************************************
                                        ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
                                        ;;******************************************************************
                 003572                         .$X=.   ;;SAVE CURRENT LOCATION
                 000024                         .=24    ;;SET POWER FAIL TO POINT TO START OF PROGRAM
000024  000200                          200     ;;FOR APT START UP
                 000044                         .=44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
000044  003572                          $APTHDR ;;POINT TO APT HEADER BLOCK
                 003572                         .=.$X   ;;RESET LOCATION COUNTER
                                        ;;******************************************************************
                                        ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE API-PDP11 DIAGNOSTIC
                                        ;INTERFACE SPEC.
003572                                  $APTHD:
003572  000000                          $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
003574  001316                          $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
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003576  000010                  $TSTM:  .WORD   10      ;;RUN TIM OF LONGEST TEST
003600  000040                  $PASTM: .WORD   40      ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
003602  000000                  $UNITM: .WORD   0       ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
003604  000052                          .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
 1137
 1138
 1139 003606                  START:
                              .SBTTL  INITIALIZE THE COMMON TAGS
                              ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
003606  012706  001100                  MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
003612  005026                          CLR     (R6)+           ;;CLEAR MEMORY LOCATION
003614  022706  001140                  CMP     #SWR,R6 ;;DONE?
003620  001374                          BNE     .-6             ;;LOOP BACK IF NO
003622  012706  001100                  MOV     #STACK,SP       ;;SETUP THE STACK POINTER
                              ;;INITIALIZE A FEW VECTORS
003626  012737  035034  000020          MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
003634  012737  000340  000022          MOV     #340,@#IOTVEC+2 ;;LEVEL 7
003642  012737  035314  000030          MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
003650  012737  000340  000032          MOV     #340,@#EMTVEC+2 ;;LEVEL 7
003656  012737  037332  000034          MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
003664  012737  000340  000036          MOV     #340,@#TRAPVEC+2;LEVEL 7
003672  012737  037416  000024          MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
003700  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;LEVEL 7
003706  016767  030664  030654          MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
003714  005067  175362                  CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
003720  005067  175360                  CLR     $ESCAPE         ;;CLEAR THE ESCAPE ON ERROR ADDRESS
003724  112767  000001  175163          MOVB    #1,$ERMAX       ;;ALLOW ONE ERROR PER TEST
                              ;;INITIALIZE THE "T-BIT" TRAP VECTOR. THEN LOAD LOCATION "$RTRN", IN
                              ;;THE "END-OF-PASS" ($EOP) ROUTINE, WITH A "RTI" OR "RTT".
003732  012737  035020  000014          MOV     #$RTRN,@#TBITVEC ;;SET "T" BIT VECTOR TO $RTRN
003740  012737  000340  000016          MOV     #340,@#TBITVEC+2 ;;LEVEL 7
003746  012767  000002  031044          MOV     #RTI,$RTRN      ;;SET $RTRN TO A RTI
003754  012737  004002  000010          MOV     #65$,@#RESVEC   ;;TRY TO DO A RTT
003762  005046                          CLR     -(SP)           ;;DUMMY PS
003764  012746  003772                  MOV     #64$,-(SP)      ;;AND PC
003770  000006                          RTT                     ;;TRY THE RTT
003772  012767  000006  031020  64$:    MOV     #RTT,$RTRN      ;;RTT IS LEGAL--SET $RTRN TO A RTT
004000  000402                          BR      66$
004002  062706  000010          65$:    ADD     #10,SP          ;;RTT ILLEGAL--CLEAN OFF THE STACK
004006  012737  000012  000010  66$:    MOV     #RESVEC+2,@#RESVEC ;;RESTORE TRAP CATCHER
004014  005067  031006                  CLR     $TBIT           ;;CLEAR "T" BIT SWITCH
004020  012767  004020  175060          MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
004026  012767  004026  175054          MOV     #.,$LPERR       ;;SETUP THE ERROR LOOP ADDRESS
                              ;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
                              ;;EQUAL TO A "-1", SETUP FOR A SOFTWARE SWITCH REGISTER.
004034  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE ERROR VECTOR
004040  012737  004074  000004          MOV     #67$,@#ERRVEC   ;;SET UP ERROR VECTOR
004046  012767  177570  175064          MOV     #DSWR,SWR       ;;SETUP FOR A HARDWARE SWICH REGISTER
004054  012767  177570  175060          MOV     #DDISP,DISPLAY  ;;AND A HARDWARE DISPLAY REGISTER
004062  022777  177777  175050          CMP     #-1,@SWR        ;;TRY TO REFERENCE HARDWARE SWR
004070  001012                          BNE     69$             ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
                                                                ;;AND  THE HARDWARE SWR IS NOT  -1
004072  000403                          BR      68$             ;;BRANCH IF NO TIMEOUT
004074  012716  004102          67$:    MOV     #68$,(SP)       ;;SET UP FOR TRAP RETURN
004100  000002                          RTI
004102  012767  000176  175030  68$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
004110  012767  000174  175024          MOV     #DISPREG,DISPLAY
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        004116  012637  000004          69$:    MOV     (SP)+,@#ERRVEC  ;;RESTORE ERROR VECTOR
        004122  005067  175176                  CLR     $PASS           ;;CLEAR PASS COUNT
        004126  132767  000200  175203        BITB    #APTSIZE,$ENVM  ;;TEST USER SIZE UNDER APT
        004134  001403                        BEQ     70$             ;;YES,USE NON-APT SWITCH
        004136  012767  001340  174774        MOV     #$SWREG,SWR     ;;NO,USE APT SWITCH REGISTER
        004144                          70$:
   1140                                 .SBTTL  TYPE PROGRAM NAME
                                        ;;TYPE THE NAME OF THE PROGRAM IF FIRST PASS
        004144  005227  177777                  INC     #-1             ;;FIRST TIME?
        004150  001047                          BNE     71$             ;;BRANCH IF NO
        004152  022737  034754  000042          CMP     #$ENDAD,@#42    ;;ACT-11?
        004160  001443                          BEQ     71$             ;;BRANCH IF YES
        004162  104401  004230                  TYPE    ,72$            ;;TYPE ASCIZ STRING
                                        .SBTTL  GET VALUE FOR SOFTWARE SWITCH REGISTER
        004166  005737  000042                  TST     @#42            ;;ARE WE RUNNING UNDER XXDP/ACT?
        004172  001012                          BNE     73$             ;;BRANCH IF YES
        004174  126727  175136  000001          CMPB    $ENV,#1         ;;ARE WE RUNNING UNDER APT?
        004202  001406                          BEQ     73$             ;;BRANCH IF YES
        004204  026727  174730  000176          CMP     SWR,#SWREG      ;;SOFTWARE SWITCH REG SELECTED?
        004212  001005                          BNE     74$             ;;BRANCH IF NO
        004214  104405                          GTSWR                   ;;GET SOFT-SWR SETTINGS
        004216  000403                          BR      74$
        004220  112767  000001  174706  73$:    MOVB    #1,$AUTOB       ;;SET AUTO-MODE INDICATOR
        004226                          74$:
        004226  000420                          BR      71$             ;;GET OVER THE ASCIZ
                                        ;;72$:  .ASCIZ  <CRLF>*CKFPAA0 FP11F FLTG PNT PRT A*<CRLF>
        004270                          71$:
   1141
   1142 004270                     LOOP:
   1143
   1144
   1145
   1146
   1147
   1166                 ;;*****************************************************************
                        ;*TEST 1        LDFPS, STFPS AND DATA PATHS TEST
                        ;*
                        ;*THIS IS A TEST OF THE LDFPS (LOAD FLOATING POINT STATUS) AND STFPS
                        ;*(STORE FLOATING POINT STATUS) INSTRUCTIONS. A COUNT PATTERN IS GENERATED
                        ;*AND RUN THROUGH THE FLOATING POINT STATUS REGISTER.
                        ;*THIS WILL TEST THE 16-BIT TRI STATE BUS WHICH CONNECTS THE CPU
                        ;*WITH THE FPP AND ALSO RUNS INTERNALLY WITHIN THE FPP. ONLY DMO AND
                        ;*SMO ARE USED.
                        ;*NOTE THAT A MASK MUST BE USED BECAUSE SOME OF THE FPS BITS CANNOT
                        ;*BE SET.
                        ;*
                        ;*ONLY THE FIRST FIVE ERRORS WILL BE REPORTED INDIVIDUALLY.
                        ;*THIS IS TO PREVENT LOCKING OUT THE COMPLETION OF THE TEST BECAUSE
                        ;*OF VIRTUALLY ENDLESS NUMBER OF ERRORS. ONLY FIVE INDIVIDUAL ERRORS
                        ;*WILL BE REPORTED THEN THE TEST WILL BE COMPLETED AND AN ERROR
                        ;*SUMMARY GIVEN (SEE NOTE BELOW).
                        ;*
                        ;*NOTE THAT THIS TEST KEEPS A DYNAMIC RECORD OF THE LOGICAL 'AND' AND 'OR'
                        ;*OF THE FAILING DATA PATTERNS. THESE CAN BE VERY USEFUL IN DETERMINING
                        ;*STUCK BITS. IF THE USER HAS THE INHIBIT ERROR TYPE OUT SWITCH (SWR13)
                        ;*OFF, THEN THE USER WILL RECIEVE EACH INDIVIDUAL ERROR MESSAGE PLUS
                        ;*AN ERROR SUMMARY AT THE END OF THE TEST. INHIBITING ERROR PRINT OUT
```

```
                                        ;*WILL INHIBIT ERROR SUMMARY PRINT OUT, EXCEPT IN THE CASE DESCRIBED BELOW.
                                        ;*TO GET JUST THE ERROR SUMMARY WITH NO INDIVIDUAL ERROR REPORTS,
                                        ;*SET SWITCH REGISTER BIT 3 AND SWITCH REGISTER BIT 7 BOTH ON.
                                        ;*
                                        ;;*****************************************************************
     004270  000004                     TST1:   SCOPE
1167 004272  005037  004544                     CLR     @#AERFLG
1168 004276  104413                             LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
1169 004300  012700  177777                     MOV     #-1,R0                  ;INITIALIZE THE COUNT PATTERN.
1170 004304  012737  004546  000244             MOV     #AERR1,@#FPVECT         ;SET UP FOR UNABLE TO DECODE
1171 004312  012737  004560  000010             MOV     #AERR2,@#10             ;FPP INSTRUCTION TRAP TO 244 OR 10.
1172 004320  005002                             CLR     R2                      ;R2 IS THE 'AND' OF BAD DATA.
1173 004322  005102                             COM     R2
1174 004324  005003                             CLR     R3                      ;R3 IS THE 'OR' OF BAD DATA.
1175 004326  012737  004612  000004             MOV     #AERR3,@#ERRVECT        ;IF EITHER INSTRUCTION
1176                                                                             ;FAILS TO GO THROUGH THE
1177                                                                             ;CORRECT SRC OR DST MODE AN
1178                                                                             ;ODD ADDRESS TRAP WILL OCCUR.
1179 004334                             A1:
1180 004334  010004                     A11:    MOV     R0,R4
1181 004336  042704  030020                     BIC     #30020,R4
1182 004342  170104                             LDFPS   R4                      ;TEST INSTRUCTION.
1183
1184 004344  012701  177777                     MOV     #-1,R1
1185 004350  170201                     A12:    STFPS   R1                      ;TEST INSTRUCTION.
1186 004352  012737  040234  000244             MOV     #FPSPUR,@#FPVECT        ;SET UP FOR UNEXPECTED TRAPS.
1187 004360  010004                             MOV     R0,R4                   ;MASK OFF UNSETTABLE BITS.
1188 004362  042704  030020                     BIC     #30020,R4
1189 004366  012737  040266  000004             MOV     #CPSPUR,@#ERRVECT
1190 004374  012737  040304  000010             MOV     #CPTWO,@#10
1191 004402  020401                             CMP     R4,R1                   ;COMPARE DATA EXPECTED WITH
1192                                                                             ;THE DATA READ.
1193 004404  001002                             BNE     A3                      ;IF NOT EQUAL GO REPORT ERROR.
1194
1195 004406  077026                     A2:     SOB     R0,A1                   ;OTHERWISE DECREMENT COUNT PATTERN
1196 004410  000425                             BR      A5                      ;UNTIL IT IS ZERO.
1197
1198 004412  005237  004544             A3:     INC     @#AERFLG                ;RECORD ERROR.
1199 004416  050003                             BIS     R0,R3                   ;COMPUTE 'OR' OF FAILING PATTERNS.
1200 004420  010005                             MOV     R0,R5                   ;COMPUTE 'AND' OF FAILING PATTERNS.
1201 004422  005105                             COM     R5
1202 004424  040502                             BIC     R5,R2
1203
1204 004426  022737  000005  004544             CMP     #5,@#AERFLG             ;SEE IF MORE THAN 5 ERRORS HAVE
1205 004434  103412                             BLO     A05                     ;OCCURRED. BR IF YES.
1206                                                                             ;OTHERWISE
1207                                                                             ;REPORT ERROR.
1208 004436  012737  004334  001236             MOV     #A1,@#$TMP2
1209 004444  010037  001240                     MOV     R0,@#$TMP3
1210 004450  010137  001242                     MOV     R1,@#$TMP4
1211 004454  010437  001244                     MOV     R4,@#$TMP5
1212 004460  104001                     A4:     ERROR   +1
1213
1214 004462  000751                     A05:    BR      A2                      ;CONTINUE TESTING.
1215
1216 004464  005737  004544             A5:     TST     @#AERFLG                ;SEE IF ANY ERRORS OCCURRED.
1217 004470  001471                             BEQ     ADONE                   ;IF NOT GO TO NEXT TEST.
```

```
1218 004472  032777  020000  174440          BIT     #SW13,@SWR              ;OTHERWISE SEE IF A SUMMARY
1219 004500  001404                          BEQ     A6                      ;SHOULD BE TYPED.
1220 004502  032777  000200  174430          BIT     #SW7,@SWR
1221 004510  001461                          BEQ     ADONE
1222
1223 004512                          A6:                                     ;TYPE ERROR SUMMARY.
1224 004512  010237  001236                  MOV     R2,@#$TMP2
1225 004516  010337  001240                  MOV     R3,@#$TMP3
1226 004522  012737  004536  001116          MOV     #A7,@#$ERRPC
1227 004530  .2737   000002  001114          MOVB    #2,@#$ITEMB
1228 004536  004737  037602          A7:     JSR     PC,@#ERTYPE
1229 004542  000444                          BR      ADONE
1230
1231 004544  000000                  AERFLG:.WORD    0
1232
1233                                  ;UNABLE TO DECODE FPP INSTRUCTION. TRAPPED TO 244.
1234 004546  011637  001236          AERR1:  MOV     (SP),@#$TMP2            ;SAVE PC OF TRAP.
1235 004552  022626                          CMP     (SP)+,(SP)+
1236 004554  104010                  1$:     ERROR   +10
1237 004556  000436                          BR      ADONE
1238
1239                                  ;UNABLE TO DECODE INSTRUCTION. TRAPPED TO 10.
1240 004560  021627  004336          AERR2:  CMP     (SP),#A11+2             ;DID TRAP OCCUR OF FPP INSTRUCTION?
1241 004564  001405                          BEQ     1$
1242 004566  021627  004352                  CMP     (SP),#A12+2
1243 004572  001402                          BEQ     1$
1244 004574  000137  040304                  JMP     @#CPTWO                 ;IF NOT FPP INSTRUCTION THEN
1245                                                                          ;REPORT SPURIOUS TRAP TO 10.
1246
1247 004600  011637  001236          1$:     MOV     (SP),@#$TMP2            ;OTHERWISE REPORT IR DECIDE ERROR.
1248 004604  022626                          CMP     (SP)+,(SP)+
1249 004606  104011                  2$:     ERROR   +11
1250 004610  000421                          BR      ADONE
1251
1252                                  ;TRAP TO 4 HANDLER:
1253 004612  021627  004336          AERR3:  CMP     (SP),#A11+2             ;DID THE TRAP OCCUR ON THE
1254 004616  001405                          BEQ     1$                      ;LDFPS INSTRUCTION?
1255 004620  021627  004352                  CMP     (SP),#A12+2             ;OR THE STFPS INSTRUCTION?
1256 004624  001407                          BEQ     2$
1257 004626  000137  040266                  JMP     @#CPSPUR                ;IF NEITHER THEN REPORT
1258                                                                          ;UNEXPECTED TRAP TO 4.
1259
1260 004632  011637  001236          1$:     MOV     (SP),@#$TMP2
1261 004636  022626                          CMP     (SP)+,(SP)+
1262 004640  104014                  15$:    ERROR   +14
1263 004642  000404                          BR      ADONE
1264
1265 004644  011637  001236          2$:     MOV     (SP),@#$TMP2
1266 004650  022626                          CMP     (SP)+,(SP)+
1267 004652  104015                  25$:    ERROR   +15
1268
1269 004654                          ADONE:
     004654  104412                          RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                             ;SEE IF THE USER HAS EXPRESSED
                                             ;THE DESIRE TO CHANGE THE SOFTWARE
                                             ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                             ;THE USER TYPED CONTROL G?).
```

```
1270
1271
1277                                    ;;*****************************************************************
                                        ;*TEST 2        CFCC TEST
                                        ;*
                                        ;*THIS IS A TEST OF THE COPY CONDITION CODES INSTRUCTION, CFCC.
                                        ;*
                                        ;;*****************************************************************
     004656  000004                     TST2:   SCOPE
1278 004660  104413                             LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
1279 004662  012700  000017                     MOV     #17,R0          ;R0 CONTAINS TO TEST PATTERN.
1280
1281 004666                             B1:
1282 004666  170100                             LDFPS   R0              ;LOAD THE TEST PATTERN
1283
1284 004670                             B2:
1285 004670  170000                             CFCC                    ;COPY CONDITION CODES.
1286
1287 004672  013703  177776                     MOV     @#PSW,R3        ;SEE IF PATTERN TRANSFERED.
1288 004676  042703  177760                     BIC     #177760,R3
1289 004702  020003                             CMP     R0,R3
1290 004704  001002                             BNE     BERR
1291
1292 004706  077011                     B3:     SOB     R0,B1
1293 004710  000422                             BR      BDONE
1294
1295 004712                             BERR:
1296 004712  170201                             STFPS   R1              ;WAS FPS MODIFIED BY CFCC?
1297 004714  012737  004670  001236             MOV     #B2,@#$TMP2
```

```
1299
```

```
1301 004722  020001                        CMP     R0,R1
1302 004724  001006                        BNE     BERR1
1303
1304 004726  010337  001240                MOV     R3,@#$TMP3
1305 004732  010037  001242                MOV     R0,@#$TMP4
1306 004736  104003                1$:     ERROR   +3
1307 004740  000762                        BR      B3
1308
1309 004742                        BERR1:
1310 004742  010037  001240                MOV     R0,@#$TMP3
1311 004746  010137  001242                MOV     R1,@#$TMP4
1312 004752  104004                1$:     ERROR   +4
1313 004754  000754                        BR      B3
1314
1315 004756                        BDONE:
     004756  104412                        RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                                    ;SEE IF THE USER HAS EXPRESSED
                                                                    ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                    ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                    ;THE USER TYPED CONTROL G?).
1316
1325                                ;;******************************************************************
                                    ;*TEST 3        SETF, SETD, SETI AND SETL TEST
                                    ;*
                                    ;*THIS IS A TEST OF THE SETF, SETD, SETI AND SETL INSTRUCTIONS.
                                    ;*EACH INSTRUCTION IS EXECUTED WITH THE FPS CONTAINING
                                    ;*ALL ONES AND ALSO WITH THE FPS CLEAR. THE RESULT OF EACH
                                    ;* SITUATION IS CHECKED.
                                    ;*
                                    ;;******************************************************************
     004760  000004                 TST3:  SCOPE
1326 004762  104413                        LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
1327 004764  012737  000760  001244        MOV     #760,@#$TMP5
1328 004772  012737  000202  001250  C1:   MOV     #202,@#$TMP7
1329 005000  012737  041406  001252        MOV     #SETF1,@#$TMP10
1330 005006  005000                        CLR     R0
1331
1332 005010  170100                        LDFPS   R0                      ;CLEAR THE FPS.
1333 005012  012737  005020  001236        MOV     #C15,@#$TMP2
1334
1335 005020  170001                C15:    SETF                            ;TEST INSTRUCTION.
1336
1337 005022  170201                        STFPS   R1                      ;GET RESULT.
1338 005024  005002                        CLR     R2
1339 005026  020201                        CMP     R2,R1                   ;DID AN ERROR OCCUR?
1340 005030  001402                        BEQ     1$
1341 005032  004737  005416                JSR     PC,@#CERR1
1342
1343 005036                        1$:
     005036  104413                        LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
1344 005040  012700  147757          C2:   MOV     #147757,R0
1345
1346 005044  170100                        LDFPS   R0                      ;PUT 147757 IS FPS
1347 005046  012737  005054  001236        MOV     #C25,@#$TMP2
1348 005054  170001                C25:    SETF                            ;CLEAR FD BIT.
1349
1350 005056  170201                        STFPS   R1                      ;GET RESULT
```

```
1351 005060  012702  147557                MOV     #147557,R2
1352 005064  020102                        CMP     R1,R2                   ;RESULT CORRECT.
1353 005066  001402                        BEQ     1$
1354 005070  004737  005514                JSR     PC,@#CERR2
1355
1356 005074                          1$:
     005074  104413                        LPERR                           ;SET UP THE LOOP ON ERROR ADDRESS.
1357 005076  012737  000203  001250  C3:    MOV     #203,@#$TMP7
1358 005104  012737  041414  001252        MOV     #SETD1,@#$TMP10
1359 005112  012700  147757                MOV     #147757,R0
1360
1361 005116  170100                        LDFPS   R0                      ;LOAD 147757 INTO FPS.
1362 005120  012737  005126  001236        MOV     #C35,@#$TMP2
1363 005126  170011                  C35:  SETD                            ;SETD FD BIT.
1364
1365 005130  170201                        STFPS   R1
1366 005132  012702  147757                MOV     #147757,R2
1367 005136  020102                        CMP     R1,R2                   ;RESULT CORRECT?
1368 005140  001402                        BEQ     1$
1369 005142  004737  005514                JSR     PC,@#CERR2
1370
1371 005146                          1$:
     005146  104413                        LPERR                           ;SET UP THE LOOP ON ERROR ADDRESS.
1372 005150  005000                  C4.   CLR     R0
1373 005152  170100                        LDFPS   R0                      ;CLEAR FPS.
1374 005154  012737  005162  001236        MOV     #C45,@#$TMP2
1375
1376 005162  170011                  C45:  SETD                            ;SET FD BIT.
1377
1378 005164  170201                        STFPS   R1                      ;GET RESULT.
1379 005166  012702  000200                MOV     #200,R2
1380 005172  020102                        CMP     R1,R2                   ;RESULT CORRECT?
1381 005174  001402                        BEQ     1$
1382 005176  004737  005416                JSR     PC,@#CERR1
1383
1384 005202                          1$:
     005202  104413                        LPERR                           ;SET UP THE LOOP ON ERROR ADDRESS.
1385 005204  012737  000204  001250  C5:    MOV     #204,@#$TMP7
1386 005212  012737  041422  001252        MOV     #SETI1,@#$TMP10
1387 005220  005000                        CLR     R0
1388
1389 005222  170100                        LDFPS   R0                      ;CLEAR FPS
1390 005224  012737  005232  001236        MOV     #C55,@#$TMP2
1391
1392 005232  170002                  C55:  SETI                            ;CLEAR FL BIT.
1393
1394 005234  170201                        STFPS   R1                      ;GET RESULT.
1395 005236  005002                        CLR     R2
1396 005240  020201                        CMP     R2,R1                   ;RESULT CORRECT?
1397 005242  001402                        BEQ     1$
1398 005244  004737  005416                JSR     PC,@#CERR1
1399
1400 005250                          1$:
     005250  104413                        LPERR                           ;SET UP THE LOOP ON ERROR ADDRESS.
1401 005252  012700  147757          C6:   MOV     #147757,R0
1402 005256  170100                        LDFPS   R0                      ;PUT 147757 INTO FPS
1403 005260  012737  005266  001236        MOV     #C65,@#$TMP2
```

```
1404
1405 005266  170002                  C65:    SETI                            ;CLEAR FL BIT.
1406
1407 005270  170201                          STFPS   R1                      ;GET THE RESULT.
1408 005272  012702  147657                  MOV     #147657,R2
1409 005276  020102                          CMP     R1,R2                   ;RESULT CORRECT?
1410 005300  001402                          BEQ     1$
1411 005302  004737  005514                  JSR     PC,@#CERR2
1412
1413 005306                          1$:
     005306  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
1414 005310  012737  000205  001250  C7:     MOV     #205,@#$TMP7
1415 005316  012737  041430  001252          MOV     #SETL1,@#$TMP10
1416 005324  012700  147757                  MOV     #147757,R0
1417 005330  170100                          LDFPS   R0                      ;SET FPS TO 147757.
1418 005332  012737  005340  001236          MOV     #C75,@#$TMP2
1419
1420 005340  170012                  C75:    SETL                            ;SET FL BIT.
1421
1422 005342  170201                          STFPS   R1                      ;GET THE RESULT.
1423 005344  012702  147757                  MOV     #147757,R2
1424 005350  020102                          CMP     R1,R2                   ;RESULT CORRECT?
1425 005352  001402                          BEQ     1$
1426 005354  004737  005514                  JSR     PC,@#CERR2
1427
1428 005360                          1$:
     005360  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
1429 005362  005000                  C8:     CLR     R0
1430 005364  170100                          LDFPS   R0                      ;CLEAR FPS.
1431 005366  012737  005374  00.236          MOV     #C85,@#$TMP2
1432
1433 005374  170012                  C85:    SETL                            ;SET FL BIT.
1434
1435 005376  170201                          STFPS   R1
1436 005400  012702  000100                  MOV     #100,R2
1437 005404  020102                          CMP     R1,R2                   ;RESULT CORRECT.
1438 005406  001402                          BEQ     1$
1439 005410  004737  005416                  JSR     PC,@#CERR1
1440
1441 005414  000522                  1$:     BR      CDONE
1442
1443                                  ;THESE ARE ERROR ANALYSIS ROUTINES:
1444 005416  010103                  CERR1:  MOV     R1,R3
1445 005420  032703  177477                  BIT     #177477,R3              ;ARE ANY OTHER BITS SET?
1446 005424  001401                          BEQ     2$
1447 005426  000503                  1$:     BR      CERR4
1448
1449 005430  022703  000300          2$:     CMP     #300,R3                 ;ARE BOTH FD AND FL SET?
1450 005434  001774                          BEQ     1$
1451 005436  032703  000300                  BIT     #300,R3                 ;ARE THEY BOTH CLEAR?
1452 005442  001771                          BEQ     1$
1453
1454 005444  032703  000200                  BIT     #200,R3                 ;IS FD SET?
1455 005450  001407                          BEQ     3$
1456 005452  012737  041414  001254          MOV     #SETD1,@#$TMP11
1457 005460  012737  000203  001246          MOV     #203,@#$TMP6
1458 005466  000452                          BR      CERR3
```

```
1459
1460 005470  032703  000100          3$:     BIT     #100,R3                 ;IS FL SET
1461 005474  001754                          BEQ     1$
1462 005476  012737  041430  001254          MOV     #SETL1,@#$TMP11
1463 005504  012737  000205  001246          MOV     #205,@#$TMP6
1464 005512  000440                          BR      CERR3
1465
1466 005514  010103                  CERR2:  MOV     R1,R3
1467 005516  005103                          COM     R3
1468
1469 005520  032703  177477                  BIT     #177477,R3              ;ARE ANY OTHFR BITS SET?
1470 005524  001401                          BEQ     2$
1471 005526  000443                  1$:     BR      CERR4
1472
1473 005530  032703  000300          2$:     BIT     #300,R3                 ;ARE BOTH FD AND FL SET?
1474 005534  001774                          BEQ     1$
1475 005536  032701  000300                  BIT     #300,R1                 ;ARE THEY BOTH CLEAR?
1476 005542  001771                          BEQ     1$
1477
1478 005544  032701  000200                  BIT     #200,R1                 ;IS FD CLEAR?
1479 005550  001007                          BNE     3$
1480 005552  012737  041406  001254          MOV     #SETF1,@#$TMP11
1481 005560  012737  000202  001246          MOV     #202,@#$TMP6
1482 005566  000412                          BR      CERR3
1483
1484 005570  032701  000100          3$:     BIT     #100,R1
1485 005574  001354                          BNE     1$                      ;IS FL CLEAR.
1486 005576  012737  041422  001254          MOV     #SETI1,@#$TMP11
1487 005604  012737  000204  001246          MOV     #204,@#$TMP6
1488 005612  000400                          BR      CERR3
1489
1490                                  ;REPORT THE ERRORS:
1491 005614                           CERR3:
1492 005614  010137  001240                  MOV     R1,@#$TMP3
1493 005620  010237  001242                  MOV     R2,@#$TMP4
1494 005624  012637  005660                  MOV     (SP)+,@#CPC
1495 005630  104012                  1$.     ERROR   +12
1496 005632  000177  000022                  JMP     @CPC
1497
1498 005636                           CERR4:
1499 005636  010137  001240                  MOV     R1,@#$TMP3
1500 005642  010237  001242                  MOV     R2,@#$TMP4
1501 005646  012637  005660                  MOV     (SP)+,@#CPC
1502 005652  104013                  1$:     ERROR   +13
1503 005654  000177  000000                  JMP     @CPC
1504
1505 005660  000000                  CPC:    .WORD   0
1506
1507 005662                           CDONE:
     005662  104412                          RSETUP                          ;GO INITIALIZE THE FPS AND STACK; ANL
                                                                             ;SEE IF THE USER HAS EXPRESSED
                                                                             ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                             ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                             ;THE USER TYPED CONTROL G?).
1508
1509
1529                                  ;;*****************************************************************
```

```
                                        ;*TEST 4        ILLEGAL FPP OP CODES AND STST TEST
                                        ;*
                                        ;*THIS IS A TEST OF THE FPP OPERATION CODES:
                                        ;*                      170003
                                        ;*                      170004
                                        ;*                        :
                                        ;*                      170010
                                        ;*                      170013
                                        ;*                      170014
                                        ;*                        :
                                        ;*                      170077
                                        ;*THESE ARE ILLEGAL INSTRUCTIONS AND (WITH INTERRUPTS ENABLED)
                                        ;*SHOULD CAUSE A TRAP TO 244.
                                        ;*ALSO TESTED HERE IS THE INSTRUCTION:
                                        ;*              STST    R1
                                        ;*WHICH SHOULD PUT THE FEC CODE 2 IN R1, AFTER ANY OF THE ABOVE
                                        ;*OP CODES IS EXECUTED.
                                        ;*
                                        ;;*****************************************************************
     005664  000004                     TST4:   SCOPE
1530 005666  104413                             LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
1531 005670  012705  170003                     MOV     #170003,R5      ;INITIAL OP CODE.
1532 005674  012737  006100  000004             MOV     #DERR2,@#ERRVECT
1533 005702  012737  006004  000244             MOV     #DERR1,@#FPVECT
1534
1535 005710  005000                     D1:     CLR     R0
1536 005712  170100                             LDFPS   R0              ;CLEAR FPS.
1537 005714  005002                             CLR     R2
1538 005716  010537  005734                     MOV     R5,@#D2         ;SET UP THE ILLEGAL INSTRUCTION.
1539 005722  010537  001244                     MOV     R5,@#$TMP5
1540 005726  012737  005734  001236             MOV     #D2,@#$TMP2
1541 005734  000000                     D2:     .WORD   0
1542 005736  170000                     D3:     CFCC
1543 005740  005202                             INC     R2
1544 005742  005202                     D4:     INC     R2
1545
1546 005744  170201                             STFPS   R1              ;REPORT FAILURE. DID NOT TRAP.
1547 005746  010137  001240                     MOV     R1,@#$TMP3
1548 005752  104016                     1$:     ERROR   +16
1549
1550 005754  022705  170010             D5:     CMP     #170010,R5      ;COMPUTE NEXT OP CODE
1551 005760  001003                             BNE     D6
1552 005762  012705  170013                     MOV     #170013,R5
1553 005766  000750                             BR      D1
1554
1555 005770  022705  170077             D6:     CMP     #170077,R5
1556 005774  001001                             BNE     D7
1557 005776  000452                             BR      DDONE
1558 006000  005205                     D7:     INC     R5
1559 006002  000742                             BR      D1
1560
1561 006004  022716  005736             DERR1:  CMP     #D3,(SP)        ;DID TRAP OCCUR ON TEST INSTRUCTION?
1562 006010  001402                             BEQ     1$
1563 006012  000137  040234                     JMP     @#FPSPUR
1564
1565 006016  022626                     1$:     CMP     (SP)+,(SP)+
1566 006020  170201                             STFPS   R1              ;GET THE FPS AND SEE IF IT IS
```

```
1567 006022  022701  100000              CMP     #100000,R1          ;SET CORRECTLY.
1568 006026  001406                      BEQ     3$
1569
1570 006030  012737  100000  001240      MOV     #100000,@#$TMP3
1571 006036  010137  001242              MOV     R1,@#$TMP4
1572 006042  104017              2$:     ERROR   +17
1573
1574 006044  012704  000001      3$:     MOV     #1,R4
1575 006050  170304              D8:     STST    R4                  ;GET THE FEC CODE. NOTE THAT
1576                                                                  ;IF THE DESTINATION MODE IS
1577                                                                  ;IMPROPERLY DECODED AN ODD
1578                                                                  ;ADDRESS TRAP TO 4 SHOULD OCCUR.
1579 006052  022704  000002              CMP     #2,R4               ;WAS FEC CORRECT?
1580 006056  001001                      BNE     D9
1581 006060  000735                      BR      D5
1582
1583 006062                      D9:                                 ;REPORT STST FAILURE
1584 006062  012737  006050  001240      MOV     #D8,@#$TMP3
1585 006070  010437  001242              MOV     R4,@#$TMP4
1586 006074  104020              1$:     ERROR   +20
1587 006076  000726                      BR      D5
1588
1589 006100  022716  006052      DERR2:  CMP     #D8+2,(SP)          ;DID THE TRAP OCCUR ON THE
1590 006104  001402                      BEQ     D10                 ;STST INSTRUCTION?
1591 006106  000137  040266              JMP     @#CPSPUR
1592
1593 006112                      D10:
1594 006112  011637  001236              MOV     (SP),@#$TMP2
1595 006116  022626                      CMP     (SP)+,(SP)+
1596 006120  104021              1$:     ERROR   +21
1597 006122  000714                      BR      D5
1598
1599 006124                      DDONE:
     006124  104412                      RSETUP                      ;GO INITIALIZE THE FPS AND STACK; AND
                                                                     ;SEE IF THE USER HAS EXPRESSED
                                                                     ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                     ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                     ;THE USER TYPED CONTROL G?).
1600
1601
1609                                 ;;******************************************************************
                                     ;*TEST 5        FID, INTERRUPT DISABLE, BIT TEST
                                     ;*
                                     ;*THIS IS A TEST OF FPS BIT 14 (FID) OR FLOATING INTERRUPT DISABLE.
                                     ;*AN ILLEGAL INSTRUCTION IS EXECUTED WITH FID=1. NO INTERRUPT SHOULD
                                     ;*OCCUR.
                                     ;*
                                     ;;******************************************************************
     006126  000004      TST5:   SCOPE
1610 006130  104413              LPERR                               ;SET UP THE LOOP ON ERROR ADDRESS.
1611 006132  012737  006234  000244      MOV     #EERR2,@#FPVECT     ;SETUP FOR THE INTERRUPT.
1612
1613 006140  012700  040000      E1:     MOV     #40000,R0
1614 006144  170100              LDFPS   R0                          ;SET FID.
1615 006146  012737  006154  001236      MOV     #E3,@#$TMP2
1616 006154                      E2:
1617 006154  170020              E3:     .WORD   170020              ;ILLEGAL FPP INSTRUCTION.
```

```
1618 006156  170000                E4:     CFCC
1619
1620 006160  170201                        STFPS   R1                      ;SEE IF ERROR WAS DETECTED.
1621 006162  022701  140000                CMP     #140000,R1
1622 006166  001005                        BNE     EERR0
1623
1624 006170  170304                        STST    R4                      ;SEE IF FEC=2
1625 006172  022704  000002                CMP     #2,R4
1626 006176  001010                        BNE     EERR1
1627 006200  000431                        BR      EDONE
1628
1629 006202                        EERR0:                                  ;REPORT FPS INCORRECTLY SET.
1630 006202  010137  001240                MOV     R1,@#$TMP3
1631 006206  012737  140000  001242        MOV     #140000,@#$TMP4
1632 006214  104022                1$:     ERROR   +22
1633 006216  000422                        BR      EDONE
1634
1635 006220                        EERR1:                                  ;REPORT FEC NOT 2.
1636 006220  010537  001240                MOV     R5,@#$TMP3
1637 006224  010437  001242                MOV     R4,@#$TMP4
1638 006230  104023                1$:     ERROR   +23
1639 006232  000414                        BR      EDONE
1640
1641 006234  021627  006156        EERR2:  CMP     (SP),#E4                ;DID THE ILLEGAL INSTRUCTION TRAP:
1642 006240  001402                        BEQ     1$
1643 006242  000137  040234                JMP     @#FPSPUR
1644
1645 006246                        1$:
1646 006246  011637  001236                MOV     (SP),@#$TMP2
1647 006252  022626                        CMP     (SP)+,(SP)+
1648 006254  170201                        STFPS   R1
1649 006256  010137  001240                MOV     R1,@#$TMP3
1650 006262  104024                2$:     ERROR   +24
1651
1652 006264                        EDONE:
     006264  104412                        RSETUP                          ;GO INITIALIZE THE FPS AND STACK; AND
                                                                           ;SEE IF THE USER HAS EXPRESSED
                                                                           ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                           ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                           ;THE USER TYPED CONTROL G?).
1653
1654
1667                                    ;;*****************************************************************
                                        ;*TEST 6        LDD AND STD, WITH SRC AND DST MODE 1, TEST
                                        ;*
                                        ;*THIS IS A TEST OF BOTH THE INSTRUCTION:
                                        ;*              LDD     (R0),AC0
                                        ;*AND THE INSTRUCTION:
                                        ;*              STD     AC0,(R0)
                                        ;*MOST OF THE FAILURES ARE ISOLATED TO THE SRC OR DST FLOWS. NOTE
                                        ;*THAT THE INTEGRITY OF AC0 HAS NOT BEEN ASSURED. THIS MEANS THAT
                                        ;*IN SOME CASES IT WILL BE IMPOSSIBLE TO ISOLATE CERTAIN DATA PATTERN
                                        ;*FAILURES TO EITHER THE FLOWS OR THIS ACCUMULATOR.
                                        ;*
                                        ;;*****************************************************************
     006266  000004                     TST6:   SCOPE
1668
```

```
006270                            F1:
006270  104413                            LPERR                          ;SET UP THE LOOP ON ERROR ADDRESS.
006272  012737  006342  001236            MOV     #F3,@#$TMP2
006300  005000                            CLR     R0
006302  170100                            LDFPS   R0
006304  170011                            SETD
006306  012701  010074                    MOV     #FDATI0,R1             ;SET UP THE LOAD DATA.
006312  012702  010140                    MOV     #FXDAT0,R2
006316  012703  000010                    MOV     #10,R3

006322  012221                    F2:     MOV     (R2)+,(R1)+
006324  077302                            SOB     R3,F2

006326  012700  010104                    MOV     #FDATI4,R0             ;SETUP R0 FOR THE LDD (R0),AC0.
006332  012737  007560  000004            MOV     #FERR20,@#ERRVECT      ;IF THE SRC FLOWS FAIL THEN
                                                                         ;AN ODD ADDRESS MAY OCCUR.
006340  005003                            CLR     R3

006342  172410                    F3:     LDD     (R0),AC0
006344  005203                    F4:     INC     R3
006346  005203                            INC     R3

006350  020027  010104                    CMP     R0,#FDATI4             ;WAS R0 AFFECTED?
006354  001402                            BEQ     F5
006356  000137  006724                    JMP     @#FERR1

006362  020327  000002            F5:     CMP     R3,#2                  ;SEE IF THE PC WAS ADVERSELY
006366  001402                            BEQ     1$                     ;AFFECTED DURING THE INSTRUCTION.
006370  000137  007022                    JMP     @#FERR2

006374  012701  010074            1$:     MOV     #FDATI0,R1             ;MAKE SURE THE SOURCE DATA WAS
006400  012702  010140                    MOV     #FXDAT0,R2             ;NOT AFFECTED.
006404  012703  000010                    MOV     #10,R3
006410  022122                    2$:     CMP     (R1)+,(R2)+
006412  001402                            BEQ     3$
006414  000137  006666                    JMP     @#FERR0
006420  077305                    3$:     SOB     R3,2$

006422  170201                            STFPS   R1                     ;MAKE SURE THE FPS IS CORRECT.
006424  022701  000200                    CMP     #200,R1
006430  001402                            BEQ     F6
006432  000137  007540                    JMP     @#FERR11

006436                            F6:
006436  104413                            LPERR                          ;SET UP THE LOOP ON ERROR ADDRESS.
006440  012737  006502  001236            MOV     #F10,@#$TMP2

006446  012703  177777                    MOV     #-1,R3
006452  012704  000010                    MOV     #10,R4
006456  012705  010116                    MOV     #FDAT00,R5             ;SET UP THE OUTPUT DATA BUFFER.
006462  010325                    F7:     MOV     R3,(R5)+
006464  077402                            SOB     R4,F7

006466  012700  010126                    MOV     #FDAT04,R0             ;SET UP R0 FOR DST MODE 1 REG 0.
006472  012737  007726  000004            MOV     #FERR25,@#ERRVECT      ;IF THE DST FLOWS FAIL AN ODD
                                                                         ;ADDRESS COULD OCCUR.
006500  005003                            CLR     R3
```

```
1724
1725 006502  174010                F10:    STD     AC0,(R0)            ;TEST INSTRUCTION.
1726 006504  005203                F11:    INC     R3
1727 006506  005203                        INC     R3
1728
1729 006510  020027  010126                CMP     R0,#FDAT04          ;WAS R0 MODIFIED?
1730 006514  001402                        BEQ     F12
1731 006516  000137  007062                JMP     @#FERR3
1732
1733 006522  020327  000002        F12:    CMP     R3,#2               ;WAS THE PC AFFECTED CORRECTLY?
1734 006526  001402                        BEQ     F135
1735 006530  000167  000320                JMP     FERR4
1736
1737 006534  012701  010116        F135:   MOV     #FDAT00,R1
1738 006540  012702  010140                MOV     #FXDAT0,R2
1739
1740 006544  022122                        CMP     (R1)+,(R2)+         ;SEE IF THE DATA WAS OUTPUT
1741 006546  001402                        BEQ     F13                 ;TO THE TARGET AREA CORRECTLY.
1742 006550  000137  007160                JMP     @#FERR5
1743
1744 006554  022122                F13:    CMP     (R1)+,(R2)+
1745 006556  001402                        BEQ     F14
1746 006560  000137  007160                JMP     @#FERR5
1747
1748 006564  022122                F14:    CMP     (R1)+,(R2)+
1749 006566  001402                        BEQ     F15
1750 006570  000137  007160                JMP     @#FERR5
1751
1752 006574  022122                F15:    CMP     (R1)+,(R2)+
1753 006576  001402                        BEQ     F16
1754 006600  000137  007160                JMP     @#FERR5
1755
1756 006604  022122                F16:    CMP     (R1)+,(R2)+
1757 006606  001402                        BEQ     F17
1758 006610  000137  007504                JMP     @#FERR10
1759
1760 006614  022122                F17:    CMP     (R1)+,(R2)+
1761 006616  001402                        BEQ     F20
1762 006620  000137  007214                JMP     @#FERR6
1763
1764 006624  022122                F20:    CMP     (R1)+,(R2)+
1765 006626  001402                        BEQ     F21
1766 006630  000167  000514                JMP     FERR7
1767
1768 006634  022122                F21:    CMP     (R1)+,(R2)+
1769 006636  001402                        BEQ     F22
1770 006640  000137  007504                JMP     @#FERR10
1771
1772 006644  005001                F22:    CLR     R1
1773 006646  170201                        STFPS   R1                  ;MAKE SURE FPS IS CORRECT.
1774 006650  022701  000200                CMP     #200,R1
1775 006654  001402                        BEQ     F23
1776 006656  000137  007540                JMP     @#FERR11
1777 006662  000137  010160        F23:    JMP     @#FDONE
1778
1779 006666                        FERR0:                              ;SOURCE DATA AFFECTED BY
1780 006666  012737  010140  001240        MOV     #FXDAT0,@#$TMP3     ;THE LDD INSTRUCTION.
```

```
1781 006674  012737  010152  001242          MOV     #FXDAT0+12,@#$TMP4
1782 006702  012737  010074  001244          MOV     #FDATI0,@#$TMP5
1783 006710  012737  010106  001246          MOV     #FDATI0+12,@#$TMP6
1784 006716  104025                  1$:     ERROR   +25
1785 006720  000137  010160                  JMP     @#FDONE
1786
1787 006724  012737  010104  001242  FERR1:  MOV     #FDATI4,@#$TMP4         ;FSRC FLOWS FAILURE.
1788 006732  010037  001240                  MOV     R0,@#$TMP3
1789 006736  012737  000762  001244          MOV     #762,@#$TMP5
1790 006744  012737  000321  001250          MOV     #321,@#$TMP7
1791
1792 006752  022700  010074                  CMP     #FDATI0,R0              ;FSRC MODE 4?
1793 006756  001004                          BNE     1$
1794 006760  012737  000324  001246          MOV     #324,@#$TMP6
1795 006766  000412                          BR      4$
1796
1797 006770  022700  010114          1$:     CMP     #FDATI4+10,R0           ;FSRC MODE 2?
1798 006774  001004                          BNE     2$
1799 006776  012737  000322  001246          MOV     #322,@#$TMP6
1800 007004  000403                          BR      4$
1801
1802 007006                          2$:
1803 007006  104027                  3$:     ERROR   +27
1804 007010  000137  010160                  JMP     @#FDONE
1805
1806 007014                          4$:
1807 007014  104026                  5$:     ERROR   +26
1808 007016  000137  010160                  JMP     @#FDONE
1809
1810 007022  012701  006344          FERR2:  MOV     #F4,R1                  ;THE PC WAS INCORRECTLY AFFECTED
1811                                                                          ;DURING THE INSTRUCTION.
1812 007026  010137  001242          FER2:   MOV     R1,@#$TMP4
1813 007032  162701  000004                  SUB     #4,R1
1814 007036  006303                          ASL     R3
1815 007040  060301                          ADD     R3,R1
1816 007042  010137  001240                  MOV     R1,@#$TMP3
1817 007046  104030                  1$:     ERROR   +30
1818 007050  000137  010160                  JMP     @#FDONE
1819
1820 007054  012701  006504          FERR4:  MOV     #F11,R1
1821 007060  000762                          BR      FER2
1822
1823 007062  012737  010126  001242  FERR3:  MOV     #FDAT04,@#$TMP4         ;FAILURE IN THE FDST FLOWS.
1824 007070  010037  001240                  MOV     R0,@#$TMP3
1825 007074  012737  000527  001244          MOV     #527,@#$TMP5
1826 007102  012737  000641  001250          MOV     #641,@#$TMP7
1827
1828 007110  022700  010116                  CMP     #FDAT00,R0              ;DST MODE 4?
1829 007114  001004                          BNE     1$
1830 007116  012737  000644  001246          MOV     #644,@#$TMP6
1831 007124  000412                          BR      4$
1832
1833 007126  022700  010136          1$:     CMP     #FDAT04+10,R0           ;DST MODE 2?
1834 007132  001004                          BNE     2$
1835 007134  012737  000642  001246          MOV     #642,@#$TMP6
1836 007142  000403                          BR      4$
1837
```

```
1838 007144                          2$:
1839 007144  104032                  3$:     ERROR   +32
1840 007146  000137  010160                  JMP     @#FDONE
1841
1842 007152                          4$:
1843 007152  104031                  5$:     ERROR   +31
1844 007154  000137  01016C                  JMP     @#FDONE
1845
1846 007160                          FERR5:                          ;FAILURE OF STD.
1847 007160  010037  001240                  MOV     R0,@#$TMP3
1848 007164  012737  010116  001242          MOV     #FDAT00,@#$TMP4
1849 007172  012737  010134  001244          MOV     #FDAT07,@#$TMP5
1850 007200  012737  010140  001246          MOV     #FXDAT0,@#$TMP6
1851 007206  104033                  1$:     ERROR   +33
1852 007210  000137  010160                  JMP     @#FDONE
1853
1854 007214  012701  010130          FERR6:  MOV     #FDAT05,R1      ;DID (BUT GR7) FAIL IN THE FDST
1855 007220  012702  177777                  MOV     #-1,R2          ;FLOWS?
1856 007224  012703  000003                  MOV     #3,R3
1857 007230  020221                  1$:     CMP     R2,(R1)+
1858 007232  001017                          BNE     5$
1859 007234  077303                          SOB     R3,1$
1860
1861                                                                  ;REPORT FAILURE OF (BUT GR7) IN
1862 007236  010037  001240                  MOV     R0,@#$TMP3      ;THE FDST FLOWS.
1863 007242  012737  000412  001244          MOV     #412,@#$TMP5
1864 007250  012737  000147  001246          MOV     #147,@#$TMP6
1865 007256  012737  000145  001250          MOV     #145,@#$TMP7
1866 007264  104034                  2$:     ERROR   +34
1867 007266  000137  010160                  JMP     @#FDONE
1868
1869 007272  012701  010130          5$:     MOV     #FDAT05,R1      ;DID (BUT GR7) FAIL IN THE SRC FLOWS?
1870 007276  012703  000003                  MOV     #3,R3
1871 007302  005721                  6$:     TST     (R1)+
1872 007304  001402                          BEQ     7$
1873 007306  000137  007504                  JMP     @#FERR10
1874 007312  077305                  7$:     SOB     R3,6$
1875
1876                                                                  ;REPORT FAILURE OF (BUT GR7) IN
1877 007314  010037  001240                  MOV     R0,@#$TMP3      ;THE FSRC FLOWS.
1878 007320  012737  000207  001244          MOV     #207,@#$TMP5
1879 007326  012737  000176  001246          MOV     #176,@#$TMP6
1880 007334  012737  000174  001250          MOV     #174,@#$TMP7
1881
1882 007342  104035                  10$:    ERROR   +35
1883 007344  000137  010160                  JMP     @#FDONE
1884
1885 007350  012701  010132          FERR7:  MOV     #FDAT06,R1      ;DID (BUT FD) FAIL IN THE FDST FLOWS?
1886 007354  012702  177777                  MOV     #-1,R2
1887 007360  012703  000002                  MOV     #2,R3
1888 007364  020221                  1$:     CMP     R2,(R1)+
1889 007366  001017                          BNE     5$
1890 007370  077303                          SOB     R3,1$
1891
1892                                                                  ;REPORT FAILURE OF (BUT FD) IN THE
1893 007372  010037  001240                  MOV     R0,@#$TMP3      ;FDST FLOWS.
1894 007376  012737  000707  001244          MOV     #707,@#$TMP5
```

```
1895 007404  012737  000244  001246          MOV     #244,@#$TMP6
1896 007412  012737  000245  001250          MOV     #245,@#$TMP7
1897 007420  104036                  2$:     ERROR   +36
1898 007422  000137  010160                  JMP     @#FDONE
1899
1900 007426  012701  010132          5$:     MOV     #FDAT06,R1          ;DID (BUT FD) FAIL IN THE FSRC FLOWS?
1901 007432  012703  000002                  MOV     #2,R3
1902 007436  005721                  6$:     TST     (R1)+
1903 007440  001402                          BEQ     7$
1904 007442  000137  007504                  JMP     @#FERR10
1905 007446  077305                  7$:     SOB     R3,6$
1906
1907                                                                      ;REPORT FAILURE OF (BUT FD) IN THE
1908 007450  010037  001240                  MOV     R0,@#$TMP3          ;FSRC FLOWS.
1909 007454  012737  000441  001244          MOV     #441,@#$TMP5
1910 007462  012737  000076  001246          MOV     #76,@#$TMP6
1911 007470  012737  000077  001250          MOV     #77,@#$TMP7
1912 007476  104037                  10$:    ERROR   +37
1913 007500  000137  010160                  JMP     @#FDONE
1914
1915 007504                          FERR10: :                           ;REPORT DATA ERROR.
1916 007504  010037  001240                  MOV     R0,@#$TMP3
1917 007510  012737  010126  001242          MOV     #FDAT04,@#$TMP4
1918 007516  012737  010134  001244          MOV     #FDAT07,@#$TMP5
1919 007524  012737  010150  001246          MOV     #FXDAT4,@#$TMP6
1920 007532  104040                  1$:     ERROR   +40
1921 007534  000137  010160                  JMP     @#FDONE
1922
1923 007540                          FERR11: :                           ;REPORT BAD FPS.
1924 007540  010137  001240                  MOV     R1,@#$TMP3
1925 007544  012737  000200  001242          MOV     #200,@#$TMP4
1926 007552  104041                  1$:     ERROR   +41
1927 007554  000137  010160                  JMP     @#FDONE
1928
1929 007560  012737  040445  001264  FERR20: MOV     #NULL,@#$TMP15      ;THE EXECUTION OF THE LDD
1930 007566  005037  001252                  CLR     @#$TMP10            ;CAUSED A TRAP TO 4, BECAUSE
1931 007572  011637  001236                  MOV     (SP),@#$TMP2        ;A FSRC FLOW FAILURE RESULTED
1932 007576  012737  010104  001240          MOV     #FDATI4,@#$TMP3     ;IN AN ODD ADDRESS.
1933 007604  012737  000321  001250          MOV     #321,@#$TMP7
1934 007612  012737  000762  001244          MOV     #762,@#$TMP5
1935
1936 007620  021627  006346                  CMP     (SP),#F4+2          ;SEE IF FSRC MODE 6 OR 7 WAS
1937 007624  001424                          BEQ     FERR21              ;EXECUTED.
1938
1939 007626  020027  010102                  CMP     R0,#FDATI3          ;FSRC MODE 5?
1940 007632  001006                          BNE     2$
1941
1942                                                                      ;REPORT FSRC FLOW FAILURE TO
1943 007634  012737  000325  001246          MOV     #325,@#$TMP6        ;MODE 5.
1944 007642  022626                          CMP     (SP)+,(SP)+
1945 007644  104042                  1$:     ERROR   +42
1946 007646  000544                          BR      FDONE
1947
1948 007650  020027  010106          2$:     CMP     R0,#FDATI5          ;FSRC MODE 3?
1949 007654  001402                          BEQ     3$
1950 007656  000137  040266                  JMP     @#CPSPUR
1951
```

```
1952 007662                          3$:                                ;REPORT FSRC     FLOW FAILURE TO
1953 007662  012737  000323  001246          MOV     #323,@#$TMP6        ;MODE 3.
1954 007670  022626                          CMP     (SP)+,(SP)+
1955 007672  104042                  4$:     ERROR   +42
```

```
1957 007674  000531                          BR      FDONE
1958
1959 007676  022626                FERR21:   CMP     (SP)+,(SP)+          ;REPORT FSRC FLOW FAILURE TO
1960                                                                       ;MODE 6 OR MODE 7.
1961 007700  012737  042212  001264          MOV     #MS16,@#$TMP15
1962 007706  012737  000326  001246          MOV     #326,@#$TMP6
1963 007714  012737  000327  001252          MOV     #327,@#$TMP10
1964 007722  104042                1$:       ERROR   +42
1965 007724  000515                          BR      FDONE
1966
1967 007726  012737  040445  001264  FERR25: MOV     #NULL,@#$TMP15       ;THE EXECUTION OF THE STD INSTRUCTION
1968 007734  005037  001252                  CLR     @#$TMP10             ;TRAPPED TO 4, BECAUSE A FAILURE
1969 007740  012737  010126  001240          MOV     #FDAT04,@#$TMP3      ;IN THE FDST FLOWS RESULTED
1970 007746  011637  001236                  MOV     (SP),@#$TMP2         ;IN AN ODD ADDRESS.
1971 007752  012737  000527  001244          MOV     #527,@#$TMP5
1972 007760  012737  000641  001250          MOV     #641,@#$TMP7
1973
1974 007766  021627  006504                  CMP     (SP),#F10+2          ;FLOW FAILURE TO FDST MODE 6 OR 7?
1975 007772  001424                          BEQ     FERR26
1976
1977 007774  020027  010124                  CMP     R0,#FDAT03           ;DID FDST FLOW FAIL TO MODE 5?
1978 010000  001006                          BNE     2$
1979
1980                                                                       ;REPORT FLOW FAILURE TO FDST
1981 010002  012737  000645  001246          MOV     #645,@#$TMP6         ;MODE 5.
1982 010010  022626                          CMP     (SP)+,(SP)+
1983 010012  104043                1$:       ERROR   +43
1984 010014  000461                          BR      FDONE
1985
1986 010016  020027  010130          2$:     CMP     R0,#FDAT05           ;DID FDST FLOW FAIL TO MODE 3?
1987 010022  001402                          BEQ     3$
1988 010024  000137  040266                  JMP     @#CPSPUR
1989
1990 010030                        3$:                                    ;REPORT FDST FLOW FAILED TO MODE 3.
1991 010030  012737  000643  001246          MOV     #643,@#$TMP6
1992 010036  022626                          CMP     (SP)+,(SP)+
1993 010040  104043                4$:       ERROR   +43
1994 010042  000446                          BR      FDONE
1995
1996 010044                        FERR26:                                ;REPORT FDST FLOW FAILURE TO MODE
1997 010044  012737  042212  001264          MOV     #MS16,@#$TMP15       ;6 OR MODE 7.
1998 010052  012737  000646  001246          MOV     #646,@#$TMP6
1999 010060  012737  000647  001252          MOV     #647,@#$TMP10
2000 010066  022626                          CMP     (SP)+,(SP)+
2001 010070  104043                1$:       ERROR   +43
2002 010072  000432                          BR      FDONE
2003
2004 010074  177777                FDATI0: -1
2005 010076  177777                FDATI1: -1
2006 010100  177777                FDATI2: -1
2007 010102  177777                FDATI3: -1
2008 010104  177777                FDATI4: -1
2009 010106  177777                FDATI5: -1
2010 010110  177777                FDATI6: -1
2011 010112  177777                FDATI7: -1
2012 010114  177777                        -1
2013 010116  177777                FDAT00: -1
```

```
                        FDAT01: -1
                        FDAT02: -1
                        FDAT03: -1
                        FDAT04: -1
                        FDAT05: -1
                        FDAT06: -1
                        FDAT07: -1
                                -1
                        FXDAT0: -1
                        FXDAT1: -1
                        FXDAT2: -1
                        FXDAT3: -1
                        FXDAT4: 052525
                        FXDAT5: 031463
                        FXDAT6: 007417
                        FXDAT7: 000477

                        FDONE:
                                RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                        ;SEE IF THE USER HAS EXPRESSED
                                                        ;THE DESIRE TO CHANGE THE SOFTWARE
                                                        ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                        ;THE USER TYPED CONTROL G?).


                        ;;*******************************************************************
                        ;*TEST 7        FSRC MODE 0 TEST
                        ;*
                        ;*THIS IS A TEST OF FSRC MODE ZERO USING THE LDD AND LDF INSTRUCTIONS.
                        ;*
                        ;;*******************************************************************
010162  000004          TST7:   SCOPE
010164  104413                  LPERR                  ;SET UP THE LOOP ON ERROR ADDRESS.

010166                  I1:
010166  170011                  SETD                                   ;SET FD.
010170  012700  011012          MOV     #IDAT10,R0
010174  012701  010762          MOV     #IPAT10,R1
010200  012702  000004          MOV     #4,R2
010204  012120          I2:     MOV     (R1)+,(R0)+            ;SET UP THE INPUT DATA BUFFER.
010206  077202                  SOB     R2,I2

010210  012700  011012          MOV     #IDAT10,R0             ;LOAD AC1
010214  172510                  LDD     (R0),AC1

010216  012700  010772          MOV     #IPAT20,R0             ;LOAD AC0
010222  172410                  LDD     (R0),AC0

010224  012701  000001          MOV     #1,R1                  ;IN CASE THE FSRC F OWS FAIL
010230  012737  010562  000004  MOV     #IERR0,@#ERRVECT       ;AN ODD ADDRESS TRAP TO 4 MAY OCCUR.
010236  012737  010252  001236  MOV     #I3,@#$TMP2
010244  012737  042672  001240  MOV     #MS35,@#$TMP3
010252  172401          I3:     LDD     AC1,AC0                ;TEST INSTRUCTION.
010254  000240          I4:     NOP
010256  000240          I5:     NOP
```

```
2065 010260  012700  011002            MOV     #IDAT00,R0
2066 010264  174010                    STD     AC0,(R0)                ;GET AC0, THE RESULTS.
2067
2068 010266  012700  011002            MOV     #IDAT00,R0              ;SEE IF DATA IS CORRECT.
2069 010272  012701  011012            MOV     #IDAT10,R1
2070 010276  012702  000004            MOV     #4,R2
2071 010302  022021            I6:     CMP     (R0)+,(R1)+
2072 010304  001424                    BEQ     I105
2073
2074 010306  012700  011006            MOV     #IDAT02,R0              ;SEE IF (BUT FD) FAILED.
2075 010312  012702  000002            MOV     #2,R2
2076 010316  005720            I7:     TST     (R0)+
2077 010320  001413                    BEQ     I10
2078
2079 010322  012700  011006            MOV     #IDAT02,R0
2080 010326  012702  000002            MOV     #2,R2
2081 010332  022720  177777    1$:     CMP     #-1,(R0)+
2082 010336  001402                    BEQ     2$
2083 010340  000137  010644            JMP     @#IERR1
2084 010344  077206            2$:     SOB     R2,1$
2085 010346  000401                    BR      I106
2086 010350  077216            I10:    SOB     R2,I7
2087 010352  000137  010664    I106:   JMP     @#IERR2
2088
2089 010356  077227            I105:   SOB     R2,I6
2090
2091                            ;NOW TEST THE LOAD INSTRUCTION WITH FSRC MODE ZERO AND FD CLEAR.
2092
2093 010360                     I11:
     010360  104413                    LPERR                           ;SET UP THE LOOP ON ERROR ADDRESS.
2094
2095 010362  012700  010762    I12:    MOV     #IPAT10,R0
2096 010366  012701  011012            MOV     #IDAT10,R1
2097 010372  012702  000004            MOV     #4,R2
2098 010376  012021            I13:    MOV     (R0)+,(R1)+
2099 010400  077202                    SOB     R2,I13
2100
2101 010402  012700  011012            MOV     #IDAT10,R0              ;SET UP AC1
2102 010406  172510                    LDD     (R0),AC1
2103
2104 010410  012700  010772            MOV     #IPAT20,R0              ;SET UP AC0
2105 010414  172410                    LDD     (R0),AC0
2106
2107 010416  012701  000001            MOV     #1,R1
2108 010422  012737  010440  001236    MOV     #I14,@#$TMP2
2109 010430  012737  042677  001240    MOV     #MS36,@#$TMP3
2110 010436  170001                    SETF                            ;CLEAR FD.
2111
2112 010440  172401            I14:    LDF     AC1,AC0                 ;TEST INSTRUCTION.
2113 010442  000240            I15:    NOP
2114 010444  000240            I16:    NOP
2115
2116 010446  170200                    STFPS   R0                      ;SEE IF FPS IS STILL CLEAR.
2117 010450  022700  000004            CMP     #4,R0
2118 010454  001402                    BEQ     I17
2119 010456  000137  010736            JMP     @#IERR3
2120
```

```
2121 010462                          I17:                                   ;RESET TO DOUBLE MODE.
2122 010462  170011                          SETD
2123
2124 010464  012700  011002                  MOV     #IDAT00,R0
2125 010470  174010                          STD     AC0,(R0)               ;GET AC0
2126
2127 010472  012737  177777  011016          MOV     #-1,@#IDAT12
2128 010500  012737  177777  011020          MOV     #-1,@#IDAT13
2129 010506  012700  011002                  MOV     #IDAT00,R0
2130 010512  012701  011012                  MOV     #IDAT10,R1
2131 010516  012702  000004                  MOV     #4,R2
2132 010522  022021                  I20:    CMP     (R0)+,(R1)+            ;SEE IF AC0 WAS CORRECT.
2133 010524  001414                          BEQ     I23
2134
2135 010526  023737  011006  010766          CMP     @#IDAT02,@#IPAT12      ;DID (BUT FD) FAIL?
2136 010534  001402                          BEQ     I22
2137 010536  000137  010644          I21:    JMP     @#IERR1
2138 010542  023737  011010  010770  I22:    CMP     @#IDAT03,@#IPAT13
2139 010550  001372                          BNE     I21
2140 010552  000137  010712                  JMP     @#IERR4
2141
2142 010556  077217                  I23:    SOB     R2,I20
2143
2144 010560  000520                          BR      IDONE                  ;NO ERRORS.
2145
2146                                  ;IF AN ODD ADDRESS TRAP OCCURS COME HERE TO ANALYZE THE FSRC FAILURE.
2147 010562  022716  010254          IERR0:  CMP     #I4,(SP)               ;MAKE SURE THE TRAP OCCURRED
2148 010566  001413                          BEQ     1$                     ;ON THE INSTRUCTION BEING TESTED.
2149 010570  022716  010256                  CMP     #I5,(SP)
2150 010574  001410                          BEQ     1$
2151 010576  022716  010442                  CMP     #I15,(SP)
2152 010602  001405                          BEQ     1$
2153 010604  022716  010444                  CMP     #I16,(SP)
2154 010610  001402                          BEQ     1$
2155 010612  000137  040266                  JMP     @#CPSPUR
2156
2157 010616  011637  001236          1$:     MOV     (SP),@#$TMP2           ;REPORT FAILURE.
2158 010622  012737  000627  001240          MOV     #627,@#$TMP3
2159 010630  012737  000320  001242          MOV     #320,@#$TMP4
2160 010636  022626                          CMP     (SP)+,(SP)+
2161 010640  104047                  2$:     ERROR   +47
2162 010642  000467                          BR      IDONE
2163
2164                                  ;REPORT DATA ERROR.
2165 010644                           IERR1:
2166 010644  012737  011012  001242          MOV     #IDAT10,@#$TMP4
2167 010652  012737  011002  001244          MOV     #IDAT00,@#$TMP5
2168 010660  104051                  1$:     ERROP   +51
2169 010662  000457                          BR      IDONE
2170
2171                                  ;REPORT FAILURE OF (BUT FD)
2172 010664  012737  000153  001244  IERR2:  MOV     #153,@#$TMP5
2173 010672  012737  000434  001246          MOV     #434,@#$TMP6
2174 010700  012737  000435  001250          MOV     #435,@#$TMP7
2175 010706                           IERR25:
2176 010706  104050                  1$:     ERROR   +50
2177 010710  000444                          BR      IDONE
```

```
 2178 010712  012737  000153  001244  IERR4:  MOV     #153,@#$TMP5
 2179 010720  012737  000435  001246          MOV     #435,@#$TMP6
 2180 010726  012737  000434  001250          MOV     #434,@#$TMP7
 2181 010734  000764                          BR      IERR25
 2182
 2183                                 ;REPORT INCORRECT FPS AFTER LOAD INSTRUCTION.
 2184 010736                          IERR3:
 2185 010736  012737  010440  001236          MOV     #I14,@#$TMP2
 2186 010744  010037  001240                  MOV     R0,@#$TMP3
 2187 010750  012737  000004  001242          MOV     #4,@#$TMP4
 2188 010756  104041                  1$:     ERROR   +41
 2189 010760  000420                          BR      IDONE
 2190
 2191
 2192 010762  000000                  IPAT10: 0
 2193 010764  170360                  IPAT11: 170360
 2194 010766  016161                  IPAT12: 016161
 2195 010770  052525                  IPAT13: 052525
 2196
 2197 010772  177777                  IPAT20: -1
 2198 010774  177777                  IPAT21: -1
 2199 010776  177777                  IPAT22: -1
 2200 011000  177777                  IPAT23: -1
 2201
 2202 011002  000000                  IDAT00: 0
 2203 011004  000000                  IDAT01: 0
 2204 011006  000000                  IDAT02: 0
 2205 011010  000000                  IDAT03: 0
 2206
 2207 011012  000000                  IDAT10: 0
 2208 011014  000000                  IDAT11: 0
 2209 011016  000000                  IDAT12: 0
 2210 011020  000000                  IDAT13: 0
 2211
 2212 011022                          IDONE:
      011022  104412                          RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                                      ;SEE IF THE USER HAS EXPRESSED
                                                                      ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                      ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                      ;THE USER TYPED CONTROL G?).
 2213
 2219
 2220                                 ;;*****************************************************************
                                      ;*TEST 10       FDST MODE 0 TEST
                                      ;*
                                      ;*THIS IS A TEST OF THE STORE INSTRUCTIONS, STD AND STF,  WITH FDST MODE 0.
                                      ;*
                                      ;;*****************************************************************
      011024  000004                  TST10:  SCOPE
 2221 011026                          11:
      011026  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
 2222 011030  170011                          SETD                            ;SET FD
 2223 011032  012700  011570                  MOV     #TPAT10,R0
 2224 011036  012701  011620                  MOV     #TDAT10,R1
 2225 011042  012702  000004                  MOV     #4,R2
 2226 011046  012021                  T2:     MOV     (R0)+,(R1)+             ;SET UP THE INPUT DATA BUFFER.
 2227 011050  077202                          SOB     R2,T2
```

```
 011052  012700  011620                    MOV     #TDATI0,R0           ;LOAD AC0
 011056  172410                            LDD     (R0),AC0
 011060  012700  011600                    MOV     #TPAT20,R0           ;LOAD AC1
 011064  172510                            LDD     (R0),AC1
 011066  012701  000001                    MOV     #1,R1                ;IF THE (BUT FDST) FORK FAILS
 011072  012737  011376  000004            MOV     #TERR0,@#ERRVECT     ;AN ODD ADDRESS TRAP COULD RESULT.
 011100  012737  011114  001236            MOV     #T3,@#$TMP2
 011106  012737  042672  001240            MOV     #MS35,@#$TMP3
 011114  174001                    T3:     STD     AC0,AC1
 011116  000240                    T4:     NOP
 011120  000240                    T5:     NOP
 011122  012700  011610                    MOV     #TDAT00,R0
 011126  174110                            STD     AC1,(R0)             ;GET THE DATA.
 011130  012703  011610                    MOV     #TDAT00,R3           ;SEE IF THE DATA IS CORRECT.
 011134  012704  011620                    MOV     #TDATI0,R4
 011140  012705  000004                    MOV     #4,R5
 011144  022324                    T6:     CMP     (R3)+,(R4)+
 011146  001413                            BEQ     T105
 011150  012703  011614                    MOV     #TDAT02,R3           ;DID (BUT FD) FAIL?
 011154  012705  000002                    MOV     #2,R5
 011160  005723                    T7:     TST     (R3)+
 011162  001402                            BEQ     T10
 011164  000137  011460                    JMP     @#TERR1
 011170  077505                    T10:    SOB     R5,T7
 011172  000137  011500                    JMP     @#TERR2
 011176  077516                    T105:   SOB     R5,T6
                                   ;NOW TEST THE STF AC0,AC1 INSTRUCTION.
 011200                            T11:
 011200  104413                            LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
 011202  012700  011570            T12:    MOV     #TPAT10,R0           ;SET UP THE INPUT DATA BUFFER.
 011206  012701  011620                    MOV     #TDATI0,R1
 011212  012702  000004                    MOV     #4,R2
 011216  012021                    T13:    MOV     (R0)+,(R1)+
 011220  077202                            SOB     R2,T13
 011222  012700  011620                    MOV     #TDATI0,R0           ;SET UP AC0
 011226  172410                            LDD     (R0),AC0
 011230  012700  011600                    MOV     #TPAT20,R0           ;SET UP AC1
 011234  172510                            LDD     (R0),AC1
 011236  012701  000001                    MOV     #1,R1
 011242  012737  011260  001236            MOV     #T14,@#$TMP2
 011250  012737  042677  001240            MOV     #MS36,@#$TMP3
 011256  170001                            SETF                         ;CLEAR FD
 011260  174001                    T14:    STF     AC0,AC1
 011262  000240                    T15:    NOP
```

```
2284 011264  000240                  T16:   NOP
2285
2286 011266  005000                         CLR     R0
2287 011270  170200                         STFPS   R0                      ;SEE IF FPS IS CLEAR.
2288 011272  022700  000010                 CMP     #10,R0
2289 011276  001401                         BEQ     T17
2290 011300  000521                         BR      TERR3
2291
2292 011302                          T17:
2293 011302  170011                         SETD                            ;SET FD.
2294
2295 011304  012700  011610                 MOV     #TDAT00,R0
2296 011310  174110                         STD     AC1,(R0)                ;PICK UP AC1.
2297
2298 011312  012737  177777  011624         MOV     #-1,@#TDATI2
2299 011320  012737  177777  011626         MOV     #-1,@#TDATI3
2300 011326  012703  011610                 MOV     #TDAT00,R3
2301 011332  012704  011620                 MOV     #TDATI0,R4
2302 011336  012705  000004                 MOV     #4,R5
2303 011342  022324                  T20:   CMP     (R3)+,(R4)+             ;WAS THE DATA TRANSFERRED CORRECTLY?
2304 011344  001412                         BEQ     T23
2305
2306 011346  023737  011614  011574         CMP     @#TDAT02,@#TPAT12       ;DID (BUT FD) FAIL.
2307 011354  001401                         BEQ     T22
2308 011356  000440                  T21:   BR      TERR1
2309 011360  023737  011616  011576  T22:   CMP     @#TDAT03,@#TPAT13
2310 011366  001373                         BNE     T21
2311 011370  000456                         BR      TERR4
2312
2313 011372  077515                  T23:   SOB     R5,T20
2314 011374  000515                         BR      TDONE
2315
2316
2317                                 ;TRAP HERE THROUGH VECTOR 4 IF AN ODD ADDRESS OCCURS.
2318 011376  022716  011116         TERR0:  CMP     #T4,(SP)                ;MAKE SURE THE TRAP WAS ON
2319 011402  001413                         BEQ     1$                      ;AN INSTRUCTION BEING TESTED.
2320 011404  022716  011120                 CMP     #T5,(SP)
2321 011410  001410                         BEQ     1$
2322 011412  022716  011262                 CMP     #T15,(SP)
2323 011416  001405                         BEQ     1$
2324 011420  022716  011264                 CMP     #T16,(SP)
2325 011424  001402                         BEQ     1$
2326 011426  000137  040266                 JMP     @#CPSPUR
2327
2328 011432  011637  001236         1$:     MOV     (SP),@#$TMP2
2329 011436  022626                         CMP     (SP)+,(SP)+
2330 011440  012737  000527  001240         MOV     #527,@#$TMP3
2331 011446  012737  000640  001242         MOV     #640,@#$TMP4
2332 011454  104121                  2$:    ERROR   +121
2333 011456  000464                         BR      TDONE
2334
2335                                 ;REPORT DATA FAILURE.
2336 011460                          TERR1:
2337 011460  012737  011620  001242         MOV     #TDATI0,@#$TMP4
2338 011466  012737  011610  001244         MOV     #TDAT00,@#$TMP5
2339 011474  104123                  1$:    ERROR   +123
2340 011476  000454                         BR      TDONE
```

```
2341
2342                                        ;REPORT FAILURE OF (BUT FD).
2343 011500  012737  000160  001246  TERR2:  MOV     #160,@#$TMP6
2344 011506  012737  000161  001250          MOV     #161,@#$TMP7
2345 011514  012737  000640  001244  TERR25: MOV     #640,@#$TMP5
2346 011522  104122                  1$:     ERROR   +122
2347 011524  000441                          BR      TDONE
2348 011526  012737  000161  001246  TERR4:  MOV     #161,@#$TMP6
2349 011534  012737  000160  001250          MOV     #160,@#$TMP7
2350 011542  000764                          BR      TERR25
2351
2352                                        ;REPORT INCORRECT FPS AFTER STORE INSTRUCTION.
2353 011544                          TERR3:
2354 011544  012737  011262  001236          MOV     #T15,@#$TMP2
2355 011552  010037  001240                  MOV     R0,@#$TMP3
2356 011556  012737  000010  001242          MOV     #10,@#$TMP4
2357 011564  104041                  1$:     ERROR   +41
2358 011566  000420                          BR      TDONE
2359
2360 011570  000000                  TPAT10: 0
2361 011572  170360                  TPAT11: 170360
2362 011574  016161                  TPAT12: 016161
2363 011576  052525                  TPAT13: 052525
2364
2365 011600  177777                  TPAT20: -1
2366 011602  177777                  TPAT21: -1
2367 011604  177777                  TPAT22: -1
2368 011606  177777                  TPAT23: -1
2369
2370 011610  000000                  TDAT00: 0
2371 011612  000000                  TDAT01: 0
2372 011614  000000                  TDAT02: 0
2373 011616  000000                  TDAT03: 0
2374
2375 011620  000000                  TDATI0: 0
2376 011622  000000                  TDATI1: 0
2377 011624  000000                  TDATI2: 0
2378 011626  000000                  TDATI3: 0
2379
2380 011630                          TDONE:
     011630  104412                          RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                                     ;SEE IF THE USER HAS EXPRESSED
                                                                     ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                     ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                     ;THE USER TYPED CONTROL G?).
2381
2382
2516
2517                                ;;*******************************************************************
                                    ;*TEST 11       ACCUMULATORS DATA PATTERNS TEST
                                    ;*
                                    ;*THIS IS A TEST OF THE FLOATING POINT PROCESSOR ACCUMULATORS.
                                    ;*EACH ACCUMULATOR IS TESTED IN TWO WAYS:
                                    ;*      1 TEST PATTERN GENERATED BY FLOATING A ONE ACROSS
                                    ;*        A FIELD OF ZEROES.
                                    ;*      2 TEST PATTERN GENERATED BY FLOATING A ZERO ACROSS
                                    ;*        A FIELD OF ONES.
```

```
;*EACH OF ACCUMULATORS AC0 THROUGH AC5 IS TESTED.
;*
;*NOTE THAT THIS TEST KEEPS A DYNAMIC RECORD OF THE LOGICAL 'AND' AND 'OR'
;*OF THE FAILING DATA PATTERNS. THESE CAN BE VERY USEFUL IN DETERMINING
;*STUCK BITS. IF THE USER HAS THE INHIBIT ERROR TYPE OUT SWITCH (SWR13)
;*OFF, THEN THE USER WILL RECIEVE EACH INDIVIDUAL ERROR MESSAGE PLUS
;*AN ERROR SUMMARY AT THE END OF THE TEST. INHIBITING ERROR PRINT OUT
;*WILL INHIBIT ERROR SUMMARY PRINT OUT, EXCEPT IN THE CASE DESCRIBED BELOW.
;*TO GET JUST THE ERROR SUMMARY WITH NO INDIVIDUAL ERROR REPORTS,
;*SET SWITCH REGISTER BIT13 AND SWITCH REGISTER BIT7 BOTH ON.
;*
;*
;*THE FOLLOWING PROCEDURE IS PRESENTED TO AID THE TROUBLE
;*SHOOTER IN SITUATIONS WHERE AM2901 CHIP ISOLATION IS ATTEMPTED.
;*
;*WARNING: THIS PROCEDURE ASSUMES THAT THE FAULT IS IN ONE OF THE
;*AM2901 CHIPS. THIS ASSUMPTION IS NOT NECESSARILY VALID IN ALL
;*SITUATIONS. IT REMAINS TO BE SEEN WHAT NUMBER OF FAILURES CAN
;*PROBABLILISTICALLY ASSOCIATED WITH THEM. NOTE ALSO THAT THIS
;*INFORMATION SHOULD NOT BE TAKEN AS ABSOLUTE, THAT IS
;*THIS INFORMATION IS THE AUTHOR'S SUGGESTION FOR ACHIEVING ISOLATION
;*WHEN CHIP LEVEL REPAIR IS NECESSARY.
;*
;*WHEN THIS TEST HAS FINISHED RUNNING, IF ERRORS HAVE OCCURRED,
;*AN ERROR SUMMARY WILL BE TYPED. THUS SUMMARY WILL CONSIST OF TWO
;*IMPORTANT QUANTITIES:
;*       A.      FOUR SIXTEEN BIT NUMBERS LABELED THE LOGICAL 'AND' ('*')
;*               OF THE FAILING DATA PATTERNS.
;*       B.      FOUR SIXTEEN BIT NUMBERS LABELED THE LOGICAL 'OR' ('+')
;*               OF THE FAILING DATA PATTERNS.
;*
;*A BIT STUCK HIGH IN THE HARDWARE WILL SHOW UP AS A 0 IN THAT
;*BIT POSITION OF THE 'OR' OF THE FAILING DATA PATTERNS.
;*
;*A BIT STUCK LOW IN THE HARDWARE WILL SHOW UP AS A 1 IN THAT BIT
;*POSITION OF THE 'AND' OF THE FAILING DATA PATTERNS.
;*
;*THUS IF A FAILURE OCCURS:
;*       A.      STUCK HIGHS WILL SHOW AS 0'S IN THE 'OR' PATTERN.
;*       B.      STUCK LOWS WILL SHOW AS 1'S IN THE 'AND' PATTERN.
;*IF THE FAILURE IS INTERMITTANT THEN THIS PROCEDURE WILL STILL
;*APPLY.!.
;*IF THE FAILURE MOVES FROM ONE BIT TO ANOTHER, OR FROM ONE
;*GROUP OF BITS TO ANOTHER GROUP OF BITS THEN THE FAULT WILL
;*PROBABLY NOT SHOW UP IN THE 'AND' OR THE 'OR' PATTERNS; IN THIS
;*CASE THE 'AND' PATTERN WILL BE ALL 0'S AND THE 'OR' PATTERN WILL
;*BE ALL 1'S. WHEN THIS OCCURS SOME OTHER METHOD OF REPAIR MUST
;*BE FOUND (SUCH AS INSPECTION OF EACH INDIVIDUAL ERROR REPORT
;*RATHER THAN USING THE SUMMARY).
;*
;*MAP THE FOLLOWING NOTATION ONTO EACH BIT POSITION IN THE 'AND'
;*AND THE 'OR' PATTERNS WHICH ARE TYPED IN THE ERROR SUMMARY.
;*
;*A15,A14,...A1,A0  B15,B14,...B1,B0  C15,C14,...C1,C0  D15,D14,...C1,C0
;*
;*IN THIS NOTATION A15 THROUGH A0 IS THE FIRST OF THE FOUR 16 BIT
;*OCTAL NUMBERS TYPED, B15 THROUGH B0 IS THE SECOND, ETC.
```

```
;*
;*THIS TABLE SHOWS THE CORRESPONDING AM2901 CHIP ('E' NUMBER)
;*WHICH IS RESPONSIBLE FOR EACH BIT POSITION USING THE ABOVE
;*NOTATION. NOTE THAT ECO'S TO THE HARDWARE MIGHT MAKE THIS
;*TABLE OBSOLETE IF IT IS NOT UP DATED. NOTE ALSO THAT THERE ARE
;*FOUR BITS FOR FACH AM2901 CHIP:
;*
;*       BITS                          AM2901 CHIP NUMBER
;*       ----                          ------------------
;*
;*       A15,A14,A13,A12               E61
;*       A11,A10,A9,A8                 E62
;*       A7,A6,A5,A4                   E90
;*       A3,A2,A1,A0                   E81
;*
;*       B15,B14,B13,B12               E86
;*       B11,B10,B9,B8                 E85
;*       B7,B6,B5,B4                   E83
;*       B3,B2,B1,B0                   E88
;*
;*       C15,C14,C13,C12               E79
;*       C11,C10,C9,C8                 E84
;*       C7,C6,C5,C4                   E89
;*       C3,C2,C1,C0                   E87
;*
;*       D15,D14,D13,D12               E78
;*       D11,D10,D9,D8                 E77
;*       D7,D6,D5,D4                   E82
;*       D3,D2,D1,D0                   E80
;*
;*NOW FIVE IMPORTANT CASES WHICH WILL ARRISE WHEN A FAULTY
;*AM2901 IS PRESENT CAN BE DESCRIBED:
;*
;*1.)    IF ONLY ONE BIT OF THE 64 BITS IS INCORRECT THE CHIP INDICATED
;*       IN THE ABOVE TABLE IS MOST PROBABLY AT FAULT. BUT IF THAT
;*       CHIP IS REPLACED AND THE ERROR PERSISTS THEN SUPPOSE THAT
;*       BIT IS,
;*              LN                WHERE 'L' IS A, B, C OR D
;*                                ANDN IS 15, 14, ... OR 0
;*       THEN IN GENERAL ANY OF THE FOUR CHIPS RESPONSIBLE FOR
;*       AN, BN, CN OR DN COULD BE AT FAULT, WITH LN BEING MUST PROBABLE.
;*       FOR EXAMPLE IF BIT C12 IS FAULTY, THEN CHIP E79
;*       IS THE MOST PROBABLE SOURCE OF THE ERROR. IF REPAIRING
;*       THAT CHIP DOES NOT REMOVE THE FAULT THEN TRY EACH OF THE
;*       CHIPS ASSOCIATED WITH BITS A12, B12 AND D12 SHOULD BE TRIED
;*       WITH EQUAL PROBABILITY OF THE FAULT BEING
;*       IN ANY ONE OF THESE OTHER THREE CHIPS, TRY CHIPS E61, E86 AND E78.
;*2.)    IF THERE ARE FOUR CONSECUTIVE BITS IN ERROR, FOLLOWING THE
;*       PATTERN:
;*              LN, LN+1, LN+2 AND LN+3          WHERE 'L' IS A, B, C
;*                                               OR D.
;*                                               AND N=0,4,8 OR 12
;*       THEN THE ABOVE TABLE SHOULD DIRECTLY IDENTIFY THE
;*       FAILING CHIP.
;*
;*3.)    IF FOUR BITS ARE DROPPED WHICH FIT THE PATTERN:
;*              AN, BN, CN AND DN        WHERE N=15,14,... OR 0
```

```
                                        ;*      THEN ANY ONE OF THE FOUR CHIPS ASSOCIATED WITH EACH OF
                                        ;*      THE BITS AN, BN, CN AND DN COULD BE AT FAULT WITH
                                        ;*      EQUAL PROBABILITY.
                                        ;*
                                        ;*4.)   IF 16 BITS ARE IN ERROR, FITTING THE PATTERN:
                                        ;*              AN, AN+1, AN+2, AN+3    WHERE N-0,4,8 OR 12
                                        ;*              BN, BN+1, BN+2, BN+3
                                        ;*              CN, CN+1, CN+2, CN+3
                                        ;*                    AND
                                        ;*              DN, DN+1, DN+2, AN+3
                                        ;*      THEN ANY ONE OF THE FOUR CHIPS ASSOCIATED
                                        ;*      WITH THESE BITS COULD BE AT FAULT WITH EQUAL PROBABILITY.
                                        ;*
                                        ;*5.)   IF THE FAILING BIT PATTERNS DISPLAYED IN THE 'AND' AND THE 'OR'
                                        ;*      DATA TYPED IN THE SUMMARY DOES NOT CONFORM EXPLICITELY TO
                                        ;*      ANY OF THE ABOVE PATTERNS, THEN THE TROUBLE SHOOTER MUST
                                        ;*      INTUITIVELY TRY TO FIND WHICH OF THE ABOVE CASES (1 THROUGH 4)
                                        ;*      IS A 'BEST FIT' OF THE SYMPTOMS.
                                        ;*
                                        ;**********************************************************************
011632  000004                          TST11:  SCOPE
2518 011634  170011                             SETD                            ;SET FD.
2519                                    ;TEST ACCUMULATOR 0 WITH FLOATING ONE
011636  012737  042244  001244                  MOV     #MNUM0,@#$TMP5
011644  012737  011674  001236                  MOV     #G1,@#$TMP2
011652  012700  014114                          MOV     #GPAT00,R0
011656  012701  014154                          MOV     #GDAT00,R1
011662  104413                                  LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
011664  004737  013572                          JSR     PC,@#GSETUP             ;LOAD TEST PATTERN.
011670  012703  000102                          MOV     #102,R3
011674                                  G1:
011674  172410                                  LDD     (R0),AC0
011676  174000                                  STD     AC0,AC0
011700  172400                                  LDD     AC0,AC0         ;STORE THE TEST PATTERN.
011702  174011                                  STD     AC0,(R1)
011704  004737  013670                          JSR     PC,@#GCMP               ;COMPARE THE DATA READ WITH
                                                                                ;THAT WHICH WAS WRITTEN.
011710  005737  014110                          TST     @#GFLAG1
011714  001004                                  BNE     G2
011716  005137  014110                          COM     @#GFLAG1
011722  000261                                  SEC
011724  000401                                  BR      G3
011726  000241                          G2:     CLC
011730  006160  000006                  G3:     ROL     6(R0)                   ;GENERATE THE NEXT TEST PATTERN.
011734  006160  000004                          ROL     4(R0)
011740  006160  000002                          ROL     2(R0)
011744  006110                                  ROL     (R0)
011746  004737  013650                          JSR     PC,@#GRESET             ;RESET DEFAULT PATTERN IN OUTPUT
                                                                                ;BUFFER.
011752  077330                                  SOB     R3,G1
011754  004737  014006                          JSR     PC,@#GSUM               ;TYPE ERROR SUMMARY.
2520                                    ;TEST ACCUMULATOR 0 WITH FLOATING ZERO
011760  012737  042244  001244                  MOV     #MNUM0,@#$TMP5
011766  012737  012016  001236                  MOV     #G4,@#$TMP2
011774  012700  014124                          MOV     #GPAT10,R0
012000  012701  014154                          MOV     #GDAT00,R1
012004  104413                                  LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
```

```
012006  004737  013572                  JSR     PC,@#GSETUP             ;LOAD TEST PATTERN.
012012  012703  000102                  MOV     #102,R3
012016                          G4:
012016  172410                          LDD     (R0),AC0
012020  174000                          STD     AC0,AC0
012022  172400                          LDD     AC0,AC0         ;STORE THE TEST PATTERN.
012024  174011                          STD     AC0,(R1)
012026  004737  013670                  JSR     PC,@#GCMP               ;COMPARE THE DATA READ WITH
                                                                        ;THAT WHICH WAS WRITTEN.
012032  005737  014110                  TST     @#GFLAG1
012036  001004                          BNE     G5
012040  005137  014110                  COM     @#GFLAG1
012044  000241                          CLC
012046  000401                          BR      G6
012050  000261                  G5:     SEC
012052  006160  000006          G6:     ROL     6(R0)                   ;GENERATE THE NEXT TEST PATTERN.
012056  006160  000004                  ROL     4(R0)
012062  006160  000002                  ROL     2(R0)
012066  006110                          ROL     (R0)
012070  004737  013650                  JSR     PC,@#GRESET             ;RESET DEFAULT PATTERN IN OUTPUT
                                                                        ;BUFFER.
012074  077330                          SOB     R3,G4
012076  004737  014006                  JSR     PC,@#GSUM               ;TYPE ERROR SUMMARY.
2521                            ;TEST ACCUMULATOR 1 WITH FLOATING ONE
012102  012737  042252  001244          MOV     #MNUM1,@#$TMP5
012110  012737  012140  001236          MOV     #G7,@#$TMP2
012116  012700  014114                  MOV     #GPAT00,R0
012122  012701  014154                  MOV     #GDAT00,R1
012126  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
012130  004737  013572                  JSR     PC,@#GSETUP             ;LOAD TEST PATTERN.
012134  012703  000102                  MOV     #102,R3
012140                          G7:
012140  172410                          LDD     (R0),AC0
012142  174001                          STD     AC0,AC1
012144  172401                          LDD     AC1,AC0         ;STORE THE TEST PATTERN.
012146  174011                          STD     AC0,(R1)
012150  004737  013670                  JSR     PC,@#GCMP               ;COMPARE THE DATA READ WITH
                                                                        ;THAT WHICH WAS WRITTEN.
012154  005737  014110                  TST     @#GFLAG1
012160  001004                          BNE     G10
012162  005137  014110                  COM     @#GFLAG1
012166  000261                          SEC
012170  000401                          BR      G11
012172  000241                  G10:    CLC
012174  006160  000006          G11:    ROL     6(R0)                   ;GENERATE THE NEXT TEST PATTERN.
012200  006160  000004                  ROL     4(R0)
012204  006160  000002                  ROL     2(R0)
012210  006110                          ROL     (R0)
012212  004737  013650                  JSR     PC,@#GRESET             ;RESET DEFAULT PATTERN IN OUTPUT
                                                                        ;BUFFER.
012216  077330                          SOB     R3,G7
012220  004737  014006                  JSR     PC,@#GSUM               ;TYPE ERROR SUMMARY.
2522                            ;TEST ACCUMULATOR 1 WITH FLOATING ZERO
012224  012737  042252  001244          MOV     #MNUM1,@#$TMP5
012232  012737  012262  001236          MOV     #G12,@#$TMP2
012240  012700  014124                  MOV     #GPAT10,R0
012244  012701  014154                  MOV     #GDAT00,R1
```

```
012250  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
012252  004737  013572                  JSR     PC,@#GSETUP             ;LOAD TEST PATTERN.
012256  012703  000102                  MOV     #102,R3
012262                          G12:
012262  172410                          LDD     (R0),AC0
012264  174001                          STD     AC0,AC1
012266  172401                          LDD     AC1,AC0         ;STORE THE TEST PATTERN.
012270  174011                          STD     AC0,(R1)
012272  004737  013670                  JSR     PC,@#GCMP               ;COMPARE THE DATA READ WITH
                                                                ;THAT WHICH WAS WRITTEN.
012276  005737  014110                  TST     @#GFLAG1
012302  001004                          BNE     G13
012304  005137  014110                  COM     @#GFLAG1
012310  000241                          CLC
012312  000401                          BR      G14
012314  000261                  G13:    SEC
012316  006160  000006          G14:    ROL     6(R0)                   ;GENERATE THE NEXT TEST PATTERN.
012322  006160  000004                  ROL     4(R0)
012326  006160  000002                  ROL     2(R0)
012332  006110                          ROL     (R0)
012334  004737  013650                  JSR     PC,@#GRESET             ;RESET DEFAULT PATTERN IN OUTPUT
                                                                ;BUFFER.
012340  077330                          SOB     R3,G12
012342  004737  014006                  JSR     PC,@#GSUM               ;TYPE ERROR SUMMARY.
2523                            ;TEST ACCUMULATOR 2 WITH FLOATING ONE
012346  012737  042257  001244          MOV     #MNUM2,@#$TMP5
012354  012737  012404  001236          MOV     #G15,@#$TMP2
012362  012700  014114                  MOV     #GPAT00,R0
012366  012701  014154                  MOV     #GDAT00,R1
012372  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
012374  004737  013572                  JSR     PC,@#GSETUP             ;LOAD TEST PATTERN.
012400  012703  000102                  MOV     #102,R3
012404                          G15:
012404  172410                          LDD     (R0),AC0
012406  174002                          STD     AC0,AC2
012410  172402                          LDD     AC2,AC0         ;STORE THE TEST PATTERN.
012412  174011                          STD     AC0,(R1)
012414  004737  013670                  JSR     PC,@#GCMP               ;COMPARE THE DATA READ WITH
                                                                ;THAT WHICH WAS WRITTEN.
012420  005737  014110                  TST     @#GFLAG1
012424  001004                          BNE     G16
012426  005137  014110                  COM     @#GFLAG1
012432  000261                          SEC
012434  000401                          BR      G17
012436  000241                  G16:    CLC
012440  006160  000006          G17:    ROL     6(R0)                   ;GENERATE THE NEXT TEST PATTERN.
012444  006160  000004                  ROL     4(R0)
012450  006160  000002                  ROL     2(R0)
012454  006110                          ROL     (R0)
012456  004737  013650                  JSR     PC,@#GRESET             ;RESET DEFAULT PATTERN IN OUTPUT
                                                                ;BUFFER.
012462  077330                          SOB     R3,G15
012464  004737  014006                  JSR     PC,@#GSUM               ;TYPE ERROR SUMMARY.
2524                            ;TEST ACCUMULATOR 2 WITH FLOATING ZERO
012470  012737  042257  001244          MOV     #MNUM2,@#$TMP5
012476  012737  012526  001236          MOV     #G20,@#$TMP2
012504  012700  014124                  MOV     #GPAT10,R0
```

```
012510  012701  014154                MOV     #GDAT00,R1
012514  104413                        LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
012516  004737  013572                JSR     PC,@#GSETUP             ;LOAD TEST PATTERN.
012522  012703  000102                MOV     #102,R3
012526                          G20:
012526  172410                        LDD     (R0),AC0
012530  174002                        STD     AC0,AC2
012532  172402                        LDD     AC2,AC0         ;STORE THE TEST PATTERN.
012534  174011                        STD     AC0,(R1)
012536  004737  013670                JSR     PC,@#GCMP               ;COMPARE THE DATA READ WITH
                                                                ;THAT WHICH WAS WRITTEN.
012542  005737  014110                TST     @#GFLAG1
012546  001004                        BNE     G21
012550  005137  014110                COM     @#GFLAG1
012554  000241                        CLC
012556  000401                        BR      G22
012560  000261                  G21:  SEC
012562  006160  000006          G22:  ROL     6(R0)                   ;GENERATE THE NEXT TEST PATTERN.
012566  006160  000004                ROL     4(R0)
012572  006160  000002                ROL     2(R0)
012576  006110                        ROL     (R0)
012600  004737  013650                JSR     PC,@#GRESET             ;RESET DEFAULT PATTERN IN OUTPUT
                                                                ;BUFFER.
012604  077330                        SOB     R3,G20
012606  004737  014006                JSR     PC,@#GSUM               ;TYPE ERROR SUMMARY.
2525                            ;TEST ACCUMULATOR 3 WITH FLOATING ONE
012612  012737  042264  001244        MOV     #MNUM3,@#$TMP5
012620  012737  012650  001236        MOV     #G23,@#$TMP2
012626  012700  014114                MOV     #GPAT00,R0
012632  012701  014154                MOV     #GDAT00,R1
012636  104413                        LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
012640  004737  013572                JSR     PC,@#GSETUP             ;LOAD TEST PATTERN.
012644  012703  000102                MOV     #102,R3
012650                          G23:
012650  172410                        LDD     (R0),AC0
012652  174003                        STD     AC0,AC3
012654  172403                        LDD     AC3,AC0         ;STORE THE TEST PATTERN.
012656  174011                        STD     AC0,(R1)
012660  004737  013670                JSR     PC,@#GCMP               ;COMPARE THE DATA READ WITH
                                                                ;THAT WHICH WAS WRITTEN.
012664  005737  014110                TST     @#GFLAG1
012670  001004                        BNE     G24
012672  005137  014110                COM     @#GFLAG1
012676  000261                        SEC
012700  000401                        BR      G25
012702  000241                  G24:  CLC
012704  006160  000006          G25:  ROL     6(R0)                   ;GENERATE THE NEXT TEST PATTERN.
012710  006160  000004                ROL     4(R0)
012714  006160  000002                ROL     2(R0)
012720  006110                        ROL     (R0)
012722  004737  013650                JSR     PC,@#GRESET             ;RESET DEFAULT PATTERN IN OUTPUT
                                                                ;BUFFER.
012726  077330                        SOB     R3,G23
012730  004737  014006                JSR     PC,@#GSUM               ;TYPE ERROR SUMMARY.
2526                            ;TEST ACCUMULATOR 3 WITH FLOATING ZERO
012734  012737  042264  001244        MOV     #MNUM3,@#$TMP5
012742  012737  012772  001236        MOV     #G26,@#$TMP2
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        012750  012700  014124                 MOV     #GPAT10,R0
        012754  012701  014154                 MOV     #GDAT00,R1
        012760  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
        012762  004737  013572                  JSR     PC,@#GSETUP             ;LOAD TEST PATTERN.
        012766  012703  000102                  MOV     #102,R3
        012772                          G26:
        012772  172410                          LDD     (R0),AC0
        012774  174003                          STD     AC0,AC3
        012776  172403                          LDD     AC3,AC0         ;STORE THE TEST PATTERN.
        013000  ~011                            STD     AC0,(R1)
        013002  004737  013670                  JSR     PC,@#GCMP               ;COMPARE THE DATA READ WITH
                                                                        ;THAT WHICH WAS WRITTEN.
        013006  005737  014110                  TST     @#GFLAG1
        013012  001004                          BNE     G27
        013014  005137  014110                  COM     @#GFLAG1
        013020  000241                          CLC
        013022  000401                          BR      G30
        013024  000261                  G27:    SEC
        013026  006160  000006          G30:    ROL     6(R0)                   ;GENERATE THE NEXT TEST PATTERN.
        013032  006160  000004                  ROL     4(R0)
        013036  006160  000002                  ROL     2(R0)
        013042  006110                          ROL     (R0)
        013044  004737  013650                  JSR     PC,@#GRESET             ;RESET DEFAULT PATTERN IN OUTPUT
                                                                        ;BUFFER.
        013050  077330                          SOB     R3,G26
        013052  004737  014006                  JSR     PC,@#GSUM               ;TYPE ERROR SUMMARY.
  2527                          ;TEST ACCUMULATOR 4 WITH FLOATING ONE
        013056  012737  042273  001244          MOV     #MNUM4,@#$TMP5
        013064  012737  013114  001236          MOV     #G31,@#$TMP2
        013072  012700  014114                  MOV     #GPAT00,R0
        013076  012701  014154                  MOV     #GDAT00,R1
        013102  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
        013104  004737  013572                  JSR     PC,@#GSETUP             ;LOAD TEST PATTERN.
        013110  012703  000102                  MOV     #102,R3
        013114                          G31:
        013114  172410                          LDD     (R0),AC0
        013116  174004                          STD     AC0,AC4
        013120  172404                          LDD     AC4,AC0         ;STORE THE TEST PATTERN.
        013122  174011                          STD     AC0,(R1)
        013124  004737  013670                  JSR     PC,@#GCMP               ;COMPARE THE DATA READ WITH
                                                                        ;THAT WHICH WAS WRITTEN.
        013130  005737  014110                  TST     @#GFLAG1
        013134  001004                          BNE     G32
        013136  005137  014110                  COM     @#GFLAG1
        013142  000261                          SEC
        013144  000401                          BR      G33
        013146  000241                  G32:    CLC
        013150  006160  000006          G33:    ROL     6(R0)                   ;GENERATE THE NEXT TEST PATTERN.
        013154  006160  000004                  ROL     4(R0)
        013160  006160  000002                  ROL     2(R0)
        013164  006110                          ROL     (R0)
        013166  004737  013650                  JSR     PC,@#GRESET             ;RESET DEFAULT PATTERN IN OUTPUT
                                                                        ;BUFFER.
        013172  077330                          SOB     R3,G31
        013174  004737  014006                  JSR     PC,@#GSUM               ;TYPE ERROR SUMMARY.
  2528                          ;TEST ACCUMULATOR 4 WITH FLOATING ZERO
        013200  012737  042273  001244          MOV     #MNUM4,@#$TMP5
```

```
013206  012737  013236  001236          MOV     #G34,@#$TMP2
013214  012700  014124                  MOV     #GPAT10,R0
013220  012701  014154                  MOV     #GDAT00,R1
013224  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
013226  004737  013572                  JSR     PC,@#GSETUP             ;LOAD TEST PATTERN.
013232  012703  000102                  MOV     #102,R3
013236                          G34:
013236  172410                          LDD     (R0),AC0
013240  174004                          STD     AC0,AC4
013242  172404                          LDD     AC4,AC0         ;STORE THE TEST PATTERN.
013244  174011                          STD     AC0,(R1)
013246  004737  013670                  JSR     PC,@#GCMP               ;COMPARE THE DATA READ WITH
                                                                ;THAT WHICH WAS WRITTEN.
013252  005737  014110                  TST     @#GFLAG1
013256  001004                          BNE     G35
013260  005137  014110                  COM     @#GFLAG1
013264  000241                          CLC
013266  000401                          BR      G36
013270  000261                  G35:    SEC
013272  006160  000006          G36:    ROL     6(R0)                   ;GENERATE THE NEXT TEST PATTERN.
013276  006160  000004                  ROL     4(R0)
013302  006160  000002                  ROL     2(R0)
013306  006110                          ROL     (R0)
013310  004737  013650                  JSR     PC,@#GRESET             ;RESET DEFAULT PATTERN IN OUTPUT
                                                                ;BUFFER.
013314  077330                          SOB     R3,G34
013316  004737  014006                  JSR     PC,@#GSUM               ;TYPE ERROR SUMMARY.
2529                            ;TEST ACCUMULATOR 5 WITH FLOATING ONE
013322  012737  042301  001244          MOV     #MNUM5,@#$TMP5
013330  012737  013360  001236          MOV     #G37,@#$TMP2
013336  012700  014114                  MOV     #GPAT00,R0
013342  012701  014154                  MOV     #GDAT00,R1
013346  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
013350  004737  013572                  JSR     PC,@#GSETUP             ;LOAD TEST PATTERN.
013354  012703  000102                  MOV     #102,R3
013360                          G37:
013360  172410                          LDD     (R0),AC0
013362  174005                          STD     AC0,AC5
013364  172405                          LDD     AC5,AC0         ;STORE THE TEST PATTERN.
013366  174011                          STD     AC0,(R1)
013370  004737  013670                  JSR     PC,@#GCMP               ;COMPARE THE DATA READ WITH
                                                                ;THAT WHICH WAS WRITTEN.
013374  005737  014110                  TST     @#GFLAG1
013400  001004                          BNE     G40
013402  005137  014110                  COM     @#GFLAG1
013406  000261                          SEC
013410  000401                          BR      G41
013412  000241                  G40:    CLC
013414  006160  000006          G41:    ROL     6(R0)                   ;GENERATE THE NEXT TEST PATTERN.
013420  006160  000004                  ROL     4(R0)
013424  006160  000002                  ROL     2(R0)
013430  006110                          ROL     (R0)
013432  004737  013650                  JSR     PC,@#GRESET             ;RESET DEFAULT PATTERN IN OUTPUT
                                                                ;BUFFER.
013436  077330                          SOB     R3,G37
013440  004737  014006                  JSR     PC,@#GSUM               ;TYPE ERROR SUMMARY.
2530                            ;TEST ACCUMULATOR 5 WITH FLOATING ZERO
```

```
013444  012737  042301  0C1244          MOV     #MNUM5,@#$TMP5
013452  012737  013502  001236          MOV     #G42,@#$TMP2
013460  012700  014124                  MOV     #GPAT10,R0
013464  012701  014154                  MOV     #GDAT00,R1
013470  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
013472  004737  013572                  JSR     PC,@#GSETUP             ;LOAD TEST PATTERN.
013476  012703  000102                  MOV     #102,R3
013502                          G42:
013502  172410                          LDD     (R0),AC0
013504  174005                          STD     AC0,AC5
013506  172405                          LDD     AC5,AC0         ;STORE THE TEST PATTERN.
013510  174011                          STD     AC0,(R1)
013512  004737  013670                  JSR     PC,@#GCMP               ;COMPARE THE DATA READ WITH
                                                                ;THAT WHICH WAS WRITTEN.
013516  005737  014110                  TST     @#GFLAG1
013522  001004                          BNE     G43
013524  005137  014110                  COM     @#GFLAG1
013530  000241                          CLC
013532  000401                          BR      G44
013534  000261                  G43:    SEC
013536  006160  000006          G44:    ROL     6(R0)                   ;GENERATE THE NEXT TEST PATTERN.
013542  006160  000004                  ROL     4(R0)
013546  006160  000002                  ROL     2(R0)
013552  006110                          ROL     (R0)
013554  004737  013650                  JSR     PC,@#GRESET             ;RESET DEFAULT PATTERN IN OUTPUT
                                                                ;BUFFER.
013560  077330                          SOB     R3,G42
013562  004737  014006                  JSR     PC,@#GSUM               ;TYPE ERROR SUMMARY.
253
2532 013566  000137  014166            JMP     @#GDONE
2533
2534                                    ;USE THIS ROUTINE TO INITIALIZE ALL THE DATA BUFFERS.
2535 013572  012705  014110    GSETUP: MOV     #GFLAG1,R5
2536 013576  012704  000026            MOV     #26,R4
2537 013602  005025            1$:     CLR     (R5)+
2538 013604  077402                    SOB     R4,1$
2539
2540 013606  012705  014124            MOV     #GPAT10,R5
2541 013612  012704  000010            MOV     #10,R4
2542 013616  005125            2$:     COM     (R5)+
2543 013620  077402                    SOB     R4,2$
2544
2545 013622  020067  000266    GS1:    CMP     R0,GPAT00
2546 013626  001401                    BEQ     3$
2547 013630  000207                    RTS     PC
2548
2549 013632  012705  014154    3$:     MOV     #GDAT00,R5
2550 013636  012704  000004            MOV     #4,R4
2551 013642  005125            4$:     COM     (R5)+
2552 013644  077402                    SOB     R4,4$
2553 013646  000207                    RTS     PC
2554
2555 013650  012705  014154    GRESET: MOV     #GDAT00,R5
2556 013654  012704  000004            MOV     #4,R4
2557 013660  005025            1$:     CLR     (R5)+
2558 013662  077402                    SOB     R4,1$
2559 013664  000137  013622            JMP     @#GS1
```

```
2560
2561                                    ;SEE IF THE DATA WRITTEN MATCHES THE DATA READ.
2562 013670  012705  014154          GCMP:   MOV     #GDAT00,R5
2563 013674  012704  000004                  MOV     #4,R4
2564 013700  010002                          MOV     R0,R2
2565 013702  022225                  1$:     CMP     (R2)+,(R5)+
2566 013704  001402                          BEQ     2$
2567 013706  000137  013716                  JMP     @#GERR1
2568 013712  077405                  2$:     SOB     R4,1$
2569 013714  000207                          RTS     PC
2570
2571                                    ;COME HERE TO REPORT AND RECORD ERRORS.
2572 013716  012637  014164          GERR':  MOV     (SP)+,@#GADR            ;SAVE THE RETURN ADDRESS.
2573 013722  010003                          MOV     R0,R3                   ;COMPUTE 'OR' OF BAD DATA.
2574 013724  012705  014144                  MOV     #GOR0,R5
2575 013730  012704  000004                  MOV     #4,R4
2576 013734  052325                  1$:     BIS     (R3)+,(R5)+
2577 013736  077402                          SOB     R4,1$
2578
2579 013740  010003                          MOV     R0,R3                   ;COMPUTE 'AND' OF BAD DATA.
2580 013742  012705  014134                  MOV     #GAND0,R5
2581 013746  012704  000004                  MOV     #4,R4
2582 013752  012302                  2$:     MOV     (R3)+,R2
2583 013754  005102                          COM     R2
2584 013756  040225                          BIC     R2,(R5)+
2585 013760  077404                          SOB     R4,2$
2586
2587 013762  005237  014112                  INC     @#GFLAG2                ;INCREMENT ERROR COUNT.
2588 013766  010037  001240                  MOV     R0,@#$TMP3
2589 013772  012737  014154  001242          MOV     #GDAT00,@#$TMP4
2590 014000  104044                  3$:     ERROR   +44
2591 014002  000177  000156                  JMP     @GADR
2592
2593                                    ;SEE IF ANY ERRORS HAVE OCCURRED AND WHETHER OR NOT AN ERROR SUMMARY
2594                                    ;SHOULD BE TYPED.
2595 014006  005737  014112          GSUM:   TST     @#GFLAG2                ;ANY ERRORS?
2596 014012  001435                          BEQ     3$
2597
2598 014014  032777  020000  165116          BIT     #SW13,@SWR              ;INHIBIT ERROR PRINT OUT?
2599 014022  001404                          BEQ     1$
2600 014024  032777  000200  165106          BIT     #SW7,@SWR               ;PRINT SUMMARY?
2601 014032  001425                          BEQ     3$
2602
2603 014034  013737  014112  001246  1$:     MOV     @#GFLAG2,@#$TMP6        ;YES PRINT SUMMARY.
2604 014042  012737  014134  001240          MOV     #GAND0,@#$TMP3
2605 014050  012737  014144  001242          MOV     #GOR0,@#$TMP4
2606 014056  012637  014164                  MOV     (SP)+,@#GADR            ;SAVE RETURN ADDRESS.
2607 014062  012737  014076  001116          MOV     #2$,@#$ERRPC
2608 014070  112737  000045  001114          MOVB    #45,@#$ITEMB
2609 014076  004737  037602          2$:     JSR     PC,@#ERTYPE
2610 014102  000177  000056                  JMP     @GADR
2611 014106  000207                  3$:     RTS     PC
```

```
2613
2614
2615 014110  000000                GFLAG1: 0
2616 014112  000000                GFLAG2: 0
2617
2618 014114  000000                GPAT00: 0
2619 014116  000000                GPAT01: 0
2620 014120  000000                GPAT02: 0
2621 014122  000000                GPAT03: 0
2622
2623 014124  177777                GPAT10: -1
2624 014126  177777                GPAT11: -1
2625 014130  177777                GPAT12: -1
2626 014132  177777                GPAT13: -1
2627
2628 014134  177777                GAND0:  -1
2629 014136  177777                GAND1:  -1
2630 014140  177777                GAND2:  -1
2631 014142  177777                GAND3:  -1
2632
2633 014144  000000                GOR0:   0
2634 014146  000000                GOR1:   0
2635 014150  000000                GOR2:   0
2636 014152  000000                GOR3:   0
2637
2638 014154  000000                GDAT00: 0
2639 014156  000000                GDAT01: 0
2640 014160  000000                GDAT02: 0
2641 014162  000000                GDAT03: 0
2642
2643 014164  000000                GADR:   0
2644
2645 014166                        GDONE:
     014166  104412                        RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                                    ;SEE IF THE USER HAS EXPRESSED
                                                                    ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                    ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                    ;THE USER TYPED CONTROL G?).
2646
2647
2654                                ;;*******************************************************************
                                    ;*TEST 12       FPP ACCUMULATORS DUAL ADDRESS TEST
                                    ;*
                                    ;*THIS TEST PERFORMS A DUAL ADDRESSING TEST ON THE FLOATING ACCUMULATORS.
                                    ;*NOTE THAT ACCUMULATOR ZERO IS USED TO ACCESS ALL THE OTHERS.
                                    ;*
                                    ;;*******************************************************************
     014170  000004                TST12:  SCOPE
2655 014172  104413                        LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
2656
2657 014174  005037  014720        H1:     CLR     @#HFLAG
2658 014200  012700  014722                MOV     #HA1W,R0                ;INITIALIZE THE LOAD BUFFER DATA.
2659 014204  012701  015042                MOV     #HDAT1,R1
2660 014210  012703  000024                MOV     #24,R3
2661 014214  012120                H2:     MOV     (R1)+,(R0)+
2662 014216  077302                        SOB     R3,H2
2663
```

```
2664 014220  004767  000422                JSR     PC,MCLR         ;CLEAR THE OUTPUT DATA BUFFER.
2665
2666 014224  170011              H3:       SETD
2667                             ;LOAD ACCUMULATOR 1
     014226  012700  014722                MOV     #HA1W,R0
     014232  172410                        LDD     (R0),AC0
     014234  174001                        STD     AC0,AC1
2668                             ;LOAD ACCUMULATOR 2
     014236  012700  014732                MOV     #HA2W,R0
     014242  172410                        LDD     (R0),AC0
     014244  174002                        STD     AC0,AC2
2669                             ;LOAD ACCUMULATOR 3
     014246  012700  014742                MOV     #HA3W,R0
     014252  172410                        LDD     (R0),AC0
     014254  174003                        STD     AC0,AC3
2670                             ;LOAD ACCUMULATOR 4
     014256  012700  014752                MOV     #HA4W,R0
     014262  172410                        LDD     (R0),AC0
     014264  174004                        STD     AC0,AC4
2671                             ;LOAD ACCUMULATOR 5
     014266  012700  014762                MOV     #HA5W,R0
     014272  172410                        LDD     (R0),AC0
     014274  174005                        STD     AC0,AC5
2672
2673 014276  004737  014532    H4:       JSR     PC,@#HSTD               ;GO READ ALL ACCUMULATORS BACK.
2674
2675 014302  004737  014610                JSR     PC,@#HCMP               ;SEE IF DATA IS CORRECT.
2676
2677                             ;COMPLIMENT EACH WORD OF THE DATA STORED IN ACCUMULATOR 1,
                                 ;RELOAD THAT ACCUMULATOR, READ ALL THE ACCUMULATORS BACK AND CHECK
                                 ;THE DATA.
     014306  012700  014722                MOV     #HA1W,R0
     014312  012702  000004                MOV     #4,R2
     014316  010001                        MOV     R0,R1
     014320  005121              H5:       COM     (R1)+
     014322  172410                        LDD     (R0),AC0
     014324  174001                        STD     AC0,AC1
     014326  004737  014532                JSR     PC,@#HSTD               ;READ ALL THE ACCUMULATORS BACK.
     014332  004737  014610                JSR     PC,@#HCMP               ;CHECK THE DATA.
     014336  077210                        SOB     R2,H5
2678                             ;COMPLIMENT EACH WORD OF THE DATA STORED IN ACCUMULATOR 2,
                                 ;RELOAD THAT ACCUMULATOR, READ ALL THE ACCUMULATORS BACK AND CHECK
                                 ;THE DATA.
     014340  012700  014732                MOV     #HA2W,R0
     014344  012702  000004                MOV     #4,R2
     014350  010001                        MOV     R0,R1
     014352  005121              H6:       COM     (R1)+
     014354  172410                        LDD     (R0),AC0
     014356  174002                        STD     AC0,AC2
     014360  004737  014532                JSR     PC,@#HSTD               ;READ ALL THE ACCUMULATORS BACK.
     014364  004737  014610                JSR     PC,@#HCMP               ;CHECK THE DATA.
     014370  077210                        SOB     R2,H6
2679                             ;COMPLIMENT EACH WORD OF THE DATA STORED IN ACCUMULATOR 3,
                                 ;RELOAD THAT ACCUMULATOR, READ ALL THE ACCUMULATORS BACK AND CHECK
                                 ;THE DATA.
     014372  012700  014742                MOV     #HA3W,R0
     014376  012702  000004                MOV     #4,R2
```

```
        014402  010001                  MOV     R0,R1
        014404  005121          H7:     COM     (R1)+
        014406  172410                  LDD     (R0),AC0
        014410  174003                  STD     AC0,AC3
        014412  004737  014532          JSR     PC,@#HSTD               ;READ ALL THE ACCUMULATORS BACK.
        014416  004737  014610          JSR     PC,@#HCMP               ;CHECK THE DATA.
        014422  077210                  SOB     R2,H7
  2680                          ;COMPLIMENT EACH WORD OF THE DATA STORED IN ACCUMULATOR 4,
                              ;RELOAD THAT ACCUMULATOR, READ ALL THE ACCUMULATORS BACK AND CHECK
                              ;THE DATA.
        014424  012700  014752          MOV     #HA4W,R0
        014430  012702  000004          MOV     #4,R2
        014434  010001                  MOV     R0,R1
        014436  005121          H10:    COM     (R1)+
        014440  172410                  LDD     (R0),AC0
        014442  174004                  STD     AC0,AC4
        014444  004737  014532          JSR     PC,@#HSTD               ;READ ALL THE ACCUMULATORS BACK.
        014450  004737  014610          JSR     PC,@#HCMP               ;CHECK THE DATA.
        014454  077210                  SOB     R2,H10
  2681                          ;COMPLIMENT EACH WORD OF THE DATA STORED IN ACCUMULATOR 5,
                              ;RELOAD THAT ACCUMULATOR, READ ALL THE ACCUMULATORS BACK AND CHECK
                              ;THE DATA.
        014456  012700  014762          MOV     #HA5W,R0
        014462  012702  000004          MOV     #4,R2
        014466  010001                  MOV     R0,R1
        014470  005121          H11:    COM     (R1)+
        014472  172410                  LDD     (R0),AC0
        014474  174005                  STD     AC0,AC5
        014476  004737  014532          JSR     PC,@#HSTD               ;READ ALL THE ACCUMULATORS BACK.
        014502  004737  014610          JSR     PC,@#HCMP               ;CHECK THE DATA.
        014506  077210                  SOB     R2,H11
  2682
  2683  014510  005737  014720          TST     @#HFLAG
  2684  014514  001402                  BEQ     H12
  2685  014516  000137  015112          JMP     @#HDONE
  2686
  2687  014522  005137  014720  H12:    COM     @#HFLAG
  2688  014526  000137  014224          JMP     @#H3
  2689
  2690                          ;STORE ALL ACCUMULATORS IN THE OUTPUT BUFFERS.
  2691  014532  004737  014646  HSTD:   JSR     PC,@#HCLR               ;CLEAR ALL OUTPUT BUFFERS.
  2692                          ;STORE ACCUMULATOR 1
        014536  012704  014772          MOV     #HA1R,R4
        014542  172401                  LDD     AC1,AC0
        014544  174014                  STD     AC0,(R4)
  2693                          ;STORE ACCUMULATOR 2
        014546  012704  015002          MOV     #HA2R,R4
        014552  172402                  LDD     AC2,AC0
        014554  174014                  STD     AC0,(R4)
  2694                          ;STORE ACCUMULATOR 3
        014556  012704  015012          MOV     #HA3R,R4
        014562  172403                  LDD     AC3,AC0
        014564  174014                  STD     AC0,(R4)
  2695                          ;STORE ACCUMULATOR 4
        014566  012704  015022          MOV     #HA4R,R4
        014572  172404                  LDD     AC4,AC0
        014574  174014                  STD     AC0,(R4)
```

```
                                     ;STORE ACCUMULATOR 5
     014576  012704  015032                  MOV     #HA5R,R4
     014602  172405                          LDD     AC5,AC0
     014604  174014                          STD     AC0,(R4)
     014606  000207                          RTS     PC

                                     ;COMPARE DATA LOADED WITH DATA READ.
     014610  012637  014716          HCMP:   MOV     (SP)+,@#HADR            ;SAVE RETURN ADDRESS.
     014614  012703  014722                  MOV     #HA1W,R3
     014620  012704  014772                  MOV     #HA1R,R4
     014624  012705  000024                  MOV     #24,R5
     014630  022324                  HCMP1:  CMP     (R3)+,(R4)+
     014632  001402                          BEQ     HCMP2
     014634  000137  014664                  JMP     @#HERROR
     014640  077505                  HCMP2:  SOB     R5,HCMP1
     014642  000177  000050                  JMP     @HADR

                                     ;CLEAR THE DATA OUTPUT BUFFER.
     014646  012704  014772          HCLR:   MOV     #HA1R,R4
     014652  012705  000024                  MOV     #24,R5
     014656  005024                  HCLR1:  CLR     (R4)+
     014660  077502                          SOB     R5,HCLR1
     014662  000207                          RTS     PC

                                     ;REPORT ERROR.
     014664                          HERROR:
     014664  012703  014722                  MOV     #HA1W,R3
     014670  012704  001236                  MOV     #$TMP2,R4
     014674  012705  000012                  MOV     #12,R5
     014700  010324                  1$:     MOV     R3,(R4)+
     014702  062703  000010                  ADD     #10,R3
     014706  077504                          SOB     R5,1$
     014710  104046                  2$:     ERROR   +46
     014712  000137  015112                  JMP     @#HDONE


     014716  000000                  HADR:   0
     014720  000000                  HFLAG:  0

     014722  000000  000000  000000  HA1W:   .WORD   0,0,0,0
     014730  000000
     014732  000000  000000  000000  HA2W:   .WORD   0,0,0,0
     014740  000000
     014742  000000  000000  000000  HA3W:   .WORD   0,0,0,0
     014750  000000
     014752  000000  000000  000000  HA4W.   .WORD   0,0,0,0
     014760  000000
     014762  000000  000000  000000  HA5W:   .WORD   0,0,0,0
     014770  000000

     014772  000000  000000  000000  HA1R:   .WORD   0,0,0,0
     015000  000000
     015002  000000  000000  000000  HA2R:   .WORD   0,0,0,0
     015010  000000
     015012  000000  000000  000000  HA3R:   .WORD   0,0,0,0
     015020  000000
     015022  000000  000000  000000  HA4R:   .WORD   0,0,0,0
```

```
                015030  000000
2742            015032  000000  000000  000000  HASR:   .WORD   0,0,0,0
                015040  000000
2743
2744            015042  073567  073567  073567  HDAT1:  .WORD   73567,73567,73567,73567
                015050  073567
2745            015052  063146  063146  063146  HDAT2:  .WORD   63146,63146,63146,63146
                015060  063146
2746            015062  010421  010421  010421  HDAT3:  .WORD   10421,10421,10421,10421
                015070  010421
2747            015072  031463  031463  031463  HDAT4:  .WORD   31463,31463,31463,31463
                015100  031463
2748            015102  042104  042104  042104  HDAT5:  .WORD   42104,42104,42104,42104
                015110  042104
2749
2750            015112                          HDONE:
                015112  104412                          RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                                                ;SEE IF THE USER HAS EXPRESSED
                                                                                ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                                ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                                ;THE USER TYPED CONTROL G?).
2751
2752
2760                                    ;;**************************************************************
                                        ;*TEST 13       FSRC MODE 0 WITH ILLEGAL ACCUMULATOR TEST
                                        ;*
                                        ;*THIS IS A TEST OF FSRC MODE 0 WITH ACCUMULATORS 6 AND 7. USE OF
                                        ;*EITHER OF THESE NON-EXISTENT ACCUMULATORS SHOULD RESULT IN A TRAP TO 244
                                        ;*WITH FEC=2 (ILLEGAL FPP INSTRUCTION).
                                        ;*
                                        ;;**************************************************************
                015114  000004          TST13:  SCOPE
2761            015116                  S1:
                015116  104413                  LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
2762            015120  170011                  SETD                    ;SET FD
2763            015122  012700  015626          MOV     #SPAT10,R0      ;LOAD AC0
2764            015126  172410                  LDD     (R0),AC0
2765
2766            015130  012737  015326  000244  MOV     #SERR0,@#FPVECT         ;USE OF THE NON-EXISTENT AC-
2767                                                                            ;CUMULATOR SHOULD RESULT IN
2768                                                                            ;A TRAP TO 244.
2769            015136  012700  000001          MOV     #1,R0                   ;A FAILURE IN THE FSRC FLOWS
2770                                                                            ;WILL RESULT IN AN ODD ADDRESS
2771            015142  012737  015536  000004  MOV     #SERR1,@#ERRVECT        ;TRAP TO 4.
2772            015150  005003                  CLR     R3
2773
2774            015152  172407          S2:     LDD     AC7,AC0
2775            015154  170000          S3:     CFCC
2776            015156  005203                  INC     R3
2777            015160  005203          S4:     INC     R3
2778
2779            015162  012701  015636          MOV     #SDAT00,R1              ;NO TRAP OCCURRED..
2780            015166  174011                  STD     AC0,(R1)                ;SEE IF AC0 WAS MODIFIED.
2781
2782            015170  012701  015636          MOV     #SDAT00,R1
2783            015174  012702  015626          MOV     #SPAT10,R2
2784            015200  012703  000004          MOV     #4,R3
```

```
2785 015204  022122                  S5:     CMP     (R1)+,(R2)+
2786 015206  001402                          BEQ     S6
2787 015210  000137  015466                  JMP     @#SERR2
2788 015214  077305                  S6:     SOB     R3,S5
2789
2790 015216  000137  015512                  JMP     @#SERR3
2791
2792                                 ;NOW TEST AC6.
2793 015222                          S7:
     015222  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
2794 015224  170011                          SETD
2795
2796 015226  012700  015626                  MOV     #SPAT10,R0              ;LOAD AC0
2797 015232  172410                          LDD     (R0),AC0
2798
2799 015234  012737  015404  000244          MOV     #SERR4,@#FPVECT
2800 015242  012700  000001                  MOV     #1,R0
2801 015246  012737  015570  000004          MOV     #SERR5,@#ERRVECT
2802 015254  005003                          CLR     R3
2803
2804 015256  172406                  S8:     LDD     AC6,AC0
2805 015260  170000                  S9:     CFCC
2806 015262  005203                          INC     R3
2807 015264  005203                  S10:    INC     R3
2808
2809 015266  012701  015636                  MOV     #SDAT00,R1
2810 015272  174011                          STD     AC0,(R1)                ;NO TRAP! GET AC0.
2811
2812 015274  012701  015636                  MOV     #SDAT00,R1              ;WAS AC0 MODIFIED.
2813 015300  012702  015626                  MOV     #SPAT10,R2
2814 015304  012703  000004                  MOV     #4,R3
2815 015310  022122                  S11:    CMP     (R1)+,(R2)+
2816 015312  001402                          BEQ     S12
2817 015314  000137  015500                  JMP     @#SERR6
2818 015320  077305                  S12:    SOB     R3,S11
2819 015322  000137  015524                  JMP     @#SERR7
2820
2821                                 ;TRAPPED TO 244.
2822 015326  021627  015154          SERR0:  CMP     (SP),#S3                ;PC OF TRAP CORRECT?
2823 015332  001402                          BEQ     1$
2824 015334  000137  040234                  JMP     @#FPSPUR
2825
2826 015340  012737  015222  015622  1$:     MOV     #S7,@#SADR
2827
2828 015346  011637  001236          SERR10: MOV     (SP),@#$TMP2
2829 015352  022626                          CMP     (SP)+,(SP)+
2830 015354  005004                          CLR     R4
2831 015356  170204                          STFPS   R4                      ;IS FPS CORRECT?
2832 015360  022704  100200                  CMP     #100200,R4
2833 015364  001020                          BNE     SERR15
2834
2835 015366  005004                          CLR     R4
2836 015370  170304                          STST    R4                      ;IS FEC CORRECT?
2837 015372  022704  000002                  CMP     #2,R4
2838 015376  001023                          BNE     SERR20
2839 015400  000177  000216                  JMP     @SADR
2840
```

```
2841 015404  021627  015260          SERR4:  CMP     (SP),#S9
2842 015410  001402                         BEQ     1$
2843 015412  000137  040234                 JMP     @#FPSPUR
2844 015416  012737  015646  015622  1$:    MOV     #SDONE,@#SADR
2845 015424  000750                         BR      SERR10
2846
2847                                 ;REPORT FPS FAILURE:
2848 015426  012737  100200  001242  SERR15: MOV     #100200,@#$TMP4
2849 015434  010437  001240                 MOV     R4,@#$TMP3
2850 015440  104117                 1$:     ERROR   +117
2851 015442  000177  000154                 JMP     @SADR
2852
2853                                 ;REPORT FEC BAD:
2854 015446  012737  000002  001242  SERR20: MOV     #2,@#$TMP4
2855 015454  010437  001240                 MOV     R4,@#$TMP3
2856 015460  104120                 1$:     ERROR   +120
2857 015462  000177  000134                 JMP     @SADR
2858
2859
2860                                 ;AC0 WAS MODIFIED. (BUT FSRC) FORK FAILED.
2861 015466  012737  015152  001236  SERR2:  MOV     #S2,@#$TMP2
2862 015474  104112                 1$:     ERROR   +112
2863 015476  000463                         BR      SDONE
2864 015500  012737  015256  001236  SERR6:  MOV     #S8,@#$TMP2
2865 015506  104114                 1$:     ERROR   +114
2866 015510  000456                         BR      SDONE
2867
2868 015512  012737  015152  001236  SERR3:  MOV     #S2,@#$TMP2
2869 015520  104111                 1$:     ERROR   +111
2870 015522  000451                         BR      SDONE
2871 015524  012737  015256  001236  SERR7:  MOV     #S8,@#$TMP2
2872 015532  104113                 1$:     ERROR   +113
2873 015534  000444                         BR      SDONE
2874
2875                                 ;FAILURE OF (BUT FSRC) CAUSED AN ODD ADDRESS TRAP TO 4.
2876 015536  021627  015154          SERR1:  CMP     (SP),#S3                ;DID TRAP OCCUR ON TESTED INSTRUCTION?
2877 015542  001405                         BEQ     1$
2878 015544  021627  015160                 CMP     (SP),#S4
2879 015550  001402                         BEQ     1$
2880 015552  000137  040266                 JMP     @#CPSPUR
2881
2882 015556  011637  001236          1$:     MOV     (SP),@#$TMP2
2883 015562  022626                         CMP     (SP)+,(SP)+
2884 015564  104115                 2$:     ERROR   +115
2885 015566  000427                         BR      SDONE
2886
2887 015570  021627  015256          SERR5:  CMP     (SP),#S8                ;DID TRAP OCCUR ON TEST INSTRUCTION?
2888 015574  001405                         BEQ     1$
2889 015576  021627  015260                 CMP     (SP),#S9
2890 015602  001402                         BEQ     1$
2891 015604  000137  040266                 JMP     @#CPSPUR
2892
2893 015610  011637  001236          1$:     MOV     (SP),@#$TMP2
2894 015614  022626                         CMP     (SP)+,(SP)+
2895 015616  104116                 2$:     ERROR   +116
2896 015620  000412                         BR      SDONE
2897
```

```
 2898 015622  000000                SADR:   0
 2899 015624  177777                        -1
 2900 015626  010421                SPAT10: 10421
 2901 015630  021042                SPAT11: 21042
 2902 015632  031463                SPAT12: 31463
 2903 015634  042104                SPAT13: 42104
 2904
 2905 015636  000000                SDAT00: 0
 2906 015640  000000                SDAT01: 0
 2907 015642  000000                SDAT02: 0
 2908 015644  000000                SDAT03: 0
 2909
 2910 015646                        SDONE:
      015646  104412                        RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                                      ;SEE IF THE USER HAS EXPRESSED
                                                                      ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                      ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                      ;THE USER TYPED CONTROL G?).
 2911
 2918                                ;;*********************************************************************
                                     ;*TEST 14       FSRC MODE 2 TEST
                                     ;*
                                     ;* THIS IS A TEST OF FSRC MODE 2, AUTO
                                     ;* INCREMENT MODE.
                                     ;*
                                     ;;*********************************************************************
      015650  000004                TST14:  SCOPE
 2919 015652  104413                        LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
 2920
 2921 015654                        J1:
 2922 015654  170011                        SETD                    ;SET DOUBLE MODE
 2923
 2924 015656  012700  016132                MOV     #JDAT0,R0
 2925 015662  172410                        LDD     (R0),AC0        ;LOAD AC0
 2926
 2927 015664  012700  016112                MOV     #JDAT1,R0
 2928 015670  005003                        CLR     R3
 2929 015672  012737  015762  000004        MOV     #JERR0,@#ERRVECT
 2930
 2931 015700  172420                J2:     LDD     (R0)+,AC0       ;TEST INSTRUCTION
 2932 015702  005203                J3:     INC     R3
 2933 015704  005203                J4:     INC     R3
 2934
 2935 015706  012701  016122                MOV     #JDAT00,R1
 2936 015712  174011                        STD     AC0,(R1)        ;PICK UP RESULTS
 2937
 2938 015714  020027  016102                CMP     R0,#JBUF0       ;WAS AN AUTO
 2939 015720  001001                        BNE     1$              ;DECREMENT EXECUTED?
 2940 015722  000442                        BR      JERR1
 2941
 2942 015724  012702  016112        1$:     MOV     #JDAT1,R2       ;IS DATA CORRECT?
 2943 015730  012703  016122                MOV     #JDAT00,R3
 2944 015734  012704  000004                MOV     #4,R4
 2945 015740  022223                J5:     CMP     (R2)+,(R3)+
 2946 015742  001401                        BEQ     J6
 2947 015744  000443                        BR      JERR2
 2948 015746  077404                J6:     SOB     R4,J5
```

```
                                                    CMP     #JDATI0+10,R0   ;WAS R0 INCREM.
                                                    BEQ     J7              ;BY 10 (OCTAL)
                                                    BR      JERR1

                                            J7:     BR      JDONE

                                            ;IF A TRAP THROUGH 4 OCCURS COME HERE

                                            JERR0:  CMP     (SP),#J3        ;SEE IF THE TRAP
                                                    BEQ     J10             ;OCCURRED ON THE
                                                    CMP     (SP),#J4        ;TESTED INSTRUCTION
                                                    BEQ     J10
                                                    JMP     @#CPSPUR

                                            J10:    MOV     #762,@#$TMP3    ;REPORT FSRC FLOW
                                                    MOV     #322,@#$TMP4    ;FAILURE
                                                    MOV     (SP),@#$TMP2
                                                    CMP     (SP)+,(SP)+
                                            1$:     ERROR   +52
                                                    BR      JDONE

                                            JERR1:                          ;REPORT, R0 NOT
                                                    MOV     #J2,@#$TMP2     ;CORRECTLY AFFECTED
                                                    MOV     R0,@#$TMP3
                                                    MOV     #JDATI0+10,@#$TMP4
                                            1$:     ERROR   +53
                                                    BR      JDONE

                                            ;REPORT DATA FAILURE

                                            JERR2:
                                                    MOV     #J2,@#$TMP2
                                                    MOV     #JDATI0,@#$TMP3
                                                    MOV     #JDATO0,@#$TMP4
                                            1$:     ERROR   +54
                                                    BR      JDONE

                                            JBUF0:  .WORD   010421
                                            JBUF1:          021042
                                            JBUF2:          042104
                                            JBUF3:          031463

                                            JDATI0:         052525
                                            JDATI1:         114631
                                            JDATI2:         063146
                                            JDATI3:         073567

                                            JDATO0:         0
                                            JDATO1:         0
                                            JDATO2:         0
                                            JDATO3:         0

                                            JDAT0:          -1
                                            JDAT1:          -1
                                            JDAT2:          -1
                                            JDAT3:          -1
```

```
3006
3007
3008 016142                        JDONE:
     016142  104412                        RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                                    ;SEE IF THE USER HAS EXPRESSED
                                                                    ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                    ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                    ;THE USER TYPED CONTROL G?).
3009
3016
3017                                ;;*******************************************************************
                                    ;*TEST 15       FSRC MODE 4 TEST
                                    ;*
                                    ;* THIS IS A TEST OF FSRC MODE 4, AUTO
                                    ;* DECREMENT MODE.
                                    ;*
                                    ;;*******************************************************************
     016144  000004                 TST15:  SCOPE
3018 016146  104413                        LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
3019
3020 016150                         K1:
3021 016150  170011                        SETD                    ;SET DOUBLE MODE
3022
3023 016152  012700  016424                MOV     #KPAT0,R0
3024 016156  172410                        LDD     (R0),AC0        ;LOAD A DEFAULT
3025                                                                ;PATTERN INTO AC0
3026 016160  012700  016404                MOV     #KBUF0,R0
3027 016164  005003                        CLR     R3
3028 016166  012737  016256  000004        MOV     #KERR0,@#ERRVECT
3029
3030 016174  172440                 K2:    LDD     -(R0),AC0       ;TEST INSTRUCTION
3031 016176  005203                 K3:    INC     R3
3032 016200  005203                 K4:    INC     R3
3033
3034 016202  012701  016414                MOV     #KDAT00,R1
3035 016206  174011                        STD     AC0,(R1)        ;PICK UP THE RESULT
3036
3037 016210  020027  016414                CMP     R0,#KBUF0+10    ;WAS AN AUTO
3038 016214  001001                        BNE     1$              ;INCREMENT EXECUTED
3039 016216  000441                        BR      KERR1
3040
3041 016220  012702  016374         1$:    MOV     #KDAT10,R2      ;IS DATA CORRECT?
3042 016224  012703  016414                MOV     #KDAT00,R3
3043 016230  012704  000004                MOV     #4,R4
3044 016234  022223                 K5:    CMP     (R2)+,(R3)+
3045 016236  001401                        BEQ     K6
3046 016240  000442                        BR      KERR2
3047 016242  077404                 K6:    SOB     R4,K5
3048
3049 016244  022700  016374                CMP     #KBUF0-10,R0    ;WAS R0 DECREMENTED
3050 016250  001401                        BEQ     K7              ;PROPERLY?
3051 016252  000423                        BR      KERR1
3052
3053 016254  000467                 K7:    BR      KDONE
3054
3055                                ;TRAP TO HERE ON AN ODD ADDRESS ERROR
3056
```

```
3057 016256  021627  016176          KERR0:  CMP     (SP),#K3        ;SEE IF THE ERROR
3058 016262  001405                         BEQ     K10             ;OCCURRED AT THE
3059 016264  021627  016200                 CMP     (SP),#K4        ;INSTRUCTION TESTED.
3060 016270  001402                         BEQ     K10
3061 016272  000137  040266                 JMP     @#CPSPUR
3062
3063 016276  012737  000762  001240  K10:    MOV     #762,@#$TMP3    ;REPORT FAILURE IN
3064 016304  012737  000324  001242          MOV     #324,@#$TMP4    ;FSRC FLOWS
3065 016312  011637  001236                 MOV     (SP),@#$TMP2
3066 016316  104055                 1$:     ERROR   +55
3067 016320  000445                         BR      KDONE
3068
3069 016322                          KERR*:                          ;REPORT, R0
3070 016322  012737  016174  001236          MOV     #K2,@#$TMP2     ;INCORRECTLY AFFECTED.
3071 016330  010037  001240                 MOV     R0,@#$TMP3
3072 016334  012737  016374  001242          MOV     #KDATI0,@#$TMP4
3073 016342  104056                 1$:     ERROR   +56
3074 016344  000433                         BR      KDONE
3075
3076                                 ;REPORT DATA FAILURE
3077
3078 016346                          KERR2:
3079 016346  012737  016174  001236          MOV     #K2,@#$TMP2
3080 016354  012737  016374  001240          MOV     #KDATI0,@#$TMP3
3081 016362  012737  016414  001242          MOV     #KDAT00,@#$TMP4
3082 016370  104057                 1$:     ERROR   +57
3083 016372  000420                         BR      KDONE
3084
3085 016374  052525                 KDATI0: .WORD   052525
3086 016376  114631                 KDATI1:         114631
3087 016400  063140                 KDATI2:         063140
3088 016402  073567                 KDATI3:         073567
3089
3090 016404  010421                 KBUF0:          010421
3091 016406  031463                 KBUF1:          031463
3092 016410  042104                 KBUF2:          042104
3093 016412  021042                 KBUF3:          021042
3094
3095 016414  000000                 KDAT00:         0
3096 016416  000000                 KDAT01:         0
3097 016420  000000                 KDAT02:         0
3098 016422  000000                 KDAT03:         0
3099
3100 016424  177777                 KPAT0:          -1
3101 016426  177777                 KPAT1:          -1
3102 016430  177777                 KPAT2:          -1
3103 016432  177777                 DPAT3:          -1
3104
3105 016434                          KDONE:
     016434  104412                         RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                                     ;SEE IF THE USER HAS EXPRESSED
                                                                     ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                     ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                     ;THE USER TYPED CONTROL G?).
3106
3113
3114                                 ;;*****************************************************************
```

```
                                ;*TEST 16       FSRC MODE 2, WITH FD-0, TEST
                                ;*
                                ;* THIS IS A TEST OF FSRC MODE 2 WITH
                                ;* FD=0.  (AUTO INCREMENT)
                                ;*
                                ;;*****************************************************************
 016436  000004                 TST16:  SCOPE
3115 016440  104413                     LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
3116
3117 016442                     L1:
3118 016442  170011                     SETD                    ;SET DOUBLE MODE
3119
3120 016444  012700  016712             MOV     #LPAT10,R0
3121 016450  172410                     LDD     (R0),AC0        ;LOAD AC0
3122
3123 016452  012700  016734             MOV     #LDATI0,R0      ;SET UP THE INPUT
3124 016456  012701  016722             MOV     #LPAT20,R1      ;DATA
3125 016462  012702  000004             MOV     #4,R2
3126
3127 016466  012120             1$:     MOV     (R1)+,(R0)+
3128 016470  077202                     SOB     R2,1$
3129
3130 016472  012700  016734             MOV     #LDATI0,R0
3131 016476  005003                     CLR     R3
3132 016500  170001                     SETF                    ;CLEAR FD.
3133
3134 016502  172420             L2:     LDF     (R0)+,AC0
3135 016504  005203             L3:     INC     R3
3136
3137 016506                     L4:
3138 016506  170011                     SETD                    ;SET FD
3139
3140 016510  012701  016746             MOV     #LDAT00,R1
3141 016514  174011                     STD     AC0,(R1)        ;PICK UP RESULTS
3142
3143 016516  020027  016740             CMP     R0,#LDATI2      ;WAS R0 INCREMENTED
3144 016522  001401                     BEQ     1$              ;CORRECTLY BY 4
3145 016524  000421                     BR      LERR1
3146
3147 016526  012737  177777  016740 1$:     MOV     #-1,@#LDATI2
3148 016534  012737  177777  016742         MOV     #-1,@#LDATI3
3149 016542  012702  016734             MOV     #LDATI0,R2      ;IS DATA CORREC'
3150 016546  012703  016746             MOV     #LDAT00,R3
3151 016552  012704  000004             MOV     #4,R4
3152
3153 016556  022223             L5:     CMP     (R2)+,(R3)+
3154 016560  001401                     BEQ     L6
3155 016562  000427                     BR      LERR2
3156 016564  077404             L6:     SOB     R4,L5
3157
3158 016566  000473                     BR      LDONE
3159
3160 016570                     LERR1:                          ;REPORT FAILURE
3161 016570  012737  016502  001236         MOV     #L2,@#$TMP2     ;R0 NOT INCREMENTED
3162 016576  010037  001240             MOV     R0,@#$TMP3      ;BY 4
3163 016602  012737  016740  001242         MOV     #LDATI2,@#$TMP4
3164 016610  104060             1$:     ERROR   +6C
```

```
3165 016612  000461                          BR      LDONE
3166
3167 016614                          LERR3:                          ;REPORT DATA FAILURE.
3168 016614  012737  016502  001236          MOV     #L2,@#$TMP2
3169 016622  012737  016734  001240          MOV     #LDATI0,@#$TMP3
3170 016630  012737  0'6746  001242          MOV     #LDAT00,@#$TMP4
3171 016636  104061                  1$:     ERROR   +61
3172 016640  000446                          BR      LDONE
3173
3174 016642  012702  016722          LERR2:  MOV     #LPAT20,R2      ;DID (BUT FD)
3175 016646  012703  016746                  MOV     #LDAT00,R3      ;FAIL.
3176 016652  012704  000004                  MOV     #4,R4
3177 016656  022223                  1$:     CMP     (R2)+,(R3)+
3178 016660  001355                          BNE     LERR3
3179 016662  077403                          SOB     R4,1$
3180 016664  012737  016502  001236          MOV     #L2,@#$TMP2
3181 016672  012737  016734  001240          MOV     #LDATI0,@#$TMP3
3182 016700  012737  016750  001242          MOV     #LDAT01,@#$TMP4
3183 016706  104062                  2$:     ERROR   +62
3184 016710  000422                          BR      LDONE
3185
3186 016712  177777                  LPAT10: .WORD   -1
3187 016714  177777                  LPAT11:         -1
3188 016716  177777                  LPAT12:         -1
3189 016720  177777                  LPAT13:         -1
3190
3191 016722  052525                  LPAT20:         052525
3192 016724  114631                  LPAT21:         114631
3193 016726  063142                  LPAT22:         063142
3194 016730  073567                  LPAT23:         073567
3195 016732  000001                          .WORD   000001
3196 016734  000000                  LDATI0:         0
3197 016736  000000                  LDATI1:         0
3198 016740  000000                  LDATI2:         0
3199 016742  000000                  LDATI3:         0
3200 016744  000001                          .WORD   00001
3201 016746  000000                  LDAT00:         0
3202 016750  000000                  LDAT01:         0
3203 016752  000000                  LDAT02:         0
3204 016754  000000                  LDAT03:         0
3205
3206 016756                          LDONE:
     016756  104412                          RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                                     ;SEE IF THE USER HAS EXPRESSED
                                                                     ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                     ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                     ;THE USER TYPED CONTROL G?).
3207
3215
3216                                 ;;******************************************************************
                                     ;*TEST 17       FSRC MODE 2 WITH GR7, IMMEDIATE MODE, TEST
                                     ;*
                                     ;* THIS IS A TEST OF FSRC MODE 2
                                     ;* USING GR7 (THE PC).  THIS IS IMMEDIATE
                                     ;* MODE.
                                     ;*
                                     ;;******************************************************************
```

```
                016760  000004                  TST17:  SCOPE
 3217
 3218 016762                                    M1:
 3219 016762    170011                                  SETD
 3220
 3221 016764    012700  017256                          MOV     #MPAT10,R0
 3222 016770    172410                                  LDD     (R0),AC0        ;LOAD BACKROUND
 3223                                                                           ;PATTERN INTO AC0.
 3224 016772    005004                                  CLR     R4
 3225 016774    012737  017216  000004                  MOV     #MERR3,@#ERRVECT
 3226
 3227 017002    172427  000000          M15:    LDD     #0,AC0          ;TEST INSTRUCTION
 3228            017004                          .=.-2
 3229 017004    005204                          .WORD   5204
 3230 017006    005204                  M2:     INC     R4              ;NOTE THAT
 3231 017010    005204                  M3:     INC     R4              ;005204=INC R4
 3232 017012    005204                  M4:     INC     R4
 3233
 3234 017014    020427  000003                  CMP     R4,#3           ;SEE IF THE PC
 3235 017020    001401                          BEQ     1$              ;WAS INCREMENTED
 3236 017022    000443                          BR      MERR0           ;BY 2 DURING THE
 3237                                                                   ;INSTRUCTION.  IF
 3238                                                                   ;NOT THEN A BAD
 3239                                                                   ;CONSTANT WAS GENERATED
 3240 017024    012700  017276          1$:     MOV     #MDAT00,R0
 3241 017030    174010                          STD     AC0,(R0)        ;GET THE DATA
 3242
 3243 017032    012700  017276                  MOV     #MDAT00,R0
 3244 017036    022720  005204                  CMP     #5204,(R0)+     ;IS THE DATA CORRECT?
 3245 017042    001401                          BEQ     M5
 3246 017044    000451                          BR      MERR1
 3247 017046    012701  000003          M5:     MOV     #3,R1
 3248 017052    005720                  M6:     TST     (R0)+
 3249 017054    001002                          BNE     M7
 3250 017056    077103                          SOB     R1,M6
 3251 017060    000512                          BR      MDONE
 3252
 3253 017062    012700  017276          M7:     MOV     #MDAT00,R0      ;DID (BUT GRM) FAIL?
 3254 017066    012701  000004                  MOV     #4,R1
 3255 017072    022720  005204          M8:     CMP     #5204,(R0)+
 3256 017076    001401                          BEQ     M9
 3257 017100    000433                          BR      MERR1
 3258 017102    077105                  M9:     SOB     R1,M8
 3259
 3260 017104                            MERR2:                          ;REPORT FAILURE
 3261 017104    012737  017002  001236          MOV     #M15,@#$TMP2    ;OF (BUT GR7)
 3262 017112    012737  017266  001240          MOV     #MPAT20,@#$TMP3
 3263 017120    012737  017276  001242          MOV     #MDAT00,@#$TMP4
 3264 017126    104063                  1$:     ERROR   +63
 3265 017130    000466                          BR      MDONE
 3266
 3267 017132    012705  017006          MERR0:  MOV     #M2,R5          ;REPORT FAILURE
```

```
3269 017136  010537  001242                MOV     R5,@#$TMP4      ;PC INCREMENTED
3270 017142  162704  000003                SUB     #3,R4
3271 017146  006304                        ASL     R4
3272 017150  160405                        SUB     R4,R5
3273 017152  010537  001240                MOV     R5,@#$TMP3
3274 017156  012737  017002  001236        MOV     #M15,@#$TMP2
3275 017164  104064                1$:     ERROR   +64
3276 017166  000447                        BR      MDONE
3277
3278 017170                        MERR*:                          ;REPORT DATA
3279 017170  012737  017002  001236        MOV     #M15,@#$TMP2    ;FAILURE
3280 017176  012737  017276  001240        MOV     #MDAT00,@#$TMP3
3281 017204  012737  017266  001242        MOV     #MPAT20,@#$TMP4
3282 017212  104066                1$:     ERROR   +66
3283 017214  000434                        BR      MDONE
3284                               ;*TRAP TO HERE THROUGH 4.
3285 017216  032716  000001        MERR3:  BIT     #1,(SP)         ;SEE IF THE
3286 017222  001002                        BNE     1$              ;TRAP TO 4 OCCURRED
3287 017224  000137  040266                JMP     @#CPSPUR        ;BECAUSE OF AN
3288                                                               ;ODD ADDRESS
3289 017230  011637  001240        1$:     MOV     (SP),@#$TMP3    ;IF YES REPORT
3290 017234  012737  017006  001242        MOV     #M2,@#$TMP4     ;BAD CONSTANT
3291 017242  012737  017002  001236        MOV     #M15,@#$TMP2    ;GENERATED
3292 017250  022626                        CMP     (SP)+,(SP)+
3293 017252  104065                2$:     ERROR   +65
3294 017254  000414                        BR      MDONE
3295
3296 017256  177777                MPAT10:         -1
3297 017260  177777                MPAT11:         -1
3298 017262  177777                MPAT12:         -1
3299 017264  177777                MPAT13:         -1
3300
3301 017266  005204                MPAT20:         5204
3302 017270  005204                MPAT21:         5204
3303 017272  005204                MPAT22:         5204
3304 017274  005204                MPAT23:         5204
3305
3306 017276  000000                MDAT00:         0
3307 017300  000000                MDAT01:         0
3308 017302  000000                MDAT02:         0
3309 017304  000000                MDAT03:         0
3310
3311 017306                        MDONE:
     017306  104412                        RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                                    ;SEE IF THE USER HAS EXPRESSED
                                                                    ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                    ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                    ;THE USER TYPED CONTROL G?).
3312
3319
3320                               ;;*****************************************************************
                                   ;*TEST 20       FSRC MODE 3 TEST
                                   ;*
                                   ;* THIS IS A TEST OF FSRC MODE 3, AUTO INCREMENT
                                   ;* DEFERRED
                                   ;*
                                   ;;*****************************************************************
```

```
        017310  000004                  TST20:  SCOPE
3321
3322    017312                          N1:
3323    017312  170011                          SETD                    ;SET FD MODE
3324
3325    017314  012700  017774                  MOV     #NPAT10,R0
3326    017320  172410                          LDD     (R0),AC0        ;LOAD AC0 WITH A DEFAULT
3327                                                                    ;PATTERN
3328    017322  012700  017762                  MOV     #NPAT20,R0
3329    017326  005003                          CLR     R3
3330    017330  012737  017504  000004          MOV     #NERR0,@#ERRVECT        ;IF A FAILURE OCCURS
3331                                                                    ;IN THE FSRC FLOWS AN
3332                                                                    ;ODD TRAP TO 4 COULD OCCUR
3333    017336  172430                  N2:     LDD     @(R0)+,AC0      ;TEST INSTRUCTION.
3334    017340  005203                  N3:     INC     R3
3335    017342  005203                  N4:     INC     R3
3336
3337    017344  012701  017742                  MOV     #NDAT00,R1
3338    017350  174011                          STD     AC0,(R1)        ;GET THE DATA
3339
3340    017352  020027  017764                  CMP     R0,#NPAT20+2    ;WAS R0 INCREMENTED
3341    017356  001437                          BEQ     N12             ;BY 2?
3342
3343    017360  020027  017772          N5:     CMP     R0,#NPAT20+10   ;FSRC MODE 2?
3344    017364  001001                          BNE     N6
3345    017366  000506                          BR      NERR1
3346
3347    017370  020027  017752          N6:     CMP     R0,#NPAT20-10   ;FSRC MODE 4?
3348    017374  001001                          BNE     N7
3349    017376  000520                          BR      NERR2
3350
3351    017400  020027  017762          N7:     CMP     R0,#NPAT20
3352    017404  001023                          BNE     N11
3353
3354    017406  012702  017742                  MOV     #NDAT00,R2      ;FSRC MODE 0?
3355    017412  012703  000004                  MOV     #4,R3
3356    017416  022227  177777          N8:     CMP     (R2)+,#-1
3357    017422  001002                          BNE     N9
3358    017424  077304                          SOB     R3,N8
3359    017426  000510                          BR      NERR3
3360
3361    017430  012702  017742          N9:     MOV     #NDAT00,R2      ;FSRC MODE 1
3362    017434  012703  017762                  MOV     #NPAT20,R3
3363    017440  012704  000004                  MOV     #4,R4
3364    017444  022223                  N10:    CMP     (R2)+,(R3)+
3365    017446  001002                          BNE     N11
3366    017450  077403                          SOB     R4,N10
3367    017452  000502                          BR      NERR4
3368
3369    017454  000505                  N11:    BR      NERR5
3370
3371    017456  012702  017742          N12:    MOV     #NDAT00,R2      ;DATA CORRECT?
3372    017462  012703  020004                  MOV     #NDAT10,R3
3373    017466  012704  000004                  MOV     #4,R4
3374    017472  022223                  N13:    CMP     (R2)+,(R3)+
3375    017474  001002                          BNE     N14
3376    017476  077403                          SOB     R4,N13
```

```
3377 017500  000545                        BR      NDONE
3378
3379 017502  000504                N14:    BR      NERR6
3380
3381                                ;IF AN ODD ADDRESS TRAP OCCURS COME HERE
3382                                ;TO SEE IF THE FAILURE WAS IN THE FSRC
3383                                ;FLOWS
3384
3385 017504  022716  017342        NERR0:  CMP     #N4,(SP)        ;FSRC MODE 6 OR 7?
3386 017510  001412                        BEQ     NERR10
3387 017512  022716  017340                CMP     #N3,(SP)
3388 017516  001402                        BEQ     1$
3389 017520  000137  040266                JMP     @#CPSPUR
3390 017524  020027  017760        1$:     CMP     R0,#NPAT20-2    ;FSRC MODE 5?
3391 017530  001407                        BEQ     NERR11
3392 017532  000137  040266                JMP     @#CPSPUR
3393
3394 017536                        NERR10:                         ;WENT TO FSRC
3395 017536  011637  001236                MOV     (SP),@#$TMP2    ;MODE 6 OR 7.
3396 017542  022626                        CMP     (SP)+,(SP)+
3397 017544  104067                1$:     ERROR   +67
3398 017546  000522                        BR      NDONE
3399
3400 017550  011637  001236        NERR11: MOV     (SP),@#$TMP2    ;WENT TO FSRC
3401 017554  022626                        CMP     (SP)+,(SP)+     ;MODE 5.
3402 017556  012737  000627  001244        MOV     #627,@#$TMP5
3403 017564  012737  000323  001250        MOV     #323,@#$TMP7
3404 017572  012737  000325  001246        MOV     #325,@#$TMP6
3405 017600  104070                1$:     ERROR   +70
3406 017602  000504                        BR      NDONE
3407 017604  012737  000322  001246 NERR1:  MOV     #322,@#$TMP6    ;FSRC MODE 2.
3408 017612  012737  000627  001244 NERR20: MOV     #627,@#$TMP5
3409 017620  012737  000323  001250        MOV     #323,@#$TMP7
3410 017626  012737  017336  001236        MOV     #N2,@#$TMP2
3411 017634  104071                1$:     ERROR   +71
3412 017636  000466                        BR      NDONE
3413 017640  012737  000324  001246 NERR2:  MOV     #324,@#$TMP6    ;FSRC MODE 4
3414 017646  000761                        BR      NERR20
3415 017650  012737  000320  001246 NERR3:  MOV     #320,@#$TMP6    ;FSRC MODE 0
3416 017656  000755                        BR      NERR20
3417 017660  012737  000321  001246 NERR4:  MOV     #321,@#$TMP6    ;FSRC MODE 1
3418 017666  000751                        BR      NERR20
3419
3420 017670  010037  001240        NERR5:  MOV     R0,@#$TMP3      ;R0 NOT
3421 017674  012737  017764  001242        MOV     #NPAT20+2,@#$TMP4       ;INCREMENTED
3422 017702  012737  017336  001236        MOV     #N2,@#$TMP2     ;PROPERLY.
3423 017710  104072                1$:     ERROR   +72
3424 017712  000440                        BR      NDONE
3425
3426 017714                        NERR6:                          ;DATA FAILURE.
3427 017714  012737  017336  001236        MOV     #N2,@#$TMP2
3428 017722  012737  017742  001240        MOV     #NDAT00,@#$TMP3
3429 017730  012737  020004  001242        MOV     #NDAT10,@#$TMP4
3430 017736  104073                1$:     ERROR   +73
3431 017740  000425                        BR      NDONE
3432
3433 017742  000000                NDAT00: .WORD   0
```

```
3434 017744  000000                NDAT01.         0
3435 017746  000000                NDAT02:         0
3436 017750  000000                NDAT03:         0
3437
3438 017752  052525  052525  052525        .WORD   52525,52525,52525,52525
     017760  052525
3439 017762  020004                NPAT20: .WORD   NDATI0
3440 017764  070707                NPAT21:         070707
3441 017766  070707                NPAT22:         070707
3442 017770  070707                NPAT23:         070707
3443 017772  000001                        .WORD   1
3444 017774  177777                NPAT10: .WORD   -1
3445 017776  177777                NPAT11:         -1
3446 020000  177777                NPAT12:         -1
3447 020002  177777                NPAT13:         -1
3448
3449 020004  010421                NDATI0: .WORD   010421
3450 020006  021042                NDATI1:         021042
3451 020010  031463                NDATI2:         031463
3452 020012  042104                NDATI3:         042104
3453
3454 020014                        NDONE:
     020014  104412                        RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                                    ;SEE IF THE USER HAS EXPRESSED
                                                                    ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                    ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                    ;THE USER TYPED CONTROL G?).
3455
3462
3463                                ;;*******************************************************************
                                    ;*TEST 21       FSRC MODE 5 TEST
                                    ;*
                                    ;* THIS IS A TEST OF FSRC MODE 5, AUTO DECREMENT
                                    ;* DEFERRED.
                                    ;*
                                    ;;*******************************************************************
     020016  000004                TST21:  SCOPE
3464
3465 020020                        01:
3466 020020  170011                        SETD                    ;SET FD MODE
3467
3468 020022  012700  020500                MOV     #OPAT10,R0
3469 020026  172410                        LDD     (R0),AC0        ;LOAD AC0 WITH A
3470                                                                ;DEFAULT PATTERN.
3471 020030  012700  020466                MOV     #OPAT21,R0
3472 020034  005003                        CLR     R3
3473 020036  012737  020210  000004        MOV     #OERR0,@#ERRVEC ;IF A FAILURE
3474                                                                ;OCCURS IN THE FSRC
3475                                                                ;FLOWS AN ODD ADDR.
3476                                                                ;TRAP TO 4 MAY OCCUR.
3477 020044  172450                02:     LDD     @-(R0),AC0      ;TEST INSTRUCTION
3478 020046  005203                03:     INC     R3
3479 020050  005203                04:     INC     R3
3480
3481 020052  012701  020446                MOV     #ODAT00,R1
3482 020056  174011                        STD     AC0,(R1)        ;GET THE DATA
3483
```

```
3484 020060  020027  020464          CMP     R0,#OPAT20      ;WAS R0 DECREMENTED
3485 020064  001436                  BEQ     012             ;BY 2?
3486
3487 020066  020027  020476  05:     CMP     R0,#OPAT21+10   ;FSRC MODE 2
3488 020072  001001                  BNE     06
3489 020074  000505                  BR      OERR1
3490
3491 020076  020027  020456  06:     CMP     R0,#OPAT21-10   ;FSRC MODE 4?
3492 020102  001001                  BNE     07
3493 020104  000517                  BR      OERR2
3494
3495 020106  020027  020466  07:     CMP     R0,#OPAT21
3496
3497 020112  012702  020450          MOV     #ODAT01,R2      ;FSRC MODE 0?
3498 020116  012703  000004          MOV     #4,R3
3499 020122  022227  177777  08:     CMP     (R2)+,#-1
3500 020126  001002                  BNE     09
3501 020130  077304                  SOB     R3,08
3502 020132  000510                  BR      OERR3
3503
3504 020134  012702  020446  09:     MOV     #ODAT00,R2      ;FSRC MODF 1?
3505 020140  012703  020466          MOV     #OPAT21,R3
3506 020144  012704  000004          MOV     #4,R4
3507 020150  022223          010:    CMP     (R2)+,(R3)+
3508 020152  001002                  BNE     011
3509 020154  077403                  SOB     R4,010
3510 020156  000502                  BR      OERR4
3511
3512 020160  000505          011:    BR      OERR5
3513
3514 020162  012702  020446  012:    MOV     #ODAT00,R2      ;DATA CORRECT?
3515 020166  012703  020510          MOV     #ODATI0,R3
3516 020172  012704  000004          MOV     #4,R4
3517 020176  022223          013:    CMP     (R2)+,(R3)+
3518 020200  001002                  BNE     014
3519 020202  077403                  SOB     R4,013
3520 020204  000545                  BR      ODONE
3521
3522 020206  000504          014:    BR      OERR6
3523
3524                                 ;IF AN ODD ADDRESS TRAP OCCURS COME
3525                                 ;HERE TO SEE IF THE FAILURE WAS IN THE
3526                                 ;FSRC FLOWS:
3527
3528 020210  022716  020050  OERR0:  CMP     #04,(SP)        ;FSRC MODE 6 OR 7?
3529 020214  001412                  BEQ     OERR10
3530 020216  022716  020046          CMP     #03,(SP)
3531 020222  001402                  BEQ     1$
3532 020224  000137  040266          JMP     @#CPSPUR
3533 020230  020027  020470  1$:     CMP     R0,#OPAT21+2    ;FSRC MODE 3?
3534 020234  001425                  BEQ     OERR1
3535 020236  000137  040266          JMP     @#CPSPUR
3536
3537 020242                  OERR10:                         ;WENT TO FSRC
3538 020242  011637  0012 ·          MOV     (SP),@#$TMP2    ;MODE 6 OR 7
3539 020246  022626                  CMP     (SP)+,(SP)+
3540 020250  104074          1$:     ERROR   +74
```

```
3541 020252  000522                          BR      ODONE
3542
3543 020254  011637  001240          OERR11: MOV     (SP),@#$TMP3    ;WENT TO FSRC MODE
3544 020260  022626                          CMP     (SP)+,(SP)+     ;3
3545 020262  012737  000627  001244          MOV     #627,@#$TMP5
3546 020270  012737  000325  001250          MOV     #325,@#$TMP7
3547 020276  012737  000323  001246          MOV     #323,@#$TMP6
3548 020304  104075                  1$:     ERROR   +75
3549 020306  000504                          BR      ODONE
3550
3551 020310  012737  000322  001246  OERR1:  MOV     #322,@#$TMP6    ;FSRC MODE2
3552 020316  012737  000627  001242  OERR20: MOV     #627,@#$TMP4
3553 020324  012737  000325  001250          MOV     #325,@#$TMP7
3554 020332  012737  020044  001236          MOV     #02,@#$TMP2
3555 020340  104076                  1$:     ERROR   +76
3556 020342  000466                          BR      ODONE
3557 020344  012737  000324  001246  OERR2:  MOV     #324,@#$TMP6    ;FSRC MODE 4
3558 020352  000761                          BR      OERR20
3559 020354  012737  000320  001246  OERR3:  MOV     #320,@#$TMP6    ;FSRC MODE 0
3560 020362  000755                          BR      OERR20
3561 020364  012737  000321  001246  OERR4:  MOV     #321,@#$TMP6    ;FSRC MODE 1
3562 020372  000751                          BR      OERR20
3563
3564 020374  010037  001240          OERR5:  MOV     R0,@#$TMP3      ;R0 NOT DECREMENTED
3565 020400  012737  020464  001242          MOV     #OPAT20,@#$TMP4 ;PROPERLY
3566 020406  012737  020050  001236          MOV     #04,@#$TMP2
3567 020414  104077                  1$:     ERROR   +77
3568 020416  000440                          BR      ODONE
3569
3570 020420                          OERR6:                          ;DATA FAILURE
3571 020420  012737  020044  001236          MOV     #02,@#$TMP2
3572 020426  012737  020446  001240          MOV     #ODAT00,@#$TMP3
3573 020434  012737  020510  001242          MOV     #ODATI0,@#$TMP4
3574 020442  104100                  1$:     ERROR   +100
3575 020444  000425                          BR      ODONE
3576
3577 020446  000000                  ODAT00: .WORD   0
3578 020450  000000                  ODAT01:         0
3579 020452  000000                  ODAT02:         0
3580 020454  000000                  ODAT03:         0
3581
3582 020456  052525  052525  052525          .WORD   52525,52525,52525
3583 020464  020510                  OPAT20: .WORD   ODATI0
3584 020466  070707                  OPAT21: 070707
3585 020470  070707                  OPAT22: 070707
3586 020472  070707                  OPAT23: 070707
3587 020474  070707                  OPAT24: 070707
3588 020476  000001                          .WORD   1
3589 020500  177777                  OPAT10: .WORD   -1
3590 020502  177777                  OPAT11:         -1
3591 020504  177777                  OPAT12:         -1
3592 020506  177777                  OPAT13:         -1
3593
3594 020510  073567                  ODATI0: .WORD   73567
3595 020512  004210                  ODATI1:         004210
3596 020514  114631                  ODATI2:         114631
3597 020516  125252                  ODATI3:         125252
```

```
3598
3599 020520                          ODONE:
     020520  104412                          RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                             ;SEE IF THE USER HAS EXPRESSED
                                             ;THE DESIRE TO CHANGE THE SOFTWARE
                                             ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                             ;THE USER TYPED CONTROL G?).
3600
3606
3607                                 ;;*****************************************************************
                                     ;*TEST 22       FSRC MODE 6 TEST
                                     ;*
                                     ;* THIS IS A TEST OF FSRC MODE 6, INDEX MODE
                                     ;*
                                     ;;*****************************************************************
     020522  000004                  TST22:  SCOPE
3608
3609 020524                          P1:
3610 020524  170011                          SETD                    ;SET FD MODE
3611
3612 020526  012700  021144                  MOV     #PPAT10,R0
3613 020532  172410                          LDD     (R0),AC0        ;LOAD A DEFAULT PATTERN
3614                                         ;INTO AC0
3615 020534  012737  020642  000004          MOV     #PERR0,@#ERRVECT        ;IF THE (BUT FSRC) FORQ
3616                                         ;FAILS AN ODD ADDRESS TRAP
3617 020542  012700  020713                  MOV     #PDAT10-241,R0  ;COULD OCCUR.
3618
3619 020546  172460  000241          P2:     LDD     241(R0),AC0
3620         020550                  P3-P2+2
3621
3622 020552  012701  021164          P4:     MOV     #PDAT00,R1
3623 020556  174011                          STD     AC0,(R1)        ;GET THE DATA
3624 020560  012703  000004                  MOV     #4,R3
3625 020564  012702  021154                  MOV     #PDAT10,R2
3626 020570  012701  021164                  MOV     #PDAT00,R1
3627 020574  022221                  P5:     CMP     (R2)+,(R1)+     ;CHECK THE DATA
3628 020576  001007                          BNE     P6
3629 020600  077303                          SOB     R3,P5
3630 020602  022700  020713                  CMP     #PDAT10-241,R0  ;R0 CORRECT?
3631 020606  001401                          BEQ     1$
3632 020610  000512                          BR      PERR21
3633 020612  000137  021174          1$:     JMP     @#PDONE
3634
3635 020616  012701  021164          P6:     MOV     #PDAT00,R1
3636 020622  012703  000004                  MOV     #4,R3
3637 020626  022721  177777          P7:     CMP     #-1,(R1)+       ;WAS IT FSRC MODE 0?
3638 020632  001401                          BEQ     P8
3639 020634  000512                          BR      PERR1
3640 020636  077305                  P8:     SOB     R3,P7
3641 020640  000523                          BR      PERR2
3642                                 ;TRAP TO HERE ON AN ODD ADDRESS
3643 020642  021627  020550          PERR0:  CMP     (SP),#P3
3644 020646  001411                          BEQ     PERR11
3645 020650  021627  020552                  CMP     (SP),#P4        ;WAS IT FSRC MODE 7?
3646 020654  001402                          BEQ     PERR10
3647 020656  000137  040266                  JMP     @#CPSPUR
3648
```

```
3649 020662  012737  000327  001246  PERR10: MOV     #327,@#$TMP6
3650 020670  000443                  BR      PERR17
3651 020672  022700  020713          PERR11: CMP     #PDATI0-241,R0  ;WAS IT FSRC MODE 1
3652 020676  001004                  BNE     PERR12
3653 020700  012737  000321  001246          MOV     #321,@#$TMP6
3654 020706  000434                  BR      PERR17
3655 020710  022700  020723          PERR12: CMP     #PDATI0-241+10,R0       ;WAS IT FSRC MODE 2
3656 020714  001004                  BNE     PERR13
3657 020716  012737  000322  001246          MOV     #322,@#$TMP6
3658 020724  000425                  BR      PERR17
3659 020726  022700  020715          PERR13: CMP     #PDATI0-241+2,R0        ;WAS IT FSRC MODE 3
3660 020732  001004                  BNE     PERR14
3661 020734  012737  000323  001246          MOV     #323,@#$TMP6
3662 020742  000416                  BR      PERR17
3663 020744  022700  020703          PERR14: CMP     #PDATI0-241-10,R0       ;WAS IT FSRC MODE 4
3664 020750  001004                  BNE     PERR15
3665 020752  012737  000324  001246          MOV     #324,@#$TMP6
3666 020760  000407                  BR      PERR17
3667 020762  022700  020711          PERR15: CMP     #PDATI0-241-2,R0        ;WAS IT FSRC MODE 5
3668 020766  001401                  BEQ     PERR16
3669 020770  000416                  BR      PERR20
3670 020772  012737  000325  001246  PERR16: MOV     #325,@#$TMP6
3671
3672 021000  012737  000627  001244  PERR17: MOV     #627,@#$TMP5    ;REPORT FSRC
3673 021006  012737  000326  001250          MOV     #326,@#$TMP7    ;FLOWS FAILURE.
3674 021014  011637  001236                  MOV     (SP),@#$TMP2
3675 021020  022626                          CMP     (SP)+,(SP)+
3676 021022  104101                  1$:     ERROR   +101
3677 021024  000463                  BR      PDONE
3678
3679 021026  011637  001236          PERR20: MOV     (SP),@#$TMP2    ;REPORT R0 AFFECTED
3680 021032  022626                          CMP     (SP)+,(SP)+
3681 021034  000403                  BR      PERR22
3682 021036  012737  020546  001236  PERR21: MOV     #P2,@#$TMP2
3683 021044                          PERR22:
3684 021044  010037  001240                  MOV     R0,@#$TMP3
3685 021050  012737  020713  001242          MOV     #PDATI0-241,@#$TMP4
3686 021056  104102                  1$:     ERROR   +102
3687 021060  000445                  BR      PDONE
3688
3689 021062                          PERR1:                          ;DATA FAILURE.
3690 021062  012737  020546  001236          MOV     #P2,@#$TMP2
3691 021070  012737  021154  001240          MOV     #PDATI0,@#$TMP3
3692 021076  012737  021164  001242          MOV     #PDAT00,@#$TMP4
3693 021104  104104                  1$:     ERROR   +104
3694 021106  000432                  BR      PDONE
3695
3696 021110                          PERR2:                          ;FSRC FAILURE TO
3697 021110  012737  020546  001236          MOV     #P2,@#$TMP2     ;MODE 0
3698 021116  012737  000627  001244          MOV     #627,@#$TMP5
3699 021124  012737  000326  001250          MOV     #326,@#$TMP7
3700 021132  012737  000320  001246          MOV     #320,@#$TMP6
3701 021140  104103                  1$:     ERROR   +103
3702 021142  000414                  BR      PDONE
3703
3704 021144  177777                  PPAT10: .WORD   -1
3705 021146  177777                  PPAT11:         -1
```

```
3706 021150  177777                  PPAT12:         -1
3707 021152  177777                  PPAT13:         -1
3708
3709 021154  010421                  PDATI0: .WORD   010421
3710 021156  031463                  PDATI1:         031463
3711 021160  052525                  PDATI2:         052525
3712 021162  073567                  PDATI3:         073567
3713
3714 021164  000000                  PDATO0: .WORD   0
3715 021166  000000                  PDATO1:         0
3716 021170  000000                  PDATO2:         0
3717 021172  000000                  PDATO3:         0
3718
3719 021174                          PDONE:
     021174  104412                          RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                                     ;SEE IF THE USER HAS EXPRESSED
                                                                     ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                     ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                     ;THE USER TYPED CONTROL G?).
3720
3727
3728                                 ;;*******************************************************************
                                     ;*TEST 23       FSRC MODE 7 TEST
                                     ;*
                                     ;* THIS IS A TEST OF FSRC MODE 7, INDEX
                                     ;* DEFERRED MODE.
                                     ;*
                                     ;;*******************************************************************
     021176  000004                  TST23:  SCOPE
3729
3730 021200                          Q1:
3731 021200  170011                          SETD
3732
3733 021202  012700  021634                  MOV     #QPAT10,R0
3734 021206  172410                          LDD     (R0),AC0        ;LOAD A DEFAULT
3735                                                                 ;PATTERN INTO AC0
3736 021210  012737  021342  000004          MOV     #QERR0,@#ERRVECT        ;IF THE (BUT FSRC)
3737                                                                 ;FORK FAILS AN
3738                                                                 ;ODD ADR TRAP COULD
3739                                                                 ;OCCUR
3740 021216  012700  021403                  MOV     #QPAT20-241,R0
3741
3742 021222  172470  000241          Q2:     LDD     @241(R0),AC0
3743          021224                 Q3-Q2+2
3744
3745 021226  012701  021654          Q4:     MOV     #QDATO0,R1
3746 021232  174011                          STD     AC0,(R1)        ;GET THE DATA
3747
3748 021234  012703  000004                  MOV     #4,R3
3749 021240  012704  021654                  MOV     #QDATO0,R4
3750 021244  012705  021664                  MOV     #QDATI0,R5
3751 021250  022425                  Q5:     CMP     (R4)+,(R5)+     ;CHECK THE DATA
3752 021252  001007                          BNE     Q6
3753 021254  077303                          SOB     R3,Q5
3754
3755 021256  022700  021403                  CMP     #QPAT20-241,R0  ;CHECK R0.
3756 021262  001401                          BEQ     1$
```

```
3757 021264  000514                        BR      QERR21
3758 021266  000137  021674          1$:   JMP     @#QDONE
3759
3760 021272  012701  021654          Q6:   MOV     #QDAT00,R1
3761 021276  012703  000004                MOV     #4,R3
3762 021302  022721  177777          Q7:   CMP     #-1,(R1)+       ;WAS IT FSRC MODE 0?
3763 021306  001002                        BNE     Q8
3764 021310  077304                        SOB     R3,Q7
3765 021312  000513                        BR      QERR2
3766
3767 021314  012701  021644          Q8:   MOV     #QPAT20,R1
3768 021320  012702  021654                MOV     #QDAT00,R2
3769 021324  012703  000004                MOV     #4,R3
3770 021330  022122                  Q9:   CMP     (R1)+,(R2)+     ;WAS IT FSRC 6
3771 021332  001401                        BEQ     Q10             ;OR DATA FAILURE
3772 021334  000524                        BR      QERR1
3773 021336  077304                  Q10:  SOB     R3,Q9
3774 021340  000504                        BR      QERR3
3775
3776                                 ;TRAP TO HERE ON AN ODD ADR FAILURE
3777
3778 021342  021627  020550          QERR0:  CMP     (SP),#P3
3779 021346  000137  040266                  JMP     @#CPSPUR
3780
3781 021352  022700  021403          QERR11: CMP     #QPAT20-241,R0  ;WAS IT FSRC
3782 021356  001004                        BNE     QERR12          ;MODE 1?
3783 021360  012737  000321  001246          MOV     #321,@#$TMP6
3784 021366  000434                        BR      QERR17
3785 021370  022700  021413          QERR12: CMP     #QPAT20-241+10,R0       ;WAS IT FSRC
3786 021374  001004                        BNE     QERR13          ;MODE 2?
3787 021376  012737  000322  001246          MOV     #322,@#$TMP6
3788 021404  000425                        BR      QERR17
3789 021406  022700  021405          QERR13: CMP     #QPAT20-241+2,R0        ;WAS IT FSRC
3790 021412  001004                        BNE     QERR14          ;MODE 3?
3791 021414  012737  000323  001246          MOV     #323,@#$TMP6
3792 021422  000416                        BR      QERR17
3793 021424  022700  021373          QERR14: CMP     #QPAT20-241-10,R0       ;WAS IT FSRC
3794 021430  001004                        BNE     QERR15          ;MODE 4
3795 021432  012737  000324  001246          MOV     #324,@#$TMP6
3796 021440  000407                        BR      QERR17
3797
3798 021442  022700  021401          QERR15: CMP     #QPAT20-241-2,R0        ;WAS IT FSRC
3799 021446  001401                        BEQ     QERR16          ;MODE 5
3800 021450  000416                        BR      QERR20
3801
3802 021452  012737  000325  001246  QERR16: MOV     #325,@#$TMP6
3803
3804 021460  012737  000627  001244  QERR17: MOV     #627,@#$TMP5    ;REPORT FSRC FAILURE
3805 021466  012737  000327  001250          MOV     #327,@#$TMP7
3806 021474  011637  001236                  MOV     (SP),@#$TMP2
3807 021500  022626                        CMP     (SP)+,(SP)+
3808 021502  104105                  1$:   ERROR   +105
3809 021504  000473                        BR      QDONE
3810
3811 021506  011637  001236          QERR20: MOV     (SP),@#$TMP2    ;REPORT R0 AFFECTED.
3812 021512  022626                        CMP     (SP)+,(SP)+
3813 021514  000403                        BR      QERR22
```

```
3814 021516  012737  021222  001236  QERR21: MOV     #Q2,@#$TMP2
3815 021524                          QERR22:
3816 021524  010037  001240                  MOV     R0,@#$TMP3
3817 021530  012737  021403  001242          MOV     #QPAT20-241,@#$TMP4
3818 021536  104106                  1$:     ERROR   +106
3819 021540  000455                          BR      QDONE
3820
3821 021542  012737  000320  001246  QERR2:  MOV     #320,@#$TMP6    ;WENT TO FSRC
3822 021550  000403                          BR      QERR4           ;MODE 0
3823 021552  012737  000326  001246  QERR3:  MOV     #326,@#$TMP6    ;WENT TO FSRC
3824                                                                  ;MODE 6
3825 021560  012737  000627  001244  QERR4:  MOV     #627,@#$TMP5
3826 021566  012737  000327  001250          MOV     #327,@#$TMP7
3827 021574  012737  021222  001236          MOV     #Q2,@#$TMP2
3828 021602  104107                  1$:     ERROR   +107
3829 021604  000433                          BR      QDONE
3830
3831 021606                          QERR1:                          ;DATA FAILURE
3832 021606  012737  021222  001236          MOV     #Q2,@#$TMP2
3833 021614  012737  021264  001240          MOV     #QDAT10,@#$TMP3
3834 021622  012737  021654  001242          MOV     #QDAT00,@#$TMP4
3835 021630  104110                  1$:     ERROR   +110
3836 021632  000420                          BR      QDONE
3837
3838 021634  177777                  QPAT10: .WORD   -1
3839 021636  177777                  QPAT11:         -1
3840 021640  177777                  QPAT12:         -1
3841 021642  177777                  QPAT13:         -1
3842
3843 021644  021664                  QPAT20: .WORD   QDAT10
3844 021646  052525                  QPAT21:         52525
3845 021650  052525                  QPAT22:         52525
3846 021652  052525                  QPAT23:         52525
3847
3848 021654  000000                  QDAT00: .WORD   0
3849 021656  000000                  QDAT01:         0
3850 021660  000000                  QDAT02:         0
3851 021662  000000                  QDAT03:         0
3852
3853 021664  073567                  QDAT10: .WORD   073567
3854 021666  052525                  QDAT11: .WORD   052525
3855 021670  031463                  QDAT12: .WORD   031463
3856 021672  010421                  QDAT13: .WORD   010421
3857
3858 021674                          QDONE:
     021674  104412                          RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                                     ;SEE IF THE USER HAS EXPRESSED
                                                                     ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                     ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                     ;THE USER TYPED CONTROL G?).
3859
3876                                 ;;*******************************************************************
                                     ;*TEST 24       (BUT EZBT Y8),(BUT ENBT) AND (BUT FIUV) TEST
                                     ;*
                                     ;* THIS IS A TEST OF THE (BUT EZBT Y8) FORK, THE
                                     ;* (BUT ENBT) FORK AND (BUT FIUV) FORK IN THE
                                     ;* LOAD INSTRUCTION FLOWS.
```

```
                                        ;* EACH OF THE PATTERNS:
                                        ;*              0
                                        ;*              +NUM
                                        ;*              -NUM
                                        ;*              -0
                                        ;* IS LOADED TWICE, ONCE WITH AC>0 THEN
                                        ;* WITH AC=0.  AFTER EACH LOAD THE FPS IS
                                        ;* CHECK TO INSURE THAT CONTROL WAS PASSED
                                        ;* THROUGH WITH THE FORKS PROPERLY.
                                        ;*
                                        ;*****************************************************************
     021676  000004                     TST24:  SCOPE
3877 021700  005037  022776                     CLR     @#UFLAG
3878 021704  012700  022726                     MOV     #UPAT00,R0      ;SET UP AC#0 DATA.
3879 021710  012701  000004                     MOV     #4,R1
3880 021714  012720  177777             U0:     MOV     #-1,(R0)+
3881 021720  077103                             SOB     R1,U0
3882
3883 021722  012737  000033  023000             MOV     #033,@#UTMP1
3884 021730  012737  000023  023002             MOV     #023,@#UTMP2
3885 021736  012737  022456  000244             MOV     #UERR0,@#FPVECT ;IN CASE (BUT FIUV FAILS)
3886 021744                             U1:
     021744  104413                             LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
3887 021746  012700  000200                     MOV     #200,R0
3888 021752  170100                             LDFPS   R0
3889 021754  012700  022726                     MOV     #UPAT00,R0      ;LOAD AC0
3890 021760  172410                             LDD     (R0),AC0
3891 021762  013737  023000  023004             MOV     @#UTMP1,@#UROM1
3892 021770  012737  000001  023006             MOV     #001,@#UROM2
3893 021776  012737  000254  023010             MOV     #254,@#UROM3
3394
3895 022004  012700  022736                     MOV     #UPAT10,R0      ;LOAD 0 INTO AC0
3896 022010  172410                     U2:     LDD     (R0),AC0
3897 022012  010037  001252                     MOV     R0,@#$TMP0
3898 022016  012737  022010  001236             MOV     #U2,@#$TMP2
3899
3900 022024  012704  000204                     MOV     #204,R4         ;SEE IF FPS IS CORRECT
3901 022030  170205                             STFPS   R5
3902
3903 022032  020405                             CMP     R4,R5
3904 022034  001402                             BEQ     U3
3905 022036  000137  022502                     JMP     @#UERR1
3906
3907 022042                             U3:
     022042  104413                             LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
3908 022044  012700  000200                     MOV     #200,R0
3909 022050  170100                             LDFPS   R0
3910
3911 022052  012700  022726                     MOV     #UPAT00,R0      ;LOAD AC0
3912 022056  172410                             LDD     (R0),AC0
3913 022060  013737  023002  023004             MOV     @#UTMP2,@#UROM1
3914 022066  012737  000003  023006             MOV     #003,@#UROM2
3915 022074  012737  000054  023010             MOV     #054,@#UROM3
3916
3917 022102  012700  022746                     MOV     #UPAT20,R0      ;LOAD A POSITIVE NUMBER
3918                                                                     ;INTO AC0
3919 022106  172410                     U4:     LDD     (R0),AC0
```

```
 3920 022110  010037  001252                    MOV     R0,@#$TMP10
 3921 022114  012737  022106  001236            MOV     #U4,@#$TMP2
 3922 022122  012704  000200                    MOV     #200,R4         ;FPS CORRECT?
 3923 022126  170205                            STFPS   R5
```

```
3925
3926 022130  020405                          CMP     R4,R5
3927 022132  001402                          BEQ     U5
3928 022134  000137  022566                  JMP     @#UERR2
3929 022140                          U5:
     022140  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
3930 022142  012700  000200                  MOV     #200,R0
3931 022146  170100                          LDFPS   R0
3932 022150  012700  022726                  MOV     #UPAT00,R0      ;LOAD AC0
3933 022154  172410                          LDD     (R0),AC0
3934 022156  013737  023002  023004          MOV     @#UTMP2,@#UROM1
3935 022164  012737  000403  023006          MOV     #403,@#UROM2
3936 022172  012737  000056  023010          MOV     #056,@#UROM3
3937 022200  012700  022756                  MOV     #UPAT30,R0      ;LOAD A NEGATIUE
3938                                                                 ;NUMBER INTO AL0
3939 022204  172410                  U6:     LDD     (R0),AC0
3940 022206  010037  001252                  MOV     R0,@#$TMP10
3941 022212  012737  022204  001236          MOV     #U6,@#$TMP2
3942 022220  012704  000210                  MOV     #210,R4         ;FPS CORRECT
3943 022224  170205                          STFPS   R5
3944 022226  020405                          CMP     R4,R5
3945 022230  001402                          BEQ     U7
3946 022232  000137  022566                  JMP     @#UERR2
3947 022236                          U7:
     022236  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
3948 022240  012700  000200                  MOV     #200,R0
3949 022244  170100                          LDFPS   R0
3950 022246  012700  022726                  MOV     #UPAT00,R0      ;LOAD AC0
3951 022252  172410                          LDD     (R0),AC0
3952 022254  013737  023000  023004          MOV     @#UTMP1,@#UROM1
3953 022262  012737  000401  023006          MOV     #401,@#UROM2
3954 022270  012737  000256  023010          MOV     #256,@#UROM3
3955 022276  012700  022766                  MOV     #UPAT40,R0      ;LOAD -0 INTO AC0
3956 022302  172410                  U10:    LDD     (R0),AC0
3957 022304  000240                  U11:    NOP                     ;TRAP FROM HERE IF
3958 022306  010037  001252                  MOV     R0,@#$TMP10
3959 022312  012737  022302  001236          MOV     #U10,@#$TMP2    ;(BUT FIUV) FAULS!
3960 022320  012704  000214                  MOV     #214,R4         ;SEE IF FPS IS CORRECT.
3961 022324  170205                          STFPS   R5
3962 022326  020405                          CMP     R4,R5
3963 022330  001402                          BEQ     U12
3964 022332  000137  022502                  JMP     @#UERR1
3965 022336  005737  022776          U12:    TST     @#UFLAG ;SEE IF ALL THE PATTERNS
3966 022342  001021                          BNE     U14             ;HAVE BEEN TEST WITH
3967                                                                 ;BOTH AC NOT EQUAL TO 0 AND AC 0
3968 022344  012700  022726                  MOV     #UPAT00,R0      ;IF NOT GO BACK AND
3969 022350  012701  000004                  MOV     #4,R1           ;CHECK THEM WITH AC=0
3970 022354  005020                  U13:    CLR     (R0)+
3971 022356  077102                          SOB     R1,U13
3972 022360  012737  177777  022776          MOV     #-1,@#UFLAG
3973 022366  012737  000233  023000          MOV     #233,@#UTMP1
3974 022374  012737  000223  023002          MOV     #223,@#UTMP2
3975 022402  000137  021744                  JMP     @#U1
3976 022406                          U14:
     022406  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
3977                                 ;NOW SEE IF A TRAP CAN BE FORCED BY SETTING FIUV AND LOADING -0
3978 022410  012737  022652  000244          MOV     #UERR3,@#FPVECT
```

```
3979 022416  012700  004200              MOV     #4200,R0        ;SET FD AND FIUV
3980 022422  170100                      LDFPS   R0
3981 022424  012700  022726              MOV     #UPAT00,R0      ;SET UP AC0
3982 022430  172410                      LDD     (R0),AC0
3983 022432  012700  022766              MOV     #UPAT40,R0      ;LOAD -0
3984 022436  172410          U15:        LDD     (R0),AC0        ;SHOULD TRAP TO 244
3985 022440  170000          U16:        CFCC
3986 022442  000240                      NOP
3987 022444  012737  022436  001236      MOV     #U15,@#$TMP2    ;REPORT ERROR.
3988                                                             ;DIDN'T TRAP
3989 022452  104127          1$:         ERROR   +127            ;(BUT FIUV) FAILED.
3990 022454  000556                      BR      UDONE
3991
3992                         ;TRAPPED TO 244.  DID (BUT FIUV) FAIL?
3993 022456  021627  022304  UERR0:      CMP     (SP),#U11
3994 022462  001402                      BEQ     1$
3995 022464  000137  040234              JMP     @#FPSPUR
3996 022470  011637  001236  1$:         MOV     (SP),@#$TMP2
3997 022474  022626                      CMP     (SP)+,(SP)+
3998 022476  104126          2$:         ERROR   +126
3999 022500  000544                      BR      UDONE
4000
4001                         ;COME HERE TO ANALYZE FPS ERRORS
4002
4003 022502  032705  000004  UERR1:      BIT     #4,R5
4004 022506  001432                      BEQ     UERR20
4005 022510  012737  000443  001244  UERR10: MOV     #443,@#$TMP5
4006 022516  013703  023010              MOV     @#UROM3,R3
4007 022522  010337  001250              MOV     R3,@#$TMP7
4008 022526  032703  000200              BIT     #200,R3
4009 022532  001403                      BEQ     1$
4010 022534  042703  000200              BIC     #200,R3
4011 022540  000402                      BR      2$
4012 022542  052703  000200  1$:         BIS     #200,R3
4013 022546  010337  001246  2$:         MOV     R3,@#$TMP6
4014 022552  010537  001240  UERR11:     MOV     R5,@#$TMP3
4015 022556  010437  001242              MOV     R4,@#$TMP4
4016 022562  104124          1$:         ERROR   +124
4017 022564  000512                      BR      UDONE
4018 022566  032705  000004  UERR2:      BIT     #4,R5
4019 022572  001746                      BEQ     UERR10
4020 022574  013737  023004  001244  UERR20: MOV     @#UROM1,@#$TMP5
4021 022602  013703  023006              MOV     @#UROM2,R3
4022 022606  010337  001250              MOV     R3,@#$TMP7
4023 022612  032703  000400              BIT     #400,R3
4024 022616  001403                      BEQ     1$
4025 022620  042703  000400              BIC     #400,R3
4026 022624  000402                      BR      2$
4027 022626  052703  000400  1$:         BIS     #400,R3
4028 022632  010337  001246  2$:         MOV     R3,@#$TMP6
4029 022636  010537  001240  UERR21:     MOV     R5,@#$TMP3
4030 022642  010437  001242              MOV     R4,@#$TMP4
4031 022646  104125          1$:         ERROR   +125
4032 022650  000460                      BR      UDONE
4033
4034                         ;INTERRUPT HERE WHEN FIUV SET AND ATTEMPTED TO LOAD-0
4035 022652  021627  022440  JERR3:      CMP     (SP),#U16
```

```
4036 022656  001402                          BEQ     1$
4037 022660  000137  040234                  JMP     @#FPSPUR
4038 022664  022626                  1$:     CMP     (SP)+,(SP)+
4039 022666  005000                          CLR     R0
4040 022670  170300                          STST    R0              ;GET FEC.
4041 022672  022700  000014                  CMP     #14,R0          ;CORRECT
4042 022676  001001                          BNE     UERR4
4043 022700  000444                          BR      UDONE
4044 022702  012737  022436  001236  UERR4:  MOV     #U15,@#$TMP2
4045 022710  012737  000012  001242          MOV     #12,@#$TMP4
4046 022716  010037  001240                  MOV     R0,@#$TMP3
4047 022722  104130                  1$:     ERROR   +130
4048 022724  000432                          BR      UDONE
4049 022726  000000                  UPAT00: .WORD   0
4050 022730  000000                  UPAT01:         0
4051 022732  000000                  UPAT02:         0
4052 022734  000000                  UPAT03:         0
4053
4054 022736  000000                  UPAT10: .WORD   0               ;0
4055 022740  000000                  UPAT11:         0
4056 022742  000000                  UPAT12:         0
4057 022744  000000                  UPAT13:         0
4058
4059 022746  010421                  UPAT20: .WORD   010421          ;POS NUM
4060 022750  114631                  UPAT21:         114631
4061 022752  125252                  UPAT22:         125252
4062 022754  177777                  UPAT23:         177777
4063
4064 022756  114631                  UPAT30:         114631          ;NEG NUM
4065 022760  135673                  UPAT31:         135673
4066 022762  146314                  UPAT32:         146314
4067 022764  167356                  UPAT33:         167356
4068
4069 022766  100000                  UPAT40:         100000          ;NEG ZERO
4070 022770  000000                  UPAT41:         0
4071 022772  000000                  UPAT42:         0
4072 022774  000000                  UPAT43:         0
4073
4074 022776  000000                  UFLAG:  .WORD   0
4075 023000  000000                  UTMP1:          0
4076 023002  000000                  UTMP2:          0
4077 023004  000000                  UROM1:          0
4078 023006  000000                  UROM2:          0
4079 023010  000000                  UROM3:          0
4080 023012                          UDONE:
4081
4082
4090                                 ;;*****************************************************************
                                     ;*TEST 25       ADDF,ADDD,SUBF AND SUBD WITH FSRC-AC=0 TEST

                                     ;*
                                     ;* THIS IS A TEST OF ADD AND SUB WITH FSRC-AC-0
                                     ;*

                                     ;;*****************************************************************
     023012  000004                  TST25:  SCOPE
4091 023014                          W1:
```

```
        023014  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
 4092   023016  012700  000200                  MOV     #200,R0
 4093   023022  170100                          LDFPS   R0              ;SET DOUBLE MODE
 4094   023024  012700  023546                  MOV     #WPAT00,R0      ;LOAD AC0=:
 4095   023030  172410                          LDD     (R0),AC0
 4096   023032  012737  023044  001236          MOV     #W2,@#$TMP2
 4097   023040  012700  023546                  MOV     #WPAT00,R0
 4098   023044  172010                  W2:     ADDD    (R0),AC0        ;TEST INSTRUCTION.
 4099   023046  170205                          STFPS   R5              ;GET FPS
 4100   023050  170011                          SETD                    ;SET DOUBLE MODE
 4101   023052  012700  023546                  MOV     #WPAT00,R0
 4102   023056  174010                          STD     AC0,(R0)        ;GET THE RESULT
 4103   023060  012701  023546                  MOV     #WPAT00,R1
 4104   023064  012702  000004                  MOV     #4,R2
 4105   023070  022021                  W3:     CMP     (R0)+,(R1)+     ;IS RESULT CORRECT
 4106   023072  001405                          BEQ     W4
 4107                                                                   ;NO
 4108   023074  004737  023514                  JSR     PC,@#WSETUP
 4109   023100  104133                  1$:     ERROR   +133
 4110   023102  000137  023566                  JMP     @#WDONE
 4111   023106  077210                  W4:     SOB     R2,W3
 4112   023110  022705  000204                  CMP     #204,R5         ;IS FPS CORRECT
 4113   023114  001410                          BEQ     W5
 4114                                                                   ;NO
 4115   023116  012737  000204  001242          MOV     #204,@#$TMP4
 4116   023124  010537  001240                  MOV     R5,@#$TMP3
 4117   023130  104137                  1$:     ERROR   +137
 4118   023132  000137  023566                  JMP     @#WDONE
 4119   023136                          W5:
        023136  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
 4120   023140  012700  000200                  MOV     #200,R0
 4121   023144  170100                          LDFPS   R0              ;SET DOUBLE MODE
 4122   023146  012700  023?46                  MOV     #WPAT00,R0      ;LOAD AC0-0
 4123   023152  172410                          LDD     (R0),AC0
 4124   023154  012737  023172  001236          MOV     #W6,@#$TMP2
 4125   023162  005000                          CLR     R0
 4126   023164  170100                          LDFPS   R0              ;GO TO FLOATING MODE
 4127   023166  012700  023546                  MOV     #WPAT00,R0
 4128   023172  172010                  W6:     ADDF    (R0),AC0        ;TEST INSTRUCTION
 4129   023174  170205                          STFPS   R5              ;GET FPS
 4130   023176  170011                          SETD                    ;RESET TO DOUBLE MODE
 4131   023200  012700  023546                  MOV     #WPAT00,R0
 4132   023204  174010                          STD     AC0,(R0)        ;GET THE RESULT
 4133   023206  012701  023546                  MOV     #WPAT00,R1
 4134   023212  012702  000004                  MOV     #4,R2
 4135   023216  022021                  W7:     CMP     (R0)+,(R1)+     ;WAS THE RESULT
 4136   023220  001402                          BEQ     W10             ;NO. REPORT FAILURE.
 4137   023222  104134                  1$:     ERROR   +134
 4138   023224  000560                          BR      WDONE
 4139   023226  077205                  W10:    SOB     R2,W7
 4140   023230  022705  000004                  CMP     #4,R5           ;WAS FPS CORRECT
 4141   023234  001407                          BEQ     W11
 4142                                                                   ;INCORRECT FPS.
 4143   023236  012737  000004  001242          MOV     #4,@#$TMP4
 4144   023244  010537  001240                  MOV     R5,@#$TMP3
 4145   023250  104140                  1$:     ERROR   +140
 4146   023252  000545                          BR      WDONE
```

```
                                        W11:
023254  104413                                  LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
023256  012700  000200                          MOV     #200,R0
023262  170100                                  LDFPS   R0              ;SET DOUBLE MODE
023264  012700  023546                          MOV     #WPAT00,R0      ;LOAD AC0-0
023270  172410                                  LDD     (R0),AC0
023272  012737  023304  001236                  MOV     #W12,@#$TMP2
023300  012700  023546                          MOV     #WPAT00,R0
023304  173010                          W12:    SUBD    (R0),AC0        ;TEST INSTRUCTION
023306  170205                                  STFPS   R5              ;GET FPS
023310  170011                                  SETD                    ;SET DOUBLE MODE
023312  012700  023546                          MOV     #WPAT00,R0
023316  174010                                  STD     AC0,(R0)        ;GET THE RESULT
023320  012701  023546                          MOV     #WPAT00,R1
023324  012702  000004                          MOV     #4,R2
023330  022021                          W13:    CMP     (R0)+,(R1)+     ;IS RESULT CORRECT?
023332  001404                                  BEQ     W14
                                                                        ;NO.
023334  004737  023514                          JSR     PC,@#WSETUP
023340  104135                          1$:     ERROR   +135
023342  000511                                  BR      WDONE
023344  077207                          W14:    SOB     R2,W13
023346  022705  000204                          CMP     #204,R5         ;IS FPS CORRECT?
023352  001407                                  BEQ     W15
                                                                        ;NO.
023354  012737  000204  001242                  MOV     #204,@#$TMP4
023362  010537  001240                          MOV     R5,@#$TMP3
023366  104141                          1$:     ERROR   +141
023370  000476                                  BR      WDONE
023372                                  W15:
023372  104413                                  LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
023374  012700  000200                          MOV     #200,R0
023400  170100                                  LDFPS   R0              ;SET DOUBLE MODE
023402  012700  023546                          MOV     #WPAT00,R0      ;LOAD AC0-0
023406  172410                                  LDD     (R0),AC0
023410  012737  023426  001236                  MOV     #W16,@#$TMP2
023416  005000                                  CLR     R0
023420  170100                                  LDFPS   R0              ;ENTER FLOATING MODE.
023422  012700  023546                          MOV     #WPAT00,R0
023426  173010                          W16:    SUBF    (R0),AC0        ;TEST INSTRUCTION.
023430  170205                                  STFPS   R5              ;GET FPS
023432  170011                                  SETD                    ;RESET TO DOUBLE MODE
023434  012700  023546                          MOV     #WPAT00,R0      ;GET THE RESULT.
023440  174010                                  STD     AC0,(R0)
023442  012701  023546                          MOV     #WPAT00,R1
023446  012702  000004                          MOV     #4,R2
023452  022021                          W17:    CMP     (R0)+,(R1)+     ;IS RESULT CORRECT?
023454  001404                                  BEQ     W20
                                                                        ;NO.
023456  004737  023514                          JSR     PC,@#WSETUP
023462  104136                          1$:     ERROR   +136
023464  000440                                  BR      WDONE
023466  077207                          W20:    SOB     R2,W17
023470  022705  000004                          CMP     #4,R5           ;IS FPS CORRECT?
023474  001434                                  BEQ     WDONE
                                                                        ;NO
023476  012737  000004  001242                  MOV     #4,@#$TMP4
```

```
                                        MOV     R5,@#$TMP3
                                1$:     ERROR   +142
                                        BR      WDONE

                                ;SET UP FOR ERROR CALL

                                WSETUP: MOV     #WPAT00,@#$TMP3
                                        MOV     #WPAT00,@#$TMP4
                                        MOV     #WPAT00,@#$TMP6
                                        MOV     #WPAT00,@#$TMP5
                                        RTS     PC
                                WPAT00: .WORD   0
                                WPAT01:         0
                                WPAT02:         0
                                WPAT03:         0

                                WDAP00: .WORD   0
                                WDAT01:         0
                                WDAT02:         0
                                WDAT03:         0

                                WDONE:
                                        RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                                ;SEE IF THE USER HAS EXPRESSED
                                                                ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                ;THE USER TYPED CONTROL G?).


                                ;;*****************************************************************
                                ;*TEST 26       ADDD AND SUB WITH FSRC 0
                                ;*
                                ;* THIS IS A TEST OF ADD AND SUB WITH FSRC 0.
                                ;*

                                ;;*****************************************************************
                                TST26:  SCOPE
                                X1:
                                        LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
                                        MOV     #200,R0
                                        LDFPS   R0              ;SET DOUBLE MODE
                                        MOV     #XPAT00,R0      ;SET AC0 TO POSITIVE
                                        MOV     R0,@#XTMP       ;NUMBER #0
                                        LDD     (R0),AC0
                                        MOV     #X2,@#$TMP2
                                        MOV     #XPAT10,R0      ;FSRC=0
                                X2:     ADDD    (R0),AC0        ;TEST INSTRUCTION
                                        STFPS   R5
                                        SETD
                                        MOV     #XDAT00,R0      ;GET RESULT.
                                        STD     AC0,(R0)
                                        MOV     #XPAT00,R1
                                        MOV     #4,R2
                                X3:     CMP     (R0)+,(R1)+     ;IS RESULT CORRECT?
                                        BEQ     X4
                                        BR      XERR1
                                X4:     SOB     R2,X3
```

```
4252 023662  012704  000200                    MOV     #200,R4
4253 023666  020405                            CMP     R4,R5           ;IS FPS CORRECT?
4254 023670  001402                            BEQ     X5
4255 023672  000137  024270                    JMP     @#XERR2
4256 023676                            X5:
     023676  104413                            LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
4257 023700  012700  000200                    MOV     #200,R0
4258 023704  170100                            LDFPS   R0              ;SET DOUBLE MODE
4259 023706  012700  024352                    MOV     #XPAT20,R0      ;SET AC0 TO
4260 023712  010037  024320                    MOV     R0,@#XTMP       ;NEGATIVE NUMBER
4261 023716  172410                            LDD     (R0),AC0
4262 023720  012737  023732  001236            MOV     #X6,@#$TMP2
4263 023726  012700  024342                    MOV     #XPAT10,R0      ;FSRC=0
4264 023732  172010                    X6:     ADDD    (R0),AC0        ;TEST INSTRUCTION
4265 023734  170205                            STFPS   R5
4266 023736  170011                            SETD
4267 023740  012700  024322                    MOV     #XDAT00,R0      ;GET RESULT
4268 023744  174010                            STD     AC0,(R0)
4269 023746  012701  024352                    MOV     #XPAT20,R1
4270 023752  012702  000004                    MOV     #4,R2
4271 023756  022021                    X7:     CMP     (R0)+,(R1)+     ;IS RESULT CORRECT?
4272 023760  001401                            BEQ     X10
4273 023762  000511                            BR      XERR1
4274 023764  077204                    X10:    SOB     R2,X7
4275 023766  012704  000210                    MOV     #210,R4
4276 023772  020405                            CMP     R4,R5           ;IS FPS CORRECT?
4277 023774  001401                            BEQ     X11
4278 023776  000534                            BR      XERR2
4279 024000                            X11:
     024000  104413                            LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
4280 024002  012700  000200                    MOV     #200,R0
4281 024006  170100                            LDFPS   R0              ;SET DOUBLE MODE
4282 024010  012700  024332                    MOV     #XPAT00,R0      ;SET AC0 TO NON-ZERO
4283 024014  010037  024320                    MOV     R0,@#XTMP       ;POSITIVE NUMBER
4284 024020  172410                            LDD     (R0),AC0
4285 024022  012737  024034  001236            MOV     #X12,@#$TMP2
4286 024030  012700  024342                    MOV     #XPAT10,R0      ;FSRC=0
4287 024034  173010                    X12:    SUBD    (R0),AC0        ;TEST INSTRUCTION
4288 024036  170205                            STFPS   R5
4289 024040  170011                            SETD
4290 024042  012700  024322                    MOV     #XDAT00,R0      ;GET RESULT
4291 024046  174010                            STD     AC0,(R0)
4292 024050  012701  024332                    MOV     #XPAT00,R1
4293 024054  012702  000004                    MOV     #4,R2
4294 024060  022021                    X13:    CMP     (R0)+,(R1)+     ;IS RESULT CORRECT?
4295 024062  001401                            BEQ     X14
4296 024064  000463                            BR      XERR3
4297 024066  077204                    X14:    SOB     R2,X13
4298 024070  012704  000200                    MOV     #200,R4         ;IS FPS CORRECT?
4299 024074  020405                            CMP     R4,R5
4300 024076  001401                            BEQ     X15
4301 024100  000501                            BR      XERR4
4302 024102                            X15:
     024102  104413                            LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
4303 024104  012700  000200                    MOV     #200,R0
4304 024110  170100                            LDFPS   R0              ;SET DOUBLE MODE
4305 024112  012700  024352                    MOV     #XPAT20,R0      ;SET AC0=A NEGATIVE
```

```
 4306 024116  010037  024320                    MOV     R0,@#XTMP       ;NUMBER
 4307 024122  172410                            LDD     (R0),AC0
 4308 024124  012737  024136  001236            MOV     #X16,@#$TMP2
 4309 024132  012700  024342                    MOV     #XPAT10,R0      ;FSRC=0
 4310 024136  173010                  X16:      SUBD    (R0),AC0        ;TEST INSTRUCTION.
 4311 024140  170205                            STFPS   R5
 4312 024142  170011                            SETD
 4313 024144  012700  024322                    MOV     #XDAT00,R0      ;GET RESULT
 4314 024150  174010                            STD     AC0,(R0)
 4315 024152  012701  024352                    MOV     #XPAT20,R1
 4316 024156  012702  000004                    MOV     #4,R2
 4317 024162  022021                  X17:      CMP     (R0)+,(R1)+     ;IS RESULT CORRECT?
 4318 024164  001401                            BEQ     X20
 4319 024166  000422                            BR      XERR3
 4320 024170  077204                  X20:      SOB     R2,X17
 4321 024172  012704  000210                    MOV     #210,R4         ;IS FPS CORRECT?
 4322 024176  020405                            CMP     R4,R5
 4323 024200  001401                            BEQ     X21
 4324 024202  000440                            BR      XERR4
 4325 024204  000466                  X21:      BR      XDONE
 4326
 4327                                           ;REPORT DATA ERRORS
 4328
 4329 024206  012737  024342  001240  XERR1:   MOV     #XPAT10,@#$TMP3
 4330 024214  013737  024320  001242            MOV     @#XTMP,@#$TMP4
 4331 024222  012737  024322  001244            MOV     #XDAT00,@#$TMP5
 4332 024230  104143                  1$:       ERROR   +143
 4333 024232  000453                            BR      XDONE
 4334 024234  012737  024342  001240  XERR3:   MOV     #XPAT10,@#$TMP3
 4335 024242  013737  024320  001242            MOV     @#XTMP,@#$TMP4
 4336 024250  012737  024322  001244            MOV     #XDAT00,@#$TMP5
 4337 024256  013737  024320  001246            MOV     @#XTMP,@#$TMP6
 4338 024264  104144                  1$:       ERROR   +144
 4339 024266  000435                            BR      XDONE
 4340
 4341                                           ;REPORT FPS ERRORS
 4342
 4343 024270                          XERR2:
 4344 024270  010537  001240                    MOV     R5,@#$TMP3
 4345 024274  010437  001242                    MOV     R4,@#$TMP4
 4346 024300  104145                  1$:       ERROR   +145
 4347 024302  000427                            BR      XDONE
 4348 024304                          XERR4:
 4349 024304  010537  001240                    MOV     R5,@#$TMP3
 4350 024310  010437  001242                    MOV     R4,@#$TMP4
 4351 024314  104146                  1$:       ERROR   +146
 4352 024316  000421                            BR      XDONE
 4353 024320  000000                  XTMP:     .WORD   0
 4354 024322  000000                  XDAT00:   .WORD   0
 4355 024324  000000                  XDAT01:           0
 4356 024326  000000                  XDAT02:           0
 4357 024330  000000                  XDAT03:           0
 4358
 4359 024332  010421                  XPAT00:   .WORD   010421
 4360 024334  021042                  XPAT01:           021042
 4361 024336  031463                  XPAT02:           031463
 4362 024340  042104                  XPAT03:           042104
```

```
4363
4364 024342  000000                    xPAT10: .WORD   0
4365 024344  000000                    xAPT11:         0
4366 024346  000000                    xPAT12:         0
4367 024350  000000                    xPAT13:         0
4368 024352  104210                    xPAT20: .WORD   104210
4369 024354  114631                    xPAT21:         114631
4370 024356  125252                    xPAT22:         125252
4371 024360  135673                    xPAT23:         135673
4372
4373 024362                            xDONE:
     024362  104412                            RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                                        ;SEE IF THE USER HAS EXPRESSED
                                                                        ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                        ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                        ;THE USER TYPED CONTROL G?).
4374
4382                                   ;;*****************************************************************
                                       ;*TEST 27       SUBD WITH AC=0 TEST
                                       ;*
                                       ;* THIS IS A TEST OF SUBD WITH AC=0.  BOTH POSITIVE
                                       ;* AND NEGATIVE FSRC'S ARE TRIED.
                                       ;*
                                       ;;*****************************************************************
     024364  000004                    TST27:  SCOPE
4383 024366  005037  024716                    CLR     @#YFLAG
4384 024372  012737  024736  024720            MOV     #YPAT00,@#YTMP1 ;P
4385 024400  012737  024746  024722            MOV     #YPAT10,@#YTMP2 ;N
4386 024406  012737  000210  024724            MOV     #210,@#YTMP3
4387 024414                            Y1:
     024414  104413                            LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
4388 024416  012700  000200                    MOV     #200,R0
4389 024422  170100                            LDFPS   R0              ;SET DOUBLE MODE
4390 024424  012700  024756                    MOV     #YPAT20,R0      ;SET AC0=0
4391 024430  172410                            LDD     (R0),AC0
4392 024432  013700  024720                    MOV     @#YTMP1,R0
4393 024436  173010                    Y2:     SUBD    (R0),AC0        ;TEST INSTRUCTION
4394 024440  170205                            STFPS   R5
4395 024442  170011                            SETD
4396 024444  012700  024726                    MOV     #YDAT00,R0      ;GET RESULT
4397 024450  174010                            STD     AC0,(R0)
4398 024452  012702  000004                    MOV     #4,R2
4399 024456  013701  024722                    MOV     @#YTMP2,R1      ;CHECK RESULT.
4400 024462  022021                    Y3:     CMP     (R0)+,(R1)+
4401 024464  001026                            BNE     Y6
4402 024466  077203                            SOB     R2,Y3
4403 024470  023705  024724                    CMP     @#YTMP3,R5      ;FPS CORRECT?
4404 024474  001401                            BEQ     Y4
4405 024476  000475                            BR      YERR3
4406 024500  005737  024716            Y4:     TST     @#YFLAG         ;FINISHED TEST?
4407 024504  001015                            BNE     Y5
4408 024506  012737  177777  024716            MOV     #-1,@#YFLAG
4409 024514  012737  024746  024720            MOV     #YPAT10,@#YTMP1
4410 024522  012737  024736  024722            MOV     #YPAT00,@#YTMP2
4411 024530  012737  000200  024724            MOV     #200,@#YTMP3
4412 024536  000726                            BR      Y1
```

```
4413 024540 000512                  Y5:     BR      YDONE
4414 024542 012702 000004           Y6:     MOV     #4,R2
4415 024546 012700 024720                   MOV     #YTMP1,R0       ;DID XOR OF SIGN BIT
4416 024552 012701 024726                   MOV     #YDAT00,R1      ;FAIL?
4417 024556 022021                  Y7:     CMP     (R0)+,(R1)+
4418 024560 001002                          BNE     YERR1
4419 024562 077203                          SOB     R2,Y7
4420 024564 000421                          BR      YERR2
4421 024566                         YERR1:                          ;DATA FAILURE
4422 024566 012737 024436 001236            MOV     #Y2,@#$TMP2
4423 024574 013737 024720 001240            MOV     @#YTMP1,@#$TMP3
4424 024602 012737 024756 001242            MOV     #YPAT20,@#$TMP4
4425 024610 012737 024726 001244            MOV     #YDAT00,@#$TMP5
4426 024616 013737 024722 001246            MOV     @#YTMP2,@#$TMP6
4427 024624 104147                  1$:     ERROR   +147
4428 024626 000457                          BR      YDONE
4429 024630                         YERR2:                          ;XOR OF SIGN BIT
4430 024630 012737 024436 001236            MOV     #Y2,@#$TMP2     ;FAILED
4431 024636 013737 024720 001240            MOV     @#YTMP1,@#$TMP3
4432 024644 012737 024756 001242            MOV     #YPAT20,@#$TMP4
4433 024652 012737 024726 001244            MOV     #YDAT00,@#$TMP5
4434 024660 013737 024722 001246            MOV     @#YTMP2,@#$TMP6
4435 024666 104150                  1$:     ERROR   +150
4436 024670 000436                          BR      YDONE
4437 024672                         YERR3:                          ;FPS WRONG.
4438 024672 012737 024436 001236            MOV     #Y2,@#$TMP2
4439 024700 010537 001240                   MOV     R5,@#$TMP3
4440 024704 013737 024724 001242            MOV     @#YTMP3,@#$TMP4
4441 024712 104151                  1$:     ERROR   +151
4442 024714 000424                          BR      YDONE
4443
4444 024716 000000                  YFLAG:  .WORD   0
4445 024720 000000                  YTMP1:          0
4446 024722 000000                  YTMP2:          0
4447 024724 000000                  YTMP3:          0
4448
4449 024726 000000                  YDAT00: .WORD   0
4450 024730 000000                  YDAT01:         0
4451 024732 000000                  YDAT02:         0
4452 024734 000000                  YDAT03:         0
4453
4454 024736 063146                  YPAT00:         063146
4455 024740 052525                  YPAT01:         052525
4456 024742 042104                  YPAT02:         042104
4457 024744 167356                  YPAT03:         167356
4458
4459 024746 163146                  YPAT10:         163146
4460 024750 052525                  YPAT11:         052525
4461 024752 042104                  YPAT12:         042104
4462 024754 167356                  YPAT13:         167356
4463
4464 024756 000000                  YPAT20:         0
4465 024760 000000                  YPAT21:         0
4466 024762 000000                  YPAT22:         0
4467 024764 000000                  YPAT23:         0
4468
4469 024766                         YDONE:
```

```
        024766  104412                          RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                                        ;SEE IF THE USER HAS EXPRESSED
                                                                        ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                        ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                        ;THE USER TYPED CONTROL G?).
  4478                                  ;;*****************************************************************
                                        ;*TEST 30       ADDD WITH AC=0 TEST

                                        ;@
                                        ;@ THIS IS A TEST OF ADDD WITH AC=0.  BOTH
                                        ;* POSITIVE AND NEGATIVE FSRC'S ARE TRIED.
                                        ;*

                                        ;;*****************************************************************
        024770  000004                  TST30:  SCOPE
  4479  024772  005067  000224                    CLR     ZFLAG
  4480  024776  012737  025240  025224            MOV     #ZPAT00,@#ZTMP1 ;P
  4481  025004  012737  000200  025226            MOV     #200,@#ZTMP2
  4482  025012                          Z1:
        025012  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
  4483  025014  012700  000200                    MOV     #200,R0
  4484  025020  170100                          LDFPS   R0              ;SET DOUBLE MODE
  4485  025022  012700  025260                    MOV     #ZPAT20,R0      ;SET AC0=0
  4486  025026  172410                          LDD     (R0),AC0
  4487  025030  013700  025224                    MOV     @#ZTMP1,R0
  4488  025034  172010                  Z2:     ADDD    (R0),AC0        ;TEST INSTRUCTION
  4489  025036  170205                          STFPS   R5
  4490  025040  170011                          SETD
  4491  025042  012700  025230                    MOV     #ZDAT00,R0      ;GET RESULT
  4492  025046  174010                          STD     AC0,(R0)
  4493  025050  012702  000004                    MOV     #4,R2
  4494  025054  013701  025224                    MOV     @#ZTMP1,R1      ;RESULT CORRECT?
  4495  025060  022021                  Z3:     CMP     (R0)+,(R1)+
  4496  025062  001401                          BEQ     Z4
  4497  025064  000423                          BR      ZERR1
  4498  025066  077204                  Z4:     SOB     R2,Z3
  4499  025070  023705  025226                    CMP     @#ZTMP2,R5      ;FPS CORRECT?
  4500  025074  001401                          BEQ     Z5
  4501  025076  000437                          BR      ZERR2
  4502  025100  005737  025222          Z5:     TST     @#ZFLAG         ;FINISHED TEST?
  4503  025104  001012                          BNE     Z6
  4504  025106  012737  177777  025222          MOV     #-1,@#ZFLAG
  4505  025114  012737  025250  025224          MOV     #ZPAT10,@#ZTMP1
  4506  025122  012737  000210  025226          MOV     #210,@#ZTMP2
  4507  025130  000730                          BR      Z1
  4508  025132  000456                  Z6:     BR      ZDONE
  4509  025134                          ZERR1:                          ;DATA FAILURE
  4510  025134  012737  025034  001236          MOV     #Z2,@#$TMP2
  4511  025142  013737  025224  001240          MOV     @#ZTMP1,@#$TMP3
  4512  025150  012737  025260  001242          MOV     #ZPAT20,@#$TMP4
  4513  025156  012737  025230  001244          MOV     #ZDAT00,@#$TMP5
  4514  025164  013737  025224  001246          MOV     @#ZTMP1,@#$TMP6
  4515  025172  104152                  1$:     ERROR   +152
  4516  025174  000435                          BR      ZDONE
  4517  025176                          ZERR2:
  4518  025176  012737  025034  001236          MOV     #Z2,@#$TMP2
  4519  025204  010537  001240                    MOV     R5,@#$TMP3
```

```
 4520 025210  013737  025226  001242          MOV     @#ZTMP2,@#$TMP4
 4521 025216  104133                  1$:     ERROR   +153
 4522 025220  000423                          BR      ZDONE
 4523
 4524 025222  000000                  ZFLAG:  .WORD   0
 4525 025224  000000                  ZTMP1:          0
 4526 025226  000000                  ZTMP2:          0
 4527
 4528 025230  000000                  ZDAT00: .WORD   0
 4529 025232  000000                  ZDAT01:         0
 4530 025234  000000                  ZDAT02:         0
 4531 025236  000000                  ZDAT03:         0
 4532
 4533 025240  031463                  ZPAT00:         031463
 4534 025242  010421                  ZPAT01:         010421
 4535 025244  146314                  ZPAT02:         146314
 4536 025246  156735                  ZPAT03:         156735
 4537
 4538 025250  156735                  ZPAT10:         156735
 4539 025252  167356                  ZPAT11:         167356
 4540 025254  135673                  ZPAT12:         135673
 4541 025256  146314                  ZPAT13:         146314
 4542
 4543 025260  000000                  ZPAT20:         0
 4544 025262  000000                  ZPAT21:         0
 4545 025264  000000                  ZPAT22:         0
 4546 025266  000000                  ZPAT23:         0
 4547
 4548 025270                          ZDONE:
      025270  104412                          RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                                      ;SEE IF THE USER HAS EXPRESSED
                                                                      ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                      ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                      ;THE USER TYPED CONTROL G?).
 4549
 4550
 4558                                         ;TEST TITLE:ADDF AND ADDD WITH E(AC)=E(FSRC) TEST AND (BUT FT) TEST
 4559                                 ;;*****************************************************************
                                      ;*TEST 31       SEE ABOVE COMMENT FOR TEST TITLE
                                      ;*
                                      ;* THIS IS A TEST OF THE ADD INSTRUCTION WITH THE
                                      ;* OPERANDS HAVING EQUAL EXPONENTS.  THE (BUF FT)
                                      ;* FORK IN THE ROUND/TRUNK FLOWS IS ALSO TESTED.
                                      ;*
                                      ;;*****************************************************************
      025272  000004                  TST31:  SCOPE
 4560 025274                          AA1:
      025274  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
 4561 025276  012700  003240                  MOV     #3240,R0
 4562 025302  170100                          LDFPS   R0              ;SET FIV FIV FD AND FT
 4563 025304  012737  025654  000244          MOV     #AAERR0,@#FPVECT  ;IN CASE THE OVER/UNDER
 4564 025312  012700  026232                  MOV     #AAPAT0,R0      ;FLOWS IN TRAP WILL
 4565                                                                 ;OCCUR
 4566 025316  172410                          LDD     (R0),AC0        ;SET UP AC0
 4567 025320  012737  025332  001236          MOV     #AA2,@#$TMP2    ;OPERAND
 4568 025326  012700  026242                  MOV     #AAPAT1,R0
 4569 025332  172010                  AA2:    ADDD    (R0),AC0        ;TEST INSTRUCTION
```

```
 4570                                                    ;SHOULD TRUNCATE
 4571 025334  012700  026222        AA3:    MOV     #AADAT0,R0
 4572 025340  174010                        STD     AC0,(R0)        ;GET THE RESULT
 4573 025342  012701  026252                MOV     #AAPAT2,R1
 4574 025346  012702  000004                MOV     #4,R2
 4575 025352  022021                AA4:    CMP     (R0)+,(R1)+     ;CORRECT?
 4576 025354  001414                        BEQ     AA7
 4577 025356  012700  026262                MOV     #AAPAT3,R0      ;DID (BUT FT) FAIL
 4578 025362  012701  026222                MOV     #AADAT0,R1
 4579 025366  012702  000004                MOV     #4,R2
```

```
4581 025372 022021                AA5:    CMP     (R0)+,(R1)+
```

```
4583 025374  001401                        BEQ     AA6
4584 025376  000561                        BR      AAERR1  ;DATA ERROR
4585 025400  077204                AA6:    SOB     R2,AA5
4586 025402  000137  025776                JMP     @#AAERR2        ;(BUT FT) EPROR
4587 025406  077217                AA7:    SOB     R2,AA4
4588
4589                               ;NOW TEST DOUBLE FLOATING ROUND MODE.
4590
4591 025410                        AA10:
     025410  104413                        LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
4592 025412  012700  003200                MOV     #3200,R0        ;SET FD FIV FIV. FT-0
4593 025416  170100                        LDFPS   R0
4594 025420  012700  026232                MOV     #AAPAT0,R0
4595 025424  172410                        LDD     (R0),AC0        ;SET UP AC0 OPERAND
4596 025426  012737  025440  001236        MOV     #AA11,@#$TMP2
4597 025434  012700  026242                MOV     #AAPAT1,R0
4598 025440  172010                AA11:   ADDD    (R0),AC0        ;TEST INSTRUCTION
4599                                                               ;SHOULD ROUND
4600 025442  012700  026222        AA12:   MOV     #AADAT0,R0
4601 025446  174010                        STD     AC0,(R0)        ;GET THE RESULT
4602 025450  012701  026262                MOV     #AAPAT3,R1
4603 025454  012702  000004                MOV     #4,R2
4604 025460  022021                AA13:   CMP     (R0)+,(R1)+     ;CORRECT?
4605 025462  001425                        BEQ     AA20
4606 025464  012700  026252                MOV     #AAPAT2,R0      ;DID (BUT FT) FAIL?
4607 025470  012701  026222                MOV     #AADAT0,R1
4608 025474  012702  000004                MOV     #4,R2
4609 025500  022021                AA14:   CMP     (R0)+,(R1)+
4610 025502  001413                        BEQ     AA17
4611 025504  012700  026272                MOV     #AAPAT4,R0      ;WAS THE FLOATING
4612 025510  012701  026222                MOV     #AADAT0,R1      ;CONSTANT USED
4613 025514  012702  000004                MOV     #4,R2           ;INSTEAD OF THE
4614 025520  022021                AA15:   CMP     (R0)+,(R1)+     ;DOUBLE CONSTANT
4615 025522  001401                        BEQ     AA16            ;IN THE ROUND
4616 025524  000542                        BR      AAERR3  ;FLOWS?
4617 025526  077204                AA16:   SOB     R2,AA15         ;DATA ERROR
4618 025530  000544                        BR      AAERR4  ;CONSTANT ERROR
4619 025532  077216                AA17:   SOB     R2,AA14
4620 025534  000560                        BR      AAERR5  ;(BUT FT) ERROR
4621 025536  077230                AA20:   SOB     R2,AA13
4622
4623                               ;NOW TEST ADDF WITH FT=0, ROUND MODE
4624
4625 025540                        AA21:
     025540  104413                        LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
4626 025542  012700  003200                MOV     #3200,R0                ;FIV=1, FIV=1, FT=0
4627 025546  170100                        LDFPS   R0
4628 025550  012700  026232                MOV     #AAPAT0,R0      ;LOAD AC0 OPERAND
4629 025554  172410                        LDD     (R0),AC0
4630 025556  170001                        SETF                    ;ENTER FLOATING MODE
4631 025560  012737  025572  001236        MOV     #AA22,@#$TMP2
4632 025566  012700  026302                MOV     #AAPAT5,R0
4633 025572  172010                AA22:   ADDF    (R0),AC0        ;TEST INSTRUCTION
4634                                                               ;SHOULD ROUND
4635 025574                        AA23:
4636 025574  170011                        SETD                    ;RESET TO DOUBLE
4637                                                               ;MODE
```

```
4638 025576  012700  026222                    MOV     #AADATO,R0      ;GET THE RESULT
4639 025602  174010                            STD     AC0,(R0)
4640 025604  012701  026312                    MOV     #AAPAT6,R1      ;CORRECT?
4641 025610  012702  000002                    MOV     #2,R2
4642 025614  022021                AA24:       CMP     (R0)+,(R1)+
4643 025616  001413                            BEQ     AA27
4644 025620  012700  026252                    MOV     #AAPAT2,R0      ;WAS THE DOUBLE
4645 025624  012701  026222                    MOV     #AADATO,R1      ;CONSTANT USED INSTEAD
4646 025630  012702  000002                    MOV     #2,R2           ;OF THE FLOATING
4647 025634  022011                AA25.       CMP     (R0)+,(R1)      ;CONSTANT IN THE
4648 025636  001401                            BEQ     AA26            ;ROUND FLOWS?
4649 025640  000534                            BR      AAERR6  ;DATA ERROR
4650 025642  077204                AA26:       SOB     R2,AA25
4651 025644  000550                            BR      AAERR7  ;CONSTANT ERROR
4652 025646  077216                AA27:       SOB     R2,AA24
4653 025650  000137  026322                    JMP     @#AADONE
4654
4655                               ;COME HERE IF A TRAP OCCURS TO 244.
4656
4657 025654  013700  001236        AAERRU:     MOV     @#$TMP2,R0      ;SEE IF THE TRAP WAS
4658 025660  005720                            TST     (R0)+   ;AT A TEST INSTRUCTION
4659 025662  020016                            CMP     R0,(SP)
4660 025664  001402                            BEQ     1$
4661 025666  000137  040234        10$:        JMP     @#PSPJR
4662 025672                        1$:
4663 025672  170300                            STST    R0              ;GET FEC
4664 025674  020027  000010                    CMP     R0,#10
4665 025700  001405                            BEQ     20$             ;OVERFLOW
4666 025702  020027  000012                    CMP     R0,#12
4667 025706  001410                            BEQ     30$             ;UNDERFLOW
4668 025710  000766                            BR      10$
4669 025712  025714                20$
4670 025714  011637  001236        20$:        MOV     (SP),@#$TMP2    ;REPORT OVERFLOW ERROR
4671 025720  022626                            CMP     (SP)+,(SP)+
4672 025722  104154                21$:        ERROR   +154
4673 025724  000137  026322        25$:        JMP     @#AADONE
4674 025730  011637  001236        30$:        MOV     (SP),@#$TMP2    ;REPORT UNDERFLOW
4675 025734  022626                            CMP     (SP)+,(SP)+     ;ERROR
4676 025736  104155                31$:        ERROR   +155
4677 025740  000771                            BR      25$
4678
4679                               ;ADDD RESULT INCORRECT
4680 025742  012737  026252  001246  AAERR1:   MOV     #AAPAT2,@#$TMP6
4681 025750  012737  026232  001242  AAER10:   MOV     #AAPAT0,@#$TMP4
4682 025756  012737  026242  001240            MOV     #AAPAT1,@#$TMP3
4683 025764  012737  026222  001244            MOV     #AADATO,@#$TMP5
4684 025772  104162                1$:         ERROR   +162
4685 025774  000552                            BR      AADONE
4686 025776  012737  026252  001246  AAERR2:   MOV     #AAPAT2,@#$TMP6 ;(BUT FT) FAILED.
4687 026004  012737  026232  001242            MOV     #AAPAT0,@#$TMP4
4688 026012  012737  026242  001240            MOV     #AAPAT1,@#$TMP3
4689 026020  012737  026222  001244            MOV     #AADATO,@#$TMP5
4690 026026  104156                1$:         ERROR   +156
4691 026030  000534                            BR      AADONE
4692 026032  012737  026262  001246  AAERR3:   MOV     #AAPAT3,@#$TMP6 ;DATA ERROR.
4693 026040  000743                            BR      AAER10
4694 026042  012737  026262  001246  AAERR4:   MOV     #AAPAT3,@#$TMP6 ;BAD CONSTANT
```

```
4695 026050  012737  026232  001242          MOV     #AAPAT0,@#$TMP4
4696 026056  012737  026242  001240          MOV     #AAPAT1,@#$TMP3
4697 026064  012737  026222  001244          MOV     #AADAT0,@#$TMP5
4698 026072  104160                  1$:     ERROR   +160
4699 026074  000512                          BR      AADONE
4700 026076  012737  026262  001246  AAERR5: MOV     #AAPAT3,@#$TMP6 ;(BUT FT) FAILED.
4701 026104  012737  026232  001242          MOV     #AAPAT0,@#$TMP4
4702 026112  012737  026242  001240          MOV     #AAPAT1,@#$TMP3
4703 026120  012737  026222  001244          MOV     #AADAT0,@#$TMP5
4704 026126  104157                  1$:     ERROR   +157
4705 026130  000474                          BR      AADONE
4706 026132  012737  026302  001240  AAERR6: MOV     #AAPAT5,@#$TMP3 ;FD=0 AND
4707 026140  012737  026232  001242          MOV     #AAPAT0,@#$TMP4 ;DATA ERROR
4708 026146  012737  026222  001244          MOV     #AADAT0,@#$TMP5
4709 026154  012737  026312  001246          MOV     #AAPAT6,@#$TMP6
4710 026162  104160                  1$:     ERROR   +160
4711 026164  000456                          BR      AADONE
4712 026166  012737  026302  001240  AAERR7: MOV     #AAPAT5,@#$TMP3 ;CONSTANT ERROR
4713 026174  012737  026232  001242          MOV     #AAPAT0,@#$TMP4
4714 026202  012737  026222  001244          MOV     #AADAT0,@#$TMP5
4715 026210  012737  026312  001246          MOV     #AAPAT6,@#$TMP6
4716 026216  104161                  1$:     ERROR   +161
4717 026220  000440                          BR      AADONE
4718 026222  000000                  AADAT0:         0
4719 026224  000000                                  0
4720 026226  000000                                  0
4721 026230  000000                                  0
4722 026232  000200                  AAPAT0:         200
4723 026234  000000                                  0
4724 026236  000000                                  0
4725 026240  000000                                  0
4726 026242  000200                  AAPAT1:         200
4727 026244  000000                                  0
4728 026246  000000                                  0
4729 026250  000001                                  1
4730 026252  000400                  AAPAT2:         400
4731 026254  000000                                  0
4732 026256  000000                                  0
4733 026260  000000                                  0
4734 026262  000400                  AAPAT3:         400
4735 026264  000000                                  0
4736 026266  000000                                  0
4737 026270  000001                                  1
4738 026272  000400                  AAPAT4:         400
4739 026274  000000                                  0
4740 026276  100000                                  100000
4741 026300  000000                                  0
4742 026302  000200                  AAPAT5:         200
4743 026304  000001                                  1
4744 026306  000000                                  0
4745 026310  000000                                  0
4746 026312  000400                  AAPAT6:         400
4747 026314  000001                                  1
4748 026316  000000                                  0
4749 026320  000000                                  0
4750 026322                        AADONE:
     026322  104412                          RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
```

```
                                                        ;SEE IF THE USER HAS EXPRESSED
                                                        ;THE DESIRE TO CHANGE THE SOFTWARE
                                                        ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                        ;THE USER TYPED CONTROL G?).
4761                                    ;;**************************************************************
                                        ;*TEST 32       ADDF & ADDD WITH E(AC) LESS THAN E(FSRC) TES
                                        ;*
                                        ;*THIS IS ATEST OF THE ADDD AND ADDF
                                        ;*INSTRUCTIONS AND THE ALIGN AC ALGORITHM
                                        ;*FLOWS.  THE CONSTANT (25 FOR FLOATING, 57 FOR
                                        ;*DOUBLE) USED IS CHECKED.  THEN SIMPLE
                                        ;*AND WORST CASE ALIGNMENT SITUATIONS ARE
                                        ;*TRIED.  NOTE E(AC) IS LESS THEN E(FSRC)
                                        ;*
                                        ;;**************************************************************
     026324  000004                     TST32:  SCOPE
4762                                                            ;EXPONENT DIFFERENCE-57 71 (OCT) FD 1
4763 026326                             CC1:
     026326  104413                             LPERR                       ;SET UP THE LOOP ON ERROR ADDRESS.
4764 026330  012704  003200                    MOV     #3200,R4            ;SET FIV,FIV, AND FD
4765 026334  170104                            LDFPS   R4
4766 026336  012737  026356  001236            MOV     #CC2,@#$TMP2
4767 026344  012700  027760                    MOV     #CCP0,R0            ;SET AC0 OPERAND
4768 026350  172410                            LDD     (R0),AC0                    ;AC0
4769 026352  012700  030000                    MOV     #CCP2,R0
4770 026356  172010                     CC2:   ADDD    (R0),AC0            ;TEST INSTRUCTION
4771 026360  170205                            STFPS   R5                  ;GET FPS
4772 026362  012700  027750                    MOV     #CCDAT0,R0          ;GET THE RESULT
4773 026366  174010                            STD     AC0,(R0)
4774 026370  012701  030000                    MOV     #CCP2,R1            ;IS IT CORRECT
4775 026374  012702  000004                    MOV     #4,R2
4776 026400  022021                     CC3:   CMP     (R0)+,(R1)+
4777 026402  001415                            BEQ     CC6
4778 026404  012700  027750                    MOV     #CCDAT0,R0          ;DID A BAD
4779 026410  012701  027760                    MOV     #CCP0,R1            ;CONSTANT (NOT 57)
4780 026414  012702  000004                    MOV     #4,R2               ;GET GENERATED
4781 026420  022021                     CC4:   CMP     (R0)+,(R1)+         ;FOR THE ALIGNMENT
4782 026422  001402                            BEQ     CC5                 ;FLOWS?
4783 026424  000137  027346                    JMP     @#CCER1             ;DATA ERROR.D
4784 026430  077205                     CC5:   SOB     R2,CC4
4785 026432  000137  027404                    JMP     @#CCER2             ;BAD CONSTANT.D
4786 026436  077220                     CC6:   SOB     R2,CC3
4787 026440  020405                            CMP     R4,R5               ;FPS CORRECT?
4788 026442  001402                            BEQ     CC7
4789 026444  000137  027312                    JMP     @#CCER0             ;BAD FPS.
4790                                    ;EXPONENT DIFFERENCE=56=70 (OCT) FD=1
4791 026450                             CC7:
     026450  104413                             LPERR                       ;SET UP THE LOOP ON ERROR ADDRESS.
4792 026452  012704  003200                    MOV     #3200,R4            ;SET FIV,FIV, AND FD
4793 026456  170104                            LDFPS   R4
4794 026460  012737  026500  001236            MOV     #CC8,@#$TMP2
4795 026466  012700  027760                    MOV     #CCP0,R0            ;SET AC0 OPERAND
4796 026472  172410                            LDD     (R0),AC0
4797 026474  012700  027770                    MOV     #CCP1,R0            ;FSRC
4798 026500  172010                     CC8:   ADDD    (R0),AC0            ;TEST INSTRUCTION
4799 026502  170205                            STFPS   R5                  ;GET FPS
4800 026504  012700  027750                    MOV     #CCDAT0,R0          ;GET THE RESULT
```

```
 4801 026510  174010                          STD     AC0,(R0)
 4802 026512  012701  030050                  MOV     #CCP7,R1        ;IS IT CORRECT
 4803 026516  012702  000004                  MOV     #4,R2
 4804 026522  022021                  CC9:    CMP     (R0)+,(R1)+
 4805 026524  001415                          BEQ     CC12
 4806 026526  012700  027750                  MOV     #CCDAT0,R0      ;DID A BAD
 4807 026532  012701  027770                  MOV     #CCP1,R1        ;CONSTANT (NOT 57)
 4808 026536  012702  000004                  MOV     #4,R2           ;GET GENERATED
 4809 026542  022021                  CC10:   CMP     (R0)+,(R1)+     ;FOR THE ALIGNMENT
 4810 026544  001402                          BEQ     CC11            ;FLOWS?
 4811 026546  000137  027442                  JMP     @#CCER3         ;DATA ERROR.D
 4812 026552  077205                  CC11:   SOB     R2,CC10
 4813 026554  000137  027460                  JMP     @#CCER4         ,BAD CONSTANT.D
 4814 026560  077220                  CC12:   SOB     R2,CC9
 4815 026562  020405                          CMP     R4,R5           ;FPS CORRECT?
 4816 026564  001402                          BEQ     CC13
 4817 026566  000137  027312                  JMP     @#CCER0         ;BAD FPS.
 4818                               ;EXPONENT DIFFERENCE=25=31.(OCT) FD=0
 4819 026572                        CC13:
      026572  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
 4820 026574  012737  026622  001236          MOV     #CC14,@#$TMP2
 4821 026602  012700  027760                  MOV     #CCP0,R0        ;SET UP AC0 OPERAND.
 4822 026606  172410                          LDD     (R0),AC0
 4823 026610  012704  003000                  MOV     #3000,R4        ;SET FIV,FIV. CLEAR FD.
 4824 026614  170104                          LDFPS   R4
 4825 026616  012700  030040                  MOV     #CCP6,R0        ;FSRC
 4826 026622  172010                  CC14:   ADDF    (R0),AC0        ;TEST INSTRUCTION
 4827 026624  170205                          STFPS   R5
 4828 026626  170011                          SETD                    ;REENTER DOUBLE MOVE
 4829 026630  012700  027750                  MOV     #CCDAT0,R0      ;GET THE RESULT
 4830 026634  174010                          STD     AC0,(R0)
 4831 026636  012701  030040                  MOV     #CCP6,R1        ;IS THE RESULT CORRECT?
 4832 026642  012702  000002                  MOV     #2,R2
 4833 026646  022021                  CC15:   CMP     (R0)+,(R1)+
 4834 026650  001415                          BEQ     CC18
 4835 026652  012700  027750                  MOV     #CCDAT0,R0      ;WAS A BAD CONSTANT
 4836 026656  012701  030010                  MOV     #CCP3,R1        ;USED (NOT 25) IN
 4837 026662  012702  000002                  MOV     #2,R2           ;THE ALIGN FLOWS?
 4838 026666  022021                  CC16:   CMP     (R0)+,(R1)+
 4839 026670  001402                          BEQ     CC17
 4840 026672  000137  027516                  JMP     @#CCER5         ;DATA ERROR F
 4841 026676  077205                  CC17:   SOB     R2,CC16
 4842 026700  000137  027552                  JMP     @#CCER6         ;BAD CONSTANT F
 4843 026704  077220                  CC18:   SOB     R2,CC15
 4844 026706  020405                          CMP     R4,R5
 4845 026710  001402                          BEQ     CC19
 4846 026712  000137  027330                  JMP     @#CCER90        ;BAD FPS.
 4847                               ;EXPONENT DIFFERENCE=24=30 (OCT) FD=0
 4848 026716                        CC19:
      026716  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
 4849 026720  012737  026746  001236          MOV     #CC20,@#$TMP2
 4850 026726  012700  030010                  MOV     #CCP3,R0        ;SET UP AC0 OPERAND.
 485' 026732  172410                          LDD     (R0),AC0
 4852 026734  012704  003000                  MOV     #3000,R4        ;SET FIV,FIV. CLEAR FD.
 4853 026740  170104                          LDFPS   R4
 4854 026742  012700  030030                  MOV     #CCP5,R0        ;FSRC
 4855 026746  172010                  CC20:   ADDF    (R0),AC0        ;TEST INSTRUCTION
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4856 026750  170205                        STFPS   R5
4857 026752  170011                        SETD                        ;REENTER DOUBLE MOVE
4858 026754  012700  027750                MOV     #CCDAT0,R0          ;GET THE RESULT
4859 026760  174010                        STD     AC0,(R0)
4860 026762  012701  030060                MOV     #CCP10,R1           ;IS THE RESLT CORRECT?
4861 026766  012702  000002                MOV     #2,R2
4862 026772  022021                CC21:   CMP     (R0)+,(R1)+
4863 026774  001415                        BEQ     CC24
4864 026776  012700  027750                MOV     #CCDAT0,R0          ;WAS A BAD CONSTANT
4865 027002  012701  030030                MOV     #CCP5,R1            ;USED (NOT 25) IN
4866 027006  012702  000002                MOV     #2,R2               ;THE ALIGN FLOWS?
4867 027012  022021                CC22:   CMP     (R0)+,(R1)+
4868 027014  001402                        BEQ     CC23
4869 027016  000137  027606                JMP     @#CCER7             ;DATA ERROR F
4870 027022  077205                CC23:   SOB     R2,CC22
4871 027024  000137  027624                JMP     @#CCER8 ;BAD CONSTANT F
4872 027030  077220                CC24:   SOB     R2,CC21
4873 027032  020405                        CMP     R4,R5
4874 027034  001402                        BEQ     CC25
4875 027036  000137  027330                JMP     @#CCER90            ;BAD FPS.
4876                               ;EXPONENT DIFFERENCE=1 FD=1
4877 027042                        CC25:
     027042  104413                        LPERR                       ;SET UP THE LOOP ON ERROR ADDRESS.
4878 027044  012704  003200                MOV     #3200,R4            ;SET FIV,FIV, AND FD
4879 027050  170104                        LDFPS   R4
4880 027052  012737  027072  001236        MOV     #CC26,@#$TMP2
4881 027060  012700  027760                MOV     #CCP0,R0            ;SET AC0 OPERAND
4882 027064  172410                        LDD     (R0),AC0
4883 027066  012700  030010                MOV     #CCP3,R0            ;FSRC
4884 027072  172010                CC26:   ADDD    (R0),AC0            ;TEST INSTRUCTION
4885 027074  170205                        STFPS   R5                  ;GET FPS
4886 027076  012700  027750                MOV     #CCDAT0,R0          ;GET THE RESULT
4887 027102  174010                        STD     AC0,(R0)
4888 027104  012701  030070                MOV     #CCP11,R1           ;IS IT CORRECT
4889 027110  012702  000004                MOV     #4,R2
4890 027114  022021                CC27:   CMP     (R0)+,(R1)+
4891 027116  001415                        BEQ     CC30
4892 027120  012700  027750                MOV     #CCDAT0,R0          ;DID A BAD
4893 027124  012701  030010                MOV     #CCP3,R1            ;CONSTANT (NOT 57)
4894 027130  012702  000004                MOV     #4,R2               ;GET GENERATED
4895 027134  022021                CC28:   CMP     (R0)+,(R1)+         ;FOR THE ALIGNMENT
4896 027136  001402                        BEQ     CC29                ;FLOWS?
4897 027140  000137  027660                JMP     @#CCER10            ;DATA ERROR.D
4898 027144  077205                CC29:   SOB     R2,CC28
4899 027146  000137  027676                JMP     @#CCER11            ;BAD CONSTANT.D
4900 027152  077220                CC30:   SOB     R2,CC27
4901 027154  020405                        CMP     R4,R5               ;FPS CORRECT?
4902 027156  001402                        BEQ     CC31
4903 027160  000137  027312                JMP     @#CCER0             ;BAD FPS.
4904                               ;EXPONENT DIFFERENCE=100=144 (OCT) FD-1
4905 027164                        CC31:
     027164  104413                        LPERR                       ;SET UP THE LOOP ON ERROR ADDRESS.
4906 027166  012704  003200                MOV     #3200,R4            ;SET FIV,FIV, AND FD
4907 027172  170104                        LDFPS   R4
4908 027174  012737  027214  001236        MOV     #CC32,@#$TMP2
4909 027202  012700  027760                MOV     #CCP0,R0            ;SET AC0 OPERAND
4910 027206  172410                        LDD     (R0),AC0
```

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4911 027210  012700  030020                 MOV     #CCP4,R0        ;FSRC
4912 027214  172010                 CC32:  ADDD    (R0),AC0        ;TEST INSTRUCTION
4913 027216  170205                        STFPS   R5              ;GET FPS
4914 027220  012700  027750                MOV     #CCDAT0,R0      ;GET THE RESULT
4915 027224  174010                        STD     AC0,(R0)
4916 027226  012701  030020                MOV     #CCP4,R1        ;IS IT CORRECT
4917 027232  012702  000004                MOV     #4,R2
4918 027236  022021                 CC33:  CMP     (R0)+,(R1)+
4919 027240  001415                        BEQ     CC36
4920 027242  012700  027750                MOV     #CCDAT0,R0      ;DID A BAD
4921 027246  012701  030020                MOV     #CCP4,R1        ;CONSTANT (NOT 57)
4922 027252  012702  000004                MOV     #4,R2           ;GET GENERATED
4923 027256  022021                 CC34:  CMP     (R0)+,(R1)+     ;FOR THE ALIGNMENT
4924 027260  001402                        BEQ     CC35            ;FLOWS?
4925 027262  000137  027714                JMP     @#CCER12        ;DATA ERROR.D
4926 027266  077205                 CC35:  SOB     R2,CC34
4927 027270  000137  027732                JMP     @#CCER13        ;BAD CONSTANT.D
4928 027274  077220                 CC36:  SOB     R2,CC33
4929 027276  020405                        CMP     R4,R5           ;FPS CORRECT?
4930 027300  001402                        BEQ     CC37
4931 027302  000137  027312                JMP     @#CCER0         ;BAD FPS.
4932 027306  000137  030110          CC37: JMP     @#CCDONE
4933 027312  010437  001242          CCER0: MOV    R4,@#$TMP4      ;FPS ERROR D
4934 027316  010537  001240                MOV     R5,@#$TMP3
4935 027322  104164                 1$:    ERROR   +164
4936 027324  000137  030110                JMP     @#CCDONE
4937 027330  010437  001242          CCER90: MOV   R4,@#$TMP4      ;FPS ERROR F
4938 027334  010537  001240                MOV     R5,@#$TMP3
4939 027340  104165                 1$:    ERROR   +165
4940 027342  000137  030110                JMP     @#CCDONE
4941 027346  012737  030000  001240  CCER1: MOV     #CCP2,@#$TMP3   ;DATA ERROR D
4942 027354  012737  030000  001246         MOV     #CCP2,@#$TMP6
4943 027362  012737  027760  001242  CCER50: MOV    #CCP0,@#$TMP4
4944 027370  012737  027750  001244         MOV     #CCDAT0,@#$TMP5
4945 027376  104166                 1$:    ERROR   +166
4946 027400  000137  030110                JMP     @#CCDONE
4947 027404  012737  030000  001240  CCER2: MOV     #CCP2,@#$TMP3   ;CONSTANT BAD D(B)
4948 027412  012737  030000  001246         MOV     #CCP2,@#$TMP6
4949 027420  012737  027760  001242  CCER22: MOV    #CCP0,@#$TMP4
4950 027426  012737  027750  001244         MOV     #CCDAT0,@#$TMP5
4951 027434  104172                 1$:    ERROR   +172
4952 027436  000137  030110                JMP     @#CCDONE
4953 027442  012737  027770  001240  CCER3: MOV     #CCP1,@#$TMP3
4954 027450  012737  030050  001246         MOV     #CCP7,@#$TMP6
4955 027456  000741                        BR      CCER50
4956 027460  012737  027770  001240  CCER4: MOV     #CCP1,@#$TMP3   ;CONSTANT BAD D(G)
4957 027466  012737  030050  001246         MOV     #CCP7,@#$TMP6
4958 027474  012737  027760  001242  CCER44: MOV    #CCP0,@#$TMP4
4959 027502  012737  027750  001244         MOV     #CCDAT0,@#$TMP5
4960 027510  104173                 1$:    ERROR   +173
4961 027512  000137  030110                JMP     @#CCDONE
4962 027516  012737  030040  001240  CCER5: MOV     #CCP6,@#$TMP3   ;DATA ERROR F
4963 027524  012737  030040  001246         MOV     #CCP6,@#$TMP6
4964 027532  012737  027760  001242  CCER55: MOV    #CCP0,@#$TMP4
4965 027540  012737  027750  001244         MOV     #CCDAT0,@#$TMP5
4966 027546  104170                 1$:    ERROR   +170
4967 027550  000557                        BR      CCDONE
```

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4968 027552  012737  030040  001240  CCER6:  MOV     #CCP6,@#$TMP3   ;CONSTANT BAD F(B)
4969 027560  012737  030040  001246          MOV     #CCP6,@#$TMP6
4970 027566  012737  027760  001242          MOV     #CCP0,@#$TMP4
4971 027574  012737  027750  001244          MOV     #CCDAT0,@#$TMP5
4972 027602  104174                  1$:     ERROR   +174
4973 027604  000541                          BR      CCDONE
4974 027606  012737  030030  001240  CCER7:  MOV     #CCP5,@#$TMP3   ;DATA ERROR F
4975 027614  012737  030060  001246          MOV     #CCP10,@#$TMP6
4976 027622  000743                          BR      CCER55
4977 027624  012737  030030  001240  CCER8:  MOV     #CCP5,@#$TMP3   ;CONSTANT BAD F(G)
4978 027632  012737  030060  001246          MOV     #CCP10,@#$TMP6
4979 027640  012737  027750  001244          MOV     #CCDAT0,@#$TMP5
4980 027646  012737  027760  001242          MOV     #CCP0,@#$TMP4
4981 027654  104175                  1$:     ERROR   +175
4982 027656  000514                          BR      CCDONE
4983 027660  012737  030010  001240  CCER10: MOV     #CCP3,@#$TMP3   ;DATA ERROR D
4984 027666  012737  030070  001246          MOV     #CCP11,@#$TMP6
4985 027674  000632                          BR      CCER50
4986 027676  012737  030010  001240  CCER11: MOV     #CCP3,@#$TMP3   ;CONSTANT BAD D(G)
4987 027704  012737  030070  001246          MOV     #CCP11,@#$TMP6
4988 027712  000670                          BR      CCER44
4989 027714  012737  030020  001240  CCER12: MOV     #CCP4,@#$TMP3   ;DATA ERROR D
4990 027722  012737  030020  001246          MOV     #CCP4,@#$TMP6
4991 027730  000614                          BR      CCER50
4992 027732  012737  030020  001240  CCER13: MOV     #CCP4,@#$TMP3   ;CONSTANT BAD D(B)
4993 027740  012737  030020  001246          MOV     #CCP4,@#$TMP6
4994 027746  000624                          BR      CCER22
4995 027750  000000                  CCDAT0: 0
4996 027752  000000                          0
4997 027754  000000                          0
4998 027756  000000                          0
4999 027760  000200                  CCP0:   200                     ;E(AC)-1
5000 027762  000000                          0
5001 027764  000000                          0
5002 027766  000000                          0
5003 027770  016200                  CCP1:   16200                   ;E(FSRC)=E(AC)+56=57
5004 027772  000000                          0                       ;               =71(OCT)
5005 027774  000000                          0
5006 027776  000000                          0
5007 030000  016400                  CCP2:   16400                   ;E(FSRC)=E(AC)+57=58
5008 030002  000000                          0                       ;               -72(OCT)
5009 030004  000000                          0
5010 030006  000000                          0
5011 030010  000400                  CCP3:   400                     ;E(FSRC)=E(AC)+1=2
5012 030012  000000                          0
5013 030014  000000                          0
5014 030016  000000                          0
5015 030020  031200                  CCP4:   31200                   ;E(FSRC)=E(AC)+100=101=145(OCT)
5016 030022  000000                          0
5017 030024  000000                          0
5018 030026  000000                          0
5019 030030  006200                  CCP5:   6200                    ;E(FSRC)=E(AC)+24=25=31(OCT)
5020 030032  000000                          0
5021 030034  000000                          0
5022 030036  000000                          0
5023 030040  006400                  CCP6:   6400                    ;E(FSRC)=E(AC)+25=26-32(OCT)
5024 030042  000000                          0
```

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 5025 030044  000000                          0
 5026 030046  000000                          0
 5027 030050  016200          CCP7:    16200                ;CCP1 RES
 5028 030052  000000                          0
 5029 030054  000000                          0
 5030 030056  000001                          1
 5031 030060  006200          CCP10:   6200                 ;CCP5 RES
 5032 030062  000001                          1
 5033 030064  000000                          0
 5034 030066  000000                          0
 5035 030070  000500          CCP11:   500                  ;CCP3 RES
 5036 030072  000000                          0
 5037 030074  000000                          0
 5038 030076  000000                          0
 5039 030100  000200          CCP12:   200                  ;BAD CONSTANT
 5040 030102  000000                          0             ;RES CCP2,CCP4
 5041 030104  000000                          0
 5042 030106  000000                          0
 5043
 5044 030110                  CCDONE:
      030110  104412                RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                           ;SEE IF THE USER HAS EXPRESSED
                                                           ;THE DESIRE TO CHANGE THE SOFTWARE
                                                           ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                           ;THE USER TYPED CONTROL G?).
 5045
 5056                                      ;TEST TITLE:ADDF AND ADDD WITH E(AC) GREATER THAN E(FSRC) TEST
 5057                        ;;*************************************************************
                             ;*TEST 33       SEE ABOVE COMMENT FOR TEST TITLE
                             ;*
                             ;*THIS IS A TEST OF THE ADDD AND ADDF
                             ;*INSTRUCTIONS AND THE ALIGN FSRC ALGORITHM
                             ;*FLOWS.  FIRST THE CONSTANT USED IS CHECKED.
                             ;*THEN SIMPLE AND WORST CASE ALIGNMENT
                             ;*SITUATIONS ARE TRIED.  NOTE E(AC)
                             ;*IS GREATER THAN E(FSRC).
                             ;*
                             ;;*************************************************************
      030112  000004         TST33:  SCOPE
 5058                        ;EXPONENT DIFFERENCE=57-71 (OCT) FD-1
 5059 030114                 BB1:
      030114  104413                LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
 5060 030116  012704  003200          MOV     #3200,R4        ;SET FIV FIV, AND FD
 5061 030122  170104                  LDFPS   R4
 5062 030124  012737  030752  000244  MOV     #BBERR0,@#FPVECT ;SET UP FOR ERROR
 5063 030132  012737  030152  001236  MOV     #BB2,@#$TMP2    ;IN CASE THE OVER\
 5064                                                         ;UNDER FLOWS FAIL.
 5065 030140  012700  031314          MOV     #BBPAT2,R0      ;SET AC0 OPERAND.
 5066 030144  172410                  LDD     (R0),AC0
 5067 030146  012700  031304          MOV     #BBPAT1,R0      ;FSRC
 5068 030152  172010          BB2:    ADDD    (R0),AC0        ;TEST INSTRUCTION
 5069 030154  170205                  STFPS   R5
 5070 030156  012700  031264  BB3:    MOV     #BBDAT0,R0      ;GET THE RESULT
 5071 030162  174010                  STD     AC0,(R0)
 5072 030164  012701  031314          MOV     #BBPAT2,R1      ;RESULT CORRECT?
 5073 030170  012702  000004          MOV     #4,R2
 5074 030174  022021          BB4:    CMP     (R0)+,(R1)+
```

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5075 030176  001402                        BEQ     BB5
5076 030200  000137  031012                JMP     @#BBER1         ;DATA ERROR D
5077 030204  077205                BB5:    SOB     R2,BB4
5078                                                               ;WAS FPS CORRECT?
5079 030206  020405                        CMP     R4,R5
5080 030210  001402                        BEQ     BB6
5081 030212  000137  030752                JMP     @#BBER0         ;FPS ERROR
5082                               ;EXPONENT DIFFERENCE=56=70 (OCT) FD=1
5083 030216                        BB6:
     030216  104413                        LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
5084 030220  012704  003200                MOV     #3200,R4        ;SET FIV,FIV, AND FD
5085 030224  170104                        LDFPS   R4
5086 030226  012737  030246  001236        MOV     #BB7,@#$TMP2
5087 030234  012700  031334                MOV     #BBPAT4,R0      ;SET AC0 OPERAND
5088 030240  172410                        LDD     (R0),AC0
5089 030242  012700  031304                MOV     #BBPAT1,R0      ;FSRC
5090 030246  172010                BB7:    ADDD    (R0),AC0        ;TEST INSTRUCTION
5091 030250  170205                        STFPS   R5              ;GET FPS
5092 030252  012700  031264                MOV     #BBDAT0,R0      ;GET THE RESULT
5093 030256  174010                        STD     AC0,(R0)
5094 030260  012701  031374                MOV     #BBP10,R1       ;IS IT CORRECT
5095 030264  012702  000004                MOV     #4,R2
5096 030270  022021                BB10:   CMP     (R0)+,(R1)+
5097 030272  001415                        BEQ     BB13
5098 030274  012700  031264                MOV     #BBDAT0,R0      ;DID A BAD
5099 030300  012701  031334                MOV     #BBPAT4,R1      ;CONSTANT (NOT 57)
5100 030304  012702  000004                MOV     #4,R2           ;GET GENERATED
5101 030310  022021                BB11:   CMP     (R0)+,(R1)+     ;FOR THE ALIGNMENT
5102 030312  001402                        BEQ     BB12            ;FLOWS?
5103 030314  000137  031050                JMP     @#BBER2         ;DATA ERROR.D
5104 030320  077205                BB12:   SOB     R2,BB11
5105 030322  000137  031066                JMP     @#BBER3         ;BAD CONSTANT.D
5106 030326  077220                BB13:   SOB     R2,BB10
5107 030330  020405                        CMP     R4,R5           ;FPS CORRECT?
5108 030332  001402                        BEQ     BB14
5109 030334  000137  030752                JMP     @#BBER0         ;BAD FPS.
5110                               ;EXPONENT DIFFERENCE=25=31 (OCT) FD=0
5111 030340                        BB14:
     030340  104413                        LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
5112 030342  012737  030370  001236        MOV     #BB15,@#$TMP2
5113 030350  012700  031274                MOV     #BBPAT0,R0      ;SET UP AC0 OPERAND
5114 030354  172410                        LDD     (R0),AC0
5115 030356  012704  003000                MOV     #3000,R4        ;SET FIV AND FIV
5116                                                               ;CLEAR FD
5117 030362  170104                        LDFPS   R4
5118 030364  012700  031304                MOV     #BBPAT1,R0      ;FSRC
5119 030370  172010                BB15:   ADDF    (R0),AC0        ;TEST INSTRUCTION
5120 030372  170205                        STFPS   R5
5121 030374  170011                        SETD                    ;REENTED DOUBLE MODE.
5122 030376  012700  031264                MOV     #BBDAT0,R0      ;GET THE RESULT
5123 030402  174010                        STD     AC0,(R0)
5124 030404  012701  031274                MOV     #BBPAT0,R1      ;IS THE RESULT
5125 030410  012702  000002                MOV     #2,R2           ;CORRECT?
5126 030414  022021                BB16:   CMP     (R0)+,(R1)+
5127 030416  001402                        BEQ     BB17
5128 030420  000137  031122                JMP     @#BBER4         ;DATA ERROR F
5129 030424  077205                BB17:   SOB     R2,BB16
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5130 030426  020405                        CMP     R4,R5           ;IS FPS CORRECT?
5131 030430  001402                        BEQ     BB20
5132 030432  000137  030772                JMP     @#BBER10        ;FPS ERROR.
5133                             ;EXPONENT DIFFERENCE=24=30 (OCT)
5134 030436                      BB20:
     030436  104413                        LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
5135 030440  012737  030466  001236        MOV     #BB21,@#$TMP2
5136 030446  012700  031324                MOV     #BBPAT3,R0      ;SET UP AC0 OPERAND.
5137 030452  172410                        LDD     (R0),AC0
5138 030454  012704  003000                MOV     #3000,R4        ;SET FIU,FIV. CLEAR FD.
5139 030460  170104                        LDFPS   R4
5140 030462  012700  031304                MOV     #BBPAT1,R0      ;FSRC
5141 030466  172010              BB21.     ADDF    (R0),AC0        ;TEST INSTRUCTION
5142 030470  170205                        STFPS   R5
5143 030472  170011                        SETD                    ;REENTER DOUBLE MODE
5144 030474  012700  031264                MOV     #BBDAT0,R0      ;GET THE RESULT
5145 030500  174010                        STD     AC0,(R0)
5146 030502  012701  031364                MOV     #BBP7,R1        ;IS THE RESULT CORRECT?
5147 030506  012702  000002                MOV     #2,R2
5148 030512  022021              BB22:     CMP     (R0)+,(R1)+
5149 030514  001415                        BEQ     BB25
5150 030516  012700  031264                MOV     #BBDAT0,R0      ;WAS A BAD CONSTANT
5151 030522  012701  031324                MOV     #BBPAT3,R1      ;USED (NOT 25) IN
5152 030526  012702  000002                MOV     #2,R2           ;THE ALLIGN FLOWS?
5153 030532  022021              BB23:     CMP     (R0)+,(R1)+
5154 030534  001402                        BEQ     BB24
5155 030536  000137  031156                JMP     @#BBER5         ;DATA ERROR F
5156 030542  077205              BB24:     SOB     R2,BB23
5157 030544  000137  031174                JMP     @#BBER6         ;BAD CONSTANT F
5158 030550  077220              BB25:     SOB     R2,BB22
5159 030552  020405                        CMP     R4,R5
5160 030554  001402                        BEQ     BB26
5161 030556  000137  030772                JMP     @#BBER10        ;BAD FPS.
5162                             ;EXPONENT DIFFERENCE 1
5163 030562                      BB26:
     030562  104413                        LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
5164 030564  012737  030612  001236        MOV     #BB27,@#$TMP2
5165 030572  012704  003200                MOV     #3200,R4
5166 030576  170104                        LDFPS   R4              ;SET UP AC0 OPERAND
5167 030600  012700  031344                MOV     #BBPAT5,R0
5168 030604  172410                        LDD     (R0),AC0
5169 030606  012700  031304                MOV     #BBPAT1,R0      ;FSRC
5170 030612  172010              BB27:     ADDD    (R0),AC0        ;TEST INSTRUCTION
5171 030614  170205                        STFPS   R5
5172 030616  012700  031264                MOV     #BBDAT0,R0      ;GET THE RESULT.
5173 030622  174010                        STD     AC0,(R0)
5174 030624  012701  031404                MOV     #BBP11,R1       ;IS IT CORRECT?
5175 030630  012702  000004                MOV     #4,R2
5176 030634  022021              BB30:     CMP     (R0)+,(R1)+
5177 030636  001402                        BEQ     BB31
5178 030640  000137  031230                JMP     @#BBER7         ;DATA ERROR D
5179 030644  077205              BB31:     SOB     R2,BB30
5180 030646  020405                        CMP     R4,R5           ;IS FPS CORRECT
5181 030650  001402                        BEQ     BB32
5182 030652  000137  030752                JMP     @#BBER0
5183                             ;EXPONENT DIFFERENCE-100-144 (OCT)
5184 030656                      BB32:
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                030656  104413                          LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
5185            030660  012737  030706  001236          MOV     #BB33,@#$TMP2
5186            030666  012704  003200                  MOV     #3200,R4
5187            030672  170104                          LDFPS   R4              ;SET FIV,FIV AND FD
5188            030674  012700  031354                  MOV     #BBPAT6,R0      ;SET UP AC0 OPERAND.
5189            030700  172410                          LDD     (R0),AC0
5190            030702  012700  031304                  MOV     #BBPAT1,R0      ;FSRC
5191            030706  172010                  BB33:   ADDD    (R0),AC0        ;TEST INSTRUCTION
5192            030710  170205                          STFPS   R5
5193            030712  012700  031264                  MOV     #BBDAT0,R0      ;GET THE RESULT
5194            030716  174010                          STD     AC0,(R0)
5195            030720  012701  031354                  MOV     #BBPAT6,R1      ;IS IT CORRECT
5196            030724  012702  000004                  MOV     #4,R2
5197            030730  022021                  BB34:   CMP     (R0)+,(R1)+
5198            030732  001402                          BEQ     BB35
5199            030734  000137  031246                  JMP     @#BBER8         ;DATA ERROR D
5200            030740  077205                  BB35:   SOB     R2,BB34
5201            030742  020405                          CMP     R4,R5           ;IS FPS CORRECT
5202            030744  001002                          BNE     BBER0
5203            030746  000167  000442                  JMP     BBDONE
5204            030752  010437  001242          BBER0:  MOV     R4,@#$TMP4      ;FPS ERROR D
5205            030756  010537  001240                  MOV     R5,@#$TMP3
5206            030762  104164                  1$:     ERROR   +164
5207            030764  104412                          RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                                                ;SEE IF THE USER HAS EXPRESSED
                                                                                ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                                ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                                ;THE USER TYPED CONTROL G?).
5208            030766  000137  031414                  JMP     @#BBDONE
5209            030772  010437  001242          BBER10: MOV     R4,@#$TMP4      ;FPS ERROR F
5210            030776  010537  001240                  MOV     R5,@#$TMP3
5211            031002  104165                  1$:     ERROR   +165
5212            031004  104412                          RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                                                ;SEE IF THE USER HAS EXPRESSED
                                                                                ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                                ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                                ;THE USER TYPED CONTROL G?).
5213            031006  000137  031414                  JMP     @#BBDONE
5214            031012  012737  031314  001242  BBER1:  MOV     #BBPAT2,@#$TMP4 ;DATA ERROR D
5215            031020  012737  031314  001246          MOV     #BBPAT2,@#$TMP6
5216            031026  012737  031304  001240  BBER11: MOV     #BBPAT1,@#$TMP3
5217            031034  012737  031264  001244          MOV     #BBDAT0,@#$TMP5
5218            031042  104166                  1$:     ERROR   +166
5219            031044  000137  031414                  JMP     @#BBDONE
5220            031050  012737  031334  001242  BBER2:  MOV     #BBPAT4,@#$TMP4
5221            031056  012737  031374  001246          MOV     #BBP10,@#$TMP6
5222            031064  000760                          BR      BBER11
5223            031066  012737  031334  001242  BBER3:  MOV     #BBPAT4,@#$TMP4 ;BAD CONSTANT D
5224            031074  012737  031374  001246          MOV     #BBP10,@#$TMP6
5225            031102  012737  031304  001240          MOV     #BBPAT1,@#$TMP3
5226            031110  012737  031264  001244          MOV     #BBDAT0,@#$TMP5
5227            031116  104167                  1$:     ERROR   +167
5228            031120  000535                          BR      BBDONE
5229            031122  012737  031274  001242  BBER4:  MOV     #BBPAT0,@#$TMP4 ;DATA ERROR F
5230            031130  012737  031274  001246          MOV     #BBPAT0,@#$TMP6
5231            031136  012737  031304  001240  BBER40: MOV     #BBPAT1,@#$TMP3
5232            031144  012737  031264  001244          MOV     #BBDAT0,@#$TMP5
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 5233 031152  104170                    1$:     ERROR   +170
 5234 031154  000517                            BR      BBDONE
 5235 031156  012737  031324  001242    BBER5:  MOV     #BBPAT3,@#$TMP4
 5236 031164  012737  031364  001246            MOV     #BBP7,@#$TMP6
 5237 031172  000761                            BR      BBER40
```

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 5239 031174  012737  031324  001242  BBER6:  MOV     #BBPAT3,@#$TMP4 ;CONSTANT ERROR F
```

```
5241 031202  012737  031364  001246          MOV     #BBP7,@#$TMP6
5242 031210  012737  031304  001240          MOV     #BBPAT1,@#$TMP3
5243 031216  012737  031264  001244          MOV     #BBDAT0,@#$TMP5
5244 031224  104171                  1$:     ERROR   +171
5245 031226  000472                          BR      BBDONE
5246 031230  012737  031344  001242  BBER7:  MOV     #BBPAT5,@#$TMP4
5247 031236  012737  031304  001246          MOV     #BBPAT11,@#$TMP6
5248 031244  000670                          BR      BBER11
5249 031246  012737  031354  001242  BBER8:  MOV     #BBPAT6,@#$TMP4
5250 031254  012737  031354  001246          MOV     #BBPAT6,@#$TMP6
5251 031262  000661                          BR      BBER11
5252 031264  000000                  BBDAT0: 0
5253 031266  000000                          0
5254 031270  000000                          0
5255 031272  000000                          0
5256 031274  006400                  BBPAT0: 6400                    ;F(AC)=E(FSRC)+25=26
5257 031276  000000                          0                       ;               -32(OCT)
5258 031300  000000                          0
5259 031302  000000                          0
5260 031304  000200                  BBPAT1: 200
5261 031306  000000                          0                       ;E(FSRC)=1
5262 031310  000000                          0
5263 031312  000000                          0
5264 031314  016400                  BBPAT2: 16400
5265 031316  000000                          0                       ;E(AC)=E(FSRC)+57=58
5266 031320  000000                          0                       ;               =72(OCT)
5267 031322  000000                          0
5268 031324  006200                  BBPAT3: 6200                    ;E(AC)=E(FSRC)+24=25
5269 031326  000000                          0                       ;               =31(OCT)
5270 031330  000000                          0
5271 031332  000000                          0
5272 031334  016200                  BBPAT4: 16200                   ;E(AC)=E(FSR6)+56-57
5273 031336  000000                          0                       ;               =71(OCT)
5274 031340  000000                          0
5275 031342  000000                          0
5276 031344  000400                  BBPAT5: 400                     ;E(AC)=E(FSRC)+1=2
5277 031346  000000                          0
5278 031350  000000                          0
5279 031352  000000                          0
5280 031354  031200                  BBPAT6: 31200                   ;E(AC)=E(FSRC)+100=101
5281 031356  000000                          0                       ;               =145(OCT)
5282 031360  000000                          0
5283 031362  000000                          0
5284 031364  006200                  BBP7:   6200                    ;BBPAT3 RES
5285 031366  000001                          1
5286 031370  000000                          0
5287 031372  000000                          0
5288 031374  016200                  BBP10:  16200                   ;BBPAT4 RES
5289 031376  000000                          0
5290 031400  000000                          0
5291 031402  000001                          1
5292 031404  000500                  BBP11:  500                     ;BBPAT5 RES
5293 031406  000000                          0
5294 031410  000000                          0
5295 031412  000000                          0
5296 031414                          BBDONE:
     031414  104412                          RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
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                                                        ;SEE IF THE USER HAS EXPRESSED
                                                        ;THE DESIRE TO CHANGE THE SOFTWARE
                                                        ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                        ;THE USER TYPED CONTROL G?).
 5304                           ;;*************************************************************
                                ;*TEST 34       ADDD WITH NEGATVE OPRANDS TEST
                                ;*
                                ;*THIS IS A TEST OF THE ADDD INSTRUCTION
                                ;*WITH NEGATIVE OPERANDS.  EVERY COMBINATION OF
                                ;*OPERAND SIGNS IS TRIED.
                                ;*
                                ;;*************************************************************
     031416  000004             TST34:  SCOPE
 5305                           ;BOTH OPERANDS NEGATIVE
 5306 031420                    DD1:
      031420  104413                    LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
 5307 031422  012704  003200            MOV     #3200,R4        ;SET FIO, FIV, AND FD
 5308 031426  170104                    LDFPS   R4
 5309 031430  012737  031450  001236    MOV     #DD2,@#$TMP2
 5310 031436  012700  033300            MOV     #DDP1,R0                ;SET AC0 OPERAND
 5311 031442  172410                    LDD     (R0),AC0
 5312 031444  012700  033300            MOV     #DDP1,R0                ;ESRC
 5313 031450  172010            DD2:    ADDD    (R0),AC0                ;TEST INSTRUCTION
 5314 031452  170205                    STFPS   R5                      ;GET FPS
 5315 031454  012700  033260            MOV     #DDDAT0,R0              ;GET THE RESULT
 5316 031460  174010                    STD     AC0,(R0)
 5317 031462  012701  033400            MOV     #DDP9,R1                ;IS IT CORRECT
 5318 031466  012702  000004            MOV     #4,R2
 5319 031472  022021            DD3:    CMP     (R0)+,(R1)+
 5320 031474  001415                    BEQ     DD6
 5321 031476  012700  033260            MOV     #DDDAT0,R0              ;DID A ADD-SUB
 5322 031502  012701  033330            MOV     #DDP4,R1                ;FLOW A FAILURE
 5323 031506  012702  000004            MOV     #4,R2
 5324 031512  022021            DD4:    CMP     (R0)+,(R1)+
 5325 031514  001402                    BEQ     DD5                     ;216,442,500
 5326 031516  000137  032510            JMP     @#DDER1                 ;DATA ERROR,D
 5327 031522  077205            DD5:    SOB     R2,DD4
 5328 031524  000137  032546            JMP     @#DDER2                 ;FLOW FAILURE,D
 5329 031530  077220            DD6:    SOB     R2,DD3
 5330 031532  052704  000010            BIS     #10,R4
 5331 031536  020405                    CMP     R4,R5                   ;FPS CORRECT?
 5332 031540  001402                    BEQ     DD7
 5333 031542  000137  032472            JMP     @#DDER0                 ;BAD,FPS
 5334                           ;AC POS FSRC NEG        AC=-FSRC
 5335 031546                    DD7:
      031546  104413                    LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
 5336 031550  012704  003200            MOV     #3200,R4        ;SET FIO, FIV, AND FD
 5337 031554  170104                    LDFPS   R4
 5338 031556  012737  031576  001236    MOV     #DD8,@#$TMP2
 5339 031564  012700  033310            MOV     #DDP2,R0                ;SET AC0 OPERAND
 5340 031570  172410                    LDD     (R0),AC0
 5341 031572  012700  033300            MOV     #DDP1,R0                ;FSPC
 5342 031576  172010            DD8:    ADDD    (R0),AC0                ;TEST IN TRUCTION
 5343 031600  170205                    STFPS   R5                      ;GET FPS
 5344 031602  012700  033260            MOV     #DDDAT0,R0              ;GET THE RESULT
 5345 031606  174010                    STD     AC0,(R0)
 5346 031610  012701  033270            MOV     #DDP0,R1                ;IS IT CORRECT
```

```
5347 031614  012702  000004                    MOV     #4,R2
5348 031620  022021                    DD10:   CMP     (R0)+,(R1)+
5349 031622  001402                            BEQ     DD11
5350 031624  000137  032604                    JMP     @#DDER3                 ;FLOW FAILURE
5351 031630  077205                    DD11:   SOB     R2,DD10
5352 031632  052704  000004                    BIS     #4,R4
5353 031636  020405                            CMP     R4,R5                   ;FPS CORRECT?
5354 031640  001402                            BEQ     DD12
5355 031642  000137  032472                    JMP     @#DDER0                 ;BAD FPS
5356                                ;AC NEG FSRC POS                    AC=-FSRC
5357 031646                         DD12:
     031646  104413                            LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
5358 031650  012704  003200                    MOV     #3200,R4                ;SET FIU, FIV, AND FD
5359 031654  170104                            LDFPS   R4
5360 031656  012737  031676  001236            MOV     #DD13,@#$TMP2
5361 031664  012700  033300                    MOV     #DDP1,R0                ;SET AC0 OPERAND
5362 031670  172410                            LDD     (R0),AC0
5363 031672  012700  033310                    MOV     #DDP2,R0                ;FSRC
5364 031676  172010                    DD13:   ADDD    (R0),AC0                ;TEST INSTRUCTION
5365 031700  170205                            STFPS   R5                      ;GET FPS
5366 031702  012700  033260                    MOV     #DDDAT0,R0              ;GET THE RESULT
5367 031706  174010                            STD     AC0,(R0)
5368 031710  012701  033270                    MOV     #DDP0,R1                ;IS IT CORRECT
5369 031714  012702  000004                    MOV     #4,R2
5370 031720  022021                    DD14.   CMP     (R0)+,(R1)+
5371 031722  001402                            BEQ     DD15
5372 031724  000137  032642                    JMP     @#DDER4                 ;FLOW FAILURE 216,440,121
5373 031730  077205                    DD15:   SOB     R2,DD14
5374 031732  052704  000004                    BIS     #4,R4
5375 031736  020405                            CMP     R4,R5                   ;EPS CORRECT?
5376 031740  001402                            BEQ     DD16
5377 031742  000137  032472                    JMP     @#DDER0                 ;BAD FPS
5378                                ;AC0 POC            FSRC    NEG     /AC/ > /FSRC/
5379 031746                         DD16:
     031746  104413                            LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
5380 031750  012704  003200                    MOV     #3200,R4                ;SET FIV, FIV AND FD
5381 031754  170104                            LDFPS   R4
5382 031756  012737  031776  001236            MOV     #DD17,@#$TMP2
5383 031764  012700  033320                    MOV     #DDP3,R0                ;SET AC0 OPERAND
5384 031770  172410                            LDD     (R0),AC0
5385 031772  012700  033350                    MOV     #DDP6,R0                ;ESPC
5386 031776  172010                    DD17:   ADDD    (R0),AC0                ;TEST INSTRUCTION
5387 032000  170205                            STFPS   R5                      ;GET FPS
5388 032002  012700  033260                    MOV     #DDDAT0,R0              ;GET THE RESULT
5389 032006  174010                            STD     AC0,(R0)
5390 032010  012701  033360                    MOV     #DDP7,R1                ;IS IT CORRECT
5391 032014  012702  000004                    MOV     #4,R2
5392 032020  022021                    DD18:   CMP     (R0)+,(R1)+
5393 032022  001415                            BEQ     DD21
5394 032024  012700  033260                    MOV     #DDDAT0,R0              ;FLOWS FAILURE
5395 032030  012701  033370                    MOV     #DDP8,R1                ;216,440,101
5396 032034  012702  000004                    MOV     #4,R2                   ;GET GENERATED
5397 032040  022021                    DD19:   CMP     (R0)+,(R1)+
5398 032042  001402                            BEQ     DD20
5399 032044  000137  032700                    JMP     @#DDER5                 ;DATA ERROR.
5400 032050  077205                    DD20:   SOB     R2,DD19
5401 032052  000137  032736                    JMP     @#DDER6
```

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5402 032056  077220                  DD21:  SOB   R2,DD18
5403 032060  020405                         CMP   R4,R5                    ;EPS CORRECT?
5404 032062  001402                         BEQ   DD22
5405 032064  000137  032472                 JMP   @#DDER0                  ;BAD FPS
5406                              ;AC NEG FSRC    POS     /FSRC/ > /AC/
5407 032070                       DD22:
     032070  104413                         LPERR                  ;SET UP THE LOOP ON ERROR ADDRESS.
5408 032072  012704  003200                 MOV   #3200,R4                 ;SET FIO,FIV, AND FD
5409 032076  170104                         LDFPS R4
5410 032100  012737  032120  001236         MOV   #DD23,@#$TMP2
5411 032106  012700  033350                 MOV   #DDP6,R0                 ;SET AC0 OPERAND
5412 032112  172410                         LDD   (R0),AC0
5413 032114  012700  033320                 MOV   #DDP3,R0                 ;FSPC
5414 032120  172010                DD23:    ADDD  (R0),AC0                 ;TEST INSTRUCTION
5415 032122  170205                         STFPS R5                       ;GET FPS
5416 032124  012700  033260                 MOV   #DDDAT0,R0               ;GET THE RESULT
5417 032130  174010                         STD   AC0,(R0)
5418 032132  012701  033360                 MOV   #DDP7,R1                 ;IS IT CORRECT?
5419 032136  012702  000004                 MOV   #4,R2
5420 032142  022021                DD24:    CMP   (R0)+,(R1)+
5421 032144  001415                         BEQ   DD27
5422 032146  012700  033260                 MOV   #DDDAT0,R0               ;FLO,S FAILURE
5423 032152  012701  033370                 MOV   #DDP8,R1                 ;CONSTANT (NOT 57)
5424 032156  012702  000004                 MOV   #4,R2                    ;216,042,101
5425 032162  021011                DD25:    CMP   (R0),(R1)
5426 032164  001402                         BEQ   DD26
5427 032166  000137  032774                 JMP   @#DDER7                  ;DATA ERROR.
5428 032172  077205                DD26:    SOB   R2,DD25
5429 032174  000137  033032                 JMP   @#DDER8
5430 032200  077220                DD27:    SOB   R2,DD24
5431 032202  020405                         CMP   R4,R5                    ,FPS CORRECT?
5432 032204  001402                         BEQ   DD30
5433 032206  000137  032472                 JMP   @#DDER0                  ;BAD FPS
5434                              ;AC0 POS        FSRC    NEG     /AC/</FRSRC/
5435 032212                       DD30:
     032212  104413                         LPERR                  ;SET UP THE LOOP ON ERROR ADDRESS.
5436 032214  012704  003200                 MOV   #3200,R4                 ;SET FIO,FIV,AND FD
5437 032220  170104                         LDFPS R4
5438 032222  012737  032242  001236         MOV   #DD31,@#$TMP2
5439 032230  012700  033330                 MOV   #DDP4,R0                 ;SET AC0 OPERAND
5440 032234  172410                         LDD   (R0),AC0
5441 032236  012700  033340                 MOV   #DDP5,R0                 ;FSPC
5442 032242  172010                DD31:    ADDD  (R0),AC0                 ;TEST INSTRUCTION
5443 032244  170205                         STFPS R5                       ;GET FPS
5444 032246  012700  033260                 MOV   #DDDAT0,R0               ;GET THE RESULT
5445 032252  174010                         STD   AC0,(R0)
5446 032254  012701  033370                 MOV   #DDP8,R1                 ;IS IT CORRECT
5447 032260  012702  000004                 MOV   #4,R2
5448 032264  022021                DD32:    CMP   (R0)+,(R1)+
5449 032266  001415                         BEQ   DD35                     ;ADD-SUB
5450 032270  012700  033260                 MOV   #DDDAT0,R0               ;FLOWAS FAILURE
5451 032274  012701  033360                 MOV   #DDP7,R1                 ;CON 216 N44C NOT 141
5452 032300  012702  000004                 MOV   #4,R2                    ;GET GENERATED
5453 032304  022021                DD33:    CMP   (R0)+,(R1)+              ;FOR THE ALLIGNMENT
5454 032306  001402                         BEQ   DD34                     ;FLOWS?
5455 032310  000137  033070                 JMP   @#DDER9                  ;DATA ERROR, D
5456 032314  077205                DD34:    SOB   R2,DD33
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5457 032316  000137  033126              JMP     @#DDER10
5458 032322  077220                DD35: SOB     R2,DD32
5459 032324  052704  000010              BIS     #10,R4
5460 032330  020405                      CMP     R4,R5                   ;FPS CORRECT?
5461 032332  001402                      BEQ     DD36
5462 032334  000137  032472              JMP     @#DDER0                 ;BAD FPS
5463                              ;AC0 NEG      FSRC    POS     /FSRC/<0/AC/
5464 032340                       DD36:
     032340  104413                      LPERR                           ;SET UP THE LOOP ON ERROR ADDRESS.
5465 032342  012704  003200              MOV     #3200,R4                ;SET FIO, FIV, AND FD
5466 032346  170104                      LDFPS   R4
5467 032350  012737  032370  001236      MOV     #DD37,@#$TMP2
5468 032356  012700  033340              MOV     #DDP5,R0                ;SET AC0 OPERAND
5469 032362  172410                      LDD     (R0),AC0
5470 032364  012700  033330              MOV     #DDP4,R0                ;FSPC
5471 032370  172010                DD37: ADDD    (R0),AC0                ;TEST INSTRUCTION
5472 032372  170205                      STFPS   R5                      ;GET FPS
5473 032374  012700  033260              MOV     #DDDAT0,R0              ;GET THE RESULT
5474 032400  174010                      STD     AC0,(R0)
5475 032402  012701  033370              MOV     #DDP8,R1                ;IS IT CORRECT
5476 032406  012702  000004              MOV     #4,R2
5477 032412  022021                DD38: CMP     (R0)+,(R1)+
5478 032414  001415                      BEQ     DD41
5479 032416  012700  033260              MOV     #DDDAT0,R0              ;ADD SUB
5480 032422  012701  033360              MOV     #DDP7,R1                ;FLOWS FAILURES
5481 032426  012702  000004              MOV     #4,R2                   ;GET 216,042,141
5482 032432  022021                DD39: CMP     (R0)+,(R1)+             ;FOR THE ALLIGNMENT
5483 032434  001402                      BEQ     DD40                    ;FLOWS?
5484 032436  000137  033164              JMP     @#DDER11                ;DATA ERROR. D
5485 032442  077205                DD40: SOB     R2,DD39
5486 032444  000137  033222              JMP     @#DDER12                ;BAD CONSTANT.D
5487 032450  077220                DD41: SOB     R2,DD38
5488 032452  052704  000010              BIS     #10,R4
5489 032456  020405                      CMP     R4,R5                   ;FPS CORRECT?
5490 032460  001402                      BEQ     DD42
5491 032462  000137  032472              JMP     @#DDER0                 ;BAD FPS
5492 032466  000137  033410        DD42: JMP     @#DDDONE
5493 032472  010437  001242        DDER0: MOV    R4,@#$TMP4              ;FPS ERROR
5494 032476  010537  001240              MOV     R5,@#$TMP3
5495 032502  104164                1$:   ERROR   +164
5496 032504  000137  033410              JMP     @#DDDONE
5497 032510                       DDER1:
     032510  012737  033300  001240      MOV     #DDP1,@#$TMP3
     032516  012737  033300  001242      MOV     #DDP1,@#$TMP4
     032524  012737  033260  001244      MOV     #DDDAT0,@#$TMP5
     032532  012737  033400  001246      MOV     #DDP9,@#$TMP6
     032540  104165                1$:   ERROR   +165
     032542  000137  033410              JMP     @#DDDONE
5498 032546                       DDER2:
     032546  012737  033300  001240      MOV     #DDP1,@#$TMP3
     032554  012737  033300  001242      MOV     #DDP1,@#$TMP4
     032562  012737  033260  001244      MOV     #DDDAT0,@#$TMP5  ;
     032570  012737  033400  001246      MOV     #DDP9,@#$TMP6    .
     032576  104176                1$:   ERROR   +176
     032600  000137  033410              JMP     @#DDDONE
5499 032604                       DDER3:
     032604  012737  033300  001240      MOV     #DDP1,@#$TMP3
```

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        032612  012737  033310  001242          MOV     #DDP2,a#$TMP4
        032620  012737  033260  001244          MOV     #DDDAT0,a#$TMP5
        032626  012737  033270  001246          MOV     #DDP0,a#$TMP6
        032634  104177                  1$:     ERROR   +177
        032636  000137  033410                  JMP     a#DDDONE
  5500  032642                          DDER4:
        032642  012737  033310  001240          MOV     #DDP2,a#$TMP3
        032650  012737  033300  001242          MOV     #DDP1,a#$TMP4
        032656  012737  033260  001244          MOV     #DDDAT0,a#$TMP5
        032664  012737  033270  001246          MOV     #DDP0,a#$TMP6
        032672  104200                  1$:     ERROR   +200
        032674  000137  033410                  JMP     a#DDDONE
  5501  032700                          DDER5:
        032700  012737  033350  001240          MOV     #DDP6,a#$TMP3
        032706  012737  033320  001242          MOV     #DDP3,a#$TMP4
        032714  012737  033260  001244          MOV     #DDDAT0,a#$TMP5
        032722  012737  033360  001246          MOV     #DDP7,a#$TMP6
        032730  104165                  1$:     ERROR   +165
        032732  000137  033410                  JMP     a#DDDONE
  5502  032736                          DDER6:
        032736  012737  033350  001240          MOV     #DDP6,a#$TMP3
        032744  012737  033320  001242          MOV     #DDP3,a#$TMP4
        032752  012737  033260  001244          MOV     #DDDAT0,a#$TMP5
        032760  012737  033360  001246          MOV     #DDP7,a#$TMP6
        032766  104201                  1$:     ERROR   +201
        032770  000137  033410                  JMP     a#DDDONE
  5503  032774                          DDER7:
        032774  012737  033320  001240          MOV     #DDP3,a#$TMP3
        033002  012737  033350  001242          MOV     #DDP6,a#$TMP4
        033010  012737  033260  001244          MOV     #DDDAT0,a#$TMP5
        033016  012737  033360  001246          MOV     #DDP7,a#$TMP6
        033024  104165                  1$:     ERROR   +165
        033026  000137  033410                  JMP     a#DDDONE
  5504  033032                          DDER8:
        033032  012737  033320  001240          MOV     #DDP3,a#$TMP3
        033040  012737  033350  001242          MOV     #DDP6,a#$TMP4
        033046  012737  033260  001244          MOV     #DDDAT0,a#$TMP5
        033054  012737  033360  001246          MOV     #DDP7,a#$TMP6
        033062  104202                  1$:     ERROR   +202
        033064  000137  033410                  JMP     a#DDDONE
  5505  033070                          DDER9:
        033070  012737  033340  001240          MOV     #DDP5,a#$TMP3
        033076  012737  033330  001242          MOV     #DDP4,a#$TMP4
        033104  012737  033260  001244          MOV     #DDDAT0,a#$TMP5
        033112  012737  033370  001246          MOV     #DDP8,a#$TMP6
        033120  104165                  1$:     ERROR   +165
        033122  000137  033410                  JMP     a#DDDONE
  5506  033126                          DDER10:
        033126  012737  033340  001240          MOV     #DDP5,a#$TMP3
        033134  012737  033330  001242          MOV     #DDP4,a#$TMP4
        033142  012737  033260  001244          MOV     #DDDAT0,a#$TMP5
        033150  012737  033370  001246          MOV     #DDP8,a#$TMP6
        033156  104203                  1$:     ERROR   +203
        033160  000137  033410                  JMP     a#DDDONE
  5507  033164                          DDER11:
        033164  012737  033330  001240          MOV     #DDP4,a#$TMP3
        033172  012737  033340  001242          MOV     #DDP5,a#$TMP4
```

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        033200  012737  033260  001244          MOV     #DDDATO,@#$TMP5
        033206  012737  033370  001246          MOV     #DDP8,@#$TMP6
        033214  104165                  1$:     ERROR   +165
        033216  000137  033410                  JMP     @#DDDONE
  5508  033222                          DDER*2:
        033222  012737  033330  001240          MOV     #DDP4,@#$TMP3
        033230  012737  033340  001242          MOV     #DDP5,@#$TMP4
        033236  012737  033260  001244          MOV     #DDDATO,@#$TMP5
        033244  012737  033370  001246          MOV     #DDP8,@#$TMP6
        033252  104204                  1$:     ERROR   +204
        033254  000137  033410                  JMP     @#DDDONE
  5509  033260  000000                  DDDATO: 0
  5510  033262  000000                          0
  5511  033264  000000                          0
  5512  033266  000000                          0
  5513  033270  000000                  DDP0:   0
  5514  033272  000000                          0
  5515  033274  000000                          0
  5516  033276  000000                          0
  5517  033300  100200                  DDP1:   100200                  ;-DDP2
  5518  033302  000000                          0
  5519  033304  000000                          0
  5520  033306  000000                          0
  5521  033310  000200                  DDP2:   200                     ;-DDP1
  5522  033312  000000                          0
  5523  033314  000000                          0
  5524  033316  000000                          0
  5525  033320  001100                  DDP3:   1100                    ;EXP=4
  5526  033322  000000                          0                       ;FRAC=...110...
  5527  033324  000000                          0
  5528  033326  000000                          0
  5529  033330  000600                  DDP4:   600                     ;EXP-3
  5530  033332  000000                          0                       ;FRAC ...100...
  5531  033334  000000                          0
  5532  033336  000000                          0
  5533  033340  101100                  DDP5:   101100                  ;-DDP3
  5534  033342  000000                          0
  5535  033344  000000                          0
  5536  033346  000000                          0
  5537  033350  100600                  DDP6:   100600                  ;-DDP4
  5538  033352  000000                          0
  5539  033354  000000                          0
  5540  033356  000000                          0
  5541  033360  001000                  DDP7:   1000                    ;DDP3+DDP6
  5542  033362  000000                          0
  5543  033364  000000                          0
  5544  033366  000000                          0
  5545  033370  101000                  DDP8:   101000                  ;DDP5+DDP4
  5546  033372  000000                          0
  5547  033374  000000                          0
  5548  033376  000000                          0
  5549  033400  100400                  DDP9:   100400                  ;DDP1+DDP1
  5550  033402  000000                          0
  5551  033404  000000                          0
  5552  033406  000000                          0
  5553  033410  000005                  DDDONE:         RESET
  5561                                  ;;*****************************************************************
```

```
                                ;*TEST 35       SUBD TEST
                                ;*
                                ;* THIS IS A TEST OF THE SUBD INSTRUCTION.
                                ;* BOTH A POSITIVE AND A NEGATIVE NUMBER
                                ;* IS SUBTRACTED FROM IT SELF
                                ;*
                                ;;*****************************************************************
     033412  000004             TST35:  SCOPE
5562                            ;       USE POSITIVE OPERANDS
5563 033414                     EE1:
     033414  104413                     LPERR                       ;SET UP THE LOOP ON ERROR ADDRESS.
5564 033416  012704  003200             MOV     #3200,R4            ;SET FIO, FIV, AND FD
5565 033422  170104                     LDFPS   R4
5566 033424  012737  033444  001236     MOV     #EE2,@#$TMP2
5567 033432  012700  034124             MOV     #EEP1,R0            ;SET AC0 OPERAND
5568 033436  172410                     LDD     (R0),AC0
5569 033440  012700  034124             MOV     #EEP1,R0            ;FSPC
5570 033444  173010             EE2:    SUBD    (R0),AC0            ;TEST INSTRUCTION
5571 033446  170205                     STFPS   R5                  ;GET FPS
5572 033450  012700  034102             MOV     #EEDAT0,R0          ;GET THE RESULT
5573 033454  174010                     STD     AC0,(R0)
5574 033456  012701  034112             MOV     #EEP0,R1            ;IS IT CORRECT?
5575 033462  012702  000004             MOV     #4,R2
5576 033466  022021             EE3:    CMP     (R0)+,(R1)+
5577 033470  001415                     BEQ     EE6
5578 033472  012700  034102             MOV     #EEDAT0,R0          ;DID A BAD
5579 033476  012701  034134             MOV     #EEP2,R1            ;CONSTANT (NOT 57)
5580 033502  012702  000004             MOV     #4,R2               ;GET GENERATED
5581 033506  022021             EE4:    CMP     (R0)+,(R1)+         ;FOR THE ALLIGNMENT
5582 033510  001402                     BEQ     EE5                 ;FLOWS?
5583 033512  000137  033712             JMP     @#EEER1             ;DATA EPROR.D
5584 033516  077205             EE5:    SOB     R2,EE4
5585 033520  000137  033750             JMP     @#EEER2             ;BAD CONSTANT.D
5586 033524  077220             EE6:    SOB     R2,EE3
5587 033526  052704  000004             BIS     #4,R4
5588 033532  020405                     CMP     R4,R5               ;FPS CORRECT?
5589 033534  001402                     BEQ     EE7
5590 033536  000137  033674             JMP     @#EEER0             ;BAD FPS
5591                            ;USE NEGATIVE OPERANDS
5592 033542                     EE7:
     033542  104413                     LPERR                       ;SET UP THE LOOP ON ERROR ADDRESS.
5593 033544  012704  003200             MOV     #3200,R4            ;SET FIO, FIV, AND FD
5594 033550  170104                     LDFPS   R4
5595 033552  012737  033572  001236     MOV     #EE8,@#$TMP2
5596 033560  012700  034144             MOV     #EEP3,R0            ;SET AC0 OPERAND
5597 033564  172410                     LDD     (R0),AC0
5598 033566  012700  034144             MOV     #EEP3,R0            ;FSPC
5599 033572  173010             EE8:    SUBD    (R0),AC0            ;TEST INSTRUCTION
5600 033574  170205                     STFPS   R5                  ;GET FPS
5601 033576  012700  034102             MOV     #EEDAT0,R0          ;GET THE RESULT
5602 033602  174010                     STD     AC0,(R0)
5603 033604  012701  034112             MOV     #EEP0,R1            ;IS IT CORPECT?
5604 033610  012702  000004             MOV     #4,R2
5605 033614  022021             EE9:    CMP     (R0)+,(R1)+
5606 033616  001415                     BEQ     EE12
5607 033620  012700  034102             MOV     #EEDAT0,R0          ;DID A BAD
5608 033624  012701  034154             MOV     #EEP4,R1            ;CONSTANT (NOT 57)
```

```
5609 033630  012702  000004              MOV     #4,R2                   ;GET GENERATED
5610 033634  022021                EE10:  CMP     (R0)+,(R1)+             ;FOR THE ALLIGNMENT
5611 033636  001402                       BEQ     EE11                    ;FLOWS?
5612 033640  000137  034006              JMP     @#EEER3                 ;DATA ERROR.D
5613 033644  077205                EE11:  SOB     R2,EE10
5614 033646  000137  034044              JMP     @#EEER4                 ;BAD CONSTANT.D
5615 033652  077220                EE12:  SOB     R2,EE9
5616 033654  052704  000004              BIS     #4,R4
5617 033660  020405                       CMP     R4,R5                   ;FPS CORRECT?
5618 033662  001402                       BEQ     EE13
5619 033664  000137  033674              JMP     @#EEER0                 ;BAD FPS.
5620 033670  000137  034164        EE13: JMP     @#EEDONE
5621 033674  010437  001242        EEER0: MOV     R4,@#$TMP4              ;BAD FPS
5622 033700  010537  001240               MOV     R5,@#$TMP3
5623 033704  104205                1$:    ERROR   +205
5624 033706  000137  034164              JMP     @#EEDONE
5625 033712                        EEER1:
     033712  012737  034124  001240       MOV     #EEP1,@#$TMP3
     033720  012737  034124  001242       MOV     #EEP1,@#$TMP4
     033726  012737  034102  001244       MOV     #EEDAT0,@#$TMP5
     033734  012737  034112  001246       MOV     #EEP0,@#$TMP6
     033742  104206                1$:    ERROR   +206
     033744  000137  034164              JMP     @#EEDONE
5626 033750                        EEER2:
     033750  012737  034124  001240       MOV     #EEP1,@#$TMP3
     033756  012737  034124  001242       MOV     #EEP1,@#$TMP4
     033764  012737  034102  001244       MOV     #EEDAT0,@#$TMP5
     033772  012737  034112  001246       MOV     #EEP0,@#$TMP6
     034000  104207                1$:    ERROR   +207
     034002  000137  034164              JMP     @#EEDONE
5627 034006                        EEER3:
     034006  012737  034144  001240       MOV     #EEP3,@#$TMP3
     034014  012737  034144  001242       MOV     #EEP3,@#$TMP4
     034022  012737  034102  001244       MOV     #EEDAT0,@#$TMP5
     034030  012737  034112  001246       MOV     #EEP0,@#$TMP6
     034036  104206                1$:    ERROR   +206
     034040  000137  034164              JMP     @#EEDONE
5628 034044                        EEER4:
     034044  012737  034144  001240       MOV     #EEP3,@#$TMP3
     034052  012737  034144  001242       MOV     #EEP3,@#$TMP4
     034060  012737  034102  001244       MOV     #EEDAT0,@#$TMP5
     034066  012737  034112  001246       MOV     #EEP0,@#$TMP6
     034074  104207                1$:    ERROR   +207
     034076  000137  034164              JMP     @#EEDONE
5629 034102  000000                EEDAT0: 0
5630 034104  000000                        0
5631 034106  000000                        0
5632 034110  000000                        0
5633 034112  000000                EEP0:   0
5634 034114  000000                        0
5635 034116  000000                00000
5636 034120  000000                        0
5637 034122  000000                        0
5638 034124  000200                EEP1:   200
5639 034126  000000                        0
5640 034130  000000                        0
5641 034132  000000                        0
```

```
5642 034134  000400                EEP2:   400
5643 034136  000000                        0
5644 034140  000000                        0
5645 034142  000000                        0
5646 034144  100200                EEP3:   100200
5647 034146  000000                        0
5648 034150  000000                        0
5649 034152  000000                        0
5650 034154  100400                EEP4:   100400
5651 034156  000000                        0
5652 034160  000000                        0
5653 034162  000000                        0
5654 034164                        FEDONE:
     034164  104412                        RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                                    ;SEE IF THE USER HAS EXPRESSED
                                                                    ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                    ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                    ;THE USER TYPED CONTROL G?).
5664                               ;;*****************************************************************
                                   ;*TEST 36       NORMALIZE ALGORITHM TEST
                                   ;*
                                   ;* THIS IS A TEST OF THE NORMALIZE
                                   ;* FLOW ALGORITHM.  TWO PATTERNS ARE USED,
                                   ;* FIRST THE MINIMUM SITUATION REQUIRING ONE
                                   ;* LEFT SHIFT AND THEN THE MAXIMUM SITUATION
                                   ;* REQUIRING 56 SHIFTS.
                                   ;*
                                   ;;*****************************************************************
     034166  000004                TST36:  SCOPE
5665                               ;USE DATA PATTERNS THAT REQUIRE ONLY ONE LEFT SHIFT TO NORMALIZE
5666 034170                        FF1:
     034170  104413                        LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
5667 034172  012704  003200                MOV     #3200,R4                ;SET FIO, FIV, AND FD
5668 034176  170104                        LDFPS   R4
5669 034200  012737  034220  001236        MOV     #FF2,@#$TMP2
5670 034206  012700  034512                MOV     #FFP2,R0                ;SET AC0 OPERAND
5671 034212  172410                        LDD     (R0),AC0
5672 034214  012700  034522                MOV     #FFP3,R0                ;FSPC
5673 034220  172010                FF2:    ADDD    (R0),AC0                ;TEST INSTRUCTION
5674 034222  170205                        STFPS   R5                      ;GET FPS
5675 034224  012700  034462                MOV     #FFDAT0,R0              ;GET THE RESULT
5676 034230  174010                        STD     AC0,(R0)
5677 034232  012701  034532                MOV     #FFP4, R1               ;IS IT CORRECT
5678 034236  012702  000004                MOV     #4,R2
5679 034242  022021                FF3:    CMP     (R0)+,(R1)+
5680 034244  001401                        BEQ     FF4
5681 034246  000466                        BR      FFER2                   ;BAD DATA
5682 034250  077204                FF4:    SOB     R2,FF3
5683 034252  020405                        CMP     R4,R5                   ;FPS CORRECT?
5684 034254  001401                        BEQ     FF5
5685 034256  000435                        BR      FFER0                   ;BAD FPS
5686                               ;USE DATA PATTERNS WHICH REQUIRE 56 LEFT SHIFTS TO NORMALIZE
5687                               ;THE RESULT
5688 034260                        FF5:
     034260  104413                        LPERR                   ;SET UP THE LOOP ON ERROR ADDRESS.
5689 034262  012704  003200                MOV     #3200,R4                ;SET FIO, FIV, AND FD
5690 034266  170104                        LDFPS   R4
```

```
 5691 034270  012737  034310  001236          MOV     #FF5,@#$TMP2
 5692 034276  012700  034472                  MOV     #FFP0,R0                ;SET AC0 OPERAND
 5693 034302  172410                          LDD     (R0),AC0
 5694 034304  012700  034502                  MOV     #FFP1,R0                ;FSRC
 5695 034310  172010                  FF6:    ADDD    (R0),AC0                ;TEST INSTRUCTION
 5696 034312  170205                          STFPS   R5                      ;GET FPS
 5697 034314  012700  034462                  MOV     #FFDAT0,R0              ;GET THE RESULT
 5698 034320  174010                          STD     AC0,(R0)
 5699 034322  012701  034532                  MOV     #FFP4,R1                ;IS IT CORRECT
 5700 034326  012702  000004                  MOV     #4,R2
 5701 034332  022021                  FF7:    CMP     (R0)+,(R1)+
 5702 034334  001401                          BEQ     FF10
 5703 034336  000413                          BR      FFER1                   ;BATA
 5704 034340  077204                  FF10:   SOB     R2,FF7
 5705 034342  020405                          CMP     R4,R5                   ;FPS CORRECT?
 5706 034344  001401                          BEQ     FF11
 5707 034346  000401                          BR      FFER0           ;BAD FPS
 5708 034350  000474                  FF11:   BR      FFDONE
 5709
 5710 034352  010537  001240          FFER0:  MOV     R5,@#$TMP3
 5711 034356  010437  001242                  MOV     R4,@#$TMP4
 5712 034362  104164                  1$:     ERROR   +164
 5713 034364  000466                          BR      FFDONE
 5714
 5715 034366                          FFER1:
      034366  012737  034502  001240          MOV     #FFP1,@#$TMP3
      034374  012737  034472  001242          MOV     #FFP0,@#$TMP4
      034402  012737  034462  001244          MOV     #FFDAT0,@#$TMP5
      034410  012737  034532  001246          MOV     #FFP4,@#$TMP6
      034416  104210                  1$:     ERROR   +210
      034420  000137  034542                  JMP     @#FFDONE
 5716
 5717 034424                          FFER2:
      034424  012737  034522  001240          MOV     #FFP3,@#$TMP3
      034432  012737  034512  001242          MOV     #FFP2,@#$TMP4
      034440  012737  034462  001244          MOV     #FFDAT0,@#$TMP5
      034446  012737  034532  001246          MOV     #FFP4,@#$TMP6
      034454  104210                  1$:     ERROR   +210
      034456  000137  034542                  JMP     @#FFDONE
 5718
 5719
 5720 034462  000000                  FFDAT0: 0
 5721 034464  000000                          0
 5722 034466  000000                          0
 5723 034470  000000                          C
 5724
 5725 034472  016000                  FFP0:   16000
 5726 034474  000000                          0
 5727 034476  000000                          0
 5728 034500  000001                          1
 5729 034502  116000                  FFP1:   116000
 5730 034504  000000                          0
 5731 034506  000000                          0
 5732 034510  000000                          0
 5733 034512  000500                  FFP2:   500
 5734 034514  000000                          0
 5735 034516  000000                          0
```

```
 5736 034520  000000                    0
 5737 034522  100400          FFP3:     100400
 5738 034524  000000                    0
 5739 034526  000000                    0
 5740 034530  000000                    0
 5741 034532  000200          FFP4:     200                    ;FFP4=FFP0+FFP1
 5742 034534  000000                    0                      ;    =FFP3+FFP4
 5743 034536  000000                    0
 5744 034540  000000                    0
 5745
 5746 034542                  FFDONE:
 5747
 5748
 5749 034542                  TST37:
 5750
 5751
 5752
 5753                         .SBTTL  END OF PASS ROUTINE
                              ;;*****************************************************************
                              ;*INCREMENT THE PASS NUMBER ($PASS)
                              ;*INDICATE END-OF-PROGRAM AFTER 1 PASSES THRU THE PROGRAM
                              ;*IF SW12=1 INHIBIT TRACE TRAP
                              ;*IF THERES A MONITOR GO TO IT
                              ;*IF THERE ISN'T JUMP TO LOOP
      034542                  $EOP:
      034542  000004                    SCOPE
      034544  005067  144332            CLR     $TSTNM          ;;ZERO THE TEST NUMBER
      034550  005067  144526            CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
      034554  005267  144544            INC     $PASS           ;;INCREMENT THE PASS NUMBER
      034560  042767  100000  144536    BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
      034566  005327                    DEC     (PC)+           ;;LOOP?
      034570  000001          $EOPCT:   .WORD   1
      034572  003074                    BGT     $DOAGN          ;;YES
      034574  012737                    MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
      034576  000001          $ENDCT:   .WORD   1
      034600  034570                    $EOPCT
      034602  104401  034610            TYPE    ,65$            ;;TYPE ASCIZ STRING
      034606  000407                    BR      64$             ;;GET OVER THE ASCIZ
                              ;;65$:    .ASCIZ  <12><15>/END PASS #/
      034626                  64$:
      034626  016746  144472            MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
                                                                ;;TYPE PASS NUMBER IN OCTAL
      034632  104403                    TYPOS                   ;;GO TYPE--OCTAL ASCII
      034634     006                    .BYTE   6               ;;TYPE 6 DIGITS
      034635     000                    .BYTE   0               ;;SUPPRESS LEADING ZEROS
      034636  104401  034644            TYPE    ,67$            ;;TYPE ASCIZ STRING
      034642  000421                    BR      66$             ;;GET OVER THE ASCIZ
                              ;;67$:    .ASCIZ  /  TOTAL ERRORS SINCE LAST REPORT /
      034706                  66$:
      034706  016746  144200            MOV     $ERTTL,-(SP)    ;;SAVE $ERTTL FOR TYPEOUT
                                                                ;;TOTAL NUMBER OF ERRORS IN OCTAL
      034712  104403                    TYPOS                   ;;GO TYPE--OCTAL ASCII
      034714     006                    .BYTE   6               ;;TYPE 6 DIGITS
      034715     000                    .BYTE   0               ;;SUPPRESS LEADING ZEROS
      034716  104401  001313            TYPE    ,$CRLF          ;;TYPE CARRIAGE RETURN, LINE FEED
      034722  005067  144164            CLR     $ERTTL          ;;CLEAR ERROR TOTAL
      034726  013700  000042  $GET42:   MOV     @#42,R0         ;;GET MONITOR ADDRESS
```

```
034732  00*414                          BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
034734  005046                          CLR     -(SP)           ;;INSURE THE "T" BIT IS CLEAR
034736  012746  034744                  MOV     #$CLR.T,-(SP)   ;;SETUP FOR AN RTI OR RTT
034742  000426                          BR      $RTRN           ;;GO DO AN RTI OR RTT TO LOAD THE PSW
                                                                ;;WITH A CLEARED "T" BIT
034744                          $CLR.T:
034744  013700  000042                  MOV     @#42,R0         ;;INSURE R0 CONTAINS THE MONITORS
034750  001405                          BEQ     $DOAGN          ;;RETURN ADDRESS
034752  000005                          RESET                   ;;CLEAR THE WORLD
034754  004710                  $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
034756  000240                          NOP                     ;;SAVE ROOM
034760  000240                          NOP                     ;;FOR
034762  000240                          NOP                     ;;ACT11
034764                          $DOAGN:
034764  104400                          TRAP                    ;;PUSH OLD PSW AND PC ON STACK
034766  042716  000020                  BIC     #20,(SP)        ;;CLEAR THE "T" BIT
034772  032777  010000  144140          BIT     #BIT12,@SWR     ;;RUN WITH TRACE TRAP?
035000  001005                          BNE     1$              ;;BR IF NO
035002  005167  000020                  COM     $TBIT           ;;IS IT TIME FOR TRACE TRAP
035006  100402                          BMI     1$              ;;BR IF NO
035010  052716  000020                  BIS     #20,(SP)        ;;SET TRACE TRAP
035014  012746  035022          1$:     MOV     #$LOOP,-(SP)    ;;JUMP TO START OF TEST
035020  000002                  $RTRN:  RTI                     ;;RETURN--THIS IS CHANGED TO
                                                                ;;AN "RTT" IF "RTT" IS A LEGAL
                                                                ;;INSTRUCTION
035022                          $LOOP:
035022  000137                          JMP     @(PC)+          ;;RETURN
035024  004270                  $RTNAD: .WORD   LOOP
035026  000000                  $TBIT:  .WORD   0               ;;"T" BIT STATE INDICATOR
035030     377      377     000 $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
                                    .EVEN
5754
5755                                    .SBTTL  SCOPE HANDLER ROUTINE
                                        ;;**************************************************************
                                        ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
                                        ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
                                        ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
                                        ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
                                        ;*SW14-1        LOOP ON TEST
                                        ;*SW11-1        INHIBIT ITERATIONS
                                        ;*SW09=1        LOOP ON ERROR
                                        ;*SW08=1        LOOP ON TEST IN SWR<7:0>
                                        ;*CALL
                                        ;*      SCOPE           ;;SCOPE-IOT
035034                          $SCOPE:
035034  104406                          CKSWR                   ;;TEST  FOR CHANGE IN SOFT-SWR
035036  032777  040000  144074  1$:     BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
035044  001114                          BNE     $OVER           ;;YES IF SW14=1
                                        ;#####START OF CODE FOR THE XOR TESTER#####
035046  000416                  $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
                                                                ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
035050  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
035054  012737  035074  000004          MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
035062  005737  177060                  TST     @#177060        ;;TIME OUT ON XOR?
035066  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
035072  000463                          BR      $SVLAD          ;;GO TO THE NEXT TEST
035074  022626                  5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
```

```
035076  012637  000004          MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
035102  000423                  BR      7$              ;;LOOP ON THE PRESENT TEST
035104                  6$:;#####END OF CODE FOR THE XOR TESTER#####
035104  032777  000400  144026  BIT     #BIT08,@SWR     ;;LOOP ON SPEC. TEST?
035112  001404                  BEQ     2$              ;;BR IF NO
035114  127767  144020  143760  CMPB    @SWR,$TSTNM     ;;ON THE RIGHT TEST?    SWR<7:0>
035122  001465                  BEQ     $OVER           ;;BR IF YES
035124  105767  143753  2$:     TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
035130  001421                  BEQ     3$              ;;BR IF NO
035132  126767  143757  143743  CMPB    $ERMAX,$ERFLG   ;;MAX. ERRORS FOR THIS TEST OCCURRED?
035140  101015                  BHI     3$              ;;BR IF NO
035142  032777  001000  143770  BIT     #BIT09,@SWR     ;;LOOP ON ERROR?
035150  001404                  BEQ     4$              ;;BR IF NO
035152  016767  143732  143726  7$:     MOV     $LPERR,$LPADR   ;;SET LOOP ADDRESS TO LAST SCOPE
035160  000446                  BR      $OVER
035162  105067  143715  4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
035166  005067  144110          CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
035172  000415                  BR      1$              ;;ESCAPE TO THE NEXT TEST
035174  032777  004000  143736  3$:     BIT     #BIT11,@SWR     ;;INHIBIT ITERATIONS?
035202  001011                  BNE     1$              ;;BR IF YES
035204  005767  144114          TST     $PASS           ;;IF FIRST PASS OF PROGRAM
035210  001406                  BEQ     1$              ;;      INHIBIT ITERATIONS
035212  005267  143666          INC     $ICNT           ;;INCREMENT ITERATION COUNT
035216  026767  144060  143660  CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
035224  002024                  BGE     $OVER           ;;BR IF MORE ITERATION REQUIRED
035226  012767  000001  143650  1$:     MOV     #1,$ICNT        ;;REINITIALIZE THE ITERATION COUNTER
035234  016767  000052  144040          MOV     $MXCNT,$TIMES   ;;SET NUMBER OF ITERATIONS TO DO
035242  105267  143634  $SVLAD: INCB    $TSTNM          ;;COUNT TEST NUMBERS
035246  116767  143630  144046          MOVB    $TSTNM,$TESTN   ;;SET TEST NUMBER IN APT MAILBOX
035254  011667  143626                  MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
035260  011667  143624                  MOV     (SP),$LPERR     ;;SAVE ERROR LOOP ADDRESS
035264  005067  144014                  CLR     $ESCAPE         ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
035270  112767  000001  143617          MOVB    #1,$ERMAX       ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
035276  016777  143600  143636  $OVER:  MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
035304  016716  143576                  MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
035310  000002                  RTI                     ;;FIXES PS
035312  000001          $MXCNT: 1                       ;;MAX. NUMBER OF ITERATIONS
5756
5757                    .SBTTL  ERROR HANDLER ROUTINE
                        ;;**********************************************************************
                        ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
                        ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
                        ;*AND GO TO ERTYPE ON ERROR
                        ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
                        ;*SW15=1         HALT ON ERROR
                        ;*SW13=1         INHIBIT ERROR TYPEOUTS
                        ;*SW10-1         BELL ON ERROR
                        ;*SW09-1         LOOP ON ERROR
                        ;*CALL
                        ;*      ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER
035314                  $ERROR:
035314  104406                  CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
035316  105267  143561  7$:     INCB    $ERFLG          ;;SET THE ERROR FLAG
035322  001775                  BEQ     7$              ;;DON'T LET THE FLAG GO TO ZERO
035324  016777  143552  143610          MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
035332  032777  002000  143600          BIT     #BIT10,@SWR     ;;BELL ON ERROR?
035340  001402                  BEQ     1$              ;;NO - SKIP
```

```
035342  104401  001306                  TYPE    ,$BELL          ;;RING BELL
035346  005267  143540          1$:     INC     $ERTTL          ;;COUNT THE NUMBER OF ERRORS
035352  011667  143540                  MOV     (SP),$ERRPC     ;;GET ADDRESS OF ERROR INSTRUCTION
035356  162767  000002  143532          SUB     #2,$ERRPC
035364  117767  143526  143522          MOVB    @$ERRPC,$ITEMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
035372  032777  020000  143540          BIT     #BIT13,@SWR     ;;SKIP TYPEOUT IF SET
035400  001004                          BNE     20$             ;;SKIP TYPEOUTS
035402  004767  002174                  JSR     PC,ERTYPE       ;;GO TO USER ERROR ROUTINE
035406  104401  001313                  TYPE    ,$CRLF
035412                          20$:
035412  122767  000001  143716          CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
035420  001007                          BNE     2$              ;;NO,SKIP APT ERROR REPORT
035422  116767  143466  000004          MOVB    $ITEMB,21$      ;;SET ITEM NUMBER AS ERROR NUMBER
035430  004767  001010                  JSR     PC,$ATY4        ;;REPORT FATAL ERROR TO APT
035434     000                  21$:    .BYTE   0
035435     000                          .BYTE   0
035436  000777                  22$:    BR      22$             ;;APT ERROR LOOP
035440  005777  143474          2$:     TST     @SWR            ;;HALT ON ERROR
035444  100002                          BPL     3$              ;;SKIP IF CONTINUE
035446  000000                          HALT                    ;;HALT ON ERROR
035450  104406                          CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
035452  032777  001000  143460  3$:     BIT     #BIT09,@SWR     ;;LOOP ON ERROR SWITCH SET?
035460  001402                          BEQ     4$              ;;BR IF NO
035462  016716  143422                  MOV     $LPERR,(SP)     ;;FUDGE RETURN FOR LOOPING
035466  005767  143612          4$:     TST     $ESCAPE         ;;CHECK FOR AN ESCAPE ADDRESS
035472  001402                          BEQ     5$              ;;BR IF NONE
035474  016716  143604                  MOV     $ESCAPE,(SP)    ;;FUDGE RETURN ADDRESS FOR ESCAPE
035500                          5$:
035500  022737  034754  000042          CMP     #$ENDAD,@#42    ;;ACT-11 AUTO-ACCEPT?
035506  001001                          BNE     6$              ;;BRANCH IF NO
035510  000000                          HALT                    ;;YES
035512                          6$:
035512  032777  001000  143420          BIT     #BIT09,@SWR
035520  001013                          BNE     ERM10
035522  011637  001162                  MOV     (SP),@#$REG0            ;SEE IF ERROR #377
035526  062737  177776  001162          ADD     #-2,@#$REG0
035534  122777  000377  143420          CMPB    #377,@$REG0
035542  001002                          BNE     ERM10
035544  062716  000002                  ADD     #2,(SP)
035550  000002                  ERM10:  RTI
5758
5759                                    .SBTTL  SAVE AND RESTORE R0-R5 ROUTINES
                                        ;;******************************************************************
                                        ;*SAVE R0-R5
                                        ;*CALL:
                                        ;*      SAVREG
                                        ;*UPON RETURN FROM $SAVREG THE STACK WILL LOOK LIKE:
                                        ;*
                                        ;*TOP---(+16)
                                        ;*  +2---(+18)
                                        ;*  +4---R5
                                        ;*  +6---R4
                                        ;*  +8---R3
                                        ;*+10---R2
                                        ;*+12---R1
                                        ;*+14---R0
035552                                  $SAVREG:
```

```
035552  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
035554  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
035556  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
035560  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
035562  010446                          MOV     R4,-(SP)        ;;PUSH R4 ON STACK
035564  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
035566  016646  000022                  MOV     22(SP),-(SP)    ;;SAVE PS OF MAIN FLOW
035572  016646  000022                  MOV     22(SP),-(SP)    ;;SAVE PC OF MAIN FLOW
035576  016646  000022                  MOV     22(SP),-(SP)    ;;SAVE PS OF CALL
035602  016646  000022                  MOV     22(SP),-(SP)    ;;SAVE PC OF CALL
035606  000002                          RTI
                                ;*RESTORE R0-R5
                                ;*CALL:
                                ;*      RESREG
035610                          $RESREG:
035610  012666  000022                  MOV     (SP)+,22(SP)    ;;RESTORE PC OF CALL
035614  012666  000022                  MOV     (SP)+,22(SP)    ;;RESTORE PS OF CALL
035620  012666  000022                  MOV     (SP)+,22(SP)    ;;RESTORE PC OF MAIN FLOW
035624  012666  000022                  MOV     (SP)+,22(SP)    ;;RESTORE PS OF MAIN FLOW
035630  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
035632  012604                          MOV     (SP)+,R4        ;;POP STACK INTO R4
035634  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
035636  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
035640  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
035642  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
035644  000002                          RTI
 5760
 5761                           .SBTTL  TYPE ROUTINE
                                ;;**********************************************************************
                                ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
                                ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
                                ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
                                ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
                                ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
                                ;*
                                ;*CALL:
                                ;*1) USING A TRAP INSTRUCTION
                                ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
                                ;*OR
                                ;*      TYPE
                                ;*      MESADR
                                ;*
035646  105767  143305          $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
035652  100002                          BPL     1$              ;;BR IF YES
035654  000000                          HALT                    ;;HALT HERE IF NO TERMINAL
035656  000430                          BR      3$              ;;LEAVE
035660  010046                  1$:     MOV     R0,-(SP)        ;;SAVE R0
035662  017600  000002                  MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
035666  122767  000001  143442          CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
035674  001011                          BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
035676  132767  000100  143433          BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
035704  001405                          BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
035706  010067  000004                  MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
035712  004767  000516                  JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
035716  000000                  61$:    .WORD   0               ;;MESSAGE ADDRESS
035720  132767  000040  143411  62$:    BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
035726  001003                          BNE     60$             ;;YES,SKIP TYPE OU
```

```
035730  112046                  2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
035732  001005                          BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
035734  005726                          TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
035736  012600                  60$:    MOV     (SP)+,R0        ;;RESTORE R0
035740  062716  000002          3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
035744  000002                          RTI                     ;;RETURN
035746  122716  000011          4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
035752  001430                          BEQ     8$
035754  122716  000200                  CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
035760  001006                          BNE     5$
035762  005726                          TST     (SP)+           ;;POP  <CR><LF> EQUIV
035764  104401                          TYPE                    ;;TYPE A CR AND LF
035766  001313                          $CRLF
035770  105067  000200                  CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
035774  000755                          BR      2$              ;;GET NEXT CHARACTER
035776  004767  000056          5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
036002  126726  143150          6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
036006  001350                          BNE     2$              ;;IF NO GO GET NEXT CHAR.
036010  016746  143140                  MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
                                                                ;;AND THE NULL CHAR.
036014  105366  000001          7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
036020  002770                          BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
036022  004767  000032                  JSR     PC,$TYPEC       ;;GO TYPE A NULL
036026  105367  000142                  DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
036032  000770                          BR      7$              ;;LOOP
                        ;HORIZONTAL TAB PROCESSOR
036034  112716  000040          8$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
036040  004767  000014          9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
036044  132767  000007  000122          BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
036052  001372                          BNE     9$              ;;TAB STOP
036054  005726                          TST     (SP)+           ;;POP SPACE OFF STACK
036056  000724                          BR      2$              ;;GET NEXT CHARACTER
036060  105777  143064          $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
036064  100375                          BPL     $TYPEC
036066  116677  000002  143056          MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
036074  105777  143044                  TSTB    @$TKS           ;;SEE IF KEYBOARD IS TALKING.
036100  100021                          BPL     2$              ;;BRANCH IF IT ISN'T.
036102  017746  143040                  MOV     @$TKB,-(SP)     ;;PUSH CHARACTER ONTO STACK.
036106  042716  177600                  BIC     #177600,(SP)    ;;BIT CLEAR TOP BYTE AND PARITY BIT.
036112  022726  000023                  CMP     #23,(SP)+       ;;SEE IF THIS IS A ^S.
036116  001012                          BNE     2$              ;;BRANCH TO CONTINUE IF IT ISN'T.
036120  105777  143020          3$:     TSTB    @$TKS           ;;WAIT FOR ANOTHER INPUT.
036124  100375                          BPL     3$              ;;BRANCH BACK IF NOT READY.
036126  017746  143014                  MOV     @$TKB,-(SP)     ;;PUSH NEXT CHARACTER ON STACK.
036132  042716  177600                  BIC     #177600,(SP)    ;;BIT CLEAR TOP BYTE AND PARITY BIT.
036136  022726  000021                  CMP     #21,(SP)+       ;;SEE IF THIS IS A ^Q.
036142  001366                          BNE     3$              ;;BRANCH BACK FOR MORE WAIT IF NOT.
036144  122766  000015  000002  2$·     CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
036152  001003                          BNE     1$              ;;BRANCH IF NO
036154  105067  000014                  CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
036160  000406                          BR      $TYPEX          ;;EXIT
036162  122766  000012  000002  1$:     CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
036170  001402                          BEQ     $TYPEX          ;;BRANCH IF YES
036172  105227                          INCB    (PC)+           ;;COUNT THE CHARACTER
036174  000000          $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
036176  000207          $TYPEX: RTS     PC
```

5762

```
5763                                    .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
                                        ;*************************************************************
                                        ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
                                        ;*OCTAL (ASCII) NUMBER AND TYPE IT.
                                        ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
                                        ;*CALL:
                                        ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                        ;*      TYPOS                   ;;CALL FOR TYPEOUT
                                        ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
                                        ;*      .BYTE   M               ;;M=1 OR 0
                                        ;*                                      ;;1-TYPE LEADING ZEROS
                                        ;*                                      ;;0=SUPPRESS LEADING ZEROS
                                        ;*
                                        ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
                                        ;*$TYPOS OR $TYPOC
                                        ;*CALL:
                                        ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                        ;*      TYPON                   ;;CALL FOR TYPEOUT
                                        ;*
                                        ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
                                        ;*CALL:
                                        ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                        ;*      TYPOC                   ;;CALL FOR TYPEOUT
036200  017646  000000          000211  $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
036204  116667  000001  000211          MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
036212  112667  000207                  MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
036216  062716  000002                  ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
036222  000406                          BR      $TYPON
036224  112767  000001  000171  $TYPOC: MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
036232  112767  000006  000165          MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
036240  112767  000005  000154  $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
036246  010346                          MOV     R3,-(SP)        ;;SAVE R3
036250  010446                          MOV     R4,-(SP)        ;;SAVE R4
036252  010546                          MOV     R5,-(SP)        ;;SAVE R5
036254  116704  000145                  MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
036260  005404                          NEG     R4
036262  062704  000006                  ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
036266  110467  000132                  MOVB    R4,$OMODE       ;;SAVE IT FOR USE
036272  116704  000125                  MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
036276  016605  000012                  MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
036302  005003                          CLR     R3              ;;CLEAR THE OUTPUT WORD
036304  006105                  1$:     ROL     R5              ;;ROTATE MSB INTO "C"
036306  000404                          BR      3$              ;;GO DO MSB
036310  006105                  2$:     ROL     R5              ;;FORM THIS DIGIT
036312  006105                          ROL     R5
036314  006105                          ROL     R5
036316  010503                          MOV     R5,R3
036320  006103                  3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
036322  105367  000076                  DECB    $OMODE          ;;TYPE THIS DIGIT?
036326  100016                          BPL     7$              ;;BR IF NO
036330  042703  177770                  BIC     #177770,R3      ;;GET RID OF JUNK
036334  001002                          BNE     4$              ;;TEST FOR 0
036336  005704                          TST     R4              ;;SUPPRESS THIS 0?
036340  001403                          BEQ     5$              ;;BR IF YES
036342  005204                  4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
036344  052703  000060                  BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
036350  052703  000040          5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
```

```
036354  110367  000040              MOVB    R3,8$           ;;SAVE FOR TYPING
036360  104401  036420              TYPE    ,8$             ;;GO TYPE THIS DIGIT
036364  105367  000032      7$:     DECB    $OCNT           ;;COUNT BY 1
036370  003347                      BGT     2$              ;;BR IF MORE TO DO
036372  002402                      BLT     6$              ;;BR IF DONE
036374  005204                      INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
036376  000744                      BR      2$              ;;GO DO THE LAST DIGIT
036400  012605              6$:     MOV     (SP)+,R5        ;;RESTORE R5
036402  012604                      MOV     (SP)+,R4        ;;RESTORE R4
036404  012603                      MOV     (SP)+,R3        ;;RESTORE R3
036406  016666  000002  000004      MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
036414  012616                      MOV     (SP)+,(SP)
036416  000002                      RTI                     ;;RETURN
036420     000              8$:     .BYTE   0               ;;STORAGE FOR ASCII DIGIT
036421     000                      .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
036422     000              $OCNT:  .BYTE   0               ;;OCTAL DIGIT COUNTER
036423     000              $OFILL: .BYTE   0               ;;ZERO FILL SWITCH
036424  000000              $OMODE: .WORD   0               ;;NUMBER OF DIGITS TO TYPE
 5764
 5765                             .SBTTL  APT COMMUNICATIONS ROUTINE
                                  ;;**************************************************************************
036426  112767  000001  000236  $ATY1:  MOVB    #1,$FFLG        ;;TO REPORT FATAL ERROR
036434  112767  000001  000226  $ATY3:  MOVB    #1,$MFLG        ;;TO TYPE A MESSAGE
036442  000403                      BR      $ATYC
036444  112767  000001  000220  $ATY4:  MOVB    #1,$FFLG        ;;TO ONLY REPORT FATAL ERROR
036452                           $ATYC:
036452  010046                      MOV     R0,-(SP)        ;;PUSH R0 ON STACK
036454  010146                      MOV     R1,-(SP)        ;;PUSH R1 ON STACK
036456  105767  000206              TSTB    $MFLG           ;;SHOULD TYPE A MESSAGE?
036462  001450                      BEQ     5$              ;;IF NOT:  BR
036464  122767  000001  142644      CMPB    #APTENV,$ENV    ;;OPERATING UNDER APT?
036472  001031                      BNE     3$              ;;IF NOT:  BR
036474  132767  000100  142635      BITB    #APTSPOOL,$ENVM ;;SHOULD SPOOL MESSAGES?
036502  001425                      BEQ     3$              ;;IF NOT:  BR
036504  017600  000004              MOV     @4(SP),R0       ;;GET MESSAGE ADDR.
036510  062766  000002  000004      ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
036516  005767  142574      1$:     TST     $MSGTYPE        ;;SEE IF DONE W/ LAST XMISSION?
036522  001375                      BNE     1$              ;;IF NOT:  WAIT
036524  010067  142602              MOV     R0,$MSGAD       ;;PUT ADDR IN MAILBOX
036530  105720              2$:     TSTB    (R0)+           ;;FIND END OF MESSAGE
036532  001376                      BNE     2$
036534  166700  142572              SUB     $MSGAD,R0       ;;SUB START OF MESSAGE
036540  006200                      ASR     R0              ;;GET MESSAGE LNGTH IN WORDS
036542  010067  142566              MOV     R0,$MSGLGT      ;;PUT LENGTH IN MAILBOX
036546  012767  000004  142542      MOV     #4,$MSGTYPE     ;;TELL APT TO TAKE MSG.
036554  000413                      BR      5$
036556  017667  000004  000016  3$:  MOV     @4(SP),4$       ;;PUT MSG ADDR IN JSR LINKAGE
036564  062766  000002  000004      ADD     #2,4(SP)                ;;BUMP RETURN ADDRESS
036572  016746  141200              MOV     177776,-(SP)    ;;PUSH 177776 ON STACK
036576  004767  177044              JSR     PC,$TYPE        ;;CALL TYPE MACRO
036602  000000              4$:     .WORD   0
036604                      5$:
036604  105767  000062      10$:    TSTB    $FFLG           ;;SHOULD REPORT FATAL ERROR?
036610  001416                      BEQ     12$             ;;IF NOT:  BR
036612  005767  142520              TST     $ENV            ;;RUNNING UNDER APT?
036616  001413                      BEQ     12$             ;;IF NOT:  BR
036620  005767  142472      11$:    TST     $MSGTYPE        ;;FINISHED LAST MESSAGE?
```

```
036624  001375                          BNE     11$             ;;IF NOT:  WAIT
036626  017667  000004  142464          MOV     @4(SP),$FATAL   ;;GET ERROR #
036634  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
036642  005267  142450                  INC     $MSGTYPE        ;;TELL APT TO TAKE ERROR
036646  105067  000020          12$:    CLRB    $FFLG           ;;CLEAR FATAL FLAG
036652  105067  000013                  CLRB    $LFLG           ;;CLEAR LOG FLAG
036656  105067  000006                  CLRB    $MFLG           ;;CLEAR MESSAGE FLAG
036662  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
036664  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
036666  000207                          RTS     PC              ;;RETURN
036670     000          $MFLG:  .BYTE   0               ;;MESSG. FLAG
036671     000          $LFLG:  .BYTE   0               ;;LOG FLAG
036672     000          $FFLG:  .BYTE   0               ;;FATAL FLAG
                                .EVEN
             000200             APTSIZE=200
             000001             APTENV=001
             000100             APTSPOOL=100
             000040             APTCSUP=040
  5766
  5767                          .SBTTL  TTY INPUT ROUTINE
                                ;;**********************************************************************
                                .ENABL  LSB
                                ;;**********************************************************************
                                ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
                                ;*ROUTINE IS ENTERED FROM THE TRAP HANDLER, AND WILL
                                ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP CALL
                                ;*WHEN OPERATING IN TTY FLAG MODE.
036674  022767  000176  142236  $CKSWR: CMP     #SWREG,SWR      ;;IS THE SOFT-SWR SELECTED?
036702  001074                          BNE     15$             ;;BRANCH IF NO
036704  105777  142234                  TSTB    @$TKS           ;;CHAR THERE?
036710  100071                          BPL     15$             ;;IF NO, DON'T WAIT AROUND
036712  117746  142230                  MOVB    @$TKB,-(SP)     ;;SAVE THE CHAR
036716  042716  177600                  BIC     #^C177,(SP)     ;;STRIP-OFF THE ASCII
036722  022726  000007                  CMP     #7,(SP)+        ;;IS IT A CONTROL G?
036726  001062                          BNE     15$             ;;NO, RETURN TO USER
036730  126727  142200  000001          CMPB    $AUTOB,#1       ;;ARE WE RUNNING IN AUTO-MODE?
036736  001456                          BEQ     15$             ;;BRANCH IF YES
036740  104401  037303                  TYPE    ,$CNTLG         ;;ECHO THE CONTROL-G (^G)
036744  104401  037310          $GTSWR: TYPE    ,$MSWR          ;;TYPE CURRENT CONTENTS
036750  016746  141222                  MOV     SWREG,-(SP)     ;;SAVE SWREG FOR TYPEOUT
036754  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
036756  104401  037321                  TYPE    ,$MNEW          ;;PROMPT FOR NEW SWR
036762  005046                  19$:    CLR     -(SP)           ;;CLEAR COUNTER
036764  005046                          CLR     -(SP)           ;;THE NEW SWR
036766  105777  142152          7$:     TSTB    @$TKS           ;;CHAR THERE?
036772  100375                          BPL     7$              ;;IF NOT TRY AGAIN
036774  117746  142146                  MOVB    @$TKB,-(SP)     ;;PICK UP CHAR
037000  042716  177600                  BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
037004  021627  000025          9$:     CMP     (SP),#25        ;;IS IT A CONTROL-U?
037010  001005                          BNE     10$             ;;BRANCH IF NOT
037012  104401  037276                  TYPE    ,$CNTLU         ;;YES, ECHO CONTROL-U (^U)
037016  062706  000006          20$:    ADD     #6,SP           ;;IGNORE PREVIOUS INPUT
037022  000757                          BR      19$             ;;LET'S TRY IT AGAIN
037024  021627  000015          10$:    CMP     (SP),#15        ;;IS IT A <CR>?
037030  001022                          BNE     16$             ;;BRANCH IF NO
037032  005766  000004                  TST     4(SP)           ;;YES, IS IT THE FIRST CHAR?
037036  001403                          BEQ     11$             ;;BRANCH IF YES
```

```
037040  016677  000002  142072          MOV     2(SP),@SWR      ;;SAVE NEW SWR
037046  062706  000006          1$:     ADD     #6,SP           ;;CLEAR UP STACK
037052  104401  001313          14$:    TYPE    ,$CRLF          ;;ECHO <CR> AND <LF>
037056  126727  142053  000001          CMPB    $INTAG,#1       ;;RE-ENABLE TTY KBD INTERRUPTS?
037064  001003                          BNE     15$             ;;BRANCH IF NOT
037066  012777  000100  142050          MOV     #100,@$TKS      ;;RE-ENABLE TTY KBD INTERRUPTS
037074  000002          15$:    RTI                             ;;RETURN
037076  004767  176756          16$:    JSR     PC,$TYPEC       ;;ECHO CHAR
037102  021627  000060                  CMP     (SP),#60        ;;CHAR < 0?
037106  002420                          BLT     18$             ;;BRANCH IF YES
037110  021627  000067                  CMP     (SP),#67        ;;CHAR > 7?
037114  003015                          BGT     18$             ;;BRANCH IF YES
037116  042726  000060                  BIC     #60,(SP)+       ;;STRIP-OFF ASCII
037122  005766  000002                  TST     2(SP)           ;;IS THIS THE FIRST CHAR
037126  001403                          BEQ     17$             ;;BRANCH IF YES
037130  006316                          ASL     (SP)            ;;NO, SHIFT PRESENT
037132  006316                          ASL     (SP)            ;;    CHAR OVER TO MAKE
037134  006316                          ASL     (SP)            ;;    ROOM FOR NEW ONE.
037136  005266  000002          17$:    INC     2(SP)           ;;KEEP COUNT OF CHAR
037142  056616  177776                  BIS     -2(SP),(SP)     ;;SET IN NEW CHAR
037146  000707                          BR      7$              ;;GET THE NEXT ONE
037150  104401  001312          18$:    TYPE    ,$QUES          ;;TYPE ?<CR><LF>
037154  000720                          BR      20$             ;;SIMULATE CONTROL-U
                        .DSABL  LSB
                        ;;*************************************************************************
                        ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
                        ;*CALL:
                        ;*      RDCHR                           ;;INPUT A SINGLE CHARACTER FROM THE TTY
                        ;*      RETURN HERE                     ;;CHARACTER IS ON THE STACK
                        ;*                                      ;;WITH PARITY BIT STRIPPED OFF
                        ;
037156  011646          $RDCHR: MOV     (SP),-(SP)      ;;PUSH DOWN THE PC
037160  016666  000004  000002  MOV     4(SP),2(SP)     ;;SAVE THE PS
037166  105777  141752          1$:     TSTB    @$TKS           ;;WAIT FOR
037172  100375                          BPL     1$              ;;A CHARACTER
037174  117766  141746  000004          MOVB    @$TKB,4(SP)     ;;READ THE TTY
037202  042766  177600  000004          BIC     #^C<177>,4(SP)  ;;GET RID OF JUNK IF ANY
037210  026627  000004  000023          CMP     4(SP),#23       ;;IS IT A CONTROL-S?
037216  001013                          BNE     3$              ;;BRANCH IF NO
037220  105777  141720          2$:     TSTB    @$TKS           ;;WAIT FOR A CHARACTER
037224  100375                          BPL     2$              ;;LOOP UNTIL ITS THERE
037226  117746  141714                  MOVB    @$TKB,-(SP)     ;;GET CHARACTER
037232  042716  177600                  BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
037236  022627  000021                  CMP     (SP)+,#21       ;;IS IT A CONTROL-Q?
037242  001366                          BNE     2$              ;;IF NOT DISCARD IT
037244  000750                          BR      1$              ;;YES, RESUME
037246  026627  000004  000140  3$:     CMP     4(SP),#140      ;;IS IT UPPER CASE?
037254  002407                          BLT     4$              ;;BRANCH IF YES
037256  026627  000004  000175          CMP     4(SP),#175      ;;IS IT A SPECIAL CHAR?
037264  003003                          BGT     4$              ;;BRANCH IF YES
037266  042766  000040  000004          BIC     #40,4(SP)       ;;MAKE IT UPPER CASE
037274  000002          4$:     RTI                             ;;GO BACK TO USER
037276    136     125     015   $CNTLU: .ASCIZ  /^U/<15><12>    ;;CONTROL 'U'
037301    012     000
037303    136     107     015   $CNTLG: .ASCIZ  /^G/<15><12>    ;;CONTROL 'G'
037306    012     000
037310    015     012     123   $MSWR:  .ASCIZ  <15><12>/SWR    /
```

```
        037313  127     122     040
        037316  075     040     000
        037321  040     040     116  $MNEW:  .ASCIZ  /  NEW   /
        037324  105     127     040
        037327  075     040     000
  5768
  5769                                 .SBTTL  TRAP DECODER
                                       ;;*****************************************************************
                                       ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE 'TRAP' INSTRUCTION
                                       ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
                                       ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
                                       ;*GO TO THAT ROUTINE.
        037332  010046                 $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
        037334  016600  000002                 MOV     2(SP),R0        ;;GET TRAP ADDRESS
        037340  005740                         TST     -(R0)           ;;BACKUP BY 2
        037342  111000                         MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
        037344  006300                         ASL     R0              ;;POSITION FOR INDEXING
        037346  016000  037366                 MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
        037352  000200                         RTS     R0              ;;GO TO ROUTINE
                                       ;;THIS IS USE TO HANDLE THE 'GETPRI' MACRO
        037354  011646                 $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
        037356  016666  000004  000002         MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
        037364  000002                         RTI                     ;;RESTORE THE PSW
                                       .SBTTL  TRAP TABLE
                                       ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
                                       ;*BY THE 'TRAP' INSTRUCTION.
                                       ;       ROUTINE
                                       ;       -------
        037366  037354                 $TRPAD: .WORD   $TRAP2
        037370  035646                         $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
        037372  036224                         $TYPOC  ;;CALL-TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
        037374  036200                         $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
        037376  036240                         $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
        037400  036744                         $GTSWR  ;;CALL=GTSWR    TRAP+5(104405)  GET SOFT-SWR SETTING
        037402  036674                         $CKSWR  ;;CALL=CKSWR    TRAP+6(104406)  TEST FOR CHANGE IN SOFT-SWR
        037404  037156                         $RDCHR  ;;CALL=RDCHR    TRAP+7(104407)  TTY TYPEIN CHARACTER ROUTINE
        037406  035552                         $SAVREG ;;CALL=SAVREG   TRAP+10(104410) SAVE R0-R5 ROUTINE
        037410  035610                         $RESREG ;;CALL=RESREG   TRAP+11(104411) RESTORE R0-R5 ROUTINE
  5770  037412  040330                         .RSET   ;;CALL=RSETUP   TRAP+12(104412) ROUTINE TO RESET STACK AND FPS
  5771  037414  040322                         .LPER   ;;CALL=LPERR    TRAP+13(104413) ROUTINE TO SET LOOP ON ERROR ADDRESS
  5772          000030                 $TERM .-$TRPAD
  5773
  5774                                 .SBTTL  POWER DOWN AND UP ROUTINES
                                       ;;*****************************************************************
                                       ;POWER DOWN ROUTINE
        037416  012737  037574  000024 $PWRDN: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST UP
        037424  012737  000340  000026         MOV     #340,@#PWRVEC+2 ;;PRIO:7
        037432  010046                         MOV     R0,-(SP)        ;;PUSH R0 ON STACK
        037434  010146                         MOV     R1,-(SP)        ;;PUSH R1 ON STACK
        037436  010246                         MOV     R2,-(SP)        ;;PUSH R2 ON STACK
        037440  010346                         MOV     R3,-(SP)        ;;PUSH R3 ON STACK
        037442  010446                         MOV     R4,-(SP)        ;;PUSH R4 ON STACK
        037444  010546                         MOV     R5,-(SP)        ;;PUSH R5 ON STACK
        037446  017746  141466                 MOV     @SWR,-(SP)      ;;PUSH @SWR ON STACK
        037452  010667  000122                 MOV     SP,$SAVR6       ;;SAVE SP
        037456  012737  037470  000024         MOV     #$PWRUP,@#PWRVEC ;;SET UP VECTOR
        037464  000000                         HALT
```

```
037466  000776                          BR      .-2             ;;HANG UP
                                ;;*****************************************************************
                                ;POWER UP ROUTINE
037470  012737  037574  000024  $PWRUP: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST DOWN
037476  016706  000076                  MOV     $SAVR6,SP       ;;GET SP
037502  005067  000072                  CLR     $SAVR6          ;;WAIT LOOP FOR THE TTY
037506  005267  000066          1$:     INC     $SAVR6          ;;WAIT FOR THE INC
037512  001375                          BNE     1$              ;;OF  WORD
037514  012677  141420                  MOV     (SP)+,@SWR      ;;POP STACK INTO @SWR
037520  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
037522  012604                          MOV     (SP)+,R4        ;;POP STACK INTO R4
037524  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
037526  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
037530  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
037532  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
037534  012737  037416  000024          MOV     #$PWRDN,@#PWRVEC ;,SET UP THE POWER DOWN VECTOR
037542  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;PRIO:7
037550  104401                          TYPE                    ;;REPORT THE POWER FAILURE
037552  040400                  $PWRMG: .WORD   POWERM          ;;POWER FAIL MESSAGE POINTER
037554  012716                          MOV     (PC)+,(SP)      ;;RESTART AT START
037556  003606                  $PWRAD: .WORD   START           ;;RESTART ADDRESS
037560  042766  000020  000002          BIC     #20,2(SP)       ;;CLEAR 'T' BIT
037566  005067  175234                  CLR     $TBIT           ;;CLEAR THE 'T' BIT FLAG
037572  000002                          RTI
037574  000000                  $ILLUP: HALT                    ;;THE POWER UP SEQUENCE WAS STARTED
037576  000776                          BR      .-2             ;; BEFORE THE POWER DOWN WAS COMPLETE
037600  000000                  $SAVR6: 0                       ;;PUT THE SP HERE
5775
5776
5777                                    .SBTTL  ERROR TYPE OUT ROUTINE
5778                            ;;*****************************************************************
                                ;;*****************************************************************
5779                            ;*THIS ROUTINE IS CALLED TO TYPE AN ERROR MESSAGE WHICH IS INCLUDED
5780                            ;*IN THE ERROR MESSAGE DATA TABLE. IT IS CALLED BY THE $ERROR ROUTINE
5781                            ;*OR BY FIRST SETTING $ITEMB EQUAL TO THE ERROR TABLE ITEM TO BE PRINTED
5782                            ;*OUT AND THEN ECECUTING A:
5783                            ;*              JSR     PC,ERTYPE
5784                            ;*
5785 037602  104401            ERTYPE: TYPE                                    ;TYPE A CRLF
5786 037604  001313                    .WORD   $CRLF
5787 037606  113737  001102  001232    MOVB    @#$TSTNM,@#$TMP0
5788 037614  042737  177400  001232    BIC     #177400,@#$TMP0
5789 037622  013737  001116  001234    MOV     @#$ERRPC,@#$TMP1        ;GET PC OF CALL
5790 037630  010046                    MOV     R0,-(SP)                ;SAVE R0
5791
5792 037632  113700  001114            MOVB    @#$ITEMB,R0             ;GET THE ITEM NUMBER.
5793 037636  042700  177400            BIC     #177400,R0
5794 037642  001005                    BNE     1$
5795
5796 037644  013746  001116            MOV     @#$ERRPC,-(SP)          ;IF ZERO THEN JUST
5797 037650  104402                    TYPOC                           ;PRINT THE PC
5798 037652  000137  040230            JMP     @#ERT5
5799
5800 037656  022700  000377    1$:     CMP     #377,R0
5801 037662  001005                    BNE     20$
5802 037664  016600  000004            MOV     4(SP),R0
5803 037670  011000                    MOV     (R0),R0
```

```
5804 037672  062700  000400            ADD     #400,R0
5805 037676  005300              20$:   DEC     R0                      ;OTHERWISE MAKE R0 AN
5806 037700  006300                     ASL     R0                      ;INDEX FOR THE TABLE.
5807 037702  006300                     ASL     R0
5808 037704  006300                     ASL     R0
5809 037706  062700  001442            ADD     #$ERRTB,R0
5810
5811 037712  012037  037722            MOV     (R0)+,@#2$              ;PICK UP THE ADDRESS
5812 037716  001404                     BEQ     3$                      ;OF THE EM, ERROR MESSAGE
5813 037720  104401                     TYPE
5814 037722  000000              2$:    .WORD   0
5815 037724  104401                     TYPE
5816 037726  001313                     .WORD   $CRLF
5817
5818 037730  012037  037740      3$:    MOV     (R0)+,@#4$              ;GET THE DH,DATA HEADER
5819 037734  001404                     BEQ     5$
5820 037736  104401                     TYPE
5821 037740  000000              4$:    .WORD   0
5822 037742  104401                     TYPE
5823 037744  001313                     .WORD   $CRLF
5824
5825 037746  010146              5$:    MOV     R1,-(SP)                ;SAVE R1,R2 AND R3
5826 037750  010246                     MOV     R2,-(SP)
5827 037752  010346                     MOV     R3,-(SP)
5828
5829 037754  012001                     MOV     (R0)+,R1                ;GET THE ADDRESS OF THE
5830                                                                     ;DATA TABLE.
5831 037756  001001                     BNE     6$
5832 037760  000516                     BR      ERT4                    ;RETURN IF NO DATA.
5833
5834 037762  011000              6$:    MOV     (R0),R0                 ;GET A POINTER TO THE DATA
5835                                                                     ;FORMAT TABLE.
5836 037764  105710              ERT1:  TSTB    (R0)                    ;FORMAT ZERO?
5837 037766  001003                     BNE     7$
5838
5839 037770  013146                     MOV     @(R1)+,-(SP)            ;FORMAT ZERO SO TYPE
5840 037772  104402                     TYPOC                           ;AN OCTAL NUMBER.
5841 037774  000502                     BR      ERT2
5842
5843 037776              7$:
5844 037776  122710  000002      8$:    CMPB    #2,(R0)                 ;FORMAT TWO?
5845 040002  001010                     BNE     9$
5846
5847 040004  013102                     MOV     @(R1)+,R2               ;FORMAT TWO SO TYPE TWO
5848 040006  012246                     MOV     (R2)+,-(SP)             ;OCTAL NUMBERS.
5849 040010  104402                     TYPOC
5850 040012  104401                     TYPE
5851 040014  040450                     .WORD   SPACE
5852 040016  011246                     MOV     (R2),-(SP)
5853 040020  104402                     TYPOC
5854 040022  000467                     BR      ERT2
5855
5856 040024  122710  000003      9$:    CMPB    #3,(R0)                 ;FORMAT THREE?
5857 040030  001020                     BNE     10$
5858
5859 040032  013102                     MOV     @(R1)+,R2               ;FORMAT THREE SO TYPE
5860 040034  012246                     MOV     (R2)+,-(SP)             ;FOUR OCTAL NUMBERS.
```

```
5861 040036  104402                    TYPOC
5862 040040  104401                    TYPE
5863 040042  040450                    .WORD   SPACE
5864 040044  012246                    MOV     (R2)+,-(SP)
5865 040046  104402                    TYPOC
5866 040050  104401                    TYPE
5867 040052  040450                    .WORD   SPACE
5868 040054  012246                    MOV     (R2)+,-(SP)
5869 040056  104402                    TYPOC
5870 040060  104401                    TYPE
5871 040062  040450                    .WORD   SPACE
5872 040064  011246                    MOV     (R2),-(SP)
5873 040066  104402                    TYPOC
5874 040070  000444                    BR      ERT2
5875
5876 040072  122710  000004    10$:    CMPB    #4,(R0)                 ;FORMAT FOUR?
5877 040076  001004                    BNE     11$
5878
5879 040100  013146                    MOV     @(R1)+,-(SP)            ;FORMAR FOUR SO TYPE
5880 040102  104403                    TYPOS                           ;AN OCTAL NUMBER
5881 040104     016                    .BYTE   16                      ;SUPPRESSING LEADING ZEROES.
5882 040105     000                    .BYTE   0
5883 040106  000435                    BR      ERT2
5884
5885 040110  122710  000005    11$:    CMPB    #5,(R0)                 ;FORMAT FIVE?
5886 040114  001005                    BNE     13$
5887
5888 040116  012137  040124            MOV     (R1)+,@#12$             ;FORMAT FIVE SO TYPE AN
5889 040122  104401                    TYPE                            ;ASCIZ STRING.
5890 040124  000000    12$:    .WORD   0
5891 040126  000427                    BR      ERT3
5892
5893 040130  122710  000011    13$:    CMPB    #11,(R0)                ;FORMAT ELEVEN?
5894 040134  001005                    BNE     15$
5895
```

```
5897 040136  013137  040144          MOV     @(R1)+,@#14$            ;FORMAT ELEVEN SO PICK
5898 040142  104401                  TYPE                            ;A POINTER TO AN ASCIZ
5899 040144  000000          14$:    .WORD   0                       ;STRING.
5900 040146  000417                  BR      ERT3
5901
5902 040150  122710  000012  15$:    CMPB    #12,(R0)                ;FORMAT TWELVE?
5903 040154  001011                  BNE     17$
5904
5905 040156  013102                  MOV     @(R1)+,R2               ;FORMAT TWELVE SO TYPE
5906 040160  012703  000006          MOV     #6,R3                   ;TYPE SIX OCTAL NUMBERS
5907 040164  012246          16$:    MOV     (R2)+,-(SP)
5908 040166  104402                  TYPOC
5909 040170  104401                  TYPE
5910 040172  040450                  .WORD   SPACE
5911 040174  077305                  SOB     R3,16$
5912 040176  000401                  BR      ERT2
5913
5914 040200  000000          17$:    HALT                            ;UNDEFINED FORMAT FOR DATA?????
5915
5916 040202  104401          ERT2:   TYPE                            ;PRINT A TAB AFTER TYPING
5917 040204  040446                  .WORD   $TAB                    ;AN DATA TABLE ENTRY
5918                                                                  ;OF ALL FORMATS EXCEPT
5919                                                                  ;ASCIZ, FORMATS 5 OR 11
5920
5921 040206  005200          ERT3:   INC     R0                      ;POINT TO THE NEXT FORMAT
5922 040210  005711                  TST     (R1)                    ;END OF DATA TABLE.
5923 040212  001401                  BEQ     ERT4
5924 040214  000663                  BR      ERT1
5925
5926 040216  104401          ERT4:   TYPE                            ;DONE.
5927 040220  001313                  .WORD   $CRLF
5928 040222  012603                  MOV     (SP)+,R3                ;RESTORE R1,R2 AND R3
5929 040224  012602                  MOV     (SP)+,R2
5930 040226  012601                  MOV     (SP)+,R1
5931 040230  012600          ERT5:   MOV     (SP)+,R0                ;RESTORE R0.
5932 040232  000207                  RTS     PC                      ;AND RETURN.
5933
5934
5935
5936
5937                                  .SBTTL  FPP SPURIOUS TRAP TO 244 HANDLER
5938                          ;;**********************************************************************
                              ;;**********************************************************************
5939                          ;*THIS ROUTINE HANDLES UNEXPECTED TRAPS TO THE FPP TRAP VECTOR AT 244.
5940                          ;*THE LAST FPP INSTRUCTION EXECUTED AND ITS ADDRESS HAS BEEN RECORDED
5941                          ;*THESE ALONG WITH THE FEC, FPS AND PC OF TRAP ARE REPORTED.
5942                          ;*
5943 040234  011637  001236  FPSPUR: MOV     (SP),@#$TMP2            ;SAVE PC OF TRAP.
5944 040240  022626                  CMP     (SP)+,(SP)+             ;RESTORE SP.
5945 040242  170200                  STFPS   R0                      ;GET FPS
5946 040244  010037  001240          MOV     R0,@#$TMP3
5947 040250  170300                  STST    R0                      ;GET FEC
5948 040252  010037  001242          MOV     R0,@#$TMP4
5949 040256  104211          1$:     ERROR   +211
5950 040260  104412                  RSETUP                  ;GO INITIALIZE THE FPS AND STACK; AND
                                                             ;SEE IF THE USER HAS EXPRESSED
                                                             ;THE DESIRE TO CHANGE THE SOFTWARE
```

```
                                                        ;VIRTUAL CONSOLE SWITCH REGISTER  HAS
                                                        ;THE USER TYPED CONTROL G?).
5951 040262  000137  034542                     JMP     @#$EOP
5952
5953
5954                                            .SBTTL  CPU SPURIOUS TRAP TO 4 HANDLER
5955                                    ;;**************************************************************
                                        ;;**************************************************************
5956                                    ;*THIS ROUTINE REPORTS UNEXPECTED CPU TRAPS TO VECTOR 4.
5957                                    ;*
5958 040266  011637  001236            CPSPUR: MOV     (SP),@#$TMP2            ;SAVE PC OF TRAP.
5959 040272  022626                            CMP     (SP)+,(SP)+
5960 040274  104212                    1$:     ERROR   +212
5961 040276  104412                            RSETUP                          ;GO INITIALIZE THE FPS AND STACK; AND
                                                                                ;SEE IF THE USER HAS EXPRESSED
                                                                                ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                                ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                                ;THE USER TYPED CONTROL G?).
5962 040300  000137  034542                     JMP     @#$EOP
5963
5964
5965                                            .SBTTL  CPU SPURIOUS TRAP TO 10 HANDLER
5966                                    ;;**************************************************************
                                        ;;**************************************************************
5967                                    ;*THIS ROUTINE REPORTS UNEXPECTED CPU TRAPS TO VECTOR 10.
5968                                    ;*
5969 040304  011637  001236            CPTWO:  MOV     (SP),@#$TMP2            ;SAVE PC OF TRAP.
5970 040310  022626                            CMP     (SP)+,(SP)+
5971 040312  104213                    1$:     ERROR   +213
5972 040314  104412                            RSETUP                          ;GO INITIALIZE THE FPS AND STACK; AND
                                                                                ;SEE IF THE USER HAS EXPRESSED
                                                                                ;THE DESIRE TO CHANGE THE SOFTWARE
                                                                                ;VIRTUAL CONSOLE SWITCH REGISTER (HAS
                                                                                ;THE USER TYPED CONTROL G?).
5973 040316  000137  034542                     JMP     @#$EOP
5974
5975
5976
5977
5978                                            .SBTTL  SET LOOP ON ERROR ADDRESS ROUTINE
5979                                    ;;**************************************************************
                                        ;;**************************************************************
5980                                    ;*
5981 040322  011637  001110            .LPER:  MOV     (SP),@#$LPERR
5982 040326  000002                            RTI
5983
5984                                            .SBTTL  FLAG RESET AND CONSOLE TEST ROUTINE
5985                                    ;;**************************************************************
                                        ;;**************************************************************
5986                                    ;*THIS ROUTINE WILL BE CALLED AT THE END OF EACH TEST TO
5987                                    ;*RESET THE STACK, CLEAR THE FPS AND SEE IF THE USER HAS TYPED
5988                                    ;* CONTROL G ON THE TERMINAL. IF THE USER HAS TYPED CONTROL G AND
5989                                    ;*THERE IS NO PHYSICAL CONSOLE SWITCH REGISTER THEN THE CONTENTS
5990                                    ;*OF THE SOFTWARE SWITCH REGISTER WILL BE TYPED IN OCTAL ON THE
5991                                    ;*TELETYPE AND THE USER CAN MODIFY IT.
5992                                    ;*
5993 040330  023727  001140  177570    .RSET:  CMP     @#SWR,#177570           ;SEE IF THERE IS A PHYSICAL
```

```
                                                                        ;CONSOLE SWITCH REGISTER.
040336  001001                          BNE     1$                      ;BRANCH IF NO.
040340  104406                          CKSWR                           ;OTHERWISE TYPE THE CONTENTS
                                                                        ;OF THE PROGRAM VIRTUAL SWITCH REGISTER
                                                                        ;AND GIVE THE USER A CHANCE TO
                                                                        ;MODIFY IT.
040342  012737  040234  000244  1$:     MOV     #FPSPUR,@#FPVECT
040350  012737  040266  000004          MOV     #CPSPUR,@#ERRVECT
040356  012737  040304  000010          MOV     #CPTWO,@#10
040364  011600                          MOV     (SP),R0                 ;SAVE RETURN ADDRESS.
040366  012706  001100                  MOV     #STACK,SP               ;RESET THE STACK POINTER.
040372  005004                          CLR     R4                      ;CLEAR THE FPS.
040374  170104                          LDFPS   R4
040376  000110                          JMP     (R0)                    ;RETURN.

                                        .NLIST  BEX

                                ;SPECIAL MESSAGES:

040400     200     120     117  POWERM: .ASCIZ  <CRLF>'POWER FAILURE. PROGRAM RESTARTING.'<CRLF>
040445     000                  NULL:   .BYTE   0
040446     011     000          $TAB:   .ASCIZ  <TAB>
040450     040     040     000  SPACE:  .ASCIZ  '  '
040453     200     120     103  LFIEX1: .ASCIZ  <CRLF>'PC OF LAST FPP INSTRUCTION EXECUTED: '<TAB>
040523     200     114     101  LFIEX2: .ASCIZ  <CRLF>'LAST FPP INSTRUCTION EXECUTED: '<TAB>
040565     200     106     114  FPSMS:  .ASCIZ  <CRLF>'FLOATING POINT STATUS REGISTER:    '
040631     200     106     105  FECMS:  .ASCIZ  <CRLF>'FEC:    '
040642     124     110     105  $THE:   .ASCIZ  'THE '
040647     011     040     111  NOOP1:  .ASCIZ  <TAB>' INSTRUCTION FAILED.'<CRLF>
040676     105     111     124  NOOP15: .ASCII  'EITHER A BAD CONSTANT WAS GENERATED OR '
040745     115     111     103          .ASCIZ  'MICROPROGRAM FLOW WENT'
040774     200     106     122  NOOP2:  .ASCIZ  <CRLF>'FROM STATE '
041011     124     117     040  NOOP3:  .ASCIZ  'TO STATE '
041023     200     111     116  NOOP4:  .ASCIZ  <CRLF>'INSTEAD OF '
041040     200     124     110  NOOP5:  .ASCIZ  <CRLF>'THEREBY EXECUTING A '
041066     011     040     111  NOOP6:  .ASCIZ  <TAB>' INSTEAD OF A '
041106     011     040     111  NOOP7:  .ASCIZ  <TAB>' INSTRUCTION.'<CRLF>
041126     040     040     124  NOOP10: .ASCII  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'<TAB>
041167     107     117     124          .ASCIZ  'GOT FPS. EXPECTED FPS.'<CRLF>
041217     101     040     102  NOOP11: .ASCIZ  'A BAD CONSTANT MAY HAVE BEEN USED.'<CRLF>
041263     011     114     104  LFPS1:  .ASCIZ  <TAB>'LDFPS'<TAB>'REG'
041276     011     114     104  LD1:    .ASCIZ  <TAB>'LDD'<TAB>'(REG),A'<TAB>'//FSRC#0//'
041326     011     114     104  LD2:    .ASCIZ  <TAB>'LDD'<TAB>'A,A'
041337     011     123     124  STFS1:  .ASCIZ  <TAB>'STFPS'<TAB>'REG'
041352     011     123     124  ST1:    .ASCIZ  <TAB>'STD'<TAB>'A,(REG)'
041367     011     123     124  ST2:    .ASCIZ  <TAB>'STD'<TAB>'A,A'
041400     011     103     106  CFCC1:  .ASCIZ  <TAB>'CFCC'
041406     011     123     105  SETF1:  .ASCIZ  <TAB>'SETF'
041414     011     123     105  SETD1:  .ASCIZ  <TAB>'SETD'
041422     011     123     105  SETI1:  .ASCIZ  <TAB>'SETI'
041430     011     123     105  SETL1:  .ASCIZ  <TAB>'SETL'
041436     011     111     114  ILL1:   .ASCIZ  <TAB>'ILLEGAL FPP INSTRUCTION'
041467     011     123     124  STST1:  .ASCIZ  <TAB>'STST'<TAB>'REG'
041501     011     111     114  ILL2:   .ASCIZ  <TAB>'ILLEGAL FPP INSTRUCTION (FID=1)'
041542     040     040     124  ILLMS:  .ASCIZ  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF TRAP.'<TAB>'FPS.'<CRLF>
041610     105     130     120  MS1:    .ASCIZ  'EXPECTED '
041622     107     117     124  MS2:    .ASCIZ  'GOT '
```

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6051 041627      103     117     116  MS3:     .ASCIZ  'CONTENTS OF LOCATIONS '
6052 041656      040     124     110  MS4:     .ASCIZ  ' THROUGH '
6053 041670      106     101     111  MS5:     .ASCIZ  'FAILURE IN THE MICROPROGRAM FLOW.'
6054 041732      103     117     116  MS6:     .ASCIZ  'CONTROL WENT '
6055 041750      106     122     117  MS7:     .ASCIZ  'FROM STATE '
6056 041764      040     124     117  MS10:    .ASCIZ  ' TO STATE '
6057 041777      102     125     124  MS11:    .ASCIZ  'BUT SHOULD HAVE GONE'
6058 042024      103     117     116  MS12:    .ASCIZ  'CONTROL FLOW SHOULD HAVE GONE'
6059 042062      102     125     124  MS13:    .ASCIZ  'BUT DID NOT.'
6060 042077      040     040     124  MS14:    .ASCII  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'<TAB>
6061 042140      107     117     124           .ASCIZ  'GOT PC.'<TAB>'EXPECTED PC.'
6062 042165      111     116     123  MS15:    .ASCIZ  'INSTRUCTION TESTED: '
6063 042212      040     117     122  MS16:    .ASCIZ  ' OR '
6064 042217      124     105     123  MS17:    .ASCIZ  'TESTING ACCUMULATOR '
6065 042244      132     105     122  MNUM0:   .ASCIZ  'ZERO '
6066 042252      117     116     105  MNUM1:   .ASCIZ  'ONE '
6067 042257      124     127     117  MNUM2:   .ASCIZ  'TWO '
6068 042264      124     110     122  MNUM3:   .ASCIZ  'THREE '
6069 042273      106     117     125  MNUM4:   .ASCIZ  'FOUR '
6070 042301      106     111     126  MNUM5:   .ASCIZ  'FIVE '
6071 042307      040     040     124  MS20:    .ASCIZ  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'
6072 042350      104     101     124  MS21:    .ASCIZ  'DATA (FLOATING POINT NUMBER): '
6073 042407      114     117     107  MS22:    .ASCIZ  'LOGICAL AND OF FAILING '
6074 042437      114     117     107  MS23:    .ASCIZ  'LOGICAL OR OF FAILING '
6075 042466      040     040     124  MS24:    .ASCII  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERRORS.'<TAB>
6076 042530      116     125     115           .ASCIZ  'NUMBER OF ERRORS(OCTAL).'
6077 042561      105     130     120  MS25:    .ASCIZ  'EXPECTED DATA IN '
6078 042603      107     117     124  MS26:    .ASCIZ  'GOT DATA IN '
6079 042620      200     101     103  MS27:    .ASCIZ  <CRLF>'AC0- '
6080 042627      200     101     103  MS30:    .ASCIZ  <CRLF>'AC1= '
6081 042636      200     101     103  MS31:    .ASCIZ  <CRLF>'AC2= '
6082 042645      200     101     103  MS32:    .ASCIZ  <CRLF>'AC3= '
6083 042654      200     101     103  MS33:    .ASCIZ  <CRLF>'AC4= '
6084 042663      200     101     103  MS34:    .ASCIZ  <CRLF>'AC5- '
6085 042672      123     105     124  MS35:    .ASCIZ  'SET '
6086 042677      103     114     105  MS36:    .ASCIZ  'CLEAR '
6087 042706      114     117     101  MS37:    .ASCIZ  'LOADED DATA: '
6088 042724      122     105     101  MS40:    .ASCIZ  'READ DATA: '
6089 042740      105     130     120  MS415:   .ASCIZ  'EXPECTED DATA: '
6090 042760      104     101     124  MS41:    .ASCIZ  'DATA IN (R0) FSRC: '
6091 043004      104     101     124  MS42:    .ASCIZ  'DATA IN AC0: '
6092 043022      107     117     124  MS43:    .ASCIZ  'GOT RESULT: '
6093 043037      105     130     120  MS44:    .ASCIZ  'EXPECTED RESULT: '
6094
6095
6096                                  ;ERROR MESSAGES:
6097
6098 043061      114     104     106  EM1:     .ASCIZ  'LDFPS AND STFPS TEST FAILED.'
6099 043116      114     104     106  EM2:     .ASCIZ  'LDFPS AND STFPS TEST ERROR SUMMARY.'
6100 043162      103     106     103  EM3:     .ASCIZ  'CFCC TRANSFERED BAD DATA TO THE PSW.'
6101 043227      103     106     103  EM4:     .ASCIZ  'CFCC MODIFIED THE FPS REGISTER.'
6102 043267      125     116     105  EM5:     .ASCIZ  'UNEXPECTED FPP TRAP TO 244.'
6103 043323      125     116     105  EM6:     .ASCIZ  'UNEXPECTED CPU TRAP TO 4.'
6104 043355      125     116     105  EM7:     .ASCIZ  'UNEXPECTED CPU TRAP TO 10.'
6105          043267                  EM10=EM5
6106 043410      125     116     101  EM11:    .ASCIZ  'UNABLE TO DECODE FPP INSTRUCTION. TRAPPED TO 10.'
6107          000000                  EM12=0
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6108            000000                  EM13=0
6109 043471        114     104     106  EM14:   .ASCII  'LDFPS R0 FAILED IN THE FSRC FLOWS.'
6110 043533        040     124     122          .ASCII  ' TRAPPED TO 4.'
6111 043551        200     104     111          .ASCIZ  <CRLF>'DID NOT GO FROM STATE 400 TO 670.'
6112 043614        123     124     106  EM15:   .ASCII  'STFPS R1 FAILED IN THE FDST FLOWS.'
6113 043656        040     124     122          .ASCII  ' TRAPPED TO 4.'
6114 043674        200     104     111          .ASCIZ  <CRLF>'DID NOT GO FROM STATE 634 TO 710.'
6115 043737        101     116     040  EM16:   .ASCIZ  'AN ILLEGAL FPP INSTRUCTION DID NOT TRAP.'
6116 044010        101     116     040  EM17:   .ASCII  'AN ILLEGAL FPP INSTRUCTION'
6117 044042        200     124     122          .ASCII  '<CRLF>'TRAPPED TO 244, BUT FAILED TO SET '
6118 044105        124     110     105          .ASCII  'THE FPS CORRECTLY.'<CRLF>'EITHER A BAD CONSTANT '
6119 044156        127     101     123          .ASCIZ  'WAS GENERATED OR THE ALU LOGICAL OR FUNCTION FAILED.'
6120 044243        101     116     040  EM20:   .ASCII  'AN ILLEGAL FPP INSTRUCTION'
6121 044275        040     124     122          .ASCII  ' TRAPPED TO 244, BUT A SUBSEQUENT '
6122 044337        040     123     124          .ASCII  ' STST'<CRLF>
6123 044345        106     101     111          .ASCIZ  'FAILED TO PICK UP THE CORRECT FEC CODE - 2.'
6124 044421        123     124     123  EM21:   .ASCII  'STST R4 FAILED IN THE DESTINATION FLOWS.'
6125 044471        040     124     122          .ASCII  ' TRAPPED TO 4.'<CRLF>
6126 044510        104     111     104          .ASCIZ  'DID NOT GO FROM STATE 636 TO 710.'
6127 044552        101     116     040  EM22:   .ASCII  'AN ILLEGAL FPP INSTRUCTION,'
6128 044605        127     111     124          .ASCIZ  'WITH INTERRUPTS DISABLED,'
6129            044552                  EM23=EM22
6130            044552                  EM24=EM22
6131 044637        123     117     125  EM25:   .ASCII  'SOURCE LOCATIONS MODIFIED BY, LDD.'
6132 044701        200     101     040          .ASCIZ  <CRLF>'A DATO WAS PERFORMED INSTEAD OF A DATI.'
6133 044752        114     104     104  EM26:   .ASCII  'LDD (R0),AC0 FAILED.'<CRLF>
6134 044777        122     060     040          .ASCIZ  'R0 WAS MODIFIED.'
6135           044752                   EM27=EM26
6136 045020        124     110     105  EM30:   .ASCII  'THE PC WAS BAD AFTER  '
6137 045046        101     116     040          .ASCIZ  'AN FPP INSTRUCTION.'
6138 045072        123     124     104  EM31:   .ASCII  'STD AC0,(R0) FAILED.'<CRLF>
6139 045117        122     060     040          .ASCIZ  'R0 WAS MODIFIED.'
6140           045072                   EM32=EM31
6141 045140        123     124     104  EM33:   .ASCII  'STD AC0,(R0) FAILED.'<CRLF>
6142 045165        117     125     124          .ASCIZ  'OUTPUT BAD.'
6143 045201        123     124     104  EM34:   .ASCII  'STD AC0,(R0) FAILED IN THE FDST FLOWS.'
6144 045247        200     124     110          .ASCIZ  <CRLF>'THE (BUT GR7) FORK FAILED.'
6145 045303        114     104     104  EM35:   .ASCII  'LDD (R0),AC0 FAILED IN THE FSRC FLOWS.'
6146 045351        200     124     110          .ASCIZ  <CRLF>'THE (BUT GR7) FORK FAILED.'
6147 045405        123     124     104  EM36:   .ASCII  'STD AC0,(R0) FAILED IN THE FDST FLOWS.'
6148 045453        200     124     110          .ASCIZ  <CRLF>'THE (BUT FD) FORK FAILED.'
6149 045506        114     104     104  EM37:   .ASCII  'LDD (R0),AC0 FAILED IN THE FSRC FLOWS.'
6150 045554        200     124     110          .ASCIZ  <CRLF>'THE (BUT FD) FORK FAILED.'
6151 045607        114     104     104  EM40:   .ASCII  'LDD (R0),AC0 OR THE STD AC0,(R0) FAILED.'
6152 045657        200     102     101          .ASCIZ  <CRLF>'BAD DATA WAS DETECTED AFTER A SEQUENCE OF THE TWO INSTRUCTIONS.'
6153 045760        106     120     123  EM41:   .ASCIZ  'FPS BAD AFTER EXECUTION OF: '
6158 046015                         EM42:
     046015        114     104     104          .ASCII  /LDD (R0),AC0 FAILED IN THE FSRC FLOWS./<CRLF>
     046064        124     110     105          .ASCIZ  /THE (BUT FSRC) FORK FAILED. TRAPPED TO 4./
6159 046136                         EM43:
     046136        123     124     104          .ASCII  /STD AC0,(R0) FAILED IN THE FDST FLOWS./<CRLF>
     046205        124     110     105          .ASCIZ  /THE (BUT FDST) FORK FAILED. TRAPPED TO 4./
6160 046257        106     120     120  EM44:   .ASCIZ  'FPP ACCUMULATORS DATA TEST FAILED.'
6161           046257                   EM45-EM44
6162 046322        106     120     120  EM46:   .ASCIZ  'FPP ACCUMULATORS DUAL ADDRESSING TEST FAILED.'
6167 046400                         EM47:
     046400        114     104     040          .ASCII  /LD AC  AC0 FAILED IN THE FSRC FLOWS./
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        046444   124   110   105                .ASCIZ  /THE (BUT FSRC) FORK FAILED. TRAPPED TO 4./
6168    046516   114   104   040   EM50:        .ASCII  'LD AC1,AC0 FAILED IN THE FSRC FLOWS.'
6169    046562   124   110   105                .ASCIZ  'THE (BUT FD) FORK FAILED.'
6170    046614   114   104   040   EM51:        .ASCIZ  'LD AC1,AC0 TRANSFERRED BAD DATA.'
6180    046655                     EM52:
        046655   114   104   104                .ASCII  /LDD (R0)+,AC0 FAILED IN THE FSRC FLOWS./
        046724   124   110   105                .ASCIZ  /THE (BUT FSRC) FORK FAILED. TRAPPED TO 4./
  31    046776                     EM53:
        046776   114   104   104                .ASCII  /LDD (R0)+,AC0 FAILED IN THE FSRC FLOWS./
        047045   200   122   060                .ASCII  <CRLF>'R0 WAS BAD.'<CRLF>
        047062   105   111   124                .ASCII  'EITHER A BAD CONSTANT WAS GENERATED OR'<CRLF>
        047131   104   111   104                .ASCIZ  \DID NOT GO FROM STATE 627 TO 322.\
6182    047173                     EM54:
        047173   114   104   104                .ASCIZ  /LDD (R0)+,AC0 TRANSFERRED BAD DATA./
6183    047237                     EM55:
        047237   114   104   104                .ASCII  /LDD -(R0),AC0 FAILED IN THE FSRC FLOWS./
        047306   124   110   105                .ASCIZ  /THE (BUT FSRC) FORK FAILED. TRAPPED TO 4./
6184    047360                     EM56:
        047360   114   104   104                .ASCII  /LDD -(R0),AC0 FAILED IN THE FSRC FLOWS./
        047427   200   122   060                .ASCII  <CRLF>'R0 WAS BAD.'<CRLF>
        047444   105   111   124                .ASCII  'EITHER A BAD CONSTANT WAS GENERATED OR'<CRLF>
        047513   104   111   104                .ASCIZ  \DID NOT GO FROM STATE 627 TO 324.\
6185    047555                     EM57:
        047555   114   104   104                .ASCIZ  /LDD -(R0),AC0 TRANSFERRED BAD DATA./
6186    047621                     EM60:
        047621   114   104   106                .ASCII  /LDF (R0)+,AC0 FAILED IN THE FSRC FLOWS./
        047670   200   122   060                .ASCII  <CRLF>'R0 WAS BAD.'<CRLF>
        047705   105   111   124                .ASCII  'EITHER A BAD CONSTANT WAS GENERATED OR'<CRLF>
        047754   104   111   104                .ASCIZ  \DID NOT GO FROM STATE 627 TO 322.\
6187    050016                     EM61:
        050016   114   104   106                .ASCIZ  /LDF (R0)+,AC0 TRANSFERRED BAD DATA./
6188    050062   114   104   106   EM62:        .ASCII  'LDF (R0)+,AC0 FAILED IN THE FSRC FLOWS.'
6189    050131   200   124   110                .ASCII  <CRLF>'THE (BUT FD) FORK FAILED.'<CRLF>
6190    050164   127   105   116                .ASCII  'WENT FROM STATE 441 TO 077,'<CRLF>
6191    050220   111   116   123                .ASCIZ  'INSTEAD OF FROM 441 TO 076.'
6192    050254   114   104   104   EM63:        .ASCII  'LDD #NUM,AC0 FAILED IN THE FSRC FLOWS.'
6193    050322   200   124   110                .ASCII  <CRLF>'THE (BUT GR7) FORK FAILED.'<CRLF>
6194    050356   127   105   116                .ASCII  'WENT FROM STATE 207 TO 174,'<CRLF>
6195    050412   111   116   123                .ASCIZ  'INSTEAD OF FROM 207 TO 176.'
6196    050446   114   104   104   EM64:        .ASCII  'LDD #NUM,AC0 FAILED IN THE FSRC FLOWS.'
6197    050514   200   101   040                .ASCIZ  <CRLF>'A BAD CONSTANT WAS USED WHEN THE PC WAS INCREMENTED.'
6198          050446               EM65=EM64
6199    050602                     EM66:
        050602   114   104   104                .ASCIZ  /LDD #NUM,AC0 TRANSFERRED BAD DATA./
6221    050645                     EM67:
        050645   114   104   104                .ASCII  'LDD @(R0)+,AC0 FAILED IN THE FSRC FLOWS.'
        050715   200   124   110                .ASCII  <CRLF>'THE (BUT FSRC) FORK FAILED. TRAPPED TO 4.'
        050767   200   127   105                .ASCII  <CRLF>\WENT FROM STATE 627 TO EITHER 326 OR 326,\
        051041   200   111   116                .ASCIZ  <CRLF>\INSTEAD OF FROM 627 TO 323.\
6222    051076                     EM70:
        051076   114   104   104                .ASCII  'LDD @(R0)+,AC0 FAILED IN THE FSRC FLOWS.'
        051146   200   124   110                .ASCIZ  <CRLF>'THE (BUT FSRC) FORK FAILED. TRAPPED TO 4.'
6223    051221                     EM71:
        051221   114   104   104                .ASCII  'LDD @(R0)+,AC0 FAILED IN THE FSRC FLOWS.'
        051271   124   110   105                .ASCIZ  'THE (BUT FD) FORK FAILED.'
6224    051323                     EM72:
        051323   114   104   104                .ASCII  'LDD @(R0)+,AC0'<CRLF>
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      051342      106      101      111                .ASCIZ  'FAILED TO INCREMENT R0 BY 2.'
6225  051377                                  EM73:
      051377      114      104      104                .ASCIZ  'LDD @(R0)+,AC0 LOADED BAD DATA.'
6226  051437                                  EM74:
      051437      114      104      104                .ASCII  'LDD @-(R0),AC0 FAILED IN THE FSRC FLOWS.'
      051507      200      124      110                .ASCII  <CRLF>'THE (BUT FSRC) FORK FAILED. TRAPPED TO 4.'
      051561      200      127      105                .ASCII  <CRLF>\WENT FROM STATE 627 TO EITHER 326 OR 326.\
      051633      200      111      116                .ASCIZ  <CRLF>\INSTEAD OF FROM 627 TO 325.\
6227  051670                                  EM75:
      051670      114      104      104                .ASCII  'LDD @-(R0),AC0 FAILED IN THE FSRC FLOWS.'
      051740      200      124      110                .ASCIZ  <CRLF>'THE (BUT FSRC) FORK FAILED. TRAPPED TO 4.'
6228  052013                                  EM76:
      052013      114      104      104                .ASCII  'LDD @-(R0),AC0 FAILED IN THE FSRC FLOWS.'
      052063      124      110      105                .ASCIZ  'THE (BUT FD) FORK FAILED.'
6229  052115                                  EM77:
      052115      114      104      104                .ASCII  'LDD @-(R0),AC0'<CRLF>
      052134      106      101      111                .ASCIZ  'FAILED TO DECREMENT R0 BY 2.'
6230  052171                                  EM100:
      052171      114      104      104                .ASCIZ  'LDD @-(R0),AC0 LOADED BAD DATA.'
6231  052231                                  EM101:
      052231      114      104      104                .ASCII  'LDD NUM(R0),AC0 FAILED IN THE FSRC FLOWS.'
      052302      200      124      110                .ASCIZ  <CRLF>'THE (BUT FSRC) FORK FAILED. TRAPPED TO 4.'
6232  052355                                  EM102:
      052355      114      104      104                .ASCII  'LDD NUM(R0),AC0'<CRLF>
      052375      106      101      111                .ASCIZ  'FAILED TO AFFECT R0 BY 2.'
6233  052427                                  EM103:
      052427      114      104      104                .ASCII  'LDD NUM(R0),AC0 FAILED IN THE FSRC FLOWS.'
      052500      124      110      105                .ASCIZ  'THE (BUT FD) FORK FAILED.'
6234  052532                                  EM104:
      052532      114      104      104                .ASCIZ  'LDD NUM(R0),AC0 LOADED BAD DATA.'
6235  052573                                  EM105:
      052573      114      104      104                .ASCII  'LDD @NUM(R0),AC0 FAILED IN THE FSRC FLOWS.'
      052645      200      124      110                .ASCIZ  <CRLF>'THE (BUT FSRC) FORK FAILED. TRAPPED TO 4.'
6236  052720                                  EM106:
      052720      114      104      104                .ASCII  'LDD @NUM(R0),AC0'<CRLF>
      052741      106      101      111                .ASCIZ  'FAILED TO AFFECT R0 BY 2.'
6237  052773                                  EM107:
      052773      114      104      104                .ASCII  'LDD @NUM(R0),AC0 FAILED IN THE FSRC FLOWS.'
      053045      124      110      105                .ASCIZ  'THE (BUT FD) FORK FAILED.'
6238  053077                                  EM110:
      053077      114      104      104                .ASCIZ  'LDD @NUM(R0),AC0 LOADED BAD DATA.'
6254  053141                                  EM111:
      053141      114      104      104                .ASCII  /LDD AC7,AC0 FAILED TO TRAP TO 244./
      053203      200      10'      103                .ASCIZ  <CRLF>/AC7 IS AN ILLEGAL ACCUMULATOR./
6255              053141                    EM112=EM111
6256  053243                                  EM113:
      053243      114      104      104                .ASCII  /LDD AC6,AC0 FAILED TO TRAP TO 244./
      053305      200      101      103                .ASCIZ  <CRLF>/AC6 IS AN ILLEGAL ACCUMULATOR./
625?              053243                    EM114-EM113
6258              053141                    EM115=EM111
6259              053243                    EM116=EM113
6260  053345                                  EM117:
      053345      125      123      105                .ASCII  'USE OF AN ILLEGAL ACCUMULATOR WITH FSRC MODE ZERO,'
      053427      200      124      122                .ASCIZ  <CRLF>'TRAPPED BUT FAILED TO SET FPS CORRECTLY.'
6261  053501                                  EM120:
      053501      125      123      105                .ASCII  'USE OF AN ILLEGAL ACCUMULATOR WITH FSRC MODE ZERO,'
      053563      200      124      122                .ASCIZ  <CRLF>'TRAPPED BUT FAILED TO SET FEC CORRECTLY.'
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6262 053635  123  124  040  EM121:  .ASCII  'ST AC0,AC1 FAILED IN THE FDST FLOWS.'
6263 053701  200  124  110           .ASCIZ  <CRLF>'THE (BUT FDST) FORK FAILED. TRAPPED TO 4.'
6264 053754  123  124  040  EM122:  .ASCII  'ST AC0,AC1 FAILED IN THE FDST FLOWS.'
6265 054020  200  124  110           .ASCIZ  <CRLF>'THE (BUT FD) FORK FAILED.'
6266 054053  123  124  040  EM123:  .ASCIZ  'ST AC0,AC1 TRANSFERRED BAD DATA.'
6267 054114                 EM124:
     054114  106  120  123           .ASCII  'FPS BAD AFTER LDD (R0),AC0.'
     054147  200  124  110           .ASCIZ  <CRLF>\THE (BUT EZBT Y8) FORK FAILED.\
6268 054207                 EM125:
     054207  106  120  123           .ASCII  'FPS BAD AFTER LDD (R0),AC0.'
     054242  200  124  110           .ASCIZ  <CRLF>\THE (BUT ENBT) FORK FAILED.\
6269 054277  114  104  104  EM126:  .ASCII  'LDD (R0),AC0 TRAPPED TO 244.'
6270 054333  040  106  123           .ASCII  ' FSRC= -0 AND FIUV= 0.'<CRLF>
6271 054362  124  110  105           .ASCII  'THE (BUT FIUV) FORK FAILED.'
6272 054415  200  127  105           .ASCII  <CRLF>'WENT FROM STATE 256 TO 354,'
6273 054451  200  111  116           .ASCIZ  <CRLF>'INSTEAD OF FROM 256 TO 254.'
6274 054506  114  104  104  EM127:  .ASCII  'LDD (R0),AC0 FAILED TO TRAP TO 244,'
6275 054551  040  106  123           .ASCII  ' FSRC= -0, FIUV= 1.'
6276 054574  200  124  110           .ASCII  <CRLF>'THE (BUT FIUV) FOR FAILED.'<CRLF>
6277 054630  127  105  116           .ASCII  'WENT FROM STATE 256 TO 254,'
6278 054663  200  111  116           .ASCIZ  <CRLF>'INSTEAD OF FROM 256 THE 354.'
6279 054721  114  104  104  EM130:  .ASCII  'LDD (R0),AC0 TRAPPED TO 244,'
6280 054755  106  123  122           .ASCII  'FSRC= -0, FIUV= 1.'<CRLF>
6281 055000  102  125  124           .ASCIZ  'BUT FEC WAS BAD.'
6282 055021                 EM131:
     055021  114  104  103           .ASCIZ  /LDCFD (R0),AC0 LOADED BAD DATA./
6283 055061                 EM132:
     055061  114  104  103           .ASCIZ  /LDCDF (R0),AC0 LOADED BAD DATA./
6324 055121                 EM133:
     055121  101  104  104           .ASCIZ  /ADDD (R0),AC0 WITH (R0)=AC0=0 /
6325 055160                 EM134:
     055160  101  104  104           .ASCIZ  /ADDF (R0),AC0 WITH (R0)=AC0=0 /
6326 055217                 EM135:
     055217  123  125  102           .ASCIZ  /SUBD (R0),AC0 WITH (R0)=AC0=0 /
6327 055256                 EM136:
     055256  123  125  102           .ASCIZ  /SUBF (R0),AC0 WITH (R0)=AC0=0 /
6328         055121                 EM137=EM133
6329         055160                 EM140=EM134
6330         055217                 EM141=EM135
6331         055256                 EM142=EM136
6332 055315                 EM143:
     055315  101  104  104           .ASCIZ  /ADDD (R0),AC0 WITH (R0) 0 /
6333 055350                 EM144:
     055350  123  125  102           .ASCIZ  /SUBD (R0),AC0 WITH (R0)=0 /
6334         055315                 EM145=EM143
6335         055350                 EM146=EM144
6336 055403                 EM147:
     055403  123  125  102           .ASCIZ  /SUBD (R0),AC0 WITH AC0=0 /
6337         055403                 EM150=EM147
6338         055403                 EM151=EM147
6339 055435                 EM152:
     055435  101  104  104           .ASCIZ  /ADDD (R0),AC0 WITH AC0=0 /
6340         055435                 EM153=EM152
6341 055467                 EM154:
     055467  101  116  040           .ASCII  'AN OVERFLOW ERROR OCCURRED ON ADD'<CRLF>
     055531  103  101  125           .ASCII  'CAUSING A TRAP TO 244.'
     055557  200  050  102           .ASCII  <CRLF>'(BUT EZBT Y9 Y8) FORK IN STATE 420 OF OVER\UNDER FAILED.'
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      055650  200  123  110                .ASCIZ  <CRLF>'SHOULD HAVE GONE FROM STATE 420 TO 131.'
6342  055721                          EM155:
      055721  101  116  040                .ASCII  'AN UNDERFLOW ERROR OCCURRED ON ADD'<CRLF>
      055764  103  101  125                .ASCII  'CAUSING A TRAP TO 244.'
      056012  200  050  102                .ASCII  <CRLF>'(BUT EZBT Y9 Y8) FORK IN STATE 420 OF OVER\UNDER FAILED.'
      056103  200  123  110                .ASCIZ  <CRLF>'SHOULD HAVE GONE FROM STATE 420 TO 131.'
6343  056154                          EM156:
      056154  101  104  104                .ASCII  /ADDD (R0),AC0 FAILED IN THE ROUND\TRUNK FLOWS./
      056232  200  124  110                .ASCII  <CRLF>'THE (BUT FD) FORK FAILED. WENT'
      056271  106  122  117                .ASCII  \FROM STATE 665 TO 113.\<CRLF>
      056320  111  116  123                .ASCIZ  \INSTEAD OF FROM 665 TO 313.\<CRLF>\WITH FT SET.\
6344  056371                          EM157:
      056371  101  104  104                .ASCII  /ADDD (R0),AC0 FAILED IN THE ROUND\TRUNK FLOWS./
      056447  200  124  110                .ASCII  <CRLF>'THE (BUT FD) FORK FAILED. WENT'
      056506  106  122  117                .ASCII  \FROM STATE 665 TO 313.\<CRLF>
      056535  111  116  123                .ASCIZ  \INSTEAD OF FROM 665 TO 113.\<CRLF>\WITH FT CLEAR.\
6345  056610                          EM160:
      056610  101  104  104                .ASCII  /ADDD (R0),AC0 FAILED IN THE ROUND\TRUNK FLOWS./<CRLF>
      056667  124  110  105                .ASCII  'THE FLOATING CONSTANT WAS USED INSTEAD OF THE DOUBLE CONSTANT'<CRLF>
      056765  111  116  040                .ASCIZ  'IN THE ROUND ALGORITHM.'
6346  057015                          EM161:
      057015  101  104  104                .ASCII  /ADDF (R0),AC0 FAILED IN THE ROUND\TRUNK FLOWS./<CRLF>
      057074  124  110  105                .ASCII  'THE DOUBLE CONSTANT WAS USED INSTEAD OF THE FLOATING CONSTANT'<CRLF>
      057172  111  116  040                .ASCIZ  'IN THE ROUND ALGORITHM.'
6347  057222                          EM162:
      057222  101  104  104                .ASCIZ  /ADDD (R0),AC0 PRODUCED A BAD RESULT./
6348  057267                          EM163:
      057267  101  104  104                .ASCIZ  /ADDF (R0),AC0 PRODUCED A BAD RESULT./
6349  057334                          EM164:
      057334  124  110  105                .ASCIZ  \THE FPS WAS BAD AFTER ADDD (R0),AC0.\
6350  057401                          EM165:
      057401  124  110  105                .ASCIZ  \THF FPS WAS BAD AFTER ADDF (R0),AC0.\
6351  057446                          EM166:
      057446  101  104  104                .ASCII  /ADDD (R0),AC0 PRODUCED A BAD RESULT,/<CRLF>
      057513  120  122  117                .ASCIZ  'PROBABLE ERROR IN THE ALIGN FLOWS.'
6352  057556                          EM167:
      057556  101  104  104                .ASCII  /ADDD (R0),AC0 FAILED IN THE ALIGN FLOWS./<CRLF>
      057627  106  114  117                .ASCII  \FLOW DID NOT FOLLOW THE PATH: STATE 476, TO 111, TO 014.\
      057717  200  101  040                .ASCII  <CRLF>\A BAD CONSTANT (NOT 57 DEC) \
      057754  127  101  123                .ASCIZ  'WAS USED IN THE ALIGN ALGORITHM.'
6353  060015                          EM170:
      060015  101  104  104                .ASCII  /ADDF (R0),AC0 PRODUCED A BAD RESULT,/<CRLF>
      060062  120  122  117                .ASCIZ  'PROBABLE ERROR IN THE ALIGN FLOWS.'
6354  060125                          EM171:
      060125  101  104  104                .ASCII  /ADDF (R0),AC0 FAILED IN THE ALIGN FLOWS./<CRLF>
      060176  106  114  117                .ASCII  \FLOW DID NOT FOLLOW THE PATH: STATE 476, TO 111, TO 014.\
      060266  200  101  040                .ASCII  <CRLF>\A BAD CONSTANT (NOT 25 DEC) \
      060323  127  101  123                .ASCIZ  'WAS USED IN THE ALIGN ALGORITHM.'
6355  060364                          EM172:
      060364  101  104  104                .ASCII  /ADDD (R0),AC0 FAILED IN THE ALIGN FLOWS./<CRLF>
      060435  106  114  117                .ASCII  \FLOW DID NOT FOLLOW THE PATH: STATE 476, TO 011, TO 015.\
      060525  200  101  040                .ASCII  <CRLF>\A BAD CONSTANT (NOT 57 DEC) \
      060562  127  101  123                .ASCIZ  'WAS USED IN THE ALIGN ALGORITHM.'
6356  060623                          EM173:
      060623  101  104  104                .ASCII  /ADDD (R0),AC0 FAILED IN THE ALIGN FLOWS./<CRLF>
      060674  106  114  117                .ASCII  \FLOW DID NOT FOLLOW THE PATH: STATE 476, TO 011, TO 215.\
      060764  200  101  040                .ASCII  <CRLF>\A BAD CONSTANT (NOT 57 DEC) \
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      061021   127   101   123            .ASCIZ  'WAS USED IN THE ALIGN ALGORITHM.'
6357  061062                        FM174:
      061062   101   104   104            .ASCII  /ADDF (R0),AC0 FAILED IN THE ALIGN FLOWS./<CRLF>
      061133   106   114   117            .ASCII  \FLOW DID NOT FOLLOW THE PATH: STATE 476, TO 011, TO 015.\
      061223   200   101   040            .ASCII  <CRLF>\A BAD CONSTANT (NOT 25 DEC) \
      061260   127   101   123            .ASCIZ  'WAS USED IN THE ALIGN ALGORITHM.'
6358  061321                        FM175:
      061321   101   104   104            .ASCII  /ADDF (R0),AC0 FAILED IN THE ALIGN FLOWS./<CRLF>
      061372   106   114   117            .ASCII  \FLOW DID NOT FOLLOW THE PATH: STATE 476, TO 011, TO 215.\
      061462   200   101   040            .ASCII  <CRLF>\A BAD CONSTANT (NOT 25 DEC) \
      061517   127   101   123            .ASCIZ  'WAS USED IN THE ALIGN ALGORITHM.'
6359  061560                        EM176:
      061560   101   104   104            .ASCII  'ADDD (R0),AC0 FAILED IN THE ADD-SUB FLOWS.'<CRLF>
      061633   104   111   104            .ASCIZ  \DID NOT TAKE THE PATH: STATE 216, TO 442, TO 500.\
6360  061715                        EM177:
      061715   101   104   104            .ASCII  'ADDD (R0),AC0 FAILED IN THE ADD-SUB FLOWS.'<CRLF>
      061770   104   111   104            .ASCIZ  \DID NOT TAKE THE PATH: STATE 216, TO 042, TO 121.\
6361  062052                        EM200:
      062052   101   104   104            .ASCII  'ADDD (R0),AC0 FAILED IN THE ADD-SUB FLOWS.'<CRLF>
      062125   104   111   104            .ASCIZ  \DID NOT TAKE THE PATH: STATE 216, TO 440, TO 121.\
6362  062207                        EM201:
      062207   101   104   104            .ASCII  'ADDD (R0),AC0 FAILED IN THE ADD-SUB FLOWS.'<CRLF>
      062262   104   111   104            .ASCIZ  \DID NOT TAKE THE PATH: STATE 216, TO 440, TO 101.\
6363  062344                        EM202:
      062344   101   104   104            .ASCII  'ADDD (R0),AC0 FAILED IN THE ADD-SUB FLOWS.'<CRLF>
      062417   104   111   104            .ASCIZ  \DID NOT TAKE THE PATH: STATE 216, TO 042, TO 101.\
6364  062501                        EM203:
      062501   101   104   104            .ASCII  'ADDD (R0),AC0 FAILED IN THE ADD-SUB FLOWS.'<CRLF>
      062554   104   111   104            .ASCIZ  \DID NOT TAKE THE PATH: STATE 216, TO 440, TO 141.\
6365  062636                        EM204:
      062636   101   104   104            .ASCII  'ADDD (R0),AC0 FAILED IN THE ADD-SUB FLOWS.'<CRLF>
      062711   104   111   104            .ASCIZ  \DID NOT TAKE THE PATH: STATE 216, TO 042, TO 141.\
6366  062773                        EM205:
      062773   124   110   105            .ASCIZ  \THE FPS WAS BAD AFTER SUBD (R0),AC0.\
6367  063040                        EM206:
      063040   123   125   102            .ASCIZ  /SUBD (R0),AC0 PRODUCED A BAD RESULT./
6368  063105   123   125   102  EM207:    .ASCII  'SUBD (R0),AC0 PRODUCED A BAD RESULT.'
6369  063151   200   124   110            .ASCIZ  <CRLF>'THE XOR OF THE SIGN BIT FAILED IN STATE 024.'
6370  063227   101   104   104  EM210:    .ASCIZ  'ADDD (R0),AC0 FAILED IN THE NORMALIZE FLOWS.'
6371          043267                     EM211=EM5
6372          043323                     EM212=EM6
6373          043355                     EM213=EM7
6374
6375                                     ;DATA HEADERS
6376
6377  063304     040   040   124  DH1:      .ASCII  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'
6378  063344     011   127   122            .ASCIZ  <TAB>'WROTE.'<TAB>'READ.'<TAB>'EXPECTED.'
6379  063374     040   040   124  DH2:      .ASCII  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'
6380  063434     101   116   104            .ASCIZ  'AND BAD DATA.'<TAB>'OR BAD DATA.'
6381  063467     040   040   124  DH3:      .ASCII  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'
6382  063527     011   122   105            .ASCIZ  <TAB>'READ PSW.'<TAB>'EXPECTED PSW.'
6383  063560     040   040   124  DH4:      .ASCII  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'
6384  063620     011   127   122            .ASCIZ  <TAB>'WROTE FPS.'<TAB>'FPS AFTER CFCC.'
6385  063654     040   040   124  DH5:      .ASCIZ  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF TRAP.'
6386          063654                     DH6=DH5
6387          063654                     DH7=DH5
6388          063654                     DH10=DH5
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 6389            063654                  DH11=DH5
 6390            000000                  DH12=0
 6391            000000                  DH13=0
 6392            063654                  DH14=DH5
 6393            063654                  DH15=DH5
 6394 063714        040      040     124 DH16:   .ASCII  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'
 6395 063754        011      117     120         .ASCIZ  <TAB>'OP CODE.  FPS.'
 6396 063774        040      040     124 DH17:   .ASCII  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'
 6397 064034        011      107     117         .ASCIZ  <TAB>'GOT FPS.'<TAB>'EXPECTED FPS.'
 6398 064064        040      040     124 DH20:   .ASCII  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF TRAP.'
 6399 064123        011      120     103         .ASCIZ  <TAB>'PC OF STST.'<TAB>'READ FEC.'
 6400            063654                  DH21=DH5
 6401 064152        106      101     111 DH22:   .ASCIZ  'FAILED TO CORRECTLY SET FPS.'
 6402 064207        106      101     111 DH23:   .ASCII  'FAILED TO CORRECTLY SET FEC TO 000002.'<CRLF>
 6403 064256        040      040     124         .ASCII  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'
 6404 064316        011      120     103         .ASCIZ  <TAB>'PC OF STST.'<TAB>'READ FEC.'
 6405 064345        124      122     101 DH24:   .ASCII  'TRAPPED TO 244. FLOW WENT FROM STATE 554 TO STATE 430.'
 6406 064433        200      111     116         .ASCIZ  <CRLF>'INSTEAD OF FROM STATE 554 TO STATE 432.'
 6407 064504        040      040     124 DH25:   .ASCIZ  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'<TAB>
 6408 064546        040      040     124 DH26:   .ASCII  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'
 6409 064606        011      107     117         .ASCIZ  <TAB>'GOT R0.'<TAB>'EXPECTED R0.'
 6410            064546                  DH27-DH26
 6411            000000                  DH30=0
 6412            064546                  DH31=DH26
 6413            064546                  DH32=DH26
 6414 064634        040      040     124 DH33:   .ASCII  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'
 6415 064674        011      122     060         .ASCIZ  <TAB>'R0 (TARGET LOCATIONS FOR OUTPUT).'
 6416            064634                  DH34=DH33
 6417            064634                  DH35=DH33
 6418            064634                  DH36=DH33
 6419            064634                  DH37-DH33
 6420            064634                  DH40=DH33
 6421            000000                  DH41=0
 6422 064737        040      040     124 DH42:   .ASCII  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF TRAP.'
 6423 064776        011      122     060         .ASCIZ  <TAB>'R0 (TARGET LOCATIONS FOR OUTPUT).'
 6424            064737                  DH43=DH42
 6425            000000                  DH44=0
 6426 065041        105      122     122 DH45:   .ASCIZ  'ERROR SUMMARY.'
 6427 065060        040      040     124 DH46:   .ASCIZ  '  TEST.'<TAB>'CALL AT PC.'
 6428            065041                  DH47=DH45
 6429 065104        040      040     124 DH50:   .ASCII  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'
 6430 065144        011      127     111         .ASCIZ  <TAB>'WITH FD.'
 6431            065104                  DH51=DH50
 6432            063654                  DH52=DH5
 6433            064546                  DH53=DH26
 6434 065156        040      040     124 DH54:   .ASCIZ  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'
 6435            063654                  DH55=DH5
 6436            064546                  DH56=DH26
 6437            065156                  DH57=DH54
 6438            064546                  DH60=DH26
 6439            065156                  DH61=DH54
 6440            065156                  DH62=DH54
 6441            065156                  DH63=DH54
 6442 065217        122      105     123 DH65:   .ASCII  'RESULTING IN AN ODD ADDRESS TRAP TO 4.'
 6443 065265        200                  .ASCII  <CRLF>
 6444 065266        040      040     124 DH64:   .ASCII  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'
 6445 065326        011      107     117         .ASCIZ  <TAB>'GOT PC.'<TAB>'EXPECTED PC.'
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6446          065156                  DH66=DH54
6447          063654                  DH67=DH5
6448          063654                  DH70=DH5
6449          064504                  DH71=DH25
6450          064546                  DH72=DH26
6451          065156                  DH73=DH54
6452          063654                  DH74=DH5
6453          063654                  DH75=DH5
6454          064504                  DH76=DH25
6455          064546                  DH77=DH26
6456          065156                  DH100=DH54
6457          063654                  DH101=DH5
6458          064546                  DH102=DH26
6459          064504                  DH103=DH25
6460          065156                  DH104=DH54
6461          063654                  DH105=DH5
6462          064546                  DH106=DH26
6463          064504                  DH107=DH25
6464          065156                  DH110=DH54
6465          064504                  DH111=DH25
6466 065354     124     110     105  DH112:  .ASCII  'THE (BUT FSRC) FORK FAILED.'<CRLF>
6467 065410     103     117     116          .ASCII  'CONTROL WENT FROM STATE 762 TO STATE 627.'
6468 065461     200     111     116          .ASCII  <CRLF>'INSTEAD OF FROM STATE 762 TO STATE 637.'<CRLF>
6469 065532     040     040     124          .ASCIZ  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'
6470          064504                  DH113=DH25
6471          065354                  DH114=DH112
6472 065573     124     110     105  DH115:  .ASCII  'THE (BUT FSRC) FORK FAILED RESULTING IN AN ODD ADDRESS TRAP TO 4.'
6473 065674     200     103     117          .ASCII  <CRLF>'CONTROL WENT FROM STATE 762 TO STATE 627.'<CRLF>
6474 065747     111     116     123          .ASCII  'INSTEAD OF FROM STATE 762 TO STATE 627.'<CRLF>
6475 066017     040     040     124          .ASCIZ  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF TRAP.'
6476          065573                  DH116=DH115
6477          063774                  DH117=DH17
6478 066057     040     040     124  DH120:  .ASCII  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'
6479 066117     011     107     117          .ASCIZ  <TAB>'GOT FEC.'<TAB>'EXPECTED FEC.'
6480          063654                  DH121=DH5
6481          065104                  DH122=DH50
6482          065104                  DH123=DH50
6483          063774                  DH124=DH17
6484          063774                  DH125=DH17
6485          063654                  DH126=DH5
6486          065156                  DH127=DH54
6487          066057                  DH130=DH120
6488          065156                  DH131=DH54
6489          065156                  DH132=DH54
6490 066147     106     101      11  DH133:  .ASCII  'FAILED TO PRODUCE THE CORRECT RESULTS.'<CRLF>
6491 066216     040     040     124          .ASCIZ  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'
6492          066147                  DH134=DH133
6493          066147                  DH135=DH133
6494          066147                  DH136=DH133
6495 066257     120     122     117  DH137:  .ASCII  'PRODUCED THE CORRECT RESULT BUT FAILED TO SET THE FPS CORRECTLY.'
6496 066357     040     040     124          .ASCII  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'
6497 066417     011     107     117          .ASCIZ  <TAB>'GOT FPS.'<TAB>'EXPECTED FPS.'
6498          066257                  DH140=DH137
6499          066257                  DH141 DH137
6500          066257                  DH142=DH137
6501          066147                  DH143-DH133
6502          066147                  DH144=DH133
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                066257                  DH145=DH137
                066257                  DH146=DH137
                065156                  DH147=DH54
066447    130   117   122   DH150:  .ASCII  'XOR OF SIGN BIT FAILED.'<CRLF>
066477    040   040   124           .ASCIZ  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF ERROR.'
                066257                  DH151=DH137
                066147                  DH152=DH133
                066257                  DH153=DH137
066540    040   040   124   DH154:  .ASCIZ  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF TRAP.'
                066540                  DH155=DH154
                065156                  DH156=DH54
                065156                  DH157=DH54
                065156                  DH160=DH54
                065156                  DH161=DH54
                065156                  DH162=DH54
                065156                  DH163=DH54
                063774                  DH164=DH17
                063774                  DH165=DH17
                065156                  DH166=DH54
                065156                  DH167=DH54
                065156                  DH170=DH54
                065156                  DH171=DH54
                065156                  DH172=DH54
                065156                  DH173=DH54
                065156                  DH174=DH54
                065156                  DH175=DH54
                065156                  DH176=DH54
                065156                  DH177=DH54
                065156                  DH200=DH54
                065156                  DH201=DH54
                065156                  DH202=DH54
                065156                  DH203=DH54
                065156                  DH204=DH54
                063774                  DH205=DH17
                065156                  DH206=DH54
                065156                  DH207=DH54
                065156                  DH210=DH54
066600    040   040   124   DH211:  .ASCIZ  '  TEST.'<TAB>'PC OF CALL.'<TAB>'PC OF TRAP.'<TAB>'FEC.'
                063654                  DH212=DH5
                063654                  DH213=DH5

                                        ;DATA FORMATS:

066645    004   000   005   DF1:    .BYTE   4,0,5,0,5,0,0,0
066655    004   000   005   DF2:    .BYTE   4,0,5,4,5,0,5,0
066665    004   000   005   DF3:    .BYTE   4,0,5,0,5,0,5,0
                066665                  DF4=DF3
066675    004   000   005   DF5:    .BYTE   4,0,5,0,5,0,5,11,5,0,5,0
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```
6553            006675                  DFS DFC
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6555            066675                  DF7=DF5
6556            066675                  DF10=DF5
6557            066675                  DF11=DF5
6558 066711        005      011    005  DF12:   .BYTE   5,11,5,5,5,4,5,4,5,5,5,4,5,11,5,11,5,5,4,0,5,0,5,0,0
6559 066743        005      011    005  DF13:   .BYTE   5,11,5,5,5,4,0,5,0,5,0,0
6560            066675                  DF14=DF6
6561            066675                  DF15=DF6
6562 066757        004      000    005  DF16:   .BYTE   4,0,5,0,5,0,0
6563            066665                  DF17=DF3
6564 066766        004      000    005  DF20:   .BYTE   4,0,5,0,5,0,5,0
6565 066776        004      000    005  DF21:   .BYTE   4,0,5,0
6566 067002        005      005    004  DF22:   .BYTE   5,5,4,0,5,0,5,0,5,0
6567 067014        004      000    005  DF23.   .BYTE   4,0,5,0,5,0,5,0
6568 067024        005      004    000  DF24:   .BYTE   5,4,0,5,0,5,0
6569 067033        004      000    005  DF25:   .BYTE   4,0,5,0,5,5,5,0,5,0,5,0,5,5,5,0,5,0,5,0
6570 067057        004      000    005  DF26:   .BYTE   4,0,5,0,5,0,0,5,5,5,5,4,5,4,5,5,5,5,4,5,4
6571 067104        004      000    005  DF27:   .BYTE   4,0,5,0,5,0,0,5,5,5,5,4,5,4,5,5
6572 067124        005      011    005  DF30:   .BYTE   5,11,5,5,5,5,4,0,5,0,5,0,0
6573            067057                  DF31=DF26
6574            067104                  DF32=DF27
6575 067140        004      000    005  DF33:   .BYTE   4,0,5,0,5,0,5,5,5,0,5,0,5,12,5,5,5,0,5,0,5,12
6576 067166        004      000    005  DF34:   .BYTE   4,0,5,0,5,0,5,5,5,5,4,5,4,5,5,5,5,4,5,4
6577            067166                  DF35=DF34
6578            067166                  DF36=DF34
6579            067166                  DF37=DF34
6580 067212        004      000    005  DF40:   .BYTE   4,0,5,0,5,0,5,5,5,0,5,0,5,3,5,5,5,0,5,0,5,3
6581 067240        011      005    005  DF41:   .BYTE   11,5,5,5,4,0,5,0,5,0,5,0
6582 067254        004      000    005  DF42:   .BYTE   4,0,5,0,5,0,5,5,5,5,4,5,4,11,4,5,5,5,5,4,5,4
6583            067254                  DF43-DF42
6584 067302        005      011    005  DF44:   .BYTE   5,11,5,5,5,4,0,5,0,5,5,5,5,3,5,5,5,5,3
6585 067325        005      011    005  DF45:   .BYTE   5,11,5,5,5,4,0,5,0,5,4,5,5,5,5,3,5,5,5,5,3
6586 067352        004      000    005  DF46:   .BYTE   4,0,5,5,5,3,5,3,5,3,5,3,5,3,5,5,5,3,5,3,5,3,5,3,5,3
6587 067404        004      000    005  DF47:   .BYTE   4,0,5,0,5,5,5,4,5,4,5,5,
6588 067421        004      000    005  DF50:   .BYTE   4,0,5,0,5,11,5,5,5,5,4,5,4,5,5,5,5,4,5,4
6589 067445        004      000    005  DF51:   .BYTE   4,0,5,0,5,11,5,5,5,3,5,5,5,3
6590            067404                  DF52-DF47
6591 067463        004      000    005  DF53:   .BYTE   4,0,5,0,5,0,0
6592 067472        004      000    005  DF54:   .BYTE   4,0,5,0,5,5,5,5,3,5,5,5,5,3
6593            067404                  DF55=DF47
6594            067463                  DF56=DF53
6595            067472                  DF57=DF54
6596            067463                  DF60=DF53
6597            067472                  DF61=DF54
6598            067472                  DF62=DF54
6599            067472                  DF63 DF54
6600 067510        004      000    005  DF64.:  .BYTE   4,0,5,0,5,0,0
6601            067510                  DF65=DF64
6602            067472                  DF66=DF54
6603            066776                  DF67=DF21
6604 067517        004      000    005  DF70:   .BYTE   4,0,5,0,5,5,5,5,4,5,4,5,5,5,5,4,5,4
6605            067517                  DF71-DF70
6606 067541        004      000    005  DF72:   .BYTE   4,0,5,0,5,0,0
6607            067472                  DF73=DF54
6608            066776                  DF74=DF21
6609            067517                  DF75-DF70
6610            067517                  DF76-DF70
6611            067541                  DF77-DF72
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 6612            067472                  DF100=DF54
 6613            067517                  DF101=DF70
 6614            067541                  DF102=DF72
 6615            067517                  DF103=DF70
 6616            067472                  DF104=DF54
 6617            067517                  DF105=DF70
 6618            067541                  DF106=DF72
 6619            067517                  DF107=DF70
 6620            067472                  DF110=DF54
 6621 067550       004       000   005   DF111:  .BYTE   4,0,5,0
 6622            067550                  DF112=DF111
 6623            067550                  DF113=DF111
 6624            067550                  DF114=DF111
 6625            067550                  DF115=DF111
 6626            067550                  DF116=DF111
 6627            066665                  DF117=DF3
 6628            066665                  DF120=DF3
 6629            067404                  DF121=DF47
 6630            067421                  DF122=DF50
 6631            067445                  DF123=DF51
 6632 067554       004       000   005   DF124:  .BYTE   4,0,5,0,5,0,0,5,5,5,5,4,5,4,5,5,5,5,4,5,4,5,5,5,3
 6633            067554                  DF125=DF124
 6634            067550                  DF126=DF111
 6635            067550                  DF127=DF111
 6636            066665                  DF130=DF3
 6637 067605       004       000   005   DF131:  .BYTE   4,0,5,0,5,5,5,3,5,5,5,3,5,5,5,3
 6638            067605                  DF132=DF131
 6639 067625       004       000   005   DF133:  .BYTE   4,0,5,0,5,5,5,3,5,5,5,3,5,5,5,3,5,5,5,3
 6640            067625                  DF134=DF133
 6641            067625                  DF135=DF133
 6642            067625                  DF136=DF133
 6643 067651       004       000   005   DF137:  .BYTE   4,0,5,0,5,0,5,0
 6644            067651                  DF140=DF137
 6645            067651                  DF141=DF137
 6646            067651                  DF142=DF137
 6647            067625                  DF143=DF133
 6648            067625                  DF144=DF133
 6649            067651                  DF145=DF137
 6650            067651                  DF146=DF137
 6651            067625                  DF147=DF133
 6652            067625                  DF150=DF133
 6653            067651                  DF151=DF137
 6654            067625                  DF152=DF133
 6655            067651                  DF153=DF137
 6656 067661       004       000   005   DF154:  .BYTE   4,0,5,0
 6657            067661                  DF155=DF154
 6658            067625                  DF156=DF133
 6659            067625                  DF157=DF133
 6660            067625                  DF160=DF133
 6661 067665       004       000   005   DF161:  .BYTE   4,0,5,0,5,5,5,2,5,5,5,2,5,5,5,2,5,5,5,2
 6662            067625                  DF162=DF133
 6663            067665                  DF163=DF161
 6664            066665                  DF164=DF3
 6665            066665                  DF165=DF3
 6666            067625                  DF166=DF133
 6667            067625                  DF167=DF133
 6668            067665                  DF170=DF161
```

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                067665                  DF171=DF161
                067625                  DF172=DF133
                067625                  DF173=DF133
                067665                  DF174=DF161
                067665                  DF175=DF161
                067625                  DF176=DF133
                067625                  DF177=DF133
                067625                  DF200=DF133
                067625                  DF201=DF133
                067625                  DF202=DF133
                067625                  DF203=DF133
                067625                  DF204=DF133
                066665                  DF205=DF3
                067625                  DF206=DF133
                067625                  DF207=DF133
                067625                  DF210=DF133
067711          004     000     005     DF211:  .BYTE   4,0,5,0,5,0
                067711                  DF212=DF211
                067711                  DF213=DF211

                                        .EVEN
                                        ;DATA TABLES:

067720  001232  001234  040446  DT1.    .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TAB,$TMP3
067734  001242  001244  000000          .WORD   $TMP4,$TMP5,0
067742  001232  001234  040446  DT2:    .WORD   $TMP0,$TMP1,$TAB,AERFLG,$TAB,$TMP2,$TAB,$TMP3,0
067764  001232  001234  040446  DT3:    .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TAB,$TMP3
070000  040446  001242  000000          .WORD   $TAB,$TMP4,0
                067764                  DT4=DT3
070006  001232  001234  040446  DT5:    .WORD   $TMP0,$TMP1,$TAB,$TMP2,LFIEX1,$TMP21,LFIEX2
070024  001272  040565  001240          .WORD   $TMP20,FPSMS,$TMP3,FECMS,$TMP4,0
070040  001232  001234  040446  DT6:    .WORD   $TMP0,$TMP1,$TAB,$TMP2,LFIEX1,$TMP21,LFIEX2,$TMP20,0
                070040                  DT7=DT6
                070040                  DT10 DT6
                070040                  DT11=DT6
070062  040642  001252  040647  DT12:   .WORD   $THE,$TMP10,NOOP1,NOOP15,NOOP2,$TMP5
070076  041011  001246  041023          .WORD   NOOP3,$TMP6,NOOP4,NOOP2,$TMP5,NOOP3,$TMP7,NOOP5,$TMP11
070120  041066  001252  041106          .WORD   NOOP6,$TMP10,NOOP7,NOOP10,$TMP0,$TMP1,$TAB,$TMP2
070140  040446  001240  001242          .WORD   $TAB,$TMP3,$TMP4,0
070150  040642  001252  040647  DT13:   .WORD   $THE,$TMP10,NOOP1,NOOP11,NOOP10,$TMP0,$TMP1,$TAB
070170  001236  040446  001240          .WORD   $TMP2,$TAB,$TMP3,$TMP4,0
                070040                  DT14=DT6
                070040                  DT15=DT6
070202  001232  001234  040446  DT16:   .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TAB,$TMP5,$TMP3,0
                067764                  DT17=DT3
070222  001232  001234  040446  DT20:   .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TAB,$TMP3
070236  040446  001242  000000          .WORD   $TAB,$TMP4,0
070244  001232  001234  040446  DT21:   .WORD   $TMP0,$TMP1,$TAB,$TMP2,0
070256  063467  001313          DT22:   .WORD   DH3,$CRLF
070262  001232  001234  040446          .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TAB,$TMP3
070276  040446  001242  000000          .WORD   $TAB,$TMP4,0
070304  001232  001234  040446  DT23:   .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TAB,$TMP3
070320  040446  001242  000000          .WORD   $TAB,$TMP4,0
070326  041542                  DT24:   .WORD   ILLMS
070330  001232  001234  040446          .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TAB,$TMP3
070344  040446  001242  000000          .WORD   $TAB,$TMP4,0
070352  001232  001234  040446  DT25:   .WORD   $TMP0,$TMP1,$TAB,$CRLF,MS1,MS3,$TMP3,MS4,$TMP4,$CRLF
```

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6726 070376  001242  001313  041622          .WORD   $TMP4,$CRLF,MS2,MS3,$TMP5,MS4,$TMP6,$CRLF,$TMP5,0
6727 070422  001232  001234  040446  DT26:   .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TAB,$TMP3,$TMP4,$CRLF
6728 070442  041732  001313  041750          .WORD   MS6,$CRLF,MS7,$TMP5,MS10,$TMP6,$CRLF
6729 070460  041777  001313  041750          .WORD   MS11,$CRLF,MS7,$TMP5,MS10,$TMP7,0
6730 070476  001232  001234  040446  DT27:   .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TAB,$TMP3
6731 070512  001242  001313  042024          .WORD   $TMP4,$CRLF,MS12,$CRLF,MS7,$TMP5,MS10,$TMP7,$CRLF,MS13,0
6732 070540  042165  001272  001313  DT30:   .WORD   MS15,$TMP20,$CRLF,MS14,$CRLF
6733 070552  001232  001234  040446          .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TAB,$TMP3
6734 070566  001242  000000                  .WORD   $TMP4,0
6735         070422                  DT31-DT26
6736         070476                  DT32=DT27
6737 070572  001232  001234  040446  DT33:   .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TAB,$TMP3
6738 070606  001313  041610  041627          .WORD   $CRLF,MS1,MS3,$TMP4,MS4,$TMP5,$CRLF,$TMP6,$CRLF
6739 070630  041622  041627  001242          .WORD   MS2,MS3,$TMP4,MS4,$TMP5,$CRLF,$TMP4,0
6740 070650  001232  001234  040446  DT34:   .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TAB,$TMP3
6741 070664  001313  041732  001313          .WORD   $CRLF,MS6,$CRLF,MS7,$TMP5,MS10,$TMP6,$CRLF
6742 070704  041777  001313  041750          .WORD   MS11,$CRLF,MS7,$TMP5,MS10,$TMP7,0
6743         070650                  DT35=DT34
6744         070650                  DT36=DT34
6745         070650                  DT37=DT34
6746         070572                  DT40-DT33
6747 070722  001272  001313  063467  DT41:   .WORD   $TMP20,$CRLF,DH3,$CRLF
6748 070732  001232  001234  040446          .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TAB,$TMP3
6749 070746  040446  001242  000000          .WORD   $TAB,$TMP4,0
6750 070754  001232  001234  040446  DT42:   .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TAB,$TMP3
6751 070770  001313  041732  001313          .WORD   $CRLF,MS6,$CRLF,MS7,$TMP5,MS10,$TMP6,$TMP15,$TMP10
6752 071012  001313  041777  001313          .WORD   $CRLF,MS11,$CRLF,MS7,$TMP5,MS10,$TMP7,0
6753         070754                  DT43-DT42
6754 071032  042217  001244  001313  DT44:   .WORD   MS17,$TMP5,$CRLF,MS20,$CRLF,$TMP0,$TMP1,$TAB,$TMP2
6755 071054  001313  041610  042350          .WORD   $CRLF,MS1,MS21,$CRLF,$TMP3,$CRLF,MS2,MS21,$CRLF,$TMP4,0
6756 071102  042217  001244  001313  DT45:   .WORD   MS17,$TMP5,$CRLF,MS24,$CRLF,$TMP0,$TMP1,$TAB,$TMP2,$TAB
6757 071126  001246  001313  042407          .WORD   $TMP6,$CRLF,MS22,MS21,$CRLF,$TMP3,$CRLF
6758 071144  042437  042350  001313          .WORD   MS23,MS21,$CRLF,$TMP4,0
6759 071156  001232  001234  001313  DT46:   .WORD   $TMP0,$TMP1,$CRLF,MS25,MS30,$TMP2,MS31,$TMP3
6760 071176  042645  001242  042654          .WORD   MS32,$TMP4,MS33,$TMP5,MS34,$TMP6,$CRLF,MS26
6761 071216  042627  001250  042636          .WORD   MS30,$TMP7,MS31,$TMP10
6762 071226  042645  001254  042654          .WORD   MS32,$TMP11,MS33,$TMP12,MS34,$TMP13,0
6763 071244  001232  001234  040446  DT47:   .WORD   $TMP0,$TMP1,$TAB,$TMP2,$CRLF,MS12,MS7,$TMP3,MS10
6764 071266  001242  001313  042062          .WORD   $TMP4,$CRLF,MS13,0
6765         070650                  DT50=DT34
6766 071276  001232  001234  040446  DT51:   .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TAB,$TMP3
6767 071312  001313  042561  042620          .WORD   $CRLF,MS25,MS27,$TMP4,$CRLF,MS26,MS27,$TMP5,0
6768         071244                  DT52=DT47
6769 071334  001232  001234  040446  DT53:   .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TAB,$TMP3
6770 071350  001242  000000                  .WORD   $TMP4,0
6771 071354  001232  001234  040446  DT54:   .WORD   $TMP0,$TMP1,$TAB,$TMP2,$CRLF,MS1,MS21,$CRLF,$TMP3
6772 071376  001313  041622  042350          .WORD   $CRLF,MS2,MS21,$CRLF,$TMP3,0
6773         071244                  DT55=DT47
6774         071334                  DT56=DT53
6775         071354                  DT57=DT54
6776         071334                  DT60=DT53
6777         071354                  DT61-DT54
6778         071354                  DT62=DT54
6779         071354                  DT63=DT54
6780 071412  001232  001234  040446  DT64:   .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TAB,$TMP3
6781 071426  001242  000000                  .WORD   $TMP4,0
6782         071412                  DT65 DT64
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6783            071354                          DT66-DT54
6784            070244                          DT67=DT21
6785 071432     001232  001234  040446  DT70:   .WORD   $TMP0,$TMP1,$TAB,$TMP2,$CRLF,MS6,$CRLF,MS7,$TMP5
6786 071454     041764  001246  001313          .WORD   MS10,$TMP6,$CRLF,MS11,$CRLF,MS7,$TMP5,MS10,$TMP7,0
6787            071432                          DT71=DT70
6788 071500     001232  001234  040446  DT72:   .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TAB,$TMP3,$TMP4,0
6789            071354                          DT73=DT54
6790            070244                          DT74=DT21
6791            071432                          DT75=DT70
6792            071432                          DT76=DT70
6793            071500                          DT77=DT72
6794            071354                          DT100=DT54
6795            071432                          DT101=DT70
6796            071432                          DT102=DT71
6797            071432                          DT103=DT70
6798            071354                          DT104=DT54
6799            071432                          DT105=DT70
6800            071500                          DT106=DT72
6801            071432                          DT107=DT70
6802            071354                          DT110=DT54
6803 071520     001232  001234  040446  DT111:  .WORD   $TMP0,$TMP1,$TAB,$TMP2,0
6804            071520                          DT112=DT111
6805            071520                          DT113=DT111
6806            071520                          DT114=DT111
6807            071520                          DT115=DT111
6808            071520                          DT116=DT111
6809            067764                          DT117=DT3
6810            067764                          DT120=DT3
6811            071244                          DT121=DT47
6812            070650                          DT122=DT34
6813            071276                          DT123=DT51
6814 071532     001232  001234  040446  DT124:  .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TAB,$TMP3,$TMP4,$CRLF
6815 071552     041732  001313  041750          .WORD   MS6,$CRLF,MS7,$TMP5,MS10,$TMP6,$CRLF
6816 071570     041777  001313  041750          .WORD   MS11,$CRLF,MS7,$TMP5,MS10,$TMP7,$CRLF,MS37,$CRLF,$TMP10,0
6817            071532                          DT125=DT124
6818            071520                          DT126=DT111
6819            071520                          DT127=DT111
6820            067764                          DT130=DT3
6821 071616     001232  001234  040446  DT131:  .WORD   $TMP0,$TMP1,$TAB,$TMP2,$CRLF,MS37,$CRLF,$TMP3
6822 071636     001313  042724  001313          .WORD   $CRLF,MS40,$CRLF,$TMP4,$CRLF,MS415,$CRLF,$TMP5,0
6823            071616                          DT132=DT131
6824 071660     001232  001234  040446  DT133:  .WORD   $TMP0,$TMP1,$TAB,$TMP2,$CRLF,MS41,$CRLF,$TMP3
6825 071700     001313  043004  001313          .WORD   $CRLF,MS42,$CRLF,$TMP4,$CRLF,MS43,$CRLF,$TMP5
6826 071720     001313  043037  001313          .WORD   $CRLF,MS44,$CRLF,$TMP6,0
6827            071660                          DT134=DT133
6828            071660                          DT135=DT133
6829            071660                          DT136=DT133
6830 071732     001232  001234  040446  DT137:  .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TMP10,$TAB,$TMP11,0
6831            071732                          DT140=DT137
6832            071732                          DT141=DT137
6833            071732                          DT142=DT137
6834            071660                          DT143=DT133
6835            071660                          DT144=DT133
6836            071732                          DT145=DT137
6837            071732                          DT146=DT137
6838            071660                          DT147=DT133
6839            071660                          DT150=DT133
```

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6840            071732                          DT151=DT137
6841            071660                          DT152=DT133
6842            071732                          DT153=DT137
6843 071752     001232  001234  040446  DT154:  .WORD   $TMP0,$TMP1,$TAB,$TMP2,0
6844            071752                          DT155=DT154
6845            071660                          DT156=DT133
6846            071660                          DT157=DT133
6847            071660                          DT160=DT133
6848            071660                          DT161=DT133
6849            071660                          DT162=DT133
6850            071660                          DT163=DT133
6851            067764                          DT164=DT3
6852            067764                          DT165=DT3
6853            071660                          DT166=DT133
6854            071660                          DT167=DT133
6855            071660                          DT170=DT133
6856            071660                          DT171=DT133
6857            071660                          DT172=DT133
6858            071660                          DT173=DT133
6859            071660                          DT174=DT133
6860            071660                          DT175=DT133
6861            071660                          DT176=DT133
6862            071660                          DT177=DT133
6863            071660                          DT200=DT133
6864            071660                          DT201=DT133
6865            071660                          DT202=DT133
6866            071660                          DT203=DT133
6867            071660                          DT204=DT133
6868            067764                          DT205=DT3
6869            071660                          DT206=DT133
6870            071660                          DT207=DT133
6871            071660                          DT210=DT133
6872 071764     001232  001234  040446  DT211:  .WORD   $TMP0,$TMP1,$TAB,$TMP2,$TAB,$TMP3,0
6873 072002     001232  001234  040446  DT212:  .WORD   $TMP0,$TMP1,$TAB,$TMP2,0
6874            072002                          DT213=DT212
6875
6876
6877
6878
6879                                    ;12345
6880            000001                          .END
```

```
AADATO  026222        ADDW12= 000000        A6      004512        BERR1   004742        CCP3    030010
AADONE  026322        ADDW13= 000000        A7      004536        BIT0  = 000001        CCP4    030020
AAERR0  025654        ADDW14= 000000        BBDATO  031264        BIT00 = 000001        CCP5    030030
AAERR1  025742        ADDW15= 000000        BBDONE  031414        BIT01 = 000002        CCP6    030040
AAERR2  025776        ADDW2 = 000000        BBER0   030752        BIT02 = 000004        CCP7    030050
AAERR3  026032        ADDW3 = 000000        BBER1   031012        BIT03 = 000010        CC1     026326
AAERR4  026042        ADDW4 = 000000        BBER10  030772        BIT04 = 000020        CC10    026542
AAERR5  026076        ADDW5 = 000000        BBER11  031026        BIT05 = 000040        CC11    026552
AAERR6  026132        ADDW6 = 000000        BBER2   031050        BIT06 = 000100        CC12    026560
AAERR7  026166        ADDW7 = 000000        BBER3   031066        BIT07 = 000200        CC13    026572
AAER10  025750        ADDW8 = 000000        BBER4   031122        BIT08 = 000400        CC14    026627
AAPAT0  026232        ADDW9 = 000000        BBER40  031136        BIT09 = 001000        CC15    026646
AAPAT1  026242        ADEVCT= 000000        BBER5   031156        BIT1  = 000002        CC16    026666
AAPAT2  026252        ADEVM = 000000        BBER6   031174        BIT10 = 002000        CC17    026676
AAPAT3  026262        ADONE   004654        BBER7   031230        BIT11 = 004000        CC18    026704
AAPAT4  026272        AENV  = 000000        BBER8   031246        BIT12 = 010000        CC19    026716
AAPAT5  026302        AENVM = 000000        BBPAT0  031274        BIT13 = 020000        CC2     026356
AAPAT6  026312        AERFLG  004544        BBPAT1  031304        BIT14 = 040000        CC20    026746
AA1     025274        AERR1   004546        BBPAT2  031314        BIT15 = 100000        CC21    026772
AA10    025410        AERR2   004560        BBPAT3  031324        BIT2  = 000004        CC22    027012
AA11    025440        AERR3   004612        BBPAT4  031334        BIT3  = 000010        CC23    027022
AA12    025442        AFATAL= 000000        BBPAT5  031344        BIT4  = 000020        CC24    027030
AA13    025460        AMADR1= 000000        BBPAT6  031354        BIT5  = 000040        CC25    027042
AA14    025500        AMADR2= 000000        BBP10   031374        BIT6  = 000100        CC26    027072
AA15    025520        AMADR3= 000000        BBP11   031404        BIT7  = 000200        CC27    027114
AA16    025526        AMADR4= 000000        BBP7    031364        BIT8  = 000400        CC28    027134
AA17    025532        AMAMS1= 000000        BB1     030114        BIT9  = 001000        CC29    027144
AA2     025332        AMAMS2= 000000        BB10    030270        BPTVEC= 000014        CC3     026400
AA20    025536        AMAMS3= 000000        BB11    030310        B1      004666        CC30    027152
AA21    025540        AMAMS4= 000000        BB12    030320        B2      004670        CC31    027164
AA22    025572        AMSGAD= 000000        BB13    030326        B3      004706        CC32    027214
AA23    025574        AMSGLG= 000000        BB14    030340        CCDATO  027750        CC33    027236
AA24    025614        AMSGTY= 000000        BB15    030370        CCDONE  030110        CC34    027256
AA25    025634        AMTYP1= 000000        BB16    030414        CCER0   027312        CC35    027266
AA26    025642        AMTYP2= 000000        BB17    030424        CCER1   027346        CC36    027274
AA27    025646        AMTYP3= 000000        BB2     030152        CCER10  027660        CC37    027306
AA3     025334        AMTYP4= 000000        BB20    030436        CCER11  027676        CC4     026420
AA4     025352        APASS = 000000        BB21    030466        CCER12  027714        CC5     026430
AA5     025372        APRIOR= 000000        BB22    030512        CCER13  027732        CC6     026436
AA6     025400        APTCSU= 000040        BB23    030532        CCER2   027404        CC7     026450
AA7     025406        APTENV= 000001        BB24    030542        CCER22  027420        CC8     026500
ABASE = 000000        APTSIZ= 000200        BB25    030550        CCER3   027442        CC9     026522
ACDW1 = 000000        APTSPO= 000100        BB26    030562        CCER4   027460        CDONE   005662
ACDW2 = 000000        ASWREG= 000000        BB27    030612        CCER44  027474        CERR1   005416
ACPUOP= 000000        ATESTN= 000000        BB3     030156        CCER5   027516        CERR2   005514
AC0   =%000000        AUNIT = 000000        BB30    030634        CCER50  027362        CERR3   005614
AC1   =%000001        AUSWR = 000000        BB31    030644        CCER55  027532        CERR4   005636
AC2   =%000002        AVECT1= 000000        BB32    030656        CCER6   027552        CFCC1   041400
AC3   =%000003        AVECT2= 000000        BB33    030706        CCER7   027606        CKSWR = 104406
AC4   =%000004        A05     004462        BB34    030730        CCER8   027624        CNT   = 000214
AC5   =%000005        A1      004334        BB35    030740        CCER90  027330        CPC     005660
AC6   =%000006        A11     004334        BB4     030174        CCP0    027760        CPSPUR  040266
AC7   =%000007        A12     004350        BB5     030204        CCP1    027770        CPTWO   040304
ADDW0 = 000000        A2      004406        BB6     030216        CCP10   030060        CR    = 000015
ADDW1 = 000000        A3      004412        BB7     030246        CCP11   030070        CRLF  = 000200
ADDW10= 000000        A4      004460        BDONE   004756        CCP12   030100        C1      004772
ADDW11= 000000        A5      004464        BERR    004712        CCP2    030000        C15     005020
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C2      005040    DD24    032142    DF133   067625    DF23    067014    DH105 = 063654
C25     005054    DD25    032162    DF134 = 067625    DF24    067024    DH106 = 064546
C3      005076    DD26    032172    DF135 = 067625    DF25    067033    DH107 = 064504
C35     005126    DD27    032200    DF136 = 067625    DF26    067057    DH11  = 063654
C4      005150    DD3     031472    DF137   067651    DF27    067104    DH110 = 065156
C45     005162    DD30    032212    DF14  = 066675    DF3     066665    DH111 = 064504
C5      005204    DD31    032242    DF140 = 067651    DF30    067124    DH112   065354
C55     005232    DD32    032264    DF141 = 067651    DF31  = 067057    DH113 = 064504
C6      005252    DD33    032304    DF142 = 067651    DF32  = 067104    DH114 = 065354
C65     005266    DD34    032314    DF143 = 067625    DF33    067140    DH115   065573
C7      005310    DD35    032322    DF144 = 067625    DF34    067166    DH116 = 065573
C75     005340    DD36    032340    DF145 = 067651    DF35  = 067166    DH117 = 063774
C8      005362    DD37    032370    DF146 = 067651    DF36  = 067166    DH12  = 000000
C85     005374    DD38    032412    DF147 = 067625    DF37  = 067166    DH120   066057
DDDATO  033260    DD39    032432    DF15  = 066675    DF4   = 066665    DH121 = 063654
DDDONE  033410    DD4     031512    DF150 = 067625    DF40    067212    DH122 = 065104
DDER0   032472    DD40    032442    DF151 = 067651    DF41    067240    DH123 = 065104
DDER1   032510    DD41    032450    DF152 = 067625    DF42    067254    DH124 = 063774
DDER10  033126    DD42    032466    DF153 = 067651    DF43  = 067254    DH125 = 063774
DDER11  033164    DD5     031522    DF154   067661    DF44    067302    DH126 = 063654
DDER12  033222    DD6     031530    DF155 = 067661    DF45    067325    DH127 = 065156
DDER2   032546    DD7     031546    DF156 = 067625    DF46    067352    DH13  = 000000
DDER3   032604    DD8     031576    DF157 = 067625    DF47    067404    DH130 = 066057
DDER4   032642    DERR1   006004    DF16    066757    DF5     066675    DH131 = 065156
DDER5   032700    DERR2   006100    DF160 = 067625    DF50    067421    DH132 = 065156
DDER6   032736    DF1     066645    DF161   067665    DF51    067445    DH133   066147
DDER7   032774    DF10  = 066675    DF162 = 067625    DF52  = 067404    DH134 = 066147
DDER8   033032    DF100 = 067472    DF163 = 067665    DF53    067463    DH135 = 066147
DDER9   033070    DF101 = 067517    DF164 = 066665    DF54    067472    DH136 = 066147
DDISP - 177570    DF102 = 067541    DF165 = 066665    DF55  = 067404    DH137   066257
DDONE   006124    DF103 = 067517    DF166 = 067625    DF56  = 067463    DH14  = 063654
DDP0    033270    DF104 = 067472    DF167 = 067625    DF57  = 067472    DH140 = 066257
DDP1    033300    DF105 = 067517    DF17  = 066665    DF6   = 066675    DH141 = 066257
DDP2    033310    DF106 = 067541    DF170 = 067665    DF60  = 067463    DH142 = 066257
DDP3    033320    DF107 = 067517    DF171 = 067665    DF61  = 067472    DH143 = 066147
DDP4    033330    DF11  = 066675    DF172 = 067625    DF62  = 067472    DH144 = 066147
DDP5    033340    DF110 = 067472    DF173 = 067625    DF63  = 067472    DH145 = 066257
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DDP7    033360    DF112 = 067550    DF175 = 067665    DF65  = 067510    DH147 = 065156
DDP8    033370    DF113 = 067550    DF176 = 067625    DF66  = 067472    DH15  = 063654
DDP9    033400    DF114 = 067550    DF177 = 067625    DF67  = 066776    DH150   066447
DD1     031420    DF115 = 067550    DF2     066655    DF7   = 066675    DH151 = 066257
DD10    031620    DF116 = 067550    DF20    066766    DF70    067517    DH152 = 066147
DD11    031630    DF117 = 066665    DF200 = 067625    DF71  = 067517    DH153 = 066257
DD12    031646    DF12    066711    DF201 = 067625    DF72    067541    DH154   066540
DD13    031676    DF120 = 066665    DF202 = 067625    DF73  = 067472    DH155 = 066540
DD14    031720    DF121 = 067404    DF203 = 067625    DF74  = 066776    DH156 = 065156
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DD17    031776    DF124   067554    DF206 = 067625    DF77  = 067541    DH160 = 065156
DD18    032020    DF125 = 067554    DF207 = 067625    DH1     063304    DH161 = 065156
DD19    032040    DF126 = 067550    DF21    066776    DH10  = 063654    DH162 = 065156
DD2     031450    DF127 = 067550    DF210 = 067625    DH100 = 065156    DH163 = 065156
DD20    032050    DF13    066743    DF211   067711    DH101 = 063654    DH164 = 063774
DD21    032056    DF130 = 066665    DF212 = 067711    DH102 = 064546    DH165 = 063774
DD22    032070    DF131   067605    DF213   067711    DH103 = 064504    DH166 = 065156
DD23    032120    DF132 - 067605    DF22    067002    DH104 = 065156    DH167 - 065156
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DH17    063774          DH6    = 063654          DT136 = 071660          DT26    070422          EDONE   006264
DH170 = 065156          DH60   = 064546          DT137   071732          DT27    070476          EEDATO  034102
DH171 = 065156          DH61   = 065156          DT14   = 070040          DT3     067764          EEDONE  034164
DH172 = 065156          DH62   = 065156          DT140 = 071732          DT30    070540          EEER0   033674
DH173 = 065156          DH63   = 065156          DT141 = 071732          DT31  = 070422          EEER1   033712
DH174 = 065156          DH64     065266          DT142 = 071732          DT32  = 070476          EEER2   033750
DH175 = 065156          DH65     065217          DT143 = 071660          DT33    070572          EEER3   034006
DH176 = 065156          DH66   = 065156          DT144 = 071660          DT34    070650          EEER4   034044
DH177 = 065156          DH67   = 063654          DT145 = 071732          DT35  = 070650          EEP0    034112
DH2     063374          DH7    = 063654          DT146 = 071732          DT36  = 070650          EEP1    034124
DH20    064064          DH70   = 063654          DT147 = 071660          DT37  = 070650          EEP2    034134
DH200 = 065156          DH71   = 064504          DT15   = 070040          DT4   = 067764          EEP3    034144
DH201 = 065156          DH72   = 064546          DT150 = 071660          DT40  = 070572          EEP4    034154
DH202 = 065156          DH73   = 065156          DT151 = 071732          DT41    070722          EERR0   006202
DH203 = 065156          DH74   = 063654          DT152 = 071660          DT42    070754          EERR1   006220
DH204 = 065156          DH75   = 063654          DT153 = 071732          DT43  = 070754          EERR2   006234
DH205 - 063774          DH76   = 064504          DT154   071752          DT44    071032          EE1     033414
DH206   065156          DH77   = 064546          DT155 = 071752          DT45    071102          EE10    033634
DH207 = 065156          DISPLA   001142          DT156 = 071660          DT46    071156          EE11    033644
DH21  = 063654          DISPRE   000174          DT157 = 071660          DT47    071244          EE12    033652
DH210 = 065156          DPAT3    016432          DT16    070202          DT5     070006          EE13    033670
DH211   066600          DSWR   = 177570          DT160 = 071660          DT50  = 070650          EE2     033444
DH212 = 063654          DT1      067720          DT161 = 071660          DT51    071276          EE3     033466
DH213 - 063654          DT10   = 070040          DT162 = 071660          DT52  = 071244          EE4     033506
DH22    064152          DT100  = 071354          DT163 = 071660          DT53    071334          EE5     033516
DH23    064207          DT101  = 071432          DT164 = 067764          DT54    071354          EE6     033524
DH24    064345          DT102  = 071432          DT165 = 067764          DT55  = 071244          EE7     033542
DH25    064504          DT103  = 071432          DT166 = 071660          DT56  = 071334          EE8     033572
DH26    064546          DT104  = 071354          DT167 = 071660          DT57  - 071354          EE9     033614
DH27  = 064546          DT105  = 071432          DT17   = 067764          DT6     070040          EMTVEC= 000030
DH3     063467          DT106  = 071500          DT170 = 071660          DT60  = 071334          EM1     043061
DH30  - 000000          DT107  = 071432          DT171 = 071660          DT61  = 071354          EM10  = 043267
DH31  = 064546          DT11   = 070040          DT172 = 071660          DT62  = 071354          EM100   052171
DH32  = 064546          DT110  = 071354          DT173 = 071660          DT63  = 071354          EM101   052231
DH33    064634          DT111    071520          DT174 = 071660          DT64    071412          EM102   052355
DH34  = 064634          DT112  = 071520          DT175 = 071660          DT65  = 071412          EM103   052427
DH35  - 064634          DT113  = 071520          DT176 = 071660          DT66  = 071354          EM104   052532
DH36  = 064634          DT 14  = 071520          DT177 = 071660          DT67  - 070244          EM105   052573
DH37  = 064634          DT115  = 071520          DT2     067742          DT7   = 070040          EM106   052720
DH4     063560          DT116  = 071520          DT20    070222          DT70    071432          EM107   052773
DH40  = 064634          DT117  = 067764          DT200 = 071660          DT71  = 071432          EM11    043410
DH41  = 000000          DT12     070062          DT201 - 071660          DT72    071500          EM110   053077
DH42    064737          DT120  = 067764          DT202 = 071660          DT73  = 071354          EM111   053141
DH43  = 064737          DT121  = 071244          DT203 = 071660          DT74  = 070244          EM112 = 053141
DH44  - 000000          DT122  = 070650          DT204 = 071660          DT75  = 071432          EM113   053243
DH45    065041          DT123  = 071276          DT205 - 067764          DT76  - 071432          EM114 = 053243
DH46    065060          DT124    071532          DT206 = 071660          DT77  = 071500          EM115 = 053141
DH47  = 065041          DT125  = 071532          DT207 = 071660          D1      005710          EM116 = 053243
DH5     063654          DT126  = 071520          DT21    070244          D10     006112          EM117   053345
DH50    065104          DT127  = 071520          DT210 = 071660          D2      005734          EM12  = 000000
DH51  - 065104          DT13     070150          DT211   071764          D3      005736          EM120   053501
DH52    063654          DT130  = 067764          DT212   072002          D4      005742          EM121   053635
DH53  = 064546          DT131    071616          DT213 = 072002          D5      005754          EM122   053754
DH54    065156          DT132  = 071616          DT22    070256          D6      005770          EM123   054053
DH55  - 063654          DT133    071660          DT23    070304          D7      006000          EM124   054114
DH56    064546          DT134    071660          DT24    070326          D8      006050          EM125   054207
DH57    065156          DT135    071660          DT25    070352          D9      006062          EM126   054277
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EM140 = 055160
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EM142 = 055256
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EM144   055350
EM145 = 055315
EM146 = 055350
EM147   055403
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EM153 = 055435
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EM156   056154
EM157   056371
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EM160   056610
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EM162   057222
EM163   057267
EM164   057334
EM165   057401
EM166   057446
EM167   057556
EM17    044010
EM170   060015
EM171   060125
EM172   060364
EM173   060623
EM174   061062
EM175   061321
EM176   061560
EM177   061715
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EM20    044243
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EM201   062207
EM202   062344
EM203   062501
EM204   062636
EM205   062773
EM206   063040
EM207   063105
EM21    044421
EM210   063227
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EM213 = 043355
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EM47    046400
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EM51    046614
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EM55    047237
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EM6     043323
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EM62    050062
EM63    050254
EM64    050446
EM65  = 050446
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EM67    050645
EM7     043355
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EM71    051221
EM72    051323
EM73    051377
EM74    051437
EM75    051670
EM76    052013
EM77    052115
ERM10   035550
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ERRVEC= 000004
ERTYPE  037602
ERT1    037764
ERT2    040202
ERT3    040206
ERT4    040216
ERT5    040230
E1      006140
E2      006154
E3      006154
E4      006156
FDAT10  010074
FDAT11  010076
FDAT12  010100
FDAT13  010102
FDAT14  010104
FDAT15  010106
FDAT16  010110
FDAT17  010112
FDAT00  010116
FDAT01  010120
FDAT02  010122
FDAT03  010124
FDAT04  010126
FDAT05  010130
FDAT06  010132
FDAT07  010134
FDONE   010160
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FERR0   006666
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FERR10  007504
FERR11  007540
FERR2   007022
FERR20  007560
FERR21  007676
FERR25  007726
FERR26  010044
FERR3   007062
FERR4   007054
FERR5   007160
FERR6   007214
FERR7   007350
FER2    007026
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FFDONE  034542
FFER0   034352
FFER1   034366
FFER2   034424
FFP0    034472
FFP1    034502
FFP2    034512
FFP3    034522
FFP4    034532
FF1     034170
FF10    034340
FF11    034350
FF2     034220
FF3     034242
FF4     034250
FF5     034260
FF6     034310
FF7     034332
FPSMS   040565
FPSPUR  040234
FPVECT= 000244
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FXDAT3  010146
FXDAT4  010150
FXDAT5  010152
FXDAT6  010154
FXDAT7  010156
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F10     006502
F11     006504
F12     006522
F13     006554
F135    006534
F14     006564
F15     006574
F16     006604
F17     006614
F2      006322
F20     006624
F21     006634
F22     006644
F23     006662
F3      006342
F4      006344
F5      006362
F6      006436
F7      006462
GADR    014164
GAND0   014134
GAND1   014136
GAND2   014140
GAND3   014142
GCMP    013670
GDAT00  014154
GDAT01  014156
GDAT02  014160
GDAT03  014162
GDONE   014166
GERR1   013716
GFLAG1  014110
GFLAG2  014112
GOR0    014144
GOR1    014146
GOR2    014150
GOR3    014152
GPAT00  014114
GPAT01  014116
GPAT02  014120
GPAT03  014122
GPAT10  014124
GPAT11  014126
GPAT12  014130
GPAT13  014132
GRESET  013650
GSETUP  013572
GSUM    014006
GS1     013622
GTSWR = 104405
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G11     012174
G12     012262
G13     012314
G14     012316
G15     012404
G16     012436
G17     012440
G2      011726
G20     012526
G21     012560
G22     012562
G23     012650
G24     012702
G25     012704
G26     012772
G27     013024
G3      011730
G30     013026
G31     013114
G32     013146
G33     013150
G34     013236
G35     013270
G36     013272
G37     013360
G4      012016
G40     013412
G41     013414
G42     013502
G43     013534
G44     013536
G5      012050
G6      012052
G7      012140
HADR    014716
HA1R    014772
HA1W    014722
HA2R    015002
HA2W    014732
HA3R    015012
HA3W    014742
HA4R    015022
HA4W    014752
HA5R    015032
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SYMBOL TABLE

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HCLR1   014656          I13     010376          KERR1   016322          MNUM0   042244          M6      017052
HCMP    014610          I14     010440          KERR2   016346          MNUM1   042252          M7      017062
HCMP1   014630          I15     010442          KPAT0   016424          MNUM2   042257          M8      017072
HCMP2   014640          I16     010444          KPAT1   016426          MNUM3   042264          M9      017102
HDAT1   015042          I17     010462          KPAT2   016430          MNUM4   042273          NDATI0  020004
HDAT2   015052          I2      010204          K1      016150          MNUM5   042301          NDATI1  020006
HDAT3   015062          I20     010522          K10     016276          MPAT10  017256          NDATI2  020010
HDAT4   015072          I21     010536          K2      016174          MPAT11  017260          NDATI3  020012
HDAT5   015102          I22     010542          K3      016176          MPAT12  017262          NDAT00  017742
HDONE   015112          I23     010556          K4      016200          MPAT13  017264          NDAT01  017744
HERROR  014664          I3      010252          K5      016234          MPAT20  017266          NDAT02  017746
HFLAG   014720          I4      010254          K6      016242          MPAT21  017270          NDAT03  017750
HSTD    014532          I5      010256          K7      016254          MPAT22  017272          NDONE   020014
HT    = 000011          I6      010302          LDATI0  016734          MPAT23  017274          NERR0   017504
H1      014174          I7      010316          LDATI1  016736          MS1     041610          NERR1   017604
H10     014436          IBUF0   016102          LDATI2  016740          MS10    041764          NERR10  017536
H11     014470          IBUF1   016104          LDATI3  016742          MS11    041777          NERR11  017550
H12     014522          IBUF2   016106          LDAT00  016746          MS12    042024          NERR2   017640
H2      014214          IBUF3   016110          LDAT01  016750          MS13    042062          NERR20  017612
H3      014224          IDATI0  016112          LDAT02  016752          MS14    042077          NERR3   017650
H4      014276          IDATI1  016114          LDAT03  016754          MS15    042165          NERR4   017660
H5      014320          IDATI2  016116          LDONE   016756          MS16    042212          NERR5   017670
H6      014352          IDATI3  016120          LD1     041276          MS17    042217          NERR6   017714
H7      014404          IDAT00  016122          LD2     041326          MS2     041622          NOOP1   040647
IDATI0  011012          IDAT0   016132          LERR1   016570          MS20    042307          NOOP10  041126
IDATI1  011014          IDAT01  016124          LERR2   016642          MS21    042350          NOOP11  041217
IDATI2  011016          IDAT02  016126          LERR3   016614          MS22    042407          NOOP15  040676
IDATI3  011020          IDAT03  016130          LF    = 000012          MS23    042437          NOOP2   040774
IDAT00  011002          IDAT1   016134          LFIEX1  040453          MS24    042466          NOOP3   041011
IDAT01  011004          IDAT2   016136          LFIEX2  040523          MS25    042561          NOOP4   041023
IDAT02  011006          IDAT3   016140          LFPS1   041263          MS26    042603          NOOP5   041040
IDAT03  011010          IDONE   016142          LOOP    004270          MS27    042620          NOOP6   041066
IDONE   011022          IERR0   015762          LPAT10  016712          MS3     041627          NOOP7   041106
IERR0   010562          IERR1   016030          LPAT11  016714          MS30    042627          NPAT10  017774
IERR1   010644          IERR2   016054          LPAT12  016716          MS31    042636          NPAT11  017776
IERR2   010664          J1      015654          LPAT13  016720          MS32    042645          NPAT12  020000
IERR25  010706          J10     016002          LPAT20  016722          MS33    042654          NPAT13  020002
IERR3   010736          J2      015700          LPAT21  016724          MS34    042663          NPAT20  017762
IERR4   010712          J3      015702          LPAT22  016726          MS35    042672          NPAT21  017764
ILLMS   041542          J4      015704          LPAT23  016730          MS36    042677          NPAT22  017766
ILL1    041436          J5      015740          LPERR - 104413          MS37    042706          NPAT23  017770
ILL2    041501          J6      015746          L1      016442          MS4     041656          NULL    040445
IOTVEC= 000020          J7      015760          L2      016502          MS40    042724          N1      017312
IPAT10  010762          KBUF0   016404          L3      016504          MS41    042760          N10     017444
IPAT11  010764          KBUF1   016406          L4      016506          MS415   042740          N11     017454
IPAT12  010766          KBUF2   016410          L5      016556          MS42    043004          N12     017456
IPAT13  010770          KBUF3   016412          L6      016564          MS43    043022          N13     017472
IPAT20  010772          KDATI0  016374          MDAT00  017276          MS44    043037          N14     017502
IPAT21  010774          KDATI1  016376          MDAT01  017300          MS5     041670          N2      017336
IPAT22  010776          KDATI2  016400          MDAT02  017302          MS6     041732          N3      017340
IPAT23  011000          KDATI3  016402          MDAT03  017304          MS7     041750          N4      017342
I1      010166          KDAT00  016414          MDONE   017306          M1      016762          N5      017360
I10     010350          KDAT01  016416          MERR0   017132          M15     017002          N6      017370
I105    010356          KDAT02  016420          MERR1   017170          M2      017006          N7      017400
I106    010352          KDAT03  016422          MERR2   017104          M3      017010          N8      017416
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ODATI1  020512
ODATI2  020514
ODATI3  020516
ODATO0  020446
ODATO1  020450
ODATO2  020452
ODATO3  020454
ODONE   020520
OERR0   020210
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OERR10  020242
OERR11  020254
OERR2   020344
OERR20  020316
OERR3   020354
OERR4   020364
OERR5   020374
OERR6   020420
OPAT10  020500
OPAT11  020502
OPAT12  020504
OPAT13  020506
OPAT20  020464
OPAT21  020466
OPAT22  020470
OPAT23  020472
OPAT24  020474
O1      020020
O10     020150
O11     020160
O12     020162
O13     020176
O14     020206
O2      020044
O3      020046
O4      020050
O5      020066
O6      020076
O7      020106
O8      020122
O9      020134
PDATI0  021154
PDATI1  021156
PDATI2  021160
PDATI3  021162
PDATO0  021164
PDATO1  021166
PDATO2  021170
PDATO3  021172
PDONE   021174
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PERR10  020662
PERR11  020672
PERR12  020710
PERR13  020726
PERR14  020744
PERR15  020762
PERR16  020772
PERR17  021000
PERR2   021110
PERR20  021026
PERR21  021036
PERR22  021044
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PIRQVE= 000240
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PPAT11  021146
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PPAT13  021152
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PR1     = 000040
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PR3     = 000140
PR4     - 000200
PR5     - 000240
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PR7     = 000340
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PSW     - 177776
PWRVEC= 000024
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P3      = 020550
P4      020552
P5      020574
P6      020616
P7      020626
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QPAT12  021640
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QPAT20  021644
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QPAT22  021650
QPAT23  021652
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Q2      021222
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RESVEC= 000010
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SDATO2  015642
SDATO3  015644
SDONE   015646
SERR0   015326
SERR1   015536
SERR10  015346
SERR15  015426
SERR2   015466
SERR20  015446
SERR3   015512
SERR4   015404
SERR5   015570
SERR6   015500
SERR7   015524
SETD1   041414
SETF1   041406
SETI1   041422
SETL1   041430
SPACE   040450
SPAT10  015626
SPAT11  015630
SPAT12  015632
SPAT13  015634
STACK   001100
START   003606
STFS1   041337
STKLMT= 177774
STST1   041467
ST1     041352
ST2     041367
SWR     001140
SWREG   000176
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SW01    = 000002
SW02    = 000004
SW03    = 000010
SW04    = 000020
SW05    = 000040
SW06    = 000100
SW07    = 000200
SW08    - 000400
SW09    - 001000
SW1     = 000002
SW10    - 002000
SW11    = 004000
SW12    = 010000
SW13    = 020000
SW14    = 040000
SW15    = 100000
SW2     = 000004
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SW6     - 000100
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SW8     - 000400
SW9     - 001000
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S10     015264
S11     015310
S12     015320
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S4      015160
S5      015204
S6      015214
S7      015222
S8      015256
S9      015260
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TBITVE= 000014
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TDATI1  011622
TDATI2  011624
TDATI3  011626
TDATO0  011610
TDATO1  011612
TDATO2  011614
TDATO3  011616
TDONE   011630
TERR0   011376
TERR1   011460
TERR2   011500
TERR25  011514
TERR3   011544
TERR4   011526
TKVEC = 000060
TPAT10  011570
TPAT11  011572
TPAT12  011574
TPAT13  011576
TPAT20  011600
TPAT21  011602
TPAT22  011604
TPAT23  011606
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TRAPVE= 000034
TRTVEC= 000014
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TST10   011024
TST11   011632
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TST13   015114
TST14   015650
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TST16   016436
TST17   016760
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TST23   021176
TST24   021676
TST25   023012
TST26   023570
TST27   024364
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TST30   024770
TST31   025272
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TST33   030112
TST34   031416
TST35   033412
TST36   034166
TST37   034542
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TST5    006126
TST6    006266
TST7    010162
TYPE    = 104401
TYPOC   = 104402
TYPON   = 104404
TYPOS   = 104403
T1      011026
T10     011170
T105    011176
T11     011200
T12     011202
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T15	011262	U16	022440	x11	024000	ZPAT03	025246	$DEVCT	001326		
T16	011264	U2	022010	x12	024034	ZPAT10	025250	$DEVM	001374		
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T21	011356	U6	022204	x16	024136	ZPAT20	025260	$ENULL	035030		
T22	011360	U7	022236	x17	024162	ZPAT21	025262	$ENV	001336		
T23	011372	WDAP00	023556	x2	023626	ZPAT22	025264	$ENVM	001337		
T3	011114	WDAT01	023560	x20	024170	ZPAT23	025266	$EOP	034542		
T4	011116	WDAT02	023562	x21	024204	ZTMP1	025224	$EOPCT	034570		
T5	011120	WDAT03	023564	x3	023652	ZTMP2	025226	$ERFLG	001103		
T6	011144	WDONE	023566	x4	023660	Z1	025012	$ERMAX	001115		
T7	011160	WPAT00	023546	x5	023676	Z2	025034	$ERROR	035314		
JDONE	023012	WPAT01	023550	x6	023732	Z3	025060	$ERRPC	001116		
UERR0	022456	WPAT02	023552	x7	023756	Z4	025066	$ERRTB	001442		
UERR1	022502	WPAT03	023554	YDAT00	024726	Z5	025100	$ERTTL	001112		
UERR10	022510	WSETUP	023514	YDAT01	024730	Z6	025132	$ESCAP	001304		
UERR11	022552	W1	023014	YDAT02	024732	$APTHD	003572	$ETABL	001336		
UERR2	022566	W10	023226	YDAT03	024734	$ATYC	036452	$ETEND	001442		
UERR20	022574	W11	023254	YDONE	024766	$ATY1	036426	$FATAL	001320		
UERR21	022636	W12	023304	YERR1	024566	$ATY3	036434	$FFLG	036672		
UERR3	022652	W13	023330	YERR2	024630	$ATY4	036444	$FILLC	001156		
UERR4	022702	W14	023344	YERR3	024672	$AUTOB	001134	$FILLS	001155		
UFLAG	022776	W15	023372	YFLAG	024716	$BASE	001372	$GDADR	001120		
UPAT00	022726	W16	023426	YPAT00	024736	$BDADR	001122	$GDDAT	001124		
UPAT01	022730	W17	023452	YPAT01	024740	$BDDAT	001126	$GET42	034726		
UPAT02	022732	W2	023044	YPAT02	024742	$BELL	001306	$GTSWR	036744		
UPAT03	022734	W20	023466	YPAT03	024744	$CDW1	001376	$HD	= 000003		
UPAT10	022736	W3	023070	YPAT10	024746	$CDW2	001400	$HIBTS	003572		
UPAT11	022740	W4	023106	YPAT11	024750	$CHARC	036174	$ICNT	001104		
UPAT12	022742	W5	023136	YPAT12	024752	$CKSWR	036674	$ILLUP	037574		
UPAT13	022744	W6	023172	YPAT13	024754	$CLR.T	034744	$INTAG	001135		
UPAT20	022746	W7	023216	YPAT20	024756	$CMTAG	001100	$ITEMB	001114		
UPAT21	022750	XAPT11	024344	YPAT21	024760	$CM1	= 000024	$LF	001314		
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UPAT30	022756	XDAT02	024326	YTMP1	024720	$CM4	= 000024	$LPADR	001106		
UPAT31	022760	XDAT03	024330	YTMP2	024722	$CNTLG	037303	$LPERR	001110		
UPAT32	022762	XDONE	024362	YTMP3	024724	$CNTLU	037276	$MADR1	001350		
UPAT33	022764	XERR1	024206	Y1	024414	$CPUOP	001344	$MADR2	001354		
UPAT40	022766	XERR2	024270	Y2	024436	$CRLF	001313	$MADR3	001360		
UPAT41	022770	XERR3	024234	Y3	024462	$DDW0	001402	$MADR4	001364		
UPAT42	022772	XERR4	024304	Y4	024500	$DDW1	001404	$MAIL	001316		
UPAT43	022774	XPAT00	024332	Y5	024540	$DDW10	001426	$MAMS1	001346		
UROM1	023004	XPAT01	024334	Y6	024542	$DDW11	001430	$MAMS2	001352		
UROM2	023006	XPAT02	024336	Y7	024556	$DDW12	001432	$MAMS3	001356		
UROM3	023010	XPAT03	024340	ZDAT00	025230	$DDW13	001434	$MAMS4	001362		
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UTMP2	023002	XPAT12	024346	ZDAT02	025234	$DDW15	001440	$MFLG	036670		
U0	021714	XPAT13	024350	ZDAT03	025236	$DDW2	001406	$MNEW	037321		
U1	021744	XPAT20	024352	ZDONE	025270	$DDW3	001410	$MSGAD	001332		
U10	022302	XPAT21	024354	ZERR1	025134	$DDW4	001412	$MSGLG	001334		
U11	022304	XPAT22	024356	ZERR2	025176	$DDW5	001414	$MSGTY	001316		
U12	022336	XPAT23	024360	ZFLAG	025222	$DDW6	001416	$MSWR	037310		
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CKFPAA0 FP11F FLTG PNT PRT A    MACRO M1111  26-SEP-79 09:38  PAGE 22-13
SYMBOL TABLE                                                        SEQ 0177

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$MTYP4  001363          $REG13  001210        $STUP  = 177777       $TMP15  001264        $TSTM   003576
$MXCNT  035312          $REG14  001212        $SVLAD  035242        $TMP16  001266        $TSTNM  001102
$NULL   001154          $REG15  001214        $SVPC  = 003572       $TMP17  001270        $TYPE   035646
$NWTST= 000001          $REG16  001216        $SWR   = 177400       $TMP2   001236        $TYPEC  036060
$OCNT   036422          $REG17  001220        $SWREG  001340        $TMP20  001272        $TYPEX  036176
$OMODE  036424          $REG2   001166        $SWRMK= 000000        $TMP21  001274        $TYPOC  036224
$OVER   035276          $REG20  001222        $SWRMS= 000200        $TMP22  001276        $TYPON  036240
$PASS   001324          $REG21  001224        $TAB    040446        $TMP23  001300        $TYPOS  036200
$PASTM  003600          $REG22  001226        $TBIT   035026        $TMP3   001240        $UNIT   001330
$PURAD  037556          $REG23  001230        $TERM  = 000030       $TMP4   001242        $UNITM  003602
$PURDN  037416          $REG3   001170        $TESTN  001322        $TMP5   001244        $USWR   001342
$PURMG  037552          $REG4   001172        $THE    040642        $TMP6   001246        $VECT1  001366
$PURUP  037470          $REG5   001174        $TIMES  001302        $TMP7   001250        $VECT2  001370
$QUES   001312          $REG6   001176        $TKB    001146        $TN    - 000037       $XTSTR  035046
$RDCHR  037156          $REG7   001200        $TKS    001144        $TPB    001152        $$GET4= 000001
$RDSZ  - 000001         $RESRE  035610        $TMP0   001232        $TPFLG  001157        $OFILL  036423
$REGAD  001160          $RTNAD  035024        $TMP1   001234        $TPS    001150        .LPER   040322
$REG0   001162          $RTRN   035020        $TMP10  001252        $TRAP   037332        .RSET   040330
$REG1   001164          $SAVRE  035552        $TMP11  001254        $TRAP2  037354        .$X    = 003572
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. ABS.  072014      000
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ERRORS DETECTED:  0

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DYNAMIC MEMORY:  20434 WORDS  ( 79 PAGES)
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CKFPAA0,CKFPAA0/NL:TOC/CRF/-SP CKFPAA0.MLB/ML,CKFPAA0.P11
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AADONE	026322	17-4653	17-4673	17-4685	17-4691	17-4699	17-4705	17-4711	17-4717	#17-4750
AAERR0	025654	15-4563	#17-4657							
AAERR1	025742	17-4584	#17-4680							
AAERR2	025776	17-4586	#17-4686							
AAERR3	026032	17-4616	#17-4692							
AAERR4	026042	17-4618	#17-4694							
AAERR5	026076	17-4620	#17-4700							
AAERR6	026132	17-4649	#17-4706							
AAERR7	026166	17-4651	#17-4712							
AAER10	025750	#17-4681	17-4693							
AAPAT0	026232	15-4564	17-4594	17-4628	17-4681	17-4687	17-4695	17-4701	17-4707	17-4713
		#17-4722								
AAPAT1	026242	15-4568	17-4597	17-4682	17-4688	17-4696	17-4702	#17-4726		
AAPAT2	026252	15-4573	17-4606	17-4644	17-4680	17-4686	#17-4730			
AAPAT3	026262	15-4577	17-4602	17-4692	17-4694	17-4700	#17-4734			
AAPAT4	026272	17-4611	#17-4738							
AAPAT5	026302	17-4632	17-4706	17-4712	#17-4742					
AAPAT6	026312	17-4640	17-4709	17-4715	#17-4746					
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AA10	025410	#17-4591								
AA11	025440	17-4596	#17-4598							
AA12	025442	#17-4600								
AA13	025460	#17-4604	17-4621							
AA14	025500	#17-4609	17-4619							
AA15	025520	#17-4614	17-4617							
AA16	025526	17-4615	#17-4617							
AA17	025532	17-4610	#17-4619							
AA2	025332	15-4567	#15-4569							
AA20	025536	17-4605	#17-4621							
AA21	025540	#17-4625								
AA22	025572	17-4631	#17-4633							
AA23	025574	#17-4635								
AA24	025614	#17-4642	17-4652							
AA25	025634	#17-4647	17-4650							
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AA4	025352	#15-4575	17-4587							
AA5	025372	#16-4581	17-4585							
AA6	025400	17-4583	#17-4585							
AA7	025406	15-4576	#17-4587							
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                       13-2962   13-3061   14-3287   14-3389   14-3392   14-3532   14-3535   14-3647   14-3779
                      #20-5958   20-6001
CPTWO    040304        9-1190    9-1244   #20-5969   20-6002
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SYMBOL	VALUE	REFERENCES								
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		20-6181	20-6184	20-6184	20-6184	20-6186	20-6186	20-6186	20-6189	20-6189
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		20-6270	20-6272	20-6273	20-6276	20-6276	20-6278	20-6280	20-6341	20-6341
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		20-6402	20-6406	20-6443	20-6466	20-6468	20-6468	20-6473	20-6473	20-6474
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C1	004772	#11-1328								
C15	005020	11-1333	#11-1335							
C2	005040	#11-1344								
C25	005054	11-1347	#11-1348							
C3	005076	#11-1357								
C35	005126	11-1362	#11-1363							
C4	005150	#11-1372								
C45	005162	11-1374	#11-1376							
C5	005204	#11-1385								
C55	005232	11-1390	#11-1392							
C6	005252	#11-1401								
C65	005266	11-1403	#11-1405							
C7	005310	#11-1414								
C75	005340	11-1418	#11-1420							
C8	005362	#11-1429								
C85	005374	11-1431	#11-1433							
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		19-5503	19-5504	19-5505	19-5506	19-5507	19-5508	#19-5509		
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DDER10	033126	19-5457	#19-5506							
DDER11	033164	19-5484	#19-5507							
DDER12	033222	19-5486	#19-5508							
DDER2	032546	19-5328	#19-5498							
DDER3	032604	19-5350	#19-5499							
DDER4	032642	19-5372	#19-5500							
DDER5	032700	19-5399	#19-5501							
DDER6	032736	19-5401	#19-5502							
DDER7	032774	19-5427	#19-5503							
DDER8	033032	19-5429	#19-5504							
DDER9	033070	19-5455	#19-5505							
DDISP	177570	#7-1113	8-1126	9-1139						

SYMBOL	VALUE	REFERENCES								
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		19-5500	#19-5517							
DDP2	033310	19-5339	19-5363	19-5499	19-5500	#19-5521				
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DDP5	033340	19-5441	19-5468	19-5505	19-5506	19-5507	19-5508	#19-5533		
DDP6	033350	19-5385	19-5411	19-5501	19-5502	19-5503	19-5504	#19-5537		
DDP7	033360	19-5390	19-5418	19-5451	19-5480	19-5501	19-5502	19-5503	19-5504	#19-5541
DDP8	033370	19-5395	19-5423	19-5446	19-5475	19-5505	19-5506	19-5507	19-5508	#19-5545
DDP9	033400	19-5317	19-5497	19-5498	#19-5549					
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DD10	031620	#19-5348	19-5351							
DD11	031630	19-5349	#19-5351							
DD12	031646	19-5354	#19-5357							
DD13	031676	19-5360	#19-5364							
DD14	031720	#19-5370	19-5373							
DD15	031730	19-5371	#19-5373							
DD16	031746	19-5376	#19-5379							
DD17	031776	19-5382	#19-5386							
DD18	032020	#19-5392	19-5402							
DD19	032040	#19-5397	19-5400							
DD2	031450	19-5309	#19-5313							
DD20	032050	19-5398	#19-5400							
DD21	032056	19-5393	#19-5402							
DD22	032070	19-5404	#19-5407							
DD23	032120	19-5410	#19-5414							
DD24	032142	#19-5420	19-5430							
DD25	032162	#19-5425	19-5428							
DD26	032172	19-5426	#19-5428							
DD27	032200	19-5421	#19-5430							
DD3	031472	#19-5319	19-5329							
DD30	032212	19-5432	#19-5435							
DD31	032242	19-5438	#19-5442							
DD32	032264	#19-5448	19-5458							
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DD38	032412	#19-5477	19-5487							
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DD5	031522	19-5325	#19-5327							
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DD8	031576	19-5338	#19-5342							
DERR1	006004	11-1533	#11-1561							

SYMBOL VALUE REFERENCES

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DF107 = 067517 9-1132 #22-6619
DF11 = 066675 9-1132 #22-6557
DF110 = 067472 9-1132 #22-6620
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DF112 = 067550 9-1132 #22-6622
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DF121 - 067404 9-1132 #22-6629
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DF124 067554 9-1132 #22-6632 22-6633
DF125 - 067554 9-1132 #22-6633
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DF131 067605 9-1132 #22-6637 22-6638
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DF141 = 067651 9-1132 #22-6645
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DF15 066675 9-1132 #22-6561
DF150 067625 9-1132 #22-6652

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DF157	= 067625	9-1132	#22-6659					
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DF175	- 067665	9-1132	#22-6673					
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DF206	067625	9-1132	#22-6682					
DF207	= 067625	9-1132	#22-6683					
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DF23	067014	9-1132	#22-6567					
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DF27	067104	9-1132	#22-6571	22-6574				
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		22-6681						
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DF33	067140	9-1132	#22-6575					

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DF67	- 066776	9-1132	#22-6603						
DF7	- 066675	9-1132	#22-6555						
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DH103	- 064504	9-1132	#20-6459						
DH104	065156	9-1132	#20-6460						
DH105	063654	9-1132	#20-6461						
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DH127	= 065156	9-1132	#20-6486						
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DH21	= 063654	9-1132	#20-6400						
DH210	= 065156	9-1132	#20-6539						
DH211	066600	9-1132	#20-6540						
DH212	= 063654	9-1132	#20-6541						
DH213	= 063654	9-1132	#20-6542						
DH22	064152	9-1132	#20-6401						
DH23	064207	9-1132	#20-6402						
DH24	064345	9-1132	#20-6405						
DH25	064504	9-1132	#20-6407	20-6449	20-6454	20-6459	20-6463	20-6465	20-6470
DH26	064546	9-1132	#20-6408	20-6410	20-6412	20-6413	20-6433	20-6436	20-6438
		20-6455	20-6458	20-6462					
DH27	064546	9-1132	#20-6410						
DH3	063467	9-1132	#20-6381	22-6717	22-6747				
DH30	= 000000	9-1132	#20-6411						
DH31	= 064546	9-1132	#20-6412						
DH32	= 064546	9-1132	#20-6413						
DH33	064634	9-1132	#20-6414	20-6416	20-6417	20-6418	20-6419	20-6420	
DH34	= 064634	9-1132	#20-6416						
DH35	= 064634	9-1132	#20-6417						
DH36	= 064634	9-1132	#20-6418						
DH37	= 064634	9-1132	#20-6419						
DH4	063560	9-1132	#20-6383						
DH40	064634	9-1132	#20-6420						
DH41	= 000000	9-1132	#20-6421						
DH42	064737	9-1132	#20-6422	20-6424					
DH43	= 064737	9-1132	#20-6424						
DH44	= 000000	9-1132	#20-6425						
DH45	065041	9-1132	#20-6426	20-6428					
DH46	065060	9-1132	#20-6427						
DH47	= 065041	9-1132	#20-6428						
DH5	063654	9-1132	#20-6385	20-6386	20-6387	20-6388	20-6389	20-6392	20-6393
		20-6432	20-6435	20-6447	20-6448	20-6452	20-6453	20-6457	20-6461

20-6400				
20-6480				

SYMBOL	VALUE	REFERENCES								
		20-6485	20-6541	20-6542						
DH50	065104	9-1132	#20-6429	20-6431	20-6481	20-6482				
DH51	= 065104	9-1132	#20-6431							
DH52	= 063654	9-1132	#20-6432							
DH53	= 064546	9-1132	#20-6433							
DH54	065156	9-1132	#20-6434	20-6437	20-6439	20-6440	20-6441	20-6446	20-6451	20-6456
		20-6460	20-6464	20-6486	20-6488	20-6489	20-6505	20-6513	20-6514	20-6515
		20-6516	20-6517	20-6518	20-6521	20-6522	20-6523	20-6524	20-6525	20-6526
		20-6527	20-6528	20-6529	20-6530	20-6531	20-6532	20-6533	20-6534	20-6535
		20-6537	20-6538	20-6539						
DH55	= 063654	9-1132	#20-6435							
DH56	= 064546	9-1132	#20-6436							
DH57	= 065156	9-1132	#20-6437							
DH6	- 063654	9-1132	#20-6386							
DH60	- 064546	9-1132	#20-6438							
DH61	= 065156	9-1132	#20-6439							
DH62	= 065156	9-1132	#20-6440							
DH63	= 065156	9-1132	#20-6441							
DH64	065266	9-1132	#20-6444							
DH65	065217	9-1132	#20-6442							
DH66	= 065156	9-1132	#20-6446							
DH67	063654	9-1132	#20-6447							
DH7	= 063654	9-1132	#20-6387							
DH70	063654	9-1132	#20-6448							
DH71	- 064504	9-1132	#20-6449							
DH72	- 064546	9-1132	#20-6450							
DH73	- 065156	9-1132	#20-6451							
DH74	= 063654	9-1132	#20-6452							
DH75	063654	9-1132	#20-6453							
DH76	064504	9-1132	#20-6454							
DH77	- 064546	9-1132	#20-6455							
DISPLA	001142	#8-1126	*9-1139	*9-1139	19-5755	19-5757				
DISPRE	000174	#7-1125	9-1139							
DPAT3	016432	#13-3103								
DSWR	= 177570	#7-1113	8-1126	9-1139						
DT1	067720	9-1132	#22-6692							
DT10	- 070040	9-1132	#22-6702							
DT100	- 071354	9-1132	#22-6794							
DT101	= 071432	9-1132	#22-6795							
DT102	- 071432	9-1132	#22-6796							
DT103	- 071432	9-1132	#22-6797							
DT104	= 071354	9-1132	#22-6798							
DT105	- 071432	9-1132	#22-6799							
DT106	= 071500	9-1132	#22-6800							
DT107	= 071432	9-1132	#22-6801							
DT11	- 070040	9-1132	#22-6703							
DT110	- 071354	9-1132	#22-6802							
DT111	071520	9-1132	#22-6803	22-6804	22-6805	22-6806	22-6807	22-6808	22-6818	22-6819
DT112	- 071520	9-1132	#22-6804							
DT113	071520	9-1132	#22-6805							
DT114	= 071520	9-1132	#22-6806							
DT115	- 071520	9-1132	#22-6807							

SYMBOL	VALUE	REFERENCES							
DT116	= 071520	9-1132	#22-6808						
DT117	= 067764	9-1132	#22-6809						
DT12	070062	9-1132	#22-6704						
DT120	= 067764	9-1132	#22-6810						
DT121	= 071244	9-1132	#22-6811						
DT122	= 070650	9-1132	#22-6812						
DT123	= 071276	9-1132	#22-6813						
DT124	071532	9-1132	#22-6814	22-6817					
DT125	= 071532	9-1132	#22-6817						
DT126	= 071520	9-1132	#22-6818						
DT127	= 071520	9-1132	#22-6819						
DT13	070150	9-1132	#22-6708						
DT130	= 067764	9-1132	#22-6820						
DT131	071616	9-1132	#22-6821	22-6823					
DT132	= 071616	9-1132	#22-6823						
DT133	071660	9-1132	#22-6824	22-6827	22-6828	22-6829	22-6834	22-6835	22-6838	22-6839
		22-6841	22-6845	22-6846	22-6847	22-6848	22-6849	22-6850	22-6853	22-6854
		22-6855	22-6856	22-6857	22-6858	22-6859	22-6860	22-6861	22-6862	22-6863
		22-6864	22-6865	22-6866	22-6867	22-6869	22-6870	22-6871		
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DT135	= 071660	9-1132	#22-6828						
DT136	= 071660	9-1132	#22-6829						
DT137	071732	9-1132	#22-6830	22-6831	22-6832	22-6833	22-6836	22-6837	22-6840	22-6842
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DT140	= 071732	9-1132	#22-6831						
DT141	= 071732	9-1132	#22-6832						
DT142	= 071732	9-1132	#22-6833						
DT143	= 071660	9-1132	#22-6834						
DT144	= 071660	9-1132	#22-6835						
DT145	= 071732	9-1132	#22-6836						
DT146	= 071732	9-1132	#22-6837						
DT147	= 071660	9-1132	#22-6838						
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DT150	= 071660	9-1132	#22-6839						
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DT152	= 071660	9-1132	#22-6841						
DT153	= 071732	9-1132	#22-6842						
DT154	071752	9-1132	#22-6843	22-6844					
DT155	= 071752	9-1132	#22-6844						
DT156	= 071660	9-1132	#22-6845						
DT157	= 071660	9-1132	#22-6846						
DT16	070202	9-1132	#22-6712						
DT160	= 071660	9-1132	#22-6847						
DT161	= 071660	9-1132	#22-6848						
DT162	= 071660	9-1132	#22-6849						
DT163	= 071660	9-1132	#22-6850						
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DT165	= 067764	9-1132	#22-6852						
DT166	= 071660	9-1132	#22-6853						
DT167	= 071660	9-1132	#22-6854						
DT17	067764	9-1132	#22-6713						
DT170	= 071660	9-1132	#22-6855						

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DT171	= 071660	9-1132	#22-6856							
DT172	= 071660	9-1132	#22-6857							
DT173	= 071660	9-1132	#22-6858							
DT174	= 071660	9-1132	#22-6859							
DT175	= 071660	9-1132	#22-6860							
DT176	= 071660	9-1132	#22-6861							
DT177	= 071660	9-1132	#22-6862							
DT2	067742	9-1132	#22-6694							
DT20	070222	9-1132	#22-6714							
DT200	= 071660	9-1132	#22-6863							
DT201	= 071660	9-1132	#22-6864							
DT202	= 071660	9-1132	#22-6865							
DT203	= 071660	9-1132	#22-6866							
DT204	= 071660	9-1132	#22-6867							
DT205	= 067764	9-1132	#22-6868							
DT206	= 071660	9-1132	#22-6869							
DT207	= 071660	9-1132	#22-6870							
DT21	070244	9-1132	#22-6716	22-6784	22-6790					
DT210	= 071660	9-1132	#22-6871							
DT211	071764	9-1132	#22-6872							
DT212	072002	9-1132	#22-6873	22-6874						
DT213	072002	9-1132	#22-6874							
DT22	070256	9-1132	#22-6717							
DT23	070304	9-1132	#22-6720							
DT24	070326	9-1132	#22-6722							
DT25	070352	9-1132	#22-6725							
DT26	070422	9-1132	#22-6727	22-6735						
DT27	070476	9-1132	#22-6730	22-6736						
DT3	067764	9-1132 22-6868	#22-6695	22-6697	22-6713	22-6809	22-6810	22-6820	22-6851	22-6852
DT30	070540	9-1132	#22-6732							
DT31	= 070422	9-1132	#22-6735							
DT32	070476	9-1132	#22-6736							
DT33	070572	9-1132	#22-6737	22-6746						
DT34	070650	9-1132	#22-6740	22-6743	22-6744	22-6745	22-6765	22-6812		
DT35	= 070650	9-1132	#22-6743							
DT36	= 070650	9-1132	#22-6744							
DT37	= 070650	9-1132	#22-6745							
DT4	= 067764	9-1132	#22-6697							
DT40	= 070572	9-1132	#22-6746							
DT41	070722	9-1132	#22-6747							
DT42	070754	9-1132	#22-6750	22-6753						
DT43	070754	9-1132	#22-6753							
DT44	071032	9-1132	#22-6754							
DT45	071102	9-1132	#22-6756							
DT46	071156	9-1132	#22-6759							
DT47	071244	9-1132	#22-6763	22-6768	22-6773	22-6811				
DT5	070006	9-1132	#22-6698							
DT50	070650	9-1132	#22-6765							
DT51	071276	9-1132	#22-6766	22-6813						
DT52	071244	9-1132	#22-6768							
DT53	071334	9-1132	#22-6769	22-6774	22-6776					

SYMBOL	VALUE	REFERENCES								
DT54	071354	9-1132	#22-6771	22-6775	22-6777	22-6778	22-6779	22-6783	22-6789	22-6794
		22-6798	22-6802							
DT55	= 071244	9-1132	#22-6773							
DT56	= 071334	9-1132	#22-6774							
DT57	= 071354	9-1132	#22-6775							
DT6	070040	9-1132	#22-6700	22-6701	22-6702	22-6703	22-6710	22-6711		
DT60	= 071334	9-1132	#22-6776							
DT61	= 071354	9-1132	#22-6777							
DT62	= 071354	9-1132	#22-6778							
DT63	= 071354	9-1132	#22-6779							
DT64	071412	9-1132	#22-6780	22-6782						
DT65	= 071412	9-1132	#22-6782							
DT66	= 071354	9-1132	#22-6783							
DT67	= 070244	9-1132	#22-6784							
DT7	= 070040	9-1132	#22-6701							
DT70	071432	9-1132	#22-6785	22-6787	22-6791	22-6792	22-6795	22-6797	22-6799	22-6801
DT71	= 071432	9-1132	#22-6787	22-6796						
DT72	071500	9-1132	#22-6788	22-6793	22-6800					
DT73	= 071354	9-1132	#22-6789							
DT74	= 070244	9-1132	#22-6790							
DT75	= 071432	9-1132	#22-6791							
DT76	= 071432	9-1132	#22-6792							
DT77	= 071500	9-1132	#22-6793							
D1	005710	#11-1535	11-1553	11-1559						
D10	006112	11-1590	#11-1593							
D2	005734	11-1538	11-1540	#11-1541						
D3	005736	#11-1542	11-1561							
D4	005742	#11-1544								
D5	005754	#11-1550	11-1581	11-1587	11-1597					
D6	005770	11-1551	#11-1555							
D7	006000	11-1556	#11-1558							
D8	006050	#11-1575	11-1584	11-1589						
D9	006062	11-1580	#11-1583							
EDONE	006264	11-1627	11-1633	11-1639	#11-1652					
EEDATO	034102	19-5572	19-5578	19-5601	19-5607	19-5625	19-5626	19-5627	19-5628	#19-5629
EEDONE	034164	19-5620	19-5624	19-5625	19-5626	19-5627	19-5628	#19-5654		
EEER0	033674	19-5590	19-5619	#19-5621						
EEER1	033712	19-5583	#19-5625							
EEER2	033750	19-5585	#19-5626							
EEER3	034006	19-5612	#19-5627							
EEER4	034044	19-5614	#19-5628							
EEP0	034112	19-5574	19-5603	19-5625	19-5626	19-5627	19-5628	#19-5633		
EEP1	034124	19-5567	19-5569	19-5625	19-5625	19-5626	19-5626	#19-5638		
EEP2	034134	19-5579	#19-5642							
EEP3	034144	19-5596	19-5598	19-5627	19-5627	19-5628	19-5628	#19-5646		
EEP4	034154	19-5608	#19-5650							
EERR0	006202	11-1622	#11-1629							
EERR1	006220	11-1626	#11-1635							
EERR2	006234	11-1611	#11-1641							
EE1	033414	#19-5563								
EE10	033634	#19-5610	19-5613							
EE11	033644	19-5611	#19-5613							

SYMBOL		VALUE	REFERENCES			
EE12		033652	19-5606	#19-5615		
EE13		033670	19-5618	#19-5620		
EE2		033444	19-5566	#19-5570		
EE3		033466	#19-5576	19-5586		
EE4		033506	#19-5581	19-5584		
EE5		033516	19-5582	#19-5584		
EE6		033524	19-5577	#19-5586		
EE7		033542	19-5589	#19-5592		
EE8		033572	19-5595	#19-5599		
EE9		033614	#19-5605	19-5615		
EMTVEC	=	000030	#7-1113	9-1139	9-1139	
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EM100		052171	9-1132	#20-6230		
EM101		052231	9-1132	#20-6231		
EM102		052355	9-1132	#20-6232		
EM103		052427	9-1132	#20-6233		
EM104		052532	9-1132	#20-6234		
EM105		052573	9-1132	#20-6235		
EM106		052720	9-1132	#20-6236		
EM107		052773	9-1132	#20-6237		
EM11		043410	9-1132	#20-6106		
EM110		053077	9-1132	#20-6238		
EM111		053141	9-1132	#20-6254	20-6255	20-6258
EM112	=	053141	9-1132	#20-6255		
EM113		053243	9-1132	#20-6256	20-6257	20-6259
EM114	-	053243	9-1132	#20-6257		
EM115	=	053141	9-1132	#20-6258		
EM116	=	053243	9-1132	#20-6259		
EM117		053345	9-1132	#20-6260		
EM12	=	000000	9-1132	#20-6107		
EM120		053501	9-1132	#20-6261		
EM121		053635	9-1132	#20-6262		
EM122		053754	9-1132	#20-6264		
EM123		054053	9-1132	#20-6266		
EM124		054114	9-1132	#20-6267		
EM125		054207	9-1132	#20-6268		
EM126		054277	9-1132	#20-6269		
EM127		054506	9-1132	#20-6274		
EM13	=	000000	9-1132	#20-6108		
EM130		054721	9-1132	#20-6279		
EM131		055021	9-1132	#20-6282		
EM132		055061	9-1132	#20-6283		
EM133		055121	9-1132	#20-6324	20-6328	
EM134		055160	9-1132	#20-6325	20-6329	
EM135		055217	9-1132	#20-6326	20-6330	
EM136		055256	9-1132	#20-6327	20-6331	
EM137	=	055121	9-1132	#20-6328		
EM14		043471	9-1132	#20-6109		
EM140		055160	9-1132	#20-6329		
EM141		055217	9-1132	#20-6330		
EM142		055256	9-1132	#20-6331		

SYMBOL		VALUE	REFERENCES			
EM143		055315	9-1132	#20-6332	20-6334	
EM144		055350	9-1132	#20-6333	20-6335	
EM145	=	055315	9-1132	#20-6334		
EM146	=	055350	9-1132	#20-6335		
EM147		055403	9-1132	#20-6336	20-6337	20-6338
EM15		043614	9-1132	#20-6112		
EM150	=	055403	9-1132	#20-6337		
EM151	=	055403	9-1132	#20-6338		
EM152		055435	9-1132	#20-6339	20-6340	
EM153	=	055435	9-1132	#20-6340		
EM154		055467	9-1132	#20-6341		
EM155		055721	9-1132	#20-6342		
EM156		056154	9-1132	#20-6343		
EM157		056371	9-1132	#20-6344		
EM16		043737	9-1132	#20-6115		
EM160		056610	9-1132	#20-6345		
EM161		057015	9-1132	#20-6346		
EM162		057222	9-1132	#20-6347		
EM163		057267	9-1132	#20-6348		
EM164		057334	9-1132	#20-6349		
EM165		057401	9-1132	#20-6350		
EM166		057446	9-1132	#20-6351		
EM167		057556	9-1132	#20-6352		
EM17		044010	9-1132	#20-6116		
EM170		060015	9-1132	#20-6353		
EM171		060125	9-1132	#20-6354		
EM172		060364	9-1132	#20-6355		
EM173		060623	9-1132	#20-6356		
EM174		061062	9-1132	#20-6357		
EM175		061321	9-1132	#20-6358		
EM176		061560	9-1132	#20-6359		
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EM20		044243	9-1132	#20-6120		
EM200		062052	9-1132	#20-6361		
EM201		062207	9-1132	#20-6362		
EM202		062344	9-1132	#20-6363		
EM203		062501	9-1132	#20-6364		
EM204		062636	9-1132	#20-6365		
EM205		062773	9-1132	#20-6366		
EM206		063040	9-1132	#20-6367		
EM207		063105	9-1132	#20-6368		
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EM212	=	043323	9-1132	#20-6372		
EM213	=	043355	9-1132	#20-6373		
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EM23	=	044552	9-1132	#20-6129		
EM24		044552	9-1132	#20-6130		
EM25		044637	9-1132	#20-6131		
EM26		044752	9-1132	#20-6133	20-6135	

SYMBOL	VALUE	REFERENCES								
EM27	= 044752	9-1132	#20-6135							
EM3	043162	9-1132	#20-6100							
EM30	045020	9-1132	#20-6136							
EM31	045072	9-1132	#20-6138	20-6140						
EM32	= 045072	9-1132	#20-6140							
EM33	045140	9-1132	#20-6141							
EM34	045201	9-1132	#20-6143							
EM35	045303	9-1132	#20-6145							
EM36	045405	9-1132	#20-6147							
EM37	045506	9-1132	#20-6149							
EM4	043227	9-1132	#20-6101							
EM40	045607	9-1132	#20-6151							
EM41	045760	9-1132	#20-6153							
EM42	046015	9-1132	#20-6158							
EM43	046136	9-1132	#20-6159							
EM44	046257	9-1132	#20-6160	20-6161						
EM45	- 046257	9-1132	#20-6161							
EM46	046322	9-1132	#20-6162							
EM47	046400	9-1132	#20-6167							
EM5	043267	9-1132	#20-6102	20-6105	20-6371					
EM50	046516	9-1132	#20-6168							
EM51	046614	9-1132	#20-6170							
EM52	046655	9-1132	#20-6180							
EM53	046776	9-1132	#20-6181							
EM54	047173	9-1132	#20-6182							
EM55	047237	9-1132	#20-6183							
EM56	047360	9-1132	#20-6184							
EM57	047555	9-1132	#20-6185							
EM6	043323	9-1132	#20-6103	20-6372						
EM60	047621	9-1132	#20-6186							
EM61	050016	9-1132	#20-6187							
EM62	050062	9-1132	#20-6188							
EM63	050254	9-1132	#20-6192							
EM64	050446	9-1132	#20-6196	20-6198						
EM65	- 050446	9-1132	#20-6198							
EM66	050602	9-1132	#20-6199							
EM67	050645	9-1132	#20-6221							
EM7	043355	9-1132	#20-6104	20-6373						
EM70	051076	9-1132	#20-6222							
EM71	051221	9-1132	#20-6223							
EM72	051323	9-1132	#20-6224							
EM73	051377	9-1132	#20-6225							
EM74	051437	9-1132	#20-6226							
EM75	051670	9-1132	#20-6227							
EM76	052013	9-1132	#20-6228							
EM77	052115	9-1132	#20-6229							
ERM10	035550	19-5757	19-5757	#19-5757						
ERROR	- 104000	#7-1113	9-1212	9-1236	9-1249	9-1262	9-1267	11-1306	11-1312	11-1495
		11-1502	11-1548	11-1572	11-1586	11-1596	11-1632	11-1638	11-1650	11-1784
		11-1803	11-1807	11-1817	11-1839	11-1843	11-1851	11-1866	11-1882	11-1897
		11-1912	11-1920	11-1926	11-1945	11-1955	12-1964	12-1983	12-1993	12-2001
		12-2161	12-2168	12-2176	12-2188	12-2332	12-2339	12-2346	12-2357	12-2590

SYMBOL	VALUE	REFERENCES								
		13-2725	13-2850	13-2856	13-2862	13-2865	13-2869	13-2872	13-2884	13-2895
		13-2968	13-2975	13-2984	13-3066	13-3073	13-3082	13-3164	13-3171	13-3183
		13-3264	14-3275	14-3282	14-3293	14-3397	14-3405	14-3411	14-3423	14-3430
		14-3540	14-3548	14-3555	14-3567	14-3574	14-3676	14-3686	14-3693	14-3701
		14-3808	14-3818	14-3828	14-3835	15-3989	15-3998	15-4016	15-4031	15-4047
		15-4109	15-4117	15-4137	15-4145	15-4165	15-4173	15-4195	15-4203	15-4332
		15-4338	15-4346	15-4351	15-4427	15-4435	15-4441	15-4515	15-4521	17-4672
		17-4676	17-4684	17-4690	17-4698	17-4704	17-4710	17-4716	17-4935	17-4939
		17-4945	17-4957	17-4960	17-4966	17-4972	17-4981	17-5206	17-5211	17-5218
		17-5227	17-5233	19-5244	19-5495	19-5497	19-5498	19-5499	19-5500	19-5501
		19-5502	19-5503	19-5504	19-5505	19-5506	19-5507	19-5508	19-5623	19-5625
		19-5626	19-5627	19-5628	19-5712	19-5715	19-5717	20-5949	20-5960	20-5971
ERRVEC	- 000004	#7-1113	9-1139	9-1139	9-1139	9-1175	9-1189	11-1532	11-1682	11-1721
		12-2058	12-2236	13-2771	13-2801	13-2929	13-3028	13-3225	14-3330	14-3473
		14-3615	14-3736	19-5755	19-5755	19-5755	19-5755	20-6001		
ERTYPE	037602	9-1228	12-2609	19-5757	#19-5785					
ERT1	037764	#19-5836	20-5924							
ERT2	040202	19-5841	19-5854	19-5874	19-5883	20-5912	#20-5916			
ERT3	040206	19-5891	20-5900	#20-5921						
ERT4	040216	19-5832	20-5923	#20-5926						
ERT5	040230	19-5798	#20-5931							
E1	006140	#11-1613								
E2	006154	#11-1616								
E3	006154	11-1615	#11-1617							
E4	006156	#11-1618	11-1641							
FDATI0	010074	11-1674	11-1698	11-1782	11-1783	11-1792	#12-2004			
FDATI1	010076	#12-2005								
FDATI2	010100	#12-2006								
FDATI3	010102	11-1939	#12-2007							
FDATI4	010104	11-1681	11-1690	11-1787	11-1797	11-1932	#12-2008			
FDATI5	010106	11-1948	#12-2009							
FDATI6	010110	#12-2010								
FDATI7	010112	#12-2011								
FDATO0	010116	11-1716	11-1737	11-1828	11-1848	#12-2013				
FDATO1	010120	#12-2014								
FDATO2	010122	#12-2015								
FDATO3	010124	12-1977	#12-2016							
FDATO4	010126	11-1720	11-1729	11-1823	11-1833	11-1917	12-1969	#12-2017		
FDATO5	010130	11-1854	11-1869	12-1986	#12-2018					
FDATO6	010132	11-1885	11-1900	#12-2019						
FDATO7	010134	11-1849	11-1918	#12-2020						
FDONE	010160	11-1777	11-1785	11-1804	11-1808	11-1818	11-1840	11-1844	11-1852	11-1867
		11-1883	11-1898	11-1913	11-1921	11-1927	11-1946	12-1957	12-1965	12-1984
		12-1994	12-2002	#12-2032						
FECMS	040631	#20-6020	22-6699							
FERR0	006666	11-1703	#11-1779							
FERR1	006724	11-1692	#11-1787							
FERR10	007504	11-1758	11-1770	11-1873	11-1904	#11-1915				
FERR11	007540	11-1709	11-1776	#11-1923						
FERR2	007022	11-1696	#11-1810							
FERR20	007560	11-1682	#11-1929							
FERR21	007676	11-1937	#12-1959							

SYMBOL	VALUE	REFERENCES								
FERR25	007726	11-1721	#12-1967							
FERR26	010044	12-1975	#12-1996							
FERR3	007062	11-1731	#11-1823							
FERR4	007054	11-1735	#11-1820							
FERR5	007160	11-1742	11-1746	11-1750	11-1754	#11-1846				
FERR6	007214	11-1762	#11-1854							
FERR7	007350	11-1766	#11-1885							
FER2	007026	#11-1812	11-1821							
FFDATO	034462	19-5675	19-5697	19-5715	19-5717	#19-5720				
FFDONE	034542	19-5708	19-5713	19-5715	19-5717	#19-5746				
FFER0	034352	19-5685	19-5707	#19-5710						
FFER1	034366	19-5703	#19-5715							
FFER2	034424	19-5681	#19-5717							
FFP0	034472	19-5692	19-5715	#19-5725						
FFP1	034502	19-5694	19-5715	#19-5729						
FFP2	034512	19-5670	19-5717	#19-5733						
FFP3	034522	19-5672	19-5717	#19-5737						
FFP4	034532	19-5677	19-5699	19-5715	19-5717	#19-5741				
FF1	034170	#19-5666								
FF10	034340	19-5702	#19-5704							
FF11	034350	19-5706	#19-5708							
FF2	034220	19-5669	#19-5673							
FF3	034242	#19-5679	19-5682							
FF4	034250	19-5680	#19-5682							
FF5	034260	19-5684	#19-5688							
FF6	034310	19-5691	#19-5695							
FF7	034332	#19-5701	19-5704							
FPSMS	040565	#20-6019	22-6699							
FPSPUR	040234	9-1186	11-1563	11-1643	13-2824	13-2843	15-3995	15-4037	17-4661	#20-5943
		20-6000								
FPVECT	= 000244	#7-1107	9-1170	9-1186	11-1533	11-1611	13-2766	13-2799	14-3885	15-3978
		15-4563	17-5062	20-6000						
FXDAT0	010140	11-1675	11-1699	11-1738	11-1780	11-1781	11-1850	#12-2022		
FXDAT1	010142	#12-2023								
FXDAT2	010144	#12-2024								
FXDAT3	010146	#12-2025								
FXDAT4	010150	11-1919	#12-2026							
FXDAT5	010152	#12-2027								
FXDAT6	010154	#12-2028								
FXDAT7	010156	#12-2029								
F1	006270	#11-1669								
F10	006502	11-1712	#11-1725	12-1974						
F11	006504	#11-1726	11-1820							
F12	006522	11-1730	#11-1733							
F13	006554	11-1741	#11-1744							
F135	006534	11-1734	#11-1737							
F14	006564	11-1745	#11-1748							
F15	006574	11-1749	#11-1752							
F16	006604	11-1753	#11-1756							
F17	006614	11-1757	#11-1760							
F2	006322	#11-1678	11-1679							
F20	006624	11-1761	#11-1764							

SYMBOL	VALUE	REFERENCES								
F21	006634	11-1765	#11-1768							
F22	006644	11-1769	#11-1772							
F23	006662	11-1775	#11-1777							
F3	006342	11-1670	#11-1686							
F4	006344	#11-1687	11-1810	11-1936						
F5	006362	11-1691	#11-1694							
F6	006436	11-1708	#11-1711							
F7	006462	#11-1717	11-1718							
GADR	014164	12-2572	12-2591	12-2606	12-2610	#13-2643				
GANDO	014134	12-2580	12-2604	#13-2628						
GAND1	014136	#13-2629								
GAND2	014140	#13-2630								
GAND3	014142	#13-2631								
GCMP	013670	12-2519	12-2520	12-2521	12-2522	12-2523	12-2524	12-2525	12-2526	12-2527
		12-2528	12-2529	12-2530	#12-2562					
GDATOO	014154	12-2519	12-2520	12-2521	12-2522	12-2523	12-2524	12-2525	12-2526	12-2527
		12-2528	12-2529	12-2530	12-2549	12-2555	12-2562	12-2589	#13-2638	
GDAT01	014156	#13-2639								
GDAT02	014160	#13-2640								
GDAT03	014162	#13-2641								
GDONE	014166	12-2532	#13-2643							
GERR1	013716	12-2567	#12-2572							
GFLAG1	014110	12-2519	12-2519	12-2520	12-2520	12-2521	12-2521	12-2522	12-2522	12-2523
		12-2523	12-2524	12-2524	12-2525	12-2525	12-2526	12-2526	12-2527	12-2527
		12-2528	12-2528	12-2529	12-2529	12-2530	12-2530	12-2535	#13-2615	
GFLAG2	014112	12-2587	12-2595	12-2603	#13-2616					
GNS =	******	7-1125	7-1125	9-1140	19-5753	19-5753	19-5769	19-5769	19-5769	19-5769
		19-5769	19-5769	19-5769	19-5769	19-5769	19-5769	19-5769	19-5769	19-5769
		19-5769	19-5769	19-5769	19-5769	19-5769	19-5770	19-5770	19-5771	19-5771
GOR0	014144	12-2574	12-2605	#13-2633						
GOR1	014146	#13-2634								
GOR2	014150	#13-2635								
GOR3	014152	#13-2636								
GPAT00	014114	12-2519	12-2521	12-2523	12-2525	12-2527	12-2529	12-2545	#13-2618	
GPAT01	014116	#13-2619								
GPAT02	014120	#13-2620								
GPAT03	014122	#13-2621								
GPAT10	014124	12-2520	12-2522	12-2524	12-2526	12-2528	12-2530	12-2540	#13-2623	
GPAT11	014126	#13-2624								
GPAT12	014130	#13-2625								
GPAT13	014132	#13-2626								
GRESET	013650	12-2519	12-2520	12-2521	12-2522	12-2523	12-2524	12-2525	12-2526	12-2527
		12-2528	12-2529	12-2530	#12-2555					
GSETUP	013572	12-2519	12-2520	12-2521	12-2522	12-2523	12-2524	12-2525	12-2526	12-2527
		12-2528	12-2529	12-2530	#12-2535					
GSUM	014006	12-2519	12-2520	12-2521	12-2522	12-2523	12-2524	12-2525	12-2526	12-2527
		12-2528	12-2529	12-2530	#12-2595					
GS1	013622	#12-2545	12-2559							
GTSWR =	104405	9-1140	#19-5769							
G1	011674	12-2519	#12-2519	12-2519						
G10	012172	12-2521	#12-2521							
G11	012174	12-2521	#12-2521							

SYMBOL	VALUE	REFERENCES						
G12	012262	12-2522	#12-2522	12-2522				
G13	012314	12-2522	#12-2522					
G14	012316	12-2522	#12-2522					
G15	012404	12-2523	#12-2523	12-2523				
G16	012436	12-2523	#12-2523					
G17	012440	12-2523	#12-2523					
G2	011726	12-2519	#12-2519					
G20	012526	12-2524	#12-2524	12-2524				
G21	012560	12-2524	#12-2524					
G22	012562	12-2524	#12-2524					
G23	012650	12-2525	#12-2525	12-2525				
G24	012702	12-2525	#12-2525					
G25	012704	12-2525	#12-2525					
G26	012772	12-2526	#12-2526	12-2526				
G27	013024	12-2526	#12-2526					
G3	011730	12-2519	#12-2519					
G30	013026	12-2526	#12-2526					
G31	013114	12-2527	#12-2527	12-2527				
G32	013146	12-2527	#12-2527					
G33	013150	12-2527	#12-2527					
G34	013236	12-2528	#12-2528	12-2528				
G35	013270	12-2528	#12-2528					
G36	013272	12-2528	#12-2528					
G37	013360	12-2529	#12-2529	12-2529				
G4	012016	12-2520	#12-2520	12-2520				
G40	013412	12-2529	#12-2529					
G41	013414	12-2529	#12-2529					
G42	013502	12-2530	#12-2530	12-2530				
G43	013534	12-2530	#12-2530					
G44	013536	12-2530	#12-2530					
G5	012050	12-2520	#12-2520					
G6	012052	12-2520	#12-2520					
G7	012140	12-2521	#12-2521	12-2521				
HADR	014716	13-2700	13-2708	#13-2729				
HA1R	014772	13-2692	13-2702	13-2711	#13-2738			
HA1W	014722	13-2658	13-2667	13-2677	13-2701	13-2719	#13-2732	
HA2R	015002	13-2693	#13-2739					
HA2W	014732	13-2668	13-2678	#13-2733				
HA3R	015012	13-2694	#13-2740					
HA3W	014742	13-2669	13-2679	#13-2734				
HA4R	015022	13-2695	#13-2741					
HA4W	014752	13-2670	13-2680	#13-2735				
HA5R	015032	13-2696	#13-2742					
HA5W	014762	13-2671	13-2681	#13-2736				
HCLR	014646	13-2664	13-2691	#13-2711				
HCLR1	014656	#13-2713	13-2714					
HCMP	014610	13-2675	13-2677	13-2678	13-2679	13-2680	13-2681	#13-2700
HCMP1	014630	#13-2704	13-2707					
HCMP2	014640	13-2705	#13-2707					
HDAT1	015042	13-2659	#13-2744					
HDAT2	015052	#13-2745						
HDAT3	015062	#13-2746						

SYMBOL	VALUE	REFERENCES							
HDAT4	015072	#13-2747							
HDAT5	015102	#13-2748							
HDONE	015112	13-2685	13-2726	#13-2750					
HERROR	014664	13-2706	#13-2718						
HFLAG	014720	13-2657	13-2683	13-2687	#13-2730				
HSTD	014532	13-2673	13-2677	13-2678	13-2679	13-2680	13-2681	#13-2691	
HT	= 000011	#7-1113	19-5761	19-5761					
H1	014174	#13-2657							
H10	014436	#13-2680	13-2680						
H11	014470	#13-2681	13-2681						
H12	014522	13-2684	#13-2687						
H2	014214	#13-2661	13-2662						
H3	014224	#13-2666	13-2688						
H4	014276	#13-2673							
H5	014320	#13-2677	13-2677						
H6	014352	#13-2678	13-2678						
H7	014404	#13-2679	13-2679						
IDATI0	011012	12-2045	12-2051	12-2069	12-2096	12-2101	12-2130	12-2166	#12-2207
IDATI1	011014	#12-2208							
IDATI2	011016	12-2127	#12-2209						
IDATI3	011020	12-2128	#12-2210						
IDATO0	011002	12-2065	12-2068	12-2124	12-2129	12-2167	#12-2202		
IDATO1	011004	#12-2203							
IDATO2	011006	12-2074	12-2079	12-2135	#12-2204				
IDATO3	011010	12-2138	#12-2205						
IDONE	011022	12-2144	12-2162	12-2169	12-2177	12-2189	#12-2212		
IERR0	010562	12-2058	#12-2147						
IERR1	010644	12-2083	12-2137	#12-2165					
IERR2	010664	12-2087	#12-2172						
IERR25	010706	#12-2175	12-2181						
IERR3	010736	12-2119	#12-2184						
IERR4	010712	12-2140	#12-2178						
ILLMS	041542	#20-6048	22-6722						
ILL1	041436	#20-6045							
ILL2	041501	#20-6047							
IOTVEC	- 000020	#7-1113	9-1139	9-1139					
IPATI0	010762	12-2046	12-2095	#12-2192					
IPATI1	010764	#12-2193							
IPATI2	010766	12-2135	#12-2194						
IPATI3	010770	12-2138	#12-2195						
IPAT20	010772	12-2054	12-2104	#12-2197					
IPAT21	010774	#12-2198							
IPAT22	010776	#12-2199							
IPAT23	011000	#12-2200							
I1	010166	#12-2043							
I10	010350	12-2077	#12-2086						
I105	010356	12-2072	#12-2089						
I106	010352	12-2085	#12-2087						
I11	010360	#12-2093							
I12	010362	#12-2095							
I13	010376	#12-2098	12-2099						
I14	010440	12-2108	#12-2112	12-2185					

SYMBOL	VALUE	REFERENCES					
I15	010442	#12-2113	12-2151				
I16	010444	#12-2114	12-2153				
I17	010462	12-2118	#12-2121				
I2	010204	#12-2048	12-2049				
I20	010522	#12-2132	12-2142				
I21	010536	#12-2137	12-2139				
I22	010542	12-2136	#12-2138				
I23	010556	12-2133	#12-2142				
I3	010252	12-2059	#12-2061				
I4	010254	#12-2062	12-2147				
I5	010256	#12-2063	12-2149				
I6	010302	#12-2071	12-2089				
I7	010316	#12-2076	12-2086				
JBUF0	016102	13-2938	#13-2987				
JBUF1	016104	#13-2988					
JBUF2	016106	#13-2989					
JBUF3	016110	#13-2990					
JDATI0	016112	13-2927	13-2942	13-2950	13-2974	13-2982	#13-2992
JDATI1	016114	#13-2993					
JDATI2	016116	#13-2994					
JDATI3	016120	#13-2995					
JDATO0	016122	13-2935	13-2943	13-2983	#13-2997		
JDATO	016132	13-2924	#13-3002				
JDATO1	016124	#13-2998					
JDATO2	016126	#13-2999					
JDATO3	016130	#13-3000					
JDATI	016134	#13-3003					
JDAT2	016136	#13-3004					
JDAT3	016140	#13-3005					
JDONE	016142	13-2954	13-2969	13-2976	13-2985	#13-3008	
JERR0	015762	13-2929	#13-2958				
JERR1	016030	13-2940	13-2952	#13-2971			
JERR2	016054	13-2947	#13-2980				
J1	015654	#13-2921					
J10	016002	13-2959	13-2961	#13-2964			
J2	015700	#13-2931	13-2972	13-2981			
J3	015702	#13-2932	13-2958				
J4	015704	#13-2933	13-2960				
J5	015740	#13-2945	13-2948				
J6	015746	13-2946	#13-2948				
J7	015760	13-2951	#13-2954				
KBUF0	016404	13-3026	13-3037	13-3049	#13-3090		
KBUF1	016406	#13-3091					
KBUF2	016410	#13-3092					
KBUF3	016412	#13-3093					
KDATI0	016374	13-3041	13-3072	13-3080	#13-3085		
KDATI1	016376	#13-3086					
KDATI2	016400	#13-3087					
KDATI3	016402	#13-3088					
KDATO0	016414	13-3034	13-3042	13-3081	#13-3095		
KDATO1	016416	#13-3096					
KDATO2	016420	#13-3097					

SYMBOL	VALUE	REFERENCES								
KDAT03	016422	#13-3098								
KDONE	016434	13-3053	13-3067	13-3074	13-3083	#13-3105				
KERR0	016256	13-3028	#13-3057							
KERR1	016322	13-3039	13-3051	#13-3069						
KERR2	016346	13-3046	#13-3078							
KPAT0	016424	13-3023	#13-3100							
KPAT1	016426	#13-3101								
KPAT2	016430	#13-3102								
K1	016150	#13-3020								
K10	016276	13-3058	13-3060	#13-3063						
K2	016174	#13-3030	13-3070	13-3079						
K3	016176	#13-3031	13-3057							
K4	016200	#13-3032	13-3059							
K5	016234	#13-3044	13-3047							
K6	016242	13-3045	#13-3047							
K7	016254	13-3050	#13-3053							
LDATI0	016734	13-3123	13-3130	13-3149	13-3169	13-3181	#13-3196			
LDATI1	016736	#13-3197								
LDATI2	016740	13-3143	13-3147	13-3163	#13-3198					
LDATI3	016742	13-3148	#13-3199							
LDAT00	016746	13-3140	13-3150	13-3170	13-3175	#13-3201				
LDAT01	016750	13-3182	#13-3202							
LDAT02	016752	#13-3203								
LDAT03	016754	#13-3204								
LDONE	016756	13-3158	13-3165	13-3172	13-3184	#13-3206				
LD1	041276	#20-6035								
LD2	041326	#20-6036								
LERR1	016570	13-3145	#13-3160							
LERR2	016642	13-3155	#13-3174							
LERR3	016614	#13-3167	13-3178							
LF	= 000012	#7-1113	19-5761	19-5761						
LFIEX1	040453	#20-6017	22-6698	22-6700						
LFIEX2	040523	#20-6018	22-6698	22-6700						
LFPS1	041263	#20-6034								
LOOP	004270	#9-1142	19-5753							
LPAT10	016712	13-3120	#13-3186							
LPAT11	016714	#13-3187								
LPAT12	016716	#13-3188								
LPAT13	016720	#13-3189								
LPAT20	016722	13-3124	13-3174	#13-3191						
LPAT21	016724	#13-3192								
LPAT22	016726	#13-3193								
LPAT23	016730	#13-3194								
LPERR	- 104413	9-1168	9-1278	11-1326	11-1343	11-1356	11-1371	11-1384	11-1400	11-1413
		11-1428	11-1530	11-1610	11-1669	11-1711	12-2041	12-2093	12-2221	12-2264
		12-2519	12-2520	12-2521	12-2522	12-2523	12-2524	12-2525	12-2526	12-2527
		12-2528	12-2529	12-2530	13-2655	13-2761	13-2793	13-2919	13-3018	13-3115
		14-3886	14-3907	15-3929	15-3947	15-3976	15-4091	15-4119	15-4147	15-4175
		15-4233	15-4256	15-4279	15-4302	15-4387	15-4482	15-4560	17-4591	17-4625
		17-4763	17-4791	17-4819	17-4848	17-4877	17-4905	17-5059	17-5083	17-5111
		17-5134	17-5163	17-5184	19-5306	19-5335	19-5357	19-5379	19-5407	19-5435
		19-5464	19-5563	19-5592	19-5666	19-5688	#19-5771			

SYMBOL	VALUE	REFERENCES							
L1	016442	#13-3117							
L2	016502	#13-3134	13-3161	13-3168	13-3180				
L3	016504	#13-3135							
L4	016506	#13-3137							
L5	016556	#13-3153	13-3156						
L6	016564	13-3154	#13-3156						
MDAT00	017276	13-3240	13-3243	13-3253	13-3263	14-3280	#14-3306		
MDAT01	017300	#14-3307							
MDAT02	017302	#14-3308							
MDAT03	017304	#14-3309							
MDONE	017306	13-3251	13-3265	14-3276	14-3283	14-3294	#14-3311		
MERR0	017132	13-3236	#13-3267						
MERR1	017170	13-3246	13-3257	#14-3278					
MERR2	017104	#13-3260							
MERR3	017216	13-3225	#14-3285						
MNUMBE	= 000213	#7-856	9-1130						
MNUM0	042244	12-2519	12-2520	#20-6065					
MNUM1	042252	12-2521	12-2522	#20-6066					
MNUM2	042257	12-2523	12-2524	#20-6067					
MNUM3	042264	12-2525	12-2526	#20-6068					
MNUM4	042273	12-2527	12-2528	#20-6069					
MNUM5	042301	12-2529	12-2530	#20-6070					
MPAT10	017256	13-3221	#14-3296						
MPAT11	017260	#14-3297							
MPAT12	017262	#14-3298							
MPAT13	017264	#14-3299							
MPAT20	017266	13-3262	14-3281	#14-3301					
MPAT21	017270	#14-3302							
MPAT22	017272	#14-3303							
MPAT23	017274	#14-3304							
MS1	041610	#20-6049	22-6725	22-6738	22-6755	22-6771			
MS10	041764	#20-6056	22-6728	22-6729	22-6731	22-6741	22-6742	22-6751	22-6752
		22-6786	22-6786	22-6815	22-6816				
MS11	041777	#20-6057	22-6729	22-6742	22-6752	22-6786	22-6816		
MS12	042024	#20-6058	22-6731	22-6763					
MS13	042062	#20-6059	22-6731	22-6764					
MS14	042077	#20-6060	22-6732						
MS15	042165	#20-6062	22-6732						
MS16	042212	12-1961	12-1997	#20-6063					
MS17	042217	#20-6064	22-6754	22-6756					
MS2	041622	#20-6050	22-6726	22-6739	22-6755	22-6772			
MS20	042307	#20-6071	22-6754						
MS21	042350	#20-6072	22-6755	22-6755	22-6757	22-6758	22-6771	22-6772	
MS22	042407	#20-6073	22-6757						
MS23	042437	#20-6074	22-6758						
MS24	042466	#20-6075	22-6756						
MS25	042561	#20-6077	22-6759	22-6767					
MS26	042603	#20-6078	22-6760	22-6767					
MS27	042620	#20-6079	22-6767	22-6767					
MS3	041627	#20-6051	22-6725	22-6726	22-6738	22-6739			
MS30	042627	#20-6080	22-6759	22-6761					
MS31	042636	#20-6081	22-6759	22-6761					

SYMBOL	VALUE	REFERENCES								
MS32	042645	#20-6082	22-6760	22-6762						
MS33	042654	#20-6083	22-6760	22-6762						
MS34	042663	#20-6084	22-6760	22-6762						
MS35	042672	12-2060	12-2238	#20-6085						
MS36	042677	12-2109	12-2280	#20-6086						
MS37	042706	#20-6087	22-6816	22-6821						
MS4	041656	#20-6052	22-6725	22-6726	22-6738	22-6739				
MS40	042724	#20-6088	22-6822							
MS41	042760	#20-6090	22-6824							
MS415	042740	#20-6089	22-6822							
MS42	043004	#20-6091	22-6825							
MS43	043022	#20-6092	22-6825							
MS44	043037	#20-6093	22-6826							
MS5	041670	#20-6053								
MS6	041732	#20-6054	22-6728	22-6741	22-6751	22-6785	22-6815			
MS7	041750	#20-6055	22-6728	22-6729	22-6731	22-6741	22-6742	22-6751	22-6752	22-6763
		22-6785	22-6786	22-6815	22-6816					
M1	016762	#13-3218								
M15	017002	#13-3227	13-3261	14-3274	14-3279	14-3291				
M2	017006	#13-3230	13-3267	14-3290						
M3	017010	#13-3231								
M4	017012	#13-3232								
M5	017046	13-3245	#13-3247							
M6	017052	#13-3248	13-3250							
M7	017062	13-3249	#13-3253							
M8	017072	#13-3255	13-3258							
M9	017102	13-3256	#13-3258							
NDATI0	020004	14-3372	14-3429	14-3439	#14-3449					
NDATI1	020006	#14-3450								
NDATI2	020010	#14-3451								
NDATI3	020012	#14-3452								
NDATO0	017742	14-3337	14-3354	14-3361	14-3371	14-3428	#14-3433			
NDATO1	017744	#14-3434								
NDATO2	017746	#14-3435								
NDATO3	017750	#14-3436								
NDONE	020014	14-3377	14-3398	14-3406	14-3412	14-3424	14-3431	#14-3454		
NERR0	017504	14-3330	#14-3385							
NERR1	017604	14-3345	#14-3407							
NERR10	017536	14-3386	#14-3394							
NERR11	017550	14-3391	#14-3400							
NERR2	017640	14-3349	#14-3413							
NERR20	017612	#14-3408	14-3414	14-3416	14-3418					
NERR3	017650	14-3359	#14-3415							
NERR4	017660	14-3367	#14-3417							
NERR5	017670	14-3369	#14-3420							
NERR6	017714	14-3379	#14-3426							
NOOP1	040647	#20-6022	22-6704	22-6708						
NOOP10	041126	#20-6031	22-6706	22-6708						
NOOP11	041217	#20-6033	22-6708							
NOOP15	040676	#20-6023	22-6704							
NOOP2	040774	#20-6025	22-6704	22-6705						
NOOP3	041011	#20-6026	22-6705	22-6705						

SYMBOL	VALUE	REFERENCES							
NOOP4	041023	#20-6027	22-6705						
NOOP5	041040	#20-6028	22-6705						
NOOP6	041066	#20-6029	22-6706						
NOOP7	041106	#20-6030	22-6706						
NPAT10	017774	14-3325	#14-3444						
NPAT11	017776	#14-3445							
NPAT12	020000	#14-3446							
NPAT13	020002	#14-3447							
NPAT20	017762	14-3328	14-3340	14-3343	14-3347	14-3351	14-3362	14-3390	14-3421	#14-3439
NPAT21	017764	#14-3440							
NPAT22	017766	#14-3441							
NPAT23	017770	#14-3442							
NULL	040445	11-1929	12-1967	#20-6014					
N1	017312	#14-3322							
N10	017444	#14-3364	14-3366						
N11	017454	14-3352	14-3365	#14-3369					
N12	017456	14-3341	#14-3371						
N13	017472	#14-3374	14-3376						
N14	017502	14-3375	#14-3379						
N2	017336	#14-3333	14-3410	14-3422	14-3427				
N3	017340	#14-3334	14-3387						
N4	017342	#14-3335	14-3385						
N5	017360	#14-3343							
N6	017370	14-3344	#14-3347						
N7	017400	14-3348	#14-3351						
N8	017416	#14-3356	14-3358						
N9	017430	14-3357	#14-3361						
ODATI0	020510	14-3515	14-3573	14-3583	#14-3594				
ODATI1	020512	#14-3595							
ODATI2	020514	#14-3596							
ODATI3	020516	#14-3597							
ODAT00	020446	14-3481	14-3504	14-3514	14-3572	#14-3577			
ODAT01	020450	14-3497	#14-3578						
ODAT02	020452	#14-3579							
ODAT03	020454	#14-3580							
ODONE	020520	14-3520	14-3541	14-3549	14-3556	14-3568	14-3575	#14-3599	
OERR0	020210	14-3473	#14-3528						
OERR1	020310	14-3489	14-3534	#14-3551					
OERR10	020242	14-3529	#14-3537						
OERR11	020254	#14-3543							
OERR2	020344	14-3493	#14-3557						
OERR20	020316	#14-3552	14-3558	14-3560	14-3562				
OERR3	020354	14-3502	#14-3559						
OERR4	020364	14-3510	#14-3561						
OERR5	020374	14-3512	#14-3564						
OERR6	020420	14-3522	#14-3570						
OPAT10	020500	14-3468	#14-3589						
OPAT11	020502	#14-3590							
OPAT12	020504	#14-3591							
OPAT13	020506	#14-3592							
OPAT20	020464	14-3484	14-3565	#14-3583					
OPAT21	020466	14-3471	14-3487	14-3491	14-3495	14-3505	14-3533	#14-3584	

SYMBOL		VALUE	REFERENCES							
OPAT22		020470	#14-3585							
OPAT23		020472	#14-3586							
OPAT24		020474	#14-3587							
01		020020	#14-3465							
010		020150	#14-3507	14-3509						
011		020160	14-3508	#14-3512						
012		020162	14-3485	#14-3514						
013		020176	#14-3517	14-3519						
014		020206	14-3518	#14-3522						
02		020044	#14-3477	14-3554	14-3571					
03		020046	#14-3478	14-3530						
04		020050	#14-3479	14-3528	14-3566					
05		020066	#14-3487							
06		020076	14-3488	#14-3491						
07		020106	14-3492	#14-3495						
08		020122	#14-3499	14-3501						
09		020134	14-3500	#14-3504						
PDATIC		021154	14-3617	14-3625	14-3630	14-3651	14-3655	14-3659	14-3663	14-3667	14-3685
			14-3691	#14-3709						
PDATI1		021156	#14-3710							
PDATI2		021160	#14-3711							
PDATI3		021162	#14-3712							
PDATO0		021164	14-3622	14-3626	14-3635	14-3692	#14-3714			
PDATO1		021166	#14-3715							
PDATO2		021170	#14-3716							
PDATO3		021172	#14-3717							
PDONE		021174	14-3633	14-3677	14-3687	14-3694	14-3702	#14-3719		
PERR0		020642	14-3615	#14-3643						
PERR1		021062	14-3639	#14-3689						
PERR10		020662	14-3646	#14-3649						
PERR11		020672	14-3644	#14-3651						
PERR12		020710	14-3652	#14-3655						
PERR13		020726	14-3656	#14-3659						
PERR14		020744	14-3660	#14-3663						
PERR15		020762	14-3664	#14-3667						
PERR16		020772	14-3668	#14-3670						
PERR17		021000	14-3650	14-3654	14-3658	14-3662	14-3666	#14-3672		
PERR2		021110	14-3641	#14-3696						
PERR20		021026	14-3669	#14-3679						
PERR21		021036	14-3632	#14-3682						
PERR22		021044	14-3681	#14-3683						
PIRQ	=	177772	#7-1113							
PIRQVE	=	000240	#7-1113							
POWERM		040400	19-5774	#20-6013						
PPAT10		021144	14-3612	#14-3704						
PPAT11		021146	#14-3705							
PPAT12		021150	#14-3706							
PPAT13		021152	#14-3707							
PROGNU		000001	#7-857	9-1140						
PR0		000000	#7-1113							
PR1		000040	#7-1113							
PR2	-	000100	#7-1113							

SYMBOL	VALUE	REFERENCES								
PR3	= 000140	#7-1113								
PR4	= 000200	#7-1113								
PR5	= 000240	#7-1113								
PR6	= 000300	#7-1113								
PR7	= 000340	#7-1113								
PS	= 177776	#7-1113	7-1113							
PSW	= 177776	#7-1113	9-1287							
PWRVEC	= 000024	#7-1113	9-1139	9-1139	19-5774	19-5774	19-5774	19-5774	19-5774	19-5774
P1	020524	#14-3609								
P2	020546	#14-3619	14-3620	14-3682	14-3690	14-3697				
P3	= 020550	#14-3620	14-3643	14-3778						
P4	020552	#14-3622	14-3645							
P5	020574	#14-3627	14-3629							
P6	020616	14-3628	#14-3635							
P7	020626	#14-3637	14-3640							
P8	020636	14-3638	#14-3640							
QDATI0	021664	14-3750	14-3833	14-3843	#14-3853					
QDATI1	021666	#14-3854								
QDATI2	021670	#14-3855								
QDATI3	021672	#14-3856								
QDATO0	021654	14-3745	14-3749	14-3760	14-3768	14-3834	#14-3848			
QDATO1	021656	#14-3849								
QDATO2	021660	#14-3850								
QDATO3	021662	#14-3851								
QDONE	021674	14-3758	14-3809	14-3819	14-3829	14-3836	#14-3858			
QERR0	021342	14-3736	#14-3778							
QERR1	021606	14-3772	#14-383'							
QERR11	021352	#14-3781								
QERR12	021370	14-3782	#14-3785							
QERR13	021406	14-3786	#14-3789							
QERR14	021424	14-3790	#14-3793							
QERR15	021442	14-3794	#14-3798							
QERR16	021452	14-3799	#14-3802							
QERR17	021460	14-3784	14-3788	14-3792	14-3796	#14-3804				
QERR2	021542	14-3765	#14-3821							
QERR20	021506	14-3800	#14-3811							
QERR21	021516	14-3757	#14-3814							
QERR22	021524	14-3813	#14-3815							
QERR3	021552	14-3774	#14-3823							
QERR4	021560	14-3822	#14-3825							
QPAT10	021634	14-3733	#14-3838							
QPAT11	021636	#14-3839								
QPAT12	021640	#14-3840								
QPAT13	021642	#14-3841								
QPAT20	021644	14-3740	14-3755	14-3767	14-3781	14-3785	14-3789	14-3793	14-3798	14-3817
		#14-3843								
QPAT21	021646	#14-3844								
QPAT22	021650	#14-3845								
QPAT23	021652	#14-3846								
Q1	021200	#14-3730								
Q10	021336	14-3771	#14-3773							
Q2	021222	#14-3742	14-3743	14-3814	14-3827	14-3832				

SYMBOL	VALUE	REFERENCES								
Q3	- 021224	#14-3743								
Q4	021226	#14-3745								
Q5	021250	#14-3751	14-3753							
Q6	021272	14-3752	#14-3760							
Q7	021302	#14-3762	14-3764							
Q8	021314	14-3763	#14-3767							
Q9	021330	#14-3770	14-3773							
RDCHR	= 104407	#19-5769								
RESREG	= 104411	#19-5769								
RESVEC	= 000010	#7-1113	9-1139	9-1139	9-1139					
RSETUP	= 104412	9-1269	11-1315	11-1507	11-1599	11-1652	12-2032	12-2212	12-2380	13-2645
		13-2750	13-2910	13-3008	13-3105	13-3206	14-3311	14-3454	14-3599	14-3719
		14-3858	15-4223	15-4373	15-4469	15-4548	17-4750	17-5044	17-5207	17-5212
		19-5296	19-5654	#19-5770	20-5950	20-5961	20-5972			
R6	-%000006	#7-1113	*9-1139	*9-1139	9-1139					
R7	=%000007	#7-1113								
SADR	015622	13-2826	13-2839	13-2844	13-2851	13-2857	#13-2898			
SAVREG	= 104410	#19-5769								
SCOPF	= 000004	#7-1113	9-1166	9-1277	11-1325	11-1529	11-1609	11-1667	12-2040	12-2220
		12-2517	13-2654	13-2760	13-2918	13-3017	13-3114	13-3216	14-3320	14-3463
		14-3607	14-3728	14-3876	15-4090	15-4232	15-4382	15-4478	15-4559	17-4761
		17-5057	19-5304	19-5561	19-5664	19-5753				
SDATO0	015636	13-2779	13-2782	13-2809	13-2812	#13-2905				
SDATO1	015640	#13-2906								
SDATO2	015642	#13-2907								
SDATO3	015644	#13-2908								
SDONE	015646	13-2844	13-2863	13-2866	13-2870	13-2873	13-2885	13-2896	#13-2910	
SERR0	015326	13-2766	#13-2822							
SERR1	015536	13-2771	#13-2876							
SERR10	015346	#13-2828	13-2845							
SERR15	015426	13-2833	#13-2848							
SERR2	015466	13-2787	#13-2861							
SERR20	015446	13-2838	#13-2854							
SERR3	015512	13-2790	#13-2868							
SERR4	015404	13-2799	#13-2841							
SERR5	015570	13-2801	#13-2887							
SERR6	015500	13-2817	#13-2864							
SERR7	015524	13-2819	#13-2871							
SETD1	041414	11-1358	11-1456	#20-6042						
SETF1	041406	11-1329	11-1480	#20-6041						
SETI1	041422	11-1386	11-1486	#20-6043						
SETL1	041430	11-1415	11-1462	#20-6044						
SPACE	040450	19-5851	19-5863	19-5867	19-5871	20-5910	#20-6016			
SPAT10	015626	13-2763	13-2783	13-2796	13-2813	#13-2900				
SPAT11	015630	#13-2901								
SPAT12	015632	#13-2902								
SPAT13	015634	#13-2903								
STACK	- 001100	#7-1113	9-1139	20-6004						
START	003606	7-1125	#9-1139	19-5774						
STFS1	041337	#20-6037								
STKLMT	177774	#7-1113								
STST1	041467	#20-6046								

SYMBOL		VALUE	REFERENCES								
ST1		041352	#20-6038								
ST2		041367	#20-6039								
SWR		001140	#8-1126	9-1139	*9-1139	9-1139	*9-1139	*9-1139	9-1140	9-1218	9-1220
			12-2598	12-2600	19-5753	19-5755	19-5755	19-5755	19-5755	19-5755	19-5757
			19-5757	19-5757	19-5757	19-5757	19-5767	19-5767	19-5774	19-5774	20-5993
SWREG		000176	#7-1125	9-1139	9-1140	19-5767	19-5767				
SW0	=	000001	#7-1113								
SW00	=	000001	#7-1113	7-1113							
SW01	=	000002	#7-1113	7-1113							
SW02	=	000004	#7-1113	7-1113							
SW03	=	000010	#7-1113	7-1113							
SW04	=	000020	#7-1113	7-1113							
SW05	=	000040	#7-1113	7-1113							
SW06	=	000100	#7-1113	7-1113							
SW07	=	000200	#7-1113	7-1113							
SW08	=	000400	#7-1113	7-1113							
SW09	-	001000	#7-1113	7-1113							
SW1	=	000002	#7-1113								
SW10	=	002000	#7-1113								
SW11	-	004000	#7-1113								
SW12	=	010000	#7-1113								
SW13	-	020000	#7-1113	9-1218	12-2598						
SW14	-	040000	#7-1113								
SW15		100000	#7-1113								
SW2	=	000004	#7-1113								
SW3	=	000010	#7-1113								
SW4	=	000020	#7-1113								
SW5	-	000040	#7-1113								
SW6	-	000100	#7-1113								
SW7	-	000200	#7-1113	9-1220	12-2600						
SW8	-	000400	#7-1113								
SW9		001000	#7-1113								
S1		015116	#13-2761								
S10		015264	#13-2807								
S11		015310	#13-2815	13-2818							
S12		015320	13-2816	#13-2818							
S2		015152	#13-2774	13-2861	13-2868						
S3		015154	#13-2775	13-2822	13-2876						
S4		015160	#13-2777	13-2878							
S5		015204	#13-2785	13-2788							
S6		015214	13-2786	#13-2788							
S7		015222	#13-2793	13-2826							
S8		015256	#13-2804	13-2864	13-2871	13-2887					
S9		015260	#13-2805	13-2841	13-2889						
TAB		000011	#7-1110	20-6015	20-6017	20-6018	20-6022	20-6029	20-6030	20-6031	20-6031
			20-6031	20-6034	20-6034	20-6035	20-6035	20-6035	20-6036	20-6036	20-6037
			20-6037	20-6038	20-6038	20-6039	20-6039	20-6040	20-6041	20-6042	20-6043
			20-6044	20-6045	20-6046	20-6046	20-6047	20-6048	20-6048	20-6048	20-6060
			20-6060	20-6060	20-6061	20-6071	20-6071	20-6075	20-6075	20-6075	20-6377
			20-6377	20-6378	20-6378	20-6378	20-6379	20-6379	20-6380	20-6381	20-6381
			20-6382	20-6382	20-6383	20-6383	20-6384	20-6384	20-6385	20-6385	20-6394
			20-6394	20-6395	20-6396	20-6396	20-6397	20-6397	20-6398	20-6398	20-6399

SYMBOL	VALUE	REFERENCES								
		20-6399	20-6403	20-6403	20-6404	20-6404	20-6407	20-6407	20-6407	20-6408
		20-6408	20-6409	20-6409	20-6414	20-6414	20-6415	20-6422	20-6422	20-6423
		20-6427	20-6429	20-6429	20-6430	20-6434	20-6434	20-6444	20-6444	20-6445
		20-6445	20-6469	20-6469	20-6475	20-6475	20-6478	20-6478	20-6479	20-6479
		20-6491	20-6491	20-6496	20-6496	20-6497	20-6497	20-6507	20-6507	20-6511
		20-6511	20-6540	20-6540	20-6540					
TBITVE	= 000014	#7-1113	9-1139	9-1139						
TDATI0	011620	12-2224	12-2229	12-2247	12-2267	12-2272	12-2301	12-2337	#12-2375	
TDATI1	011622	#12-2376								
TDATI2	011624	12-2298	#12-2377							
TDATI3	011626	12-2299	#12-2378							
TDATO0	011610	12-2243	12-2246	12-2295	12-2300	12-2338	#12-2370			
TDATO1	011612	#12-2371								
TDATO2	011614	12-2252	12-2306	#12-2372						
TDATO3	011616	12-2309	#12-2373							
TDONE	011630	12-2314	12-2333	12-2340	12-2347	12-2358	#12-2380			
TERR0	011376	12-2236	#12-2318							
TERR1	011460	12-2256	12-2308	#12-2336						
TERR2	011500	12-2258	#12-2343							
TERR25	011514	#12-2345	12-2350							
TERR3	011544	12-2290	#12-2353							
TERR4	011526	12-2311	#12-2348							
TKVEC	= 000060	#7-1113								
TPATI0	011570	12-2223	12-2266	#12-2360						
TPATI1	011572	#12-2361								
TPATI2	011574	12-2306	#12-2362							
TPATI3	011576	12-2309	#12-2363							
TPATI20	011600	12-2232	12-2275	#12-2365						
TPATI21	011602	#12-2366								
TPATI22	011604	#12-2367								
TPATI23	011606	#12-2368								
TPVEC	= 000064	#7-1113								
TRAPVE	= 000034	#7-1113	9- 139	9-1139						
TRTVEC	- 000014	#7-1113								
TST1	004270	#9-1166								
TST10	011024	#12-2220								
TST11	011632	#12-2517								
TST12	014170	#13-2654								
TST13	015114	#13-2760								
TST14	015650	#13-2918								
TST15	016144	#13-3017								
TST16	016436	#13-3114								
TST17	016760	#13-3216								
TST2	004656	#9-1277								
TST20	017310	#14-3320								
TST21	020016	#14-3463								
TST22	020522	#14-3607								
TST23	021176	#14-3728								
TST24	021676	#14-3876								
TST25	023012	#15-4090								
TST26	023570	#15-4232								
TST27	024364	#15-4382								

SYMBOL	VALUE	REFERENCES
TST3	004760	#11-1325
TST30	024770	#15-4478
TST31	025272	#15-4559
TST32	026324	#17-4761
TST33	030112	#17-5057
TST34	031416	#19-5304
TST35	033412	#19-5561
TST36	034166	#19-5664
TST37	034542	#19-5749
TST4	005664	#11-1529
TST5	006126	#11-1609
TST6	006266	#11-1667
TST7	010162	#12-2040
TYPE	= 104401	9-1140 19-5753 19-5753 19-5753 19-5757 19-5757 19-5761 19-5763 19-5767 19-5767 19-5767 19-5767 19-5767 19-5767 #19-5769 19-5774 19-5785 19-5813 19-5815 19-5820 19-5822 19-5850 19-5862 19-5866 19-5870 19-5889 20-5898 20-5909 20-5916 20-5926
TYPOC	= 104402	19-5767 #19-5769 19-5797 19-5840 19-5849 19-5853 19-5861 19-5865 19-5869 19-5873 20-5908
TYPON	= 104404	#19-5769
TYPOS	= 104403	19-5753 19-5753 #19-5769 19-5880
T1	011026	#12-2221
T10	011170	12-2255 #12-2257
T105	011176	12-2250 #12-2260
T11	011200	#12-2264
T12	011202	#12-2266
T13	011216	#12-2269 12-2270
T14	011260	12-2279 #12-2282
T15	011262	#12-2283 12-2322 12-2354
T16	011264	#12-2284 12-2324
T17	011302	12-2289 #12-2292
T2	011046	#12-2226 12-2227
T20	011342	#12-2303 12-2313
T21	011356	#12-2308 12-2310
T22	011360	12-2307 #12-2309
T23	011372	12-2304 #12-2313
T3	011114	12-2237 #12-2239
T4	011116	#12-2240 12-2318
T5	011120	#12-2241 12-2320
T6	011144	#12-2249 12-2260
T7	011160	#12-2254 12-2257
UDONE	023012	15-3990 15-3999 15-4017 15-4032 15-4043 15-4048 #15-4080
UERR0	022456	14-3885 #15-3993
UERR1	022502	14-3905 15-3964 #15-4003
UERR10	022510	#15-4005 15-4019
UERR11	022552	#15-4014
UERR2	022566	15-3928 15-3946 #15-4018
UERR20	022574	15-4004 #15-4020
UERR21	022636	#15-4029
UERR3	022652	15-3978 #15-4035
UERR4	022702	15-4042 #15-4044
UFLAG	022776	14-3877 15-3965 15-3972 #15-4074

SYMBOL	VALUE	REFERENCES								
UPAT00	022726	14-3878	14-3889	14-3911	15-3932	15-3950	15-3968	15-3981	#15-4049	
UPAT01	022730	#15-4050								
UPAT02	022732	#15-4051								
UPAT03	022734	#15-4052								
UPAT10	022736	14-3895	#15-4054							
JPAT11	022740	#15-4055								
UPAT12	022742	#15-4056								
UPAT13	022744	#15-4057								
UPAT20	022746	14-3917	#15-4059							
UPAT21	022750	#15-4060								
UPAT22	022752	#15-4061								
UPAT23	022754	#15-4062								
UPAT30	022756	15-3937	#15-4064							
UPAT31	022760	#15-4065								
UPAT32	022762	#15-4066								
UPAT33	022764	#15-4067								
UPAT40	022766	15-3955	15-3983	#15-4069						
UPAT41	022770	#15-4070								
UPAT42	022772	#15-4071								
UPAT43	022774	#15-4072								
UROM1	023004	14-3891	14-3913	15-3934	15-3952	15-4020	#15-4077			
UROM2	023006	14-3892	14-3914	15-3935	15-3953	15-4021	#15-4078			
UROM3	023010	14-3893	14-3915	15-3936	15-3954	15-4006	#15-4079			
UTMP1	023000	14-3883	14-3891	15-3952	15-3973	#15-4075				
UTMP2	023002	14-3884	14-3913	15-3934	15-3974	#15-4076				
U0	021714	#14-3880	14-3881							
U1	021744	#14-3886	15-3975							
U10	022302	#15-3956	15-3959							
U11	022304	#15-3957	15-3993							
U12	022336	15-3963	#15-3965							
U13	022354	#15-3970	15-3971							
U14	022406	15-3966	#15-3976							
U15	022436	#15-3984	15-3987	15-4044						
U16	022440	#15-3985	15-4035							
U2	022010	#14-3896	14-3898							
U3	022042	14-3904	#14-3907							
U4	022106	#14-3919	14-3921							
U5	022140	15-3927	#15-3929							
U6	022204	#15-3939	15-3941							
U7	022236	15-3945	#15-3947							
WDAP00	023556	#15-4218								
WDAT01	023560	#15-4219								
WDAT02	023562	#15-4220								
WDAT03	023564	#15-4221								
WDONE	023566	15-4110	15-4118	15-4138	15-4146	15-4166	15-4174	15-4196	15-4199	15-4204
		#15-4223								
WPAT00	023546	15-4094	15-4097	15-4101	15-4103	15-4122	15-4127	15-4131	15-4133	15-4150
		15-4153	15-4157	15-4159	15-4178	15-4183	15-4187	15-4189	15-4208	15-4209
		15-4210	15-4211	#15-4213						
WPAT01	023550	#15-4214								
WPAT02	023552	#15-4215								
WPAT03	023554	#15-4216								

SYMBOL	VALUE	REFERENCES						
WSETUP	023514	15-4108	15-4164	15-4194	#15-4208			
W1	023014	#15-4091						
W10	023226	15-4136	#15-4139					
W11	023254	15-4141	#15-4147					
W12	023304	15-4152	#15-4154					
W13	023330	#15-4161	15-4167					
W14	023344	15-4162	#15-4167					
W15	023372	15-4169	#15-4175					
W16	023426	15-4180	#15-4184					
W17	023452	#15-4191	15-4197					
W2	023044	15-4096	#15-4098					
W20	023466	15-4192	#15-4197					
W3	023070	#15-4105	15-4111					
W4	023106	15-4106	#15-4111					
W5	023136	15-4113	#15-4119					
W6	023172	15-4124	#15-4128					
W7	023216	#15-4135	15-4139					
XAPT11	024344	#15-4365						
XDAT00	024322	15-4244	15-4267	15-4290	15-4313	15-4331	15-4336	#15-4354
XDAT01	024324	#15-4355						
XDAT02	024326	#15-4356						
XDAT03	024330	#15-4357						
XDONE	024362	15-4325	15-4333	15-4339	15-4347	15-4352	#15-4373	
XERR1	024206	15-4250	15-4273	#15-4329				
XERR2	024270	15-4255	15-4278	#15-4343				
XERR3	024234	15-4296	15-4319	#15-4334				
XERR4	024304	15-4301	15-4324	#15-4348				
XPAT00	024332	15-4236	15-4246	15-4282	15-4292	#15-4359		
XPAT01	024334	#15-4360						
XPAT02	024336	#15-4361						
XPAT03	024340	#15-4362						
XPAT10	024342	15-4240	15-4263	15-4286	15-4309	15-4329	15-4334	#15-4364
XPAT12	024346	#15-4366						
XPAT13	024350	#15-4367						
XPAT20	024352	15-4259	15-4269	15-4305	15-4315	#15-4368		
XPAT21	024354	#15-4369						
XPAT22	024356	#15-4370						
XPAT23	024360	#15-4371						
XTMP	024320	15-4237	15-4260	15-4283	15-4306	15-4330	15-4335	15-4337	#15-4353
X1	023572	#15-4233						
X10	023764	15-4272	#15-4274					
X11	024000	15-4277	#15-4279					
X12	024034	15-4285	#15-4287					
X13	024060	#15-4294	15-4297					
X14	024066	15-4295	#15-4297					
X15	024102	15-4300	#15-4302					
X16	024136	15-4308	#15-4310					
X17	024162	#15-4317	15-4320					
X2	023626	15-4239	#15-4241					
X20	024170	15-4318	#15-4320					
X21	024204	15-4323	#15-4325					
X3	023652	#15-4248	15-4251					

SYMBOL	VALUE	REFERENCES					
X4	023660	15-4249	#15-4251				
X5	023676	15-4254	#15-4256				
X6	023732	15-4262	#15-4264				
X7	023756	#15-4271	15-4274				
YDAT00	024726	15-4396	15-4416	15-4425	15-4433	#15-4449	
YDAT01	024730	#15-4450					
YDAT02	024732	#15-4451					
YDAT03	024734	#15-4452					
YDONE	024766	15-4413	15-4428	15-4436	15-4442	#15-4469	
YERR1	024566	15-4418	#15-4421				
YERR2	024630	15-4420	#15-4429				
YERR3	024672	15-4405	#15-4437				
YFLAG	024716	15-4383	15-4406	15-4408	#15-4444		
YPAT00	024736	15-4384	15-4410	#15-4454			
YPAT01	024740	#15-4455					
YPAT02	024742	#15-4456					
YPAT03	024744	#15-4457					
YPAT10	024746	15-4385	15-4409	#15-4459			
YPAT11	024750	#15-4460					
YPAT12	024752	#15-4461					
YPAT13	024754	#15-4462					
YPAT20	024756	15-4390	15-4424	15-4432	#15-4464		
YPAT21	024760	#15-4465					
YPAT22	024762	#15-4466					
YPAT23	024764	#15-4467					
YTMP1	024720	15-4384	15-4392	15-4409	15-4415	15-4423	15-4431	#15-4445
YTMP2	024722	15-4385	15-4399	15-4410	15-4426	15-4434	#15-4446
YTMP3	024724	15-4386	15-4403	15-4411	15-4440	#15-4447	
Y1	024414	#15-4387	15-4412				
Y2	024436	#15-4393	15-4422	15-4430	15-4438		
Y3	024462	#15-4400	15-4402				
Y4	024500	15-4404	#15-4406				
Y5	024540	15-4407	#15-4413				
Y6	024542	15-4401	#15-4414				
Y7	024556	#15-4417	15-4419				
ZDAT00	025230	15-4491	15-4513	#15-4528			
ZDAT01	025232	#15-4529					
ZDAT02	025234	#15-4530					
ZDAT03	025236	#15-4531					
ZDONE	025270	15-4508	15-4516	15-4522	#15-4548		
ZERR1	025134	15-4497	#15-4509				
ZERR2	025176	15-4501	#15-4517				
ZFLAG	025222	*15-4479	15-4502	15-4504	#15-4524		
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	#14-3313	#14-3320	#14-3456	#14-3463	#14-3601	#14-3607	#14-3721	#14-3728	#14-3860	#14-3876
	#15-4083	#15-4090	#15-4226	#15-4232	#15-4375	#15-4382	#15-4470	#15-4478	#15-4551	#15-4559
	#17-4751	#17-4761	#17-5046	#17-5057	#19-5297	#19-5304	#19-5554	#19-5561	#19-5655	#19-5664
MULT	#7-1113									
NAMEP	#7-885	9-1140								
NEWTST	#7-1113	9-1166	9-1277	11-1325	11-1529	11-1609	11-1667	12-2040	12-2220	12-2517
	13-2654	13-2760	13-2918	13-3017	13-3114	13-3216	14-3320	14-3463	14-3607	14-3728
	14-3876	15-4090	15-4232	15-4382	15-4478	15-4559	17-4761	17-5057	19-5304	19-5561
	19-5664									
NTMPM	#7-881									
POP	#7-1113	19-5759	19-5765	19-5765	19-5774	19-5774				
PUSH	#7-1113	19-5759	19-5765	19-5765	19-5765	19-5774	19-5774			
REPORT	#7-1113									
ROM	#7-915									
ROMAC	#7-1047									
ROM1	#7-918									
ROM10	#7-939									
ROM11	#7-942									
ROM12	#7-945									
ROM13	#7-948									
ROM14	#7-951									
ROM15	#7-954									
ROM16	#7-957									
ROM17	#7-960									
ROM2	#7-921									
ROM20	#7-963									
ROM3	#7-924									
ROM30	#7-908									
ROM31	#7-911									
ROM4	#7-927									
ROM5	#7-930									
ROM6	#7-933									
ROM7	#7-936									
RSET	#7-888	#9-1269	#11-1315	#11-1507	#11-1599	#11-1652	#12-2032	#12-2212	#12-2380	#13-2645
	#13-2750	#13-2910	#13-3008	#13-3105	#13-3206	#14-3311	#14-3454	#14-3599	#14-3719	#14-3858
	#15-4223	#15-4373	#15-4469	#15-4548	#17-4750	#17-5044	#17-5207	#17-5212	#19-5296	#19-5654
	#20-5950	#20-5961	#20-5972							
RTMPM	#7-876									
SETPRI	#7-1113									
SETTRA	#19-5769	#19-5769	#19-5769	#19-5769	#19-5769	#19-5769	#19-5769	#19-5769	#19-5769	#19-5769

MACRO NAME	REFERENCES									
	#19-5770	#19-5771								
SETUP	#7-1113	9-1139								
SKIP	#7-1113									
SLASH	#7-1113									
SPACE	#7-1096	#7-1113								
SSKAD	#7-1086									
STARS	#7-1113	8-1126	8-1126	8-1126	9-1135	9-1136	9-1136	9-1136	9-1166	9-1166
	9-1277	9-1277	11-1325	11-1325	11-1529	11-1529	11-1609	11-1609	11-1667	11-1667
	12-2040	12-2040	12-2220	12-2220	12-2517	12-2517	13-2654	13-2654	13-2760	13-2760
	13-2918	13-2918	13-3017	13-3017	13-3114	13-3114	13-3216	13-3216	14-3320	14-3320
	14-3463	14-3463	14-3607	14-3607	14-3728	14-3728	14-3876	14-3876	15-4090	15-4090
	15-4232	15-4232	15-4382	15-4382	15-4478	15-4478	15-4559	15-4559	17-4761	17-4761
	17-5057	17-5057	19-5304	19-5304	19-5561	19-5561	19-5664	19-5664	19-5753	19-5755
	19-5757	19-5759	19-5761	19-5763	19-5765	19-5767	19-5767	19-5767	19-5769	19-5774
	19-5774	19-5778	20-5938	20-5955	20-5966	20-5979	20-5985			
SUMMAC	#7-1074	9-1166	12-2517							
SWRSU	#7-1113	#9-1139	#9-1139							
TMAC	#7-905	19-5749								
TRMTRP	#19-5769	#19-5772								
TYPBIN	#7-1113									
TYPDEC	#7-1113									
TYPNAM	#7-1113	#9-1140								
TYPNUM	#7-1113									
TYPOCS	#7-1113	19-5753	19-5753							
TYPOCT	#7-1113	#19-5767								
TYPTXT	#7-1113	19-5753	19-5753							
$$CMRE	#7-1126	8-1126	8-1126	8-1126	8-1126	8-1126	8-1126	8-1126	8-1126	8-1126
	8-1126	8-1126	8-1126	8-1126	8-1126	8-1126	8-1126	8-1126	8-1126	8-1126
	8-1126									
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	8-1126									
$$ESCA	#7-1113									
$$NEWT	#7-1113	#9-1166	#9-1277	#11-1325	#11-1529	#11-1609	#11-1667	#12-2040	#12-2220	#12-2517
	#13-2654	#13-2760	#13-2918	#13-3017	#13-3114	#13-3216	#14-3320	#14-3463	#14-3607	#14-3728
	#14-3876	#15-4090	#15-4232	#15-4382	#15-4478	#15-4559	#17-4761	#17-5057	#19-5304	#19-5561
	#19-5664									
$$SET	#19-5769	19-5769	19-5769	19-5769	19-5769	19-5769	19-5769	19-5769	19-5769	19-5769
	19-5770	19-5771								
$$SETM	#9-1139	9-1139								
$$SETU	#9-1139	9-1139								
$$SKIP	#7-1113									
.EQUAT	#7-1099	7-1113								
.EQUIV	#7-1093	#7-1103	#7-1113	#7-1113	#7-1113	#7-1113	#7-1113	#7-1113	#7-1113	#7-1113
	#7-1113	#7-1113	#7-1113	#7-1113	#7-1113	#7-1113	#7-1113	#7-1113	#7-1113	#7-1113
	#7-1113	#7-1113	#7-1113	#7-1113	#7-1113					
.HEADE	#7-1099	7-1104								
.SETUP	#7-1099	7-1123								
.SWRHI	#7-1099									
.$ACT1	#7-1099	#9-1135								
.$APTB	#7-1101	#8-1126	8-1126							
.$APTH	#7-1101	9-1136								

MACRO NAME	REFERENCES	
.$APTY	#7-1102	19-5765
.$CATC	#7-1099	7-1125
.$CMTA	#7-1099	#7-1126
.$EOP	#7-1100	19-5753
.$ERRO	#7-1100	#19-5757
.$POWE	#7-1101	#19-5774
.$READ	#7-1102	19-5767
.$SAVE	#7-1100	19-5759
.$SCOP	#7-1100	#19-5755
.$TRAP	#7-1101	#19-5769
.$TYPD	#7-1101	
.$TYPE	#7-1100	#19-5761
.$TYPO	#7-1100	#19-5763