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961.0 GENERAL INFORMATION
-----1.1 ABSTRACT

THIS DIAGNOSTIC VERIFIES THE OPERATION OF THE DIBOL DECIMAL INSTRUCTIONS OF THE LSI-11 (ADDN, SUBN, CMPN, CVTNL).

THE PROGRAM CHECKS THAT EACH INSTRUCTION IS INTERRUPTABLE USING THE CONSOLE SLU INTERFACE (SEE PARA 2.3.4) AND RUNS ALTERNATE PASSES WITH THE TRACE TRAP ENABLED, UNLESS INHIBITED BY THE SWITCH REGISTER (2). THE PROGRAM IS DESIGNED TO RUN ON AN LSI-11 WITH 4K OF MEMORY AND THE DIS MICROMS. IT CAN BE RUN UNDER XXDP, APT, AND ACT MONITORS. THE SOFTWARE SWITCH REGISTER IS AT LOCATION 176.

TO FULLY TEST THE LSI-11 DIBOL INSTRUCTION SET MICROMS, THE FOLLOWING DIAGNOSTICS MUST BE RUN:

MD-11-DVKAI*	DIS MOVE & STRING INSTRUCTION TEST
MD-11-DVKAJ*	[THIS DIAGNOSTIC]
MD-11-DVKAB*	LSI-11 EIS INSTRUCTION TEST

WHERE "*" IS THE LATEST REVISION

1.2 SYSTEM REQUIREMENTS
-----1.2.1 EQUIPMENT

LSI-11(KD11-P) WITH A SERIAL LINE INTERFACE AND 4K OF MEMORY

1.2.2 STORAGE

THE PROGRAM USES MEMORY FROM 000000 TO 017040.

1.2.3 PRELIMINARY PROGRAMS

IT IS ASSUMED THAT THE FOLLOWING DIAGNOSTICS HAVE BEEN RUN:

LSI-11 BASIC CPU TEST	MD-11-DVKAA*
LSI-11 TRAPS TEST	MD-11-DVKAD*

WHERE "*" IS THE LATEST REVISION

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2.0 OPERATING INSTRUCTIONS

2.1 LOADING PROCEDURES

USE STANDARD PROCEDURE FOR PDP-11 ABSOLUTE BINARY FORMATTED TAPES

2.2 STARTING PROCEDURE

LOAD THE SWITCH REGISTER WITH THE DESIRED SETTING
(SOFTWARE SWITCH REGISTER LOCATION = 176)

THE PROGRAM SHOULD ALWAYS BE STARTED AT 200.
STARTING AT 200, THE PROGRAM CLEARS ALL PROGRAM PARAMETERS AND
THEN PRINTS ITS MAINDEC IDENTIFICATION. "END PASS" IS PRINTED
AT THE END OF EACH FULL PASS OF THE DIAGNOSTIC.

2.3 OPERATING PROCEDURES

2.3.1 OPERATIONAL SWITCH REGISTER

LOCATION 176 IS USED FOR THE SOFTWARE SWITCH REGISTER AND
THE FOLLOWING OPTIONS MAY BE SELECTED BY INSERTING A 1 IN THEIR
RESPECTIVE BIT POSITIONS.

BIT15	- HALT ON ERROR
BIT14	+ SCOPE LOOP
BIT13	- INHIBIT ERROR TYPEOUT
BIT12	- INHIBIT TRACE TRAP
BIT11	- UNUSED
BIT10	- UNUSED
BIT09	- LOOP ON ERROR
BIT08	- LOOP ON TEST IN SWR<05:00>
BIT07	- INHIBIT INTERRUPTABILITY TESTS

NOTE: ALL TYPEOUTS CAN BE SUPPRESSED BY MAKING BITS OF BYTE \$ENVM
HIGH.

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1742.3.2 RUNNING UNDER APT

THE APT MAILBOX-ETABLE IS LOCATED AT LOCATION 566.

USING THE CONSOLE INTERFACE AS THE INTERRUPTING DEVICE, THE INTERRUPTABILITY TESTS WILL BE RUN ON ONLY THE FIRST PASS TO AVOID INTERFERENCE WITH THE APT INTERFACE. IF INTERRUPTABILITY TESTS ARE DESIRED ON ALL PASSES, ANOTHER SLU MUST BE SUPPLIED AND ITS RECEIVER STATUS REGISTER ADDRESS & ITS INTERRUPT VECTOR MUST BE PLACED IN THE APT E-TABLE AT LOCATIONS "\$BASE" & "\$VECT1" RESPECTIVELY.

2.3.3 RUN WITH ALTERNATE CONSOLE ADDRESS

TO USE A CONSOLE ADDRESS OTHER THAN 177560, THE OPERATOR MUST SUPPLY THE PROGRAM WITH THE CORRECT ADDRESSES BY INSERTING THEM AT THE LOCATIONS LABELED:

\$TKS: RCSR ADDRESS
\$TKB: RBUF ADDRESS
\$TPS: TCSR ADDRESS
\$TPB: TBUF ADDRESS

2.3.4 RUN INTERRUPT TESTS WITH ALTERNATE SLU

TO USE A SERIAL LINE INTERFACE ADDRESS OTHER THAN THE STANDARD CONSOLE ADDRESS (177560), THE OPERATOR MUST SUPPLY THE CORRECT ADDRESS AND INTERRUPT VECTOR BY INSERTING THEM IN THE LOCATIONS LABELED:

\$BASE: *RCSR ADDRESS*
\$VECT1: *RECEIVER INTERRUPT VECTOR*

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2.4 EXECUTION TIMES

 THE GIVEN EXECUTION TIMES TAKE INTO ACCOUNT THE RANDOM CHARACTERISTIC OF THE INTERRUPT TESTS. THE EXECUTION TIME OF THE FIRST PASS IS APPROXIMATELY 10 SECONDS; BUT SUBSEQUENT PASSES WITH INTERRUPT TESTS ENABLED COULD TAKE AS LONG AS 32 SECONDS. THEREFORE THE 32 SECOND EXECUTION TIME IS USED. THE PASS TIME WITHOUT INTERRUPTS IS APPROXIMATELY 2 SECONDS.

3.0 ERROR REPORTING

 IF A ROUTINE FAILS AND THE INHIBIT ERROR TYPEOUT (BIT13) OF THE SWR IS NOT SET, THE PC OF THE ERROR IS PRINTED. THE OPERATOR CAN FIND THE ERROR REPORT IN THE COMMENT FIELD OF THAT PC LOCATION IN THE PROGRAM LISTING. IF HALT ON ERROR (BIT15) OF THE SWR IS SET THE PROGRAM WILL HALT AFTER PRINTING THE ERROR PC AND ENTER THE MACHINE ODT.

E.G. XXXXXX <--PC OF THE ERROR
 XXXXXX <--PC+2 OF THE HALT ON ERROR LOCATION
 a <--ODT ENTERED

WHERE "XXXXXX" IS AN OCTAL VALUE

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4.0 SUBROUTINE ABSTRACTS

4.1 TRAPCATCHER

A ".+2 - HALT" SEQUENCE IS REPEATED FROM 0-776 TO CATCH ALL UNEXPECTED TRAPS. THUS ALL UNEXPECTED TRAPS OR INTERRUPTS WILL HALT AT THE VECTOR+2, EXCEPT TRAPS TO LOCATION 0,4, & 10 WHICH GO TO THEIR RESPECTIVE REPORTING ROUTINES "TZERO", "TIMTRP" & "ILLTRP". THE OTHER EXCEPTION IS LOCATION 100 (RTC INTERRUPT VECTOR) WHICH CONTAINS A ".+2 - RTI" SEQUENCE (RETURNS FROM THE INTERRUPT).

4.2 SCOPE

THIS ROUTINE CALL IS PLACED BETWEEN EACH SUBTEST. IT RECORDS THE STARTING ADDRESS OF EACH SUBTEST AS IT IS BEING ENTERED & UPDATES THE TEST NUMBER. IF A SCOPE LOOP IS REQUESTED IT WILL JUMP TO THE START OF THE SUBTEST AT WHICH THE SCOPE LOOP IS REQUESTED.

4.3 ERROR

THIS ROUTINE CALL IS PLACED WHEREVER AN ERROR REPORT IS DESIRED. THE LOWER BYTE OF THIS CALL IS USED AS THE ERROR NUMBER. THIS ROUTINE REPORTS ERRORS TO APT USING "\$APTYPE", TYPES ERRORS TO THE CONSOLE USING THE "\$STYPE" & "\$STYPOCT" ROUTINES, AND HANDLES ERROR RESPONSES VIA SWR SETTINGS.

4.4 \$POWER

THIS ROUTINE SAVES ALL GENERAL REGISTERS DURING POWER-DOWN AND RESTORES THEM AT POWER-UP. IF A POWER FAILURE OCCURS "POWER" IS PRINTED AT THE CONSOLE AFTER POWER IS RESTORED AND THE PROGRAM IS RESTARTED AT TEST# 1.

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- 4.5 NPREP

THIS ROUTINE IS USED TO STORE A COPY OF THE INSTRUCTION TEST ARGUMENTS TO BE STORED IN RC-->R5.
- 4.6 GENR

THIS ROUTINE IS USED TO TRANSFER INSTRUCTION TEST ARGUMENTS TO THE GENERAL REGISTERS AND TO COPY THE STACK POINTER BEFORE THE TEST INSTRUCTION EXECUTION.
- 4.7 XPSW

THIS ROUTINE IS USED TO STORED THE EXPECTED PSW OF THE INSTRUCTION TEST AND TO SET THE T-BIT IN THE EXPECTED PSW ON PASSES USING THE TRACE TRAP.
- 4.8 INTR

THIS ROUTINE IS USED TO DETECT WHEN THE TEST INSTRUCTION HAS BEEN INTERRUPTED AND TO CONTINUE THE INTERRUPT STREAM UNTIL THE INSTRUCTION IS INTERRUPTED.

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5.0 MISCELLANEOUS

5.1 STACK POINTER

STACK POINTER IS INITIALLY SET TO 600.

5.2 PASS COUNT

A 16 BIT LOCATION "\$PASS" IS USED TO KEEP THE PASS COUNT. IT IS CLEARED BY STARTING AT 200.

5.3 TEST NUMBER

A 16 BIT LOCATION "\$TSTNM" IS USED TO KEEP TRACK OF THE SUBTEST NUMBER. THIS NUMBER IS ALSO PLACED IN THE APT E-TABLE AT "\$TESTN" WHEN UNDER APT.

5.4 POWER FAIL

THE DIAGNOSTIC CAN BE POWER FAILED WITH NO ERRORS. AFTER POWERING DOWN AND THEN UP AGAIN, THE PROGRAM WILL RESTART FROM TEST# 1 (I.E., RESTARTS THE PASS THAT WAS INTERRUPTED) AFTER TYPING "POWER" TO THE CONSOLE. HOWEVER IF THE PROGRAM IS STORED IN MOS MEMORY THAT CAN NOT HOLD DATA WITH POWER DOWN, THEN THE PROGRAM WILL NOT RECOVER FROM A POWER FAIL.

5.5 EVENT INTERRUPTS

THIS DIAGNOSTIC CAN BE RUN WITH THE REAL TIME CLOCK ACTIVE (INTERRUPT = 100). LOCATION 100 POINTS TO LOCATION 102 WHICH CONTAINS AN "RTI" INSTRUCTION. THUS ON CLOCK INTERRUPTS, AN RTI IS EXECUTED TO HANDLED IT.

!

.ENABLE ABS
.LIST ME
.NLIST MC,MD,CND


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351
352
353       .SBTTL  BASIC DEFINITIONS
354
355       ;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
356       001100  STACK= 1100
357       .EQUIV  EMT,ERROR      ;;BASIC DEFINITION OF ERROR CALL
358       .EQUIV  IOT,SCOPE     ;;BASIC DEFINITION OF SCOPE CALL
359
360       ;*MISCELLANEOUS DEFINITIONS
361       000011  HT= 11          ;;CODE FOR HORIZONTAL TAB
362       000012  LF= 12          ;;CODE FOR LINE FEED
363       000015  CR= 15          ;;CODE FOR CARRIAGE RETURN
364       000200  CRLF= 200       ;;CODE FOR CARRIAGE RETURN-LINE FEED
365       177776  PS= 177776     ;;PROCESSOR STATUS WORD
366       .EQUIV  PS,PSW
367       177774  STKLMT= 177774 ;;STACK LIMIT REGISTER
368       177772  PIRQ= 177772   ;;PROGRAM INTERRUPT REQUEST REGISTER
369       177570  DSWR= 177570   ;;HARDWARE SWITCH REGISTER
370       177570  DDISP= 177570 ;;HARDWARE DISPLAY REGISTER
371
372       ;*GENERAL PURPOSE REGISTER DEFINITIONS
373       000000  R0= %0          ;;GENERAL REGISTER
374       000001  R1= %1          ;;GENERAL REGISTER
375       000002  R2= %2          ;;GENERAL REGISTER
376       000003  R3= %3          ;;GENERAL REGISTER
377       000004  R4= %4          ;;GENERAL REGISTER
378       000005  R5= %5          ;;GENERAL REGISTER
379       000006  R6= %6          ;;GENERAL REGISTER
380       000007  R7= %7          ;;GENERAL REGISTER
381       000006  SP= %6         ;;STACK POINTER
382       000007  PC= %7         ;;PROGRAM COUNTER
383
384       ;*PRIORITY LEVEL DEFINITIONS
385       000000  PR0= 0          ;;PRIORITY LEVEL 0
386       000040  PR1= 40         ;;PRIORITY LEVEL 1
387       000100  PR2= 100       ;;PRIORITY LEVEL 2
388       000140  PR3= 140       ;;PRIORITY LEVEL 3
389       000200  PR4= 200       ;;PRIORITY LEVEL 4
390       000240  PR5= 240       ;;PRIORITY LEVEL 5
391       000300  PR6= 300       ;;PRIORITY LEVEL 6
392       000340  PR7= 340       ;;PRIORITY LEVEL 7
393
394       ;*"SWITCH REGISTER" SWITCH DEFINITIONS
395       100000  SW15= 100000
396       040000  SW14= 40000
397       020000  SW13= 20000
398       010000  SW12= 10000
399       004000  SW11= 4000
400       002000  SW10= 2000
401       001000  SW09= 1000
402       000400  SW08= 400
403       000200  SW07= 200
404       000100  SW06= 100
405       000040  SW05= 40
406       000020  SW04= 20

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SEQ 0013

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407      000010      SW03= 10
408      000004      SW02= 4
409      000002      SW01= 2
410      000001      SW00= 1
411      .EQUIV      SW09,SW9
412      .EQUIV      SW08,SW8
413      .EQUIV      SW07,SW7
414      .EQUIV      SW06,SW6
415      .EQUIV      SW05,SW5
416      .EQUIV      SW04,SW4
417      .EQUIV      SW03,SW3
418      .EQUIV      SW02,SW2
419      .EQUIV      SW01,SW1
420      .EQUIV      SW00,SW0
421
422      .:DATA BIT DEFINITIONS (BIT00 TO BIT15)
423      100000      BIT15= 100000
424      040000      BIT14= 40000
425      020000      BIT13= 20000
426      010000      BIT12= 10000
427      004000      BIT11= 4000
428      002000      BIT10= 2000
429      001000      BIT09= 1000
430      000400      BIT08= 400
431      000200      BIT07= 200
432      000100      BIT06= 100
433      000040      BIT05= 40
434      000020      BIT04= 20
435      000010      BIT03= 10
436      000004      BIT02= 4
437      000002      BIT01= 2
438      000001      BIT00= 1
439      .EQUIV      BIT09,BIT9
440      .EQUIV      BIT08,BIT8
441      .EQUIV      BIT07,BIT7
442      .EQUIV      BIT06,BIT6
443      .EQUIV      BIT05,BIT5
444      .EQUIV      BIT04,BIT4
445      .EQUIV      BIT03,BIT3
446      .EQUIV      BIT02,BIT2
447      .EQUIV      BIT01,BIT1
448      .EQUIV      BIT00,BIT0
449
450      .:BASIC "CPU" TRAP VECTOR ADDRESSES
451      000004      ERRVEC= 4          :: TIME OUT AND OTHER ERRORS
452      000010      RESVEC= 10         :: RESERVED AND ILLEGAL INSTRUCTIONS
453      000014      TBITVEC=14         :: "T" BIT
454      000014      TRTVEC= 14         :: TRACE TRAP
455      000014      BPTVEC= 14         :: BREAKPOINT TRAP (BPT)
456      000020      IOTVEC= 20         :: INPUT/OUTPUT TRAP (IOT) **SCOPE**
457      000024      PWRVEC= 24         :: POWER FAIL
458      000030      EMTVEC= 30         :: EMULATOR TRAP (EMT) **ERROR**
459      000034      TRAPVEC=34         :: "TRAP" TRAP
460      000060      TKVEC= 60          :: TTY KEYBOARD VECTOR
461      000064      TPVEC= 64          :: TTY PRINTER VECTOR
462      000240      PIRQVEC=240        :: PROGRAM INTERRUPT REQUEST VECTOR

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SEQ 0014

463	000200	APTSIZE=	200
464	000001	APTENV= 001	
465	000100	APTSPool=	100
466	000040	APTCSUP=	040
467	171400	\$SWR= 171400	
468	000300	\$SWRMK= 300	
469	000020	TBIT= 20	
470	000001	\$TN= 1	
471	000001	N= 1	
472	000000	X= \$TN-1	
473	177777	NXM= 177777	
474	177560	ABASE= 177560	
475	000060	AVECT1= 60	
476	000000	. = 0	
477			


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478
479
480      .SBTTL  TRAP CATCHER
481
482      000000
483
484      ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
485      ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
486      ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
487      000174 000174
488      000176 000000
489
490
491      000000 000000
492      000000 014702      ;=0
493      000002 000340      TZERO      ;SET LOCATIONS 0,4,6 TO ERROR REPORTS
494      000004 014712      340
495      000006 000340      TIMTRP
496      000010 014722      340
497      000012 000340      ILLTRP
498
499
500
501      000100 000100      ;=100
502      000100 000102      .WORD 102
503      000102 000002      .WORD 2      ;HANDLE EVENT LINE INTERRUPTS
504
505
506      000200 000200      ;=200
507      000200 000167 000512  JMP START      ;STARTING LOCATION FOR PROGRAM
508
  
```

```

509
510      000400
511      .SBTTL      .=400
512      ACT11 HOOKS
513      ;;*****
514      ;HOOKS REQUIRED BY ACT11
515      $SVPC=.      ;SAVE PC
516      .=46
517      000046      $ENDAD      ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
518      000052      .=52
519      000052      .WORD      0      ;;2)SET LOC.52 TO ZERO
520      000400      .= $SVPC      ;; RESTORE PC
521      .SBTTL      APT PARAMETER BLOCK
522
523      ;;*****
524      ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
525      ;;*****
526      000400      . $X=.      ;;SAVE CURRENT LOCATION
527      000024      .=24      ;;SET POWER FAIL TO POINT TO START OF PROGRAM
528      000024      200      ;;OR APT START UP
529      000044      .=44      ;;POINT TO APT INDIRECT ADDRESS PNTR.
530      000044      $APTHDR      ;;POINT TO APT HEADER BLOCK
531      000400      .= $X      ;;RESET LOCATION COUNTER
532
533      ;;*****
534      ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
535      ;INTERFACE SPEC.
536      000400      $APTHD:
537      000400      000000      $HIBTS: .WORD      0      ;; TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
538      000402      000566      $MBADR: .WORD      $MAIL      ;; ADDRESS OF APT MAILBOX (BITS 0-15)
539      000404      000030      $TSTM: .WORD      30      ;; RUN TIM OF LONGEST TEST
540      000406      000040      $PASTM: .WORD      40      ;; RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
541      000410      000000      $UNITM: .WORD      ;; ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
542      000412      000027      .WORD      $ETEND-$MAIL/2 ;; LENGTH MAILBOX-ETABLE(WORDS)
543

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C02

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SEQ 0017

544

545
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548
549
550
551 000500
552 000500
553 000500 000000
554 000502 000
555 000503 000
556 000504 000000
557 000506 000000
558 000510 000000
559 000512 000000
560 000514 000
561 000515 001
562 000516 000000
563 000520 000000
564 000522 000000
565 000524 000000
566 000526 000000
567 000530 000000
568 000532 000000
569 000534 000
570 000535 000
571 000536 000000
572 000540 177570
573 000542 177570
574 000544 177560
575 000546 177562
576 000550 177564
577 000552 177566
578 000554 000
579 000555 002
580 000556 012
581 000557 000
582 000560 000000
583 000562 077
584 000563 015
585 000564 000012
586
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591 000566
592 000566 000000
593 000570 000000
594 000572 000000
595 000574 000000
596 000576 000000
597 000600 000000
598 000602 000000
599 000604 000000
600 000606

.SBTTL COMMON TAGS

*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
*USED IN THE PROGRAM.

SCMTAG: . =500 ;: START OF COMMON TAGS
\$.STNM: .WORD 0 ;: CONTAINS THE TEST NUMBER
\$.SERFLG: .BYTE 0 ;: CONTAINS ERROR FLAG
\$.SICNT: .WORD 0 ;: CONTAINS SUBTEST ITERATION COUNT
\$.LPADR: .WORD 0 ;: CONTAINS SCOPE LOOP ADDRESS
\$.LPERR: .WORD 0 ;: CONTAINS SCOPE RETURN FOR ERRORS
\$.SERTTL: .WORD 0 ;: CONTAINS TOTAL ERRORS DETECTED
\$.ITEMB: .BYTE 0 ;: CONTAINS ITEM CONTROL BYTE
\$.SERMAX: .BYTE 1 ;: CONTAINS MAX. ERRORS PER TEST
\$.SERRPC: .WORD 0 ;: CONTAINS PC OF LAST ERROR INSTRUCTION
\$.SGDADR: .WORD 0 ;: CONTAINS ADDRESS OF 'GOOD' DATA
\$.SBDADR: .WORD 0 ;: CONTAINS ADDRESS OF 'BAD' DATA
\$.SGDJAT: .WORD 0 ;: CONTAINS 'GOOD' DATA
\$.SBDDAT: .WORD 0 ;: CONTAINS 'BAD' DATA
;: RESERVED--NOT TO BE USED
\$.SAUTOB: .BYTE 0 ;: AUTOMATIC MODE INDICATOR
\$.SINTAG: .BYTE 0 ;: INTERRUPT MODE INDICATOR
\$.SWR: .WORD DSWR ;: ADDRESS OF SWITCH REGISTER
\$.DISPLAY: .WORD DDISP ;: ADDRESS OF DISPLAY REGISTER
\$.STKS: 177560 ;: TTY KBD STATUS
\$.STKB: 177562 ;: TTY KBD BUFFER
\$.STPS: 177564 ;: TTY PRINTER STATUS REG. ADDRESS
\$.STPB: 177566 ;: TTY PRINTER BUFFER REG. ADDRESS
\$.NULL: .BYTE 0 ;: CONTAINS NULL CHARACTER FOR FILLS
\$.FILLS: .BYTE 2 ;: CONTAINS # OF FILLER CHARACTERS REQUIRED
\$.FILLC: .BYTE 12 ;: INSERT FILL CHARS. AFTER A "LINE FEED"
\$.STPFLG: .BYTE 0 ;: "TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
\$.ESCAPE: 0 ;: ESCAPE ON ERROR ADDRESS
\$.QUES: .ASCII /?/ ;: QUESTION MARK
\$.CRLF: .ASCII <15> ;: CARRIAGE RETURN
\$.LF: .ASCIZ <12> ;: LINE FEED

.SBTTL APT MAILBOX-ETABLE

\$.EVEN ;: APT MAILBOX
\$.MAIL: ;: MESSAGE TYPE CODE
\$.MSGTY: .WORD AMSGTY ;: FATAL ERROR NUMBER
\$.FATAL: .WORD AFATAL ;: TEST NUMBER
\$.TESTN: .WORD ATESTN ;: PASS COUNT
\$.PASS: .WORD APASS ;: DEVICE COUNT
\$.DEVCT: .WORD ADEVCT ;: I/O UNIT NUMBER
\$.UNIT: .WORD AUNIT ;: MESSAGE ADDRESS
\$.MSGAD: .WORD AMSGAD ;: MESSAGE LENGTH
\$.MSGLG: .WORD AMSGLG ;: APT ENVIRONMENT TABLE
\$.ETABLE: ;:

E02

601	000606	000	\$ENV:	.BYTE	AENV	:: ENVIRONMENT BYTE
602	000607	000	\$ENVM:	.BYTE	AENVM	:: ENVIRONMENT MODE BITS
603	000610	000000	\$SWREG:	.WORD	ASWREG	:: APT SWITCH REGISTER
604	000612	000000	\$USWR:	.WORD	AUSWR	:: USER SWITCHES
605	000614	000000	\$CPUOP:	.WORD	ACPUOP	:: CPU TYPE, OPTIONS
606			.*			BITS 15-11=CPU TYPE
607			.*			11/04=01, 11/05=02, 11/20=03, 11/40=04, 11/45=05
608			.*			11/70=06, PDQ=07, Q=10
609			.*			BIT 10=REAL TIME CLOCK
610			.*			BIT 9=FLOATING POINT PROCESSOR
611			.*			BIT 8=MEMORY MANAGEMENT
612	000616	000	\$MAMS1:	.BYTE	AMAMS1	:: HIGH ADDRESS, M.S. BYTE
613	000617	000	\$MTYP1:	.BYTE	AMTYP1	:: MEM. TYPE, BLK#1
614			.*			MEM. TYPE BYTE -- (HIGH BYTE)
615			.*			900 NSEC CORE=001
616			.*			300 NSEC BIPOLAR=002
617			.*			500 NSEC MOS=003
618	000620	000000	\$MADR1:	.WORD	AMADR1	:: HIGH ADDRESS, BLK#1
619			.*			MEM. LAST ADDR.=3 BYTES, THIS WORD AND LOW OF "TYPE" ABOVE
620	000622	000	\$MAMS2:	.BYTE	AMAMS2	:: HIGH ADDRESS, M.S. BYTE
621	000623	000	\$MTYP2:	.BYTE	AMTYP2	:: MEM. TYPE, BLK#2
622	000624	000000	\$MADR2:	.WORD	AMADR2	:: MEM. LAST ADDRESS, BLK#2
623	000626	000	\$MAMS3:	.BYTE	AMAMS3	:: HIGH ADDRESS, M.S. BYTE
624	000627	000	\$MTYP3:	.BYTE	AMTYP3	:: MEM. TYPE, BLK#3
625	000630	000000	\$MADR3:	.WORD	AMADR3	:: MEM. LAST ADDRESS, BLK#3
626	000632	000	\$MAMS4:	.BYTE	AMAMS4	:: HIGH ADDRESS, M.S. BYTE
627	000633	000	\$MTYP4:	.BYTE	AMTYP4	:: MEM. TYPE, BLK#4
628	000634	000000	\$MADR4:	.WORD	AMADR4	:: MEM. LAST ADDRESS, BLK#4
629	000636	000060	\$VECT1:	.WORD	AVECT1	:: INTERRUPT VECTOR#1, BUS PRIORITY#1
630	000640	000000	\$VECT2:	.WORD	AVECT2	:: INTERRUPT VECTOR#2, BUS PRIORITY#2
631	000642	177560	\$BASE:	.WORD	ABASE	:: BASE ADDRESS OF EQUIPMENT UNDER TEST
632	000644		\$ETEND:			
633			.MEXIT			

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000644
000644 000000
000646 000000
000650 000000
000652 000000
000654 000000
000656 017000
000660 000000
000662 000000
000664 177564
000666 177566
000670 000064
000672 000066
000674 000000
000676 000000
000700 000000
000702 000000
000704 000000
000706 000000
000710 000000
000712 000000
000714 000000

.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: EACH 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

\$ERRTB:

S1LN: .WORD 0 ;SOURCE1 LENGTH
S1ADR: .WORD ;SOURCE1 ADDRESS
S2LN: .WORD 0 ;SOURCE2 LENGTH
S2ADR: .WORD 0 ;SOURCE2 ADDRESS
DSTLN: .WORD ;DESTINATION LENGTH
DSTAD: .WORD BUF ;DESTINATION ADDRESS
FILL: .WORD ;FILL CHARACTER
TABLE: .WORD 0 ;TRANSLATION TABLE ADDRESS
TCSR: 177564 ;TCSR ADDRESS OF SLU USED FOR INTERRUPTS
TBUF: 177566 ;TBUF ADDRESS
TVECT: 64 ;TRANSMIT INTERRUPT VECTOR
TPSW: 66 ;AND PSW LOCATION
PCI: 0 ;ADDRESS OF TEST INSTRUCTION TO INTERRUPT
CCODES: 0 ;CONDITION CODES AFTER EXECUTION OF TEST INSTRUCTION
EXPPSW: 0 ;EXPECTED PSW
SAVR6: 0 ;STACK POINTER VALUE BEFORE TEST INSTRUCTION EXECUTION
BADR6: 0 ;BAD STACK POINTER VALUE
OLDPC: 0 ;ADDRESS WHERE UNEXPECTED TRAP OR INTERRUPT OCCURRED
TEMP: 0
TEMP1: 0
TEMP2: 0

H02

.MAIN. MACY11 27(1006) 21-DEC-76 11:53 PAGE 20
DVKAJA.P11 20-DEC-76 15:02 INITIALIZE THE COMMON TAGS

SEQ 0022

728	001240	062700	000004	ADD	#4,RO	:ADJUST TO TCSR ADDRESS
729	001244	010037	000664	MOV	RO,@#TCSR	:STORE TCSR ADDRESS
730	001250	005720		TST	(RO)+	:ADJUST TO TBUF ADDRESS
731	001252	010037	000666	MOV	RO,@#TBUF	:STORE TBUF ADDRESS
732	001256	013700	000636	MOV	@#\$VECT1,RO	:GET SLU INTERRUPT VECTOR
733	001262	062700	000004	ADD	#4,RO	:ADJUST TO TRANSMIT INTERRUPT VECTOR
734	001266	010037	000670	MOV	RO,@#TVECT	:STORE TRANSMIT INTERRUPT VECTOR
735	001272	005720		TST	(RO)+	:ADJUST TO TRANSMIT INTERRUPT PSW
736	001274	010037	000672	MOV	RO,@#TPSW	:STORE TRANSMIT INTERRUPT PSW LOCATION
737						
738						
739	001300	106427	000200	BEGIN:	MTPS #200	:SET PRIORITY TO 7
740						

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746 001304 000004
747 001306 004567 013420
748 001312 000000
749 001314 001550
750 001316 000001
751 001320 001551
752 001322 000000
753 001324 004767 013474
754 001330 013767 000010 177354
755 001336 013767 000012 177350
756 001344 012737 001402 000010
757 001352 012737 000340 000012
758 001360 004567 013460
759 001364 000217
760 001366 004767 013366
761 001372 000277
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763 001374 076050
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765 001376 104001
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768 001400 000464
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770 001402
771 001402 020067 177236
772 001406 001401
773 001410 104002
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776 001412 020167 177230
777 001416 001401
778 001420 104003
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781 001422 020267 177222
782 001426 001401
783 001430 104004
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785
786 001432 020367 177214
787 001436 001401
788 001440 104005
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791 001442 020467 177212
792 001446 001401
793 001450 104006
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796 001452 020567 177200

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*****
*TEST 1 TEST "ADDN" WITH SOURCE1 LENGTH =0 & SOURCE2 STRING VALID
*****
TST1: SCOPE
      JSR    R5,NPREP      ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
      0      ;SOURCE1 LENGTH
      SIT1   ;SOURCE1 ADDRESS
      1      ;SOURCE2 LENGTH
      S2T1   ;SOURCE2 ADDRESS
      0      ;DESTINATION LENGTH
      JSR    PC,CLBUF     ;CLEAR BUFFER AREA
      MOV    @#10,TEMP1   ;SAVE TIMEOUT TRAP VECTOR CONTENTS
      MOV    @#12,TEMP2
      MOV    #T1CONT,@#10 ;POINT TIMEOUT VECTOR TO TEST CONTINUATION
      MOV    #340,@#12
      JSR    R5,XPSW     ;STORE EXPECTED PSW VALUE
      .WORD  217
      JSR    PC,GENR     ;SET UP GENERAL REGISTERS
      SCC

T1:   ADDN      ;EXECUTE "ADDN" INSTRUCTION
      ERROR 1    ;*****TEST 1 - ERROR 1*****
              ;DECIMAL INSTRUCTION DID NOT TRAP ON
              ;A ZERO SOURCE1 LENGTH
      BR ENDT1

T1CONT:
      CMP    R0,S1LN     ;CHECK R0 UNCHANGED
      BEQ    64$
      ERROR 2    ;*****TEST 1 - ERROR 2*****
              ;R0 CHANGED
              ;R0 SHOULD STILL EQUAL CONTENTS OF "S1LN"
      64$:   CMP    R1,S1ADR ;CHECK R1 UNCHANGED
      BEQ    65$
      ERROR 3    ;*****TEST 1 - ERROR 3*****
              ;R1 CHANGED
              ;R1 SHOULD STILL EQUAL CONTENTS OF "S1ADR"
      65$:   CMP    R2,S2LN     ;CHECK R2 UNCHANGED
      BEQ    66$
      ERROR 4    ;*****TEST 1 - ERROR 4*****
              ;R2 CHANGED
              ;R2 SHOULD STILL EQUAL THE CONTENTS OF "S2LN"
      66$:   CMP    R3,S2ADR    ;CHECK R3 UNCHANGED
      BEQ    67$
      ERROR 5    ;*****TEST 1 - ERROR 5*****
              ;R3 CHANGED
              ;R3 SHOULD STILL EQUAL THE CONTENTS OF "S2ADR"
      67$:   CMP    R4,FILL     ;CHECK R4 UNCHANGED
      BEQ    68$
      ERROR 6    ;*****TEST 1 - ERROR 6*****
              ;R4 CHANGED
              ;R4 SHOULD STILL EQUAL THE CONTENTS OF "FILL"
      68$:   CMP    R5,DSTAD   ;CHECK R5 UNCHANGED

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J02

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 DVKAJA.P11 20-DEC-76 15:02 T1

TEST "ADDN" WITH SOURCE1 LENGTH =0 & SOURCE2 STRING VALID

SEQ 0024

797	001456	001401			BEQ	69\$			
798	001460	104007			ERROR	7			;*****TEST 1 - ERROR 7*****
799									;R5 CHANGED
800									;R5 SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
801	001462			69\$:					
802	001462	016600	000002		MOV	2(SP),R0			;CHECK PSW AT TIME OF TRAP
803	001466	042700	177400		BIC	#177400,R0			
804	001472	020067	177202		CMP	R0,EXPPSW			
805	001476	001401			BEQ	1\$			
806	001500	104010			ERROR	10			;*****TEST 1 - ERROR 10*****
807									;PSW ERROR
808									;EXPECTED PSW IS STORED AT "EXPPSW"
809									;RESULTANT PSW IS IN R0
810	001502	021627	001376	1\$:	CMP	(SP),#T1+2			;CHECK ADDRESS OF TRAP
811	001506	001403			BEQ	2\$			
812	001510	011637	000522		MOV	(SP),@#\$BDADR			;STORE BAD ADDRESS
813	001514	104011			ERROR	11			;*****TEST 1 - ERROR 11*****
814									;TRAP ADDRESS ERROR
815									;EXPECTED ADDRESS IS "T1+2"
816									;RESULTANT ADDRESS IS STORED AT "\$BDADR"
817	001516	010600		2\$:	MOV	SP,R0			;CHECK SP RESTORATION
818	001520	062700	000004		ADD	#4,R0			
819	001524	020037	000702		CMP	R0,@#SAVR6			
820	001530	001401			BEQ	3\$			
821	001532	104012			ERROR	12			;*****TEST 1 - ERROR 12*****
822									;STACK POINTER WAS NOT RESTORED
823									;EXPECTED SP VALUE IS STORED AT "SAVR6"
824									;ERRONEOUS SO VALUE IS AT "BADR6"
825	001534	012716	001552	3\$:	MOV	#ENDT1,(SP)			;RESTORE SP & PSW
826	001540	013766	000700	000002	MOV	@#EXPPSW,2(SP)			
827	001546	000002			RTI				
828									
829	001550			S1T1:					;SOURCE1 STRING
830	001550	060			.BYTE	60			;MOST SIGNIFICANT DIGIT
831	001551			S2T1:					;SOURCE2 STRING
832	001551	060			.BYTE	60			;MOST SIGNIFICANT DIGIT
833					.EVEN				
834									
835	001552	016737	177134	000010	ENDT1:	MOV	TEMP1,@#10		;RESTORE TIMEOUT VECTOR CONTENTS
836	001560	016737	177130	000012	MOV	TEMP2,@#12			

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842 001566 000004
843 001570 004567 013136
844 001574 000001
845 001576 002032
846 001600 000001
847 001602 002033
848 001604 000000
849 001606 004767 013212
850 001612 013767 000010 177072
851 001620 013767 000012 177066
852 001626 012737 001664 000010
853 001634 012737 000340 000012
854 001642 004567 013176
855 001646 000217
856 001650 004767 013104
857 001654 000277
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859 001656 076050
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861 001660 104001
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864 001662 000464
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866 001664
867 001664 020067 176754
868 001670 001401
869 001672 104002
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872 001674 020167 176746
873 001700 001401
874 001702 104003
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877 001704 020267 176740
878 001710 001401
879 001712 104004
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882 001714 020367 176732
883 001720 001401
884 001722 104005
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887 001724 020467 176730
888 001730 001401
889 001732 104006
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892 001734 020567 176716

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*****
*TEST 2 TEST "ADDN" WITH A POSITIVE LEADING SIGN SOURCE1, & VALID SOURCE2
*****
TST2: SCOPE
      JSR R5,NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
      1 ;SOURCE1 LENGTH
      S1T2 ;SOURCE1 ADDRESS
      1 ;SOURCE2 LENGTH
      S2T2 ;SOURCE2 ADDRESS
      0 ;DESTINATION LENGTH
      JSR PC,CLBUF ;CLEAR BUFFER AREA
      MOV Q#10,TEMP1 ;SAVE TIMEOUT TRAP VECTOR CONTENTS
      MOV Q#12,TEMP2
      MOV #T2CONT,Q#10 ;POINT TIMEOUT VECTOR TO TEST CONTINUATION
      MOV #340,Q#12
      JSR R5,XPSW ;STORE EXPECTED PSW VALUE
      .WORD 217
      JSR PC,GENR ;SET UP GENERAL REGISTERS
      SCC
T2: ADDN ;EXECUTE "ADDN" INSTRUCTION
      ERROR 1 ;*****TEST 2 - ERROR 1*****
      ;DECIMAL INSTRUCTION DID NOT TRAP ON
      ;A POSITIVE LEADING SIGN SOURCE1
      BR ENDT2
T2CONT:
      CMP R0,S1LN ;CHECK R0 UNCHANGED
      BEQ 64$
      ERROR 2 ;*****TEST 2 - ERROR 2*****
      ;R0 CHANGED
      ;R0 SHOULD STILL EQUAL CONTENTS OF "S1LN"
      64$: CMP R1,S1ADR ;CHECK R1 UNCHANGED
      BEQ 65$
      ERROR 3 ;*****TEST 2 - ERROR 3*****
      ;R1 CHANGED
      ;R1 SHOULD STILL EQUAL CONTENTS OF "S1ADR"
      65$: CMP R2,S2LN ;CHECK R2 UNCHANGED
      BEQ 66$
      ERROR 4 ;*****TEST 2 - ERROR 4*****
      ;R2 CHANGED
      ;R2 SHOULD STILL EQUAL THE CONTENTS OF "S2LN"
      66$: CMP R3,S2ADR ;CHECK R3 UNCHANGED
      BEQ 67$
      ERROR 5 ;*****TEST 2 - ERROR 5*****
      ;R3 CHANGED
      ;R3 SHOULD STILL EQUAL THE CONTENTS OF "S2ADR"
      67$: CMP R4,FILL ;CHECK R4 UNCHANGED
      BEQ 68$
      ERROR 6 ;*****TEST 2 - ERROR 6*****
      ;R4 CHANGED
      ;R4 SHOULD STILL EQUAL THE CONTENTS OF "FILL"
      68$: CMP R5,DSTAD ;CHECK R5 UNCHANGED

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L02

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893 001740 001401      BEQ      69$
894 001742 104007      ERROR    7      ;*****TEST 2 - ERROR 7*****
895                                     ;R5 CHANGED
896                                     ;R5 SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
897 001744                                     69$:
898 001744 016600 000002      MOV      2(SP),R0      ;CHECK PSW AT TIME OF TRAP
899 001750 042700 177400      BIC     #177400,R0
900 001754 020067 176720      CMP     R0,EXPPSW
901 001760 001401      BEQ     1$
902 001762 104010      ERROR   10      ;*****TEST 2 - ERROR 10*****
903                                     ;PSW ERROR
904                                     ;EXPECTED PSW IS STORED AT "EXPPSW"
905                                     ;RESULTANT PSW IS IN R0
906 001764 021627 001660      1$:      CMP     (SP),#T2+2      ;CHECK ADDRESS OF TRAP
907 001770 001403      BEQ     2$
908 001772 011637 000522      MOV     (SP),@#$BDADR      ;STORE BAD ADDRESS
909 001776 104011      ERROR   11      ;*****TEST 2 - ERROR 11*****
910                                     ;TRAP ADDRESS ERROR
911                                     ;EXPECTED ADDRESS IS "T2+2"
912                                     ;RESULTANT ADDRESS IS STORED AT "$BDADR"
913 002000 010600      2$:      MOV     SP,R0      ;CHECK SP RESTORATION
914 002002 062700 000004      ADD     #4,R0
915 002006 020037 000702      CMP     R0,@$SAVR6
916 002012 001401      BEQ     3$
917 002014 104012      ERROR   12      ;*****TEST 2 - ERROR 12*****
918                                     ;STACK POINTER WAS NOT RESTORED
919                                     ;EXPECTED SP VALUE IS STORED AT "SAVR6"
920                                     ;ERRONEOUS SO VALUE IS AT "BADR6"
921 002016 012716 002034      3$:      MOV     #ENDT2,(SP)      ;RESTORE SP & PSW
922 002022 013766 000700 000002      MOV     @EXPPSW,2(SP)
923 002030 000002      RTI
924
925 002032                                     S1T2:
926 002032      055      .BYTE   55      ;SOURCE1 STRING
927 002033                                     S2T2:
928 002033      060      .BYTE   60      ;MOST SIGNIFICANT DIGIT
929                                     .EVEN
930
931 002034 016737 176652 000010      ENDT2:  MOV     TEMP1,@#10      ;RESTORE TIMEOUT VECTOR CONTENTS
932 002042 016737 176646 000012      MOV     TEMP2,@#12
  
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M02

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938 002050 000004
939 002052 004567 012654
940 002056 000001
941 002060 002314
942 002062 000001
943 002064 002315
944 002066 000000
945 002070 004767 012730
946 002074 013767 000010 176610
947 002102 013767 000012 176604
948 002110 012737 002146 000010
949 002116 012737 000340 000012
950 002124 004567 012714
951 002130 000217
952 002132 004767 012622
953 002136 000277
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955 002140 076050
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957 002142 104001
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960 002144 000464
961
962 002146
963 002146 020067 176472
964 002152 001401
965 002154 104002
966
967
968 002156 020167 176464
969 002162 001401
970 002164 104003
971
972
973 002166 020267 176456
974 002172 001401
975 002174 104004
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978 002176 020367 176450
979 002202 001401
980 002204 104005
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983 002206 020467 176446
984 002212 001401
985 002214 104006
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988 002216 020567 176434

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*****
*TEST 3 TEST "ADDN" WITH A NEGATIVE LEADING SIGN SOURCE1, & VALID SOURCE2
*****
T3: SCOPE
    JSR R5,NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
    1 ;SOURCE1 LENGTH
    S1T3 ;SOURCE1 ADDRESS
    1 ;SOURCE2 LENGTH
    S2T3 ;SOURCE2 ADDRESS
    0 ;DESTINATION LENGTH
    JSR PC,CLBUF ;CLEAR BUFFER AREA
    MOV Q#10,TEMP1 ;SAVE TIMEOUT TRAP VECTOR CONTENTS
    MOV Q#12,TEMP2
    MOV #T3CONT,Q#10 ;POINT TIMEOUT VECTOR TO TEST CONTINUATION
    MOV #340,Q#12
    JSR R5,XPSW ;STORE EXPECTED PSW VALUE
    .WORD 217
    JSR PC,GENR ;SET UP GENERAL REGISTERS
    SCC

T3: ADDN ;EXECUTE "ADDN" INSTRUCTION

ERROR 1 ;*****TEST 3 - ERROR 1*****
;DECIMAL INSTRUCTION DID NOT TRAP ON
;A NEGATIVE LEADING SIGN SOURCE2

BR ENDT3

T3CONT:
    CMP R0,S1LN ;CHECK R0 UNCHANGED
    BEQ 64$
    ERROR 2 ;*****TEST 3 - ERROR 2*****
;R0 CHANGED
;R0 SHOULD STILL EQUAL CONTENTS OF "S1LN"
;CHECK R1 UNCHANGED

64$: CMP R1,S1ADR
    BEQ 65$
    ERROR 3 ;*****TEST 3 - ERROR 3*****
;R1 CHANGED
;R1 SHOULD STILL EQUAL CONTENTS OF "S1ADR"
;CHECK R2 UNCHANGED

65$: CMP R2,S2LN
    BEQ 66$
    ERROR 4 ;*****TEST 3 - ERROR 4*****
;R2 CHANGED
;R2 SHOULD STILL EQUAL THE CONTENTS OF "S2LN"
;CHECK R3 UNCHANGED

66$: CMP R3,S2ADR
    BEQ 67$
    ERROR 5 ;*****TEST 3 - ERROR 5*****
;R3 CHANGED
;R3 SHOULD STILL EQUAL THE CONTENTS OF "S2ADR"
;CHECK R4 UNCHANGED

67$: CMP R4,FILL
    BEQ 68$
    ERROR 6 ;*****TEST 3 - ERROR 6*****
;R4 CHANGED
;R4 SHOULD STILL EQUAL THE CONTENTS OF "FILL"
;CHECK R5 UNCHANGED

68$: CMP R5,DSTAD

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N02

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TEST "ADDN" WITH A NEGATIVE LEADING SIGN SOURCE1, & VALID SOURCE2

SEQ 0028

989	002222	001401			BEQ	69\$			
990	002224	104007			ERROR	7			*****TEST 3 - ERROR 7*****
991									;RS CHANGED
992									;RS SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
993	002226			69\$:					;CHECK PSW AT TIME OF TRAP
994	002226	016600	000002		MOV	2(SP),RO			
995	002232	042700	177400		BIC	#177400,RO			
996	002236	020067	176436		CMP	RO,EXPPSW			
997	002242	001401			BEQ	1\$			
998	002244	104010			ERROR	10			*****TEST 3 - ERROR 10*****
999									;PSW ERROR
1000									;EXPECTED PSW IS STORED AT "EXPPSW"
1001									;RESULTANT PSW IS IN RO
1002	002246	021627	002142	1\$:	CMP	(SP),#T3+2			;CHECK ADDRESS OF TRAP
1003	002252	001403			BEQ	2\$			
1004	002254	011637	000522		MOV	(SP),@#\$BDADR			;STORE BAD ADDRESS
1005	002260	104011			ERROR	11			*****TEST 3 - ERROR 11*****
1006									;TRAP ADDRESS ERROR
1007									;EXPECTED ADDRESS IS "T3+2"
1008									;RESULTANT ADDRESS IS STORED AT "\$BDADR"
1009	002262	010600		2\$:	MOV	SP,RO			;CHECK SP RESTORATION
1010	002264	062700	000004		ADD	#4,RO			
1011	002270	020037	000702		CMP	RO,@\$SAVR6			
1012	002274	001401			BEQ	3\$			
1013	002276	104012			ERROR	12			*****TEST 3 - ERROR 12*****
1014									;STACK POINTER WAS NOT RESTORED
1015									;EXPECTED SP VALUE IS STORED AT "SAVR6"
1016									;ERRONEOUS SO VALUE IS AT "BADR6"
1017	002300	012716	002316	3\$:	MOV	#ENDT3,(SP)			;RESTORE SP & PSW
1018	002304	013766	000700	000002	MOV	@#EXPPSW,2(SP)			
1019	002312	000002			RTI				
1020									
1021	002314			S1T3:					;SOURCE1 STRING
1022	002314	053			.BYTE	53			;MOST SIGNIFICANT DIGIT
1023	002315			S2T3:					;SOURCE2 STRING
1024	002315	060			.BYTE	60			;MOST SIGNIFICANT DIGIT
1025					.EVEN				
1026									
1027	002316	016737	176370	000010	ENDT3:	MOV	TEMP1,@#10		;RESTORE TIMEOUT VECTOR CONTENTS
1028	002324	016737	176364	000012	MOV	TEMP2,@#12			

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002332 000004
002334 004567 012372
002340 000001
002342 002576
002344 000000
002346 002577
002350 000000
002352 004767 012446
002356 013767 000010 176326
002364 013767 000012 176322
002372 012737 002430 000010
002400 012737 000340 000012
002406 004567 012432
002412 000217
002414 004767 012340
002420 000277
002422 076050
002424 104001
002426 000464
002430
002430 020067 176210
002434 001401
002436 104002
002440 020167 176202
002444 001401
002446 104003
002450 020267 176174
002454 001401
002456 104004
002460 020367 176166
002464 001401
002466 104005
002470 020467 176164
002474 001401
002476 104006
002500 020567 176152

```
*****  
:TEST 4 TEST "ADDN" WITH SOURCE2 LENGTH = 0, & VALID SOURCE1  
*****  
TST4: SCOPE  
JSR R5,NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST  
1 ;SOURCE1 LENGTH  
S1T4 ;SOURCE1 ADDRESS  
0 ;SOURCE2 LENGTH  
S2T4 ;SOURCE2 ADDRESS  
0 ;DESTINATION LENGTH  
JSR PC,CLBUF ;CLEAR BUFFER AREA  
MOV @#10,TEMP1 ;SAVE TIMEOUT TRAP VECTOR CONTENTS  
MOV @#12,TEMP2  
MOV #T4CONT,@#10 ;POINT TIMEOUT VECTOR TO TEST CONTINUATION  
MOV #340,@#12  
JSR R5,XPSW ;STORE EXPECTED PSW VALUE  
.WORD 217  
JSR PC,GENR ;SET UP GENERAL REGISTERS  
SCC  
  
T4: ADDN ;EXECUTE "ADDN" INSTRUCTION  
  
ERROR 1 ;*****TEST 4 - ERROR 1*****  
;DECIMAL INSTRUCTION DID NOT TRAP ON  
;A ZERO SOURCE2 LENGTH  
  
BR ENDT4  
  
T4CONT:  
CMP R0,S1LN ;CHECK R0 UNCHANGED  
BEQ 64$  
ERROR 2 ;*****TEST 4 - ERROR 2*****  
;R0 CHANGED  
;R0 SHOULD STILL EQUAL CONTENTS OF "S1LN"  
;CHECK R1 UNCHANGED  
  
64$: CMP R1,S1ADR  
BEQ 65$  
ERROR 3 ;*****TEST 4 - ERROR 3*****  
;R1 CHANGED  
;R1 SHOULD STILL EQUAL CONTENTS OF "S1ADR"  
;CHECK R2 UNCHANGED  
  
65$: CMP R2,S2LN  
BEQ 66$  
ERROR 4 ;*****TEST 4 - ERROR 4*****  
;R2 CHANGED  
;R2 SHOULD STILL EQUAL THE CONTENTS OF "S2LN"  
;CHECK R3 UNCHANGED  
  
66$: CMP R3,S2ADR  
BEQ 67$  
ERROR 5 ;*****TEST 4 - ERROR 5*****  
;R3 CHANGED  
;R3 SHOULD STILL EQUAL THE CONTENTS OF "S2ADR"  
;CHECK R4 UNCHANGED  
  
67$: CMP R4,FILL  
BEQ 68$  
ERROR 6 ;*****TEST 4 - ERROR 6*****  
;R4 CHANGED  
;R4 SHOULD STILL EQUAL THE CONTENTS OF "FILL"  
;CHECK R5 UNCHANGED  
  
68$: CMP R5,DSTAD
```



```

1085 002504 001401      BEQ      69$
1086 002506 104007      ERROR    7
1087
1088
1089 002510              69$:
1090 002510 016600 000002      MOV      2(SP),RO
1091 002514 042700 177400      BIC      #177400,RO
1092 002520 020067 176154      CMP      RO,EXPPSW
1093 002524 001401      BEQ      1$
1094 002526 104010      ERROR    10
1095
1096
1097
1098 002530 021627 002424      1$:      CMP      (SP),#T4+2
1099 002534 001403      BEQ      2$
1100 002536 011637 000522      MOV      (SP),@#$BDADR
1101 002542 104011      ERROR    11
1102
1103
1104
1105 002544 010600              2$:      MOV      SP,RO
1106 002546 062700 000004      ADD      #4,RO
1107 002552 020037 000702      CMP      RO,@#SAVR6
1108 002556 001401      BEQ      3$
1109 002560 104012      ERROR    12
1110
1111
1112
1113 002562 012716 002600              3$:      MOV      #ENDT4,(SP)
1114 002566 013766 000700 000002      MOV      @#EXPPSW,2(SP)
1115 002574 000002      RTI
1116
1117 002576              S1T4:
1118 002576      060      .BYTE    60
1119 002577              S2T4:
1120 002577      060      .BYTE    60
1121
1122
1123 002600 016737 176106 000010      ENDT4:  MOV      TEMP1,@#10
1124 002606 016737 176102 000012      MOV      TEMP2,@#12

```

```

;*****TEST 4 - ERROR 7*****
;R5 CHANGED
;R5 SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
;CHECK PSW AT TIME OF TRAP
;*****TEST 4 - ERROR 10*****
;PSW ERROR
;EXPECTED PSW IS STORED AT "EXPPSW"
;RESULTANT PSW IS IN RO
;CHECK ADDRESS OF TRAP
;STORE BAD ADDRESS
;*****TEST 4 - ERROR 11*****
;TRAP ADDRESS ERROR
;EXPECTED ADDRESS IS "T4+2"
;RESULTANT ADDRESS IS STORED AT "$BDADR"
;CHECK SP RESTORATION
;*****TEST 4 - ERROR 12*****
;STACK POINTER WAS NOT RESTORED
;EXPECTED SP VALUE IS STORED AT "SAVR6"
;ERRONEOUS SO VALUE IS AT "BADR6"
;RESTORE SP & PSW
;SOURCE1 STRING
;MOST SIGNIFICANT DIGIT
;SOURCE2 STRING
;MOST SIGNIFICANT DIGIT
;RESTORE TIMEOUT VECTOR CONTENTS

```

```

1125
1126
1127
1128      ;*****
1129      ;*TEST 5      TEST "ADDN" BY ADDING TWO ZEROES WITH ZERO DESTINATION LENGTH
1130      ;*****
1130 002614 000004      TSTS:  SCOPE
1131 002616 004567 012110      JSR      R5,NPREP      ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
1132 002622 000001      JSR      1      ;SOURCE1 LENGTH
1133 002624 002772      JSR      S1T5      ;SOURCE1 ADDRESS
1134 002626 000001      JSR      1      ;SOURCE2 LENGTH
1135 002630 002773      JSR      S2T5      ;SOURCE2 ADDRESS
1136 002632 000000      JSR      0      ;DESTINATION LENGTH
1137 002634 004767 012164      JSR      PC,CLBUF      ;CLEAR BUFFER AREA
1138 002640 004567 012200      JSR      R5,XPSW
1139 002644 000204      JSR      .WORD      204
1140 002646 004767 012106      JSR      PC,GENR      ;SET UP GENERAL REGISTERS
1141 002652 000277      SCC      ;SET UP THE COMPLEMENT OF EXPECTED CC'S
1142 002654 000244
1143 002656 076050      CLZ
1144      ADDN
1145 002660 106767 176312      MFPS      CCODES      ;STORE RESULTANT PSW
1146 002664 042767 177400 176004      BIC      #177400,CCODES      ;CLEAR UNUSED BITS
1147 002672 023767 000700 175776      CMP      @#EXPPSW,CCODES      ;CHECK PSW AGAINST EXPECTED VALUE
1148 002700 001401      BEQ      64$      ;BR, IF EQUAL
1149 002702 104001      ERROR      1      ;*****TEST 5 - ERROR 1*****
1150      PSW ERROR
1151      EXPECTED PSW IS STORED AT "SAVR6"
1152      ERRONEOUS SP VALUE IS AT "BADR6"
1153 002704      64$:
1154 002704 005700      TST      R0      ;CHECK R0=0
1155 002706 001401      BEQ      65$
1156 002710 104002      ERROR      2      ;*****TEST 5 - ERROR 2*****
1157      ;R0 SHOULD BE ZERO
1158 002712 005701      65$:  TST      R1      ;CHECK R1=0
1159 002714 001401      BEQ      66$
1160 002716 104003      ERROR      3      ;*****TEST 5 - ERROR 3*****
1161      ;R1 SHOULD BE ZERO
1162 002720 005702      66$:  TST      R2      ;CHECK R2=0
1163 002722 001401      BEQ      67$
1164 002724 104004      ERROR      4      ;*****TEST 5 - ERROR 4*****
1165      ;R2 SHOULD BE ZERO
1166 002726 005703      67$:  TST      R3      ;CHECK R3=0
1167 002730 001401      BEQ      68$
1168 002732 104005      ERROR      5      ;*****TEST 5 - ERROR 5*****
1169      ;R3 SHOULD BE ZERO
1170 002734 020467 175714      68$:  CMP      R4,DSTLN      ;CHECK R4= DESTINATION LENGTH
1171 002740 001401      BEQ      69$
1172 002742 104006      ERROR      6      ;*****TEST 5 - ERROR 6*****
1173      ;R4 SHOULD STILL BE DESTINATION LENGTH
1174 002744 020567 175706      69$:  CMP      R5,DSTAD      ;CHECK R5 = DESTINATION ADDRESS
1175 002750 001401      BEQ      70$
1176 002752 104007      ERROR      7      ;*****TEST 5 - ERROR 7*****
1177      ;R5 SHOULD STILL BE DESTINATION ADDRESS
1178 002754 023706 000702      70$:  CMP      @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
1179 002760 001403      BEQ      71$      ;BR IF OK
1180 002762 010637 000704      MOV      SP,@#BADR6      ;COPY BAD SP VALUE

```

E03

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TEST "ADDN" BY ADDING TWO ZEROES WITH ZERO DESTINATION LENGTH

SEQ 0032

1181 002766 104010
1182
1183
1184
1185 002770
1186 002770 000401
1187 002772
1188 002772 060
1189 002773
1190 002773 060
1191
1192

ERROR 10

715: BR TST6
S1T5: .BYTE 60
S2T5: .BYTE 60

.EVEN

*****TEST 5 - ERROR 10*****
;STACK POINTER NOT RESTORED BY INSTRUCTION
;EXPECTED SP IS STORED AT "SAVR6"
;ERRONEOUS SP VALUE IS AT "BADR6"

;BR TO NEXT TEST
;SOURCE1 STRING
;MOST SIGNIFICANT DIGIT
;SOURCE2 STRING
;MOST SIGNIFICANT DIGIT

F03

1193
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1199
1200
1201
1202
1203
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1234
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1248

002774 000004
002776 004567 011730
003002 000004
003004 003176
003006 000002
003010 003202
003012 000002
003014 004767 012004
003020 004567 012020
003024 000200
003026 004767 011726
003032 000277
003034 076050

003036 106767 175634
003042 042767 177400 175626
003050 023767 000700 175620
003056 001401
003060 104001

003062
003062 005700
003064 001401
003066 104002

003070 005701
003072 001401
003074 104003

003076 005702
003100 001401
003102 104004

003104 005703
003106 001401
003110 104005

003112 020467 175536
003116 001401
003120 104006

003122 020567 175530
003126 001401
003130 104007

003132 023706 000702
003136 001403
003140 010637 000704

```
*****  
*TEST 6 TEST "ADDN" WITH POSITIVE OPERANDS, SRC1 LENGTH .GT. SRC2 LENGTH, DL = NO  
*****  
↑ST6: SCOPE  
JSR R5,NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST  
4 ;SOURCE1 LENGTH  
S1T6 ;SOURCE1 ADDRESS  
2 ;SOURCE2 LENGTH  
S2T6 ;SOURCE2 ADDRESS  
2 ;DESTINATION LENGTH  
;CLEAR BUFFER AREA  
JSR PC,CLBUF  
JSR R5,XPSW  
.WORD 200  
JSR PC,GENR ;SET UP GENERAL REGISTERS  
SCC ;SET UP THE COMPLEMENT OF EXPECTED CC'S  
ADDN  
  
MFPS CCODES ;STORE RESULTANT PSW  
BIC #177400,CCODES ;CLEAR UNUSED BITS  
CMP @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE  
BEQ 64$ ;BR, IF EQUAL  
ERROR 1 ;*****TEST 6 - ERROR 1*****  
;PSW ERROR  
;EXPECTED PSW IS STORED AT "SAVR6"  
;ERRONEOUS SP VALUE IS AT "BADR6"  
  
64$: TST R0 ;CHECK R0=0  
BEQ 65$  
ERROR 2 ;*****TEST 6 - ERROR 2*****  
;R0 SHOULD BE ZERO  
;CHECK R1=0  
  
65$: TST R1  
BEQ 66$  
ERROR 3 ;*****TEST 6 - ERROR 3*****  
;R1 SHOULD BE ZERO  
;CHECK R2=0  
  
66$: TST R2  
BEQ 67$  
ERROR 4 ;*****TEST 6 - ERROR 4*****  
;R2 SHOULD BE ZERO  
;CHECK R3=0  
  
67$: TST R3  
BEQ 68$  
ERROR 5 ;*****TEST 6 - ERROR 5*****  
;R3 SHOULD BE ZERO  
;CHECK R4= DESTINATION LENGTH  
  
68$: CMP R4,DSTLN  
BEQ 69$  
ERROR 6 ;*****TEST 6 - ERROR 6*****  
;R4 SHOULD STILL BE DESTINATION LENGTH  
;CHECK R5 = DESTINATION ADDRESS  
  
69$: CMP R5,DSTAD  
BEQ 70$  
ERROR 7 ;*****TEST 6 - ERROR 7*****  
;R5 SHOULD STILL BE DESTINATION ADDRESS  
;VERIFY STACK POINTER IS RESTORED  
;BR IF OK  
MOV SP,@#BADR6 ;COPY BAD SP VALUE
```


H03

```

1280
1281
1282
1283
1284
1285 003206 000004
1286 003210 004567 011516
1287 003214 000002
1288 003216 003412
1289 003220 000004
1290 003222 003414
1291 003224 000004
1292 003226 004767 011572
1293 003232 004567 011606
1294 003236 000210
1295 003240 004767 011514
1296 003244 000277
1297 003246 000250
1298 003250 076050
1299
1300 003252 106767 175420
1301 003256 042767 177400 175412
1302 003264 023767 000700 175404
1303 003272 001401
1304 003274 104001
1305
1306
1307
1308 003276
1309 003276 005700
1310 003300 001401
1311 003302 104002
1312
1313 003304 005701
1314 003306 001401
1315 003310 104003
1316
1317 003312 005702
1318 003314 001401
1319 003316 104004
1320
1321 003320 005703
1322 003322 001401
1323 003324 104005
1324
1325 003326 020467 175322
1326 003332 001401
1327 003334 104006
1328
1329 003336 020567 175314
1330 003342 001401
1331 003344 104007
1332
1333 003346 023706 000702
1334 003352 001403
1335 003354 010637 000704

```

```

*****
*TEST 7 TEST "ADDN" WITH NEGATIVE OPERANDS, S2L .GT. S1L, NO OVERFLOW
*****
TST7: SCOPE
      JSR R5,NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
          2 ;SOURCE1 LENGTH
          S1T7 ;SOURCE1 ADDRESS
          4 ;SOURCE2 LENGTH
          S2T7 ;SOURCE2 ADDRESS
          4 ;DESTINATION LENGTH
          JSR PC,CLBUF ;CLEAR BUFFER AREA
          JSR R5,XPSW
          .WORD 210
          JSR PC,GENR ;SET UP GENERAL REGISTERS
          SCC ;SET UP THE COMPLEMENT OF EXPECTED CC'S
          CLN
          ADDN
      MFPS CCODES ;STORE RESULTANT PSW
      BIC #177400,CCODES ;CLEAR UNUSED BITS
      CMP @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
      BEQ 64$ ;BR, IF EQUAL
      ERROR 1 ;*****TEST 7 - ERROR 1*****
      ;PSW ERROR
      ;EXPECTED PSW IS STORED AT "SAVR6"
      ;ERRONEOUS SP VALUE IS AT "BADR6"
64$:
      TST R0 ;CHECK R0=0
      BEQ 65$
      ERROR 2 ;*****TEST 7 - ERROR 2*****
      ;R0 SHOULD BE ZERO
      ;CHECK R1=0
65$:
      TST R1
      BEQ 66$
      ERROR 3 ;*****TEST 7 - ERROR 3*****
      ;R1 SHOULD BE ZERO
      ;CHECK R2=0
66$:
      TST R2
      BEQ 67$
      ERROR 4 ;*****TEST 7 - ERROR 4*****
      ;R2 SHOULD BE ZERO
      ;CHECK R3=0
67$:
      TST R3
      BEQ 68$
      ERROR 5 ;*****TEST 7 - ERROR 5*****
      ;R3 SHOULD BE ZERO
      ;CHECK R4= DESTINATION LENGTH
68$:
      CMP R4,DSTLN
      BEQ 69$
      ERROR 6 ;*****TEST 7 - ERROR 6*****
      ;R4 SHOULD STILL BE DESTINATION LENGTH
      ;CHECK R5 = DESTINATION ADDRESS
69$:
      CMP R5,DSTAD
      BEQ 70$
      ERROR 7 ;*****TEST 7 - ERROR 7*****
      ;R5 SHOULD STILL BE DESTINATION ADDRESS
      ;VERIFY STACK POINTER IS RESTORED
      ;BR IF OK
      MOV SP,@#BADR6 ;COPY BAD SP VALUE

```


1336	003360	104010		ERROR	10		*****TEST 7 - ERROR 10*****
1337							;STACK POINTER NOT RESTORED BY INSTRUCTION
1338							;EXPECTED SP IS STORED AT "SAVR6"
1339							;ERRONEOUS SP VALUE IS AT "BADR6"
1340	003362		71\$:				;CHECK ANSWER
1341							;POINT R0 TO EXPECTED ANSWER
1342	003362	012700	003420	MOV	#ANS7,R0		;POINT R1 TO RESULTANT ANSWER
1343	003366	016701	175264	MOV	DSTAD,R1		;STORE ANSWER LENGTH IN R1
1344	003372	016702	175256	MOV	DSTLN,R2		;COMPARE EACH DIGIT
1345	003376	122021		72\$:	CMPB	(R0)+,(R1)+	;BR IF EQUAL
1346	003400	001401			BEQ	73\$	*****TEST 7 - ERROR 11*****
1347	003402	104011		ERROR	11		;ERRONEOUS ANSWER
1348							;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
1349							;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
1350							;DECREMENT ANSWER LENGTH
1351	003404	005302	73\$:	DEC	R2		;BR IF NOT FINISHED
1352	003406	001373		BNE	72\$;BR TO NEXT TEST
1353	003410	000405		BR	TST10		;SOURCE1 STRING
1354	003412		S1T7:				;MOST SIGNIFICANT DIGIT
1355	003412	063		.BYTE	63		
1356	003413	165		.BYTE	165		
1357	003414		S2T7:				;SOURCE2 STRING
1358	003414	060		.BYTE	60		;MOST SIGNIFICANT DIGIT
1359	003415	071		.BYTE	71		
1360	003416	066		.BYTE	66		
1361	003417	165		.BYTE	165		
1362	003420		ANS7:				;EXPECTED ANSWER
1363	003420	061		.BYTE	61		;MOST SIGNIFICANT DIGIT
1364	003421	060		.BYTE	60		
1365	003422	060		.BYTE	60		
1366	003423	160		.BYTE	160		
1367							
1368				.EVEN			

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1369
1370
1371
1372
1373
1374 003424 000004
1375 003426 004567 011300
1376 003432 000004
1377 003434 003630
1378 003436 000002
1379 003440 003634
1380 003442 000002
1381 003444 004767 011354
1382 003450 004567 011370
1383 003454 000212
1384 003456 004767 011276
1385 003462 000265
1386 003464 000252
1387 003466 076050
1388
1389 003470 106767 175202
1390 003474 042767 177400 175174
1391 003502 023767 000700 175166
1392 003510 001401
1393 003512 104001
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1397 003514
1398 003514 005700
1399 003516 001401
1400 003520 104002
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1402 003522 005701
1403 003524 001401
1404 003526 104003
1405
1406 003530 005702
1407 003532 001401
1408 003534 104004
1409
1410 003536 005703
1411 003540 001401
1412 003542 104005
1413
1414 003544 020467 175104
1415 003550 001401
1416 003552 104006
1417
1418 003554 020567 175076
1419 003560 001401
1420 003562 104007
1421
1422 003564 023706 000702
1423 003570 001403
1424 003572 010637 000704

```

```

*****
*TEST 10 TEST "ADDN" WITH NEGATIVE OPERANDS, OVERFLOW
*****
TST10: SCOPE
      JSR      R5,NPREP      ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
      4          ;SOURCE1 LENGTH
      S1T10     ;SOURCE1 ADDRESS
      2          ;SOURCE2 LENGTH
      S2T10     ;SOURCE2 ADDRESS
      2          ;DESTINATION LENGTH
      JSR      PC,CLBUF     ;CLEAR BUFFER AREA
      JSR      R5,XPSW
      .WORD    212
      JSR      PC,GENR     ;SET UP GENERAL REGISTERS
      +SEZ!SEC          ;SET UP THE COMPLEMENT OF EXPECTED CC'S
      +CLN!CLV
      ADDN

MFPS   CCODES      ;STORE RESULTANT PSW
BIC    #177400,CCODES ;CLEAR UNUSED BITS
CMP    @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
BEQ    64$         ;BR, IF EQUAL
ERROR  1          ;*****TEST 10 - ERROR 1*****
                    ;PSW ERROR
                    ;EXPECTED PSW IS STORED AT "SAVR6"
                    ;ERRONEOUS SP VALUE IS AT "BADR6"

64$:
      TST      R0          ;CHECK R0=0
      BEQ     65$
      ERROR   2          ;*****TEST 10 - ERROR 2*****
                    ;R0 SHOULD BE ZERO
                    ;CHECK R1=0

65$:
      TST      R1
      BEQ     66$
      ERROR   3          ;*****TEST 10 - ERROR 3*****
                    ;R1 SHOULD BE ZERO
                    ;CHECK R2=0

66$:
      TST      R2
      BEQ     67$
      ERROR   4          ;*****TEST 10 - ERROR 4*****
                    ;R2 SHOULD BE ZERO
                    ;CHECK R3=0

67$:
      TST      R3
      BEQ     68$
      ERROR   5          ;*****TEST 10 - ERROR 5*****
                    ;R3 SHOULD BE ZERO
                    ;CHECK R4= DESTINATION LENGTH

68$:
      CMP     R4,DSTLN
      BEQ     69$
      ERROR   6          ;*****TEST 10 - ERROR 6*****
                    ;R4 SHOULD STILL BE DESTINATION LENGTH
                    ;CHECK R5 = DESTINATION ADDRESS

69$:
      CMP     R5,DSTAD
      BEQ     70$
      ERROR   7          ;*****TEST 10 - ERROR 7*****
                    ;R5 SHOULD STILL BE DESTINATION ADDRESS
                    ;VERIFY STACK POINTER IS RESTORED
                    ;BR IF OK
                    ;COPY BAD SP VALUE

70$:
      CMP     @#SAVR6,SP
      BEQ     71$
      MOV     SP,@#BADR6

```

K03

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TEST "ADDN" WITH NEGATIVE OPERANDS, OVERFLOW

SEQ 0038

1425	003576	104010		ERROR	10		*****TEST 10 - ERROR 10*****
1426							;STACK POINTER NOT RESTORED BY INSTRUCTION
1427							;EXPECTED SP IS STORED AT "SAVR6"
1428							;ERRONEOUS SP VALUE IS AT "BADR6"
1429	003600		71\$:				
1430							;CHECK ANSWER
1431	003600	012700		MOV	#ANS10,R0		;POINT R0 TO EXPECTED ANSWER
1432	003604	016701		MOV	DSTAD,R1		;POINT R1 TO RESULTANT ANSWER
1433	003610	016702		MOV	DSTLN,R2		;STORE ANSWER LENGTH IN R1
1434	003614	122021	72\$:	CMPB	(R0)+,(R1)+		;COMPARE EACH DIGIT
1435	003616	001401		BEQ	73\$;BR IF EQUAL
1436	003620	104011		ERROR	11		*****TEST 10 - ERROR 11*****
1437							;ERRONEOUS ANSWER
1438							;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
1439							;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
1440	003622	005302	73\$:	DEC	R2		;DECREMENT ANSWER LENGTH
1441	003624	001373		BNE	72\$;BR IF NOT FINISHED
1442	003626	000404		BR	TST11		;BR TO NEXT TEST
1443	003630		S1T10:				;SOURCE1 STRING
1444	003630	060		.BYTE	60		;MOST SIGNIFICANT DIGIT
1445	003631	061		.BYTE	61		
1446	003632	062		.BYTE	62		
1447	003633	163		.BYTE	163		
1448	003634		S2T10:				;SOURCE2 STRING
1449	003634	065		.BYTE	65		;MOST SIGNIFICANT DIGIT
1450	003635	164		.BYTE	164		
1451	003636		ANS10:				;EXPECTED ANSWER
1452	003636	067		.BYTE	67		;MOST SIGNIFICANT DIGIT
1453	003637	167		.BYTE	167		
1454							
1455				.EVEN			


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1456
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1461 003640 000004
1462 003642 004567 011064
1463 003646 000002
1464 003650 004044
1465 003652 000002
1466 003654 004046
1467 003656 000002
1468 003660 004767 011140
1469 003664 004567 011154
1470 003670 000206
1471 003672 004767 011062
1472 003676 000271
1473 003700 000246
1474 003702 076050
1475
1476 003704 106767 174766
1477 003710 042767 177400 174760
1478 003716 023767 000700 174752
1479 003724 001401
1480 003726 104001
1481
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1484 003730
1485 003730 005700
1486 003732 001401
1487 003734 104002
1488
1489 003736 005701
1490 003740 001401
1491 003742 104003
1492
1493 003744 005702
1494 003746 001401
1495 003750 104004
1496
1497 003752 005703
1498 003754 001401
1499 003756 104005
1500
1501 003760 020467 174670
1502 003764 001401
1503 003766 104006
1504
1505 003770 020567 174662
1506 003774 001401
1507 003776 104007
1508
1509 004000 023706 000702
1510 004004 001403
1511 004006 010637 000704

```

```

*****
*TEST 11 TEST "ADDN" WITH POSITIVE OPERANDS, S2L=S1L, OVERFLOW
*****
†ST11: SCOPE
      JSR      R5,NPREP      ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
      2
      S1T11      ;SOURCE1 LENGTH
      2
      S2T11      ;SOURCE1 ADDRESS
      2
      2
      2
      PC,CLBUF    ;SOURCE2 LENGTH
      ;SOURCE2 ADDRESS
      ;DESTINATION LENGTH
      ;CLEAR BUFFER AREA
      JSR      R5,XPSW
      .WORD      206
      JSR      PC,GENR      ;SET UP GENERAL REGISTERS
      +SEN!SEC      ;SET UP THE COMPLEMENT OF EXPECTED CC'S
      +CLZ!CLV
      ADDN
      MFPS      CCODES      ;STORE RESULTANT PSW
      BIC      #177400,CCODES ;CLEAR UNUSED BITS
      CMP      @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
      BEQ      64$          ;BR, IF EQUAL
      ERROR    1
      ;*****TEST 11 - ERROR 1*****
      ;PSW ERROR
      ;EXPECTED PSW IS STORED AT "SAVR6"
      ;ERRONEOUS SP VALUE IS AT "BADR6"
      64$:
      TST      R0          ;CHECK R0=0
      BEQ      65$
      ERROR    2
      ;*****TEST 11 - ERROR 2*****
      ;R0 SHOULD BE ZERO
      ;CHECK R1=0
      65$:
      TST      R1
      BEQ      66$
      ERROR    3
      ;*****TEST 11 - ERROR 3*****
      ;R1 SHOULD BE ZERO
      ;CHECK R2=0
      66$:
      TST      R2
      BEQ      67$
      ERROR    4
      ;*****TEST 11 - ERROR 4*****
      ;R2 SHOULD BE ZERO
      ;CHECK R3=0
      67$:
      TST      R3
      BEQ      68$
      ERROR    5
      ;*****TEST 11 - ERROR 5*****
      ;R3 SHOULD BE ZERO
      ;CHECK R4= DESTINATION LENGTH
      68$:
      CMP      R4,DSTLN
      BEQ      69$
      ERROR    6
      ;*****TEST 11 - ERROR 6*****
      ;R4 SHOULD STILL BE DESTINATION LENGTH
      ;CHECK R5 = DESTINATION ADDRESS
      69$:
      CMP      R5,DSTAD
      BEQ      70$
      ERROR    7
      ;*****TEST 11 - ERROR 7*****
      ;R5 SHOULD STILL BE DESTINATION ADDRESS
      ;VERIFY STACK POINTER IS RESTORED
      ;BR IF OK
      MOV      @#SAVR6,SP
      70$:
      CMP      71$
      BEQ
      MOV      SP,@#BADR6 ;COPY BAD SP VALUE

```

M03

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TEST "ADDN" WITH POSITIVE OPERANDS, S2L=S1L, OVERFLOW

SEQ 0040

1512	004012	104010		ERROR	10		*****TEST 11 - ERROR 10*****
1513							;STACK POINTER NOT RESTORED BY INSTRUCTION
1514							;EXPECTED SP IS STORED AT "SAVR6"
1515							;ERRONEOUS SP VALUE IS AT "BADR6"
1516	004014			71\$:			
1517							;CHECK ANSWER
1518	004014	012700	004050	MOV	#ANS11,R0		;POINT R0 TO EXPECTED ANSWER
1519	004020	016701	174632	MOV	DSTAD,R1		;POINT R1 TO RESULTANT ANSWER
1520	004024	016702	174624	MOV	DSTLN,R2		;STORE ANSWER LENGTH IN R1
1521	004030	122021		72\$:	CMPB	(R0)+,(R1)+	;COMPARE EACH DIGIT
1522	004032	001401		SEQ	73\$;BR IF EQUAL
1523	004034	104011		ERROR	11		*****TEST 11 - ERROR 11*****
1524							;ERRONEOUS ANSWER
1525							;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
1526							;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
1527	004036	005302		73\$:	DEC	R2	;DECREMENT ANSWER LENGTH
1528	004040	001373		BNE	72\$;BR IF NOT FINISHED
1529	004042	000403		BR	TST12		;BR TO NEXT TEST
1530	004044			S1T11:			;SOURCE1 STRING
1531	004044	063			.BYTE	63	;MOST SIGNIFICANT DIGIT
1532	004045	062			.BYTE	62	
1533	004046			S2T11:			;SOURCE2 STRING
1534	004046	066			.BYTE	66	;MOST SIGNIFICANT DIGIT
1535	004047	070			.BYTE	70	
1536	004050			ANS11:			;EXPECTED ANSWER
1537	004050	060			.BYTE	60	
1538	004051	060			.BYTE	60	
1539							
1540					.EVEN		

N03

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1546 004052 000004
1547 004054 004567 010652
1548 004060 000002
1549 004062 004256
1550 004064 000002
1551 004066 004260
1552 004070 000001
1553 004072 004767 010726
1554 004076 004567 010742
1555 004102 000212
1556 004104 004767 010650
1557 004110 000265
1558 004112 000252
1559 004114 076050
1560
1561 004116 106767 174554 MFPS CCODES ;STORE RESULTANT PSW
1562 004122 042767 177400 174546 BIC #177400,CCODES ;CLEAR UNUSED BITS
1563 004130 023767 000700 174540 CMP @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
1564 004136 001401 BEQ 64$ ;BR, IF EQUAL
1565 004140 104001 ERROR 1 ;*****TEST 12 - ERROR 1*****
1566
1567
1568
1569 004142 64$: TST R0 ;CHECK R0=0
1570 004142 005700 BEQ 65$
1571 004144 001401 ERROR 2 ;*****TEST 12 - ERROR 2*****
1572 004146 104002 ;R0 SHOULD BE ZERO
1573 ;CHECK R1=0
1574 004150 005701 65$: TST R1
1575 004152 001401 BEQ 66$
1576 004154 104003 ERROR 3 ;*****TEST 12 - ERROR 3*****
1577 ;R1 SHOULD BE ZERO
1578 004156 005702 66$: TST R2
1579 004160 001401 BEQ 67$
1580 004162 104004 ERROR 4 ;CHECK R2=0
1581 ;*****TEST 12 - ERROR 4*****
1582 004164 005703 67$: TST R3
1583 004166 001401 BEQ 68$
1584 004170 104005 ERROR 5 ;R3 SHOULD BE ZERO
1585 ;CHECK R3=0
1586 004172 020467 174456 68$: CMP R4,DSTLN
1587 004176 001401 BEQ 69$
1588 004200 104006 ERROR 6 ;*****TEST 12 - ERROR 6*****
1589 ;R4 SHOULD STILL BE DESTINATION LENGTH
1590 004202 020567 174450 69$: CMP R5,DSTAD
1591 004206 001401 BEQ 70$
1592 004210 104007 ERROR 7 ;CHECK R5 = DESTINATION ADDRESS
1593 ;*****TEST 12 - ERROR 7*****
1594 004212 023706 000702 70$: CMP @#SAVR6,SP
1595 004216 001403 BEQ 71$
1596 004220 010637 000704 MOV SP,@#BADR6 ;VERIFY STACK POINTER IS RESTORED
;BR IF OK
;COPY BAD SP VALUE

```



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1597 004224 104010          ERROR 10          ;*****TEST 12 - ERROR 10*****
1598                                     ;STACK POINTER NOT RESTORED BY INSTRUCTION
1599                                     ;EXPECTED SP IS STORED AT "SAVR6"
1600                                     ;ERRONEOUS SP VALUE IS AT "BADR6"
1601 004226          71$:
1602                                     ;CHECK ANSWER
1603 004226 012700 004262      MOV    #ANS12,R0      ;POINT R0 TO EXPECTED ANSWER
1604 004232 016701 174420      MOV    DSTAD,R1      ;POINT R1 TO RESULTANT ANSWER
1605 004236 016702 174412      MOV    DSTLN,R2      ;STORE ANSWER LENGTH IN R1
1606 004242 122021          72$: CMPB   (R0)+,(R1)+    ;COMPARE EACH DIGIT
1607 004244 001401          BEQ    73$           ;BR IF EQUAL
1608 004246 104011          ERROR 11          ;*****TEST 12 - ERROR 11*****
1609                                     ;ERRONEOUS ANSWER
1610                                     ;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
1611                                     ;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
1612 004250 005302          73$: DEC    R2           ;DECREMENT ANSWER LENGTH
1613 004252 001373          BNE    72$           ;BR IF NOT FINISHED
1614 004254 000403          BR     TST13        ;BR TO NEXT TEST
1615 004256          S1T12: ;SOURCE1 STRING
1616 004256          .BYTE 66      ;MOST SIGNIFICANT DIGIT
1617 004257          .BYTE 161
1618 004260          S2T12: ;SOURCE2 STRING
1619 004260          .BYTE 64      ;MOST SIGNIFICANT DIGIT
1620 004261          .BYTE 165
1621 004262          ANS12: ;EXPECTED ANSWER
1622 004262          .BYTE 166
1623
1624          004264          .EVEN
    
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1625
1626
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1630 C04264 000004
1631 004266 004567 010440
1632 004272 000001
1633 004274 004442
1634 004276 000001
1635 004300 004443
1636 004302 000000
1637 004304 004767 010514 JSR PC,CLBUF
1638 004310 004567 010530 JSR R5,XPSW
1639 004314 000204 .WORD 204
1640 004316 004767 010436 JSR PC,GENR
1641 004322 000277 SCC
1642 004324 000244 CLZ
1643 004326 076050 ADDN
1644
1645 004330 106767 174342 MFPS CCODES
1646 004334 042767 177400 174334 BIC #177400,CCODES
1647 004342 023767 000700 174326 CMP #EXPPSW,CCODES
1648 004350 001401 BEQ 64$
1649 004352 104001 ERROR 1
1650
1651
1652
1653 004354 64$: TST R0
1654 004354 005700 BEQ 65$
1655 004356 001401 ERROR 2
1656 004360 104002
1657
1658 004362 005701 65$: TST R1
1659 004364 001401 BEQ 66$
1660 004366 104003 ERROR 3
1661
1662 004370 005702 66$: TST R2
1663 004372 001401 BEQ 67$
1664 004374 104004 ERROR 4
1665
1666 004376 005703 67$: TST R3
1667 004400 001401 BEQ 68$
1668 004402 104005 ERROR 5
1669
1670 004404 020467 174244 68$: CMP R4,DSTLN
1671 004410 001401 BEQ 69$
1672 004412 104006 ERROR 6
1673
1674 004414 020567 174236 69$: CMP R5,DSTAD
1675 004420 001401 BEQ 70$
1676 004422 104007 ERROR 7
1677
1678 004424 023706 000702 70$: CMP #SAVR6,SP
1679 004430 001403 BEQ 71$
1680 004432 010637 000704 MOV SP,#BADR6

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;*****
;*TEST 13 TEST "ADDN" WITH +SRC1 & -SRC2, ZERO RESULT
;*****
†ST13: SCOPE
JSR R5,NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
1 ;SOURCE1 LENGTH
S1T13 ;SOURCE1 ADDRESS
1 ;SOURCE2 LENGTH
S2T13 ;SOURCE2 ADDRESS
0 ;DESTINATION LENGTH
;CLEAR BUFFER AREA
JSR PC,CLBUF
JSR R5,XPSW
.WORD 204
JSR PC,GENR ;SET UP GENERAL REGISTERS
SCC ;SET UP THE COMPLEMENT OF EXPECTED CC'S
CLZ
ADDN
MFPS CCODES ;STORE RESULTANT PSW
BIC #177400,CCODES ;CLEAR UNUSED BITS
CMP #EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
BEQ 64$ ;BR, IF EQUAL
ERROR 1 ;*****TEST 13 - ERROR 1*****
;PSW ERROR
;EXPECTED PSW IS STORED AT "SAVR6"
;ERRONEOUS SP VALUE IS AT "BADR6"
;CHECK R0=0
;*****TEST 13 - ERROR 2*****
;R0 SHOULD BE ZERO
;CHECK R1=0
;*****TEST 13 - ERROR 3*****
;R1 SHOULD BE ZERO
;CHECK R2=0
;*****TEST 13 - ERROR 4*****
;R2 SHOULD BE ZERO
;CHECK R3=0
;*****TEST 13 - ERROR 5*****
;R3 SHOULD BE ZERO
;CHECK R4= DESTINATION LENGTH
;*****TEST 13 - ERROR 6*****
;R4 SHOULD STILL BE DESTINATION LENGTH
;CHECK R5 = DESTINATION ADDRESS
;*****TEST 13 - ERROR 7*****
;R5 SHOULD STILL BE DESTINATION ADDRESS
;VERIFY STACK POINTER IS RESTORED
;BR IF OK
;COPY BAD SP VALUE

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1681 004436 104010
1682
1683
1684
1685 004440
1686 004440 000401
1687 004442
1688 004442 063
1689 004443
1690 004443 163
1691
1692

71\$:
S1T13: BR TST14
.BYTE 63
S2T13: .BYTE 163
.EVEN

*****TEST 13 - ERROR 10*****
;STACK POINTER NOT RESTORED BY INSTRUCTION
;EXPECTED SP IS STORED AT "SAVR6"
;ERRONEOUS SP VALUE IS AT "BADR6"
;BR TO NEXT TEST
;SOURCE1 STRING
;MOST SIGNIFICANT DIGIT
;SOURCE2 STRING
;MOST SIGNIFICANT DIGIT

E04

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1693
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1695
1696
1697
1698 004444 000004
1699 004446 004567 010260
1700 004452 000003
1701 004454 004650
1702 004456 000004
1703 004460 004653
1704 004462 000002
1705 004464 004767 010334
1706 004470 004567 010350
1707 004474 000210
1708 004476 004767 010256
1709 004502 000277
1710 004504 000250
1711 004506 076050
1712
1713 004510 106767 174162
1714 004514 042767 177400 174154
1715 004522 023767 000700 174146
1716 004530 001401
1717 004532 104001
1718
1719
1720
1721 004534
1722 004534 005700
1723 004536 001401
1724 004540 104002
1725
1726 004542 005701
1727 004544 001401
1728 004546 104003
1729
1730 004550 005702
1731 004552 001401
1732 004554 104004
1733
1734 004556 005703
1735 004560 001401
1736 004562 104005
1737
1738 004564 020467 174064
1739 004570 001401
1740 004572 104006
1741
1742 004574 020567 174056
1743 004600 001401
1744 004602 104007
1745
1746 004604 023706 000702
1747 004610 001403
1748 004612 010637 000704

;*****
;*TEST 14 TEST "ADDN" WITH -SRC1 & +SRC2, S1L .LT. S2L, /S2/ .GT. /S1/
;*****
†ST14: SCOPE
      JSR      R5,NPREP      ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
      3
      S1T14      ;SOURCE1 LENGTH
      4
      S2T14      ;SOURCE2 LENGTH
      2
      PC,CLBUF   ;SOURCE2 ADDRESS
      JSR      R5,XPSW      ;DESTINATION LENGTH
      JSR      PC,GENR      ;CLEAR BUFFER AREA
      SCC
      CLN
      ADDN
      MFPS      CCODES      ;STORE RESULTANT PSW
      BIC      #177400,CCODES ;CLEAR UNUSED BITS
      CMP      @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
      BEQ      64$
      ERROR    1
      ;*****TEST 14 - ERROR 1*****
      ;PSW ERROR
      ;EXPECTED PSW IS STORED AT "SAVR6"
      ;ERRONEOUS SP VALUE IS AT "BADR6"
      64$:
      TST      R0
      BEQ      65$
      ERROR    2
      ;*****TEST 14 - ERROR 2*****
      ;R0 SHOULD BE ZERO
      ;CHECK R1=0
      65$:
      TST      R1
      BEQ      66$
      ERROR    3
      ;*****TEST 14 - ERROR 3*****
      ;R1 SHOULD BE ZERO
      ;CHECK R2=0
      66$:
      TST      R2
      BEQ      67$
      ERROR    4
      ;*****TEST 14 - ERROR 4*****
      ;R2 SHOULD BE ZERO
      ;CHECK R3=0
      67$:
      TST      R3
      BEQ      68$
      ERROR    5
      ;*****TEST 14 - ERROR 5*****
      ;R3 SHOULD BE ZERO
      ;CHECK R4= DESTINATION LENGTH
      68$:
      CMP      R4,DSTLN
      BEQ      69$
      ERROR    6
      ;*****TEST 14 - ERROR 6*****
      ;R4 SHOULD STILL BE DESTINATION LENGTH
      ;CHECK R5 = DESTINATION ADDRESS
      69$:
      CMP      R5,DSTAD
      BEQ      70$
      ERROR    7
      ;*****TEST 14 - ERROR 7*****
      ;R5 SHOULD STILL BE DESTINATION ADDRESS
      ;VERIFY STACK POINTER IS RESTORED
      ;BR IF OK
      MOV      SP,@#BADR6   ;COPY BAD SP VALUE
  
```

F04

1749	004616	104010		ERROR	10		;*****TEST 14 - ERROR 10*****
1750							;STACK POINTER NOT RESTORED BY INSTRUCTION
1751							;EXPECTED SP IS STORED AT "SAVR6"
1752							;ERRONEOUS SP VALUE IS AT "BADRE"
1753	004620		71\$:				
1754							;CHECK ANSWER
1755	004620	012700		MOV	#ANS14,R0		;POINT R0 TO EXPECTED ANSWER
1756	004624	016701		MOV	DSTAD,R1		;POINT R1 TO RESULTANT ANSWER
1757	004630	016702		MOV	DSTLN,R2		;STORE ANSWER LENGTH IN R1
1758	004634	122021		72\$:	CMPB	(R0)+,(R1)+	;COMPARE EACH DIGIT
1759	004636	001401			BEQ	73\$;BR IF EQUAL
1760	004640	104011			ERROR	11	;*****TEST 14 - ERROR 11*****
1761							;ERRONEOUS ANSWER
1762							;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
1763							;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
1764	004642	005302	73\$:	DEC	R2		;DECREMENT ANSWER LENGTH
1765	004644	001373		BNE	72\$;BR IF NOT FINISHED
1766	004646	000405		BR	TST15		;BR TO NEXT TEST
1767	004650		S1T14:				;SOURCE1 STRING
1768	004650	067		.BYTE	67		;MOST SIGNIFICANT DIGIT
1769	004651	066		.BYTE	66		
1770	004652	064		.BYTE	64		
1771	004653		S2T14:				;SOURCE2 STRING
1772	004653	060		.BYTE	60		;MOST SIGNIFICANT DIGIT
1773	004654	070		.BYTE	70		
1774	004655	063		.BYTE	63		
1775	004656	171		.BYTE	171		
1776	004657		ANS14:				;EXPECTED ANSWER
1777	004657	067		.BYTE	67		;MOST SIGNIFICANT DIGIT
1778	004660	165		.BYTE	165		
1779							
1780		004662		.EVEN			

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1781
1782
1783
1784
1785
1786 004662 000304
1787 004664 004567 010042
1788 004670 000004
1789 004672 005066
1790 004674 000003
1791 004676 005072
1792 004700 000002
1793 004702 004767 010116
1794 004706 004567 010132
1795 004712 000206
1796 004714 004767 010040
1797 004720 000271
1798 004722 000246
1799 004724 076050
1800
1801 004726 106767 173744
1802 004732 042767 177400 173736
1803 004740 023767 000700 173730
1804 004746 001401
1805 004750 104001
1806
1807
1808
1809 004752
1810 004752 005700
1811 004754 001401
1812 004756 104002
1813
1814 004760 005701
1815 004762 001401
1816 004764 104003
1817
1818 004766 005702
1819 004770 001401
1820 004772 104004
1821
1822 004774 005703
1823 004776 001401
1824 005000 104005
1825
1826 005002 020467 173646
1827 005006 001401
1828 005010 104006
1829
1830 005012 020567 173640
1831 005016 001401
1832 005020 104007
1833
1834 005022 023706 000702
1835 005026 001403
1836 005030 010637 000704

```

```

*****
:TEST 15 TEST "ADDN" WITH +SRC1 & -SRC2, S1L .GT. S2L, /S2/ .GT. /S1/, OVERFLOW
*****
†ST15: SCOPE
JSR R5,NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
4 ;SOURCE1 LENGTH
S1T15 ;SOURCE1 ADDRESS
3 ;SOURCE2 LENGTH
S2T15 ;SOURCE2 ADDRESS
2 ;DESTINATION LENGTH
JSR PC,CLBUF ;CLEAR BUFFER AREA
JSR R5,XPSW
.WORD 206
JSR PC,GENR ;SET UP GENERAL REGISTERS
+SEN!SEC ;SET UP THE COMPLEMENT OF EXPECTED CC'S
+CLZ!CLV
ADDN

MFPS CCODES ;STORE RESULTANT PSW
BIC #177400,CCODES ;CLEAR UNUSED BITS
CMP @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
BEQ 64$ ;R0, IF EQUAL
ERROR 1 ;*****TEST 15 - ERROR 1*****
;PSW ERROR
;EXPECTED PSW IS STORED AT "SAVR6"
;ERRONEOUS SP VALUE IS AT "BADR6"

64$:
TST R0 ;CHECK R0=0
BEQ 65$
ERROR 2 ;*****TEST 15 - ERROR 2*****
;R0 SHOULD BE ZERO
;CHECK R1=0

65$:
TST R1
BEQ 66$
ERROR 3 ;*****TEST 15 - ERROR 3*****
;R1 SHOULD BE ZERO
;CHECK R2=0

66$:
TST R2
BEQ 67$
ERROR 4 ;*****TEST 15 - ERROR 4*****
;R2 SHOULD BE ZERO
;CHECK R3=0

67$:
TST R3
BEQ 68$
ERROR 5 ;*****TEST 15 - ERROR 5*****
;R3 SHOULD BE ZERO
;CHECK R4= DESTINATION LENGTH

68$:
CMP R4,DSTLN
BEQ 69$
ERROR 6 ;*****TEST 15 - ERROR 6*****
;R4 SHOULD STILL BE DESTINATION LENGTH
;CHECK R5 = DESTINATION ADDRESS

69$:
CMP R5,DSTAD
BEQ 70$
ERROR 7 ;*****TEST 15 - ERROR 7*****
;R5 SHOULD STILL BE DESTINATION ADDRESS
;VERIFY STACK POINTER IS RESTORED
;BR IF OK
MOV SP,@#BADR6 ;COPY BAD SP VALUE

```


H04

.MAIN. MACY11 27(1006) 21-DEC-76 11:53 PAGE 46
DVKAJA.P11 20-DEC-76 15:02 T15 TEST "ADDN" WITH +SRC1 & -SRC2, S1L .GT. S2L, /S2 .GT. /S1/, OVERFLOW SEQ 0049

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1837 005034 104010          ERROR 10          ;*****TEST 15 - ERROR 10*****
1838                                     ;STACK POINTER NOT RESTORED BY INSTRUCTION
1839                                     ;EXPECTED SP IS STORED AT "SAVR6"
1840                                     ;ERRONEOUS SP VALUE IS AT "BADR6"
1841 005036          71$:
1842                                     ;CHECK ANSWER
1843 005036 012700 005075      MOV      #ANS15,R0      ;POINT R0 TO EXPECTED ANSWER
1844 005042 016701 173610      MOV      DSTAD,R1      ;POINT R1 TO RESULTANT ANSWER
1845 005046 016702 173602      MOV      DSTLN,R2      ;STORE ANSWER LENGTH IN R1
1846 005052 122021          72$:      CMPB     (R0)+,(R1)+    ;COMPARE EACH DIGIT
1847 005054 001401          BEQ      73$           ;BR IF EQUAL
1848 005056 104011          ERROR 11          ;*****TEST 15 - ERROR 11*****
1849                                     ;ERRONEOUS ANSWER
1850                                     ;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
1851                                     ;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
1852 005060 005302          73$:      DEC      R2           ;DECREMENT ANSWER LENGTH
1853 005062 001373          BNE      72$           ;BR IF NOT FINISHED
1854 005064 000405          BR       TST16        ;BR TO NEXT TEST
1855 005066          S1T15:          ;SOURCE1 STRING
1856 005066          .BYTE 60      ;MOST SIGNIFICANT DIGIT
1857 005067          .BYTE 60
1858 005070          .BYTE 67
1859 005071          .BYTE 163
1860 005072          S2T15:          ;SOURCE2 STRING
1861 005072          .BYTE 61      ;MOST SIGNIFICANT DIGIT
1862 005073          .BYTE 67
1863 005074          .BYTE 63
1864 005075          ANS15:          ;EXPECTED ANSWER
1865 005075          .BYTE 60      ;MOST SIGNIFICANT DIGIT
1866 005076          .BYTE 60
1867
1868          005100          .EVEN
1869
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005100 000004
005102 004567 007624
005106 000003
005110 005304
005112 000004
005114 005307
005116 000002
005120 004767 007700
005124 004567 007714
005130 000206
005132 004767 007622
005136 000271
005140 000246
005142 076050

005144 106767 173526
005150 042767 177400 173520
005156 023767 000700 173512
005164 001401
005166 104001

005170
005170 005700
005172 001401
005174 104002

005176 005701
005200 001401
005202 104003

005204 005702
005206 001401
005210 104004

005212 005703
005214 001401
005216 104005

005220 020467 173430
005224 001401
005226 104006

005230 020567 173422
005234 001401
005236 104007

005240 023706 000702
005244 001403
005246 010637 000704

```
*****  
*TEST 16 TEST ADDN WITH -SRC1 & +SRC2,S1L .LT. S2L, /S1/ .GT. /S2/,OVERFLOW  
*****  
†ST16: SCOPE  
JSR R5,NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST  
3 ;SOURCE1 LENGTH  
S1T16 ;SOURCE1 ADDRESS  
4 ;SOURCE2 LENGTH  
S2T16 ;SOURCE2 ADDRESS  
2 ;DESTINATION LENGTH  
JSR PC,CLBUF ;CLEAR BUFFER AREA  
JSR R5,XPSW  
.WORD 206  
JSR PC,GENR ;SET UP GENERAL REGISTERS  
+SEN!SEC ;SET UP THE COMPLEMENT OF EXPECTED CC'S  
+CLZ!CLV  
ADDN  
  
MFPS CCODES ;STORE RESULTANT PSW  
BIC #177400,CCODES ;CLEAR UNUSED BITS  
CMP @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE  
BEQ 64$ ;BR, IF EQUAL  
ERROR 1 ;*****TEST 16 - ERROR 1*****  
;PSW ERROR  
;EXPECTED PSW IS STORED AT "SAVR6"  
;ERRONEOUS SP VALUE IS AT "BADR6"  
  
64$: TST R0 ;CHECK R0=0  
BEQ 65$  
ERROR 2 ;*****TEST 16 - ERROR 2*****  
;R0 SHOULD BE ZERO  
;CHECK R1=0  
  
65$: TST R1  
BEQ 66$  
ERROR 3 ;*****TEST 16 - ERROR 3*****  
;R1 SHOULD BE ZERO  
;CHECK R2=0  
  
66$: TST R2  
BEQ 67$  
ERROR 4 ;*****TEST 16 - ERROR 4*****  
;R2 SHOULD BE ZERO  
;CHECK R3=0  
  
67$: TST R3  
BEQ 68$  
ERROR 5 ;*****TEST 16 - ERROR 5*****  
;R3 SHOULD BE ZERO  
;CHECK R4= DESTINATION LENGTH  
  
68$: CMP R4,DSTLN  
BEQ 69$  
ERROR 6 ;*****TEST 16 - ERROR 6*****  
;R4 SHOULD STILL BE DESTINATION LENGTH  
;CHECK R5 = DESTINATION ADDRESS  
  
69$: CMP R5,DSTAD  
BEQ 70$  
ERROR 7 ;*****TEST 16 - ERROR 7*****  
;R5 SHOULD STILL BE DESTINATION ADDRESS  
;VERIFY STACK POINTER IS RESTORED  
;BR IF OK  
;COPY BAD SP VALUE  
  
70$: CMP @#SAVR6,SP  
BEQ 71$  
MOV SP,@#BADR6
```

J04

.MAIN. MACY11 27(1006) 21-DEC-76 11:53 PAGE 48
 DVKAJA.P11 20-DEC-76 15:02 T16 TEST ADDN WITH -SRC1 & +SRC2,S1L .LT. S2L, /S1/ .GT. /S2/,OVERFLOW SEQ 0050

1926	005252	104010		ERROR	10		*****TEST 16 - ERROR 10*****
1927							STACK POINTER NOT RESTORED BY INSTRUCTION
1928							EXPECTED SP IS STORED AT "SAYR6"
1929							ERRONEOUS SP VALUE IS AT "BADR6"
1930	005254			71\$:			
1931							CHECK ANSWER
1932	005254	012700	005313	MOV	#ANS16,R0		POINT R0 TO EXPECTED ANSWER
1933	005260	016701	173372	MOV	DSTAD,R1		POINT R1 TO RESULTANT ANSWER
1934	005264	016702	173364	MOV	DSTLN,R2		STORE ANSWER LENGTH IN R1
1935	005270	122021		72\$:	CMPB	(R0)+,(R1)+	COMPARE EACH DIGIT
1936	005272	001401		BEQ	73\$		BR IF EQUAL
1937	005274	104011		ERROR	11		*****TEST 16 - ERROR 11*****
1938							ERRONEOUS ANSWER
1939							R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
1940							R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
1941	005276	005302		73\$:	DEC	R2	DECREMENT ANSWER LENGTH
1942	005300	001373			BNE	72\$	BR IF NOT FINISHED
1943	005302	000405			BR	TST17	BR TO NEXT TEST
1944	005304			S1T16:			SOURCE1 STRING
1945	005304	061			.BYTE	61	MOST SIGNIFICANT DIGIT
1946	005305	067			.BYTE	67	
1947	005306	162			.BYTE	162	
1948	005307			S2T16:			SOURCE2 STRING
1949	005307	060			.BYTE	60	MOST SIGNIFICANT DIGIT
1950	005310	060			.BYTE	60	
1951	005311	067			.BYTE	67	
1952	005312	062			.BYTE	62	
1953	005313			ANS16:			EXPECTED ANSWER
1954	005313	060			.BYTE	60	MOST SIGNIFICANT DIGIT
1955	005314	060			.BYTE	60	
1956							
1957		005316			.EVEN		

K04

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1963 005316 000004
1964 005320 004567 007406
1965 005324 000003
1966 005326 005522
1967 005330 000003
1968 005332 005525
1969 005334 000002
1970 005336 004767 007462
1971 005342 004567 007476
1972 005346 000202
1973 005350 004767 007404
1974 005354 000277
1975 005356 000242
1976 005360 076050
1977
1978 005362 106767 173310
1979 005366 042767 177400 173302
1980 005374 023767 000700 173274
1981 005402 001401
1982 005404 104001
1983
1984
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1986 005406
1987 005406 005700
1988 005410 001401
1989 005412 104002
1990
1991 005414 005701
1992 005416 001401
1993 005420 104003
1994
1995 005422 005702
1996 005424 001401
1997 005426 104004
1998
1999 005430 005703
2000 005432 001401
2001 005434 104005
2002
2003 005436 020467 173212
2004 005442 001401
2005 005444 104006
2006
2007 005446 020567 173204
2008 005452 001401
2009 005454 104007
2010
2011 005456 023706 000702
2012 005462 001403
2013 005464 010637 000704

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*****
*TEST 17 TEST ADDN WITH +SRC1 & -SRC2, S1L=S2L, /S1/ .GT./S2/,OVERFLOW
*****
ST17: SCOPE
      JSR      R5,NPREP      ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
      3
      S1T17    ;SOURCE1 LENGTH
      3
      S2T17    ;SOURCE1 ADDRESS
      2
      PC,CLBUF ;SOURCE2 LENGTH
      R5,XPSW  ;SOURCE2 ADDRESS
      202      ;DESTINATION LENGTH
      PC,GENR  ;CLEAR BUFFER AREA
      ;SET UP GENERAL REGISTERS
      ;SET UP THE COMPLEMENT OF EXPECTED CC'S
MFP5  CCODES      ;STORE RESULTANT PSW
BIC    #177400,CCODES ;CLEAR UNUSED BITS
CMP    2#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
BEQ    64$
ERROR  1
*****TEST 17 - ERROR 1*****
PSW ERROR
EXPECTED PSW IS STORED AT "SAVR6"
ERRONEOUS SP VALUE IS AT "BADR6"
64$:
TST    R0
BEQ    65$
ERROR  2
*****TEST 17 - ERROR 2*****
R0 SHOULD BE ZERO
CHECK R0=0
65$:
TST    R1
BEQ    66$
ERROR  3
*****TEST 17 - ERROR 3*****
R1 SHOULD BE ZERO
CHECK R1=0
66$:
TST    R2
BEQ    67$
ERROR  4
*****TEST 17 - ERROR 4*****
R2 SHOULD BE ZERO
CHECK R2=0
67$:
TST    R3
BEQ    68$
ERROR  5
*****TEST 17 - ERROR 5*****
R3 SHOULD BE ZERO
CHECK R3=0
68$:
CMP    R4,DSTLN
BEQ    69$
ERROR  6
*****TEST 17 - ERROR 6*****
R4 SHOULD STILL BE DESTINATION LENGTH
CHECK R4= DESTINATION LENGTH
69$:
CMP    R5,DSTAD
BEQ    70$
ERROR  7
*****TEST 17 - ERROR 7*****
R5 SHOULD STILL BE DESTINATION ADDRESS
VERIFY STACK POINTER IS RESTORED
BR IF OK
MOV    SP,2#BADR6 ;COPY BAD SP VALUE

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2014 005470 104010          ERROR 10          ;*****TEST 17 - ERROR 10*****
2015                                     ;STACK POINTER NOT RESTORED BY INSTRUCTION
2016                                     ;EXPECTED SP IS STORED AT "SAVR6"
2017                                     ;ERRONEOUS SP VALUE IS AT "BADR6"
2018 005472          71$:
2019
2020 005472 012700 005530      MOV      #ANS17,R0      ;CHECK ANSWER
2021 005476 016701 173154      MOV      DSTAD,R1      ;POINT R0 TO EXPECTED ANSWER
2022 005502 016702 173146      MOV      DSTLN,R2      ;POINT R1 TO RESULTANT ANSWER
2023 005506 122021          72$:      CMPB     (R0)+,(R1)+    ;STORE ANSWER LENGTH IN R1
2024 005510 001401          ;BEQ     73$           ;COMPARE EACH DIGIT
2025 005512 104011          ;ERROR 11           ;BR IF EQUAL
2026                                     ;*****TEST 17 - ERROR 11*****
2027                                     ;ERRONEOUS ANSWER
2028                                     ;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
2029 005514 005302          73$:      DEC     R2             ;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
2030 005516 001373          ;BNE     72$           ;DECREMENT ANSWER LENGTH
2031 005520 000404          ;BR     TST20        ;BR IF NOT FINISHED
2032 005522          S1T17:      ;BR     TO NEXT TEST
2033 005522          .BYTE     63      ;SOURCE1 STRING
2034 005523          .BYTE     65      ;MOST SIGNIFICANT DIGIT
2035 005524          .BYTE     67
2036 005525          S2T17:      ;SOURCE2 STRING
2037 005525          .BYTE     60      ;MOST SIGNIFICANT DIGIT
2038 005526          .BYTE     63
2039 005527          .BYTE     165
2040 005530          ANS17:      ;EXPECTED ANSWER
2041 005530          .BYTE     62      ;MOST SIGNIFICANT DIGIT
2042 005531          .BYTE     62
2043
2044          .EVEN

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M04

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2050 005532 000004
2051 005534 004567 007172
2052 005540 000003
2053 005542 005736
2054 005544 000003
2055 005546 005741
2056 005550 000002
2057 005552 004767 007246
2058 005556 004567 007262
2059 005562 000202
2060 005564 004767 007170
2061 005570 000277
2062 005572 000242
2063 005574 076050
2064
2065 005576 106767 173074
2066 005602 042767 177400 173066
2067 005610 023767 000700 173060
2068 005616 001401
2069 005620 104001
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2073 005622
2074 005622 005700
2075 005624 001401
2076 005626 104002
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2078 005630 005701
2079 005632 001401
2080 005634 104003
2081
2082 005636 005702
2083 005640 001401
2084 005642 104004
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2086 005644 005703
2087 005646 001401
2088 005650 104005
2089
2090 005652 020467 172776
2091 005656 001401
2092 005660 104006
2093
2094 005662 020567 172770
2095 005666 001401
2096 005670 104007
2097
2098 005672 023706 000702
2099 005676 001403
2100 005700 010637 000704

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*****
:TEST 20 TEST ADDN WITH POSITIVE OPERANDS, OVERFLOW, NO CARRY OUT OF OVERFLOW
*****
TST20: SCOPE
      JSR      R5,NPREP      ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
      3        ;SOURCE1 LENGTH
      S1T20    ;SOURCE1 ADDRESS
      3        ;SOURCE2 LENGTH
      S2T20    ;SOURCE2 ADDRESS
      2        ;DESTINATION LENGTH
      JSR      PC,CLBUF      ;CLEAR BUFFER AREA
      JSR      R5,XPSW
      .WORD    202
      JSR      PC,GENR      ;SET UP GENERAL REGISTERS
      SCC      ;SET UP THE COMPLEMENT OF EXPECTED CC'S
      CLV
      ADDN
      MFPS     CCODES      ;STORE RESULTANT PSW
      BIC      #177400,CCODES ;CLEAR UNUSED BITS
      CMP      @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
      BEQ      64$         ;BR, IF EQUAL
      ERROR    1          ;*****TEST 20 - ERROR 1*****
                          ;PSW ERROR
                          ;EXPECTED PSW IS STORED AT "SAVR6"
                          ;ERRONEOUS SP VALUE IS AT "BADR6"
64$:
      TST      R0          ;CHECK R0=0
      BEQ      65$
      ERROR    2          ;*****TEST 20 - ERROR 2*****
                          ;R0 SHOULD BE ZERO
                          ;CHECK R1=0
65$:
      TST      R1
      BEQ      66$
      ERROR    3          ;*****TEST 20 - ERROR 3*****
                          ;R1 SHOULD BE ZERO
                          ;CHECK R2=0
66$:
      TST      R2
      BEQ      67$
      ERROR    4          ;*****TEST 20 - ERROR 4*****
                          ;R2 SHOULD BE ZERO
                          ;CHECK R3=0
67$:
      TST      R3
      BEQ      68$
      ERROR    5          ;*****TEST 20 - ERROR 5*****
                          ;R3 SHOULD BE ZERO
                          ;CHECK R4= DESTINATION LENGTH
68$:
      CMP      R4,DSTLN
      BEQ      69$
      ERROR    6          ;*****TEST 20 - ERROR 6*****
                          ;R4 SHOULD STILL BE DESTINATION LENGTH
                          ;CHECK R5 = DESTINATION ADDRESS
69$:
      CMP      R5,DSTAD
      BEQ      70$
      ERROR    7          ;*****TEST 20 - ERROR 7*****
                          ;R5 SHOULD STILL BE DESTINATION ADDRESS
                          ;VERIFY STACK POINTER IS RESTORED
                          ;BR IF OK
                          ;COPY BAD SP VALUE
70$:
      CMP      @#SAVR6,SP
      BEQ      71$
      MOV      SP,@#BADR6

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N04

2101	005704	104010		ERROR	10		;*****TEST 20 - ERROR 10*****
2102							;STACK POINTER NOT RESTORED BY INSTRUCTION
2103							;EXPECTED SP IS STORED AT "SAVR6"
2104							;ERRONEOUS SP VALUE IS AT "BADR6"
2105	005706			71\$:			
2106							;CHECK ANSWER
2107	005706	012700	005744		MOV	#ANS20,R0	;POINT R0 TO EXPECTED ANSWER
2108	005712	016701	172740		MOV	DSTAD,R1	;POINT R1 TO RESULTANT ANSWER
2109	005716	016702	172732		MOV	DSTLN,R2	;STORE ANSWER LENGTH IN R1
2110	005722	122021		72\$:	CMPB	(R0)+,(R1)+	;COMPARE EACH DIGIT
2111	005724	001401			BEG	73\$;BR IF EQUAL
2112	005726	104011			ERROR	11	;*****TEST 20 - ERROR 11*****
2113							;ERRONEOUS ANSWER
2114							;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
2115							;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
2116	005730	005302		73\$:	DEC	R2	;DECREMENT ANSWER LENGTH
2117	005732	001373			BNE	72\$;BR IF NOT FINISHED
2118	005734	000404			BR	TST21	;BR TO NEXT TEST
2119	005736			S1T20:			;SOURCE1 STRING
2120	005736	070			.BYTE	70	;MOST SIGNIFICANT DIGIT
2121	005737	062			.BYTE	62	
2122	005740	064			.BYTE	64	
2123	005741			S2T20:			;SOURCE2 STRING
2124	005741	061			.BYTE	61	;MOST SIGNIFICANT DIGIT
2125	005742	070			.BYTE	70	
2126	005743	065			.BYTE	65	
2127	005744			ANS20:			;EXPECTED ANSWER
2128	005744	060			.BYTE	60	;MOST SIGNIFICANT DIGIT
2129	005745	071			.BYTE	71	
2130							
2131					.EVEN		

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005746 000004
005750 105777 172564
005754 100555
005756 026767 172566 172700
005764 001007
005766 032767 000001 172612
005774 001403
005776 005767 172572
006002 001142
006004
006004 004567 006722
006010 000004
006012 006260
006014 000004
006016 006264
006020 000005
006022 004767 006776
006026 012767 006106 172640
006034 012777 015114 172626
006042 005077 172624
006046 004767 007016
006052 013777 000554 172606
006060 004567 006760
006064 000000
006066 106427 000000
006072 052777 000100 172564
006100 004767 006654
006104 000277
006106 076050
006110 106767 172562
006114 032777 000100 172542
006122 001366
006124 042767 177400 172544
006132 023767 000700 172536
006140 001401
006142 104001
006144
006144 005700
006146 001401
006150 104002
006152 005701
006154 001401
006156 104003
006160 005702
006162 001401

*TEST 21 TEST INTERRUPTABILITY OF "ADDN"

TST21: SCOPE ;TEST BIT 7 OF SWR
TSTB QSWR ;SKIP TO NEXT TEST IF SET
BMI TST22 ;IS SLU USED FOR INTERRUPTS THE CONSOLE?
CMP \$TPS, TCSR ;BR, IF NOT & PERFORM INTERRUPTABILITY TEST
BNE T21CONT ;IF YES, IS PROGRAM UNDER APT?
BIT #BIT0, \$ENV ;BR, IF NOT
BEQ T21CONT ;IF YES, CHECK IF NOT ON FIRST PASS
TST \$PASS ;IF NOT, BR & SKIP TEST
BNE TST22

T21CONT: JSR R5, NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
4 ;SOURCE1 LENGTH
S1T21 ;SOURCE1 ADDRESS
4 ;SOURCE2 LENGTH
S2T21 ;SOURCE2 ADDRESS
5 ;DESTINATION LENGTH
JSR PC, CLBUF ;CLEAR BUFFER AREA
MOV #ADDNPC, PCI ;STORE PC OF TEST INSTRUCTION
MOV #INTR, @TVECT ;POINT TTY VECTOR TO INTERRUPT ROUTINE
CLR @TPSW ;ALLOW INTERRUPTS AFTER TTY INTERRUPT
JSR PC, TDONE ;WAIT FOR SLU READY
MOV @#\$NULL, @TBUF ;SEND NULL CHARACTER
JSR R5, XPSW ;STORE EXPECTED PSW
.WORD 0
MTPS #0 ;ALLOW INTERRUPTS
BIS #100, @TCSR ;ENABLE TTY INTERRUPTS
READN: JSR PC, GENR ;SET UP GENERAL REGISTERS
SCC ;SET UP THE COMPLEMENT OF EXPECTED CC'S
ADDNPC: ADDN

MFPS CCODES ;STORE RESULTANT PSW
BIT #100, @TCSR ;IF INTERRUPTS ARE DISABLED, INSTRUCTION WAS INTERRUPTED
BNE READN ;BR & DO TEST AGAIN, IF INSTRUCTION WAS NOT INTERRUPTED
BIC #177400, CCODES ;CLEAR UNUSED BITS
CMP @#EXPPSW, CCODES ;CHECK PSW AGAINST EXPECTED VALUE
BEQ 64\$;BR, IF EQUAL
2173: ERROR 1 ;*****TEST 21 - ERROR 1*****
PSW ERROR
EXPECTED PSW IS STORED AT "SAVR6"
ERRONEOUS SP VALUE IS AT "BADR6"

64\$: TST R0 ;CHECK R0=0
BEQ 65\$
ERROR 2 ;*****TEST 21 - ERROR 2*****
R0 SHOULD BE ZERO
65\$: TST R1 ;CHECK R1=0
BEQ 66\$
ERROR 3 ;*****TEST 21 - ERROR 3*****
R1 SHOULD BE ZERO
66\$: TST R2 ;CHECK R2=0
BEQ 67\$

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2188 006164 104004          ERROR 4          ;*****TEST 21 - ERROR 4*****
2189                                     ;R2 SHOULD BE ZERO
2190 006166 005703      67$:  TST    R3          ;CHECK R3=0
2191 006170 001401          BEQ    68$
2192 006172 104005          ERROR 5          ;*****TEST 21 - ERROR 5*****
2193                                     ;R3 SHOULD BE ZERO
2194 006174 020467 172454    68$:  CMP    R4,DSTLN      ;CHECK R4= DESTINATION LENGTH
2195 006200 001401          BEQ    69$
2196 006202 104006          ERROR 6          ;*****TEST 21 - ERROR 6*****
2197                                     ;R4 SHOULD STILL BE DESTINATION LENGTH
2198 006204 020567 172446    69$:  CMP    R5,DSTAD      ;CHECK R5 = DESTINATION ADDRESS
2199 006210 001401          BEQ    70$
2200 006212 104007          ERROR 7          ;*****TEST 21 - ERROR 7*****
2201                                     ;R5 SHOULD STILL BE DESTINATION ADDRESS
2202 006214 023706 000702    70$:  CMP    @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
2203 006220 001403          BEQ    71$
2204 006222 010637 000704    MOV    SP,@#BADR6
2205 006226 104010          ERROR 10         ;*****TEST 21 - ERROR 10*****
2206                                     ;STACK POINTER NOT RESTORED BY INSTRUCTION
2207                                     ;EXPECTED SP IS STORED AT "SAVR6"
2208                                     ;ERRONEOUS SP VALUE IS AT "BADR6"
2209 006230          71$:
2210                                     ;CHECK ANSWER
2211 006230 012700 006270    MOV    #ANS21,R0      ;POINT R0 TO EXPECTED ANSWER
2212 006234 016701 172416    MOV    DSTAD,R1      ;POINT R1 TO RESULTANT ANSWER
2213 006240 016702 172410    MOV    DSTLN,R2      ;STORE ANSWER LENGTH IN R1
2214 006244 122021          CMPB   (R0)+,(R1)+    ;COMPARE EACH DIGIT
2215 006246 001401          BEQ    73$
2216 006250 104011          ERROR 11         ;*****TEST 21 - ERROR 11*****
2217                                     ;ERRONEOUS ANSWER
2218                                     ;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
2219                                     ;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
2220 006252 005302          73$:  DEC    R2
2221 006254 001373          BNE    72$
2222 006256 000407          BR     ENDT21
2223 006260          S1T21:
2224 006260          .BYTE 61
2225 006261          .BYTE 62
2226 006262          .BYTE 63
2227 006263          .BYTE 64
2228 006264          S2T21:
2229 006264          .BYTE 65
2230 006265          .BYTE 66
2231 006266          .BYTE 67
2232 006267          .BYTE 70
2233 006270          ANS21:
2234 006270          .BYTE 60
2235 006271          .BYTE 66
2236 006272          .BYTE 71
2237 006273          .BYTE 61
2238 006274          .BYTE 62
2239
2240          006276          .EVEN
2241 006276 016777 172370 172364 ENDT21: MOV    TPSW,@TVECT
2242 006304 106427 000200          MTPS  #200

```



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2243
2244
2245
2246
2247
2248 006310 000004
2249 006312 004567 006414
2250 006316 000004
2251 006320 006514
2252 006322 000003
2253 006324 006520
2254 006326 000003
2255 006330 004767 006470
2256 006334 004567 006504
2257 006340 000210
2258 006342 004767 006412
2259 006346 000277
2260 006350 000250
2261 006352 076051
2262
2263 006354 106767 172316
2264 006360 042767 177400 172310
2265 006366 023767 000700 172302
2266 006374 001401
2267 006376 104001
2268
2269
2270
2271 006400
2272 006400 005700
2273 006402 001401
2274 006404 104002
2275
2276 006406 005701
2277 006410 001401
2278 006412 104003
2279
2280 006414 005702
2281 006416 001401
2282 006420 104004
2283
2284 006422 005703
2285 006424 001401
2286 006426 104005
2287
2288 006430 020467 172220
2289 006434 001401
2290 006436 104006
2291
2292 006440 020567 172212
2293 006444 001401
2294 006446 104007
2295
2296 006450 023706 000702
2297 006454 001403
2298 006456 010637 000704

```

```

;*****
;*TEST 22 TEST "SUBN" WITH POSITIVE OPERANDS, SRC1 .GT. SRC2
;*****
TST22: SCOPE
        JSR      R5,NPREP      ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
        4
        S1T22      ;SOURCE1 LENGTH
        3
        S2T22      ;SOURCE2 LENGTH
        3
        JSR      PC,CLBUF      ;DESTINATION LENGTH
        JSR      R5,XPSW      ;CLEAR BUFFER AREA
        .WORD     210
        JSR      PC,GENR      ;SET UP GENERAL REGISTERS
        SCC
        CLN
        SUBN
        MFP5      CCODES      ;STORE RESULTANT PSW
        BIC      #177400,CCODES ;CLEAR UNUSED BITS
        CMP      @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
        BEQ      64$
        ERROR    1
        ;*****TEST 22 - ERROR 1*****
        PSW ERROR
        EXPECTED PSW IS STORED AT "SAVR6"
        ERRONEOUS SP VALUE IS AT "BADR6"
64$:
        TST      R0
        BEQ      65$
        ERROR    2
        ;*****TEST 22 - ERROR 2*****
        ;R0 SHOULD BE ZERO
        ;CHECK R0=0
65$:
        TST      R1
        BEQ      66$
        ERROR    3
        ;*****TEST 22 - ERROR 3*****
        ;R1 SHOULD BE ZERO
        ;CHECK R1=0
66$:
        TST      R2
        BEQ      67$
        ERROR    4
        ;*****TEST 22 - ERROR 4*****
        ;R2 SHOULD BE ZERO
        ;CHECK R2=0
67$:
        TST      R3
        BEQ      68$
        ERROR    5
        ;*****TEST 22 - ERROR 5*****
        ;R3 SHOULD BE ZERO
        ;CHECK R3=0
68$:
        CMP      R4,DSTLN
        BEQ      69$
        ERROR    6
        ;*****TEST 22 - ERROR 6*****
        ;R4 SHOULD STILL BE DESTINATION LENGTH
        ;CHECK R4= DESTINATION LENGTH
69$:
        CMP      R5,DSTAD
        BEQ      70$
        ERROR    7
        ;*****TEST 22 - ERROR 7*****
        ;R5 SHOULD STILL BE DESTINATION ADDRESS
        ;VERIFY STACK POINTER IS RESTORED
        ;BR IF OK
        MOV      SP,@#BADR6 ;COPY BAD SP VALUE

```

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2299	006462	104010		ERROR	10		;*****TEST 22 - ERROR 10*****
2300							;STACK POINTER NOT RESTORED BY INSTRUCTION
2301							;EXPECTED SP IS STORED AT "SAVR6"
2302							;ERRONEOUS SP VALUE IS AT "BADR6"
2303	006464			71\$:			
2304							;CHECK ANSWER
2305	006464	012700	006523	MOV	#ANS22,R0		;POINT R0 TO EXPECTED ANSWER
2306	006470	016701	172162	MOV	DSTAD,R1		;POINT R1 TO RESULTANT ANSWER
2307	006474	016702	172154	MOV	DSTLN,R2		;STORE ANSWER LENGTH IN R1
2308	006500	122021		72\$:	CMPB	(R0)+,(R1)+	;COMPARE EACH DIGIT
2309	006502	001401		BEQ	73\$;BR IF EQUAL
2310	006504	104011		ERROR	11		;*****TEST 22 - ERROR 11*****
2311							;ERRONEOUS ANSWER
2312							;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
2313							;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
2314	006506	005302		73\$:	DEC	R2	;DECREMENT ANSWER LENGTH
2315	006510	001373		BNE	72\$;BR IF NOT FINISHED
2316	006512	000405		BR	TST23		;BR TO NEXT TEST
2317	006514			S1T22:			;SOURCE1 STRING
2318	006514	060			.BYTE	60	;MOST SIGNIFICANT DIGIT
2319	006515	071			.BYTE	71	
2320	006516	066			.BYTE	66	
2321	006517	062			.BYTE	62	
2322	006520			S2T22:			;SOURCE2 STRING
2323	006520	067			.BYTE	67	;MOST SIGNIFICANT DIGIT
2324	006521	065			.BYTE	65	
2325	006522	064			.BYTE	64	
2326	006523			ANS22:			;EXPECTED ANSWER
2327	006523	062			.BYTE	62	;MOST SIGNIFICANT DIGIT
2328	006524	060			.BYTE	60	
2329	006525	170			.BYTE	170	
2330							
2331					.EVEN		

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SEQ 0059

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2332
2333
2334
2335
2336 006526 000004
2337 006530 004567 006176
2338 006534 000003
2339 006536 006730
2340 006540 000004
2341 006542 006733
2342 006544 000003
2343 006546 004767 006252
2344 006552 004567 006266
2345 006556 000200
2346 006560 004767 006174
2347 006564 000277
2348 006566 076051
2349
2350 006570 106767 172102
2351 006574 042767 177400 172074
2352 006602 023767 000700 172066
2353 006610 001401
2354 006612 104001
2355
2356
2357
2358 006614
2359 006614 005700
2360 006616 001401
2361 006620 104002
2362
2363 006622 005701
2364 006624 001401
2365 006626 104003
2366
2367 006630 005702
2368 006632 001401
2369 006634 104004
2370
2371 006636 005703
2372 006640 001401
2373 006642 104005
2374
2375 006644 020467 172004
2376 006650 001401
2377 006652 104006
2378
2379 006654 020567 171776
2380 006660 001401
2381 006662 104007
2382
2383 006664 023706 000702
2384 006670 001403
2385 006672 010637 000704
2386 006676 104010
2387
  
```

```

*****
*TEST 23 TEST "SUBN" WITH NEGATIVE OPERANDS, SRC1 .GTT. SRC2
*****
TST23: SCOPE
      JSR      R5,NPREP      ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
      3
      S1T23      ;SOURCE1 LENGTH
      4
      S2T23      ;SOURCE1 ADDRESS
      3
      PC,CLBUF    ;SOURCE2 LENGTH
      JSR      R5,XPSW      ;SOURCE2 ADDRESS
      .WORD 200      ;DESTINATION LENGTH
      JSR      PC,GENR      ;CLEAR BUFFER AREA
      SCC
      SUBN
      MFPS      CCODES      ;STORE RESULTANT PSW
      BIC      #177400,CCODES ;CLEAR UNUSED BITS
      CMP      @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
      BEQ      64$
      ERROR 1
      *****TEST 23 - ERROR 1*****
      PSW ERROR
      EXPECTED PSW IS STORED AT "SAVR6"
      ERRONEOUS SP VALUE IS AT "BADR6"
      64$:
      TST      R0
      BEQ      65$
      ERROR 2
      *****TEST 23 - ERROR 2*****
      R0 SHOULD BE ZERO
      CHECK R0=0
      65$:
      TST      R1
      BEQ      66$
      ERROR 3
      *****TEST 23 - ERROR 3*****
      R1 SHOULD BE ZERO
      CHECK R1=0
      66$:
      TST      R2
      BEQ      67$
      ERROR 4
      *****TEST 23 - ERROR 4*****
      R2 SHOULD BE ZERO
      CHECK R2=0
      67$:
      TST      R3
      BEQ      68$
      ERROR 5
      *****TEST 23 - ERROR 5*****
      R3 SHOULD BE ZERO
      CHECK R3=0
      68$:
      CMP      R4,DSTLN
      BEQ      69$
      ERROR 6
      *****TEST 23 - ERROR 6*****
      R4 SHOULD STILL BE DESTINATION LENGTH
      CHECK R4= DESTINATION LENGTH
      69$:
      CMP      R5,DSTAD
      BEQ      70$
      ERROR 7
      *****TEST 23 - ERROR 7*****
      R5 SHOULD STILL BE DESTINATION ADDRESS
      VERIFY STACK POINTER IS RESTORED
      BR IF OK
      MOV      SP,@#BADR6
      ERROR 10
      *****TEST 23 - ERROR 10*****
      STACK POINTER NOT RESTORED BY INSTRUCTION
  
```



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2419
2420
2421
2422
2423 006742 000004
2424 006744 105777 171570
2425 006750 100556
2426 006752 026767 171572 171704
2427 006760 001007
2428 006762 032767 000001 171616
2429 006770 001403
2430 006772 005767 171576
2431 006776 001143
2432 007000
2433 007000 004567 005726
2434 007004 000004
2435 007006 007256
2436 007010 000004
2437 007012 007262
2438 007014 000005
2439 007016 004767 006002
2440 007022 012767 007104 171644
2441 007030 012777 015114 171632
2442 007036 005077 171630
2443 007042 004767 006022
2444 007046 013777 000554 171612
2445 007054 004567 005764
2446 007060 000010
2447 007062 106427 000000
2448 007066 052777 000100 171570
2449 007074 004767 005660
2450 007100 000277
2451 007102 000250
2452 007104 076051
2453
2454 007106 106767 171564
2455 007112 032777 000100 171544
2456 007120 001365
2457 007122 042767 177400 171546
2458 007130 023767 000700 171540
2459 007136 001401
2460 007140 104001
2461
2462
2463
2464 007142
2465 007142 005700
2466 007144 001401
2467 007146 104002
2468
2469 007150 005701
2470 007152 001401
2471 007154 104003
2472
2473 007156 005702
2474 007160 001401

;*****
;TEST 24 TEST INTERRUPTABILITY OF "SUBN"
;*****
†ST24: SCOPE
TSTB @SWR ;TEST BIT 7 OF SWR
BMI TST25 ;SKIP TO NEXT TEST IF SET
CMP $TPS,TCR ;IS SLU USED FOR INTERRUPTS THE CONSOLE?
BNE T24CONT ;BR, IF NOT & PERFORM INTERRUPTABILITY TEST
BIT #BIT0,$ENV ;IF YES, IS PROGRAM UNDER APT?
BEQ T24CONT ;BR, IF NOT
TST $PASS ;IF YES,CHECK IF NOT ON FIRST PASS
BNE TST25 ;IF NOT, BR & SKIP TEST

T24CONT:
JSR R5,NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
4 ;SOURCE1 LENGTH
S1T24 ;SOURCE1 ADDRESS
4 ;SOURCE2 LENGTH
S2T24 ;SOURCE2 ADDRESS
5 ;DESTINATION LENGTH
JSR PC,CLBUF ;CLEAR BUFFER AREA
MOV #SUBNPC,PCI ;STORE PC OF TEST INSTRUCTION
MOV #INTR,@TVECT ;POINT TTY VECTOR TO INTERRUPT ROUTINE
CLR @TPSW ;ALLOW INTERRUPTS AFTER TTY INTERRUPT
JSR PC,TDONE ;WAIT FOR SLU READY
MOV @#$NULL,@TBUF ;SEND NULL CHARACTER
JSR R5,XPSW ;STORE EXPECTED PSW
.WORD 10
MTPS #0 ;ALLOW INTERRUPTS
BIS #100,@TCR ;ENABLE TTY INTERRUPTS
RESUBN: JSR PC,GENR ;SET UP GENERAL REGISTERS
SCC ;SET UP THE COMPLEMENT OF EXPECTED CC'S
CLN
SUBNPC: SUBN

MFPS CCODES ;STORE RESULTANT PSW
BIT #100,@TCR ;IF INTERRUPTS ARE DISABLED, INSTRUCTION WAS INTERRUPTED
BNE RESUBN ;BR & DO TEST AGAIN, IF INSTRUCTION WAS NOT INTERRUPTED
BIC #177400,CCODES ;CLEAR UNUSED BITS
CMP @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
BEQ 64$ ;BR, IF EQUAL
ERROR 1 ;*****TEST 24 - ERROR 1*****
;PSW ERROR
;EXPECTED PSW IS STORED AT "SAVR6"
;ERRONEOUS SP VALUE IS AT "BADR6"

64$:
TST R0 ;CHECK R0=0
BEQ 65$
ERROR 2 ;*****TEST 24 - ERROR 2*****
;R0 SHOULD BE ZERO
;CHECK R1=0

65$:
TST R1
BEQ 66$
ERROR 3 ;*****TEST 24 - ERROR 3*****
;R1 SHOULD BE ZERO
;CHECK R2=0

66$:
TST R2
BEQ 67$

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2475	007162	104004			ERROR	4		*****TEST 24 - ERROR 4*****
2476								:R2 SHOULD BE ZERO
2477	007164	005703		67\$:	TST	R3		:CHECK R3=0
2478	007166	001401			BEQ	68\$		
2479	007170	104005			ERROR	5		*****TEST 24 - ERROR 5*****
2480								:R3 SHOULD BE ZERO
2481	007172	020467	171456	68\$:	CMP	R4,DSTLN		:CHECK R4= DESTINATION LENGTH
2482	007176	001401			BEQ	69\$		
2483	007200	104006			ERROR	6		*****TEST 24 - ERROR 6*****
2484								:R4 SHOULD STILL BE DESTINATION LENGTH
2485	007202	020567	171450	69\$:	CMP	R5,DSTAD		:CHECK R5 = DESTINATION ADDRESS
2486	007206	001401			BEQ	70\$		
2487	007210	104007			ERROR	7		*****TEST 24 - ERROR 7*****
2488								:R5 SHOULD STILL BE DESTINATION ADDRESS
2489	007212	023706	000702	70\$:	CMP	2#SAVR6,SP		:VERIFY STACK POINTER IS RESTORED
2490	007216	001403			BEQ	71\$:BR IF OK
2491	007220	010637	000704		MOV	SP,2#BADR6		:COPY BAD SP VALUE
2492	007224	104010			ERROR	10		*****TEST 24 - ERROR 10*****
2493								:STACK POINTER NOT RESTORED BY INSTRUCTION
2494								:EXPECTED SP IS STORED AT "SAVR6"
2495								:ERRONEOUS SP VALUE IS AT "BADR6"
2496	007226			71\$:				
2497								:CHECK ANSWER
2498	007226	012700	007266		MOV	#ANS24,R0		:POINT R0 TO EXPECTED ANSWER
2499	007232	016701	171420		MOV	DSTAD,R1		:POINT R1 TO RESULTANT ANSWER
2500	007236	016702	171412		MOV	DSTLN,R2		:STORE ANSWER LENGTH IN R1
2501	007242	122021		72\$:	CMPB	(R0)+,(R1)+		:COMPARE EACH DIGIT
2502	007244	001401			BEQ	73\$:BR IF EQUAL
2503	007246	104011			ERROR	11		*****TEST 24 - ERROR 11*****
2504								:ERRONEOUS ANSWER
2505								:R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
2506								:R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
2507	007250	005302		73\$:	DEC	R2		:DECREMENT ANSWER LENGTH
2508	007252	001373			BNE	72\$:BR IF NOT FINISHED
2509	007254	000407			BR	ENDT24		:BR TO END OF THIS TEST
2510	007256			S1T24:				:SOURCE1 STRING
2511	007256	061			.BYTE	61		:MOST SIGNIFICANT DIGIT
2512	007257	062			.BYTE	62		
2513	007260	063			.BYTE	63		
2514	007261	064			.BYTE	64		
2515	007262			S2T24:				:SOURCE2 STRING
2516	007262	065			.BYTE	65		:MOST SIGNIFICANT DIGIT
2517	007263	066			.BYTE	66		
2518	007264	067			.BYTE	67		
2519	007265	170			.BYTE	170		
2520	007266			ANS24:				:EXPECTED ANSWER
2521	007266	060			.BYTE	60		:MOST SIGNIFICANT DIGIT
2522	007267	066			.BYTE	66		
2523	007270	071			.BYTE	71		
2524	007271	061			.BYTE	61		
2525	007272	162			.BYTE	162		
2526								
2527		007274			.EVEN			
2528	007274	016777	171372	171366	ENDT24: MOV	TPSW,2TVECT		
2529	007302	106427	000200		MTPS	#200		


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2530
2531
2532
2533
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2535 007306 000004
2536 007310 004567 005416
2537 007314 000003
2538 007316 007460
2539 007320 000003
2540 007322 007463
2541 007324 000377
2542 007326 004567 005512
2543 007332 000204
2544 007334 004767 005420
2545 007340 000277
2546 007342 000244
2547
2548 007344 076052
2549
2550 007346 106767 171324
2551 007352 042767 177400 171316
2552 007360 023767 000700 171310
2553 007366 001401
2554 007370 104001
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2558 007372
2559 007372 005700
2560 007374 001401
2561 007376 104002
2562
2563 007400 005701
2564 007402 001401
2565 007404 104003
2566
2567 007406 005702
2568 007410 001401
2569 007412 104004
2570
2571 007414 005703
2572 007416 001401
2573 007420 104005
2574
2575 007422 020467 171226
2576 007426 001401
2577 007430 104006
2578
2579
2580 007432 020567 171220
2581 007436 001401
2582 007440 104007
2583
2584
2585 007442 023706 000702

```

```

*****
*TEST 25 TEST "CMPN" WITH ALL ZEROES IN BOTH SOURCE STRINGS
*****
†ST25: SCOPE
      JSR      R5,NPREP      ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
      3              ;SOURCE1 LENGTH
      S1T25      ;SOURCE1 ADDRESS
      3              ;SOURCE2 LENGTH
      S2T25      ;SOURCE2 ADDRESS
      377          ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
      JSR      R5,XPSW
      .WORD    204
      JSR      PC,GENR      ;SET UP GENERAL REGISTERS
      SCC
      CLZ          ;SET UP THE COMPLEMENT OF EXPECTED CC'S
      CMPN
      MFPS      CCODES      ;STORE RESULTANT PSW
      BIC      #177400,CCODES ;CLEAR UNUSED BITS
      CMP      @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
      BEQ     64$          ;BR, IF EQUAL
      ERROR    1          ;*****TEST 25 - ERROR 1*****
                        ;PSW ERROR
                        ;EXPECTED PSW IS STORED AT "SAVR6"
                        ;ERRONEOUS SP VALUE IS AT "BADR6"
64$:
      TST     R0          ;CHECK R0=0
      BEQ     65$
      ERROR    2          ;*****TEST 25 - ERROR 2*****
                        ;R0 SHOULD BE ZERO
                        ;CHECK R1=0
65$:
      TST     R1
      BEQ     66$
      ERROR    3          ;*****TEST 25 - ERROR 3*****
                        ;R1 SHOULD BE ZERO
                        ;CHECK R2=0
66$:
      TST     R2
      BEQ     67$
      ERROR    4          ;*****TEST 25 - ERROR 4*****
                        ;R2 SHOULD BE ZERO
                        ;CHECK R3=0
67$:
      TST     R3
      BEQ     68$
      ERROR    5          ;*****TEST 25 - ERROR 5*****
                        ;R3 SHOULD BE ZERO
                        ;CHECK R4 UNCHANGED
                        ;BR IF OK
68$:
      CMP     R4,DSTLN
      BEQ     69$
      ERROR    6          ;*****TEST 25 - ERROR 6*****
                        ;R4 CHANGED
                        ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
                        ;CHECK R5 UNCHANGED
69$:
      CMP     R5,DSTAD
      BEQ     70$
      ERROR    7          ;*****TEST 25 - ERROR 7*****
                        ;R5 CHANGED
                        ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
                        ;VERIFY STACK POINTER IS RESTORED
70$:
      CMP     @#SAVR6,SP

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TEST "CMPN" WITH ALL ZEROES IN BOTH SOURCE STRINGS

SEQ 0064

2586	007446	001403		BEQ	71\$;BR IF OK
2587	007450	010637	000704	MOV	SP,0#BADR6		;COPY BAD SP VALUE
2588	007454	104010		ERROR	10		;*****TEST 25 - ERROR 10*****
2589							;STACK POINTER NOT RESTORED BY INSTRUCTION
2590							;EXPECTED SP IS STORED AT "SAVR6"
2591							;ERRONEOUS SP VALUE IS AT "BADR6"
2592	007456			71\$:			
2593	007456	000403		BR	TST26		;BR TO NEXT TEST
2594	007460			S1T25:			;SOURCE1 STRING
2595	007460	060		.BYTE	60		;MOST SIGNIFICANT DIGIT
2596	007461	060		.BYTE	60		
2597	007462	060		.BYTE	60		
2598	007463			S2T25:			;SOURCE2 STRING
2599	007463	060		.BYTE	60		;MOST SIGNIFICANT DIGIT
2600	007464	060		.BYTE	60		
2601	007465	060		.BYTE	60		
2602							
2603				.EVEN			

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2604
2605
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2609 007466 000004
2610 007470 004567 005236
2611 007474 000004
2612 007476 007640
2613 007500 000004
2614 007502 007644
2615 007504 000377
2616 007506 004567 005332
2617 007512 000204
2618 007514 004767 005240
2619 007520 000277
2620 007522 000244
2621
2622 007524 076052
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2624 007526 106767 171144
2625 007532 042767 177400 171136
2626 007540 023767 000700 171130
2627 007546 001401
2628 007550 104001
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2632 007552
2633 007552 005700
2634 007554 001401
2635 007556 104002
2636
2637 007560 005701
2638 007562 001401
2639 007564 104003
2640
2641 007566 005702
2642 007570 001401
2643 007572 104004
2644
2645 007574 005703
2646 007576 001401
2647 007600 104005
2648
2649 007602 020467 171046
2650 007606 001401
2651 007610 104006
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2654 007612 020567 171040
2655 007616 001401
2656 007620 104007
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2659 007622 023706 000702

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```

;*****
;*TEST 26 TEST "CMPN" WITH SRC1 = SRC2
;*****
TST26: SCOPE
        JSR      R5,NPREP      ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
        4          ;SOURCE1 LENGTH
        S1T26    ;SOURCE1 ADDRESS
        4          ;SOURCE2 LENGTH
        S2T26    ;SOURCE2 ADDRESS
        377       ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
        JSR      R5,XPSW
        .WORD    204
        JSR      PC,GENR      ;SET UP GENERAL REGISTERS
        SCC
        CLZ          ;SET UP THE COMPLEMENT OF EXPECTED CC'S
        CMPN
        MFPS      CCODES      ;STORE RESULTANT PSW
        BIC      #177400,CCODES ;CLEAR UNUSED BITS
        CMP      @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
        BEQ     64$          ;BR, IF EQUAL
        ERROR    1          ;*****TEST 26 - ERROR 1*****
        PSW ERROR
        EXPECTED PSW IS STORED AT "SAVR6"
        ERRONEOUS SP VALUE IS AT "BADR6"
        64$:
        TST      R0          ;CHECK R0=0
        BEQ     65$
        ERROR    2          ;*****TEST 26 - ERROR 2*****
        ;R0 SHOULD BE ZERO
        ;CHECK R1=0
        65$:
        TST      R1
        BEQ     66$
        ERROR    3          ;*****TEST 26 - ERROR 3*****
        ;R1 SHOULD BE ZERO
        ;CHECK R2=0
        66$:
        TST      R2
        BEQ     67$
        ERROR    4          ;*****TEST 26 - ERROR 4*****
        ;R2 SHOULD BE ZERO
        ;CHECK R3=0
        67$:
        TST      R3
        BEQ     68$
        ERROR    5          ;*****TEST 26 - ERROR 5*****
        ;R3 SHOULD BE ZERO
        ;CHECK R4 UNCHANGED
        ;BR IF OK
        68$:
        CMP      R4,DSTLN
        BEQ     69$
        ERROR    6          ;*****TEST 26 - ERROR 6*****
        ;R4 CHANGED
        ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
        ;CHECK R5 UNCHANGED
        69$:
        CMP      R5,DSTAD
        BEQ     70$
        ERROR    7          ;*****TEST 26 - ERROR 7*****
        ;R5 CHANGED
        ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
        70$:
        CMP      @#SAVR6,SP ;VERIFY STACK POINTER IS RESTORED

```


M05

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TEST "CMPN" WITH SRC1 = SRC2

SEQ 0066

2660	007626	001403		BEG	71\$;BR IF OK
2661	007630	010637	000704	MOV	SP,2#BADR6		;COPY BAD SP VALUE
2662	007634	104010		ERROR	10		;*****TEST 26 - ERROR 10*****
2663							;STACK POINTER NOT RESTORED BY INSTRUCTION
2664							;EXPECTED SP IS STORED AT "SAVR6"
2665							;ERRONEOUS SP VALUE IS AT "BADR6"
2666	007636						
2667	007636	000404		BR	TST27		;BR TO NEXT TEST
2668	007640			S1T26:			;SOURCE1 STRING
2669	007640	071			.BYTE 71		;MOST SIGNIFICANT DIGIT
2670	007641	066			.BYTE 66		
2671	007642	062			.BYTE 62		
2672	007643	063			.BYTE 63		
2673	007644			S2T26:			;SOURCE2 STRING
2674	007644	071			.BYTE 71		;MOST SIGNIFICANT DIGIT
2675	007645	066			.BYTE 66		
2676	007646	062			.BYTE 62		
2677	007647	063			.BYTE 63		
2678							
2679					.EVEN		

N05

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2685 007650 000004
2686 007652 004567 005054
2687 007656 000004
2688 007660 010020
2689 007662 000004
2690 007664 010024
2691 007666 000377
2692 007670 004567 005150
2693 007674 000200
2694 007676 004767 005056
2695 007702 000277
2696
2697 007704 076052
2698
2699 007706 106767 170764
2700 007712 042767 177400 170756
2701 007720 023767 000700 170750
2702 007726 001401
2703 007730 104001
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2708 007732 005700
2709 007734 001401
2710 007736 104002
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2712 007740 005701
2713 007742 001401
2714 007744 104003
2715
2716 007746 005702
2717 007750 001401
2718 007752 104004
2719
2720 007754 005703
2721 007756 001401
2722 007760 104005
2723
2724 007762 020467 170666
2725 007766 001401
2726 007770 104006
2727
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2729 007772 020567 170660
2730 007776 001401
2731 010000 104007
2732
2733
2734 010002 023706 000702
2735 010006 001403

```

```

*****
:TEST 27 TEST "CMPN" WITH IDENTICAL NON-ZERO MAGNITUDES, NEGATIVE SOURCE2, POSITI
*****
TST27: SCOPE
JSR R5,NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
4 ;SOURCE1 LENGTH
S1T27 ;SOURCE1 ADDRESS
4 ;SOURCE2 LENGTH
S2T27 ;SOURCE2 ADDRESS
377 ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
JSR R5,XPSW
.WORD 200
JSR PC,GENR ;SET UP GENERAL REGISTERS
SCC ;SET UP THE COMPLEMENT OF EXPECTED CC'S
CMPN
MFPS CCODES ;STORE RESULTANT PSW
BIC #177400,CCODES ;CLEAR UNUSED BITS
CMP #EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
BEQ 64$ ;BR, IF EQUAL
ERROR 1 ;*****TEST 27 - ERROR 1*****
;PSW ERROR
;EXPECTED PSW IS STORED AT "SAVR6"
;ERRONEOUS SP VALUE IS AT "BADR6"
64$: TST R0 ;CHECK R0=0
BEQ 65$
ERROR 2 ;*****TEST 27 - ERROR 2*****
;R0 SHOULD BE ZERO
;CHECK R1=0
65$: TST R1
BEQ 66$
ERROR 3 ;*****TEST 27 - ERROR 3*****
;R1 SHOULD BE ZERO
;CHECK R2=0
66$: TST R2
BEQ 67$
ERROR 4 ;*****TEST 27 - ERROR 4*****
;R2 SHOULD BE ZERO
;CHECK R3=0
67$: TST R3
BEQ 68$
ERROR 5 ;*****TEST 27 - ERROR 5*****
;R3 SHOULD BE ZERO
;CHECK R4 UNCHANGED
;BR IF OK
68$: CMP R4,DSTLN
BEQ 69$
ERROR 6 ;*****TEST 27 - ERROR 6*****
;R4 CHANGED
;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
;CHECK R5 UNCHANGED
69$: CMP R5,DSTAD
BEQ 70$
ERROR 7 ;*****TEST 27 - ERROR 7*****
;R5 CHANGED
;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
;VERIFY STACK POINTER IS RESTORED
;BR IF OK
70$: CMP #SAVR6,SP
BEQ 71$

```

2736	010010	010637	000704	MOV	SP,3#BADR6	;COPY BAD SP VALUE
2737	010014	104010		ERROR	10	;*****TEST 27 - ERROR 10*****
2738						;STACK POINTER NOT RESTORED BY INSTRUCTION
2739						;EXPECTED SP IS STORED AT "SAVR6"
2740						;ERRONEOUS SP VALUE IS AT "BADR6"
2741	010016			71\$:		
2742	010016	000404		BR	TST30	;BR TO NEXT TEST
2743	010020			S1T27:		;SOURCE1 STRING
2744	010020	071		.BYTE	71	;MOST SIGNIFICANT DIGIT
2745	010021	067		.BYTE	67	
2746	010022	065		.BYTE	65	
2747	010023	063		.BYTE	63	
2748	010024			S2T27:		;SOURCE2 STRING
2749	010024	071		.BYTE	71	;MOST SIGNIFICANT DIGIT
2750	010025	067		.BYTE	67	
2751	010026	065		.BYTE	65	
2752	010027	163		.BYTE	163	
2753						
2754				.EVEN		

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010030 000004
010032 004567 004674
010036 000004
010040 010202
010042 000004
010044 010206
010046 000377
010050 004567 004770
010054 000210
010056 004767 004676
010062 000277
010064 000250
010066 076052
010070 106767 170602
010074 042767 177400 170574
010102 023767 000700 170566
010110 001401
010112 104001
010114
010114 005700
010116 001401
010120 104002
010122 005701
010124 001401
010126 104003
010130 005702
010132 001401
010134 104004
010136 005703
010140 001401
010142 104005
010144 020467 170504
010150 001401
010152 104006
010154 020567 170476
010160 001401
010162 104007
010164 023706 000702

```
*****  
:TEST 30 TEST "CMPN" WITH IDENTICAL NON-ZERO MAGNITUDES, POSITIVE SOURCE2, NEGATI  
*****  
↑ST30: SCOPE  
JSR R5,NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST  
4 ;SOURCE1 LENGTH  
S1T30 ;SOURCE1 ADDRESS  
4 ;SOURCE2 LENGTH  
S2T30 ;SOURCE2 ADDRESS  
377 ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN  
JSR R5,XPSW  
.WORD 210  
JSR PC,GENR ;SET UP GENERAL REGISTERS  
SCC ;SET UP THE COMPLEMENT OF EXPECTED CC'S  
CLN  
CMPN  
MFPS CCODES ;STORE RESULTANT PSW  
BIC #177400,CCODES ;CLEAR UNUSED BITS  
CMP @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE  
BEQ 64$ ;BR, IF EQUAL  
ERROR 1 ;*****TEST 30 - ERROR 1*****  
;PSW ERROR  
;EXPECTED PSW IS STORED AT "SAVR6"  
;ERRONEOUS SP VALUE IS AT "BADR6"  
64$: TST R0 ;CHECK R0=0  
BEQ 65$  
ERROR 2 ;*****TEST 30 - ERROR 2*****  
;R0 SHOULD BE ZERO  
;CHECK R1=0  
65$: TST R1  
BEQ 66$  
ERROR 3 ;*****TEST 30 - ERROR 3*****  
;R1 SHOULD BE ZERO  
;CHECK R2=0  
66$: TST R2  
BEQ 67$  
ERROR 4 ;*****TEST 30 - ERROR 4*****  
;R2 SHOULD BE ZERO  
;CHECK R3=0  
67$: TST R3  
BEQ 68$  
ERROR 5 ;*****TEST 30 - ERROR 5*****  
;R3 SHOULD BE ZERO  
;CHECK R4 UNCHANGED  
;BR IF OK  
68$: CMP R4,DSTLN  
BEQ 69$  
ERROR 6 ;*****TEST 30 - ERROR 6*****  
;R4 CHANGED  
;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"  
;CHECK R5 UNCHANGED  
69$: CMP R5,DSTAD  
BEQ 70$  
ERROR 7 ;*****TEST 30 - ERROR 7*****  
;R5 CHANGED  
;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"  
70$: CMP @#SAVR6,SP ;VERIFY STACK POINTER IS RESTORED
```

2811	010170	001403		BEG	71\$;BR IF OK
2812	010172	010637	000704	MOV	SP,#BADR6		;COPY BAD SP VALUE
2813	010176	104010		ERROR	10		;*****TEST 30 - ERROR 10*****
2814							;STACK POINTER NOT RESTORED BY INSTRUCTION
2815							;EXPECTED SP IS STORED AT "SAVR6"
2816							;ERRONEOUS SP VALUE IS AT "BADR6"
2817	010200						
2818	010200	000404		BR	TST31		;BR TO NEXT TEST
2819	010202			S1T30:			;SOURCE1 STRING
2820	010202	070			.BYTE	70	;MOST SIGNIFICANT DIGIT
2821	010203	066			.BYTE	66	
2822	010204	064			.BYTE	64	
2823	010205	162			.BYTE	162	
2824	010206			S2T30:			;SOURCE2 STRING
2825	010206	070			.BYTE	70	;MOST SIGNIFICANT DIGIT
2826	010207	066			.BYTE	66	
2827	010210	064			.BYTE	64	
2828	010211	062			.BYTE	62	
2829							
2830					.EVEN		

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010212 000004
010214 004567 004512
010220 000002
010222 010364
010224 000002
010226 010366
010230 000377
010232 004567 004606
010236 000200
010240 004767 004514
010244 000277
010246 000250
010250 076052
010252 106767 170420
010256 042767 177400 170412
010264 023767 000700 170404
010272 001401
010274 104001
010276
010276 005700
010300 001401
010302 104002
010304 005701
010306 001401
010310 104003
010312 005702
010314 001401
010316 104004
010320 005703
010322 001401
010324 104005
010326 020467 170322
010332 001401
010334 104006
010336 020567 170314
010342 001401
010344 104007

```
*****  
*TEST 31 TEST "CMPN" WITH +SRC1 & -SRC2, S1L = S2L, /S1/ .GT. /S2/  
*****  
TST31: SCOPE  
JSR R5,NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST  
2 ;SOURCE1 LENGTH  
S1T31 ;SOURCE1 ADDRESS  
2 ;SOURCE2 LENGTH  
S2T31 ;SOURCE2 ADDRESS  
377 ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN  
JSR R5,XPSW  
.WORD 200  
JSR PC,GENR ;SET UP GENERAL REGISTERS  
SCC ;SET UP THE COMPLEMENT OF EXPECTED CC'S  
CLN  
CMPN  
MFPS CCODES ;STORE RESULTANT PSW  
BIC #177400,CCODES ;CLEAR UNUSED BITS  
CMP 2#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE  
BEQ 64$ ;BR, IF EQUAL  
ERROR 1 ;*****TEST 31 - ERROR 1*****  
;PSW ERROR  
;EXPECTED PSW IS STORED AT "SAVR6"  
;ERRONEOUS SP VALUE IS AT "BADR6"  
64$: TST R0 ;CHECK R0=0  
BEQ 65$  
ERROR 2 ;*****TEST 31 - ERROR 2*****  
;R0 SHOULD BE ZERO  
;CHECK R1=0  
65$: TST R1  
BEQ 66$  
ERROR 3 ;*****TEST 31 - ERROR 3*****  
;R1 SHOULD BE ZERO  
;CHECK R2=0  
66$: TST R2  
BEQ 67$  
ERROR 4 ;*****TEST 31 - ERROR 4*****  
;R2 SHOULD BE ZERO  
;CHECK R3=0  
67$: TST R3  
BEQ 68$  
ERROR 5 ;*****TEST 31 - ERROR 5*****  
;R3 SHOULD BE ZERO  
;CHECK R4 UNCHANGED  
;BR IF OK  
68$: CMP R4,DSTLN  
BEQ 69$  
ERROR 6 ;*****TEST 31 - ERROR 6*****  
;R4 CHANGED  
;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"  
;CHECK R5 UNCHANGED  
69$: CMP R5,DSTAD  
BEQ 70$  
ERROR 7 ;*****TEST 31 - ERROR 7*****  
;R5 CHANGED  
;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
```


F06

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TEST "CMPN" WITH +SRC1 & -SRC2, S1L = S2L, /S1/ .GT. /S2/

SEQ 0072

2887	010346	023706	000702	70\$:	CMP	3#SAVR6,SP	;VERIFY STACK POINTER IS RESTORED
2888	010352	001403			BEG	71\$;BR IF OK
2889	010354	010637	000704		MOV	SP,3#BADR6	;COPY BAD SP VALUE
2890	010360	104010			ERROR	10	;*****TEST 31 - ERROR 10*****
2891							;STACK POINTER NOT RESTORED BY INSTRUCTION
2892							;EXPECTED SP IS STORED AT "SAVR6"
2893							;ERRONEOUS SP VALUE IS AT "BADR6"
2894	010362			71\$:			
2895	010362	000402			BR	TST32	;BR TO NEXT TEST
2896	010364			S1T31:			;SOURCE1 STRING
2897	010364	071			.BYTE	71	;MOST SIGNIFICANT DIGIT
2898	010365	066			.BYTE	66	
2899	010366			S2T31:			;SOURCE2 STRING
2900	010366	066			.BYTE	66	;MOST SIGNIFICANT DIGIT
2901	010367	171			.BYTE	171	
2902							
2903					.EVEN		

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2909 010370 000004
2910 010372 004567 004334
2911 010376 000003
2912 010400 010542
2913 010402 000003
2914 010404 010545
2915 010406 000377
2916 010410 004567 004430
2917 010414 000210
2918 010416 004767 004336
2919 010422 000267
2920 010424 000250
2921
2922 010426 076052
2923
2924 010430 106767 170242
2925 010434 042767 177400 170234
2926 010442 023767 000700 170226
2927 010450 001401
2928 010452 104001
2929
2930
2931
2932 010454
2933 010454 005700
2934 010456 001401
2935 010460 104002
2936
2937 010462 005701
2938 010464 001401
2939 010466 104003
2940
2941 010470 005702
2942 010472 001401
2943 010474 104004
2944
2945 010476 005703
2946 010500 001401
2947 010502 104005
2948
2949 010504 020467 170144
2950 010510 001401
2951 010512 104006
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2954 010514 020567 170136
2955 010520 001401
2956 010522 104007
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2959 010524 023706 000702

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*****
*TEST 32 TEST "CMPN" WITH -SRC1 & +SRC2, S1L = S2L, /S1/ .GT. /S2/
*****
†ST32: SCOPE
      JSR R5,NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
      3 ;SOURCE1 LENGTH
      S1T32 ;SOURCE1 ADDRESS
      3 ;SOURCE2 LENGTH
      S2T32 ;SOURCE2 ADDRESS
      377 ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
      JSR R5,XPSW
      .WORD 210
      JSR PC,GENR ;SET UP GENERAL REGISTERS
      +SEV!SEZ!SEC ;SET UP THE COMPLEMENT OF EXPECTED CC'S
      CLN
      CMPN
      MFPS CCODES ;STORE RESULTANT PSW
      BIC #177400,CCODES ;CLEAR UNUSED BITS
      CMP #EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
      BEQ 64$ ;BR, IF EQUAL
      ERROR 1 ;*****TEST 32 - ERROR 1*****
      ;PSW ERROR
      ;EXPECTED PSW IS STORED AT "SAVR6"
      ;ERRONEOUS SP VALUE IS AT "BADR6"
64$: TST R0 ;CHECK R0=0
      BEQ 65$
      ERROR 2 ;*****TEST 32 - ERROR 2*****
      ;R0 SHOULD BE ZERO
      ;CHECK R1=0
65$: TST R1
      BEQ 66$
      ERROR 3 ;*****TEST 32 - ERROR 3*****
      ;R1 SHOULD BE ZERO
      ;CHECK R2=0
66$: TST R2
      BEQ 67$
      ERROR 4 ;*****TEST 32 - ERROR 4*****
      ;R2 SHOULD BE ZERO
      ;CHECK R3=0
67$: TST R3
      BEQ 68$
      ERROR 5 ;*****TEST 32 - ERROR 5*****
      ;R3 SHOULD BE ZERO
      ;CHECK R4 UNCHANGED
      ;BR IF OK
68$: CMP R4,DSTLN
      BEQ 69$
      ERROR 6 ;*****TEST 32 - ERROR 6*****
      ;R4 CHANGED
      ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
      ;CHECK R5 UNCHANGED
69$: CMP R5,DSTAD
      BEQ 70$
      ERROR 7 ;*****TEST 32 - ERROR 7*****
      ;R5 CHANGED
      ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
      ;VERIFY STACK POINTER IS RESTORED
70$: CMP #SAVR6,SP

```

H06

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TEST "CMPN" WITH -SRC1 & +SRC2, S1L = S2L, /S1/ .GT. /S2/

SEQ 0074

2960 010530 001403
2961 010532 010637 000704
2962 010536 104010
2963
2964
2965
2966 010540
2967 010540 000403
2968 010542
2969 010542 070
2970 010543 063
2971 010544 161
2972 010545
2973 010545 061
2974 010546 063
2975 010547 070
2976
2977

BEQ 71\$
MOV SP,2#BADR6
ERROR 10

;BR IF OK
;COPY BAD SP VALUE
;*****TEST 32 - ERROR 10*****
;STACK POINTER NOT RESTORED BY INSTRUCTION
;EXPECTED SP IS STORED AT "SAVR6"
;ERRONEOUS SP VALUE IS AT "BADR6"

71\$: BR TST33

;BR TO NEXT TEST
;SOURCE1 STRING
;MOST SIGNIFICANT DIGIT

S1T32: .BYTE 70
.BYTE 63
.BYTE 161

S2T22: .BYTE 61
.BYTE 63
.BYTE 70

;SOURCE2 STRING
;MOST SIGNIFICANT DIGIT

.EVEN


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2978
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2983 010550 000304
2984 010552 004567 004154
2985 010556 000004
2986 010560 010722
2987 010562 000004
2988 010564 010726
2989 010566 000377
2990 010570 004567 004250
2991 010574 000210
2992 010576 004767 004156
2993 010602 000277
2994 010604 000250
2995
2996 010606 076052
2997
2998 010610 106767 170062
2999 010614 042767 177400 170054
3000 010622 023767 000700 170046
3001 010630 001401
3002 010632 104001
3003
3004
3005
3006 010634
3007 010634 005700 64$:
3008 010636 001401
3009 010640 104002
3010
3011 010642 005701 65$:
3012 010644 001401
3013 010646 104003
3014
3015 010650 005702 66$:
3016 010652 001401
3017 010654 104004
3018
3019 010656 005703 67$:
3020 010660 001401
3021 010662 104005
3022
3023 010664 020467 167764 68$:
3024 010670 001401
3025 010672 104006
3026
3027
3028 010674 020567 167756 69$:
3029 010700 001401
3030 010702 104007
3031
3032
3033 010704 023706 000702 70$:

```

```

*****
*TEST 33 TEST "CMPN" WITH S1L = S2L, POSITIVE SOURCE2, SOURCE2 MAGNITUDE IS GREAT
*****
TST33: SCOPE
JSR R5,NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
4 ;SOURCE1 LENGTH
S1T33 ;SOURCE1 ADDRESS
4 ;SOURCE2 LENGTH
S2T33 ;SOURCE2 ADDRESS
377 ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
JSR R5,XPSW
.WORD 210
JSR PC,GENR ;SET UP GENERAL REGISTERS
SCC ;SET UP THE COMPLEMENT OF EXPECTED CC'S
CLN
CMPN
MFPS CCODES ;STORE RESULTANT PSW
BIC #177400,CCODES ;CLEAR UNUSED BITS
CMP #EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
BEQ 64$ ;BR, IF EQUAL
ERROR 1 ;*****TEST 33 - ERROR 1*****
;PSW ERROR
;EXPECTED PSW IS STORED AT "SAVR6"
;ERRONEOUS SP VALUE IS AT "BADR6"
;CHECK R0=0
;*****TEST 33 - ERROR 2*****
;R0 SHOULD BE ZERO
;CHECK R1=0
;*****TEST 33 - ERROR 3*****
;R1 SHOULD BE ZERO
;CHECK R2=0
;*****TEST 33 - ERROR 4*****
;R2 SHOULD BE ZERO
;CHECK R3=0
;*****TEST 33 - ERROR 5*****
;R3 SHOULD BE ZERO
;CHECK R4 UNCHANGED
;BR IF OK
;*****TEST 33 - ERROR 6*****
;R4 CHANGED
;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
;CHECK R5 UNCHANGED
;*****TEST 33 - ERROR 7*****
;R5 CHANGED
;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
;VERIFY STACK POINTER IS RESTORED

```

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DVKAJA.P11 20-DEC-76 15:02 T33 TEST "CMPN" WITH S1L = S2L, POSITIVE SOURCE2, SOURCE2 MAGNITUDE IS GREATER SEQ 0076

3034	010710	001403		BEQ	71\$:BR IF OK
3035	010712	010637	000704	MOV	SP,3#BADR6		:COPY BAD SP VALUE
3036	010716	104010		ERROR	10		:*****TEST 33 - ERROR 10*****
3037							:STACK POINTER NOT RESTORED BY INSTRUCTION
3038							:EXPECTED SP IS STORED AT "SAVR6"
3039							:ERRONEOUS SP VALUE IS AT "BADR6"
3040	010720						
3041	010720	000404		BR	TST34		:BR TO NEXT TEST
3042	010722			S1T33:			:SOURCE1 STRING
3043	010722	067		.BYTE	67		:MOST SIGNIFICANT DIGIT
3044	010723	066		.BYTE	66		
3045	010724	065		.BYTE	65		
3046	010725	064		.BYTE	64		
3047	010726			S2T33:			:SOURCE2 STRING
3048	010726	067		.BYTE	67		:MOST SIGNIFICANT DIGIT
3049	010727	066		.BYTE	66		
3050	010730	065		.BYTE	65		
3051	010731	065		.BYTE	65		
3052							
3053				.EVEN			

```

3054
3055
3056
3057
3058
3059 010732 000004
3060 010734 004567 003772
3061 010740 000002
3062 010742 011104
3063 010744 000004
3064 010746 011106
3065 010750 000377
3066 010752 004567 004066
3067 010756 000204
3068 010760 004767 003774
3069 010764 000277
3070 010766 000244
3071
3072 010770 076052
3073
3074 010772 106767 167700
3075 010776 042767 177400 167672
3076 011004 023767 000700 167664
3077 011012 001401
3078 011014 104001
3079
3080
3081
3082 011016
3083 011016 005700
3084 011020 001401
3085 011022 104002
3086
3087 011024 005701
3088 011026 001401
3089 011030 104003
3090
3091 011032 005702
3092 011034 001401
3093 011036 104004
3094
3095 011040 005703
3096 011042 001401
3097 011044 104005
3098
3099 011046 020467 167602
3100 011052 001401
3101 011054 104006
3102
3103
3104 011056 020567 167574
3105 011062 001401
3106 011064 104007
3107
3108
3109 011066 023706 000702

```

```

*****
*TEST 34 TEST "CMPN" WITH S2L .GT. S1L, SUCCESSFUL COMPARE
*****
TST34: SCOPE
        JSR      R5,NPREP      ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
        2          ;SOURCE1 LENGTH
        S1T34    ;SOURCE1 ADDRESS
        4          ;SOURCE2 LENGTH
        S2T34    ;SOURCE2 ADDRESS
        377       ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
        JSR      R5,XPSW
        .WORD    204
        JSR      PC,GENR      ;SET UP GENERAL REGISTERS
        SCC
        CLZ          ;SET UP THE COMPLEMENT OF EXPECTED CC'S
        CMPN
        MFPS      CCODES      ;STORE RESULTANT PSW
        BIC      #177400,CCODES ;CLEAR UNUSED BITS
        CMP      @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
        BEQ      64$          ;BR, IF EQUAL
        ERROR    1          ;*****TEST 34 - ERROR 1*****
        PSW ERROR
        EXPECTED PSW IS STORED AT "SAVR6"
        ERRONEOUS SP VALUE IS AT "BADR6"
        64$:
        TST      R0          ;CHECK R0=0
        BEQ      65$
        ERROR    2          ;*****TEST 34 - ERROR 2*****
        R0 SHOULD BE ZERO
        65$:
        TST      R1          ;CHECK R1=0
        BEQ      66$
        ERROR    3          ;*****TEST 34 - ERROR 3*****
        R1 SHOULD BE ZERO
        66$:
        TST      R2          ;CHECK R2=0
        BEQ      67$
        ERROR    4          ;*****TEST 34 - ERROR 4*****
        R2 SHOULD BE ZERO
        67$:
        TST      R3          ;CHECK R3=0
        BEQ      68$
        ERROR    5          ;*****TEST 34 - ERROR 5*****
        R3 SHOULD BE ZERO
        68$:
        CMP      R4,DSTLN    ;CHECK R4 UNCHANGED
        BEQ      69$
        ERROR    6          ;BR IF OK
        ;*****TEST 34 - ERROR 6*****
        R4 CHANGED
        R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
        69$:
        CMP      R5,DSTAD    ;CHECK R5 UNCHANGED
        BEQ      70$
        ERROR    7          ;*****TEST 34 - ERROR 7*****
        R5 CHANGED
        R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
        70$:
        CMP      @#SAVR6,SP ;VERIFY STACK POINTER IS RESTORED

```


3110	011072	001403	
3111	011074	010637	000704
3112	011100	104010	
3113			
3114			
3115			
3116	011102		
3117	011102	000403	
3118	011104		
3119	011104	067	
3120	011105	071	
3121	011106		
3122	011106	060	
3123	011107	060	
3124	011110	067	
3125	011111	071	
3126			
3127			

BEG	71\$
MOV	SP,2#BADR6
ERROR	10
71\$:	
BR	TST35
S1T34:	
.BYTE	67
.BYTE	71
S2T34:	
.BYTE	60
.BYTE	60
.BYTE	67
.BYTE	71
.EVEN	

```

;BR IF OK
;COPY BAD SP VALUE
;*****TEST 34 - ERROR 10*****
;STACK POINTER NOT RESTORED BY INSTRUCTION
;EXPECTED SP IS STORED AT "SAVR6"
;ERRONEOUS SP VALUE IS AT "BADR6"
;BR TO NEXT TEST
;SOURCE1 STRING
;MOST SIGNIFICANT DIGIT
;SOURCE2 STRING
;MOST SIGNIFICANT DIGIT

```

```

3128
3129
3130
3131
3132
3133 011112 000004
3134 011114 004567 003612
3135 011120 000002
3136 011122 011262
3137 011124 000004
3138 011124 011264
3139 011130 000377
3140 011132 004567 003706
3141 011136 000200
3142 011140 004767 003614
3143 011144 000277
3144
3145 011146 076052
3146
3147 011150 106767 167522
3148 011154 042767 177400 167514
3149 011162 023767 000700 167506
3150 011170 001401
3151 011172 104001
3152
3153
3154
3155 011174
3156 011174 005700
3157 011176 001401
3158 011200 104002
3159
3160 011202 005701
3161 011204 001401
3162 011206 104003
3163
3164 011210 005702
3165 011212 001401
3166 011214 104004
3167
3168 011216 005703
3169 011220 001401
3170 011222 104005
3171
3172 011224 020467 167424
3173 011230 001401
3174 011232 104006
3175
3176
3177 011234 020567 167416
3178 011240 001401
3179 011242 104007
3180
3181
3182 011244 023706 000702
3183 011250 001403

```

```

*****
*TEST 35 TEST "CMPN" WITH NEGATIVE OPERANDS & SRC2 LENGTH .GT. SRC1 LENGTH, NON-Z
*****
TST35: SCOPE
JSR R5,NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
2 ;SOURCE1 LENGTH
S1T35 ;SOURCE1 ADDRESS
4 ;SOURCE2 LENGTH
S2T35 ;SOURCE2 ADDRESS
377 ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
JSR R5,XPSW
.WORD 200
JSR PC,GENR ;SET UP GENERAL REGISTERS
SCC ;SET UP THE COMPLEMENT OF EXPECTED CC'S
CMPN
MFPS CCODES ;STORE RESULTANT PSW
BIC #177400,CCODES ;CLEAR UNUSED BITS
CMP #EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
BEQ 64$ ;BR, IF EQUAL
ERROR 1 ;*****TEST 35 - ERROR 1*****
;PSW ERROR
;EXPECTED PSW IS STORED AT "SAVR6"
;ERRONEOUS SP VALUE IS AT "BADR6"
64$: TST R0 ;CHECK R0=0
BEQ 65$
ERROR 2 ;*****TEST 35 - ERROR 2*****
;R0 SHOULD BE ZERO
;CHECK R1=0
65$: TST R1
BEQ 66$
ERROR 3 ;*****TEST 35 - ERROR 3*****
;R1 SHOULD BE ZERO
;CHECK R2=0
66$: TST R2
BEQ 67$
ERROR 4 ;*****TEST 35 - ERROR 4*****
;R2 SHOULD BE ZERO
;CHECK R3=0
67$: TST R3
BEQ 68$
ERROR 5 ;*****TEST 35 - ERROR 5*****
;R3 SHOULD BE ZERO
;CHECK R4 UNCHANGED
;BR IF OK
68$: CMP R4,DSTLN
BEQ 69$
ERROR 6 ;*****TEST 35 - ERROR 6*****
;R4 CHANGED
;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
;CHECK R5 UNCHANGED
69$: CMP R5,DSTAD
BEQ 70$
ERROR 7 ;*****TEST 35 - ERROR 7*****
;R5 CHANGED
;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
;VERIFY STACK POINTER IS RESTORED
;BR IF OK
70$: CMP #SAVR6,SP
BEQ 71$

```

NO6

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3184	011252	010637	000704	MOV	SP, @#BADR6	; COPY BAD SP VALUE
3185	011256	104010		ERROR	10	; *****TEST 35 - ERROR 10*****
3186						; STACK POINTER NOT RESTORED BY INSTRUCTION
3187						; EXPECTED SP IS STORED AT "SAVR6"
3188						; ERRONEOUS SP VALUE IS AT "BADR6"
3189	011260			71\$:		
3190	011260	000403		BR	TST36	; BR TO NEXT TEST
3191	011262			S1T35:		; SOURCE1 STRING
3192	011262	070		.BYTE	70	; MOST SIGNIFICANT DIGIT
3193	011263	161		.BYTE	161	
3194	011264			S2T35:		; SOURCE2 STRING
3195	011264	061		.BYTE	61	; MOST SIGNIFICANT DIGIT
3196	011265	060		.BYTE	60	
3197	011266	070		.BYTE	70	
3198	011267	161		.BYTE	161	
3199						
3200				.EVEN		


```

3201
3202
3203
3204
3205
3206 011270 000004
3207 011272 004567 003434
3208 011276 000002
3209 011300 011442
3210 011302 000004
3211 011304 011445
3212 011306 000377
3213 011310 004567 003530
3214 011314 000210
3215 011316 004767 003436
3216 011322 000277
3217 011324 000250
3218
3219 011326 076052
3220
3221 011330 106767 167342
3222 011334 042767 177400 167334
3223 011342 023767 000700 167326
3224 011350 001401
3225 011352 104001
3226
3227
3228
3229 011354
3230 011354 005700
3231 011356 001401
3232 011360 104002
3233
3234 011362 005701
3235 011364 001401
3236 011366 104003
3237
3238 011370 005702
3239 011372 001401
3240 011374 104004
3241
3242 011376 005703
3243 011400 001401
3244 011402 104005
3245
3246 011404 020467 167244
3247 011410 001401
3248 011412 104006
3249
3250
3251 011414 020567 167236
3252 011420 001401
3253 011422 104007
3254
3255
3256 011424 023706 000702

```

```

*****
*TEST 36 TEST "CMPN" WITH POSITIVE OPERANDS & SRC2 LENGTH .GT. SRC1 LENGTH, NON-Z
*****
TST36: SCOPE
        JSR      R5,NPREP      ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
        2          ;SOURCE1 LENGTH
        S1T36    ;SOURCE1 ADDRESS
        4          ;SOURCE2 LENGTH
        S2T36    ;SOURCE2 ADDRESS
        377       ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
        JSR      R5,XPSW
        .WORD    210
        JSR      PC,GENR      ;SET UP GENERAL REGISTERS
        SCC
        CLN      ;SET UP THE COMPLEMENT OF EXPECTED CC'S
        CMPN
        MFPS     CCODES      ;STORE RESULTANT PSW
        BIC      #177400,CCODES ;CLEAR UNUSED BITS
        CMP      @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
        BEQ     64$          ;BR, IF EQUAL
        ERROR    1          ;*****TEST 36 - ERROR 1*****
        PSW ERROR
        EXPECTED PSW IS STORED AT "SAVR6"
        ERRONEOUS SP VALUE IS AT "BADR6"
64$:
        TST     R0          ;CHECK R0=0
        BEQ     65$
        ERROR    2          ;*****TEST 36 - ERROR 2*****
        ;R0 SHOULD BE ZERO
        ;CHECK R1=0
65$:
        TST     R1
        BEQ     66$
        ERROR    3          ;*****TEST 36 - ERROR 3*****
        ;R1 SHOULD BE ZERO
        ;CHECK R2=0
66$:
        TST     R2
        BEQ     67$
        ERROR    4          ;*****TEST 36 - ERROR 4*****
        ;R2 SHOULD BE ZERO
        ;CHECK R3=0
67$:
        TST     R3
        BEQ     68$
        ERROR    5          ;*****TEST 36 - ERROR 5*****
        ;R3 SHOULD BE ZERO
        ;CHECK R4 UNCHANGED
        ;BR IF OK
        ;*****TEST 36 - ERROR 6*****
        ;R4 CHANGED
        ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
        ;CHECK R5 UNCHANGED
68$:
        CMP     R4,DSTLN
        BEQ     69$
        ERROR    6
        ;*****TEST 36 - ERROR 7*****
        ;R5 CHANGED
        ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
        ;VERIFY STACK POINTER IS RESTORED
69$:
        CMP     R5,DSTAD
        BEQ     70$
        ERROR    7
70$:
        CMP     @#SAVR6,SP

```

3257 011430 001403
3258 011432 010637 000704
3259 011436 104010
3260
3261
3262
3263 011440
3264 011440 000403
3265 011442
3266 011442 070
3267 011443 061
3268 011444 061
3269 011445
3270 011445 060
3271 011446 070
3272 011447 061
3273
3274

BEG 71\$
MOV SP, @#BADR6
ERROR 10

71\$:
BR TST37
S1T36:
.BYTE 70
.BYTE 61
.BYTE 61
S2T36:
.BYTE 60
.BYTE 70
.BYTE 61

.EVEN

;BR IF OK
;COPY BAD SP VALUE
;*****TEST 36 - ERROR 10*****
;STACK POINTER NOT RESTORED BY INSTRUCTION
;EXPECTED SP IS STORED AT "SAVR6"
;ERRONEOUS SP VALUE IS AT "BADR6"

;BR TO NEXT TEST
;SOURCE1 STRING
;MOST SIGNIFICANT DIGIT

;SOURCE2 STRING
;MOST SIGNIFICANT DIGIT

```

3275
3276
3277
3278
3279
3280 011450 000004
3281 011452 004567 003254
3282 011456 000004
3283 011460 011622
3284 011462 000002
3285 011464 011626
3286 011466 000377
3287 011470 004567 003350
3288 011474 000204
3289 011476 004767 003256
3290 011502 000277
3291 011504 000244
3292
3293 011506 076052
3294
3295 011510 106767 167162
3296 011514 042767 177400 167154
3297 011522 023767 000700 167146
3298 011530 001401
3299 011532 104001
3300
3301
3302
3303 011534
3304 011534 005700
3305 011536 001401
3306 011540 104002
3307
3308 011542 005701
3309 011544 001401
3310 011546 104003
3311
3312 011550 005702
3313 011552 001401
3314 011554 104004
3315
3316 011556 005703
3317 011560 001401
3318 011562 104005
3319
3320 011564 020467 167064
3321 011570 001401
3322 011572 104006
3323
3324
3325 011574 020567 167056
3326 011600 001401
3327 011602 104007
3328
3329
3330 011604 023706 000702

```

```

*****
*TEST 37 TEST "CMPN" WITH S1L .GT. S2L, SUCCESSFUL COMPARE
*****
TST37: SCOPE
      JSR      R5,NPREP      ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
      4          ;SOURCE1 LENGTH
      S1T37    ;SOURCE1 ADDRESS
      2          ;SOURCE2 LENGTH
      S2T37    ;SOURCE2 ADDRESS
      377      ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
      JSR      R5,XPSW
      .WORD    204
      JSR      PC,GENR      ;SET UP GENERAL REGISTERS
      SCC
      CLZ          ;SET UP THE COMPLEMENT OF EXPECTED CC'S
      CMPN
      MFPS      CCODES      ;STORE RESULTANT PSW
      BIC      #177400,CCODES ;CLEAR UNUSED BITS
      CMP      @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
      BEQ      64$          ;BR, IF EQUAL
      ERROR    1          ;*****TEST 37 - ERROR 1*****
      ;PSW ERROR
      ;EXPECTED PSW IS STORED AT "SAVR6"
      ;ERRONEOUS SP VALUE IS AT "BADR6"
      64$:
      TST      R0          ;CHECK R0=0
      BEQ      65$
      ERROR    2          ;*****TEST 37 - ERROR 2*****
      ;R0 SHOULD BE ZERO
      ;CHECK R1=0
      65$:
      TST      R1
      BEQ      66$
      ERROR    3          ;*****TEST 37 - ERROR 3*****
      ;R1 SHOULD BE ZERO
      ;CHECK R2=0
      66$:
      TST      R2
      BEQ      67$
      ERROR    4          ;*****TEST 37 - ERROR 4*****
      ;R2 SHOULD BE ZERO
      ;CHECK R3=0
      67$:
      TST      R3
      BEQ      68$
      ERROR    5          ;*****TEST 37 - ERROR 5*****
      ;R3 SHOULD BE ZERO
      ;CHECK R4 UNCHANGED
      ;BR IF OK
      68$:
      CMP      R4,DSTLN
      BEQ      69$
      ERROR    6          ;*****TEST 37 - ERROR 6*****
      ;R4 CHANGED
      ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
      ;CHECK R5 UNCHANGED
      69$:
      CMP      R5,DSTAD
      BEQ      70$
      ERROR    7          ;*****TEST 37 - ERROR 7*****
      ;R5 CHANGED
      ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
      ;VERIFY STACK POINTER IS RESTORED
      70$:
      CMP      @#SAVR6,SP

```


E07

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TEST "CMPN" WITH S1L .GT. S2L, SUCCESSFUL COMPARE

SEQ 0024

3331	011610	001403		BEQ	71\$;BR IF OK
3332	011612	010637	000704	MOV	SP,#BADR6		;COPY BAD SP VALUE
3333	011616	104010		ERROR	10		;*****TEST 37 - ERROR 10*****
3334							;STACK POINTER NOT RESTORED BY INSTRUCTION
3335							;EXPECTED SP IS STORED AT "SAVR6"
3336							;ERRONEOUS SP VALUE IS AT "BADR6"
3337	011620			71\$:			
3338	011620	000403		BR	TST40		;BR TO NEXT TEST
3339	011622			S1T37:			;SOURCE1 STRING
3340	011622	060		.BYTE	60		;MOST SIGNIFICANT DIGIT
3341	011623	060		.BYTE	60		
3342	011624	071		.BYTE	71		
3343	011625	070		.BYTE	70		
3344	011626			S2T37:			;SOURCE2 STRING
3345	011626	071		.BYTE	71		;MOST SIGNIFICANT DIGIT
3346	011627	070		.BYTE	70		
3347							
3348				.EVEN			

```

3349
3350
3351
3352
3353
3354 011630 000004
3355 011632 004567 003074
3356 011636 000004
3357 011640 012002
3358 011642 000002
3359 011644 012006
3360 011646 000377
3361 011650 004567 003170
3362 011654 000210
3363 011656 004767 003076
3364 011662 000277
3365 011664 000250
3366
3367 011666 076052
3368
3369 011670 106767 167002
3370 011674 042767 177400 166774
3371 011702 023767 000700 166766
3372 011710 001401
3373 011712 104001
3374
3375
3376
3377 011714
3378 011714 005700
3379 011716 001401
3380 011720 104002
3381
3382 011722 005701
3383 011724 001401
3384 011726 104003
3385
3386 011730 005702
3387 011732 001401
3388 011734 104004
3389
3390 011736 005703
3391 011740 001401
3392 011742 104005
3393
3394 011744 020467 166704
3395 011750 001401
3396 011752 104006
3397
3398
3399 011754 020567 166676
3400 011760 001401
3401 011762 104007
3402
3403
3404 011764 023706 000702

```

```

*****
*TEST 40 TEST "CMPN" WITH S1L .GT. S2L, NEGATIVE SOURCE1, NON-ZERO IN EXCESS
*****
TST40: SCOPE
        JSR      R5,NPREP      ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
        4          ;SOURCE1 LENGTH
        S1T40    ;SOURCE1 ADDRESS
        2          ;SOURCE2 LENGTH
        S2T40    ;SOURCE2 ADDRESS
        377       ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
        JSR      R5,XPSW
        .WORD    210
        JSR      PC,GENR      ;SET UP GENERAL REGISTERS
        SCC
        CLN      ;SET UP THE COMPLEMENT OF EXPECTED CC'S

        CMPN

        MFPS     CCODES      ;STORE RESULTANT PSW
        BIC      #177400,CCODES ;CLEAR UNUSED BITS
        CMP      2#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
        BEQ     64$          ;BR, IF EQUAL
        ERROR   1          ;*****TEST 40 - ERROR 1*****
                          ;PSW ERROR
                          ;EXPECTED PSW IS STORED AT "SAVR6"
                          ;ERRONEOUS SP VALUE IS AT "BADR6"

64$:    TST      R0          ;CHECK R0=0
        BEQ     65$
        ERROR   2          ;*****TEST 40 - ERROR 2*****
                          ;R0 SHOULD BE ZERO
                          ;CHECK R1=0

65$:    TST      R1
        BEQ     66$
        ERROR   3          ;*****TEST 40 - ERROR 3*****
                          ;R1 SHOULD BE ZERO
                          ;CHECK R2=0

66$:    TST      R2
        BEQ     67$
        ERROR   4          ;*****TEST 40 - ERROR 4*****
                          ;R2 SHOULD BE ZERO
                          ;CHECK R3=0

67$:    TST      R3
        BEQ     68$
        ERROR   5          ;*****TEST 40 - ERROR 5*****
                          ;R3 SHOULD BE ZERO
                          ;CHECK R4 UNCHANGED
                          ;BR IF OK

68$:    CMP      R4,DSTLN
        BEQ     69$
        ERROR   6          ;*****TEST 40 - ERROR 6*****
                          ;R4 CHANGED
                          ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
                          ;CHECK R5 UNCHANGED

69$:    CMP      R5,DSTAD
        BEQ     70$
        ERROR   7          ;*****TEST 40 - ERROR 7*****
                          ;R5 CHANGED
                          ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
                          ;VERIFY STACK POINTER IS RESTORED

70$:    CMP      2#SAVR6,SP

```

3405	011770	001403		BEQ	71\$:BR IF OK
3406	011772	010637	000704	MOV	SP,2#BADR6		:COPY BAD SP VALUE
3407	011776	104010		ERROR	10		:*****TEST 40 - ERROR 10*****
3408							:STACK POINTER NOT RESTORED BY INSTRUCTION
3409							:EXPECTED SP IS STORED AT "SAVR6"
3410							:ERRONEOUS SP VALUE IS AT "BADR6"
3411	012000						
3412	012000	000403		71\$:			
3413	012002			S1T40:	BR	TST41	:BR TO NEXT TEST
3414	012002	061			.BYTE	61	:SOURCE1 STRING
3415	012003	060			.BYTE	60	:MOST SIGNIFICANT DIGIT
3416	012004	063			.BYTE	63	
3417	012005	167			.BYTE	167	
3418	012006			S2T40:			:SOURCE2 STRING
3419	012006	063			.BYTE	63	:MOST SIGNIFICANT DIGIT
3420	012007	167			.BYTE	167	
3421							
3422					.EVEN		


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3423
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3428 012010 000004
3429 012012 004567 002714
3430 012016 000004
3431 012020 012160
3432 012022 000002
3433 012024 012164
3434 012026 000377
3435 012030 004567 003010
3436 012034 000200
3437 012036 004767 002716
3438 012042 000277
3439
3440 012044 076052
3441
3442 012046 106767 166624
3443 012052 042767 177400 166616
3444 012060 023767 000700 166610
3445 012066 001401
3446 012070 104001
3447
3448
3449
3450 012072
3451 012072 005700
3452 012074 001401
3453 012076 104002
3454
3455 012100 005701
3456 012102 001401
3457 012104 104003
3458
3459 012106 005702
3460 012110 001401
3461 012112 104004
3462
3463 012114 005703
3464 012116 001401
3465 012120 104005
3466
3467 012122 020467 166526
3468 012126 001401
3469 012130 104006
3470
3471
3472 012132 020567 166520
3473 012136 001401
3474 012140 104007
3475
3476
3477 012142 023706 000702
3478 012146 001403

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*****
*TEST 41 TEST "CMPN" WITH S1L .GT. S2L, POSITIVE SOURCE1, NON-ZERO IN EXCESS
*****
TST41: SCOPE
JSR R5,NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
4 ;SOURCE1 LENGTH
S1T41 ;SOURCE1 ADDRESS
2 ;SOURCE2 LENGTH
S2T41 ;SOURCE2 ADDRESS
377 ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
JSR R5,XPSW
.WORD 200
JSR PC,GENR ;SET UP GENERAL REGISTERS
SCC ;SET UP THE COMPLEMENT OF EXPECTED CC'S
CMPN
MFPS CCODES ;STORE RESULTANT PSW
BIC #177400,CCODES ;CLEAR UNUSED BITS
CMP #EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
BEQ 64$ ;BR, IF EQUAL
ERROR 1 ;*****TEST 41 - ERROR 1*****
;PSW ERROR
;EXPECTED PSW IS STORED AT "SAVR6"
;ERRONEOUS SP VALUE IS AT "BADR6"
64$:
TST R0 ;CHECK R0=0
BEQ 65$
ERROR 2 ;*****TEST 41 - ERROR 2*****
;R0 SHOULD BE ZERO
;CHECK R1=0
65$:
TST R1
BEQ 66$
ERROR 3 ;*****TEST 41 - ERROR 3*****
;R1 SHOULD BE ZERO
;CHECK R2=0
66$:
TST R2
BEQ 67$
ERROR 4 ;*****TEST 41 - ERROR 4*****
;R2 SHOULD BE ZERO
;CHECK R3=0
67$:
TST R3
BEQ 68$
ERROR 5 ;*****TEST 41 - ERROR 5*****
;R3 SHOULD BE ZERO
;CHECK R4 UNCHANGED
;BR IF OK
68$:
CMP R4,DSTLN
BEQ 69$
ERROR 6 ;*****TEST 41 - ERROR 6*****
;R4 CHANGED
;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
;CHECK R5 UNCHANGED
69$:
CMP R5,DSTAD
BEQ 70$
ERROR 7 ;*****TEST 41 - ERROR 7*****
;R5 CHANGED
;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
;VERIFY STACK POINTER IS RESTORED
70$:
CMP #SAVR6,SP
BEQ 71$

```

3479	012150	010637	000704	MOV	SP,3#BADR6	;COPY BAD SP VALUE
3480	012154	104010		ERROR	10	;*****TEST 41 - ERROR 10*****
3481						;STACK POINTER NOT RESTORED BY INSTRUCTION
3482						;EXPECTED SP IS STORED AT "SAVR6"
3483						;ERRONEOUS SP VALUE IS AT "BADR6"
3484	012156			71\$:		
3485	012156	000403		S1T41:	BR TST42	;BR TO NEXT TEST
3486	012160					;SOURCE1 STRING
3487	012160	061			.BYTE 61	;MOST SIGNIFICANT DIGIT
3488	012161	060			.BYTE 60	
3489	012162	063			.BYTE 63	
3490	012163	067			.BYTE 67	
3491	012164			S2T41:		;SOURCE2 STRING
3492	012164	063			.BYTE 63	;MOST SIGNIFICANT DIGIT
3493	012165	067			.BYTE 67	
3494						
3495					.EVEN	

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3502 012166 000004
3503 012170 004567 002536
3504 012174 000003
3505 012176 012336
3506 012200 000003
3507 012202 012341
3508 012204 000377
3509 012206 004567 002632
3510 012212 000200
3511 012214 004767 002540
3512 012220 000277
3513
3514 012222 076052
3515
3516 012224 106767 166446
3517 012230 042767 177400 166440
3518 012236 023767 000700 166432
3519 012244 001401
3520 012246 104001
3521
3522
3523
3524 012250
3525 012250 005700
3526 012252 001401
3527 012254 104002
3528
3529 012256 005701
3530 012260 001401
3531 012262 104003
3532
3533 012264 005702
3534 012266 001401
3535 012270 104004
3536
3537 012272 005703
3538 012274 001401
3539 012276 104005
3540
3541 012300 020467 166350
3542 012304 001401
3543 012306 104006
3544
3545
3546 012310 020567 166342
3547 012314 001401
3548 012316 104007
3549
3550
3551 012320 023706 000702

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*****
*TEST 42 TEST "CMPN" WITH POSITIVE OPERANDS, /S1/ .GT. /S2/
*****
TST42: SCOPE
        JSR      R5,NPREP      ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
        3              ;SOURCE1 LENGTH
        S1T42 ;SOURCE1      ;ADDRESS
        3              ;SOURCE2 LENGTH
        S2T42              ;SOURCE2 ADDRESS
        377             ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
        JSR      R5,XPSW
        .WORD     200
        JSR      PC,GENR      ;SET UP GENERAL REGISTERS
        SCC              ;SET UP THE COMPLEMENT OF EXPECTED CC'S
        CMPN
        MFPS      CCODES      ;STORE RESULTANT PSW
        BIC      #177400,CCODES ;CLEAR UNUSED BITS
        CMP      @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
        BEQ      64$          ;BR, IF EQUAL
        ERROR    1           ;*****TEST 42 - ERROR 1*****
                               ;PSW ERROR
                               ;EXPECTED PSW IS STORED AT "SAVR5"
                               ;ERRONEOUS SP VALUE IS AT "BADR6"
        64$:
        TST      R0              ;CHECK R0=0
        BEQ      65$
        ERROR    2           ;*****TEST 42 - ERROR 2*****
                               ;R0 SHOULD BE ZERO
                               ;CHECK R1=0
        65$:
        TST      R1              ;CHECK R1=0
        BEQ      66$
        ERROR    3           ;*****TEST 42 - ERROR 3*****
                               ;R1 SHOULD BE ZERO
                               ;CHECK R2=0
        66$:
        TST      R2              ;CHECK R2=0
        BEQ      67$
        ERROR    4           ;*****TEST 42 - ERROR 4*****
                               ;R2 SHOULD BE ZERO
                               ;CHECK R3=0
        67$:
        TST      R3              ;CHECK R3=0
        BEQ      68$
        ERROR    5           ;*****TEST 42 - ERROR 5*****
                               ;R3 SHOULD BE ZERO
                               ;CHECK R4 UNCHANGED
                               ;BR IF OK
                               ;*****TEST 42 - ERROR 6*****
        68$:
        CMP      R4,DSTLN      ;R4 CHANGED
        BEQ      69$          ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
        ERROR    6           ;CHECK R5 UNCHANGED
        69$:
        CMP      R5,DSTAD      ;*****TEST 42 - ERROR 7*****
        BEQ      70$          ;R5 CHANGED
        ERROR    7           ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
                               ;VERIFY STACK POINTER IS RESTORED
        70$:
        CMP      @#SAVR6,SP

```


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TEST "CMPN" WITH POSITIVE OPERANDS, /S1/ .GT. /S2/

SEQ 0090

```
3552 012324 001403          BEQ      71$          ;BR IF OK
3553 012326 010637 000704  MOV      SP,#BADR6   ;COPY BAD SP VALUE
3554 012332 104010          ERROR    10          ;*****TEST 42 - ERROR 10*****
3555                                     ;STACK POINTER NOT RESTORED BY INSTRUCTION
3556                                     ;EXPECTED SP IS STORED AT "SAVR6"
3557                                     ;ERRONEOUS SP VALUE IS AT "BADR6"
3558 012334          71$:          BR      TST43        ;BR TO NEXT TEST
3559 012334 000403          S1T42:  .BYTE    67        ;SOURCE1 STRING
3560 012336          .BYTE    65        ;MOST SIGNIFICANT DIGIT
3561 012336          .BYTE    64
3562 012337          .BYTE    67
3563 012340          .BYTE    65
3564 012341          S2T42:  .BYTE    67        ;SOURCE2 STRING
3565 012341          .BYTE    65        ;MOST SIGNIFICANT DIGIT
3566 012342          .BYTE    63
3567 012343          .EVEN
3568
3569
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3571
3572
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3575 012344 000004
3576 012346 004567 002360
3577 012352 000003
3578 012354 012514
3579 012356 000003
3580 012360 012517
3581 012362 000377
3582 012364 004567 002454
3583 012370 000210
3584 012372 004767 002362
3585 012376 000277
3586
3587 012400 076052
3588
3589 012402 106767 166270
3590 012406 042767 177400 166262
3591 012414 023767 000700 166254
3592 012422 001401
3593 012424 104001
3594
3595
3596
3597 012426
3598 012426 005700
3599 012430 001401
3600 012432 104002
3601
3602 012434 005701
3603 012436 001401
3604 012440 104003
3605
3606 012442 005702
3607 012444 001401
3608 012446 104004
3609
3610 012450 005703
3611 012452 001401
3612 012454 104005
3613
3614 012456 020467 166172
3615 012462 001401
3616 012464 104006
3617
3618
3619 012466 020567 166164
3620 012472 001401
3621 012474 104007
3622
3623
3624 012476 023706 000702
3625 012502 001403

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*****
:TEST 43 TEST "CMPN" WITH NEGATIVE OPERANDS, /S1/ .GT. /S2/
*****
TST43: SCOPE
JSR R5,NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
3 ;SOURCE1 LENGTH
S1T43 ;SOURCE1 ADDRESS
3 ;SOURCE2 LENGTH
S2T43 ;SOURCE2 ADDRESS
377 ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
JSR R5,XPSW
.WORD 210
JSR PC,GENR ;SET UP GENERAL REGISTERS
SCC ;SET UP THE COMPLEMENT OF EXPECTED CC'S
CMPN
MFPS CCODES ;STORE RESULTANT PSW
BIC #177400,CCODES ;CLEAR UNUSED BITS
CMP #EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
BEQ 64$ ;BR, IF EQUAL
ERROR 1 ;*****TEST 43 - ERROR 1*****
;PSW ERROR
;EXPECTED PSW IS STORED AT "SAVR6"
;ERRONEOUS SP VALUE IS AT "BADR6"
64$: TST R0 ;CHECK R0=0
BEQ 65$
ERROR 2 ;*****TEST 43 - ERROR 2*****
;R0 SHOULD BE ZERO
;CHECK R1=0
65$: TST R1
BEQ 66$
ERROR 3 ;*****TEST 43 - ERROR 3*****
;R1 SHOULD BE ZERO
;CHECK R2=0
66$: TST R2
BEQ 67$
ERROR 4 ;*****TEST 43 - ERROR 4*****
;R2 SHOULD BE ZERO
;CHECK R3=0
67$: TST R3
BEQ 68$
ERROR 5 ;*****TEST 43 - ERROR 5*****
;R3 SHOULD BE ZERO
;CHECK R4 UNCHANGED
;BR IF OK
68$: CMP R4,DSTLN
BEQ 69$
ERROR 6 ;*****TEST 43 - ERROR 6*****
;R4 CHANGED
;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
;CHECK R5 UNCHANGED
69$: CMP R5,DSTAD
BEQ 70$
ERROR 7 ;*****TEST 43 - ERROR 7*****
;R5 CHANGED
;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
;VERIFY STACK POINTER IS RESTORED
;BR IF OK
70$: CMP #SAVR6,SP
BEQ 71$

```

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TEST "CMPN" WITH NEGATIVE OPERANDS, /S1/ .GT. /S2/

SEQ 0092

3626 012504 010637 000704
3627 012510 104010
3628
3629
3630
3631 012512
3632 012512 000403
3633 012514
3634 012514 067
3635 012515 065
3636 012516 164
3637 012517
3638 012517 067
3639 012520 065
3640 012521 163
3641
3642

MOV SP,3#BADR6
ERROR 10

;COPY BAD SP VALUE
;*****TEST 43 - ERROR 10*****
;STACK POINTER NOT RESTORED BY INSTRUCTION
;EXPECTED SP IS STORED AT "SAVR6"
;ERRONEOUS SP VALUE IS AT "BADR6"

71\$:

BR TST44

;BR TO NEXT TEST
;SOURCE1 STRING
;MOST SIGNIFICANT DIGIT

S1T43:

.BYTE 67
.BYTE 65
.BYTE 164

S2T43:

.BYTE 67
.BYTE 65
.BYTE 163

;SOURCE2 STRING
;MOST SIGNIFICANT DIGIT

.EVEN


```

3643
3644
3645
3646
3647
3648 012522 000004
3649 012524 105777 166010
3650 012530 100535
3651 012532 026767 166012 166124
3652 012540 001007
3653 012542 032767 000001 166036
3654 012550 001403
3655 012552 005767 166016
3656 012556 001122
3657 012560
3658 012560 004567 002146
3659 012564 000004
3660 012566 013002
3661 012570 000004
3662 012572 013006
3663 012574 000377
3664 012576 012767 012656 166070
3665 012604 012777 015114 166056
3666 012612 005077 166054
3667 012616 004767 002246
3668 012622 013777 000554 166036
3669 012630 004567 002210
3670 012634 000000
3671 012636 106427 000000
3672 012642 052777 000100 166014
3673 012650 004767 002104
3674 012654 000277
3675
3676 012656 076052
3677
3678 012660 106767 166012
3679 012664 032777 000100 165772
3680 012672 001366
3681 012674 042767 177400 165774
3682 012702 023767 000700 165766
3683 012710 001401
3684 012712 104001
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3688 012714
3689 012714 005700
3690 012716 001401
3691 012720 104002
3692
3693 012722 005701
3694 012724 001401
3695 012726 104003
3696
3697 012730 005702
3698 012732 001401

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*****
:TEST 44 TEST INTERRUPTABILITY OF "CMPN"
*****
TST44: SCOPE
TSTB @SWR ;TEST BIT 7 OF SWR
BMI TST45 ;SKIP TO NEXT TEST IF SET
CMP $TCS, TCSR ;IS SLU USED FOR INTERRUPTS THE CONSOLE?
BNE T44CONT ;BR, IF NOT & PERFORM INTERRUPTABILITY TEST
BIT #BIT0, $ENV ;IF YES, IS PROGRAM UNDER APT?
BEQ T44CONT ;BR, IF NOT
TST $PASS ;IF YES, CHECK IF NOT ON FIRST PASS
BNE TST45 ;IF NOT, BR & SKIP TEST

T44CONT:
JSR R5, NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
4 ;SOURCE1 LENGTH
S1T44 ;SOURCE1 ADDRESS
4 ;SOURCE2 LENGTH
S2T44 ;SOURCE2 ADDRESS
377 ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
MOV #CMPNPC, PC ;STORE PC OF TEST INSTRUCTION
MOV #INTR, @TVECT ;POINT TTY VECTOR TO INTERRUPT ROUTINE
CLR @TSPW ;ALLOW INTERRUPTS AFTER TTY INTERRUPT
JSR PC, TDONE ;WAIT FOR SLU READY
MOV @#NULL, @TBUF ;SEND NULL CHARACTER
JSR R5, XPSW ;STORE EXPECTED PSW
.WORD 0
MTPS #0 ;ALLOW INTERRUPTS
BIS #100, @TCSR ;ENABLE TTY INTERRUPTS
RECMPN: JSR PC, GENR ;SET UP GENERAL REGISTERS
SCC ;SET UP THE COMPLEMENT OF EXPECTED CC'S

CMPNPC: CMPN
MFPS CCODES ;STORE RESULTANT PSW
BIT #100, @TCSR ;IF INTERRUPTS ARE DISABLED, INSTRUCTION WAS INTERRUPTED
BNE RECMPN ;BR & DO TEST AGAIN, IF INSTRUCTION WAS NOT INTERRUPTED
BIC #177400, CCODES ;CLEAR UNUSED BITS
CMP @#EXPPSW, CCODES ;CHECK PSW AGAINST EXPECTED VALUE
BEQ 64$ ;BR, IF EQUAL
ERROR 1 ;*****TEST 44 - ERROR 1*****
;PSW ERROR
;EXPECTED PSW IS STORED AT "SAVR6"
;ERRONEOUS SP VALUE IS AT "BADR6"

64$: TST R0 ;CHECK R0=0
BEQ 65$
ERROR 2 ;*****TEST 44 - ERROR 2*****
;R0 SHOULD BE ZERO

65$: TST R1 ;CHECK R1=0
BEQ 66$
ERROR 3 ;*****TEST 44 - ERROR 3*****
;R1 SHOULD BE ZERO

66$: TST R2 ;CHECK R2=0
BEQ 67$

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3699 012734 104004          ERROR 4          ;*****TEST 44 - ERROR 4*****
3700                                     ;R2 SHOULD BE ZERO
3701 012736 005703          67$: TST R3          ;CHECK R3=0
3702 012740 001401          BEQ 68$
3703 012742 104005          ERROR 5          ;*****TEST 44 - ERROR 5*****
3704                                     ;R3 SHOULD BE ZERO
3705 012744 020467 165704    68$: CMP R4,DSTLN    ;CHECK R4 UNCHANGED
3706 012750 001401          BEQ 69$          ;BR IF OK
3707 012752 104006          ERROR 6          ;*****TEST 44 - ERROR 6*****
3708                                     ;R4 CHANGED
3709                                     ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
3710 012754 020567 165676    69$: CMP R5,DSTAD    ;CHECK R5 UNCHANGED
3711 012760 001401          BEQ 70$
3712 012762 104007          ERROR 7          ;*****TEST 44 - ERROR 7*****
3713                                     ;R5 CHANGED
3714                                     ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
3715 012764 023706 000702    70$: CMP @SAVR6,SP    ;VERIFY STACK POINTER IS RESTORED
3716 012770 001403          BEQ 71$          ;BR IF OK
3717 012772 010637 000704    MOV SP,@BADR6     ;COPY BAD SP VALUE
3718 012776 104010          ERROR 10         ;*****TEST 44 - ERROR 10*****
3719                                     ;STACK POINTER NOT RESTORED BY INSTRUCTION
3720                                     ;EXPECTED SP IS STORED AT "SAVR6"
3721                                     ;ERRONEOUS SP VALUE IS AT "BADR6"
3722 013000                                     71$:
3723 013000 000404          BR ENDT44          ;BR TO END OF THIS TEST
3724 013002          S1T44: .BYTE 71          ;SOURCE1 STRING
3725 013002 071          .BYTE 70          ;MOST SIGNIFICANT DIGIT
3726 013003 070          .BYTE 67
3727 013004 067          .BYTE 66
3728 013005 066          .BYTE
3729 013006          S2T44: .BYTE 71          ;SOURCE2 STRING
3730 013006 071          .BYTE 70          ;MOST SIGNIFICANT DIGIT
3731 013007 070          .BYTE 67
3732 013010 067          .BYTE 65
3733 013011 065          .BYTE
3734
3735 .EVEN
3736 013012 016777 165654 165650 ENDT44: MOV TPSW,@TVECT
3737 013020 106427 000200          MTPS #200

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3793

013024 000004
013026 004567 001700
013032 000012
013034 013164
013036 177777
013040 177777
013042 000377
013044 004567 001774
013050 000200
013052 004767 001702
013056 000277
013060 076053
013062 106767 165610
013066 042767 177400 165602
013074 023767 000700 165574
013102 001401
013104 104001

013106
013106 005700
013110 001401
013112 104002

013114 005701
013116 001401
013120 104003

013122 020227 077777
013126 001401
013130 104004

013132 020327 177777
013136 001401
013140 104005

013142 020467 165506
013146 001401
013150 104006

013152 020567 165500
013156 001401

*TEST 45 TEST "CVTNL" WITH SRC = +2,147,483,647

TST45: SCOPE
JSR R5,NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
12 ;SOURCE LENGTH
ST45 ;SOURCE ADDRESS
177777 ;STORE ALL ONES TO LOAD INTO R2 & R3 REGISTERS
177777
377 ;STORE A NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CVTZL"
JSR R5,XPSW
.WORD 200
JSR PC,GENR ;SET UP GENERAL REGISTERS
SCC ;SET UP THE COMPLEMENT OF EXPECTED CC'S

CVTNL
MFPS CCODES ;STORE RESULTANT PSW
BIC #177400,CCODES ;CLEAR UNUSED BITS
CMP #EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
BEQ 64\$;BR, IF EQUAL
ERROR 1 ;*****TEST 45 - ERROR 1*****
;PSW ERROR
;EXPECTED PSW IS STORED AT "SAVR6"
;ERRONEOUS SP VALUE IS AT "BADR6"

64\$: TST R0 ;CHECK R0=0
BEQ 65\$
ERROR 2 ;*****TEST 45 - ERROR 2*****
;R0 SHOULD BE ZERO
;CHECK R1=0

65\$: TST R1
BEQ 66\$
ERROR 3 ;*****TEST 45 - ERROR 3*****
;R1 SHOULD BE ZERO
;CHECK UPPER WORD OF ANSWER
;BR IF OK
;*****TEST 45 - ERROR 4*****
;UPPER WORD OF ANSWER IS IN ERROR
;EXPECTED VALUE IS 077777
;ERRONEOUS ANSWER VALUE IS IN R2
;CHECK LOWER WORD OF ANSWER
;BR IF OK
;*****TEST 45 - ERROR 5*****
;LOWER WORD OF ANSWER IS IN ERROR
;EXPECTED VALUE IS 177777
;ERRONEOUS ANSWER IS IN R3
;CHECK R4 UNCHANGED

68\$: CMP R4,DSTLN
BEQ 69\$
ERROR 6 ;*****TEST 45 - ERROR 6*****
;R4 CHANGED
;R4 SHOULD STILL EQUAL TH CONTENTS OF "FILL"
;CHECK R5 UNCHANGED
;BR IF OK

69\$: CMP R5,DSTAD
BEQ 70\$

3794	013160	104007
3795		
3796		
3797	013162	
3798	013162	000405
3799	013164	
3800	013164	062
3801	013165	061
3802	013166	064
3803	013167	067
3804	013170	064
3805	013171	070
3806	013172	063
3807	013173	066
3808	013174	064
3809	013175	067
3810		

70\$:

ST45:

ERROR	7
BR	TST46
.BYTE	62
.BYTE	61
.BYTE	64
.BYTE	67
.BYTE	64
.BYTE	70
.BYTE	63
.BYTE	66
.BYTE	64
.BYTE	67

```

:*****TEST 45 - ERROR 7*****
:RS CHANGED
:RS SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
:BR TO NEXT TEST
:SOURCE STRING
:MOST SIGNIFICANT DIGIT

```

```

3811
3812
3813
3814
3815
3816
3817 013176 000004
3818 013200 004567 001526
3819 013204 000012
3820 013206 013340
3821 013210 177777
3822 013212 177777
3823 013214 000377
3824 013216 004567 001622
3825 013222 000202
3826 013224 004767 001530
3827 013230 000277
3828 013232 000242
3829
3830 013234 076053
3831
3832 013236 106767 165434
3833 013242 042767 177400 165426
3834 013250 023767 000700 165420
3835 013256 001401
3836 013260 104001
3837
3838
3839
3840 013262
3841 013262 005700
3842 013264 001401
3843 013266 104002
3844
3845 013270 005701
3846 013272 001401
3847 013274 104003
3848
3849 013276 020227 014631
3850 013302 001401
3851 013304 104004
3852
3853
3854
3855 013306 020327 031462
3856 013312 001401
3857 013314 104005
3858
3859
3860
3861 013316 020467 165332
3862 013322 001401
3863 013324 104006
3864
3865
3866 013326 020567 165324

```

```

*****
*TEST 46 TEST "CVTNL" WITH SRC= +2,687,483,648, OVERFLOW WITH CORRECT SIGN
*****
†ST46: SCOPE
      JSR      R5,NPREP      ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
      12      ;SOURCE LENGTH
      ST46    ;SOURCE ADDRESS
      177777  ;STORE ALL ONES TO LOAD INTO R2 & R3 REGISTERS
      177777
      377     ;STORE A NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CVTZL"
      JSR      R5,XPSW
      .WORD   202
      JSR      PC,GENR      ;SET UP GENERAL REGISTERS
      SCC
      CLV     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
      CVTNL
      MFPS    CCODES      ;STORE RESULTANT PSW
      BIC     #177400,CCODES ;CLEAR UNUSED BITS
      CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
      BEQ    64$          ;BR, IF EQUAL
      ERROR  1           ;*****TEST 46 - ERROR 1*****
                        ;PSW ERROR
                        ;EXPECTED PSW IS STORED AT "SAVR6"
                        ;ERRONEOUS SP VALUE IS AT "BADR6"
      64$:
      TST     R0          ;CHECK R0=0
      BEQ    65$
      ERROR  2           ;*****TEST 46 - ERROR 2*****
                        ;R0 SHOULD BE ZERO
                        ;CHECK R1=0
      65$:
      TST     R1
      BEQ    66$
      ERROR  3           ;*****TEST 46 - ERROR 3*****
                        ;R1 SHOULD BE ZERO
                        ;CHECK UPPER WORD OF ANSWER
                        ;BR IF OK
      66$:
      CMP     R2,#014631 ;*****TEST 46 - ERROR 4*****
      BEQ    67$
      ERROR  4           ;UPPER WORD OF ANSWER IS IN ERROR
                        ;EXPECTED VALUE IS 014631
                        ;ERRONEOUS ANSWER VALUE IS IN R2
                        ;CHECK LOWER WORD OF ANSWER
                        ;BR IF OK
      67$:
      CMP     R3,#031462 ;*****TEST 46 - ERROR 5*****
      BEQ    68$
      ERROR  5           ;LOWER WORD OF ANSWER IS IN ERROR
                        ;EXPECTED VALUE IS 031462
                        ;ERRONEOUS ANSWER IS IN R3
                        ;CHECK R4 UNCHANGED
      68$:
      CMP     R4,DSTLN
      BEQ    69$
      ERROR  6           ;*****TEST 46 - ERROR 6*****
                        ;R4 CHANGED
                        ;R4 SHOULD STILL EQUAL TH CONTENTS OF "FILL"
                        ;CHECK R5 UNCHANGED
      69$:
      CMP     R5,DSTAD

```

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3867	013332	001401		BEQ	70\$:BR IF OK
3868	013334	104007		ERROR	7	:*****TEST 46 - ERROR 7*****
3869						:R5 CHANGED
3870						:R5 SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
3871	013336		70\$:			
3872	013336	000405		BR	TST47	:BR TO NEXT TEST
3873	013340		ST46:			:SOURCE STRING
3874	013340	064		.BYTE	64	:MOST SIGNIFICANT DIGIT
3875	013341	062		.BYTE	62	
3876	013342	071		.BYTE	71	
3877	013343	064		.BYTE	64	
3878	013344	071		.BYTE	71	
3879	013345	066		.BYTE	66	
3880	013346	067		.BYTE	67	
3881	013347	062		.BYTE	62	
3882	013350	071		.BYTE	71	
3883	013351	066		.BYTE	66	
3884						


```

3885
3886
3887
3888
3889
3890 013352 000004
3891 013354 004567 001352
3892 013360 000012
3893 013362 013514
3894 013364 177777
3895 013366 177777
3896 013370 000377
3897 013372 004567 001446
3898 013376 000212
3899 013400 004767 001354
3900 013404 000277
3901 013406 000242
3902
3903 013410 076053
3904
3905 013412 106767 165260
3906 013416 042767 177400 165252
3907 013424 023767 000700 165244
3908 013432 001401
3909 013434 104001
3910
3911
3912
3913 013436
3914 013436 005700
3915 013440 001401
3916 013442 104002
3917
3918 013444 005701
3919 013446 001401
3920 013450 104003
3921
3922 013452 020227 100000
3923 013456 001401
3924 013460 104004
3925
3926
3927
3928 013462 020327 000000
3929 013466 001401
3930 013470 104005
3931
3932
3933
3934 013472 020467 165156
3935 013476 001401
3936 013500 104006
3937
3938
3939 013502 020567 165150
3940 013506 001401

```

```

*****
*TEST 47 TEST "CVTNL" WITH SRC = +2,147,483,648, OVERFLOW
*****
†ST47: SCOPE
      JSR      R5,NPREP      ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
      12      ;SOURCE LENGTH
      ST47    ;SOURCE ADDRESS
      177777  ;STORE ALL ONES TO LOAD INTO R2 & R3 REGISTERS
      177777
      377     ;STORE A NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CVTZL"
      JSR      R5,XPSW
      .WORD   212
      JSR      PC,GENR      ;SET UP GENERAL REGISTERS
      SCC
      CLV      ;SET UP THE COMPLEMENT OF EXPECTED CC'S
      CVTNL
      MFPS     CCODES      ;STORE RESULTANT PSW
      BIC     #177400,CCODES ;CLEAR UNUSED BITS
      CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
      BEQ     64$          ;BR, IF EQUAL
      ERROR   1           ;*****TEST 47 - ERROR 1*****
                          ;PSW ERROR
                          ;EXPECTED PSW IS STORED AT "SAVR5"
                          ;ERRONEOUS SP VALUE IS AT "BADR6"
      64$:
      TST     R0          ;CHECK R0=0
      BEQ     65$
      ERROR   2           ;*****TEST 47 - ERROR 2*****
                          ;R0 SHOULD BE ZERO
                          ;CHECK R1=0
      65$:
      TST     R1
      BEQ     66$
      ERROR   3           ;*****TEST 47 - ERROR 3*****
                          ;R1 SHOULD BE ZERO
                          ;CHECK UPPER WORD OF ANSWER
                          ;BR IF OK
      66$:
      CMP     R2,#100000  ;CHECK UPPER WORD OF ANSWER
      BEQ     67$
      ERROR   4           ;*****TEST 47 - ERROR 4*****
                          ;UPPER WORD OF ANSWER IS IN ERROR
                          ;EXPECTED VALUE IS 100000
                          ;ERRONEOUS ANSWER VALUE IS IN R2
      67$:
      CMP     R3,#0      ;CHECK LOWER WORD OF ANSWER
      BEQ     68$
      ERROR   5           ;BR IF OK
                          ;*****TEST 47 - ERROR 5*****
                          ;LOWER WORD OF ANSWER IS IN ERROR
                          ;EXPECTED VALUE IS 0
                          ;ERRONEOUS ANSWER IS IN R3
                          ;CHECK R4 UNCHANGED
      68$:
      CMP     R4,DSTLN
      BEQ     69$
      ERROR   6           ;*****TEST 47 - ERROR 6*****
                          ;R4 CHANGED
                          ;R4 SHOULD STILL EQUAL TH CONTENTS OF "FILL"
                          ;CHECK R5 UNCHANGED
      69$:
      CMP     R5,DSTAD
      BEQ     70$
      ;BR IF OK

```

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TEST "CVTNL" WITH SRC = +2,147,483,648, OVERFLOW

SEQ 0100

3941 013510 104007
3942
3943
3944 013512
3945 013512 000405
3946 013514
3947 013514 062
3948 013515 061
3949 013516 064
3950 013517 067
3951 013520 064
3952 013521 070
3953 013522 063
3954 013523 066
3955 013524 064
3956 013525 070
3957

70\$:
ST47:

BR TST50
.BYTE 62
.BYTE 61
.BYTE 64
.BYTE 67
.BYTE 64
.BYTE 70
.BYTE 63
.BYTE 66
.BYTE 64
.BYTE 70

;*****TEST 47 - ERROR 7*****
;R5 CHANGED
;R5 SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
;BR TO NEXT TEST
;SOURCE STRING
;MOST SIGNIFICANT DIGIT

```

3958
3959
3960
3961
3962
3963 013526 000004
3964 013530 004567 001176
3965 013534 000012
3966 013536 013670
3967 013540 177777
3968 013542 177777
3969 013544 000377
3970 013546 004567 001272
3971 013552 000210
3972 013554 004767 001200
3973 013560 000277
3974 013562 000250
3975
3976 013564 076053
3977
3978 013566 106767 165104
3979 013572 042767 177400 165076
3980 013600 023767 000700 165070
3981 013606 001401
3982 013610 104001
3983
3984
3985
3986 013612
3987 013612 005700
3988 013614 001401
3989 013616 104002
3990
3991 013620 005701
3992 013622 001401
3993 013624 104003
3994
3995 013626 020227 100000
3996 013632 001401
3997 013634 104004
3998
3999
4000
4001 013636 020327 000000
4002 013642 001401
4003 013644 104005
4004
4005
4006
4007 013646 020467 165002
4008 013652 001401
4009 013654 104006
4010
4011
4012 013656 020567 164774
4013 013662 001401

```

```

*****
*TEST 50 TEST "CVTNL" WITH SRC = -2,147,483,648
*****
TST50: SCOPE
      JSR      R5,NPREP      ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
      12      ;SOURCE LENGTH
      ST50    ;SOURCE ADDRESS
      177777  ;STORE ALL ONES TO LOAD INTO R2 & R3 REGISTERS
      177777
      377     ;STORE A NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CVTZL"
      JSR      R5,XPSW
      .WORD   210
      JSR      PC,GENR      ;SET UP GENERAL REGISTERS
      SCC     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
      CLN
      CVTNL
      MFPS    CCODES      ;STORE RESULTANT PSW
      BIC     #177400,CCODES ;CLEAR UNUSED BITS
      CMP     #EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
      BEQ     64$         ;BR, IF EQUAL
      ERROR   1          ;*****TEST 50 - ERROR 1*****
                          ;PSW ERROR
                          ;EXPECTED PSW IS STORED AT "SAVR6"
                          ;ERRONEOUS SP VALUE IS AT "BADR6"
      64$: TST      R0      ;CHECK R0=0
      BEQ     65$
      ERROR   2          ;*****TEST 50 - ERROR 2*****
                          ;R0 SHOULD BE ZERO
                          ;CHECK R1=0
      65$: TST      R1
      BEQ     66$
      ERROR   3          ;*****TEST 50 - ERROR 3*****
                          ;R1 SHOULD BE ZERO
                          ;CHECK UPPER WORD OF ANSWER
      66$: CMP     R2,#100000 ;CHECK UPPER WORD OF ANSWER
      BEQ     67$
      ERROR   4          ;*****TEST 50 - ERROR 4*****
                          ;UPPER WORD OF ANSWER IS IN ERROR
                          ;EXPECTED VALUE IS 100000
                          ;ERRONEOUS ANSWER VALUE IS IN R2
      67$: CMP     R3,#0    ;CHECK LOWER WORD OF ANSWER
      BEQ     68$
      ERROR   5          ;*****TEST 50 - ERROR 5*****
                          ;LOWER WORD OF ANSWER IS IN ERROR
                          ;EXPECTED VALUE IS 0
                          ;ERRONEOUS ANSWER IS IN R3
      68$: CMP     R4,DSTLN ;CHECK R4 UNCHANGED
      BEQ     69$
      ERROR   6          ;*****TEST 50 - ERROR 6*****
                          ;R4 CHANGED
                          ;R4 SHOULD STILL EQUAL TH CONTENTS OF "FILL"
      69$: CMP     R5,DSTAD ;CHECK R5 UNCHANGED
      BEQ     70$
      ERROR   7          ;BR IF OK

```


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DVKAJA.P11 20-DEC-76 15:02 TSO TEST "CVTNL" WITH SRC = -2,147,483,648

SEQ 0102

4014	013664	104007	ERROR	7	*****TEST 50 - ERROR 7*****
4015					:R5 CHANGED
4016					:R5 SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
4017	013666		70\$:		
4018	013666	000405	BR	TST51	:BR TO NEXT TEST
4019	013670		ST50:		:SOURCE STRING
4020	013670	062	.BYTE	62	:MOST SIGNIFICANT DIGIT
4021	013671	061	.BYTE	61	
4022	013672	064	.BYTE	64	
4023	013673	067	.BYTE	67	
4024	013674	064	.BYTE	64	
4025	013675	070	.BYTE	70	
4026	013676	063	.BYTE	63	
4027	013677	066	.BYTE	66	
4028	013700	064	.BYTE	64	
4029	013701	170	.BYTE	170	
4030					

```

4031
4032
4033
4034
4035
4036 013702 000004
4037 013704 004567 001022
4038 013710 000012
4039 013712 014044
4040 013714 177777
4041 013716 177777
4042 013720 000377
4043 013722 004567 001116
4044 013726 000202
4045 013730 004767 001024
4046 013734 000265
4047 013736 000252
4048
4049 013740 076053
4050
4051 013742 106767 164730
4052 013746 042767 177400 164722
4053 013754 023767 000700 164714
4054 013762 001401
4055 013764 104001
4056
4057
4058
4059 013766
4060 013766 005700
4061 013770 001401
4062 013772 104002
4063
4064 013774 005701
4065 013776 001401
4066 014000 104003
4067
4068 014002 020227 077777
4069 014006 001401
4070 014010 104004
4071
4072
4073
4074 014012 020327 177777
4075 014016 001401
4076 014020 104005
4077
4078
4079
4080 014022 020467 164626
4081 014026 001401
4082 014030 104006
4083
4084
4085 014032 020567 164620
4086 014036 001401

```

```

*****
*TEST 51 TEST "CVTNL" WITH SRC = -2,147,483,649, OVERFLOW
*****
TST51: SCOPE
JSR R5,NPREP ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
12 ;SOURCE LENGTH
ST51 ;SOURCE ADDRESS
177777 ;STORE ALL ONES TO LOAD INTO R2 & R3 REGISTERS
177777
377 ;STORE A NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CVTZL"
JSR R5,XPSW
WORD 202
JSR PC,GENR ;SET UP GENERAL REGISTERS
+SEZ!SEC ;SET UP THE COMPLEMENT OF EXPECTED CC'S
+CLN!CLV
CVTNL
MFPS CCODES ;STORE RESULTANT PSW
BIC #177400,CCODES ;CLEAR UNUSED BITS
CMP #EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
BEQ 64$ ;BR, IF EQUAL
ERROR 1 ;*****TEST 51 - ERROR 1*****
PSW ERROR
EXPECTED PSW IS STORED AT "SAVR6"
ERRONEOUS SP VALUE IS AT "BADR6"
64$: TST R0 ;CHECK R0=0
BEQ 65$
ERROR 2 ;*****TEST 51 - ERROR 2*****
R0 SHOULD BE ZERO
CHECK R1=0
65$: TST R1
BEQ 66$
ERROR 3 ;*****TEST 51 - ERROR 3*****
R1 SHOULD BE ZERO
CHECK UPPER WORD OF ANSWER
BR IF OK
66$: CMP R2,#077777
BEQ 67$
ERROR 4 ;*****TEST 51 - ERROR 4*****
UPPER WORD OF ANSWER IS IN ERROR
EXPECTED VALUE IS 077777
ERRONEOUS ANSWER VALUE IS IN R2
CHECK LOWER WORD OF ANSWER
BR IF OK
67$: CMP R3,#177777
BEQ 68$
ERROR 5 ;*****TEST 51 - ERROR 5*****
LOWER WORD OF ANSWER IS IN ERROR
EXPECTED VALUE IS 177777
ERRONEOUS ANSWER IS IN R3
CHECK R4 UNCHANGED
68$: CMP R4,DSTLN
BEQ 69$
ERROR 6 ;*****TEST 51 - ERROR 6*****
R4 CHANGED
R4 SHOULD STILL EQUAL TH CONTENTS OF "FILL"
69$: CMP R5,DSTAD
BEQ 70$

```

L08

4087 014040 104007
4088
4089
4090 014042
4091 014042 000405
4092 014044
4093 014044 062
4094 014045 061
4095 014046 064
4096 014047 067
4097 014050 064
4098 014051 070
4099 014052 063
4100 014053 066
4101 014054 064
4102 014055 171
4103

ERROR 7
70\$:
ST51: BR TST52
.BYTE 62
.BYTE 61
.BYTE 64
.BYTE 67
.BYTE 64
.BYTE 70
.BYTE 63
.BYTE 66
.BYTE 64
.BYTE 171

:*****TEST 51 - ERROR 7*****
:R5 CHANGED
:R5 SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
:BR TO NEXT TEST
:SOURCE STRING
:MOST SIGNIFICANT DIGIT

:


```

4104
4105
4106
4107
4108
4109 014056 000004
4110 014060 004567 000646
4111 014064 000002
4112 014066 014220
4113 014070 177777
4114 014072 177777
4115 014074 000377
4116 014076 004567 000742
4117 014102 000204
4118 014104 004767 000650
4119 014110 000277
4120 014112 000244
4121
4122 014114 076053
4123
4124 014116 106767 164554
4125 014122 042767 177400 164546
4126 014130 023767 000700 164540
4127 014136 001401
4128 014140 104001
4129
4130
4131
4132 014142
4133 014142 005700
4134 014144 001401
4135 014146 104002
4136
4137 014150 005701
4138 014152 001401
4139 014154 104003
4140
4141 014156 020227 000000
4142 014162 001401
4143 014164 104004
4144
4145
4146
4147 014166 020327 000000
4148 014172 001401
4149 014174 104005
4150
4151
4152
4153 014176 020467 164452
4154 014202 001401
4155 014204 104006
4156
4157
4158 014206 020567 164444
4159 014212 001401

```

```

;*****
;TEST 52 TEST "CVTNL" WITH SRC LENGTH = 1, SOURCE= 50,60
;*****
†ST52: SCOPE
      JSR      R5,NPREP      ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
      2              ;SOURCE LENGTH
      ST52         ;SOURCE ADDRESS
      177777       ;STORE ALL ONES TO LOAD INTO R2 & R3 REGISTERS
      177777
      377          ;STORE A NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CVTZL"
      JSR      R5,XPSW
      .WORD    204
      JSR      PC,GENR      ;SET UP GENERAL REGISTERS
      SCC
      CLZ          ;SET UP THE COMPLEMENT OF EXPECTED CC'S
      CVTNL
      MFPS       CCODES     ;STORE RESULTANT PSW
      BIC      #177400,CCODES ;CLEAR UNUSED BITS
      CMP      @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
      BEQ     64$         ;BR, IF EQUAL
      ERROR    1          ;*****TEST 52 - ERROR 1*****
                        ;PSW ERROR
                        ;EXPECTED PSW IS STORED AT "SAVR6"
                        ;ERRONEOUS SP VALUE IS AT "BADR6"
64$:  TST      R0          ;CHECK R0=0
      BEQ     65$
      ERROR    2          ;*****TEST 52 - ERROR 2*****
                        ;R0 SHOULD BE ZERO
                        ;CHECK R1=0
65$:  TST      R1
      BEQ     66$
      ERROR    3          ;*****TEST 52 - ERROR 3*****
                        ;R1 SHOULD BE ZERO
                        ;CHECK UPPER WORD OF ANSWER
                        ;BR IF OK
                        ;*****TEST 52 - ERROR 4*****
                        ;UPPER WORD OF ANSWER IS IN ERROR
                        ;EXPECTED VALUE IS 0
                        ;ERRONEOUS ANSWER VALUE IS IN R2
66$:  CMP      R2,#0      ;CHECK UPPER WORD OF ANSWER
      BEQ     67$
      ERROR    4          ;*****TEST 52 - ERROR 4*****
                        ;UPPER WORD OF ANSWER IS IN ERROR
                        ;EXPECTED VALUE IS 0
                        ;ERRONEOUS ANSWER VALUE IS IN R2
67$:  CMP      R3,#0      ;CHECK LOWER WORD OF ANSWER
      BEQ     68$
      ERROR    5          ;*****TEST 52 - ERROR 5*****
                        ;LOWER WORD OF ANSWER IS IN ERROR
                        ;EXPECTED VALUE IS 0
                        ;ERRONEOUS ANSWER IS IN R3
                        ;CHECK R4 UNCHANGED
68$:  CMP      R4,DSTLN
      BEQ     69$
      ERROR    6          ;*****TEST 52 - ERROR 6*****
                        ;R4 CHANGED
                        ;R4 SHOULD STILL EQUAL TH CONTENTS OF "FILL"
                        ;CHECK R5 UNCHANGED
                        ;BR IF OK
69$:  CMP      R5,DSTAD
      BEQ     70$

```

N08

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.MAIN. MACY11 27(1006) 21-DEC-76 11:53 PAGE 104
DVKAJA.P11 20-DEC-76 15:02 T52 TEST "CVTNL" WITH SRC LENGTH = 1, SOURCE= 60,60          SEG 0106

4160 014214 104007          ERROR 7          ;*****TEST 52 - ERROR 7*****
4161                                     ;R5 CHANGED
4162                                     ;R5 SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
4163 014216          70$:          BR          TST53          ;BR TO NEXT TEST
4164 014216 000401          ST52:          .BYTE 60          ;SOURCE STRING
4165 014220          .BYTE 60          ;MOST SIGNIFICANT DIGIT
4166 014220          060
4167 014221          060
4168
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4170
4171
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4173 014222 000004
4174 014224 105777 164310
4175 014230 100532
4176 014232 026767 164312 164424
4177 014240 001007
4178 014242 032767 000001 164336
4179 014250 001403
4180 014252 005767 164316
4181 014256 001117
4182 014260
4183 014260 004567 000446
4184 014264 000012
4185 014266 014472
4186 014270 177777
4187 014272 177777
4188 014274 000377
4189 014276 012767 014356 164370
4190 014304 012777 015114 164356
4191 014312 005077 164354
4192 014316 004767 000546
4193 014322 013777 000554 164336
4194 014330 004567 000510
4195 014334 000000
4196 014336 106427 000000
4197 014342 052777 000100 164314
4198 014350 004767 000404
4199 014354 000277
4200
4201 014356 076053
4202
4203 014360 106767 164312
4204 014364 032777 000100 164272
4205 014372 001366
4206 014374 042767 177400 164274
4207 014402 023767 000700 164266
4208 014410 001401
4209 014412 104001
4210
4211
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4213 014414
4214 014414 005700
4215 014416 001401
4216 014420 104002
4217
4218 014422 005701
4219 014424 001401
4220 014426 104003
4221
4222 014430 020227 052525
4223 014434 001401
4224 014436 104004

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```

*****
;TEST 53 TEST INTERRUPTABILITY OF "CVTNL"
*****
†ST53: SCOPE
      TSTB      @SWR      ;TEST BIT 7 OF SWR
      BMI      $EOP      ;SKIP TO NEXT TEST IF SET
      CMP      $TPS,TCSR ;IS SLU USED FOR INTERRUPTS THE CONSOLE?
      BNE      CVTCONT   ;BR, IF NOT & PERFORM INTERRUPTABILITY TEST
      BIT      #BIT0,$ENV ;IF YES, IS PROGRAM UNDER APT?
      BEQ      CVTCONT   ;BR, IF NOT
      TST      $PASS     ;IF YES,CHECK IF NOT ON FIRST PASS
      BNE      $EOP      ;IF NOT, BR & SKIP TEST

CVTCONT:
      JSR      R5,NPREP  ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
      L       12        ;SOURCE LENGTH
      ST53     ;SOURCE ADDRESS
      L       177777    ;STORE ALL ONES TO LOAD INTO R2 & R3 REGISTERS
      L       177777
      L       377
      MOV      #CVTPC,PC ;STORE A NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CVTZL"
      MOV      #INTR,@TVECT ;STORE PC OF TEST INSTRUCTION
      CLR      @TPSW     ;POINT TTY VECTOR TO INTERRUPT ROUTINE
      JSR      PC,TDONE  ;ALLOW INTERRUPTS AFTER TTY INTERRUPT
      MOV      @#$NULL,@TBUF ;WAIT FOR SLU READY
      JSR      R5,XPSW   ;SEND NULL CHARACTER
      L       0         ;STORE EXPECTED PSW
      MTPS    #0        ;ALLOW INTERRUPTS
      BIS      #100,@TCSR ;ENABLE TTY INTERRUPTS
      JSR      PC,GENR   ;SET UP GENERAL REGISTERS
      SCC
      ;SET UP THE COMPLEMENT OF EXPECTED CC'S

CVTPC: CVTNL

MFPS   CCODES      ;STORE RESULTANT PSW
BIT    #100,@TCSR  ;IF INTERRUPTS ARE DISABLED, INSTRUCTION WAS INTERRUPTED
BNE    RECVTN     ;BR & DO TEST AGAIN, IF INSTRUCTION WAS NOT INTERRUPTED
BIC    #177400,CCODES ;CLEAR UNUSED BITS
CMP    @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
BEQ    64$
ERROR  1
;*****TEST 53 - ERROR 1*****
;PSW ERROR
;EXPECTED PSW IS STORED AT "SAVR6"
;ERRONEOUS SP VALUE IS AT "BADR6"

64$:
TST    R0
BEQ    65$
ERROR  2
;*****TEST 53 - ERROR 2*****
;R0 SHOULD BE ZERO
;CHECK R1=0

65$:
TST    R1
BEQ    66$
ERROR  3
;*****TEST 53 - ERROR 3*****
;R1 SHOULD BE ZERO
;CHECK UPPER WORD OF ANSWER
;BR IF OK

66$:
CMP    R2,#052525
BEQ    67$
ERROR  4
;*****TEST 53 - ERROR 4*****

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4225 ;UPPER WORD OF ANSWER IS IN ERROR
4226 ;EXPECTED VALUE IS 052525
4227 ;ERRONEOUS ANSWER VALUE IS IN R2
4228 014440 020327 125252 67$: CMP R3,#125252 ;CHECK LOWER WORD OF ANSWER
4229 014444 001401 BEQ 68$ ;BR IF OK
4230 014446 104005 ERROR 5 ;*****TEST 53 - ERROR 5*****
4231 ;LOWER WORD OF ANSWER IS IN ERROR
4232 ;EXPECTED VALUE IS 125252
4233 ;ERRONEOUS ANSWER IS IN R3
4234 014450 020467 164200 68$: CMP R4,DSTLN ;CHECK R4 UNCHANGED
4235 014454 001401 BEQ 69$
4236 014456 104006 ERROR 6 ;*****TEST 53 - ERROR 6*****
4237 ;R4 CHANGED
4238 ;R4 SHOULD STILL EQUAL TH CONTENTS OF "FILL"
4239 014460 020567 164172 69$: CMP R5,DSTAD ;CHECK R5 UNCHANGED
4240 014464 001401 BEQ 70$ ;BR IF OK
4241 014466 104007 ERROR 7 ;*****TEST 53 - ERROR 7*****
4242 ;R5 CHANGED
4243 ;R5 SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
4244 014470 70$: BR ENDT53 ;BR TO END OF THIS TEST
4245 014470 000405 ST53: ;SOURCE STRING
4246 014472 ;MOST SIGNIFICANT DIGIT
4247 014472 061 .BYTE 61
4248 014473 064 .BYTE 64
4249 014474 063 .BYTE 63
4250 014475 061 .BYTE 61
4251 014476 066 .BYTE 66
4252 014477 067 .BYTE 67
4253 014500 067 .BYTE 67
4254 014501 066 .BYTE 66
4255 014502 061 .BYTE 61
4256 014503 060 .BYTE 60
4257
4258 014504 016777 164162 164156 ENDT53: MOV TPSW,@TVECT
4259 014512 106427 000200 MTPS #200
4260

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4261
4262
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4264
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4271 014516
4272 014516 000004
4273 014520 005067 163756
4274 014524 005267 164044
4275 014530 042767 100000 164036
4276 014536 005327
4277 014540 000001
4278 014542 003024
4279 014544 012737
4280 014546 000001
4281 014550 014540
4282 014552 104401 014664
4283 014556 013700 000042
4284 014562 001414
4285 014564 005046
4286 014566 012746 014574
4287 014572 000426
4288
4289 014574
4290 014574 013700 000042
4291 014600 001405
4292 014602 000005
4293 014604 004710
4294 014606 000240
4295 014610 000240
4296 014612 000240
4297 014614
4298 014614 104400
4299 014616 042716 000020
4300 014622 032777 010000 163710
4301 014630 001005
4302 014632 005167 000020
4303 014636 100402
4304 014640 052716 000020
4305 014644 012746 014652
4306 014650 000002
4307
4308
4309 014652
4310 014652 000137
4311 014654 001300
4312 014656 000000
4313 014660 377 377 000
4314 014664
4315 014664 005015 047105 020104
4316 014672 040520 051523 020040

.SBTTL END OF PASS ROUTINE
;*****
;*INCREMENT THE PASS NUMBER ($PASS)
;*IF SW12=1 INHIBIT TRACE TRAP
;*IF THERES A MONITOR GO TO IT
;*IF THERE ISN'T JUMP TO BEGIN

$EOP:
SCOPE
CLR $STNM ;;ZERO THE TEST NUMBER
INC $PASS ;;INCREMENT THE PASS NUMBER
BIC #100000,$PASS ;;DON'T ALLOW A NEG. NUMBER
DEC (PC)+ ;;LOOP?
$EOPCT: .WORD 1
BGT $DOAGN ;;YES
MOV (PC)+,2(PC)+ ;;RESTORE COUNTER
$ENDCT: .WORD 1
$EOPCT
TYPE, ENDMMSG ;;TYPE "END PASS"
$GET42: MOV 2#42,RO ;;GET MONITOR ADDRESS
BEQ $DOAGN ;;BRANCH IF NO MONITOR
CLR -(SP) ;;INSURE THE "T" BIT IS CLEAR
MOV #SCLR.T,-(SP) ;;SETUP FOR AN RTI OR RTT
BR $RTRN ;;GO DO AN RTI OR RTT TO LOAD THE PSW
;;WITH A CLEARED "T" BIT

$CLR.T:
MOV 2#42,RO ;;INSURE RO CONTAINS THE MONITORS
BEQ $DOAGN ;;RETURN ADDRESS
RESET ;;CLEAR THE WORLD
$ENDAD: JSR PC,(RO) ;;GO TO MONITOR
NOP ;;SAVE ROOM
NOP ;;FOR
NOP ;;ACT11

$DOAGN:
TRAP ;;PUSH OLD PSW AND PC ON STACK
BIC #20,(SP) ;;CLEAR THE "T" BIT
BIT #BIT12,2SWR ;;RUN WITH TRACE TRAP?
BNE 1$ ;;BR IF NO
COM $TBIT ;;IS IT TIME FOR TRACE TRAP
BMI 1$ ;;BR IF NO
BIS #20,(SP) ;;SET TRACE TRAP
1$: MOV #SLOOP,-(SP) ;;JUMP TO START OF TEST
$RTRN: RTI ;;RETURN--THIS IS CHANGED TO
;;AN "RTT" IF "RTT" IS A LEGAL
;;INSTRUCTION

$LOOP:
JMP 2(PC)+ ;;RETURN
$RTNAD: .WORD BEGIN
$TBIT: .WORD 0 ;; "T" BIT STATE INDICATOR
$ENULL: .BYTE -1,-1,0 ;;NULL CHARACTER STRING
.ENDMSG: .ASCIZ <15><12>/END PASS /

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E09

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DVKAJA.P11 20-DEC-76 15:02 END OF PASS ROUTINE

SEQ 0110

4317 014700 000
4318 014702
4319

.EVEN


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4320
4321
4322      ;ROUTINE TO REPORT UNEXPECTED TRAPS TO LOCATION 0
4323 014702 011637 000706  †ZERO: MOV      (SP),@#OLDPC      ;GET PC+2 WHERE UNEXPECTED TRAP OCCURRED
4324 014706 104200          ERROR 200      ;*****ERROR 200*****
4325          ;UNEXPECTED TRAP TO LOCATION 0
4326          ;"OLDPC" CONTAINS THE PC+2 OF THE TRAP OCCURRENCE
4327 014710 000000          HALT          ;PROGRAM MUST BE RESTARTED AT THIS POINT
4328
4329
4330      ;ROUTINE TO REPORT UNEXPECTED TRAPS TO LOCATION 4
4331 014712 011637 000706  †IMTRP: MOV      (SP),@#OLDPC      ;GET PC+2 WHERE UNEXPECTED TIMEOUT TRAP OCCURRED
4332 014716 104204          ERROR 204      ;*****ERROR 204*****
4333          ;UNEXPECTED TRAP TO LOCATION 4
4334          ;"OLDPC" CONTAINS THE PC+2 OF THE TRAP OCCURRENCE
4335 014720 000000          HALT          ;PROGRAM MUST BE RESTARTED AT THIS POINT
4336
4337
4338      ;ROUTINE TO REPORT UNEXPECTED TRAPS TO LOCATION 10
4339 014722 011637 000706  †ILLTRP: MOV      (SP),@#OLDPC      ;GET PC+2 WHERE UNEXPECTED ILLEGAL INSTRUCTION TRAP OCCU
4340 014726 104210          ERROR 210      ;*****ERROR 210*****
4341          ;UNEXPECTED TRAP TO LOCATION 10
4342          ;"OLDPC" CONTAINS THE PC+2 OF THE TRAP OCCURRENCE
4343 014730 000000          HALT          ;PROGRAM MUST BE RESTARTED AT THIS POINT
4344
4345
4346
4347
4348      ;SUBROUTINE TO SET OPERAND VALUES
4349
4350 014732 012567 163706  NPREP: MOV      (R5)+,S1LN      ;STORE INSTRUCTION TEST ARGUMENTS
4351 014736 012567 163704          MOV      (R5)+,S1ADR
4352 014742 012567 163702          MOV      (R5)+,S2LN
4353 014746 012567 163700          MOV      (R5)+,S2ADR
4354 014752 012567 163676          MOV      (R5)+,DSTLN
4355 014756 000205          RTS      R5
4356
4357
4358      ;SUBROUTINE TO SET UP GENERAL REGISTERS
4359
4360 014760 016700 163660  GENR: MOV      S1LN,R0      ;TRANSFER INSTRUCTION TEST ARGUMENTS TO
4361 014764 016701 163656          MOV      S1ADR,R1      ; THE GENERAL REGISTERS
4362 014770 016702 163654          MOV      S2LN,R2
4363 014774 016703 163652          MOV      S2ADR,R3
4364 015000 016704 163650          MOV      DSTLN,R4
4365 015004 016705 163646          MOV      DSTAD,R5
4366 015010 010637 000702          MOV      SP,@#SAVRE      ;COPY STACK POINTER BEFORE INSTRUCTION EXECUTION
4367 015014 062737 000002 000702  ADD      #2,@#SAVRE      ;ADJUST SAVED SP BECAUSE OF JSR TO THIS ROUTINE
4368 015022 000207          RTS      PC
4369

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4370
4371
4372 ;SUBROUTINE TO CLEAR BUFFER AREA
4373 015024 012700 017000 CLBUF: MOV #BUF,RO ;POINT RO TO BUFFER AREA
4374 015030 012701 000020 MOV #20,R1 ;STORE BUFFER LENGTH IN R1
4375 015034 005020 1$: CLR (RO)+ ;CLEAR BUFFER
4376 015036 005301 DEC R1 ;DECREMENT BUFFER LENGTH
4377 015040 001375 BNE 1$ ;BR IF NOT FINISHED
4378 015042 000207 RTS PC ;RETURN
4379
4380 ;SUBROUTINE TO RECORD EXPECTED PSW
4381 015044 012537 000700 XPSW: MOV (R5)+,Q#EXPPSW ;STORE EXPECTED PSW VALUE IN "EXPPSW"
4382 015050 106700 MFPS RO ;GET PRESENT PSW
4383 015052 032700 000020 BIT #TBIT,RO ;IS T-BIT SET?
4384 015056 001403 BEQ 1$ ;BR IF NOT
4385 015060 052737 000020 000700 BIS #TBIT,Q#EXPPSW ;OTHERWISE SET T-BIT IN EXPECTED PSW VALUE
4386 015066 000205 1$: RTS R5 ;RETURN
4387
4388
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4390
4391 ;SUBROUTINE TO TEST FOR TRANSMIT DONE FLAG
4392 015070 005077 163614 TDONE: CLR QTEMP ;CLEAR TIMER
4393 015074 105777 163564 1$: TSTB QTCR ;IS SLU READY?
4394 015100 100404 BMI RETN ;BR IF READY
4395 015102 005277 163602 INC QTEMP ;OTHERWISE INCREMENT TIMER
4396 015106 001372 BNE 1$ ;BR IF NOT TIMED OUT
4397 015110 104300 ERROR 300 ;*****ERROR 300*****
4398 ;NEVER GOT TRANSMIT DONE FLAG
4399 015112 000207 RETN: RTS PC ;RETURN
4400
4401
4402 ;SUBROUTINE TO HANDLE TTY INTERRUPTS IN INSTRUCTION
4403 ;INTERRUPTABILITY TESTS
4404
4405 015114 INTR:
4406 015114 021667 163554 CMP (SP),PCI ;WAS PC AT INSTRUCTION UNDER TEST?
4407 015120 001003 BNE SEND ;BR, IF NO
4408 015122 032704 177400 CKR4: BIT #177400,R4 ;IF YES, CHECK UPPER BYTE OF R4
4409 015126 001004 BNE CLRINT ;IF ZERO, INSTRUCTION WAS NOT INTERRUPTED-TRY AGAIN
4410 015130 013777 000554 163530 SEND: MOV Q#SNULL,Q#TBUF ;SEND ANOTHER CHARACTER
4411 015136 000002 RTI ;RETURN
4412 015140 042777 000100 163516 CLRINT: BIC #100,QTCR ;IF NON-ZERO, CLEAR INTERRUPT ENABLE
4413 015146 000002 RTI ;CONTINUE INSTRUCTION
4414

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.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
*SW09=1 LOOP ON ERROR
*SW08=1 LOOP ON TEST IN SWR<5:0>
*CALL
* SCOPE ;:SCOPE=IOT

```
015150 $SCOPE:
015150 032777 040000 163362 1$: BIT #BIT14,$SWR ;:LOOP ON PRESENT TEST?
015156 001065 BNE $OVER ;:YES IF SW14=1
:*****START OF CODE FOR THE XOR TESTER*****
015160 000416 $XTSTR: BR 6$ ;:IF RUNNING ON THE "XOR" TESTER CHANGE
;:THIS INSTRUCTION TO A "NOP" (NOP=240)
015162 013746 000004 MOV @#ERRVEC,-(SP) ;:SAVE THE CONTENTS OF THE ERROR VECTOR
015166 012737 015206 000004 MOV #5,$@#ERRVEC ;:SET FOR TIMEOUT
015174 005737 177060 TST @#177060 ;:TIME OUT ON XOR?
015200 012637 000004 MOV (SP)+,@#ERRVEC ;:RESTORE THE ERROR VECTOR
015204 000434 BR $SVLAD ;:GO TO THE NEXT TEST
015206 022626 5$: CMP (SP)+,(SP)+ ;:CLEAR THE STACK AFTER A TIME OUT
015210 012637 000004 MOV (SP)+,@#ERRVEC ;:RESTORE THE ERROR VECTOR
015214 000422 BR 7$ ;:LOOP ON THE PRESENT TEST
015216 6$::*****END OF CODE FOR THE XOR TESTER*****
015216 032777 000400 163314 BIT #BIT08,$SWR ;:LOOP ON SPEC. TEST?
015224 001407 BEQ 2$ ;:BR IF NO
015226 017746 163306 MOV @SWR,-(SP) ;:SET DESIRED TEST NUM. FROM SWR
015232 042716 000300 BIC #$$SWRMK,(SP) ;:STRIP AWAY UNDESIRED BITS
015236 122667 163240 CMPB (SP)+,$TSTNM ;:ON THE RIGHT TEST?
015242 001433 BEQ $OVER ;:BR IF YES
015244 105767 163233 2$: TSTB $ERFLG ;:HAS AN ERROR OCCURRED?
015250 001412 BEQ $SVLAD ;:BR IF NO
015252 032777 001000 163260 BIT #BIT09,$SWR ;:LOOP ON ERROR?
015260 001404 BEQ 4$ ;:BR IF NO
015262 016767 163222 163216 7$: MOV $LPERR,$LPADR ;:SET LOOP ADDRESS TO LAST SCOPE
015270 000420 BR $OVER
015272 105067 163205 4$: CLRB $ERFLG ;:ZERO THE ERROR FLAG
015276 105267 163200 $SVLAD: INCB $TSTNM ;:COUNT TEST NUMBERS
015302 116767 163174 163262 MOVB $TSTNM,$TESTN ;:SET TEST NUMBER IN APT MAILBOX
015310 011667 163172 MOV (SP),$LPADR ;:SAVE SCOPE LOOP ADDRESS
015314 011667 163170 MOV (SP),$LPERR ;:SAVE ERROR LOOP ADDRESS
015320 005067 163234 CLR $ESCAPE ;:CLEAR THE ESCAPE FROM ERROR ADDRESS
015324 112767 000001 163163 MOVB #1,$ERMAX ;:ONLY ALLOW ONE(1) ERROR ON NEXT TEST
015332 016777 163144 163202 $OVER: MOV $TSTNM,@DISPLAY ;:DISPLAY TEST NUMBER
015340 016716 163142 MOV $LPADR,(SP) ;:FUDGE RETURN ADDRESS
015344 000002 RTI ;:FIXES PS
```



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4467
4468 .SBTTL POWER DOWN AND UP ROUTINES
4469
4470
4471 *****
4472 015346 012737 015530 000024 $PWRDN: MOV $ILLUP,@#PWRVEC ;;SET FOR FAST UP
4473 015354 012737 000340 000026 MOV #340,@#PWRVEC+2 ;;PRIO:7
4474 015362 010046 MOV RO,-(SP) ;;PUSH RO ON STACK
4475 015364 010146 MOV R1,-(SP) ;;PUSH R1 ON STACK
4476 015366 010246 MOV R2,-(SP) ;;PUSH R2 ON STACK
4477 015370 010346 MOV R3,-(SP) ;;PUSH R3 ON STACK
4478 015372 010446 MOV R4,-(SP) ;;PUSH R4 ON STACK
4479 015374 010546 MOV R5,-(SP) ;;PUSH R5 ON STACK
4480 015376 017746 163136 MOV @SWR,-(SP) ;;PUSH @SWR ON STACK
4481 015402 010667 000126 MOV SP,$SAVR6 ;;SAVE SP
4482 015406 012737 015420 000024 MOV $PWRUP,@#PWRVEC ;;SET UP VECTOR
4483 015414 000000 HALT
4484 015416 000776 BR .-2 ;;HANG UP
4485
4486 *****
4487 POWER UP ROUTINE
4488 015420 012737 015530 000024 $PWRUP: MOV $ILLUP,@#PWRVEC ;;SET FOR FAST DOWN
4489 015426 016706 000102 MOV $SAVR6,SP ;;GET SP
4490 015432 005067 000076 CLR $SAVR6 ;;WAIT LOOP FOR THE TTY
4491 015436 005267 000072 1$: INC $SAVR6 ;;WAIT FOR THE INC
4492 015442 001375 BNE 1$ ;;OF WORD
4493 015444 005067 163032 CLR $STNM
4494 015450 012677 163064 MOV (SP)+,@SWR ;;POP STACK INTO @SWR
4495 015454 012605 MOV (SP)+,R5 ;;POP STACK INTO R5
4496 015456 012604 MOV (SP)+,R4 ;;POP STACK INTO R4
4497 015460 012603 MOV (SP)+,R3 ;;POP STACK INTO R3
4498 015462 012602 MOV (SP)+,R2 ;;POP STACK INTO R2
4499 015464 012601 MOV (SP)+,R1 ;;POP STACK INTO R1
4500 015466 012600 MOV (SP)+,R0 ;;POP STACK INTO R0
4501 015470 012737 015346 000024 MOV $PWRDN,@#PWRVEC ;;SET UP THE POWER DOWN VECTOR
4502 015476 012737 000340 000026 MOV #340,@#PWRVEC+2 ;;PRIO:7
4503 015504 104401 TYPE REPORT THE POWER FAILURE
4504 015506 015536 $PWRMG: .WORD $POWER ;;POWER FAIL MESSAGE POINTER
4505 015510 012716 MOV (PC)+,(SP) ;;RESTART AT $LOOP
4506 015512 014652 $PWRAD: .WORD $LOOP ;;RESTART ADDRESS
4507 015514 042766 000020 000002 BIC #20,2(SP) ;;CLEAR "T" BIT
4508 015522 005067 177130 CLR $TBIT ;;CLEAR THE "T" BIT FLAG
4509 015526 000002 RTI
4510 015530 000000 $ILLUP: HALT ;;THE POWER UP SEQUENCE WAS STARTED
4511 015532 000776 BR .-2 ;;BEFORE THE POWER DOWN WAS COMPLETE
4512 015534 000000 $SAVR6: 0 ;;PUT THE SP HERE
4513 015536 005015 047520 042527 $POWER: .ASCIZ <15><12>"POWER"
4514 015544 000122
4515 .EVEN

```

4516
4517
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.SBTTL ERROR HANDLER ROUTINE

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*****
*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
*AND TYPE OUT THE PC OF THE ERROR INSTRUCTION
*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
*SW15=1      HALT ON ERROR
*SW13=1      INHIBIT ERROR TYPEOUTS
*SW09=1      LOOP ON ERROR
*CALL
*          ERROR  N          ;;ERROR=EMT AND N=ERROR ITEM NUMBER

$ERROR:
7$:      INCB      $ERFLG          ;; SET THE ERROR FLAG
          BEQ      7$              ;; DON'T LET THE FLAG GO TO ZERO
          MOV      $STNM, @DISPLAY ;; DISPLAY TEST NUMBER AND ERROR FLAG
          INC      $ERTTL          ;; INC THE ERROR COUNT
          MOV      (SP), $ERRPC    ;; GET ADDRESS OF ERROR INSTRUCTION
          SUB      #2, $ERRPC
          MOV      @ $ERRPC, $ITEMB ;; STRIP AND SAVE THE ERROR ITEM CODE
          BIT      #BIT13, @SWR    ;; SKIP TYPEOUT IF SET
          BNE      20$            ;; SKIP TYPEOUTS
          TYPE    $CRLF
          MOV      $ERRPC, -(SP)   ;; SAVE $ERRPC FOR TYPEOUT
                                   ;; ERROR ADDRESS
                                   ;; GO TYPE--OCTAL ASCII(ALL DIGITS)
20$:     TPOC
          TYPE    , $CRLF

21$:     CMPB     #APTENV, $ENV    ;; RUNNING IN APT MODE
          BNE      2$              ;; NO, SKIP APT ERROR REPORT
          MOV      $ITEMB, 21$    ;; SET ITEM NUMBER AS ERROR NUMBER
          JSR      PC, $ATY4      ;; REPORT FATAL ERROR TO APT

22$:     .BYTE   0
          .BYTE   0
23$:     BR      22$              ;; APT ERROR LOOP
24$:     TST     @SWR              ;; HALT ON ERROR
          BPL      3$              ;; SKIP IF CONTINUE
          HALT
25$:     BIT     #BIT09, @SWR     ;; LOOP ON ERROR SWITCH SET?
          BEQ     4$              ;; BR IF NO
          MOV     $LPERR, (SP)    ;; FUDGE RETURN FOR LOOPING
          TST     $ESCAPE        ;; CHECK FOR AN ESCAPE ADDRESS
          BEQ     5$              ;; BR IF NONE
          MOV     $ESCAPE, (SP)  ;; FUDGE RETURN ADDRESS FOR ESCAPE

26$:     CMP     #$ENDAD, @#42    ;; ACT-11 AUTO-ACCEPT?
          BNE      6$              ;; BRANCH IF NO
          HALT                    ;; YES

27$:     RTI                      ;; RETURN

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.SBTTL TYPE ROUTINE

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*****
*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
*
$TYPE:  TSTB      $TPFLG      ;; IS THERE A TERMINAL?
        BPL       1$          ;; BR IF YES
        HALT     ;; HALT HERE IF NO TERMINAL
        BR       3$          ;; LEAVE
1$:     MOV      RD, -(SP)     ;; SAVE RD
        MOV      22(SP), RD   ;; GET ADDRESS OF ASCIZ STRING
        CMPB    #APTENV, $ENV ;; RUNNING IN APT MODE
        BNE     62$          ;; NO, GO CHECK FOR APT CONSOLE
        BITB    #APTPOOL, $ENVM ;; SPOOL MESSAGE TO APT
        BEQ     62$          ;; NO, GO CHECK FOR CONSOLE
        MOV     RD, 61$       ;; SETUP MESSAGE ADDRESS FOR APT
        JSR    PC, $ATY3     ;; SPOOL MESSAGE TO APT
        .WORD   0            ;; MESSAGE ADDRESS
61$:    BITB    #APTCSUP, $ENVM ;; APT CONSOLE SUPPRESSED
        BNE     60$          ;; YES, SKIP TYPE OUT
2$:     MOV     (RD)+, -(SP)  ;; PUSH CHARACTER TO BE TYPED ONTO STACK
        BNE     4$          ;; BR IF IT ISN'T THE TERMINATOR
        TST    (SP)+        ;; IF TERMINATOR POP IT OFF THE STACK
60$:    MOV     (SP)+, RD     ;; RESTORE RD
3$:     ADD     #2, (SP)     ;; ADJUST RETURN PC
        RTI                    ;; RETURN
4$:     CMPB    #HT, (SP)    ;; BRANCH IF <HT>
        BEQ     8$          ;; BRANCH IF NOT <CRLF>
        CMPB    #CRLF, (SP)
        BNE     5$          ;; POP <CR><LF> EQUIV
        TST    (SP)+        ;; TYPE A CR AND LF
        TYPE
        $CRLF
        CLRB    $CHARCNT    ;; CLEAR CHARACTER COUNT
        BR     2$          ;; GET NEXT CHARACTER
5$:     JSR    PC, $TYPEC    ;; GO TYPE THIS CHARACTER
6$:     CMPB    $FILLC, (SP)+ ;; IS IT TIME FOR FILLER CHARS.?
        BNE     2$          ;; IF NO GO GET NEXT CHAR.
        MOV     $NULL, -(SP) ;; GET # OF FILLER CHARS. NEEDED
        AND    THE NULL CHAR.
7$:     DECB   1(SP)        ;; DOES A NULL NEED TO BE TYPED?
        BLT    6$          ;; BR IF NO--GO POP THE NULL OFF OF STACK
        JSR    PC, $TYPEC    ;; GO TYPE A NULL
    
```


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SEG 0117

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4624 016114 105367 000072          DECB  $CHARCNT      ;; DO NOT COUNT AS A COUNT
4625 016120 000770          BR      7$          ;; LOOP
4626
4627          :HORIZONTAL TAB PROCESSOR
4628
4629 016122 112716 000040      8$:      MOVB  #' (SP)      ;; REPLACE TAB WITH SPACE
4630 016126 004767 000014      9$:      JSR   PC,$TYPEC      ;; TYPE A SPACE
4631 016132 132767 000007 000052  BITB  #',$CHARCNT      ;; BRANCH IF NOT AT
4632 016140 001372          BNE   9$          ;; TAB STOP
4633 016142 005726          TST   (SP)+        ;; POP SPACE OFF STACK
4634 016144 000724          BR    2$          ;; GET NEXT CHARACTER
4635 016146 105777 162376  $TYPEC: TSTB  @STPS      ;; WAIT UNTIL PRINTER IS READY
4636 016152 100375          BPL  $TYPEC
4637 016154 116677 000002 162370  MOVB  2(SP),@STPB      ;; LOAD CHAR TO BE TYPED INTO DATA REG.
4638 016162 122766 000015 000002  CMPB  #CR,2(SP)      ;; IS CHARACTER A CARRIAGE RETURN?
4639 016170 001003          BNE  1$          ;; BRANCH IF NO
4640 016172 105067 000014          CLRB  $CHARCNT      ;; YES--CLEAR CHARACTER COUNT
4641 016176 000406          BR    $TYPEX      ;; EXIT
4642 016200 122766 000012 000002  1$:   CMPB  #LF,2(SP)      ;; IS CHARACTER A LINE FEED?
4643 016206 001402          BEQ  $TYPEX      ;; BRANCH IF YES
4644 016210 105227          INCB  (PC)+        ;; COUNT THE CHARACTER
4645 016212 000000          $CHARCNT: .WORD 0      ;; CHARACTER COUNT STORAGE
4646 016214 000207          $TYPEX: RTS   PC
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.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
*$TYPOS: MOV      2(SP),-(SP)    ;;PICKUP THE MODE
        MOV      1(SP), $OFILL   ;;LOAD ZERO FILL SWITCH
        MOV      (SP)+, $OMODE+1 ;;NUMBER OF DIGITS TO TYPE
        ADD      #2, (SP)        ;;ADJUST RETURN ADDRESS
        BR       $TYPON
*$TYPOC: MOV      #1, $OFILL    ;;SET THE ZERO FILL SWITCH
        MOV      #6, $OMODE+1   ;;SET FOR SIX(6) DIGITS
*$TYPON: MOV      #5, $OCNT     ;;SET THE ITERATION COUNT
        MOV      R3,-(SP)       ;;SAVE R3
        MOV      R4,-(SP)       ;;SAVE R4
        MOV      R5,-(SP)       ;;SAVE R5
        MOV      $OMODE+1,R4    ;;GET THE NUMBER OF DIGITS TO TYPE
        NEG      R4
        ADD      #6,R4          ;;SUBTRACT IT FOR MAX. ALLOWED
        MOV      R4,$OMODE     ;;SAVE IT FOR USE
        MOV      $OFILL,R4     ;;GET THE ZERO FILL SWITCH
        MOV      12(SP),R5     ;;PICKUP THE INPUT NUMBER
        CLR      R3           ;;CLEAR THE OUTPUT WORD
        ROL      R5           ;;ROTATE MSB INTO "C"
        BR       3$          ;;GO DO MSB
        ROL      R5           ;;FORM THIS DIGIT
        ROL      R5
        ROL      R5
        MOV      R5,R3
        ROL      R3           ;;GET LSB OF THIS DIGIT
        DECB    $OMODE        ;;TYPE THIS DIGIT?
        BPL     7$           ;;BR IF NO
        BIC     #177770,R3   ;;GET RID OF JUNK
        BNE     4$           ;;TEST FOR 0
        TST     R4           ;;SUPPRESS THIS 0?

```

016216 017646 000000
016222 116667 000001 000211
016230 112667 000207
016234 062716 000002
016240 000406
016242 112767 000001 000171
016250 112767 000006 000165
016256 112767 000005 000154
016264 010346
016266 010446
016270 010546
016272 116704 000145
016276 005404
016300 062704 000006
016304 110467 000132
016310 116704 000125
016314 016605 000012
016320 005003
016322 006105
016324 000404
016326 006105
016330 006105
016332 006105
016334 010503
016336 006103
016340 105367 000076
016344 100016
016346 042703 177770
016352 001002
016354 005704

1\$:
2\$:
3\$:

4704	016356	001403			BEQ	5\$:: BR IF YES
4705	016360	005204		4\$:	INC	R4	:: DON'T SUPPRESS ANYMORE 0'S
4706	016362	052703	000060		BIS	#'0,R3	:: MAKE THIS DIGIT ASCII
4707	016366	052703	000040		BIS	#' R3	:: MAKE ASCII IF NOT ALREADY
4709	016372	110367	000040		MOVB	R3,8\$:: SAVE FOR TYPING
4709	016376	104401	016436		TYPE	8\$:: GO TYPE THIS DIGIT
4710	016402	105367	000032		DECB	\$OCNT	:: COUNT BY 1
4711	016406	003347			BGT	2\$:: BR IF MORE TO DO
4712	016410	002402			BLT	6\$:: BR IF DONE
4713	016412	005204			INC	R4	:: INSURE LAST DIGIT ISN'T A BLANK
4714	016414	000744			BR	2\$:: GO DO THE LAST DIGIT
4715	016416	012605		6\$:	MOV	(SP)+,R5	:: RESTORE R5
4716	016420	012604			MOV	(SP)+,R4	:: RESTORE R4
4717	016422	012603			MOV	(SP)+,R3	:: RESTORE R3
4718	016424	016666	000002 000004		MOV	2(SP),4(SP)	:: SET THE STACK FOR RETURNING
4719	016432	012616			MOV	(SP)+,(SP)	
4720	016434	000002			RTI		:: RETURN
4721	016436	000		8\$:	.BYTE	0	:: STORAGE FOR ASCII DIGIT
4722	016437	000			.BYTE	0	:: TERMINATOR FOR TYPE ROUTINE
4723	016440	000		\$OCNT:	.BYTE	0	:: OCTAL DIGIT COUNTER
4724	016441	000		\$OFILL:	.BYTE	0	:: ZERO FILL SWITCH
4725	016442	000000		\$OMODE:	.WORD	0	:: NUMBER OF DIGITS TO TYPE


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4730 016444 112767 000001 000236 $ATY1: MOVB #1,$FFLG ;;TO REPORT FATAL ERROR
4731 016452 112767 000001 000226 $ATY3: MOVB #1,$MFLG ;;TO TYPE A MESSAGE
4732 016460 000403
4733 016462 112767 000001 000220 $ATY4: MOVB #1,$FFLG ;;TO ONLY REPORT FATAL ERROR
4734 016470 $ATYC:
4735 016470 010046 MOV RO,-(SP) ;;PUSH RO ON STACK
4736 016472 010146 MOV R1,-(SP) ;;PUSH R1 ON STACK
4737 016474 105767 000206 TSTB $MFLG ;;SHOULD TYPE A MESSAGE?
4738 016500 001450 BEQ 5$ ;;IF NOT: BR
4739 016502 122767 000001 162076 CMPB #APTENV,$ENV ;;OPERATING UNDER APT?
4740 016510 001031 BNE 3$ ;;IF NOT: BR
4741 016512 132767 000100 162067 BITB #APTPOOL,$ENVM ;;SHOULD SPOOL MESSAGES?
4742 016520 001425 BEQ 3$ ;;IF NOT: BR
4743 016522 017600 000004 MOV #4(SP),RO ;;GET MESSAGE ADDR.
4744 016526 062766 000002 000004 ADD #2,4(SP) ;;BUMP RETURN ADDR.
4745 016534 005767 162026 1$: TST $MSGTYPE ;;SEE IF DONE W/ LAST XMISSION?
4746 016540 001375 BNE 1$ ;;IF NOT: WAIT
4747 016542 010067 162034 MOV RO,$MSGAD ;;PUT ADDR IN MAILBOX
4748 016546 105720 2$: TSTB (RO)+ ;;FIND END OF MESSAGE
4749 016550 001376 BNE 2$
4750 016552 166700 162024 SUB $MSGAD,RO ;;SUB START OF MESSAGE
4751 016556 006200 ASR RO ;;GET MESSAGE LNTH IN WORDS
4752 016560 010067 162020 MOV RO,$MSGLGT ;;PUT LENGTH IN MAILBOX
4753 016564 012767 000004 161774 MOV #4,$MSGTYPE ;;TELL APT TO TAKE MSG.
4754 016572 000413 BR 5$
4755 016574 017667 000004 000016 3$: MOV #4(SP),4$ ;;PUT MSG ADDR IN JSR LINKAGE
4756 016602 062766 000002 000004 ADD #2,4(SP) ;;BUMP RETURN ADDRESS
4757 016610 016746 161162 MOV 177776,-(SP) ;;PUSH 177776 ON STACK
4758 016614 004767 177114 JSR PC,$TYPE ;;CALL TYPE MACRO
4759 016620 000000 4$: .WORD 0
4760 016622 5$:
4761 016622 105767 000062 10$: TSTB $FFLG ;;SHOULD REPORT FATAL ERROR?
4762 016626 001416 BEQ 12$ ;;IF NOT: BR
4763 016630 005767 161752 TST $ENV ;;RUNNING UNDER APT?
4764 016634 001413 BEQ 12$ ;;IF NOT: BR
4765 016636 005767 161724 11$: TST $MSGTYPE ;;FINISHED LAST MESSAGE?
4766 016642 001375 BNE 11$ ;;IF NOT: WAIT
4767 016644 017667 000004 161716 MOV #4(SP),$FATAL ;;GET ERROR #
4768 016652 062766 000002 000004 ADD #2,4(SP) ;;BUMP RETURN ADDR.
4769 016660 005267 161702 INC $MSGTYPE ;;TELL APT TO TAKE ERROR
4770 016664 105067 000020 12$: CLRB $FFLG ;;CLEAR FATAL FLAG
4771 016670 105067 000013 CLRB $LFLG ;;CLEAR LOG FLAG
4772 016674 105067 000006 CLRB $MFLG ;;CLEAR MESSAGE FLAG
4773 016700 012601 MOV (SP)+,R1 ;;POP STACK INTO R1
4774 016702 012600 MOV (SP)+,RO ;;POP STACK INTO RO
4775 016704 000207 RTS PC ;;RETURN
4776 016706 000 $MFLG: .BYTE 0 ;;MESSG. FLAG
4777 016707 000 $LFLG: .BYTE 0 ;;LOG FLAG
4778 016710 000 $FFLG: .BYTE 0 ;;FATAL FLAG
4779 016712 .EVEN
4780 000200 APTSIZE=200
4781 000001 APTENV=001

```

C10

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SEQ 0121

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APTSPool=100
APTCSUP=040

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016712 010046
016714 016600 000002
016720 005740
015722 111000
016724 006300
016726 016000 016746
016732 000200

016734 011646
016736 016666 000004 000002
016744 000002

016746 016734
016750 015734
016752 016242
016754 016216
016756 016256

016760 005015 042115 030455
016766 026461 053104 040513
016774 026512 000101

017000 000020
000001

.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.

```
$TRAP:  MOV    RO, -(SP)          ;; SAVE RO
        MOV    2(SP), RO        ;; GET TRAP ADDRESS
        TST    -(RO)           ;; BACKUP BY 2
        MOVB   (RO), RO        ;; GET RIGHT BYTE OF TRAP
        ASL    RO              ;; POSITION FOR INDEXING
        MOV    $TRPAD(RO), RO  ;; INDEX TO TABLE
        RTS    RO              ;; GO TO ROUTINE
```

;; THIS IS USE TO HANDLE THE "GETPRI" MACRO

```
$TRAP2: MOV    (SP), -(SP)      ;; MOVE THE PC DOWN
        MOV    4(SP), 2(SP)    ;; MOVE THE PSW DOWN
        RTI                    ;; RESTORE THE PSW
```

.SBTTL TRAP TABLE

*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
*BY THE "TRAP" INSTRUCTION.

	ROUTINE
\$TRPAD:	.WORD \$TRAP2
\$TYPE	::CALL=TYPE TRAP+1(104401) TTY TYPEOUT ROUTINE
\$TYPOC	::CALL=TYPOC TRAP+2(104402) TYPE OCTAL NUMBER (WITH LEADING ZEROS)
\$TYPOS	::CALL=TYPOS TRAP+3(104403) TYPE OCTAL NUMBER (NO LEADING ZEROS)
\$TYPON	::CALL=TYPON TRAP+4(104404) TYPE OCTAL NUMBER (AS PER LAST CALL)

NAME: .ASCIZ <15><12>/MD-11-DVKAJ-A/

BUF: .BLKW 20
.END

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 DVKAJA.P11 20-DEC-76 15:02 CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0125

CLBUF	015024	753	849	945	1041	1137	1206	1292	1381	1468	1553	1637	1705	1793
CLRINT	015140	1882	1970	2057	2153	2255	2343	2439	4373#					
CMPN	= 076052	4409	4412#											
		463#	2548	2622	2697	2773	2850	2922	2996	3072	3145	3219	3293	3367
		3440	3514	3587	3676									
CMNPC	012656	3664	3676#											
CR	= 000015	363#	4638	4648										
CRLF	= 000200	364#	4609	4648										
CVTCON	014260	4177	4179	4182#										
CVTNL	= 076053	463#	3756	3830	3903	3976	4049	4122	4201					
CVTPC	014356	4189	4201#											
DDISP	= 177570	370#	573											
DISPLA	000542	573#	716*	4464*	4533*									
DISPRE	000174	487#	716											
DSTAD	000656	655#	796	892	988	1084	1174	1242	1256	1329	1343	1418	1432	1505
		1519	1590	1604	1674	1742	1756	1830	1844	1919	1933	2007	2021	2094
		2108	2198	2212	2292	2306	2379	2393	2485	2499	2580	2654	2729	2805
		2882	2954	3028	3104	3177	3251	3325	3399	3472	3546	3619	3710	3792
		3866	3939	4012	4085	4158	4239	4365						
DSTLN	000654	654#	1170	1238	1257	1325	1344	1414	1433	1501	1520	1586	1605	1670
		1738	1757	1826	1845	1915	1934	2003	2022	2090	2109	2194	2213	2288
		2307	2375	2394	2481	2500	2575	2649	2724	2800	2877	2949	3023	3099
		3172	3246	3320	3394	3467	3541	3614	3705	3787	3861	3934	4007	4080
		4153	4234	4354*	4364									
DSWR	= 177570	369#	572											
EMTVEC	= 000030	458#	688*	689*										
ENDMSG	014664	4282	4315#											
ENDT1	001552	768	825	835#										
ENDT2	002034	864	921	931#										
ENDT21	006276	2222	2241#											
ENDT24	007274	2509	2528#											
ENDT3	002316	960	1017	1027#										
ENDT4	002600	1056	1113	1123#										
ENDT44	013012	3723	3736#											
ENDT53	014504	4245	4258#											
ERRVEC	= 000004	451#	4436	4437*	4439*	4442*								
EXPPSW	000700	664#	804	826	900	922	996	1018	1092	1114	1147	1215	1302	1391
		1478	1563	1647	1715	1803	1892	1980	2067	2171	2265	2352	2458	2552
		2626	2701	2777	2854	2926	3000	3076	3149	3223	3297	3371	3444	3518
		3591	3682	3760	3834	3907	3980	4053	4126	4207	4381*	4385*		
FILL	000660	656#	791	887	983	1079								
GENR	014760	760	856	952	1048	1140	1209	1295	1384	1471	1556	1640	1708	1796
		1885	1973	2060	2163	2258	2346	2449	2544	2618	2694	2769	2846	2918
		2992	3068	3142	3215	3289	3363	3437	3511	3584	3673	3753	3826	3899
		3972	4045	4118	4198	4360#								
		486	4816	4817	4818	4819								
GNS	= ***** U	361#	4607	4648										
HT	= 000011	496	4339#											
ILLTRP	014722	2155	2441	3665	4190	4405#								
INTR	015114	456#	686*	687*										
IOTVEC	= 000020	362#	4642	4648										
LF	= 000012	471#	747#	765	766#	773	774#	778	779#	783	784#	788	789#	793
N	= 000010	794#	798	799#	806	807#	813	814#	821	822#	843#	861	862#	869
		870#	874	875#	879	880#	884	885#	889	890#	894	895#	902	903#
		909	910#	917	918#	939#	957	958#	965	966#	970	971#	975	976#
		980	981#	985	986#	990	991#	998	999#	1005	1006#	1013	1014#	1035#

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SEQ 0126

1053	1054#	1061	1062#	1066	1067#	1071	1072#	1076	1077#	1081	1082#	1086
1087#	1094	1095#	1101	1102#	1109	1110#	1131#	1149	1150#	1156	1157#	1160
1161#	1164	1165#	1168	1169#	1172	1173#	1176	1177#	1181	1182#	1200#	1217
1218#	1224	1225#	1228	1229#	1232	1233#	1236	1237#	1240	1241#	1244	1245#
1249	1250#	1260	1261#	1286#	1304	1305#	1311	1312#	1315	1316#	1319	1320#
1323	1324#	1327	1328#	1331	1332#	1336	1337#	1347	1348#	1375#	1393	1394#
1400	1401#	1404	1405#	1408	1409#	1412	1413#	1416	1417#	1420	1421#	1425
1426#	1436	1437#	1462#	1480	1481#	1487	1488#	1491	1492#	1495	1496#	1499
1500#	1503	1504#	1507	1508#	1512	1513#	1523	1524#	1547#	1565	1566#	1572
1573#	1576	1577#	1580	1581#	1584	1585#	1588	1589#	1592	1593#	1597	1598#
1608	1609#	1631#	1649	1650#	1656	1657#	1660	1661#	1664	1665#	1668	1669#
1672	1673#	1676	1677#	1681	1682#	1699#	1717	1718#	1724	1725#	1728	1729#
1732	1733#	1736	1737#	1740	1741#	1744	1745#	1749	1750#	1760	1761#	1787#
1805	1806#	1812	1813#	1816	1817#	1820	1821#	1824	1825#	1828	1829#	1832
1833#	1837	1838#	1848	1849#	1876#	1894	1895#	1901	1902#	1905	1906#	1909
1910#	1913	1914#	1917	1918#	1921	1922#	1925	1927#	1937	1938#	1964#	1982
1983#	1989	1990#	1993	1994#	1997	1998#	2001	2002#	2005	2006#	2009	2010#
2014	2015#	2025	2026#	2051#	2069	2070#	2076	2077#	2080	2081#	2084	2085#
2088	2089#	2092	2093#	2096	2097#	2101	2102#	2112	2113#	2138#	2173	2174#
2180	2181#	2184	2185#	2188	2189#	2192	2193#	2196	2197#	2200	2201#	2205
2206#	2216	2217#	2249#	2267	2268#	2274	2275#	2278	2279#	2282	2283#	2286
2287#	2290	2291#	2294	2295#	2299	2300#	2310	2311#	2337#	2354	2355#	2361
2362#	2365	2366#	2369	2370#	2373	2374#	2377	2378#	2381	2382#	2386	2387#
2397	2398#	2424#	2460	2461#	2467	2468#	2471	2472#	2475	2476#	2479	2480#
2483	2484#	2487	2488#	2492	2493#	2503	2504#	2536#	2554	2555#	2561	2562#
2565	2566#	2569	2570#	2573	2574#	2577	2578#	2582	2583#	2588	2589#	2610#
2628	2629#	2635	2636#	2639	2640#	2643	2644#	2647	2648#	2651	2652#	2656
2657#	2662	2663#	2686#	2703	2704#	2710	2711#	2714	2715#	2718	2719#	2722
2723#	2726	2727#	2731	2732#	2737	2738#	2761#	2779	2780#	2786	2787#	2790
2791#	2794	2795#	2798	2799#	2802	2803#	2807	2808#	2813	2814#	2838#	2856
2857#	2863	2864#	2867	2868#	2871	2872#	2875	2876#	2879	2880#	2884	2885#
2890	2891#	2910#	2928	2929#	2935	2936#	2939	2940#	2943	2944#	2947	2948#
2951	2952#	2956	2957#	2962	2963#	2984#	3002	3003#	3009	3010#	3013	3014#
3017	3018#	3021	3022#	3025	3026#	3030	3031#	3036	3037#	3060#	3078	3079#
3085	3086#	3089	3090#	3093	3094#	3097	3098#	3101	3102#	3106	3107#	3112
3113#	3134#	3151	3152#	3158	3159#	3162	3163#	3166	3167#	3170	3171#	3174
3175#	3179	3180#	3185	3186#	3207#	3225	3226#	3232	3233#	3236	3237#	3240
3241#	3244	3245#	3248	3249#	3253	3254#	3259	3260#	3281#	3299	3300#	3306
3307#	3310	3311#	3314	3315#	3318	3319#	3322	3323#	3327	3328#	3333	3334#
3355#	3373	3374#	3380	3381#	3384	3385#	3388	3389#	3392	3393#	3396	3397#
3401	3402#	3407	3408#	3429#	3446	3447#	3453	3454#	3457	3458#	3461	3462#
3465	3466#	3469	3470#	3474	3475#	3480	3481#	3503#	3520	3521#	3527	3528#
3531	3532#	3535	3536#	3539	3540#	3543	3544#	3548	3549#	3554	3555#	3576#
3593	3594#	3600	3601#	3604	3605#	3608	3609#	3612	3613#	3616	3617#	3621
3622#	3627	3628#	3649#	3684	3685#	3691	3692#	3695	3696#	3699	3700#	3703
3704#	3707	3708#	3712	3713#	3718	3719#	3745#	3762	3763#	3769	3770#	3773
3774#	3777	3778#	3783	3784#	3789	3790#	3794	3795#	3818#	3836	3837#	3843
3844#	3847	3848#	3851	3852#	3857	3858#	3863	3864#	3868	3869#	3891#	3909
3910#	3916	3917#	3920	3921#	3924	3925#	3930	3931#	3936	3937#	3941	3942#
3964#	3982	3983#	3989	3990#	3993	3994#	3997	3998#	4003	4004#	4009	4010#
4014	4015#	4037#	4055	4056#	4062	4063#	4066	4067#	4070	4071#	4076	4077#
4082	4083#	4087	4088#	4110#	4128	4129#	4135	4136#	4139	4140#	4143	4144#
4149	4150#	4155	4156#	4160	4161#	4174#	4209	4210#	4216	4217#	4220	4221#
4224	4225#	4230	4231#	4236	4237#	4241	4242#					
725	4823#											
747	843	939	1035	1131	1200	1286	1375	1462	1547	1631	1699	1787

NAME 016760
NPREP 014722

SW10	=	002000	400#						
SW11	=	004000	399#						
SW12	=	010000	398#						
SW13	=	020000	397#						
SW14	=	040000	396#						
SW15	=	100000	395#						
SW2	=	000004	418#						
SW3	=	000010	417#						
SW4	=	000020	416#						
SW5	=	000040	415#						
SW6	=	000100	414#						
SW7	=	000200	413#						
SW8	=	000400	412#						
SW9	=	001000	411#						
S1ADR		000646	651#	776	872	968	1064	4351*	4361
S1LN		000644	650#	771	867	963	1059	4350*	4360
S1T1		001550	749	829#					
S1T10		003630	1377	1443#					
S1T11		004044	1464	1530#					
S1T12		004256	1549	1615#					
S1T13		004442	1633	1687#					
S1T14		004650	1701	1767#					
S1T15		005066	1789	1855#					
S1T16		005304	1878	1944#					
S1T17		005522	1966	2032#					
S1T2		002032	845	925#					
S1T20		005736	2053	2119#					
S1T21		006260	2149	2223#					
S1T22		006514	2251	2317#					
S1T23		006730	2339	2404#					
S1T24		007256	2435	2510#					
S1T25		007460	2538	2594#					
S1T26		007640	2612	2668#					
S1T27		010020	2688	2743#					
S1T3		002314	941	1021#					
S1T30		010202	2763	2819#					
S1T31		010364	2840	2896#					
S1T32		010542	2912	2968#					
S1T33		010722	2986	3042#					
S1T34		011104	3062	3118#					
S1T35		011262	3136	3191#					
S1T36		011442	3209	3265#					
S1T37		011622	3283	3339#					
S1T4		002576	1037	1117#					
S1T40		012002	3357	3413#					
S1T41		012160	3431	3486#					
S1T42		012336	3505	3560#					
S1T43		012514	3578	3633#					
S1T44		013002	3660	3724#					
S1T5		002772	1133	1187#					
S1T6		003176	1202	1267#					
S1T7		003412	1288	1354#					
S2ADR		000652	653#	786	882	978	1074	4353*	4363
S2LN		000650	652#	781	877	973	1069	4352*	4362
S2T1		001551	751	831#					
S2T10		003634	1379	1448#					

TST15	004662	1766	1786#																		
TST16	005100	1854	1875#																		
TST17	005316	1943	1963#																		
TST2	001566	842#																			
TST20	005532	2031	2050#																		
TST21	005746	2118	2137#																		
TST22	006310	2139	2145	2248#																	
TST23	006526	2316	2336#																		
TST24	006742	2403	2423#																		
TST25	007306	2425	2431	2535#																	
TST26	007466	2593	2609#																		
TST27	007650	2667	2685#																		
TST3	002050	938#																			
TST30	010030	2742	2760#																		
TST31	010212	2818	2837#																		
TST32	010370	2895	2909#																		
TST33	010550	2967	2983#																		
TST34	010732	3041	3059#																		
TST35	011112	3117	3133#																		
TST36	011270	3190	3206#																		
TST37	011450	3264	3280#																		
TST4	002332	1034#																			
TST40	011630	3338	3354#																		
TST41	012010	3412	3428#																		
TST42	012166	3485	3502#																		
TST43	012344	3559	3575#																		
TST44	012522	3632	3648#																		
TST45	013024	3650	3656	3744#																	
TST46	013176	3798	3817#																		
TST47	013352	3872	3890#																		
TST5	002614	1130#																			
TST50	013526	3945	3963#																		
TST51	013702	4018	4036#																		
TST52	014056	4091	4109#																		
TST53	014222	4164	4173#																		
TST6	002774	1186	1199#																		
TST7	003206	1266	1285#																		
TVECT	000670	660#	734#	2155*	2241*	2441*	2528*	3665*	3736*	4190*	4258*										
TYPE =	104401	725	4282	4503	4540	4544	4612	4709	4816#												
TYPOC =	104402	4543	4817#																		
TYPON =	104404	4819#																			
TYPOS =	104403	4818#																			
TZERO	014702	492	4323#																		
T1	001374	763#	810																		
T1CONT	001402	756	770#																		
T2	001656	859#	906																		
T2CONT	001664	852	866#																		
T21CON	006004	2141	2143	2146#																	
T24CON	007000	2427	2429	2432#																	
T3	002140	955#	1002																		
T3CONT	002146	948	962#																		
T4	002422	1051#	1098																		
T4CONT	002430	1044	1058#																		
T44CON	012560	3652	3654	3657#																	
X =	000000	472#																			
XPSW	015044	758	854	950	1046	1138	1207	1293	1382	1469	1554	1639	1706	1794							

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0131

		1883	1971	2058	2159	2256	2344	2445	2542	2616	2692	2767	2844	2916
		2990	3066	3140	3213	3287	3361	3435	3509	3582	3669	3751	3824	3897
		3970	4043	4116	4194	4381#								
\$APTHD	000400	530	536#											
\$ASTAT=	***** U	4761	4776											
\$ATYC	016470	4732	4734#											
\$ATY1	016444	4730#												
\$ATY3	016452	4597	4731#											
\$ATY4	016462	4549	4733#											
\$AUTOB	000534	569#												
\$BASE	000642	631#	727											
\$BDADR	000522	564#	812*	908*	1004*	1100*								
\$BDDAT	000526	566#												
\$CHARC	016212	4614*	4624*	4631	4640*	4645#								
\$CKSWR=	***** U	4822												
\$CLR.T	014574	4286	4289#											
\$CMTAG	000500	552#	680											
\$CM3 =	000000	582#												
\$CPUOP	000614	605#												
\$CRLF	000563	584#	4540	4544	4568	4613	4648							
\$DEVCT	000576	596#												
\$DOAGN	014614	4278	4284	4291	4297#									
\$ENDAD	014604	517	723	4293#	4563									
\$ENDCT	014546	694	4280#											
\$ENULL	014660	4313#												
\$ENV	000606	601#	2142	2428	3653	4178	4546	4592	4739	4763				
\$ENVM	000607	602#	719	4594	4599	4741								
\$EOP	014516	4175	4181	4271#										
\$EOPCT	014540	694*	4277#	4281										
\$ERFLG	000503	555#	4422	4451	4457*	4467	4531*	4568						
\$ERMAX	000515	561#	696*	4463*	4467									
\$ERROR	015546	688	4530#											
\$ERRPC	000516	562#	4535*	4536*	4537	4541	4568							
\$ERRTB	000644	648#												
\$ERTTL	000512	559#	4534*	4568										
\$ESCAP	000560	582#	695*	4462*	4559	4561	4568							
\$ETABL	000606	600#												
\$ETEND	000644	542	632#											
\$FATAL	000570	593#	675*	4767*										
\$FFLG	016710	4730*	4733*	4761	4770*	4778#								
\$FILLC	000556	580#	4617	4648										
\$FILLS	000555	579#	4648											
\$GDADR	000520	563#												
\$GDDAT	000524	565#												
\$GET42	014556	4283#												
\$GTSWR=	***** U	4821												
\$HIBTS	000400	537#												
\$ICNT	000504	556#												
\$ILLUP	015530	4472	4488	4510#										
\$INTAG	000535	570#												
\$ITEMB	000514	560#	4537*	4548	4568									
\$LF	000564	585#	4568	4648										
\$LFLG	016707	4771*	4777#											
\$LOOP	014652	4305	4309#	4506										
\$LPADR	000506	557#	712*	4455*	4460*	4465	4467							
\$LPERR	000510	558#	713*	4455	4461*	4467	4558							

CATCH	329#	4323	4331	4339												
CMPNIN	345#	3649														
CMPNTS	344#	2536	2610	2686	2761	2838	2910	2984	3060	3134	3207	3281	3355	3429	3503	
	3576															
CMPREP	331#	2536	2610	2686	2761	2838	2910	2984	3060	3134	3207	3281	3355	3429	3503	
	3576	3658														
COMMEN	463#															
CVPREP	345#	3745	3818	3891	3964	4037	4110	4182								
CVTINT	347#	4174														
CVTSRC	342#	3799	3873	3946	4019	4092	4165	4246								
CVTTST	346#	3745	3818	3891	3964	4037	4110									
DECTRP	348#	747	843	939	1035											
EHLT	327#	765	773	778	783	788	793	798	806	813	821	861	869	874	879	
	884	889	894	902	909	917	957	965	970	975	980	985	990	998	1005	
	1013	1053	1061	1066	1071	1076	1081	1086	1094	1101	1109	1149	1156	1160	1164	
	1168	1172	1176	1181	1217	1224	1228	1232	1236	1240	1244	1249	1260	1304	1311	
	1315	1319	1323	1327	1331	1336	1347	1393	1400	1404	1408	1412	1416	1420	1425	
	1436	1480	1487	1491	1495	1499	1503	1507	1512	1523	1565	1572	1576	1580	1584	
	1588	1592	1597	1608	1649	1656	1660	1664	1668	1672	1676	1681	1717	1724	1728	
	1732	1736	1740	1744	1749	1760	1805	1812	1816	1820	1824	1828	1832	1837	1848	
	1894	1901	1905	1909	1913	1917	1921	1926	1937	1982	1989	1993	1997	2001	2005	
	2009	2014	2025	2069	2076	2080	2084	2088	2092	2096	2101	2112	2173	2180	2184	
	2188	2192	2196	2200	2205	2216	2267	2274	2278	2282	2286	2290	2294	2299	2310	
	2354	2361	2365	2369	2373	2377	2381	2386	2397	2460	2467	2471	2475	2479	2483	
	2487	2492	2503	2554	2561	2565	2569	2573	2577	2582	2588	2628	2635	2639	2643	
	2647	2651	2656	2662	2703	2710	2714	2718	2722	2726	2731	2737	2779	2786	2790	
	2794	2798	2802	2807	2813	2856	2863	2867	2871	2875	2879	2884	2890	2928	2935	
	2939	2943	2947	2951	2956	2962	3002	3009	3013	3017	3021	3025	3030	3036	3078	
	3085	3089	3093	3097	3101	3106	3112	3151	3158	3162	3166	3170	3174	3179	3185	
	3225	3232	3236	3240	3244	3248	3253	3259	3299	3306	3310	3314	3318	3322	3327	
	3333	3373	3380	3384	3388	3392	3396	3401	3407	3446	3453	3457	3461	3465	3469	
	3474	3480	3520	3527	3531	3535	3539	3543	3548	3554	3593	3600	3604	3608	3612	
	3616	3621	3627	3684	3691	3695	3699	3703	3707	3712	3718	3762	3769	3773	3777	
	3783	3789	3794	3836	3843	3847	3851	3857	3863	3868	3909	3916	3920	3924	3930	
	3936	3941	3982	3989	3993	3997	4003	4009	4014	4055	4062	4066	4070	4076	4082	
	4087	4128	4135	4139	4143	4149	4155	4160	4209	4216	4220	4224	4230	4236	4241	
ENDCOM	463#															
ENDPAS	325#	4282														
ERR	328#	765	773	778	783	788	793	798	806	813	821	861	869	874	879	
	884	889	894	902	909	917	957	965	970	975	980	985	990	998	1005	
	1013	1053	1061	1066	1071	1076	1081	1086	1094	1101	1109	1149	1156	1160	1164	
	1168	1172	1176	1181	1217	1224	1228	1232	1236	1240	1244	1249	1260	1304	1311	
	1315	1319	1323	1327	1331	1336	1347	1393	1400	1404	1408	1412	1416	1420	1425	
	1436	1480	1487	1491	1495	1499	1503	1507	1512	1523	1565	1572	1576	1580	1584	
	1588	1592	1597	1608	1649	1656	1660	1664	1668	1672	1676	1681	1717	1724	1728	
	1732	1736	1740	1744	1749	1760	1805	1812	1816	1820	1824	1828	1832	1837	1848	
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	1436	1480	1487	1491	1495	1499	1503	1507	1512	1523	1565	1572	1576	1580	1584
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	2009	2014	2025	2069	2076	2080	2084	2088	2092	2096	2101	2112	2173	2180	2184
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	4087	4128	4135	4139	4143	4149	4155	4160	4209	4216	4220	4224	4230	4236	4241
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GETSWR	463#														
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NUMINT	342#	2138	2424												
POP	323#	463#	4494	4495	4773	4774									
PUSH	323#	463#	4474	4480	4734	4736	4757								
REPORT	463#														
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	1963	2050	2137	2248	2336	2423	2535	2609	2685	2760	2837	2909	2983	3059	3133
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G11

.MAIN. MACY11 27(1006) 21-DEC-76 11:53 PAGE 138
DVKAJA.P11 20-DEC-76 15:02 CROSS REFERENCE TABLE -- MACRO NAMES

SEQ 0139

. ABS. 017040 000

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0

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RUN-TIME: 67 58 6 SECONDS
RUN-TIME RATIO: 522/132=3.9
CORE USED: 23K (45 PAGES)

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