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* V.D.M. PART NO. 92L0107-035B

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* RELEASED 2-27-73 75

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* 73/620 REAL TIME CLOCK TEST

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* 73/620 REAL TIME CLOCK TEST 000010

* 000020

* 000030

* **** ***** * * ***** *** * * ***** 000040

* * * * * * * * * * * ** ** * 000050

* * * * * * * * * * * * * * * 000060

* **** *** * * * * * * * * * *** 000070

* * * * ***** * * * * * * 000080

* * * * * * * * * * * * 000090

* * * ***** * * ***** * *** * * ***** 000100

* 000110

* 000120

* *** * ***** *** * * ***** ***** *** ***** 000130

* * * * * * * * * * * * * * * 000140

* * * * * * * * * * * * * * 000150

* * * * * * ** * *** * * 000160

* * * * * * * * * * * * 000170

* * * * * * * * * * * * * * 000180

* *** ***** ***** *** * * * ***** *** * 000190

* 000200

* 000210

* THIS TEST PROGRAM IS A PART OF THE MAINTAIN II 000220

* TEST PROGRAM SYSTEM 000230

* 000240

* 000250

* 000260

* 000270

********** 000280

* * 000290

* 73/620 REAL TIME CLOCK TEST PROGRAM 000300

* * 000310

* 73 AND 620/F: VARIABLE INTERVAL INTERRUPT, MEMORY OVERFLOW INTER 000320

* AND READABLE FREE RUNNING COUNTER ARE EXERCISED. 000330

```
                *      620/I,L AND 622/I: INTERVAL INTERRUPT AND MEMORY OVERFLOW INTERRU  000340
                *                         ARE EXERCISED.                                 000350
                *      NOTE: NO SOFTWARE TIMING CHECKS ARE MADE.                         000360
                *                                                                    *    000370
                ************************************************************************ 000380
                *                                                                       000390
                *                                                                       000400
                *                                                                       000410
                *                                                                       000420
                *                                                                       000430
                *                                                                       000440
                *                                                                       000450
                *      ********************************                                 000460
                *      *                              *                                 000470
                *      * AREAS RESERVED BY EXECUTIVE *                                  000480
                *      ********************************                                 000490
                *      ORG     0                                                        000500
                *      JMP     EXECUTIVE                                                000510
                *      ORG     040                                                      000520
                *      JMPM    POWER DOWN ROUTINE                                       000530
                *      JMP     POWER UP   ROUTINE                                       000540
                *      NOTE:   THE TEST EXECUTIVE ALSO RESERVES LOCATIONS 0400 TO 0477  000550
                *              FOR A POINTER TABLE TO STANDARD ROUTINES,AND AS AN AREA  000560
                *              FOR EXECUTIVE DATA. ALL TEST PROGRAMS WORKING WITH THE   000570
                *              EXECUTIVE MUST PRESERVE THIS BLOCK.                      000580
                *              STANDARD ROUTINES WILL BE CALLED INDIRECTLY THRU         000590
                *              THIS TABLE                                               000600
                *                                                                       000610
                *                                                                       000620
                *                                                                       000630
                *                                                                       000640
                *                                                                       000650
                *                                                                       000660
000400                  ORG     0400                                                    000670
000400          OUTA    BSS     1           OUTPUT ONE CHAR ROUTINE                     000680
000401          OUTB    BSS     1           OUTPUT TWO CHAR ROUTINE                     000690
000402          OUTC    BSS     1           OUTPUT CR/LF    ROUTINE                     000700
000403          OUTD    BSS     1           OUTPUT MESSAGE  ROUTINE                     000710
000404          OUTE    BSS     1           OUTPUT OCTAL WORD ROUTINE                   000720
000405          OUTF    BSS     1           OUTPUT OCTAL ADDR ROUTINE                   000730
000406          OUTG    BSS     1           OUTPUT ERROR MSG  ROUTINE                   000740
000407          OUTH    BSS     1           OUTPUT CONTROL CHAR TO TTY ROUTINE          000750
```

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000410                INPA    BSS     1               INPUT  ONE CHAR              ROUTINE          000760
000411                INPB    BSS     1               INPUT  AND PRINT ONE CHAR  ROUTINE          000770
000412                INPC    BSS     1               INPUT  ONE CHAR EDITED     ROUTINE          000780
000413                INPD    BSS     1               INPUT  ONE ALPHA CHAR      ROUTINE          000790
000414                INPE    BSS     1               INPUT  TWO ALPHA CHAR      ROUTINE          000800
000415                INPF    BSS     1               INPUT  COMMA/PERIOD TERMINATION ROUTINE     000810
000416                INPG    BSS     1               INPUT  OCTAL NUMBER ROUTINE                 000820
000417                TOUT    BSS     1               TIME-OUT             ROUTINE                000830
000420                TDLY    BSS     1               TIME DELAY           ROUTINE                000840
000421                SSWT    BSS     1               STANDARD SENSE SWITCH ROUTINE               000850
000422                $LWE    BSS     1               LOWEST WORD USED BY EXEC                    000860
000423                ESZC    BSS     1               MEMORY SIZE DETERMINATION ROUTINE           000870
000424                $MSM    BSS     1               MEMORY SIZE MESSAGE                         000880
                      *                                                                           000890
                      *                                                                           000900
000440                        ORG     0440                                                        000910
                      *                                                                           000920
                      *       EXECUTIVE DATA TABLE                                                000930
                      *                                                                           000940
000440                $FLG    BSS     1               LOOP ON ERROR FLAG, 0=DON'T LOOP 1=LOOP     000950
000441                $MEM    BSS     1               MEMORY SIZE (HIGHEST AVAIL CORE)            000960
000442                $CON    BSS     1               0=CONSOLE MODE 1=TTY MODE                   000970
000443                        BSS     22                                                          000980
000471                $DCT    BSS     1               DIGIT COUNTER FOR INPG                      000990
                      *                                                                           001000
                      ********************************************************************************001010
                      *                                                                      *    001020
                      ********************************************************************************001030
                      *                                                                           001040
                      *                                                                           001050
      000047          RTC     EQU     047                                                         001060
000500                        ORG     0500                                                        001070
000500  001000                JMP     *+7                                                         001080
000501  000507 R
000502                PNTR    BSS     5               INDIRECT POINTERS                           001090
      000502 R        IAOR    BEGI    PNTR                                                        001100
000507  005101                INCR    1               BIT SIZE DETERMINER                         001110
000510  004260                LRLA    16                                                          001120
000511  006130                ERAI    1                                                           001130
000512  000001
000513  001010                JAZ     *+7                                                         001140
000514  000522 R
```

```
000515  006010          LDAI    18                                              001150
000516  000022
000517  051122          STA     NBIT        18 BITS                             001160
000520  001000          JMP     *+5                                             001170
000521  000525 R
000522  006010          LDAI    16                                              001180
000523  000020
000524  051122          STA     NBIT        16 BITS                             001190
000525  002000          CALL    BCNG        SET AFFECTED INSTRUCTIONS IN ARITH, SUBS,  001200
000526  003247 R
000527  100447    RTCT  EXC     0400+RTC                                        001210
000530  006020          LDBI    2                                               001220
000531  000002
000532  005021          TBA                     EXCEPT LOCATIONS  040 TO 043 (PF/R)  001230
000533  006110          ORAI    0400        INCLUSIVE-OR BIT 8 IN A REG,        001240
000534  000400
000535  056000          STA     0,2                                             001250
000536  005122          IBR                                                     001260
000537  005021          TBA                                                     001270
000540  006140          SUBI    040         CHECK IF LOC 040  (POWER FAILUE RESTART  001280
000541  000040
000542  001010          JAZ     *+9                 INTERRUPT ADDRESSES)        001290
000543  000553 R
000544  005021          TBA                                                     001300
000545  006140          SUBI    0377        CHECK IF ALL INTERRUPT LOCATIONS SETUP  001310
000546  000377
000547  001010          JAZ     RTC1                                            001320
000550  000557 R
000551  001000          JMP     RTCT+3                                          001330
000552  000532 R
000553  006020          LDBI    044         JUMP OVER PF/R INTERRUPT ADDRESSES,  001340
000554  000044
000555  001000          JMP     RTCT+3                                          001350
000556  000532 R
000557  010442    RTC1  LDA     $CON=\      CHECK IF CONSOLE MODE               001360
000560  001010          JAZ     RTCK                                            001370
000561  000570 R
000562  002000          CALL*   OUTC        CR/LF                               001380
000563  100402 R
000564  006030          LDXI    MES1        WRITE (REAL TIME CLOCK TEST)        001390
000565  002716 R
000566  002000          CALL*   OUTD                                            001400
```

```
000567  100403 R
000570  010442    RTCK    LDA     $CON = 1        CHECK IF CONSOLE MODE                   001410
000571  001010            JAZ     RTCP                                                    001420
000572  000636 R
000573  006030            LDXI    MS15            WRITE (COMPUTER IS AN)                  001430
000574  003116 R
000575  002000            CALL*   OUTD                                                    001440
000576  100403 R
000577  002000    RTCM    CALL*   INPB                                                    001450
000600  100411 R
000601  001000            JMP     RTCM                                                    001460
000602  000577 R
000603  005012            TAB                                                             001470
000604  002000            CALL*   OUTC            CR/LF                                   001480
000605  100402 R
000606  002000            CALL*   OUTC            CR/LF                                   001490
000607  100402 R
000610  005021            TBA                                                             001500
000611  006140            SUBI    0261            AN 'F' OR V73?                          001510
000612  000261
000613  001010            JAZ     RTCN                                                    001520
000614  000627 R
000615  006120            ADDI    1                                                       001530
000616  000001
000617  001010            JAZ     RTCO                                                    001540
000620  000633 R
000621  006030            LDXI    MS16            WRITE (INVALID)                         001550
000622  003242 R
000623  002000            CALL*   OUTD                                                    001560
000624  100403 R
000625  001000            JMP     RTCK                                                    001570
000626  000570 R
000627  005111    RTCN    IAR                                                             001580
000630  051123            STA     COMP            SET COMPUTER FLAG FOR 'F'               001590
000631  001000            JMP     RTCL                                                    001600
000632  000640 R
000633  051123    RTCO    STA     COMP            SET COMPUTER FLAG FOR 'I'               001610
000634  001000            JMP     RTCL                                                    001620
000635  000640 R
000636  000000    RTCP    HLT                     SET A=0 FOR I, OR A=1 FOR F             001630
000637  051123            STA     COMP            SET COMPUTER FLAG FROM REGISTER ENTRY   001640
000640  010442    RTCL    LDA     $CON            CHECK IF CONSOLE MODE                   001650
```

```
000641  001010          JAZ     RTC2                                            001660
000642  000647 R
000643  006030          LDXI    MES2            WRITE (I/O INST, AND INT, TEST) 001670
000644  002732 R
000645  002000          CALL*   OUTD                                            001680
000646  100403 R
000647  006010  RTC2    LDAI    1               SET ERROR COUNT TO ONE  ** 1 ** 001690
000650  000001
000651  051124          STA     ERRC                                            001700
000652  006010          LDAI    02000           SET UP JUMP AND MARK IN INTERRUPT ADDRESSES 001710
000653  002000
000654  050044          STA     044                                             001720
000655  050046          STA     046                                             001730
000656  006010          LDAI    ERRS            STORE LOC. OF ERROR SUBROUTINE AS JUMP ADDR 001740
000657  001131 R
000660  050047          STA     047                                             001750
000661  006010          LDAI    RTC3            LOCATION TO RETURN UPON INTERRUPT 001760
000662  000674 R
000663  050045          STA     045                                             001770
000664  100447          EXC     0400+RTC        INITIALIZE RTC                  001780
000665  100147          EXC     0100+RTC        ENABLE RTC                      001790
000666  006030          LDXI    16                4 SEC. WAIT                   001800
000667  000020
000670  002000          CALL    TDSC                                            001810
000671  002650 R
000672  002000          CALL    ERRS            NO INTERRUPT ERROR              001820
000673  001131 R
                *           ENTRANCE FROM RECEIVING INTERRUPT                   001830
000674  000000  RTC3    ENTR                                                    001840
000675  100747          EXC     0700+RTC        INHIBIT VII                     001850
000676  041124          INR     ERRC            INCR. ERROR COUNT       ** 2 ** 001860
000677  006010          LDAI    ERRS            IF INTERRUPT - GO TO ERRC       001870
000700  001131 R
000701  050045          STA     045                                             001880
000702  006030          LDXI    8                 2 SEC. WAIT                   001890
000703  000010
000704  002000          CALL    TDSC                                            001900
000705  002650 R
000706  041124          INR     ERRC            ERROR COUNT             ** 3 ** 001910
000707  006010          LDAI    RTC4            LOC. TO RETURN UPON INTERRUPT   001920
000710  000722 R
000711  050045          STA     045                                             001930
```

```
000712  100647          EXC     0600+RTC        INITIALIZE VARIABLE INTERVAL INTERRUPT      001940
000713  100347          EXC     0300+RTC        ENABLE VII AND INHIBIT MOI                  001950
000714  006030          LDXI    16                                                          001960
000715  000020
000716  002000          CALL    TDSC                                                        001970
000717  002650 R
000720  002000          CALL    ERRS                                                        001980
000721  001131 R
                *           ENTRANCE FROM RECEIVING INTERRUPT                             001990
000722  000000    RTC4  ENTR                                                              002000
000723  100447          EXC     0400+RTC        INITIALIZE RTC                              002010
000724  006010          LDAI    ERRS                                                        002020
000725  001131 R
000726  050045          STA     045                                                         002030
000727  010442          LDA     $CON            CHECK IF CONSOLE MODE                       002040
000730  001010          JAZ     *+13                                                        002050
000731  000745 R
000732  011123          LDA     COMP                                                        002060
000733  001010          JAZ     *+6                                                         002070
000734  000741 R
000735  006030          LDXI    MES4            WRITE (VARIABLE)                            002080
000736  002764 R
000737  002000          CALL*   OUTD                                                        002090
000740  100403 R                                                  (CHECK)
000741  006030          LDXI    MESA            TYPE (INTERVAL INTERRUPT)                   002100
000742  002771 R
000743  002000          CALL*   OUTD                                                        002110
000744  100403 R
                *                       TEST FOR ERROR CODE 4                             002120
000745  041124          INR     ERRC            INCR. ERROR COUNT           ** 4 **       002130
000746  006010          LDAI    040045          INCR. AND REPLACE INSTR. STORE IN LOC. 044 002140
000747  040045
000750  050044          STA     044                                                         002150
000751  006010          LDAI    RTC5            LOC TO RETURN UPON INTERRUPT                002160
000752  000772 R
000753  050047          STA     047                                                         002170
000754  006010          LDAI    1               SET UP NO. OF TRIES FOR TEST 4              002180
000755  000001
000756  051127          STA     CNTL                                                        002190
000757  006010    RTT4  LDAI    037775          SET UP OVERFLOW COUNT                       002200
000760  037775
000761  050045          STA     045                                                         002210
```

```
000762  100447          EXC     0400+RTC        INITIALIZE RTC                                  002220
000763  100147          EXC     0100+RTC        ENABLE RTC                                      002230
000764  006030          LDXI    16                4 SEC, WAIT                                   002240
000765  000020
000766  002000          CALL    TDSC                                                            002250
000767  002650 R
000770  002000          CALL    ERRS            NO INTERRUPT = ERROR 4                          002260
000771  001131 R
000772  000000  RTC5    ENTR                                                                    002270
000773  100247          EXC     0200+RTC        INHIBIT MOI                                     002280
000774  041124          INR     ERRC            ERROR COUNT                     ** 5 **         002290
000775  010045          LDA     045                                                             002300
000776  006140          SUBI    040001                                                          002310
000777  040001
001000  001010          JAZ     **5                                                             002320
001001  001005 R
001002  100447  RTC6    EXC     0400+RTC        ERROR INITIALIZE RTC                            002330
001003  002000          CALL    ERRS                                                            002340
001004  001131 R
001005  011127          LDA     CNTL            CHECK IF TEST TRIED 50 TIMES                    002350
001006  041127          INR     CNTL                                                            002360
001007  006140          SUBI    50                                                              002370
001010  000062
001011  001010          JAZ     RTTC                                                            002380
001012  001020 R
001013  006010          LDAI    04              RE-SETUP ERROR COUNT.                           002390
001014  000004
001015  051124          STA     ERRC                                                            002400
001016  001000          JMP     RTT4                                                            002410
001017  000757 R
001020  041124  RTTC    INR     ERRC            ERROR COUNT                     ** 6 **         002420
001021  006010          LDAI    ERRS            SET INTERRUPT ADDRESS TO ERROR SUBR.            002430
001022  001131 R
001023  050047          STA     047                                                             002440
001024  006030          LDXI    2               1/2 SECOND DELAY                                002450
001025  000002
001026  002000          CALL    TDSC                                                            002460
001027  002650 R
001030  041124          INR     ERRC            ERROR COUNT                     ** 7 **         002470
001031  010045          LDA     045               LOCATION 45 MUST BE GREATER THAN 40001        002480
001032  006140          SUBI    040001                                                          002490
001033  040001
```

```
001034  001010          JAZ     RTC6                                            002500
001035  001002 R
001036  041124          INR     ERRC        ERROR 8 CHECK - INHIBIT MOI  ** 10 ** 002510
001037  100447          EXC     0400+RTC    INITIALIZE RTC                      002520
001040  006010          LDAI    037775                                          002530
001041  037775
001042  050045          STA     045                                             002540
001043  006010          LDAI    ERRS          IF INTERRUPT GO TO ERROR ROUTINE  002550
001044  001131 R
001045  050047          STA     047                                             002560
001046  100347          EXC     0300+RTC                                        002570
001047  006030          LDXI    4           1 SECOND DELAY                      002580
001050  000004
001051  002000          CALL    TDSC                                            002590
001052  002650 R
001053  100447          EXC     0400+RTC    INITIALIZE RTC                      002600
001054  010442          LDA     $CON                                            002610
001055  001010          JAZ     *+6                                             002620
001056  001063 R
001057  006030          LDXI    MES5        WRITE MESSAGE MOI                   002630
001060  003010 R
001061  002000          CALL*   OUTD                                            002640
001062  100403 R
001063  011123          LDA     COMP                                            002650
001064  001010          JAZ     RT10        SKIP FREE RUNNING COUNTER CHECK FOR I'S 002660
001065  001163 R
                *       CHECK FREE RUNNING                                      002670
                *       CHECK CLEAR OPTION OF FREE RUNNING COUNTER              002680
                *       CHECK IF FRC INCREMENTING                               002690
001066  041124          INR     ERRC        ERROR COUNT = 11             ** 11 ** 002700
001067  100047          EXC     RTC         CLEAR FREE RUNNING COUNTER          002710
001070  102547          CIA     RTC         INPUT FREE RUNNING COUNTER TO A     002720
001071  051125          STA     RTSA                                            002730
001072  006030          LDXI    2           DELAY 1/2 SEC,                      002740
001073  000002
001074  002000          CALL    TDSC                                            002750
001075  002650 R
001076  102547          CIA     RTC         INPUT FRC TO A                      002760
001077  141125          SUB     RTSA        IF COUNTER ZERO FRC NOT             002770
001100  002010          JAZM    ERRS          INCREMENTING CORRECTLY,           002780
001101  001131 R
001102  041124          INR     ERRC        ERROR COUNT                  ** 12 ** 002790
```

```
001103  100047          EXC     RTC             CLEAR FRC                                002800
001104  102547          CIA     RTC             INPUT FRC                                002810
001105  001010          JAZ     **4                                                      002820
001106  001111 R
001107  002000          CALL    ERRS                                                     002830
001110  001131 R
001111  010442    RTC9  LDA     SCON            TEST IF CONTINUE MODE,                   002840
001112  001010          JAZ     RT10                                                     002850
001113  001163 R
001114  006030          LDXI    MES6            OUTPUT FRC (TEST COMPLETE)               002860
001115  003032 R
001116  002000          CALL*   OUTD                                                     002870
001117  100403 R
001120  001000          JMP     RT10                                                     002880
001121  001163 R
                        ********************************************************************** 002890
                        *       FLAGS, POINTER AND MESSAGE BUFFERS                       002900
                        ********************************************************************** 002910
001122  000000    NBIT  DATA    0                                                        002920
001123  000000    COMP  DATA    0                                                        002930
001124  000000    ERRC  DATA    0                                                        002940
001125  000000    RTSA  DATA    0                                                        002950
001126  000000    TMSV  DATA    0               TEMP, STORAGE                            002960
001127  000000    CNTL  DATA    0                                                        002970
001130  000000    PINT  DATA    0                                                        002980
                        ********************************************************************** 002990
                        *                                                              *  003000
                        *        ERROR SUBROUTINE ENTRANCE                             *  003010
                        *                                                              *  003020
                        ********************************************************************** 003030
001131  000000    ERRS  ENTR                                                           003040
001132  100447          EXC     0400+RTC        INITIALIZE RTC                           003050
                        *                       SET UP ERROR VOLATILE REGISTERS,         003060
001133  021131          LDB     ERRS            B = LOCATION INTERRUPTED FROM,           003070
001134  005004          TZX                                                              003080
001135  011124          LDA     ERRC            A = ERROR CODE NUMBER                    003090
001136  051141          STA     **3                                                      003100
001137  002000          CALL*   SSWT,00,(ERRP)*,RTCT,RTCL                                003110
001140  100421 R
001141  000000
001142  101147 R
001143  000527 R
```

```
001144  000640 R
001145  001000          JMP     RTCL                                            003120
001146  000640 R
001147  000000  ERRP    ENTR                                                    003130
001150  006030          LDXI    MES3            WRITE ERROR MESSAGE             003140
001151  002755 R
001152  002000          CALL*   OUTD                                            003150
001153  100403 R
001154  011124          LDA     ERRC                                            003160
001155  002000          CALL*   OUTE                                            003170
001156  100404 R
001157  002000          CALL*   OUTC            CR/LF                           003180
001160  100402 R
001161  001000          JMP*    ERRP                                            003190
001162  101147 R
                *****************************************************************003200
                *                                                               *003210
                *       THE OPERATOR IS REQUESTED TO INPUT HARDWARE SETUP        *003220
                *                                                               *003230
                *****************************************************************003240
001163  005001  RT10    TZA                     CLEAR PRINT FLAG                003250
001164  051130          STA     PINT                                            003260
001165  010442          LDA     SCON            CHECK IF CONSOLE MODE,          003270
001166  001010          JAZ     RT13                                            003280
001167  001231 R
001170  002000          CALL*   OUTC            CR/LF                           003290
001171  100402 R
001172  011123          LDA     COMP                                            003300
001173  001010          JAZ     *+15                                            003310
001174  001212 R
001175  006030          LDXI    MES7            WRITE (INPUT FRC INCREMENTS PER SEC) 003320
001176  003051 R
001177  002000          CALL*   OUTD                                            003330
001200  100403 R
001201  002000          CALL    IPDC            INPUT DECIMAL NUMBER (DOUBLE PRECISION) 003340
001202  002266 R
001203  052236          STA     FRCM                                            003350
001204  062237          STB     FRCM+1                                          003360
                *  COMPUTE INTERUPTS PER MIN                                    003370
                *  THESE WILL BE USED LATER IN COMPUTING ELAPSED TIME           003380
001205  002000          CALL    XDIM,D60                                        003390
001206  003330 R
```

```
001207  002264 R
001210  052254          STA     IFM                                             003400
001211  062255          STB     IFM+1                                           003410
001212  006030          LDXI    MES8            WRITE (INPUT BASIC INTERUPTS PER SEC)   003420
001213  003073 R
001214  002000          CALL*   OUTD                                            003430
001215  100403 R
001216  002000          CALL    IPDC                                            003440
001217  002266 R
001220  052240          STA     VIIF            INPUT DECIMAL NUMBER, (DOUBLE PRECISION)  003450
001221  062241          STB     VIIF+1                                          003460
001222  002000          CALL    XDIM,D60                                        003470
001223  003330 R
001224  002264 R
001225  052256          STA     IVM                                             003480
001226  062257          STB     IVM+1                                           003490
001227  001000          JMP     ITT             BGN INTERUPT TIMING TEST        003500
001230  001264 R
001231  011123    RT13  LDA     COMP            CONSOLE MODE                    003510
001232  001010          JAZ     *+13                                            003520
001233  001247 R
001234  005001          TZA                                                     003530
001235  005002          TZB                                                     003540
001236  005004          TZX                                                     003550
001237  000020          HLT     020                                             003560
001240  052236          STA     FRCM            INPUT IN A AND B REG, FRC INCR IN MICROSEC.  003570
001241  062237          STB     FRCM+1              (DOUBLE-PRECISION)  (OCTAL)  003580
001242  002000          CALL    XDIM,D60        COMPUTE INTERUPTSS PER MIN      003590
001243  003330 R
001244  002264 R
001245  052254          STA     IFM                                             003600
001246  062255          STB     IFM+1                                           003610
001247  005004          TZX                                                     003620
001250  005001          TZA                                                     003630
001251  005002          TZB                                                     003640
001252  000021          HLT     021                                             003650
001253  052240          STA     VIIF            INPUT IN A AND B REG, VII SOURCE FREQ.  003660
001254  062241          STB     VIIF+1             IN HZ, IN DOUBLE PRECISION (OCTAL)   003670
001255  002000          CALL    XDIM,D60        COMPUTE INTERUPTS PER MIN       003680
001256  003330 R
001257  002264 R
001260  052256          STA     IVM                                             003690
```

```
001261  062257          STB     IVM+1                                           003700
001262  001000          JMP     ITT             BGN INTERUPT TIMING TEST        003710
001263  001264 R
                ********************************************************************** 003720
                *                                                                    * 003730
                *   INTERUPT TIMING TEST                                             003740
                *                                                                    * 003750
                ********************************************************************** 003760
001264  010442  ITT    LDA     SCON            CONSOLE MODE?                   003770
001265  001010          JAZ     I1              IF SO, BRANCH                   003780
001266  001430 R
001267  002000          CALL*   OUTC            CR/LF                           003790
001270  100402 R
001271  006030          LDXI    IM1                                             003800
001272  003124 R
001273  002000          CALL*   OUTD            IDENTIFY TEST                   003810
001274  100403 R
001275  011673          LDA     I151            INIT TTY DEV ADDRESS            003820
001276  006150          ANAI    0177700                                         003830
001277  177700
001300  117502 I        ORA*    STTY                                            003840
001301  051673          STA     I151                                            003850
001302  006010          LDAI    1                                               003860
001303  000001
001304  052253          STA     INTT            INITIALIZE FOR II INRTRVL TIMER 003870
001305  011123          LDA     COMP            SEE IF THERE IS A CHOICE        003880
001306  001010          JAZ     I2              IF NOT, SKIP THE QUESTIONS      003890
001307  001341 R
001310  006030          LDXI    IM3                                             003900
001311  003141 R
001312  002000          CALL*   OUTD            FRC OR VII FOR INTERVAL TIMER   003910
001313  100403 R
001314  002000          CALL    IPDC                                            003920
001315  002266 R
001316  062253          STB     INTT                                            003930
001317  006030  ISCR    LDXI    IM4                                             003940
001320  003152 R
001321  002000          CALL*   OUTD            REQUEST VII SELECT COUNT        003950
001322  100403 R
001323  002000          CALL    IPDC                                            003960
001324  002266 R
001325  062243          STB     SELC+1                                          003970
```

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001326  001010          JAZ     **4                                     003980
001327  001332 R
001330  001000          JMP     ISCP            TOO LARGE               003990
001331  001411 R
001332  001020          JBZ     ISCP            TOO SMALL               004000
001333  001411 R
001334  005021          TBA                                             004010
001335  006140          SUBI    4096                                    004020
001336  010000
001337  001002          JAP     ISCP            TOO LARGE               004030
001340  001411 R
001341  006030    I2    LDXI    IM5             REQUEST INTERVAL LENGTH 004040
001342  003164 R
001343  002000          CALL*   OUTD                                    004050
001344  100403 R
001345  002000          CALL    IPDC                                    004060
001346  002266 R
001347  005311          DAR                                             004070
001350  001002          JAP     I3              IF INTERVAL TOO LARGE, TRY AGAIN 004080
001351  001417 R
001352  062251          STB     ILNG                                    004090
                  *  FOLLOWING COMPUTES THE NUMBER OF INTERUPTS PER INTERVAL 004100
001353  012253    I4    LDA     INTT            CJHOOSE CORRECT INTERUPTS PER SEC VALUE 004110
001354  001010          JAZ     I5                                      004120
001355  001362 R
001356  012240          LDA     VIIF                                    004130
001357  022241          LDB     VIIF+1                                  004140
001360  001000          JMP     I6                                      004150
001361  001364 R
001362  012236    I5    LDA     FRCM                                    004160
001363  022237          LDB     FRCM+1                                  004170
001364  002000    I6    CALL    XDIM,ILNG       GET INTERUPTS PER INTERVAL 004180
001365  003330 R
001366  002251 R
                  *  CHECK TO SEE IF VII SELECT COUNT NEED BE CONSIDERED  004190
001367  031123          LDX     COMP            IS THERE A VII          004200
001370  001040          JXZ     I7              IF NOT, INTERUPTS/INTERVAL VALUE IS OK 004210
001371  001442 R
001372  032253          LDX     INTT                                    004220
001373  001040          JXZ     I7              IF FRC IS THE INTERVAL TIMER, NO MOD NEEDED 004230
001374  001442 R
001375  005004          TZX                     OTHERWISE, DIVIDE INTERUPTS PER INTERVAL BY 004240
```

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001376  002000     I8      CALL    XDSU,SELC                                  004250
001377  003430 R
001400  002242 R
001401  001004             JAN     I71                                        004260
001402  001441 R
001403  007400             ROF                                                004270
001404  005144             IXR                                                004280
001405  001001             JOF     I3          CUT OUT IF DIVISION COMPLETE   004290
001406  001417 R
001407  001000             JMP     I8                                         004300
001410  001376 R
                    *  FOLLOWING HANDLES ILLEGAL INPUTS FOR INTERVAL SELECT COUNT  004310
001411  006030     ISCP    LDXI    IM6                                        004320
001412  003205 R
001413  002000             CALL*   OUTD                                       004330
001414  100403 R
001415  001000             JMP     ISCR                                       004340
001416  001317 R
                    *  ROUTINE TO HANDLE INTERVALS WHICH ARE TO LARGE          004350
001417  010442     I3      LDA     SCON                                       004360
001420  001010             JAZ     I1                                         004370
001421  001430 R
001422  006030             LDXI    IM6                                        004380
001423  003205 R
001424  002000             CALL*   OUTD        GIVE ERROR MESSAGE             004390
001425  100403 R
001426  001000             JMP     I2          GIVE ANOTHER CHANCE            004400
001427  001341 R
                    *   FOLLOWING HANDLES INITIALIZATION WHEM IN CONSOLE MODE  004410
001430  005001     I1      TZA                                                004420
001431  005002             TZB                                                004430
001432  005004             TZX                                                004440
001433  000022             HLT     022                                        004450
001434  052253             STA     INTT                                       004460
001435  062243             STB     SELC+1                                     004470
001436  072251             STX     ILNG                                       004480
001437  001000             JMP     I4                                         004490
001440  001353 R
                    *                                                          004500
001441  005042     I71     TXB                                                004510
001442  062252     I7      STB     IINT                                       004520
001443  005311             DAR                                                004530
```

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001444  001002          JAP     I3              TOO LARGE, IF HIGH HALF NOT ZERO OR NEG      004540
001445  001417 R
001446  005021          TBA                     CHECK AGAINST SIZE OF THE INTERVAL TIMER      004550
001447  006140          SUBI    037774                                                       004560
001450  037774
001451  001002          JAP     I3              IF TOO LARGE, REPORT IT                      004570
001452  001417 R
001453  012252          LDA     IINT                                                         004580
001454  001010          JAZ     I3              IF TOO SMALL (IE ZERO), REPORT IT            004590
001455  001417 R
                *  SETUP MOI INTERUPT TO UPDATAE  THE (V)II ELAPSED TIME COUNTER            004600
001456  006010  I9      LDAI    040045          STORE INR IN LOC 044                         004610
001457  040045
001460  050044          STA     044                                                          004620
001461  006010          LDAI    02000           STORE JMPM IN 046                            004630
001462  002000
001463  050046          STA     046                                                          004640
001464  006010          LDAI    I10             STORE INTERUPT HANDLING SUBROUTINE IN / 047   004650
001465  001574 R
001466  050047          STA     047                                                          004660
001467  010442          LDA     $CON            A TTY?                                       004670
001470  001010          JAZ     I70                                                          004680
001471  001476 R
001472  006030          LDXI    IM7             SIGNAL BEGINING OF TEST                      004690
001473  003215 R
001474  002000          CALL*   OUTD                                                         004700
001475  100403 R
                *  INITIALIZE AND START CLOCKS                                              004710
001476  100447  I70     EXC     0400+RTC        INIT RTC                                     004720
001477  005001          TZA                                                                  004730
001500  050045          STA     045                                                          004740
001501  052246          STA     UFRC            INIT ELAPSED TIME COUNTERS                   004750
001502  052244          STA     UVII                                                         004760
001503  052245          STA     LVII                                                         004770
001504  052247          STA     LFRC                                                         004780
001505  012252          LDA     IINT                                                         004790
001506  052250          STA     INXT            SET COUNT FOR END OF INTERVAL CHECK          004800
001507  011123  IX11    LDA     COMP                                                         004810
001510  001010          JAZ     IX12                                                         004820
001511  001516 R
001512  012243          LDA     SELC+1                                                       004830
001513  103147          OAR     RTC             SET INTERVAL SELECT COUNT                    004840
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001514  100647          EXC     0600*RTC        INIT VII COUNTER                                004850
001515  100047          EXC     RTC             CLEAR FRC                                       004860
001516  100147  IX12    EXC     0100*RTC        ENABLE VII                                      004870
                * LOOP TILL ABORT BY SS3                                                        004880
001517  001400  I11     JSS3    RTCT                                                            004890
001520  000527 R
001521  002000          JMPM    IUFR            UPDATE FRC ELAPSED TIME COUNTER IF NECESSAR     004900
001522  001635 R
                *  CHECK FOR END OF INTERVAL                                                    004910
001523  022253          LDB     INTT                                                            004920
001524  001020          JBZ     I141                                                            004930
001525  001531 R
001526  010045          LDA     045             GET VII CNT                                     004940
001527  001000          JMP     I14                                                             004950
001530  001541 R
001531  012247  I141    LDA     LFRC                                                            004960
001532  006150          ANAI    037777                                                          004970
001533  037777
001534  052260          STA     EMFR            STORE IN TEMP LOC                               004980
001535  102547          CIA     RTC                                                             004990
001536  122260          ADD     EMFR            DO ADD, NO OVERFLOW POSSIBLE                    005000
001537  006150          ANAI    037777                                                          005010
001540  037777
001541  142250  I14     SUB     INXT            SUBTRACT TARGET NUMBER OF INTERUPTS             005020
001542  001004          JAN     I15             IF TOO LOW, INTERVAL NOT UP                     005030
001543  001670 R
001544  006140          SUBI    04              IF CLOSE ENOUGH TO TARGET , TIME UP             005040
001545  000004
001546  001002          JAP     I15                                                             005050
001547  001670 R
                *  SIGNAL INTERVAL UP                                                           005060
001550  010442          LDA     $CON                                                            005070
001551  001010          JAZ     I162                                                            005080
001552  001557 R
001553  006010          LDAI    0207            RING TTY BELL                                   005090
001554  000207
001555  002000          CALL*   OUTA                                                           005100
001556  100400 R
                *   BLINK COSOLE LIGHTS                                                         005110
001557  102577  I162    CIA     077                                                             005120
001560  005211          CPA                                                                     005130
001561  103177          OAR     077                                                             005140
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                        *  BLINK THE OVERFLOW LIGHT                                    005150
001562  001001      I161  JOF     I17                                                  005160
001563  001565 R
001564  007401            SOF                                                         005170
                        *  COMPUTE NEW TARGET COUNT                                    005180
001565  012250      I17   LDA     INXT          GET OLD TARGET CNT                    005190
001566  122252            ADD     IINT          COMPUTE NEW ONE                       005200
001567  006150            ANAI    037777        MOD COUNTER SIZE                      005210
001570  037777
001571  052250            STA     INXT                                                005220
001572  001000            JMP     I15                                                 005230
001573  001670 R
                        *  FOLLOWING IS EXECUTED ON MDI INTERUPT                       005240
                        *  IT UPDATES THE DOUBLE PRECISION II COUNT                    005250
001574  000000      I10   DATA    0                                                   005260
001575  051631            STA     I10T                                                005270
001576  061632            STB     I10T+1                                              005280
001577  071633            STX     I10T+2                                              005290
001600  005004            TZX                                                         005300
001601  005544            AOFX                  SAVE ORIGNAL OVERFLOW CONDITION       005310
001602  010045            LDA     045                                                 005320
001603  006150            ANAI    037777                                              005330
001604  037777
001605  050045            STA     045                                                 005340
001606  012245            LDA     LVII                                                005350
001607  007400            ROF                                                         005360
001610  006120            ADDI    040000                                              005370
001611  040000
001612  006150      XDAX  ANAI    077777                                              005380
001613  077777
001614  052245            STA     LVII                                                005390
001615  012244            LDA     UVII                                                005400
001616  005511            AOFA                                                        005410
001617  052244            STA     UVII                                                005420
001620  007400            ROF                                                         005430
001621  001040            JXZ     I101                                                005440
001622  001624 R
001623  007401            SOF                   RESTORE OVERFLOW, IF NEC,             005450
001624  011631      I101  LDA     I10T                                                005460
001625  021632            LDB     I10T+1                                              005470
001626  031633            LDX     I10T+2                                              005480
001627  001000            JMP*    I10                                                 005490
```

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001630  101574 R
001631  000000    I10T   DATA    0,0,0,0                                          005500
001632  000000
001633  000000
001634  000000
                  *  FOLLOWING IS MANUAL UPDATE OF FRC ELAPSED TIME COUNTER       005510
001635  000000    IUFR   DATA    0                                                005520
001636  011123           LDA     COMP                                             005530
001637  001010           JAZ*    IUFR          IF NO FRC, CUT OUT                 005540
001640  101635 R
001641  102547           CIA     RTC                                              005550
001642  006150           ANAI    040000                                           005560
001643  040000
001644  001010           JAZ*    IUFR          IF BIT 14 IS ON, TIME TO UPDATE LFRC 005570
001645  101635 R
001646  005004           TZX                                                      005580
001647  005544           AOFX                  SAVE OVERFLOW                      005590
                  *    MOVE DYNAMIC COUNT INTO DBL PREC TOTAL                   005600
001650  007400           ROF                                                      005610
001651  102547           CIA     RTC           GET THE DYNAMIC COUNT              005620
001652  100047           EXC     RTC           CLEAR THE FRC                      005630
001653  122247           ADD     LFRC                                             005640
001654  006150           ANAI    077777        CUT OFF THE SIGN BIT               005650
001655  077777
001656  052247           STA     LFRC                                             005660
001657  012246           LDA     UFRC                                             005670
001660  005511           AOFA                  ADD IM ANY OVERFLOW                005680
001661  052246           STA     UFRC                                             005690
001662  007400           ROF                                                      005700
001663  001040           JXZ*    IUFR                                             005710
001664  101635 R
001665  007401           SOF                   RESTORE OVERFLOW                   005720
001666  001000           JMP*    IUFR                                             005730
001667  101635 R
                  *  FOLLOWING CHECKS FOR ELAPSED TIME READOUT REQUESTS           005740
001670  010442    I15    LDA     $CON                                             005750
001671  001010           JAZ     I30           IF NO TTY, MAKE SPEC CHECK         005760
001672  002100 R
001673  101201    I151   SEN     0201,*+4      SEE IF A CHATRACTER AWAITS         005770
001674  001677 R
001675  001000           JMP     I11           IF NOT, LOOP BACK TO REPEAT PREV CHECKS 005780
001676  001517 R
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001677  002000          CALL*   INPB            OTHERWISE, GET THE CHARACTER                005790
001700  100411 R
001701  001000          JMP     I11             IF SS3 ON, RETURN TO BEGINING OF TEST       005800
001702  001517 R
001703  005012          TAB                                                                 005810
001704  006140          SUBI    ' '                                                         005820
001705  000240
001706  001010          JAZ     I50             ELAPSED TIME WANTED                         005830
001707  001726 R
001710  002000          CALL*   OUTC            CR/LF                                       005840
001711  100402 R
001712  005021          TBA                                                                 005850
001713  006140          SUBI    'R'                                                         005860
001714  000322
001715  001010          JAZ     I70             RESET ELAPSED TIME COUNTERS                 005870
001716  001476 R
001717  005021          TBA                                                                 005880
001720  006140          SUBI    'K'                                                         005890
001721  000313
001722  001010          JAZ     ITT             RESTART                                     005900
001723  001264 R
001724  001000          JMP     I11             IF NONE OF THESE, IGNORE IT                 005910
001725  001517 R
                *  FOLLOWING COMPUTES ELAPSED TIME AND OUTPUTS IT                           005920
001726  002000      I50 JMPM    ICOM            COMPUE ELAPSED TIMES                        005930
001727  002126 R
001730  002000          CALL*   OUTC            CR/LF                                       005940
001731  100402 R
001732  011123          LDA     COMP                                                        005950
001733  001010          JAZ     I51             IF NO FRC, SKIP NEXYT                       005960
001734  002007 R
001735  002000          JMPM    IUFR            UPDATE FRC ELAP, TIME CNTR IF NEC,          005970
001736  001635 R
001737  006030          LDXI    IM9                                                         005980
001740  003224 R
001741  002000          CALL*   OUTD            TYPE 'FRC='                                 005990
001742  100403 R
001743  002000          CALL    IUFR            CHECK FRC COUNT                         B   005995
001744  001635 R
001745  005001          TZA                                                                 006000
001746  022260          LDB     EMFR            GET ELAPSED MIN FOR FRC                     006010
001747  006030          LDXI    BUFO                                                        006020
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001750  002543 R
001751  002000          CALL    CONV                                        006030
001752  002362 R
001753  006030          LDXI    BUFO                                        006040
001754  002543 R
001755  002000          CALL*   OUTD        OUT ELAPSED MIN                 006050
001756  100403 R
001757  002000          CALL    IUFR        CHECK FRC COUNT               B 006055
001760  001635 R
001761  006030          LDXI    IM10                                        006060
001762  003227 R
001763  002000          CALL*   OUTD        OUT 'MIN '                      006070
001764  100403 R
001765  002000          CALL    IUFR        CHECK FRC COUNT               B 006075
001766  001635 R
001767  005001          TZA                                                 006080
001770  022261          LDB     ESFR        GET ELAPSED SEC FOR FRC         006090
001771  006030          LDXI    BUFO                                        006100
001772  002543 R
001773  002000          CALL    CONV                                        006110
001774  002362 R
001775  006030          LDXI    BUFO                                        006120
001776  002543 R
001777  002000          CALL*   OUTD                                        006130
002000  100403 R
002001  002000          CALL    IUFR        CHECK FRC COUNT               B 006135
002002  001635 R
002003  006030          LDXI    IM11                                        006140
002004  003232 R
002005  002000          CALL*   OUTD        OUT 'SEC' AND CR/LF             006150
002006  100403 R
002007  002000    I51   JMPM    IUFR                                        006160
002010  001635 R
002011  006030          LDXI    IM12                                        006170
002012  003236 R
002013  002000          CALL*   OUTD                                        006180
002014  100403 R
002015  002000          CALL    IUFR        CHECK FRC COUNT               B 006185
002016  001635 R
002017  005001          TZA                                                 006190
002020  022262          LDB     EMVI        GET ELAPSED MIN FOR VII         006200
002021  006030          LDXI    BUFO                                        006210
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002022  002543 R
002023  002000          CALL    CONV                                        006220
002024  002362 R
002025  006030          LDXI    BUFO                                        006230
002026  002543 R
002027  002000          CALL*   OUTD                                        006240
002030  100403 R
002031  002000          CALL    IUFR        CHECK FRC COUNT                 B 006245
002032  001635 R
002033  006030          LDXI    IM10                                        006250
002034  003227 R
002035  002000          CALL*   OUTD                                        006260
002036  100403 R
002037  005001          TZA                                                 006270
002040  022263          LDB     ESVI        GET ELAPSED SEC                 006280
002041  006030          LDXI    BUFO                                        006290
002042  002543 R
002043  002000          CALL    CONV                                        006300
002044  002362 R
002045  006030          LDXI    BUFO                                        006310
002046  002543 R
002047  002000          CALL*   OUTD                                        006320
002050  100403 R
002051  002000          CALL    IUFR        CHECK FRC COUNT                 B 006325
002052  001635 R
002053  006030          LDXI    IM11                                        006330
002054  003232 R
002055  002000          CALL*   OUTD                                        006340
002056  100403 R
002057  002000          CALL    IUFR        CHECK FRC COUNT                 B 006345
002060  001635 R
                *   REINIT THE INTERVAL TIMER TARGET CNT                    006350
002061  102547          CIA     RTC         ASSUME FRC THE INT TMR          006360
002062  122247          ADD     LFRC                                        006370
002063  006150          ANAI    037777                                      006380
002064  037777
002065  022253          LDB     INTT        IS THE FRC THE INTERVAL TIMER?  006390
002066  001020          JBZ     I52         IF SO, ALL OK                   006400
002067  002071 R
002070  010045          LDA     045         ELSE, USE VII                   006410
002071  122252    I52   ADD     IINT        ADD IN INTERUPTS PER INTERVAL   006420
002072  006150          ANAI    037777      MOD COUNTER SIZE                006430
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002073  037777
002074  052250          STA     INXT            USE AS NEW TARGWET COUNT                006440
002075  007400          ROF                     RESET OVERFLOW INDICATOR                006450
002076  001000          JMP     I11                                                     006460
002077  001517 R
                *  FOLLOWING HANDLES ELAPSED TIME READOUTS IN CONSOLE MODE              006470
002100  001100  I30    JSS1    **4             NEED ELAPSED TIME?                      006480
002101  002104 R
002102  001000          JMP     I11             IF NOT,LOOP BACK                        006490
002103  001517 R
002104  002000          JMPM    ICOM            OTHERWISE, GET ELAPSED TIME             006500
002105  002126 R
002106  012262          LDA     EMVI            GET MIN/SEC CNT                         006510
002107  004246          LRLA    6                                                       006520
002110  112263          ORA     ESVI                                                    006530
002111  005012          TAB                                                             006540
002112  011123          LDA     COMP            A FRC?                                  006550
002113  001010          JAZ     I301                                                    006560
002114  002120 R
002115  012260          LDA     EMFR            GET MIN/SEC COUNT                       006570
002116  004246          LRLA    6                                                       006580
002117  112261          ORA     ESFR                                                    006590
002120  005004  I301    TZX                                                             006600
002121  000023          HLT     023             RETURN ELAPSED TIMES                    006610
002122  001004          JAN     ITT             REINIT?                                 006620
002123  001264 R
002124  001000          JMP     I70                                                     006630
002125  001476 R
                *  FOLLOWING COMPUTES ELAPSED TIMES IN MIN AND SEC                      006640
002126  000000  ICOM    DATA    0                                                       006650
002127  005001          TZA                                                             006660
002130  102647          CIB     RTC             GET CURRENT FRC COUNT                   006670
002131  062261          STB     ESFR            SAVE IT TEMPORARILY IN ESFR             006680
002132  020045          LDB     045                                                     006690
002133  002000          CALL    XDAD,UVII       GET CURRENT VII DOBL PREC CNT           006700
002134  003362 R
002135  002244 R
002136  031123          LDX     COMP                                                    006710
002137  001040          JXZ     IC1                                                     006720
002140  002145 R
002141  002000          CALL    XDIM,SELC+1     IF VII, ADJUST FOR SELECT COUNT         006730
002142  003330 R
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002143  002243 R
002144  005004          TZX                                                    006740
002145  002000    IC1   CALL    XDSU,IVM    SUB   INCR PER MIN                 006750
002146  003430 R
002147  002256 R
002150  001004          JAN     IC2                                            006760
002151  002155 R
002152  005144          IXR                                                    006770
002153  001000          JMP     IC1                                            006780
002154  002145 R
002155  002000    IC2   CALL    XDAD,IVM                                       006790
002156  003362 R
002157  002256 R
002160  072262          STX     EMVI        SAVE ELAPSED MIN                   006800
002161  005004          TZX                                                    006810
002162  002000    IC3   CALL    XDSU,VIIF                                      006820
002163  003430 R
002164  002240 R
002165  001004          JAN     IC4                                            006830
002166  002172 R
002167  005144          IXR                                                    006840
002170  001000          JMP     IC3                                            006850
002171  002162 R
002172  072263    IC4   STX     ESVI        STORE ELAPSED SEC                  006860
002173  011123          LDA     COMP        AN FRC?                            006870
002174  001010          JAZ*    ICOM        IF NOT, DONE                       006880
002175  102126 R
002176  002000          CALL    IUFR        UPDATE FRC ELAP, TIME CNTR, IF NEC 006890
002177  001635 R
002200  005001          TZA                                                    006900
002201  022261          LDB     ESFR        GET CURRENT FRC COUNT FROM ITS TEMP STORAGE 006910
002202  002000          CALL    XDAD,UFRC   GET DBL PREC TOTAL                 006920
002203  003362 R
002204  002246 R
002205  005004          TZX                                                    006930
002206  002000    IC5   CALL    XDSU,IFM    SUB INCR PER MIN                   006940
002207  003430 R
002210  002254 R
002211  001004          JAN     IC6                                            006950
002212  002216 R
002213  005144          IXR                                                    006960
002214  001000          JMP     IC5                                            006970
```

```
002215  002206 R
002216  002000    IC6     CALL    XDAD,IFM                                      006980
002217  003362 R
002220  002254 R
002221  072260            STX     EMFR          STORE ELAP MIN                  006990
002222  005004            TZX                                                   007000
002223  002000    IC7     CALL    XDSU,FRCM                                     007010
002224  003430 R
002225  002236 R
002226  001004            JAN     IC8                                           007020
002227  002233 R
002230  005144            IXR                                                   007030
002231  001000            JMP     IC7                                           007040
002232  002223 R
002233  072261    IC8     STX     ESFR          SAVE ELAPSED SEC                007050
002234  001000            JMP*    ICOM                                          007060
002235  102126 R
002236  000000    FRCM    DATA    0,0           FRC INCR, PER SEC (DOUBLE PREC.)007070
002237  000000
002240  000000    VIIF    DATA    0,0           VII INTERRUPTS PER SEC (DOUBLE PREC.)007080
002241  000000
002242  000000    SELC    DATA    0,0                                           007090
002243  000000
002244  000000    UVII    DATA    0             UPPER HALF, VII ELAP TIME CNTR  007100
002245  000000    LVII    DATA    0             LOWER HALF                      007110
002246  000000    UFRC    DATA    0             UPPER HALF, FRC ELAP TIME CNTR  007120
002247  000000    LFRC    DATA    0             LOWER HALF DBL PREC FRC ELAP TIME CNTR 007130
002250  000000    INXT    DATA    0             COUNT AT END OF NEXT INTERVAL   007140
002251  000000    ILNG    DATA    0             INTERVAL LENGTH                 007150
002252  000000    IINT    DATA    0             NUMBER OF INTERUPTS PER INTERVAL007160
002253  000000    INTT    DATA    0             INTERVAL TIMER, /=FRC, 1=VII    007170
002254  000000    IFM     DATA    0,0           DBL PREC INCR PER MIN FRC       007180
002255  000000
002256  000000    IVM     DATA    0,0           DBL PREC VII INCR PER MIN       007190
002257  000000
002260  000000    EMFR    DATA    0             TEMP LOC FOR ELAP TIME COMP     007200
002261  000000    ESFR    DATA    0                                             007210
002262  000000    EMVI    DATA    0                                             007220
002263  000000    ESVI    DATA    0                                             007230
002264  000074    D60     DATA    60                                            007240
002265  007370    STTY    DATA    07370         POINTER TO TTY DEV ADDRESS      007250
                  ********************************************************************** 007260
```

```
                        *                                                                     *  007270
                        *          INPUT DECIMAL NUMBER SUBROUTINE  (DOUBLE PRECISION)        *  007280
                        *               RETURN NUMBER IN A (HIGH ORDER) AND B (LOW ORDER)     *  007290
                        *                                                                     *  007300
                        ***********************************************************************  007310
002266  000000          IPDC    ENTR    0                                                        007320
002267  005001                  TZA                     ZERO OUT DOUBLE PRECISION SUM,           007330
002270  052355                  STA     DPSM                                                     007340
002271  052356                  STA     DPSM+1                                                   007350
002272  002000          IPD1    CALL*   INPB            GET 1 CHAR, IN A REG,                    007360
002273  100411 R
002274  001000                  JMP     RTCT                TERMINATION EXIT IF SS3 SET          007370
002275  000527 R
002276  005012                  TAB                                                              007380
002277  006140                  SUBI    0256            CHECK IF PERIOD                          007390
002300  000256
002301  001010                  JAZ     IPD4                                                     007400
002302  002342 R
002303  005021                  TBA                                                              007410
002304  006140                  SUBI    0254            CHECK IF COMMA,                          007420
002305  000254
002306  001010                  JAZ     IPD5                                                     007430
002307  002347 R
002310  005021                  TBA                     CHECK IF LEGAL CHAR,                     007440
002311  006140                  SUBI    0260                                                     007450
002312  000260
002313  001004                  JAN     IPD3                                                     007460
002314  002336 R
002315  052360                  STA     VALU                                                     007470
002316  006140                  SUBI    012                                                      007480
002317  000012
002320  001002                  JAP     IPD3                                                     007490
002321  002336 R
002322  012355                  LDA     DPSM                                                     007500
002323  022356                  LDB     DPSM+1                                                   007510
002324  002000                  CALL    XDIM,TEN        MULTI DP SUM BY TEN                      007520
002325  003330 R
002326  002361 R
002327  002000                  CALL    XDAD,VALU=1     ADD CHAR JUST READ                       007530
002330  003362 R
002331  002357 R
002332  052355                  STA     DPSM                                                     007540
```

```
002333  062356          STB     DPSM+1                                          007550
002334  001000          JMP     IPD1            GET NEXT CHAR,                  007560
002335  002272 R
002336  002000  IPD3    CALL*   OUTG            ILLEGAL CHAR,  MESSAGE          007570
002337  100406 R
002340  001000          JMP     IPDC+1                                          007580
002341  002267 R
002342  002000  IPD4    CALL*   OUTC            OUTPUT CR/LF                    007590
002343  100402 R
002344  005004          TZX                     PERIOD CHAR,                    007600
002345  001000          JMP     *+4                                             007610
002346  002351 R
002347  006030  IPD5    LDXI    1               COMMA CHAR,                     007620
002350  000001
002351  012355          LDA     DPSM                                            007630
002352  022356          LDB     DPSM+1                                          007640
002353  001000          JMP*    IPDC                                            007650
002354  102266 R
002355  000000  DPSM    DATA    0,0,0                                           007660
002356  000000
002357  000000
002360  000000  VALU    DATA    0                                               007670
002361  000012  TEN     DATA    10                                              007680
                ********************************************************************* 007690
                *          CONVERT DOUBLE PRECISION OCTAL NUMBER TO ASCII DECIMAL  007700
                *                                                                 007710
                ********************************************************************* 007720
002362  000000  CONV    ENTR                                                    007730
002363  072647          STX     ADDR+1          ADDRESS OF BUFFER               007740
002364  052565          STA     SAVN            TEMP STORAGE                    007750
002365  062566          STB     SAVN+1                                          007760
002366  006030          LDXI    BUFC            LOC OF 9 WORD TABLE             007770
002367  002553 R
002370  072646          STX     ADDR                                            007780
002371  006030          LDXI    TBDC            LOC OF TABLE                    007790
002372  002517 R
002373  072401          STX     CON1+2                                          007800
002374  072407          STX     CON3+2                                          007810
002375  072416          STX     CON4+2                                          007820
002376  005004          TZX                     INTEGER COUNTER                 007830
002377  002000  CON1    CALL    XDSU,0          SUB, VALUE FROM TABLE           007840
002400  003430 R
```

```
002401  000000
002402  001004          JAN     CON5            CHECK IF VALUE LESS THAN TABLE  INTEGER 0   007850
002403  002421 R
002404  005144    CON2  IXR                     INCR. INTEGER COUNT                         007860
002405  002000    CON3  CALL    XDSU,0          SUB. VALUE FROM TABLE                       007870
002406  003430 R
002407  000000
002410  001004          JAN     **4             CHECK IF VALUE NEG.                         007880
002411  002414 R
002412  001000          JMP     CON2              NO                                        007890
002413  002404 R
002414  002000    CON4  CALL    XDAD,0            ADD TABLE VALUE BACK                      007900
002415  003362 R
002416  000000
002417  052565          STA     SAVN              SAVE VALUE                                007910
002420  062566          STB     SAVN+1                                                      007920
002421  077503 I  CON5  STX*    ADDR            STORE INTEGER IN TABLE                      007930
002422  042646          INR     ADDR                                                        007940
002423  032401          LDX     CON1+2          UP-DATE BUFFER POINTER BY TWO.              007950
002424  005144          IXR                                                                 007960
002425  005144          IXR                                                                 007970
002426  072401          STX     CON1+2                                                      007980
002427  072407          STX     CON3+2                                                      007990
002430  072416          STX     CON4+2                                                      008000
002431  035001          LDX     1,1             CHECK IF NEXT TABLE VALUE ZERO              008010
002432  001040          JXZ     CON9                                                        008020
002433  002441 R
002434  005004          TZX                     ZERO INTEGER COUNTER                        008030
002435  012565          LDA     SAVN            RETURN VALUE                                008040
002436  022566          LDB     SAVN+1                                                      008050
002437  001000          JMP     CON1                                                        008060
002440  002377 R
002441  006030    CON9  LDXI    (BUFC)          ADD ASCII NOTATION TO BINARY NUMBER         008070
002442  002553 R
002443  005002          TZB                       BLANK OUT HIGH ORDER DIGITS.              008080
002444  015000    CONL  LDA     0,1             GET BINARY NUMBER                           008090
002445  001010          JAZ     CON7                                                        008100
002446  002463 R
002447  005322          DBR                                                                 008110
002450  006120    CON6  ADDI    0260            ADD ASCII CHARACTER ZERO.                   008120
002451  000260
002452  055000          STA     0,1                                                         008130
```

```
002453  005144          IXR                                                 008140
002454  005041          TXA                                                 008150
002455  006140          SUBI    (BUFC+9)        CHECK IF 9 CHARACTERS CHECKED.  008160
002456  002564 R
002457  001010          JAZ     CON8                                        008170
002460  002473 R
002461  001000          JMP     CONL                                        008180
002462  002444 R
002463  001020  CON7    JBZ     *+4                                         008190
002464  002467 R
002465  001000          JMP     CON6                                        008200
002466  002450 R
002467  006120          ADDI    0240            BLANK OUT HIGH ORDER CHARACTER  008210
002470  000240
002471  001000          JMP     CON6+2                                      008220
002472  002452 R
002473  006030  CON8    LDXI    (BUFC-1)        PACK ASCII CHARACTERS       008230
002474  002552 R
002475  015000  CO11    LDA     0,1             GET HIGH ORDER CHAR         008240
002476  005144          IXR                                                 008250
002477  004250          LRLA    8                                           008260
002500  125000          ADD     0,1             GET LOW ORDER CHAR.         008270
002501  005144          IXR                                                 008280
002502  057504 I        STA*    ADDR+1          STORE CHAR. IN BUFFER       008290
002503  042647          INR     ADDR+1                                      008300
002504  005041          TXA                                                 008310
002505  006140          SUBI    (BUFC+9)        CHECK IF BUFFER BACKED      008320
002506  002564 R
002507  001010          JAZ     *+4                                         008330
002510  002513 R
002511  001000          JMP     CO11            GET NEXT CHARACTERS.        008340
002512  002475 R
002513  002000          CALL    IUFR            UPDATE FRC ELAP. TIME CNTR. IF NEC  008350
002514  001635 R
002515  001000          JMP*    CONV                                        008360
002516  102362 R
002517  005753  TBDC    DATA    05753,060400    100000000                   008370
002520  060400
002521  000461          DATA    0461,013200      10000000                   008380
002522  013200
002523  000036          DATA    036,041100        1000000                   008390
002524  041100
```

```
002525 000003          DATA    03,03240        100000                  008400
002526 003240
002527 000000          DATA    0,023420         10000                  008410
002530 023420
002531 000000          DATA    0,01750           1000                  008420
002532 001750
002533 000000          DATA    0,0144             100                  008430
002534 000144
002535 000000          DATA    0,012               10                  008440
002536 000012
002537 000000          DATA    0,01                 1                  008450
002540 000001
002541 000000          DATA    0,0                  0                  008460
002542 000000
002543          BUFO   BSS     5                                       008470
002550 120240          DATA    '  ',0                                  008480
002551 000000
002552 000240          DATA    0240                                    008490
002553          BUFC   BSS     9                                       008500
002564 000000   FLGC   DATA    0                                       008510
002565 000000   SAVN   DATA    0,0                                     008520
002566 000000
002567 000000   TIME   DATA    0               TEMP. FR TIME           008530
002570 000000   CONT   DATA    0               TIME COUNTER            008540
002571          TABT   BSS     34              TIME BUFFER FOR 20 TIME PERIOD COUNTS  008550
002633 000000   SUMH   DATA    0,0             DOUBLE PRECISION ADD    008560
002634 000000
002635 000000   TWNT   DATA    0,20                                    008570
002636 000024
002637 000006   SIXM   DATA    6                                       008580
002640 000000   VAR    DATA    0,0                                     008590
002641 000000
002642 000000   HVAL   DATA    0,0             TOLERANCE HIGH          008600
002643 000000
002644 000000   LVAL   DATA    0,0             TOLERANCE LOW           008610
002645 000000
002646          ADDR   BSS     2               STORAGE LOCATIONS       008620
                ********************************************************** 008630
                *       TIME DELAY OF 1/4 SECOND                       * 008640
                *       X = NO OF 1/4 SECONDS TO DELAY                 * 008650
                *       CALLING SEQ,                                   * 008660
                *       LDXI    NUMBER                                 * 008670
```

```
                        *         CALL   TDSC                                                   *  008680
                        *                                                                       *  008690
                        ************************************************************************** 008700
002650  000000      TDSC  ENTR                                                                    008710
002651  052671            STA     TDSA          SAVE REGISTERS                                  008720
002652  062672            STB     TDSA+1                                                        008730
002653  072673            STX     TDSA+2                                                        008740
002654  002000      TDS1  CALL    HLFS                                                          008750
002655  002674 R
002656  032673            LDX     TDSA+2                                                        008760
002657  005344            DXR                   X = NO, OF 1/4 SEC, TIME OUTS,                008770
002660  072673            STX     TDSA+2                                                        008780
002661  001040            JXZ     TDS2                                                          008790
002662  002665 R
002663  001000            JMP     TDS1                                                          008800
002664  002654 R
002665  012671      TDS2  LDA     TDSA          RESTORE REGISTERS                               008810
002666  022672            LDB     TDSA+1                                                        008820
002667  001000            JMP*    TDSC                                                          008830
002670  102650 R
002671  000000      TDSA  DATA    0,0,0                                                         008840
002672  000000
002673  000000
002674  000000      HLFS  ENTR                                                                  008850
002675  011123            LDA     COMP                                                          008860
002676  001010            JAZ     *+4                                                           008870
002677  002702 R
002700  006010            LDAI    15632                                                         008880
002701  036420
002702  006120            ADDI    10684                                                         008890
002703  024674
002704  005014            TAX                   1/4 SECOND TIME-OUT                           008900
002705  001040      HLF1  JXZ*    HLFS                                                          008910
002706  102674 R
002707  012711            LDA     *+2                                                           008920
002710  012712            LDA     *+2                                                           008930
002711  012713            LDA     *+2                                                           008940
002712  012714            LDA     *+2                                                           008950
002713  005344            DXR                                                                   008960
002714  001000            JMP     HLF1                                                          008970
002715  002705 R
                        ************************************************************************** 008980
```

```
002716  151305    MES1    DATA    !REAL TIME CLOCK TEST!,0106612,0                    008990
002717  140714
002720  120324
002721  144715
002722  142640
002723  141714
002724  147703
002725  145640
002726  152305
002727  151724
002730  106612
002731  000000
002732  144657    MES2    DATA    !I/O INSTRUCTION AND INTERRUPT TEST!,0106612,0      009000
002733  147640
002734  144716
002735  151724
002736  151325
002737  141724
002740  144717
002741  147240
002742  140716
002743  142240
002744  144716
002745  152305
002746  151322
002747  152720
002750  152240
002751  152305
002752  151724
002753  106612
002754  000000
002755  142722    MES3    DATA    !ERROR NO, = !,0                                    009010
002756  151317
002757  151240
002760  147317
002761  127240
002762  136640
002763  000000
002764  153301    MES4    DATA    !VARIABLE!,0                                        009020
002765  151311
002766  140702
002767  146305
```

```
002770  000000
002771  120311  MESA    DATA    ' INTERVAL INTERRUPT CHECK',0106612,0                   009030
002772  147324
002773  142722
002774  153301
002775  146240
002776  144716
002777  152305
003000  151322
003001  152720
003002  152240
003003  141710
003004  142703
003005  145640
003006  106612
003007  000000
003010  146705  MES5    DATA    'MEMORY OVERFLOW INTERRUPT CHECK ',0106612,0            009040
003011  146717
003012  151331
003013  120317
003014  153305
003015  151306
003016  146317
003017  153640
003020  144716
003021  152305
003022  151322
003023  152720
003024  152240
003025  141710
003026  142703
003027  145640
003030  106612
003031  000000
003032  143322  MES6    DATA    'FREE RUNNING COUNTER CHECK',0106612,0                  009050
003033  142705
003034  120322
003035  152716
003036  147311
003037  147307
003040  120303
003041  147725
```

```
003042  147324
003043  142722
003044  120303
003045  144305
003046  141713
003047  106612
003050  000000
003051  144716    MES7    DATA    'INPUT FRC INCREMENTS PER SECOND ',0106612,0          009060
003052  150325
003053  152240
003054  143322
003055  141640
003056  144716
003057  141722
003060  142715
003061  142716
003062  152323
003063  120320
003064  142722
003065  120323
003066  142703
003067  147716
003070  142240
003071  106612
003072  000000
003073  144716    MES8    DATA    'INPUT BASIC INTERRUPTS PER SECOND ',0106612,0        009070
003074  150325
003075  152240
003076  141301
003077  151711
003100  141640
003101  144716
003102  152305
003103  151322
003104  152720
003105  152323
003106  120320
003107  142722
003110  120323
003111  142703
003112  147716
003113  142240
```

```
003114  106612
003115  000000
003116  151324    MS15    DATA    !RTC TYPE =!,0                              009080
003117  141640
003120  152331
003121  150305
003122  120275
003123  000000
003124  144716    IM1     DATA    !INTERRUPT TIMING TEST !,0106612,0          009090
003125  152305
003126  151322
003127  152720
003130  152240
003131  152311
003132  146711
003133  147307
003134  120324
003135  142723
003136  152240
003137  106612
003140  000000
003141  144716    IM3     DATA    !INTERVAL TIMER= !,0                        009100
003142  152305
003143  151326
003144  140714
003145  120324
003146  144715
003147  142722
003150  136640
003151  000000
003152  153311    IM4     DATA    !VII SELECT COUNT= !,0                      009110
003153  144640
003154  151705
003155  146305
003156  141724
003157  120303
003160  147725
003161  147324
003162  136640
003163  000000
003164  144716    IM5     DATA    !INTERVAL DISPLAY PERIOD IN SEC,=!,0        009120
003165  152305
```

```
003166  151326
003167  140714
003170  120304
003171  144723
003172  150314
003173  140731
003174  120320
003175  142722
003176  144717
003177  142240
003200  144716
003201  120323
003202  142703
003203  127275
003204  000000
003205  152716    IM6     DATA    !UNACCEPTABLE!,0106612,0                009130
003206  140703
003207  141705
003210  150324
003211  140702
003212  146305
003213  106612
003214  000000
003215  141305    IM7     DATA    !BEGIN TEST!,0106612,0                  009140
003216  143711
003217  147240
003220  152305
003221  151724
003222  106612
003223  000000
003224  143322    IM9     DATA    !FRC:!,0                                009150
003225  141672
003226  000000
003227  146711    IM10    DATA    !MIN,!,0                                009160
003230  147254
003231  000000
003232  151705    IM11    DATA    !SEC !,0106612,0                        009170
003233  141640
003234  106612
003235  000000
003236  124326    IM12    DATA    !(V)II:!,0                              009180
003237  124711
```

```
003240  144672
003241  000000
003242  144716      MS16    DATA    'INVALID',0                                  009190
003243  153301
003244  146311
003245  142240
003246  000000
                    *                                                            009200
003247  000000      BCNG    ENTR    0           ADJUST INSTRS, TO BIT SIZE       009210
003250  005002              TZB                                                  009220
003251  005101              INCR    1                                            009230
003252  004541              LLSR    1                                            009240
003253  063403              STB     XDSB                                         009250
003254  063413              STB     XDS4+1                                       009260
003255  005311              DAR                                                  009270
003256  004341              LSRA    1                                            009280
003257  053350              STA     XDA2+1      SET ANAI INST                    009290
003260  053416              STA     XDS2+1                                       009300
003261  051613              STA     XDAX+1                                       009310
003262  011122              LDA     NBIT                                         009320
003263  005311              DAR                                                  009330
003264  005311              DAR                                                  009340
003265  053402              STA     XDLC        SET LOOP COUNT FOR DIVIDE        009350
003266  001000              JMP*    BCNG                                         009360
003267  103247 R
                    *                                                            009370
                    *                                                       *    009380
                    *       DOUBLE PRECISION INTEGER MULTIPLY  BY ADDITION  *    009390
                    *         CALL  XDIM,MULT   WHERE MULTIPLIER MUST BE A SINGLE WORD +  *    009400
003270  073337      XDI1    STX     XDIS+4      SAVE VALUES                      009410
003271  053333              STA     XDIS                                         009420
003272  053335              STA     XDIS+2                                       009430
003273  063334              STB     XDIS+1                                       009440
003274  063336              STB     XDIS+3                                       009450
003275  023330              LDB     XDIM                                         009460
003276  036000              LDX     0,2         SET NO, OF TIMES TO ADD,         009470
003277  035000              LDX     0,1                                          009480
003300  043330              INR     XDIM                                         009490
003301  001040              JXZ     XDI3        CHECK IF MULTIPLIER ZERO,  ANS, ZERO  009500
003302  003317 R
003303  005344      XDI2    DXR                                                  009510
003304  001040              JXZ     XDI4                                         009520
```

```
003305  003324 R
003306  013333          LDA     XDIS                                    009530
003307  023334          LDB     XDIS+1                                  009540
003310  002000          CALL    XDAD,XDIS+2                             009550
003311  003362 R
003312  003335 R
003313  053333          STA     XDIS                                    009560
003314  063334          STB     XDIS+1                                  009570
003315  001000          JMP     XDI2                                    009580
003316  003303 R
003317  005001  XDI3    TZA                                             009590
003320  005002          TZB     .                                       009600
003321  033337          LDX     XDIS+4                                  009610
003322  001000          JMP*    XDIM                                    009620
003323  103330 R
003324  013333  XDI4    LDA     XDIS                                    009630
003325  023334          LDB     XDIS+1                                  009640
003326  033337          LDX     XDIS+4                                  009650
003327  001000          JMP     0                                       009660
003330  000000
003330          XDIM    BES     0                                       009670
003331  001000          JMP     XDI1                                    009680
003332  003270 R
003333  000000  XDIS    DATA    0,0,0,0,0                               009690
003334  000000
003335  000000
003336  000000
003337  000000
                *                                                       009700
                *  XDAD                 FIXED POINT DOUBLE PRECISION ADD/SUBTRACT  009710
                *                                                       009720
003340  073365          STX     XDAD+3          SAVE XR                 009730
003341  007400          ROF                     RESET OF                009740
003342  033362          LDX     XDAD                                    009750
003343  035000          LDX     0,1             XR>ADDR OF HI B         009760
003344  053366          STA     XDAD+4          SAVE HI A               009770
003345  005021          TBA                     GET LO A                009780
003346  125001          ADD     1,1             ADD LO B                009790
003347  006150  XDA2    ANAI    077777          SIGN BIT                009800
003350  077777
003351  005012          TAB                     SAVE RESULT             009810
003352  005001          TZA                                             009820
```

```
003353  005511          AOFA                    GET CARRY                       009830
003354  007400          ROF                     RESET OF                        009840
003355  123366          ADD     XDAD+4          ADD HI A                        009850
003356  125000          ADD     0,1             ADD HI B                        009860
003357  043362          INR     XDAD            SET RETURN                      009870
003360  033365          LDX     XDAD+3          RESTORE XR                      009880
003361  001000          JMP     0               RETURN                          009890
003362  000000
        003362 R XDAD   EQU     *-1             ENTRY                           009900
003363  001000          JMP     *-19                                            009910
003364  003340 R
003365  000000          DATA    0,0             TEMP STORAGE                    009920
003366  000000
                *                                                               009930
                *                                                               009940
                *  XDCO                 FIXED POINT DOUBLE PRECISION COMPLEMENT 009950
                *                                                               009960
003367  000000  XDCO    ENTR                                                    009970
003370  005211          CPA                                                     009980
003371  001020          JBZ     *+8                                             009990
003372  003401 R
003373  005222          CPB                                                     010000
003374  005122          IBR                                                     010010
003375  004041          LRLB    1                                               010020
003376  004141          LSRB    1                                               010030
003377  001000          JMP*    XDCO                                            010040
003400  103367 R
003401  005111          IAR                                                     010050
003402  000016  XDLC    DATA    14              DIVIDE LOOP COUNT (ALTERED)     010060
003403  100000  XDSB    DATA    0100000         SIGN (ALTERED)                  010070
                *                                                               010080
                *  XDSU                 FIXED POINT DOUBLE PRECISION SUBTRACT   010090
                *                                                               010100
003404  073433          STX     XDSU+3          SAVE XR                         010110
003405  007400          ROF                     RESET OF                        010120
003406  033430          LDX     XDSU                                            010130
003407  035000          LDX     0,1             XR=ADDR OF HI B                 010140
003410  053434          STA     XDSU+4          SAVE HI A                       010150
003411  005021          TBA                                                     010160
003412  006110  XDS4    ORAI    0100000         SET SIGN FOR CARRY              010170
003413  100000
003414  145001          SUB     1,1             SUB LO B                        010180
```

```
  003415  006150     XDS2   ANAI    077777        MASK SIGN                    010190
  003416  077777
  003417  005012            TAB                   SAVE RESULT                  010200
  003420  005001            TZA                                                010210
  003421  005711            SOFA                  GET CARRY                    010220
  003422  007400            ROF                   RESET OF                     010230
  003423  123434            ADD     XDSU+4        ADD HI A                     010240
  003424  145000            SUB     0,1           SUB HI B                     010250
  003425  043430            INR     XDSU          SET RETURN                   010260
  003426  033433            LDX     XDSU+3        RESTORE XR                   010270
  003427  001000            JMP     0             RETURN                       010280
  003430  000000
  003430                    ORG     *-1                                        010290
  003430  000000     XDSU   ENTR                  ENTRY                        010300
  003431  001000            JMP     *-21                                       010310
  003432  003404 R
  003433  000000            DATA    0,0           TEMP STORAGE                 010320
  003434  000000
          000500            END     0500                                       010330

LITERALS

POINTERS
  000502  102265
  000503  102646
  000504  102647


SYMBOLS

1  003430 R  XDSU
1  003415 R  XDS2
1  003412 R  XDS4
1  003403 R  XDSB
1  003402 R  XDLC
1  003367 R  XDCO
1  003362 R  XDAD
1  003347 R  XDA2
1  003333 R  XDIS
1  003330 R  XDIM
1  003324 R  XDI4
1  003317 R  XDI3
```

```
1  003303 R  XDI2
1  003270 R  XDI1
1  003247 R  BCNG
1  003242 R  MS16
1  003236 R  IM12
1  003232 R  IM11
1  003227 R  IM10
1  003224 R  IM9
1  003215 R  IM7
1  003205 R  IM6
1  003164 R  IM5
1  003152 R  IM4
1  003141 R  IM3
1  003124 R  IM1
1  003116 R  MS15
1  003073 R  MES8
1  003051 R  MES7
1  003032 R  MES6
1  003010 R  MES5
1  002771 R  MESA
1  002764 R  MES4
1  002755 R  MES3
1  002732 R  MES2
1  002716 R  MES1
1  002705 R  HLF1
1  002674 R  HLFS
1  002671 R  TDSA
1  002665 R  TDS2
1  002654 R  TDS1
1  002650 R  TDSC
1  002646 R  ADDR
0  002644 R  LVAL
0  002642 R  HVAL
0  002640 R  VAR
0  002637 R  SIXM
0  002635 R  TWNT
0  002633 R  SUMH
0  002571 R  TABT
0  002570 R  CONT
0  002567 R  TIME
1  002565 R  SAVN
0  002564 R  FLGC
```

```
1  002553 R  BUFC
1  002543 R  BUFO
1  002517 R  TBDC
1  002475 R  CO11
1  002473 R  CON8
1  002463 R  CON7
1  002450 R  CON6
1  002444 R  CONL
1  002441 R  CON9
1  002421 R  CON5
1  002414 R  CON4
1  002405 R  CON3
1  002404 R  CON2
1  002377 R  CON1
1  002362 R  CONV
1  002361 R  TEN
1  002360 R  VALU
1  002355 R  DPSM
1  002347 R  IPD5
1  002342 R  IPD4
1  002336 R  IPD3
1  002272 R  IPD1
1  002266 R  IPDC
1  002265 R  $TTY
1  002264 R  D60
1  002263 R  ESVI
1  002262 R  EMVI
1  002261 R  ESFR
1  002260 R  EMFR
1  002256 R  IVM
1  002254 R  IFM
1  002253 R  INTT
1  002252 R  IINT
1  002251 R  ILNG
1  002250 R  INXT
1  002247 R  LFRC
1  002246 R  UFRC
1  002245 R  LVII
1  002244 R  UVII
1  002242 R  SELC
1  002240 R  VIIF
1  002236 R  FRCM
```

```
1  002233 R  IC8
1  002223 R  IC7
1  002216 R  IC6
1  002206 R  IC5
1  002172 R  IC4
1  002162 R  IC3
1  002155 R  IC2
1  002145 R  IC1
1  002126 R  ICOM
1  002120 R  I301
1  002100 R  I30
1  002071 R  I52
1  002007 R  I51
1  001726 R  I50
1  001673 R  I151
1  001670 R  I15
1  001635 R  IUFR
1  001631 R  I10T
1  001624 R  I101
1  001612 R  XDAX
1  001574 R  I10
1  001565 R  I17
0  001562 R  I161
1  001557 R  I162
1  001541 R  I14
1  001531 R  I141
1  001517 R  I11
1  001516 R  IX12
0  001507 R  IX11
1  001476 R  I70
0  001456 R  I9
1  001442 R  I7
1  001441 R  I71
1  001430 R  I1
1  001417 R  I3
1  001411 R  ISCP
1  001376 R  I8
1  001364 R  I6
1  001362 R  I5
1  001353 R  I4
1  001341 R  I2
1  001317 R  ISCR
```

```
1  001264 R  ITT
1  001231 R  RT13
1  001163 R  RT10
1  001147 R  ERRP
1  001131 R  ERRS
1  001130 R  PINT
1  001127 R  CNTL
0  001126 R  TMSV
1  001125 R  RTSA
1  001124 R  ERRC
1  001123 R  COMP
1  001122 R  NBIT
0  001111 R  RTC9
1  001020 R  RTTC
1  001002 R  RTC6
1  000772 R  RTC5
1  000757 R  RTT4
1  000722 R  RTC4
1  000674 R  RTC3
1  000647 R  RTC2
1  000640 R  RTCL
1  000636 R  RTCP
1  000633 R  RTCO
1  000627 R  RTCN
1  000577 R  RTCM
1  000570 R  RTCK
1  000557 R  RTC1
1  000527 R  RTCT
1  000502 R  PNTR
1  000047    RTC
0  000471 R  $DCT
1  000442 R  $CON
0  000441 R  $MEM
0  000440 R  $FLG
0  000424 R  $MSM
0  000423 R  ESZC
0  000422 R  $LWE
1  000421 R  SSWT
0  000420 R  TDLY
0  000417 R  TOUT
0  000416 R  INPG
0  000415 R  INPF
```

```
0  000414 R  INPE
0  000413 R  INPD
0  000412 R  INPC
1  000411 R  INPB
0  000410 R  INPA
0  000407 R  OUTH
1  000406 R  OUTG
0  000405 R  OUTF
1  000404 R  OUTE
1  000403 R  OUTD
1  000402 R  OUTC
0  000401 R  OUTB
1  000400 R  OUTA
```