DM11

DM11 DATA TST
CZDMBD0

AH 8541D MC

FICHE 1 OF 1

NOV 1979
MADE IN USA

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.REM %
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IDENTIFICATION

PRODUCT CODE: AC-8540D-MC

PRODUCT NAME: CZDMBDO DM11 DATA TST

PRODUCT DATE: JULY, 1979

MAINTAINER: DIAGNOSTIC GROUP

1. ABSTRACT

TWO SEPARATE DIAGNOSTIC PROGRAMS ARE PROVIDED FOR TESTING THE DM11 (ASYNCHRONOUS DATA MULTIPLEXER), CZDMA (DM11 LOGIC TESTS), AND CZDMB (DM11 MULTIPLE LINE DATA TESTS). THE LOGICC TESTS INDIVIDUALLY TEST EACH OF THE 16 DM11 LINES AND ALL COMMON LOGIC. THE MULTIPLE LINE DATA TESTS RUN SEVERAL LINES CONCURRENTLY AND ARE USED TO TEST LINE INTERACTION AND DATA TRANSMISSION/RECEPTION RELIABILITY. THIS DOCUMENT DESCRIBES THE MULTIPLE LINE DATA TESTS. THE AVAILABLE TESTS ARE:

PRG0 - DATA TESTS
PRG1 - DATA TEST(ALL LINES SIMULTANEOUSLY)
PRG2 - TRANSMIT TO TERMINALS
PRG3 - ECHO RECEIVED DATA

2. REQUIREMENTS

2.1 EQUIPMENT

A. PDP 11 FAMILY PROCESSER
B. DM11
C. JUMPERS CONNECTING 16 TRANSMITTERS TO THEIR RESPECTIVE RECEIVERS.
D. TERMINALS (IF AVAILABLE)
E. DM11 DISTRIBUTION PANEL

2.2 STORAGE

THIS PROGRAM USES ALL OF CORE (4K) EXCEPT THAT AREA RESERVED FOR THE LOADERS.

2.3 PREREQUISITE PROGRAMS
CZDMA__ DM11 LOGIC TESTS

3. LOADING PROCEDURE

THE ABSOLUTE LOADER IS USED TO LOAD THE PROGRAM.

4. USE PROCEDURE

4.1 STARTING PROCEDURE

BEFORE STARTING MAKE SURE THAT THE TTY IS IN REMOTE MODE.
THREE STARTING ADDRESSES ARE PROVIDED.

0200 - THIS STARTING ADDRESS REQUESTS DM11 PARAMETERS, AND MUST BE USED TO INITIALLY START THE PROGRAM, AND WHENEVER ANY OF THE PARAMETERS LISTED BELOW IS CHANGED.

A. VECTOR ADDRESS ?
RESPONSE: TYPE IN THE VECTOR ADDRESS OF THE DM11 RECEIVER UNDER TEST. CARRIAGE RETURN SELECTS 0300

B. UNIT #(8)?
RESPONSE: THE DM11 UNIT NUMBER CORRESPONDS TO THE ADDRESS TO WHICH THE CLOCK STATUS REGISTER (CSR) RESPONDS.

CSR ADDRESS	DM11 UNIT #	CSR ADDRESS	DM11 UNIT #
175000	0	175100	10
175010	1	175110	11
175020	2	175120	12
175030	3	175130	13
175040	4	175140	14
175050	5	175150	15
175060	6	175160	16
175070	7	175170	17

CARRIAGE RETURN SELECTS UNIT # 0.

C. PRG #
RESPONSE: TYPE PROGRAM NUMBER OF PROGRAM YOU WISH TO RUN. CARRIAGE RETURN SELECTS PROGRAM # 0.

CARRIAGE RETURN TERMINATES ALL RESPONSES.
ANY UNACCEPTABLE RESPONSE WILL RESULT IN A ? TYPEOUT AND THE PARAMETER WILL AGAIN BE REQUESTED.

0204 - THIS STARTING ADDRESS USES PREVIOUSLY DEFINED DM11 PARAMETERS AND REQUESTS THE PROGRAM NUMBER OF THE PROGRAM YOU WISH TO RUN.

0210 - THIS STARTING ADDRESS STARTS THE PREVIOUSLY SELECTED PROGRAM USING PREVIOUSLY SELECTED PARAMETERS.

4.2 SWITCH SETTINGS

THE FOLLOWING SWITCH SETTINGS APPLY TO PROGRAM #0.

SR 0-6	ROUTINE TO BE RUN (IF ENABLED BY SR-9)
SR 9	LOOP SELECTED ROUTINE
SR 11	INHIBIT ITERATION (DO EACH ROUTINE ONCE)
SR 13	INHIBIT PRINTOUT
SR 14	SCOPE (LOOP ROUTINE)
SR 15	HALT ON ERROR

THIS PROGRAM HAS BEEN MODIFIED TO RUN ON A PROCESSOR WITH OR WITHOUT A HARDWARE SWITCH REGISTER. WHEN FIRST EXECUTED THE PROGRAM TESTS THE EXISTENCE OF A HARDWARE SWITCH REGISTER. IF NOT FOUND A SOFTWARE SWITCH REGISTER LOCATION (SWREG=LOC. 176) IS DEFAULTED TO. IF THIS IS THE CASE, UPON EXECUTION THE CONTENTS OF THE SWREG ARE DUMPED IN OCTAL ON THE CONSOLE TTY AND ANY CHANGES ARE REQUESTED

(IE) SWR XXXXXX NEW-

POSSIBLE RESPONSES ARE:

1.	<CR>	IF NO CHANGES ARE TO BE MADE
2.	6 DIGITS 0-7	TO REPRESENT IN OCTAL THE NEW SWITCH REGISTER VALUE ;LAST DIGIT FOLLOWED BY <CR>.
3.	^U	TO ALLOW REENTERING VALUE IF ERROR IS COMMITTED KEYING IN SWREG VALUE.

BUILT INTO THE PROGRAM IS THE ABILITY TO DYNAMICALLY CHANGE THE CONTENTS OF SWREG DURING PROGRAM EXECUTION. BY STRIKING ^G (CNTL G) ON CONSOLE TTY THE OPERATOR SETS A REQUEST FLAG TO CHANGE THE CONTENTS OF SWREG, WHICH IS PROCESSED IN KEY AREAS OF THE PROGRAM CODE (IE) ERROR ROUTINES, AFTER HALTS END OF PASS, AND OTHER APPLICABLE AREAS.

5.0 PROGRAM DESCRIPTIONS

5.1 PRG0 - LOGIC TESTS

PRG0 CONSISTS OF 34(8) INDEPENDENT ROUTINES WHICH TRANSMIT VARIOUS DATA PATTERNS ON ALL LINES WITH A DECREASING DELAY BEFORE STARTING SUCCESSIVE LINES. THE DATA IS CHECKED WHEN ALL TRANSMITTERS HAVE COMPLETED TRANSMITTING. IF A DATA ERROR OCCURS THE ERROR TYPEOUT WILL SHOW THE DATA FAILURE AND THE LINE NUMBER.

5.2 PRG1 - DATA TEST (ALL LINES SIMULTANEOUSLY)
PROGRAM 1 TRANSMITS ' A QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK 1234567890' ON ALL LINES SIMULTANEOUSLY. WHEN ALL LINES HAVE FINISHED RECEIVED DATA IS VERIFIED. AN ERROR TYPEOUT IS AS IN PRG0.

5.3 PRG2 - TRANSMIT TO TERMINALS
PROGRAM 2 IS THE SAME AS PROGRAM 1 EXCEPT THAT THE RECEIVED DATA IS NOT CHECKED.

5.4 PRG3 - ECHO RECEIVED DATA
NOTE: THIS PROGRAM MAY ONLY BE RUN IF USING AN ASR 33 NOT MODIFIED BY DEC.
PROGRAM 3 ECHOES BACK DATA RECEIVED FROM A TERMINAL.
NOTE: PROGRAM 3 SHOULD BE RUN AND DATA TYPED AT ALL AVAILABLE DM11 TERMINALS. IT IS THE ONLY TEST THAT INSURES CORRECT OPERATION OF THE DM11 DISTRIBUTION PANEL LOGIC. IF THE TERMINALS ARE ASR-33 WITH A PAPER TAPE READER/PUNCH I SUGGEST THAT INDIVIDUAL TAPES BE MADE UP FOR EACH LINE. THIS CAN BE DONE BY RUNNING PROGRAM 2 WITH THE PUNCH TURNED ON. PROGRAM 2 WILL THEN PUNCH A TAPE ON EACH TERMINAL WITH THE LINE NUMBER IDENTIFIER AT THE BEGINNING OF EACH TAPE. PROGRAM 3 CAN BE RUN WITH THESE TAPES IN THE PAPER TAPE READERS.

6.0 CHANGE HISTORY

NOTE: CHANGE HISTORY STARTS WITH REV. D0

CZDMBD0 - TABLE BASE ADDRESS (TBR) REGISTER WILL ONLY WORK IF SET TO 400 WORD BOUNDARY (1000,1400,2000,ETC.). THEREFOR LOC. 1100 CHANGED TO 1200, AND LOC. 1106 CHANGED TO 1400

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                                        .TITLE CZDMBDO DM11 DATA TSTS
                                        .NLIST  MC,MD
                                        .LIST   ME
                                        .ENABLE ABS,AMA

                                ;CZDMBDO DM11 DATA TSTS
                                ;COPYRIGHT 1972,1979 DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
                                ;PRG0- DATA TESTS
                                ;PRG1- DATA TEST (ALL LINES SIMULTANEOUSLY)
                                ;PRG2- TRANSMIT TO TERMINALS
                                ;PRG3-  ECHO RECEIVED DATA

                                ;STANDARD SR SWITCH OPTIONS [SWITCH SET TO A 1 (UP)]
                                ;SR15- HALT ON ERROR
                                ;SR14- SCOPE.
                                ;SR13- INHIBIT PRINTOUT
                                ;SR12- INHIBIT TRACE
                                ;SR11- INHIBIT ITERATION.
                                ;SR9- LOOP ROUTINE.
                                ;SR6 THROUGH SR0 - NUMBER OF ROUTINE TO BE LOOPED.

                                ;EQUATE STATEMENTS
177776                                  CC=177776
177776                                  PSW=177776
000004                                  ERRVEC=4
000240                                  NOP=240
000000                                  OPEN=0
100000                                  MANUAL=BIT15
100000                                  BIT15=100000
040000                                  BIT14=40000
020000                                  BIT13=20000
010000                                  BIT12=10000
004000                                  BIT11=4000
002000                                  BIT10=2000
001000                                  BIT9=1000
000400                                  BIT8=400
000200                                  BIT7=200
000100                                  BIT6=100
000040                                  BIT5=40
000020                                  BIT4=20
000010                                  BIT3=10
000004                                  BIT2=4
000002                                  BIT1=2
000001                                  BIT0=1
005726                                  POPSP=5726              ;POP THE STACK. SAME AS TST (6)+
022626                                  POPSP2=022626           ;POP STACK TWICE. SAME AS CMP (6 )+, (6 )+
000340                                  PRTY7=340               ;PRIORITY LEVEL DEFINITIONS
000300                                  PRTY6=300
000240                                  PRTY5=240
000200                                  PRTY4=200
000140                                  PRTY3=140
000100                                  PRTY2=100
000040                                  PRTY1=40
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                                PRTY0=0
                                R0=%0
                                R1=%1
                                R2=%2
                                R3=%3
                                R4=%4
                                R5=%5
                                SP=%6
                                PC=%7
                        ;EMT CALLS
                                TYPE=EMT+0
                                TYPES=EMT+1
                                STALL=EMT+2
                                ERROR=EMT+3
                                DATCHK=EMT+4
                                STRXV=EMT+6
                                STTXV=EMT+7
                                FHALT=EMT+10
                                SCOPE=EMT+12
                                SAVREG=EMT+13
                                RSTREG=EMT+14
                                ERROR1=EMT+15
                                SUSWR=EMT+16
                                KBDIN=EMT+17
                                CNTLU=EMT+20

                        000007  BELL=007
                        177777  ATLAST=-1
                        125252  ALT0=125252             ;ALTERNATING 0'S PATTERN
                        052525  ALT1=052525             ;ALTERNATING 1'S PATTERN
                        000000  Y=0
                        177777  X=-1
                        000000  A=0
                        000000  .=0
000000  000000                  HALT
000002  000000                  HALT
000004  000006                  .+2                     ;SP OVERFLOW, BUS ERROR TRAP
000006  000000                  HALT
000010  000012                  .+2                     ;RESERVED INSTRUCTION TRAP
000012  000000                  HALT
000014  000016                  .+2                     ;TRACE TRAP
000016  000000                  HALT
000020  000022                  .+2                     ;TRAP TO CALL IOX
000022  000000                  HALT
000024  000026                  .+2                     ;POWER FAIL TRAP
000026  000000                  HALT
000030  003064                  EMTINT                  ;EMT TRAP
000032  000340                  PRTY7
000034  000036                  .+2
000036  000000                  HALT
000040  000042                  .+2
000042  000000                  HALT                    ;TRAPPED TO PREVIOUS ADDRESS.
000044  000046                  .+2
000046  000000                  HALT                    ;TRAPPED TO PREVIOUS ADDRESS.
000050  000052                  .+2
000052  000000                  HALT                    ;TRAPPED TO PREVIOUS ADDRESS.
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SEQ 0008

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 315  000054  000056                .+2
 316  000056  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 317  000060  000062                .+2
 318  000062  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 319  000064  000066                .+2
 320  000066  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 321  000070  000072                .+2
 322  000072  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 323  000074  000076                .+2
 324  000076  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 325  000100  000102                .+2
 326  000102  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 327  000104  000106                .+2
 328  000106  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 329  000110  000112                .+2
 330  000112  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 331  000114  000116                .+2
 332  000116  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 333  000120  000122                .+2
 334  000122  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 335  000124  000126                .+2
 336  000126  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 337  000130  000132                .+2
 338  000132  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 339  000134  000136                .+2
 340  000136  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 341  000140  000142                .+2
 342  000142  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 343  000144  000146                .+2
 344  000146  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 345  000150  000152                .+2
 346  000152  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 347  000154  000156                .+2
 348  000156  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 349  000160  000162                .+2
 350  000162  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 351  000164  000166                .+2
 352  000166  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 353  000170  000172                .+2
 354  000172  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 355  000174  000176                .+2
 356  000176  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 357  000200  000202                .+2
 358  000202  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 359  000204  000206                .+2
 360  000206  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 361  000210  000212                .+2
 362  000212  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 363  000214  000216                .+2
 364  000216  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 365  000220  000222                .+2
 366  000222  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 367  000224  000226                .+2
 368  000226  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
 369  000230  000232                .+2
 370  000232  000000                HALT        ;TRAPPED TO PREVIOUS ADDRESS.
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  371  000234  000236                    .+2
  372  000236  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  373  000240  000242                    .+2
  374  000242  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  375  000244  000246                    .+2
  376  000246  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  377  000250  000252                    .+2
  378  000252  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  379  000254  000256                    .+2
  380  000256  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  381  000260  000262                    .+2
  382  000262  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  383  000264  000266                    .+2
  384  000266  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  385  000270  000272                    .+2
  386  000272  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  387  000274  000276                    .+2
  388  000276  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  389  000300  000302                    .+2
  390  000302  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  391  000304  000306                    .+2
  392  000306  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  393  000310  000312                    .+2
  394  000312  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  395  000314  000316                    .+2
  396  000316  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  397  000320  000322                    .+2
  398  000322  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  399  000324  000326                    .+2
  400  000326  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  401  000330  000332                    .+2
  402  000332  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  403  000334  000336                    .+2
  404  000336  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  405  000340  000342                    .+2
  406  000342  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  407  000344  000346                    .+2
  408  000346  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  409  000350  000352                    .+2
  410  000352  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  411  000354  000356                    .+2
  412  000356  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  413  000360  000362                    .+2
  414  000362  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  415  000364  000366                    .+2
  416  000366  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  417  000370  000372                    .+2
  418  000372  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  419  000374  000376                    .+2
  420  000376  000000                    HALT                ;TRAPPED TO PREVIOUS ADDRESS.
  421
```

SEQ 0010

```
                        000046                          .=46            ;ACT11 HOOKS
000046  003022                                          $ENDAD
                        000052                          .=52
000052  020000                                          020000

                        000174                          .=174
000174  000000                  DISPREG:0
000176  000000                  SWREG:  0

                        000200                          .=200
000200  000137  002404                                  JMP     @#START         ;GO TO START OF DIAGNOSTIC.
000204  000137  002422                                  JMP     @#RSTAT1        ;GO GET PROGRAM # & RESTART PROGRAM
                                                                                ;USING PREVIOUS DM11 PARAMETERS
000210  000137  002472                                  JMP     @#RSTAT2        ;RESTART PREVIOUS PROGRAM USING
                                                                                ;PREVIOUS DM11 PARAMETERS

                        001200                          .=1200                  ;                               (REV. D0)

001200  000000                  SPBOT:  0
001202  177570                  SWR:    177570
001204  177570                  DISPLAY:177570
                        001400                          .=1400                  ;                               (REV. D0)
001400  000000                  CAT:    OPEN            ;STARTING ADDRESS OF
                        001440                          .=CAT+32.               ;CURRENT ADDRESS TABLE
001440  000000                  WCT:    OPEN            ;STARTING ADDRES OF
                        001500                          .=WCT+32.               ;WORD COUNT TABLE
001500  000000                  BAT:    OPEN            ;STARTING ADDRESS OF
                        001540                          .=BAT+32.               ;BIT ASSEMBLY TABLE
001540  000000                  VAC:    OPEN            ;32. SPARE WORDS
001542  175000                  CSR:    175000          ;ADDRESS OF CLOCK STATUS REGISTER
001544  175002                  BAR:    175002          ;ADDRESS OF BUFFER ACTIVE REGISTER
001546  175004                  BKCSR:  175004          ;ADDRESS OF BREAK STATUS REGISTER
001550  175006                  BASREG: 175006          ;ADDRESS OF BASE REGISTER
001552  000000                  CLKINT: OPEN            ;DM11 VECTOR ADDRESS (RECEIVER)
001554  000240                  CLKLVL: PRTY5           ;PRIORITY LEVEL
001556  000000                  XMTINT: OPEN            ;DM11 VECTOR ADDRESS (TRANSMITTER)
001560  000240                  XMTLVL: PRTY5           ;TRANSMITTER PRIORITY LEVEL
001562  000000                  BARIM:  OPEN            ;PROGRAM BAR IMAGE
001564  000000                  TTDAT:  OPEN            ;TUMBLE TABLE DATA
001566  000000                  LINBIT: OPEN            ;LINE BIT (FOR BAR)
001570  000000                  BARDAT: OPEN            ;BAR DATA
001572  000000                  TTPTR:  OPEN            ;PROGRAM TUMBLE TABLE POINTER
                        001600                          .=VAC+32.
001600  000000                  TUMTAB: OPEN            ;STARTING ADDRESS OF
                        002000                          .=TUMTAB+128.           ;TUMBLE TABLE
002000  000060                  TKVTR:  60              ;LSR INTERRUPT VECTOR
002002  000200                  TKLVL:  PRTY4           ;LSR PRIORITY LEVEL
002004  000064                  TPVTR:  64              ;LSP INTERRUPT VECTOR
002006  000200                  TPLVL:  PRTY4           ;LSP PRIORITY LEVEL
002010  000000                  KSTART: OPEN            ;CURRENT PROGRAM START ADDRESS.
002012  000000                  CURTST: OPEN            ;CONTAINS ADDR OF CURRENT TEST.
002014  000000                  RTNNO:  OPEN            ;CONTAINS CURRENT TEST #.
002016  000000                  NXTST:  OPEN            ;CONTAINS ADDR OF NEXT TEST.
002020  000000                  ICTR:   OPEN            ;CONTAINS CURRENT ITERATION COUNT
002022  000000                  SCOPTR: OPEN            ;CONTAINS CURRENT SCOPE POINTER.
```

```
 478  002024  177774                PRGLIM: -4
 479  002026  005660                PRGTAB: PRG0                    ;PRG0 START ADDRESS
 480  002030  006640                        PRG1                    ;PRG1 START ADDRESS
 481  002032  007024                        PRG2                    ;PRG2 START ADDRESS
 482  002034  007034                        PRG3                    ;PRG3 START ADDRESS
 483  002036  005702                RSTART: PRG0R                   ;PRG0 RESTART ADDRESS
 484  002040  006656                        PRG1R                   ;PRG1    "       "
 485  002042  007030                        PRG2R                   ;PRG2    "       "
 486  002044  007052                        PRG3R                   ;PRG3    "       "
 487  002046  003220                EMTTAB: TYP                     ;POINTER TO TYPEOUT ROUTINE
 488  002050  000000                        OPEN                    ;POINTER TO CHAINED MESSAGES ROUTINE
 489  002052  000000                        OPEN                    ;POINTER TO RANDOM STALL ROUTINE
 490  002054  002224                        ERR                     ;POINTER TO ERROR ROUTINE
 491  002056  002156                        DTCHK
 492  002060  000000                        OPEN
 493  002062  000000                        OPEN
 494  002064  000000                        OPEN
 495  002066  000000                        OPEN
 496  002070  000000                        OPEN
 497  002072  002650                        ESCOPE
 498  002074  003116                        SAVRG
 499  002076  003156                        RSTRG
 500  002100  002242                        ERR1
 501  002102  004412                        SUSWRR
 502  002104  004256                        KBDINTT
 503  002106  004332                        CNTLUU
 504
 505  002110  000000                SRT:    OPEN
 506  002112  177560                TKCSR:  177560
 507  002114  177562                TKDBR:  177562
 508  002116  177564                TPCSR:  177564
 509  002120  177566                TPDBR:  177566
 510  002122  000000                RCVDAT: OPEN
 511  002124  000000                XMTDAT: OPEN
 512  002126  000000                CARMSK: OPEN
 513  002130  000000                TEMP:   OPEN
 514  002132  000000                PCADD:  OPEN
 515  002134  000000                APCADD: OPEN
 516  002136  000000                PRVCNT: OPEN
 517  002140  000000                LINE:   OPEN
 518  002142  000000                LINBUF: OPEN
 519  002144  000000                PASS:   OPEN
 520  002146  000000                COUNT:  OPEN
 521
 522
 523  002150  104000                INCRTN: TYPE
 524  002152  013300                        M1                      ;TYPE INCORRECT ROUTINE SELECTED.
 525  002154  000207                        RTS     %7              ;EXIT.
```

```
                                        ;DATA CHECK ROUTINE.
002156  123737  002122  002124  DTCHK:  CMPB    RCVDAT,XMTDAT   ;COMPARE EXPECTED AND RECEIVED
002164  001416                          BEQ     1$              ;CHARS. BRANCH IF SAME.
002166  004737  002356                  JSR     7,CNVDAT        ;CONVERT RCVDAT & XMTDAT TO ASCII
002172  032777  020000  177002          BIT     #BIT13,@SWR     ;ERROR TYPEOUT DESIRED?
002200  001010                          BNE     !$              ;BRANCH IF NO TYPEOUT DESIRED
002202  004537  005112                  JSR     5,@#OACNV       ;CONVERT LINE
002206  002140                          LINE                    ;NUMBER
002210  013254                          ALINE                   ;TO ASCII
002212  000002                          2
002214  104015                          ERROR1
002216  104000                          TYPE                    ;TYPE LINE # AS PART
002220  013245                          LINEM                   ;OF ERROR MESSAGE
002222  000002                  1$:     RTI                     ; EXIT.

                                        ;ERROR SERVICE ROUTINE CALLED BY TRAP (HLT)
002224  012737  000402  002324  ERR:    MOV     #402,ERRB               ;MOV BR .+6 TO ERRB
002232  013737  002132  002134          MOV     @#PCADD,@#APCADD        ;GET PC WHERE ERROR OCCURRED
002240  000410                          BR      ERRA
002242  012737  000240  002324  ERR1:   MOV     #240,ERRB               ;MOVE NOP TO ERRB
002250  013737  002132  002134          MOV     @#PCADD,@#APCADD        ;GET PC WHERE ERROR OCCURRED
002256  004737  002356                  JSR     7,@#CNVDAT              ;CONVERT RCVDAT & XMIT DAT TO ASCII
002262  104017                  ERRA:   KBDIN                           ;CHECK FOR ^G
002264  032777  020000  176710          BIT     #BIT13,@SWR             ;ERROR PRINTOUT DESIRED
002272  001017                          BNE     ERRC                    ;BRANCH IF NO PRINTOUT
002274  004537  005112                  JSR     5,@#OACNV               ;CONVERT
002300  002134                          APCADD                          ;DATA
002302  013734                          APC                             ;TO
002304  000006                          6                               ;ASCII
002306  004537  005112                  JSR     5,@#OACNV               ;FOR
002312  002014                          RTNNO                           ;PRINTOUT
002314  013724                          ATNUMB
002316  000003                          3
002320  104000                          TYPE                            ;TYPE ERROR
002322  013721                          EMO                             ;MESSAGE
002324  000000                  ERRB:   OPEN                            ;NOP IF ERROR1, BR .+6 IF ERROR
002326  104000                          TYPE                            ;TYPE ANOTHER MESSAGE
002330  013200                          ERDAT                           ;IF ERROR 1
002332  023737  000042  000046  ERRC:   CMP     @#42,@#46               ;ACT11?
002340  001403                          BEQ     ERRHLT                  ;BR IF YES
002342  005777  176634                  TST     @SWR                    ;HALT ON ERROR
002346  100001                          BPL     ERREX                   ;GO TO EXIT IF NO HALT ON ERROR
002350  000000                  ERRHLT: HALT                            ;HALT
002352  104017                  ERREX:  KBDIN                           ;CHECK FOR ^G
002354  000002                          RTI                             ;RETURN

                                        ;SUBROUTINE TO CONVERT RCVDAT AND XMTDAT TO ASCII AND PLACE
                                        ;IN MESSAGE.
002356  004537  005112          CNVDAT: JSR     5,OACNV
002362  002124                          XMTDAT
002364  013220                          AASB
002366  000006                          6
002370  004537  005112                  JSR     5,OACNV
002374  002122                          RCVDAT
```

SEQ 0013

```
                                        AWAS
                                        6
002402  000207                          RTS     7               ;EXIT
                                        
                                        
                                        
002404  012706  001200          START:  MOV     #SPBOT,%6       ;INITIALIZE STACK
002410  104016                          SUSWR                   ;CHECK FOR HARDWARE SWITCH REGISTER
002412  004737  003334                  JSR     7,@#DMPAR       ;GET DM11 PARAMETERS
002416  004737  004042                  JSR     7,@#OVRLAY      ;PUT HALT,.+2 IN VECTOR AREA
002422  012706  001200          RSTAT1: MOV     #SPBOT,%6       ;INITIALIZE STACK
002426  023737  000042  000046        CMP     @#42,@#46               ;ACT11?
002434  001405                        BEQ     PRGNUM+2                ;BR IF YES
002436  104000                        TYPE
002440  013260                        M0
002442  004537  004076                JSR     5,RECD          ;GET THE PRGNUM &
002446  000000          PRGNUM. 0                               ;PUT IT HERE
002450  043737  002024  002446        BIC     PRGLIM,PRGNUM   ;MASK OFF UNUSED BITS
002456  006337  002446                ASL     PRGNUM          ;SHIFT PROGRAM #
002462  013700  002446                MOV     PRGNUM,%0       ;GET PROGRAM #
002466  000170  002026                JMP     @PRGTAB(0)      ;GO START PROGRAM
002472  012706  001200          RSTAT2: MOV     #SPBOT,%6       ;INITIALIZE STACK
002476  013700  002446                MOV     PRGNUM,%0       ;GET PROGRAM #
002502  000170  002036                JMP     @RSTART(0)      ;GO RESTART PROGRAM
002506  022737  000176  001202  SRSET: CMP     #SWREG,SWR
002514  001410                        BEQ     1$
002516  023737  000042  000046        CMP     @#42,@#46               ;ACT11?
002524  001405                        BEQ     GETRDY                  ;BR IF YES
002526  104000                        TYPE                    ;TYPE OPTIONS MESSAGE
002530  013330                        M3
002532  000000                        HALT                    ;WAIT FOR USER TO SET OPTIONS
002534  000401                        BR      GETRDY
002536  104020                  1$:   CNTLU
002540  013737  002010  002016  GETRDY: MOV     KSTART,NXTST    ;ADDR OF 1ST ROUTINE TO NXTST
002546  012737  000006  000004  GTRDYX: MOV     #6,@#ERRVEC     ;RESET ERROR TRAP.
002554  005037  177776                CLR     PSW
002560  012706  001200                MOV     #SPBOT,%6       ;SET BOTTOM OF STACK.
002564  000005                        RESET                   ;ISSUE RESET.
002566  004737  003032          GTRDYA: JSR     %7,FORWD        ;ROLL FORWARD TO "NEXT" ROUTINE.
002572  032777  001000  176402        BIT     #BIT9,@SWR      ;CHECK SELECT ROUTINE SWITCH
002600  001003                        BNE     GTRDYC          ;BRANCH IF SELECT ROUTINE SWITCH IS SET.
002602  000177  177204                JMP     @CURTST         ;GO RUN CURRENT ROUTINE.
002606  000461                        BR      SCOPED          ;NO GO. MANUAL RTN BYPASSED.
002610  017700  176366          GTRDYC: MOV     @SWR,%0         ;(SR) TO R0
002614  042700  177600                BIC     #177600,%0      ;MASK UNDESIRED BITS
002620  123700  002014                CMPB    RTNNO,%0        ;COMPARE RTNNO TO (R0)
002624  001002                        BNE     GTRDYD          ;BRANCH IF ROUTINE NOT FOUND YET.
002626  000177  177160                JMP     @CURTST         ;GO RUN ROUTINE.
002632  022737  177777  002016  GTRDYD: CMP     #-1,NXTST       ;NO. CHECK FOR LAST ROUTINE.
002640  001352                        BNE     GTRDYA          ;BRANCH IF NOT LAST ROUTINE.
002642  004737  002150                JSR     %7,INCRTN       ;YES. INCORRECT ROUTINE SELECTED.
002646  000734                        BR      GETRDY          ;START OVER.
                                        
                                    ;SCOPE ROUTINE (CALLED BY EMT INST.)
002650  000240                  ESCOPE: NOP
002652  005077  176664                CLR     @CSR            ;INITIALIZE
```

```
  638  002656  005077  176664                  CLR     @BKCSR          ;THE
  639  002662  005077  176656                  CLR     @BAR            ;DM11
  640  002666  104017                          KBDIN
  641  002670  012777  001400  176652          MOV     #CAT,@BASREG
  642  002676  032777  040000  176276          BIT     #BIT14,@SWR     ;CHECK FOR SCOPE OPTION.
  643  002704  001403                          BEQ     SCOPEB          ;BRANCH IF SCOPE SW NOT SET.
  644  002706  013716  002022          SCOPEA: MOV     SCOPTR,@%6      ;SET UP TO RETURN TO ROUTINE.
  645  002712  000002                          RTI                     ;RETURN TO ROUTINE.
  646  002714  032777  004000  176260  SCOPEB: BIT     #BIT11,@SWR     ;TEST INHIBIT ITERATION SWITCH
  647  002722  001012                          BNE     SCOPEC          ;BRANCH IF INHIBIT ITERATION SW SET.
  648  002724  023737  000042  000046          CMP     @#42,@#46               ;ACT11?
  649  002732  001003                          BNE     1$                      ;BR IF NO
  650  002734  005737  002144                  TST     @#PASS                  ;1ST PASS?
  651  002740  001403                          BEQ     SCOPEC                  ;BR IF YES
  652  002742  005337  002020          1$:     DEC     ICTR            ;DECREMENT ITERATION COUNT.
  653  002746  001357                          BNE     SCOPEA          ;BRANCH IF COUNT NOT 0.
  654  002750  022626                  SCOPEC: POPSP2                  ;POP STACK TWICE
  655  002752  032777  001000  176222  SCOPED: BIT     #BIT9,@SWR      ;CHECK SELECT ROUTINE SWITCH
  656  002760  001267                          BNE     GETRDY          ;BRANCH IF SELECT RTN SW SET
  657  002762  022737  177777  002016          CMP     #-1,NXTST       ;LAST TEST?
  658  002770  001266                          BNE     GTRDYX          ;BRANCH IF NOT LAST TEST.
  659  002772  005237  002144                  INC     @#PASS                  ;IND PASS
  660  002776  104000                          TYPE                    ;TYPE
  661  003000  013303                          M2                      ;'END'
  662  003002  013702  000042                  MOV     @#42,%2         ;CHECK DDP/ACT11 MONITOR HOOK
  663  003006  001654                          BEQ     GETRDY
  664  003010  000005                          RESET
  665  003012  000240                          NOP
  666  003014  000240                          NOP
  667  003016  000240                          NOP
  668  003020  000240                          NOP
  669  003022  004712          $ENDAD: JSR     7,(2)           ;RETURN TO DDP/ACT11 MONITOR
  670  003024  000240                          NOP
  671  003026  000240                          NOP
  672  003030  000240                          NOP
  673
  674  003032  013705  002016          FORWD:  MOV     NXTST,%5        ;ADDR OF NEXT ROUTINE TO R5.
  675  003036  012537  002014                  MOV     (5)+,RTNNO      ;GET NEXT ROUTINE NUMBER.
  676  003042  012537  002016                  MOV     (5)+,NXTST      ;GET ADDR OF NEXT "NEXT" ROUTINE.
  677  003046  012537  002020                  MOV     (5)+,ICTR       ;GET ITERATION COUNT.
  678  003052  012537  002022                  MOV     (5)+,SCOPTR     ;GET SCOPE LOOP ENTRY POINTER.
  679  003056  010537  002012                  MOV     %5,CURTST       ;ADDR OF NOW CURRENT TEST TO CURTST.
  680  003062  000207                          RTS     %7              ;EXIT FORWD SUBROUTINE.
  681
  682                                  ;EMT TRAP INTERPRETER
  683  003064  011646          EMTINT: MOV     (6),-(6)        ;GET PC OF NEXT INSTRUCTION
  684  003066  162716  000002                  SUB     #2,(6)          ;POINT SP TO PC OF EMT
  685  003072  011637  002132                  MOV     (6),PCADD       ;GET PC OF EMT CALL
  686  003076  017616  000000                  MOV     @(6),(6)        ;GET EMT CALL
  687  003102  105066  000001                  CLRB    1(6)            ;STRIP EMT & SAVE IDENTIFIER
  688  003106  006316                          ASL     (6)             ;SHIFT IDENTIFIER LEFT
  689  003110  062716  002046                  ADD     #EMTTAB,(6)
  690  003114  013607                          MOV     @(6)+,%7        ;GO TO PROPER EMT
  691
  692                                  ;SAVE REGS 0 TO 4 SUBROUTINE.
  693  003116  012637  003152          SAVRG:  MOV     (6)+,1$         ;SAVE PC AND PSW.
```

```
 694  003122  012637  003154                 MOV     (6)+,2$
 695  003126  010446                         MOV     %4,-(6)         ;SAVE REGS 0 - 4
 696  003130  010346                         MOV     %3,-(6)         ;IN STACK.
 697  003132  010246                         MOV     %2,-(6)
 698  003134  010146                         MOV     %1,-(6)
 699  003136  010046                         MOV     %0,-(6)
 700  003140  013746  003154                 MOV     2$,-(6)         ;RESTORE PC AND PSW.
 701  003144  013746  003152                 MOV     1$,-(6)
 702  003150  000002                         RTI                     ;EXIT.
 703  003152  000000              1$:        OPEN                    ;CONTAINS SAVED PC
 704  003154  000000              2$:        OPEN                    ;CONTAINS SAVED PSW
 705
 706                              ;RESTORE REGS 0 TO 4 SUBROUTINE.
 707  003156  000240              RSTRG:     NOP
 708  003160  012637  003214                 MOV     (6)+,1$         ;SAVE PC AND PSW.
 709  003164  012637  003216                 MOV     (6)+,2$
 710  003170  012600                         MOV     (6)+,%0         ;RESTORE REGS 0 - 4
 711  003172  012601                         MOV     (6)+,%1         ;FROM STACK.
 712  003174  012602                         MOV     (6)+,%2
 713  003176  012603                         MOV     (6)+,%3
 714  003200  012604                         MOV     (6)+,%4
 715  003202  013746  003216                 MOV     2$,-(6)         ;RESTORE PC AND PSW.
 716  003206  013746  003214                 MOV     1$,-(6)
 717  003212  000002                         RTI                     ;EXIT
 718  003214  000000              1$:        OPEN                    ;CONTAINS SAVED PC
 719  003216  000000              2$:        OPEN                    ;CONTAINS SAVED PSW
 720
 721                              ;SUBROUTINE TO OUTPUT ASCII MESSAGE ON TELETYPE PRINTER.
 722  003220  000240              TYP:       NOP
 723  003222  011600                         MOV     (SP),%0         ;GET ADDRESS THAT CONTAINS MESSAGE ADDRESS.
 724  003224  062716  000002                 ADD     #2,(SP)         ;SET UP EXIT.
 725  003230  011000                         MOV     @%0,%0          ;ADDRESS OF MESSAGE TO R0.
 726  003232  112037  003332      1$:        MOVB    (0)+,5$         ;GET CHARACTER
 727  003236  122737  000100  003332         CMPB    #100,5$         ;CHECK FOR"@"CHARACTER
 728  003244  001001                         BNE     2$              ;BRANCH IF NOT"@".
 729  003246  000002                         RTI                     ;TERMINATOR CHAR. DONE. EXIT.
 730  003250  122737  000045  003332  2$:    CMPB    #45,5$          ;CHECK FOR"%".
 731  003256  001412                         BEQ     4$              ;BRANCH IF"%"
 732  003260  004737  003266                 JSR     %7,3$           ;TYPE CHAR IN 5$
 733  003264  000762                         BR      1$
 734  003266  113777  003332  176624  3$:    MOVB    5$,@TPDBR       ;OUTPUT CHARACTER TO PRINTER
 735  003274  105777  176616                 TSTB    @TPCSR          ;WAIT FOR DONE FLAG.
 736  003300  100375                         BPL     .-4
 737  003302  000207                         RTS     %7              ;EXIT
 738  003304  112737  000015  003332  4$:    MOVB    #15,5$          ;MOVE CARRIAGE RETURN CODE TO 5$
 739  003312  004737  003266                 JSR     %7,@#3$         ;GO TYPE CHAR.
 740  003316  112737  000012  003332         MOVB    #12,5$          ;MOVE LF CODE TO 5$.
 741  003324  004737  003266                 JSR     %7,3$           ;GO TYPE CHAR.
 742  003330  000740                         BR      1$
 743  003332  000000              5$:        OPEN
 744
 745                              ;SUBROUTINE TO GET DM11 PARAMETERS
 746                              ;VECTOR ADDRESS
 747  003334  000240              DMPAR:     NOP                     ;BEGIN
 748  003336  023737  000042  000046         CMP     @#42,@#46       ;ACT11?
 749  003344  001060                         BNE     6$              ;BR IF NO
```

```
                                                ;SIZE FOR INTERRUPT VECTOR IN AUTO MODE
003346  012700  000302                          MOV     #302,R0         ;SET UP FLOATING VECT AREA
003352  010060  177776          4$:             MOV     R0,-2(R0)
003356  012720  000003                          MOV     #3,(R0)+
003362  005720                                  TST     (R0)+
003364  022700  000776                          CMP     #776,R0
003370  100370                                  BPL     4$
003372  012737  003462  000014                  MOV     #5$,@#14        ;SET BPT VECT
003400  012737  000340  000016                  MOV     #340,@#16       ;& PSW
003406  012737  177777  001440  3$:             MOV     #-1,WCT         ;SET TO XMIT 1 CHAR
003414  012737  007362  001400                  MOV     #OUTBUF,CAT
003422  012777  000105  176112                  MOV     #BIT6+BIT2+BIT0,@CSR    ;SET IE
003430  005037  177776                          CLR     @#PSW           ;LVL 0
003434  012777  000001  176102                  MOV     #BIT0,@BAR      ;XMIT
003442  012737  177777  002146                  MOV     #-1,COUNT       ;WAIT
003450  005337  002146          2$:             DEC     COUNT
003454  001375                                  BNE     2$
003456  104003                                  ERROR                   ;NO INT OCCURRED
003460  000752                                  BR      3$              ;REPEAT IT
003462  162716  000004          5$:             SUB     #4,(SP)         ;CALC INT VECT
003466  011637  003522                          MOV     (SP),@#VECTOR   ;STORE IT
003472  012737  000016  000014                  MOV     #16,@#14        ;RESTORE BPT VECT
003500  004737  004042                          JSR     7,OVRLAY        ;.+2, HALT IN VECT AREA
003504  000415                                  BR      VECOK
003506  004737  004042          6$:             JSR     7,OVRLAY        ;PUT HALT,.+2 IN VECTOR AREA
003512  104000                                  TYPE                    ,ASK USER FOR RECEIVER INT. VECTOR
003514  013050                                  WHERE                   ;OF UNIT UNDER TEST
003516  004537  004076                          JSR     5,RECD          ;GET THE VECTOR &
003522  000000          VECTOR: 0               ;PUT IT HERE
003524  005737  003522                          TST     VECTOR
003530  001003                                  BNE     VECOK
003532  012737  000300  003522                  MOV     #300,VECTOR     ;SET VECTOR - TO 0300
003540  023727  003522  000300  VECOK:          CMP     VECTOR,#300     ;IS VECTOR HIGHER OR
003546  103003                                  BHIS    VECOKB          ;EQUAL TO 0300
003550  104000          VECOKA: TYPE                                    ;TYPE '?'
003552  013300                                  M1
003554  000667                                  BR      DMPAR           ;ASK FOR ANOTHER VECTOR
003556  023727  003522  000770  VECOKB: CMP     VECTOR,#770     ;IS VECTOR = TO OR
003564  101371                                  BHI     VECOKA          ;LESS THAN 770
003566  032737  000007  003522                  BIT     #7,VECTOR       ;LSB OF VECTOR MUST BE ALL 0'S
003574  001365                                  BNE     VECOKA
003576  013737  003522  001552                  MOV     VECTOR,@#CLKINT
003604  062737  000004  003522                  ADD     #4,VECTOR
003612  013737  003522  001556                  MOV     VECTOR,@#XMTINT

                        ;UNIT NUMBER
003620  023737  000042  000046  DMPARB: CMP     @#42,@#46       ;ACT11?
003626  001405                                  BEQ     UNIT+2          ;BR IF YES
003630  104000                                  TYPE
003632  013143                                  WHICH
003634  004537  004076                          JSR     5,RECD          ;GET THE UNIT &
003640  000000          UNIT:   0               ;PUT IT HERE
003642  023727  003640  000017                  CMP     UNIT,#17
003650  101403                                  BLOS    1$
003652  104000                                  TYPE
003654  013300                                  M1
```

```
                                        BR      DMPARB
003660  006337  003640         1$:     ASL     UNIT
003664  006337  003640                 ASL     UNIT
003670  006337  003640                 ASL     UNIT
003674  012702  000004                 MOV     #4,%2
003700  012701  001542                 MOV     #CSR,%1
003704  042711  000370         2$:     BIC     #370,(1)
003710  063721  003640                 ADD     UNIT,(1)+
003714  005302                         DEC     %2
003716  001372                         BNE     2$

                                ;CALCULATE CHARARACTER LENGTH
003720  012777  001400  175622         MOV     #CAT,@BASREG
003726  005077  175610                 CLR     @CSR
003732  012737  177777  007362         MOV     #-1,OUTBUF      ;LOAD OUTBUF WITH CHAR TO BE TRANSMITTED
003740  012737  177777  001440         MOV     #-1,WCT         ;SET UP TO TRANSMIT 1 CHAR
003746  012737  177777  002126         MOV     #-1,@#CARMSK    ;PRE SET THE CHARACTER MASK
003754  012737  007362  001400         MOV     #OUTBUF,CAT     ;1 CHARACTER ON LINE 0
003762  012777  004020  175562         MOV     #3$,@CLKINT     ;LOAD RECEIVER INTERRUPT
003770  012777  000340  175556         MOV     #340,@CLKLVL    ;AND PRIORITY LEVEL
003776  005037  001600                 CLR     TUMTAB
004002  012777  000001  175534         MOV     #1,@BAR         ;START TRANSMITTING
004010  012777  000105  175524         MOV     #BIT6+BIT2+BIT0,@CSR    ;SET IE,MAINT AND GO BITS
004016  000001                         WAIT                    ;WAIT FOR RECEIVER INTERRUPT
004020  005077  175516         3$:     CLR     @CSR
004024  143737  001600  002126         BICB    TUMTAB,CARMSK   ;LOAD CHARACTER LENGTH MASK
004032  005037  177776                 CLR     PSW             ;RESTORE PROCEESSER TO PRIORITY 0
004036  022626                         POPSP2                  ;RESTORE THE STACK POINTER
004040  000207                         RTS     7               ;EXIT PARAMETERS ROUTINE

                                ;ROUTINE TO LOAD TRAP/INTERRUPT VECTOR AREA WITH HALT,,+2. HALTS PROGRAM
                                ;AT ADDRESS OF TRAP/INTERRUPT VECTOR +2.
004042  012701  000300         OVRLAY: MOV     #300,%1
004046  012702  000302                 MOV     #302,%2
004052  010221                 1$:     MOV     %2,(1)+
004054  005021                         CLR     (1)+
004056  020227  000776                 CMP     %2,#776
004062  001403                         BEQ     2$
004064  062702  000004                 ADD     #4,%2
004070  000770                         BR      1$
004072  000240                 2$:     NOP
004074  000207                         RTS     7               ;EXIT

                                ;SUBROUTINE TO RECEIVE DATA
                                ;THIS SUBROUTINE RECEIVES DATA FROM THE KEYBOARD (UP TO SIX OCTAL
                                ;DIGITS AND PLACES THEM INTO THE ADDRESS FOLLOWING THE SUBROUTINE
                                ;CALL (JSR 5,RECD).  NO REGISTER CONTENTS ARE DISTURBED.


                                ;SUBROUTINE TO INPUT DATA FROM TTY

004076  010046                 RECD:   MOV     R0,-(SP)
004100  005015                 1$:     CLR     (5)                     ;CLEAR OLD DATA
004102  012737  000007  004254         MOV     #7,CNT                  ;SET CHAR COUNT
004110  105777  175776         2$:     TSTB    @TKCSR                  ;WAIT FOR CHAR
004114  100375                         BPL     2$
```

```
                                                MOVB    @TKDBR,R0
                                                BICB    #200,R0         ;STRIP OFF PARITY
                                                MOVB    R0,@TPDBR       ;ECHO CHARACTER
                                                CMPB    #25,R0          ;IS IT A ^U
                                                BEQ     5$              ;BRANCH IF YES
                                                CMPB    #15,R0          ;IS IT A <CR>
                                                BEQ     6$              ;BRANCH IF YESS
                                                BICB    #60,R0
                                                BITB    #110,R0         ;CHECK FOR 0-7 (8)
                                                BNE     7$              ;BRANCH IF NOT
                                                ASL     (5)
                                                ASL     (5)
                                                ASL     (5)             ;SHIFT DATA
                                                BISB    R0,(5)          ;INSET NEW CHAR
                                                DEC     CNT
                                                BEQ     7$              ;ONLY 6 CHAR'S PLEASE
                                                BR      2$              ;NEXT CHARACTER
                                        6$:     TSTB    @TPCSR
                                                BPL     6$              ;WAIT FOR READY
                                                MOV     #12,@TPDBR      ;TYPE <LF>
                                        8$:     TSTB    @TPCSR
                                                BPL     8$              ;WAIT FOR READY
                                                CLR     @TPDBR          ;NEXT CHARACTER
                                        9$:     TSTB    @TPCSR
                                                BPL     9$              ;WAIT FOR READY
                                                TST     (R5)+           ;ADJUST R5
                                                MOV     (SP)+,R0        ;RESTORE R0
                                                RTS     R5
                                        7$:     TYPE
                                                M1
                                        5$:     TYPE
                                                $CTLU
                                                BR      1$                      ;START OVER
                                        CNT:    0


                                        ;ROUTINE TO CHECK FOR ^G BEING TYPED

                                        KBDINTT:CMP     #SWREG,SWR
                                                BNE     1$
                                                CMP     @#42,@#46               ;ACT11?
                                                BEQ     1$              ;BR IF YES
                                                CLR     TMP1                    ;CLEAR TEMP AREA
                                                MOVB    @TKDBR,TMP1             ;FETCH THE BUFFER
                                                BICB    #200,TMP1               ;STRIP OFF PARITY
                                                CMPB    #7,TMP1                 ;WAS IT ^G
                                                BNE     1$                      ;NOP
                                                CNTLU                           ;GO CHANGE IT
                                        1$:     RTI                             ;EXIT


                                        ;ROUTINE TO CHANGE CONTENTS OF SWREG(LOC 176)

                                        CNTLUU: CMP     #SWREG,SWR
                                                BNE     FAJAG
                                                TYPE
```

```
 918  004344  013111                          $SWREG
 919  004346  004537  005112                  JSR     R5,DACNV                ;CONVERT TO ASCII
 920  004352  000176                          SWREG
 921  004354  013120                          $VALUE
 922  004356  000006                          6
 923  004360  104000                          TYPE
 924  004362  013120                          $VALUE
 925  004364  004537  004076                  JSR     5,RECD          ;GET THE TMP1 &
 926  004370  000000                  TMP1:   0                       ;PUT IT HERE
 927  004372  022737  000007  004254          CMP     #7,CNT
 928  004400  001403                          BEQ     FAJAG
 929  004402  013777  004370  174572          MOV     TMP1,@SWR               ;CHANGE CONTENTS OF SWREG
 930  004410  000002                  FAJAG:  RTI
 931
 932
 933  004412  013746  000006          SUSWRR: MOV     @#6,-(SP)               ;SAVE VECTORS
 934  004416  013746  000004                  MOV     @#4,-(SP)
 935  004422  012737  004442  000004          MOV     #1$,@#4                 ;SET UP FOR TIMEOUT
 936  004430  022777  177777  174544          CMP     #-1,@SWR                ;REFERENCE HARDWARE SWITCH REGISTER
 937  004436  001402                          BEQ     2$
 938  004440  000407                          BR      3$
 939  004442  022626                  1$:     CMP     (SP)+,(SP)+             ;ADJUST STACK
 940  004444  012737  000176  001202  2$:     MOV     #SWREG,SWR              ;POINT TO SOFTWARE SWITCH REG
 941  004452  012737  000174  001204          MOV     #DISPREG,DISPLAY                ;POINT TO SOFT DISPLAY REG
 942  004460  012637  000004          3$:     MOV     (SP)+,@#4               ;RESTORE VECTORS
 943  004464  012637  000006                  MOV     (SP)+,@#6
 944  004470  000002                          RTI
 945
```

```
 946                                    ;SUBROUTINE TO TRANSMIT ON ALL LINES WITH A DELAY BETWEEN TRANSMITTING
 947                                    ;ON SUCCESSIVE LINES. THE DELAY FOR THE TEST IS SUPPLIED BY THE
 948                                    ;CALLING JSR INSTRUCTION. DATA IS CHECKED AFTER ALL
 949                                    ;LINES HAVE FINISHED TRANSMITTING.
 950
 951  004472  000240                    DLYXMT: NOP                             ;BEGIN TEST
 952  004474  012777  001400  175046            MOV     #CAT,@BASREG    ;SET UP BASE REGISTER
 953  004502  004737  005024                    JSR     7,@#IDENT               ;TRANSMIT LINE # ON EACH LINE
 954  004506  000240                            NOP                             ;NOP
 955  004510  005077  175026                    CLR     @CSR
 956  004514  012537  004524                    MOV     (5)+,10$        ;GET MESSAGE ADDRESS
 957  004520  004537  005200                    JSR     5,@#BMOVE       ;LOAD OUTPUT BUFFER
 958  004524  000000                    10$:    OPEN                            ;WITH DATA TO
 959  004526  007362                            OUTBUF                          ;BE TRANSMITTED
 960  004530  000100                            64.
 961  004532  005037  001600                    CLR     @#TUMTAB        ;CLEAR TUMBLE
 962  004536  004537  005200                    JSR     5,@#BMOVE               ;TABLE (200
 963  004542  001600                            TUMTAB                  ;BYTES)
 964  004544  001601                            TUMTAB+1
 965  004546  000177                            177
 966  004550  004537  005200                    JSR     5,@#BMOVE       ;CLEAR CHARACTER COUNT TABLE
 967  004554  001600                            TUMTAB
 968  004556  012666                            CNTTAB
 969  004560  000020                            16.
 970  004562  005037  007526                    CLR     @#LNOBUF
 971  004566  004537  005200                    JSR     5,@#BMOVE       ;CLEAR ALL
 972  004572  007526                            LNOBUF                  ;LINE'S INPUT
 973  004574  007527                            LNOBUF+1                ;BUFFERS
 974  004576  003077                            1599.                   ;(16. BUFFERS OF 100. CHARS. EACH)
 975  004600  022737  000006  002446            CMP     #6,PRGNUM
 976  004606  001002                            BNE     .+6
 977  004610  000137  007062                    JMP     PRG3A
 978  004614  012504                            MOV     (5)+,%4         ;GET # OF CHARACTERS TO TRANSMIT BEFORE
 979                                            ;TRANSMITTING ON NEXT LINE
 980  004616  012737  001600  001572            MOV     #TUMTAB,@#TTPTR ;INITIALIZE TUMBLE TABLE POINTER
 981  004624  013701  001552                    MOV     @#CLKINT,%1     ;GET RECEIVER VECTOR ADDRESS
 982  004630  012721  005426                    MOV     #RINT,(1)+      ;LOAD RECEIVER VECTOR
 983  004634  013721  001554                    MOV     @#CLKLVL,(1)+   ;AND PRIORITY LEVEL
 984  004640  012721  005620                    MOV     #TINT,(1)+      ;LOAD TRANSMITTER VECTOR
 985  004644  013721  001560                    MOV     @#XMTLVL,(1)+   ;AND PRIORITY LEVEL
 986  004650  005737  002446                    TST     PRGNUM          ;RUNNING PROGRAM 0?
 987  004654  001402                            BEQ     .+6
 988  004656  000137  006666                    JMP     PRG1A           ;RETURN TO PROGRAM 1 CODE
 989  004662  012777  010101  174652            MOV     #BIT12+BIT6+BIT0,@CSR   ;SET IE & GO BITS
 990  004670  012737  000001  001566            MOV     #1,@#LINBIT
 991  004676  005037  002140                    CLR     @#LINE
 992  004702  013700  002140          1$:       MOV     LINE,%0         ;LINE # X2 TO R0
 993  004706  000240                            NOP                             ;NOP
 994  004710  004537  005222                    JSR     5,@#XMITD               ;TRANSMIT 64 CHARACTERS
 995  004714  177700                            -64.                    ;ON LINE # AS SPECIFIED IN ADDRESS LINE
 996  004716  020460  001440          2$:       CMP     %4,WCT(0)       ;WAIT FOR THE WORD COUNT TO DEC TO THE
 997  004722  001375                            BNE     2$              ;CORRECT VALUE BEFORE STARTING NEXT LINE
 998  004724  062737  000002  002140            ADD     #2,LINE         ;FORM NEXT LINE NUMBER
 999  004732  006337  001566                    ASL     LINBIT          ;SHIFT LINE BIT
1000  004736  103361                            BCC     1$              ;START NEXT LINE
1001  004740  005760  001440          3$.       TST     WCT(0)          ;WAIT FOR LAST LINE TO FINISH
```

```
 1002  004744  001375                          BNE     3$
 1003  004746  042777  177400  174566          BIC     #177400,@CSR    ;CLEAR ODD BYTE OF CSR
 1004  004754  062700  000001          31$:    ADD     #1,R0           ;WAIT FOR RECEIVER TO RECEIVE
 1005  004760  001375                          BNE     31$             ;ALL TRANSMITTED DATA
 1006  004762  017737  174556  002122          MOV     @BAR,RCVDAT     ;GET AND TEST BAR CONTENTS
 1007  004770  001410                          BEQ     4$              ;BRANCH IF IS CLEAR
 1008  004772  005037  002124                  CLR     XMTDAT
 1009  004776  005077  174540                  CLR     @CSR
 1010  005002  005077  174536                  CLR     @BAR
 1011  005006  104015                          ERROR1                  ;ERROR. BAR DID NOT CLEAR IN SUFICIENT TIME
 1012  005010  000403                          BR      5$              ;EXIT TEST
 1013  005012  000240                  4$:     NOP
 1014  005014  004737  005320                  JSR     7,@#CHKDAT      ;GO TEST DATA
 1015  005020  022626                  5$:     CMP     (6)+,(6)+       ;RESET THE STACK
 1016  005022  104012                          SCOPE                   ;SCOPE
 1017
 1018
 1019                                          ;SUBROUTINE TO TRANSMIT ON EACH LINE ITS LINE NUMBER (CRLF XX CRLF).
 1020  005024  005037  002140          IDENT:  CLR     @#LINE          ;GET LINE NUMBER 0
 1021  005030  012737  000001  001566          MOV     #1,@#LINBIT     ;GET LINE BIT
 1022  005036  013702  002140          1$:     MOV     LINE,%2
 1023  005042  016262  012706  001400          MOV     ID(2),CAT(2)    ;LOAD CAT
 1024  005050  012762  177772  001440          MOV     #-6,WCT(2)      ;LOAD WORD COUNT
 1025  005056  053777  001566  174460          BIS     LINBIT,@BAR     ;SET BAR BIT
 1026  005064  062737  000002  002140          ADD     #2,LINE         ;FORM NEXT LINE NUMBER
 1027  005072  006337  001566                  ASL     LINBIT          ;FORM NEXT LINE BIT
 1028  005076  103357                          BCC     1$              ;BRANCH IF NOT DONE
 1029  005100  005777  174440          2$:     TST     @BAR            ;WAIT FOR BAR TO CLEAR
 1030  005104  001375                          BNE     2$
 1031  005106  000240                          NOP
 1032  005110  000207                          RTS     7               ;EXIT SUBROUTINE
 1033
 1034                                          ;OCTAL TO ASCII CONVERT ROUTINE
 1035  005112  104013                  OACNV:  SAVREG                  ;SAVE REGISTERS ON THE STACK
 1036  005114  013537  005176                  MOV     @(5)+,2$        ;GET OCTAL VALUE.
 1037  005120  012501                          MOV     (5)+,%1         ;GET DESTINATION ADDR.
 1038  005122  012502                          MOV     (5)+,%2         ;GET CONVERT COUNT.
 1039  005124  060201                          ADD     %2,%1           ;DEVELOP ADDR TO STORE 1ST CHAR.
 1040  005126  013703  005176          1$:     MOV     2$,%3
 1041  005132  042703  177770                  BIC     #177770,%3      ;ISOLATE LEAST SIGNIFICANT DIGIT.
 1042  005136  062703  000060                  ADD     #60,%3          ;CONVERT DIGIT TO ASCII.
 1043  005142  110334                          MOVB    %3,-(1)         ;STORE ASCII CHARACTER.
 1044  005144  042737  000007  005176          BIC     #7,2$
 1045  005152  006037  005176                  ROR     2$
 1046  005156  006037  005176                  ROR     2$
 1047  005162  006037  005176                  ROR     2$
 1048  005166  005302                          DEC     %2              ;DONE ALL DIGITS?
 1049  005170  001356                          BNE     1$              ;BRANCH IF NOT DONE.
 1050  005172  104014                          RSTREG                  ;RESTORE THE REGISTERS
 1051  005174  000205                          RTS     %5              ;DONE. EXIT.
 1052  005176  000000                  2$:     OPEN
 1053
 1054
 1055
 1056                                          ;SUBROUTINE TO MOVE A VARIABLE NUMBER OF BYTES.
 1057  005200  104013                  BMOVE:  SAVREG                  ;SAVE REGS.
```

SEQ 0022

```
 1058  005202  012501                    MOV     (5)+,%1         ;GET''FROM''ADDRESS
 1059  005204  012502                    MOV     (5)+,%2         ;GET''TO''ADDRESS
 1060  005206  012503                    MOV     (5)+,%3         ;GET COUNT
 1061  005210  112122            1$:     MOVB    (1)+,(2)+       ;MOVE BYTE
 1062  005212  005303                    DEC     %3              ;DECREMENT COUNT
 1063  005214  001375                    BNE     1$              ;BRANCH IF NOT DONE.
 1064  005216  104014                    RSTREG                  ;RESTORE REGS.
 1065  005220  000205                    RTS     %5              ;DONE EXIT
```

```
1066
1067
1068                                    ;SUBROUTINE TO TRANSMIT DATA.  SUBROUTINE CALLED BY
1069                                    ;JSR 5,XMITD
1070  005222  000240                    XMITD:  NOP
1071  005224  010046                            MOV     %0,-(SP)          ;SAVE R0 ON THE STACK
1072  005226  013700  002140                    MOV     @#LINE,%0         ;GET LINE
1073  005232  012760  007362  001400            MOV     #OUTBUF,CAT(0)    ;LOAD FIRST CHAR ADDRESS IN CAT
1074  005240  012560  001440                    MOV     (5)+,WCT(0)       ;LOAD WORD COUNT INTO LINE'S TABLE ADDRESS
1075  005244  053737  001566  001562            BIS     @#LINBIT,@#BARIM;LOAD LINE POSITION INTO BAR IMAGE
1076  005252  053777  001566  174264            BIS     LINBIT,@BAR       ;START TRANSMITTING ON LINE SPECIFIED
1077                                                                      ;IN LINBIT
1078  005260  012600                            MOV     (SP)+,%0          ;RESTORE R0
1079  005262  000240                            NOP
1080  005264  000205                            RTS     5                 ;EXIT
1081
1082                                    ;SUBROUTINE TO FORM LINE BIT POSITION WITH THE LINE # IN LINE
1083  005266  010046                    GTLINB: MOV     %0,-(SP)          ;SAVE R0 ON THE STACK
1084  005270  005037  001566                    CLR     @#LINBIT
1085  005274  013700  002140                    MOV     @#LINE,%0         ;GET LINE
1086  005300  000261                            SEC                       ;SET CARRY
1087  005302  006137  001566            1$:     ROL     LINBIT            ;SHIFT LINE BIT
1088  005306  162700  000002                    SUB     #2,%0             ;SUBTRACT 2 FROM LINE NUMBER
1089  005312  100373                            BPL     1$
1090  005314  012600                            MOV     (SP)+,%0          ;RESTORE R0
1091  005316  000207                            RTS     7                 ;EXIT
1092
1093
1094                                    ;SUBROUTINE TO CHECK TRANSMITTED DATA
1095  005320  104013                    CHKDAT: SAVREG                    ;SAVE THE REGISTERS ON THE STACK
1096  005322  000240                            NOP                       ;NOP
1097  005324  005001                            CLR     %1                ;CLEAR CHARACTER COUNT
1098  005326  012702  012626                    MOV     #INTAB,%2         ;GET ADDRESS OF LINE'S INPUT BUFFER
1099  005332  005003                            CLR     %3                ;ADDRESS ;GET LINE COUNT
1100  005334  010337  002140            1$:     MOV     %3,@#LINE         ;MOVE LINE # TO LINE
1101  005340  012237  002142                    MOV     (2)+,@#LINBUF     ;GET LINE'S INPUT BUFFER ADDRESS
1102  005344  005337  002142                    DEC     LINBUF            ;SUBTRACT 1 FROM LINE'S INPUT BUFFER ADDRESS
1103  005350  005237  002142            2$:     INC     LINBUF            ;INCREMENT LINE'S INPUT BUFFER ADDRESS
1104  005354  117737  174562  002122            MOVB    @LINBUF,@#RCVDAT          ;GET RECEIVED CHARACTER
1105  005362  116137  007362  002124            MOVB    OUTBUF(1),XMTDAT;GET TRANSMITTED CHARACTER
1106  005370  043737  002126  002124            BIC     @#CARMSK,XMTDAT ;CLEAR UNTRANSMITTED BITS
1107  005376  104004                            DATCHK                    ;COMPARE CHARACTERS
1108  005400  005201                            INC     %1                ;INCREMENT CHARACTER COUNT
1109  005402  020127  000100                    CMP     %1,#64.           ;ALL CHARACTERS BEEN COMPARED
1110  005406  001360                            BNE     2$                ;GO CHECK NEXT CHAR. IF NOT
1111  005410  005001                            CLR     %1                ;CLEAR CHARACTER COUNT
1112  005412  005203                            INC     %3                ;INCREMENT LINE COUNT
1113  005414  020327  000020                    CMP     %3,#16.           ;ALL LINES CHECKED?
1114  005420  002745                            BLT     1$                ;BRANCH IF ALL LINES NOT CHECKED
1115  005422  104014                            RSTREG                    ;RESTORE REGISTERS
1116  005424  000207                            RTS     7                 ;EXIT SUBROUTINE
1117
1118
1119                                    ;RECEIVER INTERRUPT SERVICE ROUTINE
1120  005426  000240                    RINT:   NOP                       ;BEGIN
1121  005430  104013                            SAVREG                    ;SAVE THE REGISTERS ON THE STACK
```

```
1122  005432  013701  001572                  MOV     @#TTPTR,%1      ;GET TUMBLE TABLE POINTER
1123  005436  011137  001564                  MOV     (1),TTDAT       ;GET TUMBLE TABLE ENTRY
1124  005442  100410                          BMI     2$              ;BRANCH IF VALID DATA ENTRY
1125  005444  104003                          ERROR                   ;ERROR! FALSE INTERRUPT
1126  005446  000454                          BR      6$              ;EXIT
1127  005450  011137  001564          1$:     MOV     (1),@#TTDAT     ;GET TUMBLE TABLE ENTRY
1128  005454  001451                          BEQ     6$              ;GO TO EXIT IF NO DATA ENTRY
1129  005456  100402                          BMI     2$              ;BRANCH IF VALID DATA ENTRY
1130  005460  104003                          ERROR                   ;ERROR! NO VALID DATA ENTRY INDICATOR
1131  005462  000425                          BR      3$
1132  005464  005011                  2$:     CLR     (1)             ;CLEAR TUMBLE TABLE ENTRY
1133  005466  042737  160400  001564          BIC     #160400,@#TTDAT ;CLEAR ALL BUT CHAR. & LINE #
1134  005474  113702  001565                  MOVB    TTDAT+1,%2      ;PUT LINE # IN R2 (LINE WILL BE IN LSH)
1135  005500  010204                          MOV     %2,%4
1136  005502  016237  012626  002142          MOV     INTAB(2),@#LINBUF       ;GET LINE'S INPUT BUFFER ADDRESS
1137  005510  006202                          ASR     %2              ;SHIFT LINE #
1138  005512  005003                          CLR     %3
1139  005514  116203  012666                  MOVB    CNTTAB(2),%3    ;GET LINE'S RECEIVED CHAR. COUNT
1140  005520  105262  012666                  INCB    CNTTAB(2)       ;INCREMENT CHARACTER COUNT
1141  005524  060337  002142                  ADD     %3,LINBUF       ;FORM ADDRESS WHERE CHAR. IS TO BE STORED
1142  005530  113777  001564  174404          MOVB    TTDAT,@LINBUF   ;STORE CHAR. IN LINE'S INPUT BUFFER
1143  005536  000240                  3$:     NOP                     ;NOP
1144  005540  016437  001440  002122          MOV     WCT(4),RCVDAT   ;GET TRANSMITTERS WORD COUNT
1145  005546  003405                          BLE     4$              ;BRANCH IF WORD COUNT IS 0 OR NEGATIVE
1146  005550  010437  002124                  MOV     %4,XMTDAT       ;GET LINE # OF FAILING LINE
1147  005554  104015                          ERROR1                  ;ERROR! INCORRECT WORD COUNT IN
1148                                  ;TYPE OUT SHOWS FAILING LINE #, AND FAILING LINE'S WORD COUNT
1149  005556  000005                          RESET                   ;STOP THE DM11
1150  005560  104012                          SCOPE                   ;EXIT TEST
1151
1152  005562  022701  001776          4$:     CMP     #TUMTAB+176,%1  ;IS THE TUMBLE TABLE POINTER AT THE
1153  005566  001002                          BNE     5$              ;THE END OF THE TABLE
1154  005570  012701  001576                  MOV     #TUMTAB-2,%1    ;RESET POINTER
1155  005574  005721                  5$:     TST     (1)+            ;INCREMENT POINTER
1156  005576  000724                          BR      1$              ;GO CHECK NEXT ENTRY
1157  005600  042777  000200  173734  6$:     BIC     #BIT7,@CSR      ;CLEAR RECEIVER DONE FLAG
1158  005606  010137  001572                  MOV     %1,TTPTR        ;SAVE POINTER
1159  005612  104014                          RSTREG                  ;RESTORE THE REGISTERS
1160  005614  000240                          NOP
1161  005616  000002                          RTI                     ;EXIT SERVICE ROUTINE
1162
1163                                  ;TRANSMITTER INTERRUPT SERVICE ROUTINE
1164  005620  000240                  TINT:   NOP                     ;BEGIN
1165  005622  032777  060000  173712          BIT     #BIT14+BIT13,@CSR;TEST ERROR FLAGS
1166  005630  001404                          BEQ     1$              ;BRANCH IF NO ERROR FLAGS
1167  005632  104003                          ERROR                   ;ERROR! ERROR FLAG IS SET
1168  005634  042777  060000  173700          BIC     #BIT14+BIT13,@CSR;CLEAR ERROR FLAGS
1169  005642  005777  173674          1$:     TST     @CSR            ;TEST READY FLAG
1170  005646  100003                          BPL     2$              ;BRANCH IF READY IS CLEAR
1171  005650  042777  100000  173664          BIC     #BIT15,@CSR     ;CLEAR READY FLAG
1172  005656  000002                  2$:     RTI
1173
1174
```

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 1175
 1176  005660  104000                  PRGO:   TYPE
 1177  005662  013421                          PRGOM
 1178  005664  012737  005720  002010  PRGOA:  MOV     #RTO,KSTART     ;GET ADDRESS OF FIRST TEST
 1179  005672  005037  002014                  CLR     RTNNO           ;CLEAR ROUTINE #
 1180  005676  000137  002506                  JMP     SRSET
 1181  005702  012737  005720  002010  PRGOR:  MOV     #RTO,KSTART     ;GET ADDRESS OF FIRST TEST
 1182  005710  005037  002014                  CLR     RTNNO           ;CLEAR ROUTINE NUMBER
 1183  005714  000137  002540                  JMP     GETRDY          ;GO AND START PROGRAM
 1184                                          ;*****************************************************************
 1185  005720  000000                  RTO:    0                       ;ROUTINE # 0                           *
 1186  005722  005740                          RT1                     ;ADDR OF NEXT ROUTINE.                 *
 1187  005724  000002                          2                       ;ITERATION COUNT                       *
 1188  005726  005730                          RTOA                    ;SCOPE ENTRY POINT.                    *
 1189          000000                          X=X+1
 1190                                          ;*****************************************************************
 1191                                          ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
 1192                                          ;NEXT LINE.
 1193  005730  004537  004472          RTOA:   JSR     5,DLYXMT        ;GO DO TEST.
 1194  005734  013743                          MSG1                    ;TRANSMIT THIS MESSAGE &
 1195  005736  000000                          0                       ;DELAY THIS MUCH BETWEEN LINES
 1196                                          ;*****************************************************************
 1197  005740  000001                  RT1:    1                       ;ROUTINE # 1                           *
 1198  005742  005760                          RT2                     ;ADDR OF NEXT ROUTINE.                 *
 1199  005744  000002                          2                       ;ITERATION COUNT                       *
 1200  005746  005750                          RT1A                    ;SCOPE ENTRY POINT.                    *
 1201          000001                          X=X+1
 1202                                          ;*****************************************************************
 1203                                          ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
 1204                                          ;NEXT LINE.
 1205  005750  004537  004472          RT1A:   JSR     5,DLYXMT        ;GO DO TEST.
 1206  005754  013743                          MSG1                    ;TRANSMIT THIS MESSAGE &
 1207  005756  177740                          -32.                    ;DELAY THIS MUCH BETWEEN LINES
 1208                                          ;*****************************************************************
 1209  005760  000002                  RT2:    2                       ;ROUTINE # 2                           *
 1210  005762  006000                          RT3                     ;ADDR OF NEXT ROUTINE.                 *
 1211  005764  000002                          2                       ;ITERATION COUNT                       *
 1212  005766  005770                          RT2A                    ;SCOPE ENTRY POINT.                    *
 1213          000002                          X=X+1
 1214                                          ;*****************************************************************
 1215                                          ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
 1216                                          ;NEXT LINE.
 1217  005770  004537  004472          RT2A:   JSR     5,DLYXMT        ;GO DO TEST.
 1218  005774  013743                          MSG1                    ;TRANSMIT THIS MESSAGE &
 1219  005776  177720                          -48.                    ;DELAY THIS MUCH BETWEEN LINES
 1220                                          ;*****************************************************************
 1221  006000  000003                  RT3:    3                       ;ROUTINE # 3                           *
 1222  006002  006020                          RT4                     ;ADDR OF NEXT ROUTINE.                 *
 1223  006004  000002                          2                       ;ITERATION COUNT                       *
 1224  006006  006010                          RT3A                    ;SCOPE ENTRY POINT.                    *
 1225          000003                          X=X+1
 1226                                          ;*****************************************************************
 1227                                          ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
 1228                                          ;NEXT LINE.
 1229  006010  004537  004472          RT3A:   JSR     5,DLYXMT        ;GO DO TEST.
 1230  006014  013743                          MSG1                    ;TRANSMIT THIS MESSAGE &
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1231  006016  177710                  -56.                    ;DELAY THIS MUCH BETWEEN LINES
1232                          ;*****************************************************************
1233  006C20  000004           RT4:    4                       ;ROUTINE # 4                  *
1234  006022  006040                   RT5                     ;ADDR OF NEXT ROUTINE.        *
1235  006024  000002                   2                       ;ITERATION COUNT              *
1236  006026  006030                   RT4A                    ;SCOPE ENTRY POINT.           *
1237           000004                   X=X+1
1238                          ;*****************************************************************
1239                          ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
1240                          ;NEXT LINE.
1241  006030  004537  004472  RT4A:   JSR     5,DLYXMT        ;GO DO TEST.
1242  006034  013743                   MSG1                    ;TRANSMIT THIS MESSAGE &
1243  006036  177704                   -60.                    ;DELAY THIS MUCH BETWEEN LINES
1244                          ;*****************************************************************
1245  006040  000005           RT5:    5                       ;ROUTINE # 5                  *
1246  006042  006060                   RT6                     ;ADDR OF NEXT ROUTINE.        *
1247  006044  000002                   2                       ;ITERATION COUNT              *
1248  006046  006050                   RT5A                    ;SCOPE ENTRY POINT.           *
1249           000005                   X=X+1
1250                          ;*****************************************************************
1251                          ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
1252                          ;NEXT LINE.
1253  006050  004537  004472  RT5A:   JSR     5,DLYXMT        ;GO DO TEST.
1254  006054  013743                   MSG1                    ;TRANSMIT THIS MESSAGE &
1255  006056  177702                   -62.                    ;DELAY THIS MUCH BETWEEN LINES
1256                          ;*****************************************************************
1257  006060  000006           RT6:    6                       ;ROUTINE # 6                  *
1258  006062  006100                   RT7                     ;ADDR OF NEXT ROUTINE.        *
1259  006064  000002                   2                       ;ITERATION COUNT              *
1260  006066  006070                   RT6A                    ;SCOPE ENTRY POINT.           *
1261           000006                   X=X+1
1262                          ;*****************************************************************
1263                          ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
1264                          ;NEXT LINE.
1265  006070  004537  004472  RT6A:   JSR     5,DLYXMT        ;GO DO TEST.
1266  006074  013743                   MSG1                    ;TRANSMIT THIS MESSAGE &
1267  006076  177701                   -63.                    ;DELAY THIS MUCH BETWEEN LINES
1268                          ;*****************************************************************
1269  006100  000007           RT7:    7                       ;ROUTINE # 7                  *
1270  006102  006120                   RT10                    ;ADDR OF NEXT ROUTINE.        *
1271  006104  000002                   2                       ;ITERATION COUNT              *
1272  006106  006110                   RT7A                    ;SCOPE ENTRY POINT.           *
1273           000007                   X=X+1
1274                          ;*****************************************************************
1275                          ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
1276                          ;NEXT LINE.
1277  006110  004537  004472  RT7A:   JSR     5,DLYXMT        ;GO DO TEST.
1278  006114  013743                   MSG1                    ;TRANSMIT THIS MESSAGE &
1279  006116  177700                   -64.                    ;DELAY THIS MUCH BETWEEN LINES
1280                          ;*****************************************************************
1281  006120  000010           RT10:   10                      ;ROUTINE # 10                 *
1282  006122  006140                   RT11                    ;ADDR OF NEXT ROUTINE.        *
1283  006124  000002                   2                       ;ITERATION COUNT              *
1284  006126  006130                   RT10A                   ;SCOPE ENTRY POINT.           *
1285           000010                   X=X+1
1286                          ;*****************************************************************
```

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 1287                                   ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
 1288                                   ;NEXT LINE.
 1289  006130  004537  004472  RT10A:  JSR     5,DLYXMT        ;GO DO TEST.
 1290  006134  014044                   MSG2                    ;TRANSMIT THIS MESSAGE &
 1291  006136  177740                   -32.                    ;DELAY THIS MUCH BETWEEN LINES
 1292                                   ;*****************************************************************************
 1293  006140  000011          RT11:    11                      ;ROUTINE # 11                                        *
 1294  006142  006160                   RT12                    ;ADDR OF NEXT ROUTINE.                               *
 1295  006144  000002                   2                       ;ITERATION COUNT                                     *
 1296  006146  006150                   RT11A                   ;SCOPE ENTRY POINT.                                  *
 1297          000011                   X=X+1
 1298                                   ;*****************************************************************************
 1299                                   ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
 1300                                   ;NEXT LINE.
 1301  006150  004537  004472  RT11A:  JSR     5,DLYXMT        ;GO DO TEST.
 1302  006154  014044                   MSG2                    ;TRANSMIT THIS MESSAGE &
 1303  006156  177720                   -48.                    ;DELAY THIS MUCH BETWEEN LINES
 1304                                   ;*****************************************************************************
 1305  006160  000012          RT12:    12                      ;ROUTINE # 12                                        *
 1306  006162  006200                   RT13                    ;ADDR OF NEXT ROUTINE.                               *
 1307  006164  000002                   2                       ;ITERATION COUNT                                     *
 1308  006166  006170                   RT12A                   ;SCOPE ENTRY POINT.                                  *
 1309          000012                   X=X+1
 1310                                   ;*****************************************************************************
 1311                                   ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
 1312                                   ;NEXT LINE.
 1313  006170  004537  004472  RT12A:  JSR     5,DLYXMT        ;GO DO TEST.
 1314  006174  014044                   MSG2                    ;TRANSMIT THIS MESSAGE &
 1315  006176  177710                   -56.                    ;DELAY THIS MUCH BETWEEN LINES
 1316                                   ;*****************************************************************************
 1317  006200  000013          RT13:    13                      ;ROUTINE # 13                                        *
 1318  006202  006220                   RT14                    ;ADDR OF NEXT ROUTINE.                               *
 1319  006204  000002                   2                       ;ITERATION COUNT                                     *
 1320  006206  006210                   RT13A                   ;SCOPE ENTRY POINT.                                  *
 1321          000013                   X=X+1
 1322                                   ;*****************************************************************************
 1323                                   ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
 1324                                   ;NEXT LINE.
 1325  006210  004537  004472  RT13A:  JSR     5,DLYXMT        ;GO DO TEST.
 1326  006214  014044                   MSG2                    ;TRANSMIT THIS MESSAGE &
 1327  006216  177704                   -60.                    ;DELAY THIS MUCH BETWEEN LINES
 1328                                   ;*****************************************************************************
 1329  006220  000014          RT14:    14                      ;ROUTINE # 14                                        *
 1330  006222  006240                   RT15                    ;ADDR OF NEXT ROUTINE.                               *
 1331  006224  000002                   2                       ;ITERATION COUNT                                     *
 1332  006226  006230                   RT14A                   ;SCOPE ENTRY POINT.                                  *
 1333          000014                   X=X+1
 1334                                   ;*****************************************************************************
 1335                                   ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
 1336                                   ;NEXT LINE.
 1337  006230  004537  004472  RT14A:  JSR     5,DLYXMT        ;GO DO TEST.
 1338  006234  014044                   MSG2                    ;TRANSMIT THIS MESSAGE &
 1339  006236  177702                   -62.                    ;DELAY THIS MUCH BETWEEN LINES
 1340                                   ;*****************************************************************************
 1341  006240  000015          RT15:    15                      ;ROUTINE # 15                                        *
 1342  006242  006260                   RT16                    ;ADDR OF NEXT ROUTINE.                               *
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1343  006244  000002                          2                       ;ITERATION COUNT                *
1344  006246  006250                          RT15A                   ;SCOPE ENTRY POINT.             *
1345          000015                          X=X+1
1346                                  ;*************************************************************************
1347                                  ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
1348                                  ;NEXT LINE.
1349  006250  004537  004472          RT15A:  JSR     5,DLYXMT        ;GO DO TEST.
1350  006254  014044                          MSG2                    ;TRANSMIT THIS MESSAGE &
1351  006256  177701                          -63.                    ;DELAY THIS MUCH BETWEEN LINES
1352                                  ;*************************************************************************
1353  006260  000016                  RT16:   16                      ;ROUTINE # 16                   *
1354  006262  006300                          RT17                    ;ADDR OF NEXT ROJTINE.          *
1355  006264  000002                          2                       ;I"ERATION COUNT                *
1356  006266  006270                          RT16A                   ;SCOPE ENTRY POINT.             *
1357          000016                          X=X+1
1358                                  ;*************************************************************************
1359                                  ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
1360                                  ;NEXT LINE.
1361  006270  004537  004472          RT16A:  JSR     5,DLYXMT        ;GO DO TEST.
1362  006274  014044                          MSG2                    ;TRANSMIT THIS MESSAGE &
1363  006276  177700                          -64.                    ;DELAY THIS MUCH BETWEEN LINES
1364                                  ;*************************************************************************
1365  006300  000017                  RT17:   17                      ;ROUTINE # 17                   *
1366  006302  006320                          RT20                    ;ADDR OF NEXT ROUTINE.          *
1367  006304  000002                          2                       ;ITERATION COUNT                *
1368  006306  006310                          RT17A                   ;SCOPE ENTRY POINT.             *
1369          000017                          X=X+1
1370                                  ;*************************************************************************
1371                                  ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
1372                                  ;NEXT LINE.
1373  006310  004537  004472          RT17A:  JSR     5,DLYXMT        ;GO DO TEST.
1374  006314  014144                          MSG3                    ;TRANSMIT THIS MESSAGE &
1375  006316  177720                          -48.                    ;DELAY THIS MUCH BETWEEN LINES
1376                                  ;*************************************************************************
1377  006320  000020                  RT20:   20                      ;ROUTINE # 20                   *
1378  006322  006340                          RT21                    ;ADDR OF NEXT ROUTINE.          *
1379  006324  000002                          2                       ;ITERATION COUNT                *
1380  006326  006330                          RT20A                   ;SCOPE ENTRY POINT.             *
1381          000020                          X=X+1
1382                                  ;*************************************************************************
1383                                  ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
1384                                  ;NEXT LINE.
1385  006330  004537  004472          RT20A:  JSR     5,DLYXMT        ;GO DO TEST.
1386  006334  014144                          MSG3                    ;TRANSMIT THIS MESSAGE &
1387  006336  177704                          -60.                    ;DELAY THIS MUCH BETWEEN LINES
1388                                  ;*************************************************************************
1389  006340  000021                  RT21:   21                      ;ROUTINE # 21                   *
1390  006342  006360                          RT22                    ;ADDR OF NEXT ROUTINE.          *
1391  006344  000002                          2                       ;ITERATION COUNT                *
1392  006346  006350                          RT21A                   ;SCOPE ENTRY POINT.             *
1393          00C021                          X=X+1
1394                                  ;*************************************************************************
1395                                  ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
1396                                  ;NEXT LINE.
1397  006350  004537  004472          RT21A:  JSR     5,DLYXMT        ;GO DO TEST.
1398  006354  014144                          MSG3                    ;TRANSMIT THIS MESSAGE &
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SEQ 0029

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1399  006356  177701                  -63.                    ;DELAY THIS MUCH BETWEEN LINES
1400                          ;*********************************************************** *********
1401  006360  000022          RT22:   22                      ;ROUTINE # 22                          *
1402  006362  006400                  RT23                    ;ADDR OF NEXT ROUTINE.                 *
1403  006364  000002                  2                       ;ITERATION COUNT                       *
1404  006366  006370                  RT22A                   ;SCOPE ENTRY POINT.                    *
1405           000022                 X=X+1                                                          *
1406                          ;*************************************************************************
1407                          ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
1408                          ;NEXT LINE.
1409  006370  004537  004472  RT22A:  JSR     5,DLYXMT        ;GO DO TEST.
1410  006374  014144                  MSG3                    ;TRANSMIT THIS MESSAGE &
1411  006376  177700                  -64.                    ;DELAY THIS MUCH BETWEEN LINES
1412                          ;*************************************************************************
1413  006400  000023          RT23:   23                      ;ROUTINE # 23                          *
1414  006402  006420                  RT24                    ;ADDR OF NEXT ROUTINE.                 *
1415  006404  000002                  2                       ;ITERATION COUNT                       *
1416  006406  006410                  RT23A                   ;SCOPE ENTRY POINT.                    *
1417           000023                 X=X+1                                                          *
1418                          ;*************************************************************************
1419                          ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
1420                          ;NEXT LINE.
1421  006410  004537  004472  RT23A:  JSR     5,DLYXMT        ;GO DO TEST.
1422  006414  014244                  MSG4                    ;TRANSMIT THIS MESSAGE &
1423  006416  177740                  -32.                    ;DELAY THIS MUCH BETWEEN LINES
1424                          ;*************************************************************************
1425  006420  000024          RT24:   24                      ;ROUTINE # 24                          *
1426  006422  006440                  RT25                    ;ADDR OF NEXT ROUTINE.                 *
1427  006424  000002                  2                       ;ITERATION COUNT                       *
1428  006426  006430                  RT24A                   ;SCOPE ENTRY POINT.                    *
1429           000024                 X=X+1                                                          *
1430                          ;*************************************************************************
1431                          ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
1432                          ;NEXT LINE.
1433  006430  004537  004472  RT24A:  JSR     5,DLYXMT        ;GO DO TEST.
1434  006434  014244                  MSG4                    ;TRANSMIT THIS MESSAGE &
1435  006436  177710                  -56.                    ;DELAY THIS MUCH BETWEEN LINES
1436                          ;*************************************************************************
1437  006440  000025          RT25:   25                      ;ROUTINE # 25                          *
1438  006442  006460                  RT26                    ;ADDR OF NEXT ROUTINE.                 *
1439  006444  000002                  2                       ;ITERATION COUNT                       *
1440  006446  006450                  RT25A                   ;SCOPE ENTRY POINT.                    *
1441           000025                 X=X+1                                                          *
1442                          ;*************************************************************************
1443                          ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
1444                          ;NEXT LINE.
1445  006450  004537  004472  RT25A:  JSR     5,DLYXMT        ;GO DO TEST.
1446  006454  014244                  MSG4                    ;TRANSMIT THIS MESSAGE &
1447  006456  177702                  -62.                    ;DELAY THIS MUCH BETWEEN LINES
1448                          ;*************************************************************************
1449  006460  000026          RT26:   26                      ;ROUTINE # 26                          *
1450  006462  006500                  RT27                    ;ADDR OF NEXT ROUTINE.                 *
1451  006464  000002                  2                       ;ITERATION COUNT                       *
1452  006466  006470                  RT26A                   ;SCOPE ENTRY POINT.                    *
1453           000026                 X-X+1                                                          *
1454                          ;*************************************************************************
```

```
1455
1456
1457  006470  004537  004472          ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
1458  006474  014244                  ;NEXT LINE.
1459  006476  177700          RT26A:  JSR     5,DLYXMT        ;GO DO TEST.
1460                                   MSG4                    ;TRANSMIT THIS MESSAGE &
1461  006500  000027                  -64.                    ;DELAY THIS MUCH BETWEEN LINES
1462  006502  006520          ;*********************************************************************
1463  006504  000002          RT27:   27                      ;ROUTINE # 27                        *
1464  006506  006510                  RT30                    ;ADDR OF NEXT ROUTINE.               *
1465          000027                  2                       ;ITERATION COUNT                     *
1466                                  RT27A                   ;SCOPE ENTRY POINT.                  *
1467                                  X=X+1
1468                          ;*********************************************************************
1469  006510  004537  004472          ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
1470  006514  014344                  ;NEXT LINE.
1471  006516  177720          RT27A:  JSR     5,DLYXMT        ;GO DO TEST.
1472                                   MSG5                    ;TRANSMIT THIS MESSAGE &
1473  006520  000030                  -48.                    ;DELAY THIS MUCH BETWEEN LINES
1474  006522  006540          ;*********************************************************************
1475  006524  000002          RT30:   30                      ;ROUTINE # 30                        *
1476  006526  006530                  RT31                    ;ADDR OF NEXT ROUTINE.               *
1477          000030                  2                       ;ITERATION COUNT                     *
1478                                  RT30A                   ;SCOPE ENTRY POINT.                  *
1479                                  X=X+1
1480                          ;*********************************************************************
1481  006530  004537  004472          ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
1482  006534  014344                  ;NEXT LINE.
1483  006536  177710          RT30A:  JSR     5,DLYXMT        ;GO DO TEST.
1484                                   MSG5                    ;TRANSMIT THIS MESSAGE &
1485  006540  000031                  -56.                    ;DELAY THIS MUCH BETWEEN LINES
1486  006542  006560          ;*********************************************************************
1487  006544  000002          RT31:   31                      ;ROUTINE # 31                        *
1488  006546  006550                  RT32                    ;ADDR OF NEXT ROUTINE.               *
1489          000031                  2                       ;ITERATION COUNT                     *
1490                                  RT31A                   ;SCOPE ENTRY POINT.                  *
1491                                  X=X+1
1492                          ;*********************************************************************
1493  006550  004537  004472          ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
1494  006554  014344                  ;NEXT LINE.
1495  006556  177704          RT31A:  JSR     5,DLYXMT        ;GO DO TEST.
1496                                   MSG5                    ;TRANSMIT THIS MESSAGE &
1497  006560  000032                  -60.                    ;DELAY THIS MUCH BETWEEN LINES
1498  006562  006600          ;*********************************************************************
1499  006564  000002          RT32:   32                      ;ROUTINE # 32                        *
1500  006566  006570                  RT33                    ;ADDR OF NEXT ROUTINE.               *
1501          000032                  2                       ;ITERATION COUNT                     *
1502                                  RT32A                   ;SCOPE ENTRY POINT.                  *
1503                                  X=X+1
1504                          ;*********************************************************************
1505  006570  004537  004472          ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
1506  006574  014344                  ;NEXT LINE.
1507  006576  177702          RT32A.  JSR     5,DLYXMT        ;GO DO TEST.
1508                                   MSG5                    ;TRANSMIT THIS MESSAGE &
1509  006600  000033                  -62.                    ;DELAY THIS MUCH BETWEEN LINES
1510  006602  006620          ;*********************************************************************
                                RT33:   33                      ;ROUTINE # 33                        *
                                        RT34                    ;ADDR OF NEXT ROUTINE.               *
```

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 1511  006604  000002                          2                       ;ITERATION COUNT                        .
 1512  006606  006610                          RT33A                   ;SCOPE ENTRY POINT.                     .
 1513          000033                          X=X+1
 1514                                  ;*************************************************************************
 1515                                  ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
 1516                                  ;NEXT LINE.
 1517  006610  004537  004472          RT33A:  JSR     5,DLYXMT        ;GO DO TEST.
 1518  006614  014344                          MSG5                    ;TRANSMIT THIS MESSAGE &
 1519  006616  177701                          -63.                    ;DELAY THIS MUCH BETWEEN LINES
 1520                                  ;*************************************************************************
 1521  006620  000034                  RT34:   34                      ;ROUTINE # 34                           .
 1522  006622  177777                          RT35                    ;ADDR OF NEXT ROUTINE.                  .
 1523  006624  000002                          2                       ;ITERATION COUNT                        .
 1524  006626  006630                          RT34A                   ;SCOPE ENTRY POINT.                     .
 1525          000034                          X=X+1
 1526                                  ;*************************************************************************
 1527                                  ;TEST TO TRANSMIT ON EACH LINE WITH A DELAY BEFORE STATING THE
 1528                                  ;NEXT LINE.
 1529  006630  004537  004472          RT34A:  JSR     5,DLYXMT        ;GO DO TEST.
 1530  006634  014344                          MSG5                    ;TRANSMIT THIS MESSAGE &
 1531  006636  177700                          -64.                    ;DELAY THIS MUCH BETWEEN LINES
 1532          177777                  RT35=-1
```

```
1533
1534                                    ;PRG1-  DATA TESTS ALL LINES SIMULTANEOUSLY. DATA TRANSMITTED IS 'THE
1535                                    ;QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK 1234567890'
1536  006640  104000                    PRG1:   TYPE                            ;TYPE
1537  006642  013447                            PRG1M                           ;PROGRAM TITLE
1538  006644  022737  000176  001202    PRGX:   CMP     #SWREG,SWR              ;SEE IF SWITCH-LESS
1539  006652  001001                            BNE     PRG1R                   ;BRANCH IF NOT
1540  006654  104020                            CNTLU                           ;GET SWREG SETTINGS
1541  006656  004537  004472            PRG1R:  JSR     5,DLYXMT                ;GO TO DLYXMT TO SET UP DM11
1542  006662  013743                            MSG1                            ;MSG1 WILL BE THE DATA TRANSMITTED
1543  006664  177700                            -64.                            ;DO NOT DELAY
1544  006666  012737  007362  001400    PRG1A:  MOV     #OUTBUF,CAT             ;LOAD CURRENT
1545  006674  004537  005200                    JSR     5,BMOVE                 ;ADDRESS TABLE
1546  006700  001400                            CAT                             ;TO POINT TO
1547  006702  001402                            CAT+2                           ;OUTBUF
1548  006704  000040                            32.
1549  006706  012737  177700  001440            MOV     #-64.,WCT               ;LOAD WORD COUNT
1550  006714  004537  005200                    JSR     5,BMOVE                 ;TO -64.
1551  006720  001440                            WCT
1552  006722  001442                            WCT+2
1553  006724  000040                            32.
1554  006726  012777  010100  172606            MOV     #BIT12+BIT6,@CSR;SET TRANSMITTER & RECIEVER IE BITS
1555  006734  023727  002446  000004            CMP     PRGNUM,#4               ;RUNNING PROGRAM #2?
1556  006742  001403                            BEQ     .+10
1557  006744  052777  000001  172570            BIS     #BIT0,@CSR              ;SET THE GO BIT
1558  006752  012777  177777  172564            MOV     #-1,@BAR                ;START TRANSMITTING ON ALL LINES
1559  006760  005777  172560                    TST     @BAR                    ;WAIT FOR ALL LINES TO COMPLETE
1560  006764  001375                            BNE     .-4
1561  006766  005205                            INC     %5
1562  006770  001376                            BNE     .-2
1563  006772  005077  172544                    CLR     @CSP
1564  006776  023727  002446  000004  PRG1C:   CMP     PRGNUM,#4               ;DO NOT CHECK DATA IF RUNNING
1565  007004  001402                            BEQ     PRG1D                   ;PROGRAM # 2
1566  007006  004737  005320                    JSR     7,CHKDAT                ;GO CHECK RECEIVED DATA
1567  007012  104000                    PRG1D:  TYPE                            ;TYPE
1568  007014  013303                            M2                              ;'PRGEND'
1569  007016  012706  001200            PRG1EX: MOV     #SPBOT,SP               ;RESET THE STACK POINTER
1570  007022  000715                            BR      PRGXR                   ;GO RESTART TEST
1571
1572
1573                                    ;PRG2-PROGRAM 2 RUNS PROGRAM 1 EXCEPT FOR THE DATA CHECKING
1574                                    ;WHEN ALL LINES ARE FINISHED TRANSMITTING. THIS ALLOWS THE DATA
1575                                    ;TRANSMITTED TO BE SENT TO TERMINALS. BEFORE STARTING THIS PROGRAM
1576                                    ;REMOVE THE JUMPERS CONNECTING THE TRANSMITTERS TO THE RECEIVERS.
1577  007024  104000                    PRG2:   TYPE                            ;TYPE PROGRAM TITLE
1578  007026  013527                            PRG2M                           ;AND INSTRUCTIONS
1579  007030  000137  006644            PRG2R:  JMP     PRGX                    ;GO RUN PRG1
```

```
1580
1581                                    ;PRG3-ECHO TEST THIS PROGRAM ECHOS BACK DATA RECEIVED FROM ANY DM11
1582                                    ;TERMINAL(S)
1583                                    ;NOTE:  THIS TEST IS THE ONLY TEST THAT INSURES PROPER OPERATION
1584                                    ;OF THE DM11 DISTRIBUTION PANEL LOGIC.
1585
1586  007034  104000                    PRG3:   TYPE                            ;TYPE PROGRAM
1587  007036  013556                            PRG3M                           ;TITLE
1588  007040  022737  000176  001202            CMP     #SWREG,SWR              ;SEE IF SWITCH-LESS
1589  007046  001001                            BNE     PRG3R                   ;BRANCH IF NOT
1590  007050  104020                            CNTLU                           ;GET SWREG SETTINGS
1591  007052  004537  004472            PRG3R:  JSR     5,DLYXMT                ;USE PART OF THE
1592  007056  013743                            MSG1                            ;DLYXMT ROUTINE TO
1593  007060  000240                            NOP                             ;SET UP DM11
1594  007062  012737  001600  001572    PRG3A:  MOV     #TUMTAB,TTPTR           ;INITIALIZE SOFTWARE POINTER
1595  007070  013701  001552                    MOV     CLKINT,%1               ;LOAD RECEIVER
1596  007074  012721  007132                    MOV     #RINT3,(1)+             ;AND TRANSMITTER
1597  007100  013721  001554                    MOV     CLKLVL,(1)+             ;VECTORS AND PRIORITY
1598  007104  012721  007336                    MOV     #TINT3,(1)+             ;LEVELS
1599  007110  013721  001560                    MOV     XMTLVL,(1)+
1600  007114  012777  010101  172420            MOV     #BIT12+BIT6+BIT0,@CSR ;SET IE AND GO BITS
1601  007122  012700  000001                    MOV     #1,%0
1602  007126  005200                            INC     %0
1603  007130  000776                            BR      .-2
1604
1605
1606  007132  000240                    RINT3:  NOP
1607  007134  000240                            NOP
1608  007136  013701  001572                    MOV     TTPTR,%1                ;GET SOFTWARE POINTER
1609  007142  011137  001564            RINT3A: MOV     (1),TTDAT               ;GET TUMBLE TABLE ENTRY
1610  007146  001463                            BEQ     RINT3X                  ;EXIT IF NO ENTRY
1611  007150  005011                            CLR     (1)                     ;CLEAR ENTRY
1612  007152  032737  040000  001564            BIT     #BIT14,TTDAT            ;WAS BREAK RECEIVED
1613  007160  001047                            BNE     RINT3B                  ;DO NOTHING ABOUT IT
1614  007162  042737  160400  001564            BIC     #160400,TTDAT           ;CLEAR ALL BUT LINE # AND DATA
1615  007170  113702  001565                    MOVB    TTDAT+1,%2              ;GET LINE NUMBER
1616  007174  010237  002140                    MOV     %2,LINE                 ;FETCH LINE NUMBER
1617  007200  004737  005266                    JSR     7,GTLINB                ;FORM LINE BIT FOR BAR
1618  007204  033777  001566  172332            BIT     LINBIT,@BAR             ;IS THIS LINE ACTIVE
1619  007212  001414                            BEQ     NONACT                  ;LINE NOT ACTIVE
1620  007214  033777  001566  172322            BIT     LINBIT,@BAR             ;WAIT FOR LINE
1621  007222  001374                            BNE     .-6
1622  007224  032777  060000  172310            BIT     #BIT14+BIT13,@CSR
1623  007232  001401                            BEQ     .+4                     ;BRANCH IF NO ERRORS
1624  007234  104003                            ERROR
1625  007236  042777  100000  172276            BIC     #BIT15,@CSR             ;CLEAR TRANSMIT DONE
1626  007244  113762  001564  007362  NONAC1:  MOVB    TTDAT,OUTBUF(2)         ;STORE RECEIVED CHARACTER
1627  007252  012762  177777  001440            MOV     #-1,WCT(2)              ;LOAD LINE'S WORD COUNT
1628  007260  010203                            MOV     %2,%3
1629  007262  062703  007362                    ADD     #OUTBUF,%3
1630  007266  010362  001400                    MOV     %3,CAT(2)               ;AND CURRENT ADDRESS
1631  007272  053777  001566  172244            BIS     LINBIT,@BAR             ;ECHO RECEIVED CHARACTER
1632  007300  022701  001776            RINT3B: CMP     #TUMTAB+176,%1          ;CHECK TUMBLE
1633  007304  001002                            BNE     .+6                     ;TABLE POINTER
1634  007306  012701  001576                    MOV     #TUMTAB-2,%1
1635  007312  005721                            TST     (1)+
```

```
 1636  007314  000712                          BR      RINT3A
 1637  007316  042777  000200  172216  RINT3X: BIC     #BIT7,@CSR      ;CLEAR CHARACTER DONE FLAG
 1638  007324  010137  001572                  MOV     %1,TTPTR        ;RESTORE POINTER
 1639  007330  000240                          NOP
 1640  007332  000240                          NOP
 1641  007334  000002                          RTI                     ;EXIT
 1642
 1643  007336  000240                  TINT3:  NOP
 1644  007340  032777  060000  172174          BIT     #BIT14+BIT13,@CSR ;ANY ERROR FLAGS SET
 1645  007346  001401                          BEQ     .+4
 1646  007350  104003                          ERROR
 1647  007352  042777  160000  172162          BIC     #BIT15+BIT14+BIT13,@CSR ;CLEAR ALL FLAGS
 1648  007360  000002                          RTI                     ;EXIT
```

```
1649  007362  000000                  OUTBUF: 0
1650          007526                          .=OUTBUF+100.
1651  007526  000000                  LN0BUF: 0
1652          007672                          .=LN0BUF+100.
1653  007672  000000                  LN1BUF: 0
1654          010036                          .=LN1BUF+100.
1655  010036  000000                  LN2BUF: 0
1656          010202                          .=LN2BUF+100.
1657  010202  000000                  LN3BUF: 0
1658          010346                          .=LN3BUF+100.
1659  010346  000000                  LN4BUF: 0
1660          010512                          .=LN4BUF+100.
1661  010512  000000                  LN5BUF: 0
1662          010656                          .=LN5BUF+100.
1663  010656  000000                  LN6BUF: 0
1664          011022                          .=LN6BUF+100.
1665  011022  000000                  LN7BUF: 0
1666          011166                          .=LN7BUF+100.
1667  011166  000000                  LN10BF: 0
1668          011332                          .=LN10BF+100.
1669  011332  000000                  LN11BF: 0
1670          011476                          .=LN11BF+100.
1671  011476  000000                  LN12BF: 0
1672          011642                          .=LN12BF+100.
1673  011642  000000                  LN13BF: 0
1674          012006                          .=LN13BF+100.
1675  012006  000000                  LN14BF: 0
1676          012152                          .=LN14BF+100.
1677  012152  000000                  LN15BF: 0
1678          012316                          .=LN15BF+100.
1679  012316  000000                  LN16BF: 0
1680          012462                          .=LN16BF+100.
1681  012462  000000                  LN17BF: 0
1682          012626                          .=LN17BF+100.
1683  012626  007526                  INTAB:  LN0BUF
1684  012630  007672                          LN1BUF
1685  012632  010036                          LN2BUF
1686  012634  010202                          LN3BUF
1687  012636  010346                          LN4BUF
1688  012640  010512                          LN5BUF
1689  012642  010656                          LN6BUF
1690  012644  011022                          LN7BUF
1691  012646  011166                          LN10BF
1692  012650  011332                          LN11BF
1693  012652  011476                          LN12BF
1694  012654  011642                          LN13BF
1695  012656  012006                          LN14BF
1696  012660  012152                          LN15BF
1697  012662  012316                          LN16BF
1698  012664  012462                          LN17BF
1699  012666  000000                  CNTTAB: 0
1700          012706                          .=CNTTAB+16.
1701
1702  012706  012746                  ID:     IDENT0
1703  012710  012752                          IDENT1
1704  012712  012756                          IDENT2
```

```
1705  012714  012762                          IDENT3
1706  012716  012766                          IDENT4
1707  012720  012772                          IDENT5
1708  012722  012776                          IDENT6
1709  012724  013002                          IDENT7
1710  012726  013006                          IDNT10
1711  012730  013012                          IDNT11
1712  012732  013016                          IDNT12
1713  012734  013022                          IDNT13
1714  012736  013026                          IDNT14
1715  012740  013032                          IDNT15
1716  012742  013036                          IDNT16
1717  012744  013042                          IDNT17
1718  012746  105215              IDENT0: CRLF
1719  012750  030060                      "00
1720  012752  105215              IDENT1: CRLF
1721  012754  030460                      "01
1722  012756  105215              IDENT2: CRLF
1723  012760  031060                      "02
1724  012762  105215              IDENT3: CRLF
1725  012764  031460                      "03
1726  012766  105215              IDENT4: CRLF
1727  012770  032060                      "04
1728  012772  105215              IDENT5: CRLF
1729  012774  032460                      "05
1730  012776  105215              IDENT6: CRLF
1731  013000  033060                      "06
1732  013002  105215              IDENT7:CRLF
1733  013004  033460                      "07
1734  013006  105215              IDNT10: CRLF
1735  013010  030061                      "10
1736  013012  105215              IDNT11: CRLF
1737  013014  030461                      "11
1738  013016  1052                IDNT12: CRLF
1739  013020  0310                      "12
1740  013022  105215              IDNT13: CRLF
1741  013024  031461                      "13
1742  013026  105215              IDNT14: CRLF
1743  013030  032061                      "14
1744  013032  105215              IDNT15: CRLF
1745  013034  032461                      "15
1746  013036  105215              IDNT16: CRLF
1747  013040  033061                      "16
1748  013042  105215              IDNT17: CRLF
1749  013044  033461                      "17
1750  013046  105215                      CRLF
1751          105215          CRLF-105215
1752
```

SEQ 0037

```
 1753
 1754                                           ;MESSAGES
 1755  013050  042045  030515  020061  WHERE:  .ASCII  '%DM11 RECEIVER VECTOR ADDRESS   @'
 1756  013056  042522  042503  053111
 1757  013064  051105  053040  041505
 1758  013072  047524  020122  042101
 1759  013100  051104  051505  020123
 1760  013106  020075     100
 1761  013111     045  053523  036522  $SWREG: .ASCII  '%SWR- @'
 1762  013116  040040
 1763  013120  020040  020040  020040  $VALUE: .ASCII  '          NEW- @'
 1764  013126  020040  020040  042516
 1765  013134  036527  040040
 1766  013140  036445     040          $CTLU:  .ASCII  '%= '
 1767  013143     045  044127  041511  WHICH:  .ASCII  '%WHICH DM11 ARE YOU TESTING @'
 1768  013150  020110  046504  030461
 1769  013156  040440  042522  054440
 1770  013164  052517  052040  051505
 1771  013172  044524  043516  040040
 1772  013200  042045  052101  020101  ERDAT:  .ASCII  '%DATA ERR  S/B: '
 1773  013206  051105  020122  051440
 1774  013214  041057  020072
 1775  013220  020040  020040  020040  AASB:   .ASCII  '        WAS: '
 1776  013226  020040  040527  035123
 1777  013234     040
 1778  013235     040  020040  020040  AWAS:   .ASCII  '       @'
 1779  013242  020040     100
 1780  013245     114  047111  020105  LINEM:  .ASCII  'LINE # '
 1781  013252  020043
 1782  013254  020040  040040          ALINE:  .ASCII  '   @'
 1783  013260  052045  050131  020105  M0:     .ASCII  '%TYPE PROGRAM #@'
 1784  013266  051120  043517  040522
 1785  013274  020115  040043
 1786  013300  037445     100          M1:     .ASCII  '%?@'
 1787  013303     045  042524  052123  M2:     .ASCII  '%TEST CZDMB COMPLETE@'
 1788  013310  041440  042132  041115
 1789  013316  041440  046517  046120
 1790  013324  052105  040105
 1791  013330  051445  052105  051440  M3:     .ASCII  '%SET SR OPTIONS. NORMAL OPERATION'
 1792  013336  020122  050117  044524
 1793  013344  047117  027123  047040
 1794  013352  051117  040515  020114
 1795  013360  050117  051105  052101
 1796  013366  047511     116
 1797  013371     123  020122  020075          .ASCII  'SR - 000000 PRESS CONT.@'
 1798  013376  030060  030060  030060
 1799  013404  050040  042522  051523
 1800  013412  041440  047117  027124
 1801  013420     100
 1802  013421     045  040504  040524  PRGOM:  .ASCII  '%DATA TEST ALL LINES @'
 1803  013426  052040  051505  020124
 1804  013434  046101  020114  044514
 1805  013442  042516  020123     100
 1806  013447     045  040504  040524  PRG1M:  .ASCII  '%DATA TEST TRANSMIT ON ALL LINES SIMULTANEOUSLY@'
 1807  013454  052040  051505  020124
 1808  013462  051124  047101  046523
```

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 1809  013470  052111  047440  020116
 1810  013476  046101  020114  044514
 1811  013504  042516  020123  044523
 1812  013512  052515  052114  047101
 1813  013520  047505  051525  054514
 1814  013526     100
 1815
 1816  013527     045  051124  047101  PRG2M:  .ASCII  '%TRANSMIT TO TERMINALS@'
 1817  013534  046523  052111  052040
 1818  013542  020117  042524  046522
 1819  013550  047111  046101  040123
 1820  013556  042445  044103  020117  PRG3M:  .ASCII  '%ECHO TEST@'
 1821  013564  042524  052123     100
 1822  013571     045  052520  020124  PRG1:   .ASCII  '%PUT CHAR IN SR(0-7),DELAY IN SR(8-15)@'
 1823  013576  044103  051101  044440
 1824  013604  020116  051123  030050
 1825  013612  033455  026051  042504
 1826  013620  040514  020131  047111
 1827  013626  051440  024122  026470
 1828  013634  032461  040051
 1829  013640  052045  050131  020105  POPPAR: .ASCII  '%TYPE PARITY OPTION (N NO' DESIRED O=ODD, E-EVEN@'
 1830  013646  040520  044522  054524
 1831  013654  047440  052120  047511
 1832  013662  020116  047050  047075
 1833  013670  052117  042040  051505
 1834  013676  051111  042105  047440
 1835  013704  047475  042104  020054
 1836  013712  036505  053105  047105
 1837  013720     100
 1838  013721     045  020122          EMO:    .ASCII  '%R '
 1839  013724  020040  020040  041520  ATNUMB: .ASCII  '    PC- '
 1840  013732  020075
 1841  013734  020040  020040  020040  APC:    .ASCII  '      @'
 1842  013742     100
 1843  013743     015     012          MSG1:   .BYTE   15,12
 1844  013745     040  044124  020105          .ASCII  ' THE QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK 1234567890'
 1845  013752  052521  041511  020113
 1846  013760  051102  053517  020116
 1847  013766  047506  020130  052512
 1848  013774  050115  042105  047440
 1849  014002  042526  020122  044124
 1850  014010  020105  040514  054532
 1851  014016  042040  043517  020123
 1852  014024  040502  045503  030440
 1853  014032  031462  032464  033466
 1854  014040  034470     060
 1855          014044          .EVEN
 1856  014044     015     012          MSG2:   .BYTE   15,12
 1857  014046  177400                          177400
 1858  014050  177400                          177400
 1859  014052  177400                          177400
 1860  014054  177400                          177400
 1861  014056  177400                          177400
 1862  014060  177400                          177400
 1863  014062  177400                          177400
 1864  014064  177400                          177400
```

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 1865  014066  177400                          177400
 1866  014070  177400                          177400
 1867  014072  177400                          177400
 1868  014074  177400                          177400
 1869  014076  177400                          177400
 1870  014100  177400                          177400
 1871  014102  177400                          177400
 1872  014104  177400                          177400
 1873  014106  177400                          177400
 1874  014110  177400                          177400
 1875  014112  177400                          177400
 1876  014114  177400                          177400
 1877  014116  177400                          177400
 1878  014120  177400                          177400
 1879  014122  177400                          177400
 1880  014124  177400                          177400
 1881  014126  177400                          177400
 1882  014130  177400                          177400
 1883  014132  177400                          177400
 1884  014134  177400                          177400
 1885  014136  177400                          177400
 1886  014140  177400                          177400
 1887  014142  177400                          177400
 1888  014144     015      012          MSG3:  .BYTE   15,12
 1889  014146  125252                          ALTO
 1890  014150  125252                          ALTO
 1891  014152  125252                          ALTO
 1892  014154  125252                          ALTO
 1893  014156  125252                          ALTO
 1894  014160  125252                          ALTO
 1895  014162  125252                          ALTO
 1896  014164  125252                          ALTO
 1897  014166  125252                          ALTO
 1898  014170  125252                          ALTO
 1899  014172  125252                          ALTO
 1900  014174  125252                          ALTO
 1901  014176  125252                          ALTO
 1902  014200  125252                          ALTO
 1903  014202  125252                          ALTO
 1904  014204  125252                          ALTO
 1905  014206  125252                          ALTO
 1906  014210  125252                          ALTO
 1907  014212  125252                          ALTO
 1908  014214  125252                          ALTO
 1909  014216  125252                          ALTO
 1910  014220  125252                          ALTO
 1911  014222  125252                          ALTO
 1912  014224  125252                          ALTO
 1913  014226  125252                          ALTO
 1914  014230  125252                          ALTO
 1915  014232  125252                          ALTO
 1916  014234  125252                          ALTO
 1917  014236  125252                          ALTO
 1918  014240  125252                          ALTO
 1919  014242  125252                          ALTO
 1920  014244     015      012          MSG4:  .BYTE   15,12
```

```
 1921  014246  052525                                ALT1
 1922  014250  052525                                ALT1
 1923  014252  052525                                ALT1
 1924  014254  052525                                ALT1
 1925  014256  052525                                ALT1
 1926  014260  052525                                ALT1
 1927  014262  052525                                ALT1
 1928  014264  052525                                ALT1
 1929  014266  052525                                ALT1
 1930  014270  052525                                ALT1
 1931  014272  052525                                ALT1
 1932  014274  052525                                ALT1
 1933  014276  052525                                ALT1
 1934  014300  052525                                ALT1
 1935  014302  052525                                ALT1
 1936  014304  052525                                ALT1
 1937  014306  052525                                ALT1
 1938  014310  052525                                ALT1
 1939  014312  052525                                ALT1
 1940  014314  052525                                ALT1
 1941  014316  052525                                ALT1
 1942  014320  052525                                ALT1
 1943  014322  052525                                ALT1
 1944  014324  052525                                ALT1
 1945  014326  052525                                ALT1
 1946  014330  052525                                ALT1
 1947  014332  052525                                ALT1
 1948  014334  052525                                ALT1
 1949  014336  052525                                ALT1
 1950  014340  052525                                ALT1
 1951  014342  052525                                ALT1
 1952  014344     015      012          MSG5:   .BYTE   15,12
 1953  014346  000400                                400
 1954  014350  002002                                2002
 1955  014352  010010                                10010
 1956  014354  040040                                40040
 1957  014356  000200                                200
 1958  014360  177377                                177377
 1959  014362  175775                                175775
 1960  014364  167767                                167767
 1961  014366  137737                                137737
 1962  014370  177500                                177500
 1963  014372  000400                                400
 1964  014374  002002                                2002
 1965  014376  010010                                10010
 1966  014400  040040                                40040
 1967  014402  000200                                200
 1968  014404  177377                                177377
 1969  014406  175775                                175775
 1970  014410  167767                                167767
 1971  014412  137737                                137737
 1972  014414  177500                                177500
 1973  014416  000400                                400
 1974  014420  002002                                2002
 1975  014422  010010                                10010
 1976  014424  040040                                40040
```

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 1977  014426  000200                          200
 1978  014430  177377                          177377
 1979  014432  175775                          175775
 1980  014434  167767                          167767
 1981  014436  137737                          137737
 1982  014440  177500                          177500
 1983  014442     015      012                 .BYTE   15,12
 1984  014444     015      012                 .BYTE   15,12
 1985          000001                          .END
```

```
A       = 000000  291#
AASB      013220  578     1775#
ALINE     013254  536     1782#
ALTO    = 125252  287#    1889    1890    1891    1892    1893    1894    1895    1896    1897    1898    1899    1900
                  1901    1902    1903    1904    1905    1906    1907    1908    1909    1910    1911    1912    1913
                  1914    1915    1916    1917    1918    1919
ALT1    = 052525  288#    1921    1922    1923    1924    1925    1926    1927    1928    1929    1930    1931    1932
                  1933    1934    1935    1936    1937    1938    1939    1940    1941    1942    1943    1944    1945
                  1946    1947    1948    1949    1950    1951
APC       013734  555     1841#
APCADD    002134  515#    545*    548*    554
ATLAST= 177777    286#
ATNUMB    013724  559     1839#
AWAS      013235  582     1778#
BAR       001544  453#    639*    763*    827*    1006    1010*   1025*   1029    1076*   1558*   1559    1618    1620
                  1631*
BARDAT    001570  463#
BARIM     001562  460#    1075*
BASREG    001550  455#    641*    818*    952*
BAT       001500  449#    450
BELL    = 000007  285#
BIT0    = 000001  249#    761     763     828     989     1557    1600
BIT1    = 000002  248#
BIT10   = 002000  239#
BIT11   = 004000  238#    646
BIT12   = 010000  237#    989     1554    1600
BIT13   = 020000  236#    532     551     1165    1168    1622    1644    1647
BIT14   = 040000  235#    642     1165    1168    1612    1622    1644    1647
BIT15   = 100000  233     234#    1171    1625    1647
BIT2    = 000004  247#    761     828
BIT3    = 000010  246#
BIT4    = 000020  245#
BIT5    = 000040  244#
BIT6    = 000100  243#    761     828     989     1554    1600
BIT7    = 000200  242#    1157    1637
BIT8    = 000400  241#
BIT9    = 001000  240#    621     655
BKCSR     001546  454#    638*
BMOVE     005200  957     962     966     971     1057#   1545    1550
CARMSK    002126  512#    822*    831*    1106
CAT       001400  445#    446     641     760*    818     823*    952     1023*   1073*   1544*   1546    1547    1630*
CC      = 177776  228#
CHKDAT    005320  1014    1095#   1566
CLKINT    001552  456#    791*    824*    981     1595
CLKLVL    001554  457#    825*    983     1597
CNT       004254  859*    876*    895#    927
CNTLU   = 104020  283#    614     909     1540    1590
CNTLUU    004332  503     915#
CNTTAB    012666  968     1139    1140*   1699#   1700
CNVDAT    002356  531     549     576#
COUNT     002146  520#    764*    765*
CRLF    = 105215  1718    1720    1722    1724    1726    1728    1730    1732    1734    1736    1738    1740    1742
                  1744    1746    1748    1750    1751#
CSR       001542  452#    637*    761*    811     819*    828*    830*    955*    989*    1003*   1009*   1157*   1165
                  1168*   1169    1171*   1554*   1557*   1563*   1600*   1622    1625*   1637*   1644    1647*
CURTST    002012  473#    623     629     679*
```

```
DATCHK= 104004  273#  1107
DISPLA  001204  443#   941*
DISPRE  000174  429#   941
DLYXMT  004472  951#  1193  1205  1217  1229  1241  1253  1265  1277  1289  1301  1313  1325
                1337  1349  1361  1373  1385  1397  1409  1421  1433  1445  1457  1469  1481
                1493  1505  1517  1529  1541  1591
DMPAR   003334  590   747#   786
DMPARB  003620  796#  806
DTCHK   002156  491   529#
EMALT = 104010  276#
EMO     013721  562  1838#
EMTINT  003064  305   683#
EMTTAB  002046  487#  689
ERDAT   013200  565  1772#
ERR     002224  490   544#
ERRA    002262  546   550#
ERRB    002324  544*  547*  563#
ERRC    002332  552   566#
ERREX   002352  569   571#
ERRHLT  002350  567   570#
ERROR = 104003  272#  767   1125  1130  1167  1624  1646
ERROR1= 104015  280#  538   1011  1147
ERRVEC= 000004  230#  616*
ERR1    002242  500   547#
ESCOPE  002650  497   636#
FAJAG   004410  916   928   930#
FORWD   003032  620   674#
GETRDY  002540  609   613   615#  633   656   663   1183
GTLINB  005266 1083#  1617
GTRDYA  002566  620#  631
GTRDYC  002610  622   625#
GTRDYD  002632  628   630#
GTRDYX  002546  616#  658
ICTR    002020  476#  652*  677*
ID      012706 1023  1702#
IDENT   005024  953  1020#
IDENT0  012746 1702  1718#
IDENT1  012752 1703  1720#
IDENT2  012756 1704  1722#
IDENT3  012762 1705  1724#
IDENT4  012766 1706  1726#
IDENT5  012772 1707  1728#
IDENT6  012776 1708  1730#
IDENT7  013002 1709  1732#
IDNT10  013006 1710  1734#
IDNT11  013012 1711  1736#
IDNT12  013016 1712  1738#
IDNT13  013022 1713  1740#
IDNT14  013026 1714  1742#
IDNT15  013032 1715  1744#
IDNT16  013036 1716  1746#
IDNT17  013042 1717  1748#
INCRTN  002150  523#  632
INTAB   012626 1098  1136  1683#
KBDIN = 104017  282#  550   571   640
KBDINT  004256  502   900#
```

KSTART	002010	472#	615	1178*	1181*									
LINBIT	001566	462#	990*	999*	1021*	1025	1027*	1075	1076	1084*	1087*	1618	1620	1631
LINBUF	002142	518#	1101*	1102*	1103*	1104	1136*	1141*	1142*					
LINE	002140	517#	535	991*	992	998*	1020*	1022	1026*	1072	1085	1100*	1616*	
LINEM	013245	540	1780#											
LN0BUF	007526	970*	972	973	1651#	1652	1683							
LN1BUF	007672	1653#	1654	1684										
LN10BF	011166	1667#	1668	1691										
LN11BF	011332	1669#	1670	1692										
LN12BF	011476	1671#	1672	1693										
LN13BF	011642	1673#	1674	1694										
LN14BF	012006	1675#	1676	1695										
LN15BF	012152	1677#	1678	1696										
LN16BF	012316	1679#	1680	1697										
LN17BF	012462	1681#	1682	1698										
LN2BUF	010036	1655#	1656	1685										
LN3BUF	010202	1657#	1658	1686										
LN4BUF	010346	1659#	1660	1687										
LN5BUF	010512	1661#	1662	1688										
LN6BUF	010656	1663#	1664	1689										
LN7BUF	011022	1665#	1666	1690										
MANUAL=	100000	233#												
MSG1	013743	1194	1206	1218	1230	1242	1254	1266	1278	1542	1592	18.3#		
MSG2	014044	1290	1302	1314	1326	1338	1350	1362	1856#					
MSG3	014144	1374	1386	1398	1410	1888#								
MSG4	014244	1422	1434	1446	1458	1920#								
MSG5	014344	1470	1482	1494	1506	1518	1530	1952#						
M0	013260	596	1783#											
M1	013300	524	785	805	891	1786#								
M2	013303	661	1568	1787#										
M3	013330	611	1791#											
NONACT	007244	1619	1626#											
NOP =	000240	231#												
NXTST	002016	475#	615*	630	657	674	676*							
OACNV	005112	534	553	557	576	580	919	1035#						
OPEN =	000000	232#	445	447	449	451	456	458	460	461	462	463	464	466
		472	473	474	475	476	477	488	489	492	493	494	495	496
		505	510	511	512	513	514	515	516	517	518	519	520	563
		703	704	718	719	743	958	1052						
OUTBUF	007362	760	820*	823	959	1073	1105	1544	1626*	1629	1649#	1650		
OVRLAY	004042	591	772	774	838#									
PASS	002144	519#	650	659*										
PCADD	002132	514#	545	548	685*									
POPPAR	013640	1829#												
POPSP =	005726	250#												
POPSP2=	022626	251#	654	833										
PRGI	013571	1822#												
PRGLIM	002024	478#	599											
PRGNUM	002446	594	598#	599*	600*	601	604	975	986	1555	1564			
PRGTAB	002026	479#	602											
PRGX	006644	1538#	1579											
PRGO	005660	479	1176#											
PRGOA	005664	1178#												
PRGOM	013421	1177	1802#											
PRGOR	005702	483	1181#											
PRGI	006640	480	1536#											

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PRG1A    006666            988    1544#
PRG1C    006776           1564#
PRG1D    007012           1565    1567#
PRG1EX   007016           1569#
PRG1M    013447           1537    1806#
PRG1R    006656            484    1539    1541#   1570
PRG2     007024            481    1577#
PRG2M    013527           1578    1816#
PRG2R    007030            485    1579#
PRG3     007034            482    1586#
PRG3A    007062            977    1594#
PRG3M    013556           1587    1820#
PRG3R    007052            486    1589    1591#
PRTY0  = 000000            259#
PRTY1  = 000040            258#
PRTY2  = 000100            257#
PRTY3  = 000140            256#
PRTY4  = 000200            255#    469     471
PRTY5  = 000240            254#    457     459
PRTY6  = 000300            253#
PRTY7  = 000340            252#    306
PRVCNT   002136            516#
PSW    = 177776            229#    617*    762*    832*
RCVDAT   002122            510#    529     581    1006*   1104*   1144*
RECD     004076            597     777     800     857#    925
RINT     005426            982    1120#
RINT3    007132           1596    1606#
RINT3A   007142           1609#   1636
RINT3B   007300           1613    1632#
RINT3X   007316           1610    1637#
RSTART   002036            483#    605
RSTAT1   002422            434     592#
RSTAT2   002472            436     603#
RSTREG=  104014            279#   1050    1064    1115    1159
RSTRG    003156            499     707#
RTNNO    002014            474#    558     627     675*   1179*   1182*
RT0      005720           1178    1181    1185#
RT0A     005730           1188    1193#
RT1      005740           1186    1197#
RT1A     005750           1200    1205#
RT10     006120           1270    1281#
RT10A    006130           1284    1289#
RT11     006140           1282    1293#
RT11A    006150           1296    1301#
RT12     006160           1294    1305#
RT12A    006170           1308    1313#
RT13     006200           1306    1317#
RT13A    006210           1320    1325#
RT14     006220           1318    1329#
RT14A    006230           1332    1337#
RT15     006240           1330    1341#
RT15A    006250           1344    1349#
RT16     006260           1342    1353#
RT16A    006270           1356    1361#
RT17     006300           1354    1365#
RT17A    006310           1368    1373#
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R12	005760	1198	1209#				
R12A	005770	1212	1217#				
R120	006320	1366	1377#				
R120A	006330	1380	1385#				
R121	006340	1378	1389#				
R121A	006350	1392	1397#				
R122	006360	1390	1401#				
R122A	006370	1404	1409#				
R123	006400	1402	1413#				
R123A	006410	1416	1421#				
R124	006420	1414	1425#				
R124A	006430	1428	1433#				
R125	006440	1426	1437#				
R125A	006450	1440	1445#				
R126	006460	1438	1449#				
R126A	006470	1452	1457#				
R127	006500	1450	1461#				
R127A	006510	1464	1469#				
R13	006000	1210	1221#				
R13A	006010	1224	1229#				
R130	006520	1462	1473#				
R130A	006530	1476	1481#				
R131	006540	1474	1485#				
R131A	006550	1488	1493#				
R132	006560	1486	1497#				
R132A	006570	1500	1505#				
R133	006600	1498	1509#				
R133A	006610	1512	1517#				
R134	006620	1510	1521#				
R134A	006630	1524	1529#				
R135 =	177777	1522	1532#				
R14	006020	1222	1233#				
R14A	006030	1236	1241#				
R15	006040	1234	1245#				
R15A	006050	1248	1253#				
R16	006060	1246	1257#				
R16A	006070	1260	1265#				
R17	006100	1258	1269#				
R17A	006110	1272	1277#				
SAVREG=	104013	278#	1035	1057	1095	1121	
SAVRG	003116	498	693#				
SCOPE =	104012	277#	1016	1150			
SCOPEA	002706	644#	653				
SCOPEB	002714	643	646#				
SCOPEC	002750	647	651	654#			
SCOPED	002752	624	655#				
SCOPTR	002022	477#	644	678*			
SPBOT	001200	441#	588	592	603	618	1569
SRSET	002506	606#	1180				
SRT	002110	505#					
STALL =	104002	271#					
START	002404	433	588#				
STRXV =	104006	274#					
STTXV =	104007	275#					
SUSWR =	104016	281#	589				
SUSWRR	004412	501	933#				

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SWR     001202  442# 532  551  568  606  621  625  642  646  655  900  915  929*
                936  940* 1538 1588
SWREG   000176  430# 606  900  915  920  940  1538 1588
TEMP    002130  513#
TINT    005620  984  1164#
TINT3   007336  1598 1643#
TKCSR   002112  506# 860
TKDBR   002114  507# 862  905
TKLVL   002002  469#
TKVTR   002000  468#
TMP1    004370  904* 905* 906* 907  926# 929
TPCSR   002116  508# 735  879  882  885
TPDBR   002120  509# 734* 864* 881* 884*
TPLVL   002006  471#
TPVTR   002004  470#
TTDAT   001564  461# 1123* 1127* 1133* 1134 1142 1609* 1612 1614* 1615 1626
TTPTR   001572  464# 980* 1122 1158* 1594* 1608 1638*
TUMTAB  001600  466# 467  826* 831  961* 963  964  967  980  1152 1154 1594 1632
                1634
TYP     003220  487  722#
TYPE  = 104000  269# 523  539  561  564  595  610  660  775  784  798  804  890
                892  917  923  1176 1536 1567 1577 1586
TYPES = 104001  270#
UNIT    003640  797  801# 802  807* 808* 809* 813
VAC     001540  451# 465
VECOK   003540  773  780  782#
VECOKA  003550  784# 788  790
VECOKB  003556  783  787#
VECTOR  003522  770* 778# 779  781* 782  787  789  791  792* 793
WCT     001440  447# 448  759* 821* 996  1001 1024* 1074* 1144 1549* 1551 1552 1627*
WHERE   013050  776  1755#
WHICH   013143  799  1767#
X     = 000034  290# 1184 1189# 1196 1201# 1208 1213# 1220 1225# 1232 1237# 1244 1249#
                1256 1261# 1268 1273# 1280 1285# 1292 1297# 1304 1309# 1316 1321# 1328
                1333# 1340 1345# 1352 1357# 1364 1369# 1376 1381# 1388 1393# 1400 1405#
                1412 1417# 1424 1429# 1436 1441# 1448 1453# 1460 1465# 1472 1477# 1484
                1489# 1496 1501# 1508 1513# 1520 1525#
XMITD   005222  994  1070#
XMTDAT  002124  511# 529  577  1008* 1105* 1106* 1146*
XMTINT  001556  458# 793*
XMTLVL  001560  459# 985  1599
Y     = 000000  289#
$CTLU   013140  893  1766#
$ENDAD  003022  423  669#
$SWREG  013111  918  1761#
$VALUE  013120  921  924  1763#
.     = 014446  292# 295  297  299  301  303  307  309  311  313  315  317  319
                321  323  325  327  329  331  333  335  337  339  341  343  345
                347  349  351  353  355  357  359  361  363  365  367  369  371
                373  375  377  379  381  383  385  387  389  391  393  395  397
                399  401  403  405  407  409  411  413  415  417  419  422# 424#
                428# 432# 439# 444# 446# 448# 450# 465# 467# 736  976  987  1556
                1560 1562 1603 1621 1623 1633 1645 1650# 1652# 1654# 1656# 1658# 1660#
                1662# 1664# 1666# 1668# 1670# 1672# 1674# 1676# 1678# 1680# 1682# 1700# 1855#
```

CROSS REFERENCE TABLE -- MACRO NAMES

SEQ 0046

```
GET       211#    597     777     800     925
HEADER    211#   1184    1196    1208    1220    1232    1244    1256    1268    1280    1292    1304    1316    1328    1340
         1352    1364    1376    1388    1400    1412    1424    1436    1448    1460    1472    1484    1496    1508    1520
XMITDLY   211#   1184    1196    1208    1220    1232    1244    1256    1268    1280    1292    1304    1316    1328    1340
         1352    1364    1376    1388    1400    1412    1424    1436    1448    1460    1472    1484    1496    1508    1520

. ABS.  014446     000


ERRORS DETECTED:  0

CZDMBD,BIN,CZDMBD.LST/CRF/SOL/NL:TOC=CZDMBD.P11
RUN-TIME:  6 12 2 SECONDS
RUN-TIME RATIO: 121/21=5.5
CORE USED:  8K  (15 PAGES)
```