```
00001                                NAM   UPROM
00002          *
00003                                IFP1
00005                                ENDC
00006          *
00007    0000 87CD19AF               MOD   MODEND,MODNAM,PRGRM+OBJCT,REENT+1,MODENT,
00008          *
00009    000D 5550524F   MODNAM      FCS   "UPROM"
00010          *
00011                                TTL   UPROM OS-9 EQUATES
00012          *
00013          ******************************************************************
00014          *        UNIVERSAL EPROM PROGRAMMER SOFTWARE, VERSION 2.05       *
00015          ******************************************************************
00016          *                                                                *
00017          *     WINDRUSH MICRO SYSTEMS LIMITED, WORSTEAD LABORATORIES      *
00018          *     NORTH WALSHAM, NORFOLK, ENGLAND    TEL: (0692) 405189      *
00019          *                                                                *
00020          ******************************************************************
00021          *                                                                *
00022          *      THIS VERSION HAS BEEN CUSTOMISED FOR OS-9, LEVEL ONE.     *
00023          *                                                                *
00024          *      THIS VERSION WILL NOT RUN ON LEVEL TWO DUE TO THE         *
00025          *      MEMORY MANAGEMENT/PROTECTION SCHEME USED BY MICROWARE.    *
00026          *                                                                *
00027          *      A VERSION FOR LEVEL TWO IS IN DEVELOPMENT AND SHOULD BE   *
00028          *      AVAILABLE IN THE THIRD QUARTER OF 1982.                   *
00029          *                                                                *
00030          ******************************************************************
00031          *                                                                *
00032          *  BUFFLO AND BUFFHI EQUATES        * NOT USER MODIFIABLE *      *
00033          *                                                                *
00034          ******************************************************************
00035          *
00036    0000            BUFFLO   EQU   $0000      EPROM DATA BUFFER LOW LIMIT
00037    4000            BUFFHI   EQU   $4000      EPROM DATA BUFFER HIGH LIMIT+1
00038          *
00039          ****************************
00040          *                          *
00041          * USER MODIFIABLE EQUATES  *
00042          *                          *
00043          ****************************
00044          *
00045    FFFF            PWRDLY   EQU   $FFFF      POWER-UP DELAY FOR A 2MHZ SYST
00046          *PWRDLY EQU $7FFF POWER-UP DELAY FOR A 1MHZ SYSTEM
00047          *
00048    0008            DCYCLA   EQU   $0008      TRI-VOLT EPROMS REST TIME  (30
00049    0008            DCYCLB   EQU   $0008      5.0 VOLT EPROMS REST TIME  (30
00050          *
00051          *******************
00052          *                 *
00053          * RAM SCRATCH PAD *
00054          *                 *
00055          *******************
00056          *
00057  D 0000                     ORG   0
00058          *
00059  D 0000            START    RMB   2          MSB OF EPROM START ADDR
00060  D 0002            FINISH   RMB   2          MSB OF EPROM END ADDRESS
00061  D 0004            ADDRH    RMB   1          MSB OF EPROM RUNNING ADDRESS
```

```
00062 D 0005            ADDRL    RMB   1          LSB OF SAME
00063 D 0006            CIMAGE   RMB   2          IMAGE OF CONTROL LATCH DATA
00064 D 0008            SAVEX    RMB   2          X REG SAVE
00065 D 000A            LIMIT    RMB   2          LIMIT FOR LIMCHK ROUTINE
00066 D 000C            BUFEND   RMB   2          END OF BUFFER POINTER
00067 D 000E            TYPE     RMB   1          EPROM TYPE FLAG
00068 D 000F            SAVEXA   RMB   2
00069 D 0011            SAVEXB   RMB   2          X REG SAVE FOR MOVE
00070 D 0013            SAVEXC   RMB   2          16 BIT COUNTER
00071 D 0015            COUNT    RMB   2          PASS COUNTER FOR TRI-VOLT EPRO
00072 D 0017            FGTRIV   RMB   1
00073 D 0018            DCOUNT   RMB   2          DELAY MULTIPL.
00074 D 001A            STLINE   RMB   2          LINE START FOR ASCII DMP.
00075 D 001C            CKSM     RMB   1
00076 D 001D            ERFLG    RMB   1          NON HEX CHAR FLAG
00077 D 001E            FILCAR   RMB   1
00078 D 001F            XHI      RMB   1          MEM CHANGE BUFFER
00079 D 0020            XLOW     RMB   1
00080 D 0021            EPRTYP   RMB   2          ADDR. OF EPROM TYPE PROMPT
00081 D 0023            XSTORE   RMB   2          TEMP STORE LOCATION
00082 D 0025            PORT     RMB   2          EPROM PROGRAMMER PIA BASE ADDR
00083 D 0027            FILE     RMB   1          AUXILIARY FILE PATH NUMBER
00084         *
00085 D 0028                     RMB   350
00086 D 0186            STACKB   EQU   .
00087         *
00088   0050            NBUFFL   EQU   80
00089 D 0186            NBUFF    RMB   NBUFFL      FILE NAME BUFFER
00090         *
00091   4000            BSIZE    EQU   BUFFHI-BUFFLO
00092 D 01D6            BUFFER   RMB   BSIZE       RAM BUFFER
00093 D 41D6            BUFFEND  EQU   .
00094         *
00095 D 41D6            MODMEM   EQU   .
00096         *
00097         ********************
00098         *                  *
00099         * START OF PROGRAM *
00100         *                  *
00101         ********************
00102         *
00103   0012            MODENT   EQU   *
00104         *
00105                            USE   UPRM1D
00106
00107   0012            L
00108
00109                            TTL   EPROM PROGRAMMER PART ONE
00110         *
00111   0012 32C90186            LEAS  STACKB,U    LOAD INITIAL STACK POINTER
00112         *
00113
00114         ************************
00115         *                      *
00116         * INITIALISE VARIABLES *
00117         *                      *
00118         ************************
00119         *
00120   0016 0F27                CLR   FILE
00121         *
```

```
        ******************************************
        *                                        *
        * COPY PARAMETER AREA (IF ANY) INTO BUFFER *
        *                                        *
        ******************************************
        *
0018 10830000            CMPD  #0
001C 2716                BEQ   NOINITD
001E 10834000            CMPD  #BSIZE
0022 2210                BHI   NOINITD
0024 3420                PSHS  Y
0026 31C901D6            LEAY  BUFFER,U
002A A680       COPYBL   LDA   ,X+
002C A7A0                STA   ,Y+
002E ACE4                CMPX  ,S
0030 26F8                BNE   COPYBL
0032 3262                LEAS  2,S
0034            NOINITD  EQU   *
        *
        ***********************************
        *                                 *
        * SET PROCESS PRIORITY VERY HIGH *
        *                                 *
        ***********************************
        *
0034 103F0C              OS9   F$ID
0037 1025027F            LBCS  SYSERR
003B C664                LDB   #100       TRY THIS FOR MULTI-USER
        *LDB #254 HIGHEST PRIORITY - 1 (FOR SINGLE USER)
003D 103F0D              OS9   F$SPRI
0040 10250276            LBCS  SYSERR
        *
        ***********************************
        *                                 *
        * START TALKING TO THE OPERATOR *
        *                                 *
        ***********************************
        *
0044 308D0DAD            LEAX  BANNER,PCR GET BANNER
0048 1708A0              LBSR  PDATA2     DISPLAY IT
        *
004B 308D0E90   PORTQ    LEAX  BADDP,PCR
004F 170899              LBSR  PDATA2
0052 1707F9              LBSR  BADDR
0055 0D1D                TST   ERFLG
0057 26F2                BNE   PORTQ
0059 9F25                STX   PORT
        *
005B 8D07                BSR   INIT0
005D 8D2D                BSR   INIT3      SET UP PIA'S
005F 1704F6              LBSR  STOP       CLR LATCH
0062 2052                BRA   QMENU
        *
0064 9E25       INIT0    LDX   PORT       GET PORT
0066 6F84                CLR   0,X        START WITH DATA REG = 0
0068 A601                LDA   1,X        SET UP PIA'S
006A 84FB                ANDA  #$FB
006C A701                STA   1,X
006E 86FF                LDA   #$FF
0070 A784                STA   0,X        SET 'A' SIDE TO ALL O/P'S
```

```
0072 863C                 LDA   #$3C
0074 A701                 STA   1,X          SET 'A' SIDE DATA REG AND CA2
0076 39                   RTS                RETURN
     *
0077 9F23        INIT1    STX   XSTORE       SAVE X
0079 9E25                 LDX   PORT         GET PORT ADDRESS
007B 6F84                 CLR   0,X
007D A603                 LDA   3,X
007F 84FB                 ANDA  #$FB         SET DR
0081 A703                 STA   3,X
0083 6F02                 CLR   2,X          SET TO ALL I/P
0085 8A04                 ORA   #$04         RESTORE CR
0087 A703                 STA   3,X
0089 9E23                 LDX   XSTORE       RESTORE X
008B 39                   RTS
     *
008C 9F23        INIT3    STX   XSTORE       SAVE X
008E 9E25                 LDX   PORT         GET PORT ADDRESS
0090 6F84                 CLR   0,X
0092 A603                 LDA   3,X
0094 84FB                 ANDA  #$FB
0096 A703                 STA   3,X
0098 6F02                 CLR   2,X
009A 863C                 LDA   #$3C
009C A703                 STA   3,X          SET 'B' SIDE TO DATA REG AND C
009E 9E23                 LDX   XSTORE       RESTORE X
00A0 39                   RTS                RETURN
     *
00A1 9F23        INIT2    STX   XSTORE       SAVE X
00A3 9E25                 LDX   PORT         GET PORT ADDRESS
00A5 E603                 LDB   3,X          GET B/SIDE C/REG
00A7 C4FB                 ANDB  #$FB         SET DDR
00A9 E703                 STB   3,X
00AB 86FF                 LDA   #$FF         SET DDR TO ALL O/P'S
00AD A702                 STA   2,X
00AF CA04                 ORB   #$04         SET DATA REG
00B1 E703                 STB   3,X
00B3 9E23                 LDX   XSTORE       RESTORE X
00B5 39                   RTS                RETURN
     *
     ********************************
     *                              *
     * ASK OPERATOR FOR EPROM TYPE *
     *                              *
     ********************************
     *
00B6 8E4000      QMENU    LDX   #BUFFHI      SET LIMIT
00B9 9F0A                 STX   LIMIT
00BB 0F17                 CLR   FGTRIV       CLR TRI-VOLT EPROM FLAG
00BD 308D0E4E             LEAX  MENU,PCR
00C1 170827               LBSR  PDATA2       DISPLAY MENU
00C4 17082B               LBSR  INCH         GET REPLY
00C7 8130                 CMPA  #$30
00C9 272A                 BEQ   SWMES0
00CB 8131                 CMPA  #$31
00CD 2736                 BEQ   SWMES1
00CF 8132                 CMPA  #$32
00D1 2742                 BEQ   SWMES2
00D3 8133                 CMPA  #$33
00D5 274E                 BEQ   SWMES3
```

```
00242   00D7 8134                CMPA  #$34
00243   00D9 275A                BEQ   SWMES4
00244   00DB 8135                CMPA  #$35
00245   00DD 2766                BEQ   SWMES5
00246   00DF 8136                CMPA  #$36
00247   00E1 2771                BEQ   SWMES6
00248   00E3 8137                CMPA  #$37
00249   00E5 277C                BEQ   SWMES7
00250   00E7 8138                CMPA  #$38
00251   00E9 10270085            LBEQ  SWMES8
00252   00ED 8139                CMPA  #$39
00253   00EF 1027008E            LBEQ  SWMES9
00254   00F3 20C1                BRA   QMENU       GO ROUND AGAIN IF ILLEGAL
00255        *
00256   00F5 308D1071   SWMES0   LEAX  INMSG0,PCR 2508
00257   00F9 1707EF              LBSR  PDATA2
00258   00FC 308D15E5            LEAX  H2508,PCR
00259   0100 9F21                STX   EPRTYP
00260   0102 16008B              LBRA  P2508
00261        *
00262   0105 308D10B3   SWMES1   LEAX  INMSG1,PCR 2708
00263   0109 1707DF              LBSR  PDATA2
00264   010C 308D15E7            LEAX  H2708,PCR
00265   0110 9F21                STX   EPRTYP
00266   0112 160080              LBRA  P2708
00267        *
00268   0115 308D10ED   SWMES2   LEAX  INMSG2,PCR 2516
00269   0119 1707CF              LBSR  PDATA2
00270   011C 308D15E9            LEAX  H2516,PCR
00271   0120 9F21                STX   EPRTYP
00272   0122 16008B              LBRA  P2516
00273        *
00274   0125 308D112F   SWMES3   LEAX  INMSG3,PCR 2716
00275   0129 1707BF              LBSR  PDATA2
00276   012C 308D15EB            LEAX  H2716,PCR
00277   0130 9F21                STX   EPRTYP
00278   0132 16008B              LBRA  P2716
00279        *
00280   0135 308D1190   SWMES4   LEAX  INMSG4,PCR 2532
00281   0139 1707AF              LBSR  PDATA2
00282   013C 308D15ED            LEAX  H2532,PCR
00283   0140 9F21                STX   EPRTYP
00284   0142 160080              LBRA  P2732
00285        *
00286   0145 308D11D2   SWMES5   LEAX  INMSG5,PCR 2732
00287   0149 17079F              LBSR  PDATA2
00288   014C 308D15EF            LEAX  H2732,PCR
00289   0150 9F21                STX   EPRTYP
00290   0152 2071                BRA   P2732
00291        *
00292   0154 308D1205   SWMES6   LEAX  INMSG6,PCR 2732A
00293   0158 170790              LBSR  PDATA2
00294   015B 308D15F2            LEAX  H2732A,PCR
00295   015F 9F21                STX   EPRTYP
00296   0161 2062                BRA   P2732
00297        *
00298   0163 308D1243   SWMES7   LEAX  INMSG7,PCR 2564
00299   0167 170781              LBSR  PDATA2
00300   016A 308D15F5            LEAX  H2564,PCR
00301   016E 9F21                STX   EPRTYP
```

```
0170 2063                    BRA   P2764
        *
0172 308D127E    SWMES8      LEAX  INMSG8,PCR 2764
0176 170772                  LBSR  PDATA2
0179 308D15F8                LEAX  H2764,PCR
017D 9F21                    STX   EPRTYP
017F 2054                    BRA   P2764
        *
0181 308D12BD    SWMES9      LEAX  INMSG9,PCR 2528
0185 170763                  LBSR  PDATA2
0188 308D15FB                LEAX  H2528,PCR
018C 9F21                    STX   EPRTYP
018E 2055                    BRA   P2528
        *
0190 8E0400      P2508       LDX   #BUFFLO+$0400 SET 1K END
0193 201E                    BRA   PP2508      REST AS 2516
        *
0195 8E0400      P2708       LDX   #BUFFLO+$0400 SET 1K END
0198 9F0C        PP2716      STX   BUFEND
019A 301F                    LEAX  -1,X        SET END TO X3FF
019C 9F02                    STX   FINISH

019E 8E0000                  LDX   #0
01A1 9F00                    STX   START
01A3 0317                    COM   FGTRIV      SET TRI-VOLT EPROM FLAG
01A5 308D0F43                LEAX  SWPMT,PCR
01A9 17073F                  LBSR  PDATA2
01AC 8601                    LDA   #1          SET FLAG
01AE 2043                    BRA   MENUS
        *
01B0 8E0800      P2516       LDX   #BUFFLO+$0800 SET 2K END
01B3 9F0C        PP2508      STX   BUFEND
01B5 308D0E9F                LEAX  SWPRMT,PCR
01B9 17072F                  LBSR  PDATA2
01BC 8602                    LDA   #2          SET FLAG
01BE 2033                    BRA   MENUS
        *
01C0 8E0800      P2716       LDX   #BUFFLO+$0800 SET 2K END
01C3 20D3                    BRA   PP2716      REST AS 2708
        *
01C5 8E1000      P2732       LDX   #BUFFLO+$1000 SET 4K END
01C8 9F0C                    STX   BUFEND
01CA 308D0E8A                LEAX  SWPRMT,PCR
01CE 17071A                  LBSR  PDATA2
01D1 8603                    LDA   #3          SET FLAG
01D3 201E                    BRA   MENUS
        *
01D5 8E2000      P2764       LDX   #BUFFLO+$2000 SET 8K END
01D8 9F0C                    STX   BUFEND
01DA 308D0E7A                LEAX  SWPRMT,PCR
01DE 17070A                  LBSR  PDATA2
01E1 8604                    LDA   #4          SET FLAG
01E3 200E                    BRA   MENUS
        *
01E5 8E4000      P2528       LDX   #BUFFLO+$4000 SET 16K END
01E8 9F0C                    STX   BUFEND
01EA 308D0E6A                LEAX  SWPRMT,PCR
01EE 1706FA                  LBSR  PDATA2
01F1 8600                    LDA   #0          SET FLAG
        *
01F3 970E        MENUS       STA   TYPE
```

```
01F5 308D171C              LEAX  CONMSG,PCR
01F9 1706EF                LBSR  PDATA2
01FC 1706F3                LBSR  INCH        WAIT FOR OPERATOR
     *
01FF 32C90186   MENUX      LEAS  STACKB,U    RE-LOAD INITIAL STACK POINTER
0203 308D1289              LEAX  FRAME,PCR   PRINT EPROM + ADDR.LIMITS
0207 1706E1                LBSR  PDATA2
020A 9E21                  LDX   EPRTYP      GET ADDR. OF EPROM TYPE MESS.
020C 1706DC                LBSR  PDATA2
020F 308D12A8              LEAX  FMENU,PCR   DISPLAY OPERATIONS MENU
0213 1706D5                LBSR  PDATA2
0216 1706D9                LBSR  INCH        GET FUNCTION
0219 8130                  CMPA  #$30
021B 1027035F              LBEQ  FUNCT0
021F 8131                  CMPA  #$31
0221 10270574              LBEQ  FUNCT1
0225 8132                  CMPA  #$32
0227 10270496              LBEQ  FUNCT2
022B 8133                  CMPA  #$33
022D 10270465              LBEQ  FUNCT3
0231 8134                  CMPA  #$34
0233 2720                  BEQ   FUNCT4
0235 8135                  CMPA  #$35
0237 102703CC              LBEQ  FUNCT5
023B 8136                  CMPA  #$36
023D 276E                  BEQ   FUNCT6
023F 8137                  CMPA  #$37
0241 2773                  BEQ   FUNCT7
0243 8139                  CMPA  #$39
0245 2772                  BEQ   FUNCT9
0247 8152                  CMPA  #'R
0249 102706EB              LBEQ  FUNCTR
024D 8157                  CMPA  #'W
024F 102706FD              LBEQ  FUNCTW
0253 20AA                  BRA   MENUX       GET FUNCTION (REPEAT IF ILLEGA
     *
0255 308D15AE   FUNCT4     LEAX  PFRAME,PCR
0259 17068F                LBSR  PDATA2
025C 9E21                  LDX   EPRTYP      PRINT EPR. + ADDR RANGE
025E 17068A                LBSR  PDATA2
0261 308D15B9              LEAX  PRGMSG,PCR  GET PROGRAM EPROM MESAGE
0265 170683                LBSR  PDATA2      PRINT IT
0268 308D0EAC              LEAX  PLEPRM,PCR  GET PLACE EPROM MSG
026C 17067C                LBSR  PDATA2      PRINT IT
026F 308D0B64              LEAX  MSG12,PCR   GET HIT 'Y' WHEN READY MSG
0273 170675                LBSR  PDATA2      PRINT IT
0276 170679                LBSR  INCH        GET REPLY
0279 8159                  CMPA  #'Y
027B 2682                  BNE   MENUX
027D 1705C6                LBSR  CRLF
0280 0D17                  TST   FGTRIV      SEE IF TRI-VOLT EPROM
0282 2639                  BNE   EXTRIV      DO TRI-VOLT ROUTINES IF SET
0284 8D65                  BSR   ENTER1      GET ADDRESSES
0286 17011A                LBSR  ERACHK      CHECK ERASED
0289 0D1D                  TST   ERFLG
028B 2705                  BEQ   ERAOK
028D 170150                LBSR  PROGRX
0290 2008                  BRA   DOVER
0292 17013B     ERAOK      LBSR  PROGRM
     *
```

```
00422          * LONG DELAY FOR PSU'S TO DROP
00423          *
00424   0295 8604                  LDA   #4
00425   0297 170169                LBSR  MLOOP
00426   029A 170227       DOVER    LBSR  VERIFY
00427          *
00428   029D 308D093D     FUNEND   LEAX  MSG9,PCR
00429   02A1 170647                LBSR  PDATA2
00430   02A4 1702B1                LBSR  STOP        CLR LATCH
00431   02A7 1702C9                LBSR  ENDEX
00432   02AA 16FF52                LBRA  MENUX
00433          *
00434   02AD 170443       FUNCT6   LBSR  DUMP
00435   02B0 1702B9                LBSR  SAYDUN      DUMP AND RETURN
00436   02B3 16FF49                LBRA  MENUX
00437          *
00438   02B6 16FDFD       FUNCT7   LBRA  QMENU       RETURN TO 1ST MENU
00439          *
00440   02B9 5F           FUNCT9   CLRB
00441   02BA 103F06       SYSERR   OS9   F$EXIT
00442          *
00443   02BD 8D19         EXTRIV   BSR   OPTRIV      TELL OPR
00444   02BF 1700E1                LBSR  ERACHK      SEE IF ERASED
00445   02C2 0D1D                  TST   ERFLG       CHK FOR ERROR
00446   02C4 2705                  BEQ   ERASOK
00447   02C6 170117                LBSR  PROGRX
00448   02C9 2003                  BRA   DOVERR
00449   02CB 170102       ERASOK   LBSR  PROGRM
00450   02CE 8604         DOVERR   LDA   #$04
00451   02D0 170130                LBSR  MLOOP       ALLOW VPP. TO DROP
00452   02D3 1701EE                LBSR  VERIFY      SEE IF PROGRAMMED OK
00453   02D6 20C5                  BRA   FUNEND
00454          *
00455   02D8 308D1656     OPTRIV   LEAX  MSG08,PCR   TELL OPR NO ADDRESS OPTIONS
00456   02DC 17060C                LBSR  PDATA2
00457   02DF 8E0000                LDX   #0
00458   02E2 9F00                  STX   START
00459   02E4 9E0C                  LDX   BUFEND
00460   02E6 301F                  LEAX  -1,X
00461   02E8 9F02                  STX   FINISH
00462   02EA 39                    RTS
00463          *
00464   02EB 308D07E8     ENTER1   LEAX  MSG1,PCR    ASK FOR START ADDR  FOR PROGRA
00465   02EF 1705F9                LBSR  PDATA2
00466   02F2 9E0C                  LDX   BUFEND
00467   02F4 9F0A                  STX   LIMIT       SET TOP LIMIT TO EPROM END ADD
00468   02F6 170555                LBSR  BADDR
00469   02F9 0D1D                  TST   ERFLG
00470   02FB 26EE                  BNE   ENTER1      RESTART
00471   02FD 1705D0                LBSR  LIMCHK      CHECK LIMIT
00472   0300 2409                  BCC   CONT1
00473   0302 308D0801     NOTVAL   LEAX  MSG3,PCR    ERROR MESS.
00474   0306 1705E2                LBSR  PDATA2
00475   0309 20E0                  BRA   ENTER1      LOOP BACK
00476   030B 9F00         CONT1    STX   START       SAVE START
00477   030D 9F04                  STX   ADDRH       STORE START ADDR
00478          *
00479   030F 308D07DC     ENTER2   LEAX  MSG2,PCR    ASK FOR END OF RANGE
00480   0313 1705D5                LBSR  PDATA2
00481   0316 170535                LBSR  BADDR
```

```
0319 9F02                STX   FINISH
031B 0D1D                TST   ERFLG
031D 26F0                BNE   ENTER2
031F 1705AE              LBSR  LIMCHK      CHECK LIMIT
0322 2402                BCC   CONT2
0324 20DC                BRA   NOTVAL
0326 9E02       CONT2    LDX   FINISH      SET LIMIT TO FINISH
0328 3001                LEAX  1,X
032A 9F0A                STX   LIMIT
032C 9E00                LDX   START       SEE IF START >= FINISH
032E 17059F              LBSR  LIMCHK
0331 25CF                BCS   NOTVAL
0333 8E4000              LDX   #BUFFHI
0336 9F0A                STX   LIMIT       RESTORE LIMIT
0338 39                  RTS
     *
     ****************************************
     *                                      *
     *SPECIAL PROGRAM FOR TRI VOLT EPROMS *
     *                                      *
     ****************************************
     *
0339 8D38       PGTRIV   BSR   STROBL      TURN 5V ON
033B 1700B4              LBSR  PUPDLY      WAIT TO RISE
033E 8680                LDA   #$80        SET CYCLE COUNT 128
0340 9715                STA   COUNT
0342 17FD5C              LBSR  INIT2       SET B SIDE TO O/P
0345 9E00       LOOP82   LDX   START       GET START ADDRESS
0347 9F04                STX   ADDRH
0349 9605       LOOP81   LDA   ADDRL
034B 9E25                LDX   PORT        GET PORT ADDRESS
034D A784                STA   0,X         SET LOW ADDRESS
034F 8D22                BSR   STROBL
0351 9604                LDA   ADDRH       GET HI ADDR <<<<  ARE THESE TW
0353 8D2F                BSR   STROBH      SET HI ADDR <<<<  REALLY NECES
0355 9E04                LDX   ADDRH       POINT TO DATA
0357 1705C2              LBSR  READBUFF    GET DATA
035A 9E25                LDX   PORT        GET PORT ADDRESS
035C A702                STA   2,X         SET TO O/P
035E 1700FA              LBSR  PGRM        PULSE OUT
     *
     * DUTY CYCLE DELAY
     *
0361 8E0008              LDX   #DCYCLA
0364 170090              LBSR  DLOOP
0367 170135              LBSR  ENDCHK      INC PTR AND TEST FOR LAST
036A 25DD                BCS   LOOP81      LOOP TILL END OF PASS
036C 0A15                DEC   COUNT
036E 26D5                BNE   LOOP82
0370 1600E3              LBRA  ALLDUN
     *
     ************************************************
     *                                              *
     * STROBE ADDRESS AND CONTROL LATCHES ROUTINES *
     *                                              *
     ************************************************
     *
0373 9F23       STROBL   STX   XSTORE      SAVE X
0375 9E25                LDX   PORT        GET PORT ADDRESS
0377 E601                LDB   1,X         GET SIDE A C/REG
```

```
0379 CA08                ORB   #$08       SET BIT 3 TO STROBE DATA ON B
037B E701                STB   1,X
037D C4F7                ANDB  #$F7       CLR BIT 3 FOR STROBE
037F E701                STB   1,X
0381 9E23                LDX   XSTORE     RESTORE X
0383 39                  RTS              RETURN
     *
0384 0D0E       STROBH   TST   TYPE       CHECK FOR 2528 EPROM
0386 2704                BEQ   EP2528
0388 84E0                ANDA  #$E0
038A 2002                BRA   HSTROB
038C 84C0       EP2528   ANDA  #$C0
038E 9A04       HSTROB   ORA   ADDRH      FILL IN CURRENT ADDRESS
0390 9F23       STBHI    STX   XSTORE     SAVE X
0392 9E25                LDX   PORT       GET PORT ADDRESS
0394 A784                STA   0,X        ARM LATCH
0396 E603                LDB   3,X        GET SIDE B C/REG
0398 CA08                ORB   #$08       SET BIT 3 TO STROBE DATA ON A
039A E703                STB   3,X
039C C4F7                ANDB  #$F7       CLR BIT 3 FOR STROBE
039E E703                STB   3,X
03A0 9E23                LDX   XSTORE     RESTORE X
03A2 39                  RTS              RETURN
     *
     ****************************************
     *                                      *
     * VERIFY EPROM IS ERASED BETWEEN LIMITS *
     *                                      *
     ****************************************
     *
03A3 0F1D       ERACHK   CLR   ERFLG
03A5 8DCC                BSR   STROBL     FIRE LOW STROBE TO GET 5V
03A7 17FCCD              LBSR  INIT1      SET B SIDE TO INPUT
03AA 8D46                BSR   PUPDLY
03AC DC00                LDD   START      GET START ADDR
03AE DD04                STD   ADDRH      STORE FOR USE
03B0 8600       NOTDUN   LDA   #$00       SET UP FOR READ
03B2 8DD0                BSR   STROBH     STROBE TO LATCH
03B4 9605                LDA   ADDRL      GET LOW ADDR
03B6 9F23                STX   XSTORE     SAVE X
03B8 9E25                LDX   PORT       GET PORT ADDRESS
03BA A784                STA   0,X        ARM LATCH
03BC 8DB5                BSR   STROBL     STROBE TO LATCH
03BE 9E25                LDX   PORT       GET PORT ADDRESS
03C0 A602                LDA   2,X        GET DATA FROM EPROM
03C2 9E23                LDX   XSTORE     RESTORE X
03C4 81FF                CMPA  #$FF       IS IT ERASED?
03C6 1026011A            LBNE  ERR4       NO EXIT TO ERROR
03CA 1700D2              LBSR  ENDCHK     INCR ADDRESS AND TEST FOR LAST
03CD 25E1                BCS   NOTDUN     LOOP IF NOT LAST
03CF 39                  RTS

     *
     ******************************
     *                            *
     * ERASE CHECK OK. PROGRAM IT! *
     *                            *
     ******************************
     *
03D0 308D07D9   PROGRM   LEAX  MSG8,PCR   GET 'EPROM READY TO PROGRAM?'
```

```
03D4 170514                LBSR  PDATA2      DISPLAY IT
03D7 170518                LBSR  INCH        GET REPLY
03DA 8159                  CMPA  #'Y         IS IT A 'Y'
03DC 1026FE1F              LBNE  MENUX       IF NOT PROGRAM RETURN TO OPN'S
03E0 308D156C    PROGRX    LEAX  MSGPGM,PCR  TELL OPR ITS PROGRAMMING
03E4 170504                LBSR  PDATA2
03E7 9600                  LDA   START       GET HI START ADDRESS
03E9 9704                  STA   ADDRH       STORE FOR USE
     *
     *                          START PROGRAM SEQUENCE
     *
03EB 0D17                  TST   FGTRIV      SEE IF TRI-VOLT EPROM
03ED 272B                  BEQ   SKIP08
03EF 16FF47                LBRA  PGTRIV      IF SO JUMP TO SPECIAL ROUTINE
     *
     * 400ms DELAY FOR PSU'S TO RISE
     * (CAN'T BE ANY LONGER SO INTERUPTS ARE MASKED)
     *
03F2 1A50        PUPDLY    ORCC  #FIRQM+IRQM
03F4 8EFFFF                LDX   #PWRDLY
03F7 8C0000      DLOOP     CMPX  #0
03FA 2704                  BEQ   ENDLY3
03FC 301F                  LEAX  -1,X
03FE 20F7                  BRA   DLOOP
0400 1CAF        ENDLY3    ANDCC #$FF-FIRQM-IRQM
0402 39                    RTS
     *
     * LONG DELAY FOR PSU'S TO DROP
     *
0403 8100        MLOOP     CMPA  #0
0405 2705                  BEQ   ENDLY1
0407 4A                    DECA
0408 8D03                  BSR   DELAY2
040A 20F7                  BRA   MLOOP
040C 39          ENDLY1    RTS
     *
040D 8EFFFF      DELAY2    LDX   #PWRDLY
0410 8C0000      DLOOP3    CMPX  #0
0413 2704                  BEQ   ENDLY2
0415 301F                  LEAX  -1,X
0417 20F7                  BRA   DLOOP3
0419 39          ENDLY2    RTS
     *
     ********************************
     *                              *
     * TURN ON 25V AND ALLOW TO RISE *
     *                              *
     ********************************
     *
041A 17FF56      SKIP08    LBSR  STROBL      TURN ON 5V
041D 8660                  LDA   #$60        TURN ON 25V AND CS TO WRITE
041F 17FF62                LBSR  STROBH
0422 8DCE                  BSR   PUPDLY
0424 DC00                  LDD   START       GET ADDRESS
0426 DD04                  STD   ADDRH       SET ADDR READY FOR RUN
0428 9E00                  LDX   START       GET BUFFER POINTER
042A 17FC74      NEXT      LBSR  INIT2       SET UP PIA B SIDE FOR OUTPUT
042D 9605                  LDA   ADDRL       GET LO ADDR
042F 9F23                  STX   XSTORE      SAVE X
0431 9E25                  LDX   PORT        GET PORT ADDRESS
```

```
0433 A784                STA   0,X        ARM LO ADDR LATCH
0435 9E23                LDX   XSTORE     RESTORE X
0437 17FF39              LBSR  STROBL     STROBE TO LOW ORDER LATCH
043A 9E04                LDX   ADDRH      GET ADDRESS
043C 1704DD              LBSR  READBUFF   GET DATA.
043F 81FF                CMPA  #$FF       SEE IF PGRM IS REQ'D
0441 270F                BEQ   SKPRGM
0443 9F23                STX   XSTORE     SAVE X
0445 9E25                LDX   PORT       GET PORT ADDRESS
0447 A702                STA   2,X        LOAD TO EPROM
0449 9E23                LDX   XSTORE     RESTORE X
044B 8D0E                BSR   PGRM       PULSE OUT
     *
     ********************************
     *                              *
     * DUTY CYCLE DELAY ROUTINE     *
     *                              *
     ********************************
     *
044D 8E0008              LDX   #DCYCLB
0450 8DA5                BSR   DLOOP      DUTY CYCLE DELAY
0452 8D4B       SKPRGM   BSR   ENDCHK     LAST ADDRESS?
0454 25D4                BCS   NEXT       NOT FINISHED GET NEXT
     *
     *
0456 4F         ALLDUN   CLRA             SEND 'PROG DONE' MSG AND RETUR
0457 17FF36              LBSR  STBHI
045A 39                  RTS
     *
     *
     ****************************
     *                          *
     * GENERATE A PROGRAM PULSE *
     *                          *
     ****************************
     *
045B 0D17       PGRM     TST   FGTRIV
045D 2620                BNE   PGR08      SELECT WHICH PGRM PULSE
045F 8660                LDA   #$60       START WITH OP LO
0461 17FF20              LBSR  STROBH
0464 86E0                LDA   #$E0       SET FOR PGRM PULSE HI
0466 17FF1B              LBSR  STROBH     LOAD IT
0469 8660                LDA   #$60       PULSE LO
046B 17FF16              LBSR  STROBH     LOAD IT
046E 9F23                STX   XSTORE     SAVE X
0470 9E25                LDX   PORT       GET PORT ADDRESS
0472 A602                LDA   2,X        DUMMY READS TO CLR FLAGS
     *
0474 A603       TSTLP1   LDA   3,X
0476 8480                ANDA  #$80       TEST B REG INT FLAG FOR END OF
0478 27FA                BEQ   TSTLP1
047A A602                LDA   2,X        DUMMY READ TO CLR FLAG
047C 9E23                LDX   XSTORE     RESTORE X
047E 39                  RTS              RETURN WHEN DONE
     *
047F 8620       PGR08    LDA   #$20
0481 17FF00              LBSR  STROBH
0484 86A0                LDA   #$A0
0486 17FEFB              LBSR  STROBH
0489 8620                LDA   #$20
```

```
048B 17FEF6                LBSR  STROBH
048E 9F23                  STX   XSTORE      SAVE X
0490 9E25                  LDX   PORT        GET PORT ADDRESS
0492 A684                  LDA   0,X         DUMMY READ
     *
0494 A601        PLS08     LDA   1,X
0496 8480                  ANDA  #$80
0498 27FA                  BEQ   PLS08
049A A684                  LDA   0,X         DUMMY RD TO CLR FLG
049C 9E23                  LDX   XSTORE      RESTORE X
049E 39                    RTS
     *
     ********************************************************
     *                                                      *
     * CHECK FOR LAST ADDRESS AND INCREMENT ADDRESS IF NOT *
     *                                                      *
     ********************************************************
     *
049F 9F08        ENDCHK    STX   SAVEX       SAVE X REG
04A1 9E04                  LDX   ADDRH       GET RUNNING ADDRESS
04A3 9C02                  CMPX  FINISH      LAST ADDRESS?
04A5 2709                  BEQ   DONE        SKIP IF LAST
04A7 3001                  LEAX  1,X
04A9 9F04                  STX   ADDRH       LOAD NEW ADDR
04AB 1A01                  ORCC  #CARRY      SET CARRY TO SHOW NOT DONE
04AD 9E08                  LDX   SAVEX       RESTORE X REG
04AF 39                    RTS               RETURN
     *
04B0 1CFE        DONE      ANDCC #$FF-CARRY  CLR CARRY TO SHOW ALL DONE
04B2 9E08                  LDX   SAVEX       RESTORE X REG
04B4 39                    RTS               RETURN
     *
     *************************
     *                       *
     * READ EPROM INTO BUFFER *
     *                       *
     *************************
     *
04B5 8D6B        READ      BSR   SETADD      SET UP ADDRESSES
04B7 170083      RLOOP     LBSR  SETUPR      SET UP FOR READ
04BA 17046B                LBSR  RITEBUFF    LOAD TO BUFFER
04BD 3001                  LEAX  1,X         STEP BUFFER POINTER
04BF 8DDE                  BSR   ENDCHK      INC ADDR AND TEST FOR LAST
04C1 25F4                  BCS   RLOOP       LOOP IF NOT DONE
04C3 39                    RTS               RETURN WHEN DONE
     *
04C4 8D5C        VERIFY    BSR   SETADD
04C6 8D75        VLOOP     BSR   SETUPR      SET UP FOR READ
04C8 3402                  PSHS  A
04CA 17044F                LBSR  READBUFF
04CD A1E0                  CMPA  ,S+         VERIFY DATA
04CF 263C                  BNE   ERR3        EXIT IF NOT GOOD
04D1 3001                  LEAX  1,X         STEP BUFFER POINTER
04D3 8DCA                  BSR   ENDCHK      INC ADDR AND TEST FOR LAST
04D5 25EF                  BCS   VLOOP       BACK FOR MORE
04D7 39                    RTS               RETURN WHEN DONE
     *
04D8 308D062B    ERR1      LEAX  MSG3,PCR    GET 'OUT OF RANGE' MESG
04DC 17040C                LBSR  PDATA2      DISPLAY IT
04DF 3262        FNERR1    LEAS  2,S
```

```
04E1 16FD1B                LBRA  MENUX      RESTART
     *
04E4 0F1D        ERR4      CLR   ERFLG
04E6 031D                  COM   ERFLG      ERFLG=FF IF ERROR
04E8 308D0659              LEAX  MSG4,PCR
04EC 1703FC                LBSR  PDATA2
04EF 3044                  LEAX  ADDRH,U
04F1 1703D4                LBSR  OUT4HS     DISPLAY FAILED ADDRESS
04F4 17034F                LBSR  CRLF
04F7 8D5F                  BSR   STOP       CLR LATCH
04F9 308D0694              LEAX  MSG6,PCR
04FD 1703EB                LBSR  PDATA2
0500 1703EF                LBSR  INCH
0503 8159                  CMPA  #'Y
0505 2705                  BEQ   ABERR4
0507 17033C                LBSR  CRLF
050A 20D3                  BRA   FNERR1     RETURN TO MAIN MENU
050C 39          ABERR4    RTS
     *
050D 308D065A    ERR3      LEAX  MSG5,PCR
     *
0511 1703D7      ERREX     LBSR  PDATA2
0514 3044                  LEAX  ADDRH,U
0516 1703AF                LBSR  OUT4HS     DISPLAY ERROR MSG AND FAILED A
0519 8D3D                  BSR   STOP       CLR LATCH
051B 8D56                  BSR   ENDEX
051D 3262                  LEAS  2,S
051F 16FCDD                LBRA  MENUX      RETURN TO MAIN MENU
     *
0522 17FE4E      SETADD    LBSR  STROBL
0525 17FECA                LBSR  PUPDLY     TURN ON PWR AND WAIT
0528 17FB4C                LBSR  INIT1      SET B SIDE TO INPUTS
052B 0F00                  CLR   START
052D 0F01                  CLR   START+1    SET START ADDR TO 0
052F 9E0C                  LDX   BUFEND
0531 301F                  LEAX  -1,X       END -1
0533 9F02                  STX   FINISH     SET FINISH = END OF BUFFER
0535 0F04                  CLR   ADDRH
0537 0F05                  CLR   ADDRL
0539 8E0000                LDX   #BUFFLO    SET START POINTER
053C 39                    RTS
     *
053D 8600        SETUPR    LDA   #$00       SET UP FOR READ
053F 17FE42                LBSR  STROBH
0542 9605                  LDA   ADDRL      PUT OUT LO ADDR
0544 9F23                  STX   XSTORE     SAVE X
0546 9E25                  LDX   PORT       GET PORT ADDRESS
0548 A784                  STA   0,X
054A 9E23                  LDX   XSTORE     RESTORE X
054C 17FE24                LBSR  STROBL
054F 9F23                  STX   XSTORE     SAVE X
0551 9E25                  LDX   PORT       GET PORT ADDRESS
0553 A602                  LDA   2,X        GET DATA
0555 9E23                  LDX   XSTORE     RESTORE X
0557 39                    RTS
     *
     ************************************
     *                                  *
     *TURN OFF THE POWER WHEN COMPLETE *
     *                                  *
```

```
00842          ***********************************
00843          *
00844    0558 4F          STOP     CLRA
00845    0559 17FE17               LBSR  STROBL
00846    055C 17FE31               LBSR  STBHI
00847    055F 9F23                 STX   XSTORE      SAVE X
00848    0561 9E25                 LDX   PORT        GET PORT ADDRESS
00849    0563 A601                 LDA   1,X
00850    0565 84F7                 ANDA  #$F7
00851    0567 A701                 STA   1,X         SET 5V OFF
00852    0569 9E23                 LDX   XSTORE      RESTORE X
00853    056B 39                   RTS
00854          *
00855          *****************************************
00856          *                                       *
00857          * TELL THE OPERATOR THAT THE JOB IS DONE *
00858          *                                       *
00859          *****************************************
00860          *
00861    056C 308D12EA    SAYDUN   LEAX  DUNMSG,PCR
00862    0570 170378               LBSR  PDATA2
00863    0573 308D139E    ENDEX    LEAX  CONMSG,PCR
00864    0577 170371               LBSR  PDATA2
00865    057A 170375               LBSR  INCH
00866    057D 39                   RTS
00867          *
00868                              USE   UPRM2D
00869                              TTL   EPROM PROGRAMMER PART TWO
00870          *
00871          ************************************************
00872          *                                              *
00873          * FILL THE BUFFER WITH A SPECIFIED CHARACTER *
00874          *                                              *
00875          ************************************************
00876          *
00877    057E             FUNCT0   EQU   *
00878          *
00879    057E 308D0736    FILBUF   LEAX  FILMES,PCR
00880    0582 170366               LBSR  PDATA2      PROMPT FOR FILL CHAR.
00881    0585 8E4000               LDX   #BUFFHI     SET LIMIT TO BUFFHI
00882    0588 9F0A                 STX   LIMIT
00883    058A 1702D4               LBSR  BYTE        GET HEX BYTE
00884    058D 971E                 STA   FILCAR      SAVE IT
00885    058F 0D1D                 TST   ERFLG
00886    0591 26EB                 BNE   FILBUF
00887    0593 308D0540    ENTR1    LEAX  MSG1,PCR    ASK FOR START ADDRESS
00888    0597 170351               LBSR  PDATA2
00889    059A 1702B1               LBSR  BADDR       GET IT
00890    059D 0D1D                 TST   ERFLG       NON HEX ?
00891    059F 26F2                 BNE   ENTR1
00892    05A1 17032C               LBSR  LIMCHK      CHECK.WITHIN BUFFER LIMITS
00893    05A4 2506                 BCS   LIMER1
00894    05A6 9F00                 STX   START       SAVE START
00895    05A8 9F04                 STX   ADDRH       STORE START ADDR
00896    05AA 200E                 BRA   ENTR2
00897    05AC 308D0557    LIMER1   LEAX  MSG3,PCR
00898    05B0 170338               LBSR  PDATA2
00899    05B3 8E4000               LDX   #BUFFHI     RESTORE LIMIT
00900    05B6 9F0A                 STX   LIMIT
00901    05B8 20D9                 BRA   ENTR1
```

```
05BA 308D0531   ENTR2    LEAX  MSG2,PCR    ASK FOR END RANGE
05BE 17032A              LBSR  PDATA2
05C1 17028A              LBSR  BADDR
05C4 9F02                STX   FINISH
05C6 0D1D                TST   ERFLG       VALID HEX ?
05C8 26F0                BNE   ENTR2
05CA 170303              LBSR  LIMCHK      CHECK WITHIN BUFFER LIMITS
05CD 2502                BCS   LIMER2
05CF 2009                BRA   OK
05D1 308D0532   LIMER2   LEAX  MSG3,PCR
05D5 170313              LBSR  PDATA2
05D8 20B9                BRA   ENTR1
05DA 9E02       OK       LDX   FINISH      CHECK START>=FINISH
05DC 3001                LEAX  1,X
05DE 9F0A                STX   LIMIT
05E0 9E00                LDX   START
05E2 1702EB              LBSR  LIMCHK
05E5 25C5                BCS   LIMER1
05E7 9E02                LDX   FINISH
05E9 3001                LEAX  1,X
05EB 9F02                STX   FINISH      BUMP UP ONE
05ED 9E00                LDX   START       GET BEGIN ADDRESS
05EF 961E                LDA   FILCAR
05F1 170334     CLOOPA   LBSR  RITEBUFF
05F4 3001                LEAX  1,X
05F6 9C02                CMPX  FINISH      CHK.FOR END
05F8 26F7                BNE   CLOOPA
05FA 17FF6F     FILDUN   LBSR  SAYDUN
05FD 16FBFF              LBRA  MENUX
        *
        ******************************
        *                            *
        * EXAMINE & CHANGE THE BUFFER *
        *                            *
        ******************************
        *
0600 308D049B   OTLIMT   LEAX  MERMSG,PCR
0604 1702E4              LBSR  PDATA2
        *
0607            FUNCT5   EQU   *
        *
0607 308D06FA   INSERT   LEAX  INSMSG,PCR
060B 1702DD              LBSR  PDATA2
060E 8E4000              LDX   #BUFFHI     SET UPPER LIMIT OF BUFFER
0611 9F0A                STX   LIMIT
0613 170238              LBSR  BADDR
0616 17022D              LBSR  CRLF
0619 0D1D                TST   ERFLG
061B 26EA                BNE   INSERT
        *
        * TEST TO SEE IF STARTING ADDRESS IS WITHIN LIMITS
        *
061D 9E1F                LDX   XHI
061F 1702AE              LBSR  LIMCHK
0622 25DC                BCS   OTLIMT
        *
0624 17021F     CHA51    LBSR  CRLF
0627 30C81F              LEAX  XHI,U       GET AND RE-PRINT ADDRESS
062A 17029B              LBSR  OUT4HS
062D 9E1F                LDX   XHI         GET DATA
```

```
062F 1702EA                LBSR  READBUFF
0632 3001                  LEAX  1,X
0634 9F1F                  STX   XHI
0636 170287                LBSR  OUT2HAS     AND PRINT IT
0639 0F1D                  CLR   ERFLG
063B 1702B4                LBSR  INCH        GET NEW DATA
063E 8120                  CMPA  #$20        IF SPACE GET NEXT
0640 2731                  BEQ   CHA81
0642 8155                  CMPA  #'U         IF 'UP' GET PREVIOUS ADDRESS
0644 2722                  BEQ   CHA71
0646 815E                  CMPA  #'^
0648 271E                  BEQ   CHA71
064A 810D                  CMPA  #$0D        IF 'RET' RETURN TO MENU
064C 1027FBAF              LBEQ  MENUX
0650 170245                LBSR  INHEXX
0653 0D1D                  TST   ERFLG
0655 2609                  BNE   NONHEX
0657 170209                LBSR  BYTE+2      GET NEW DATA
065A 0D1D                  TST   ERFLG
065C 2602                  BNE   NONHEX
065E 202D                  BRA   CHA61       STORE NEW DATA
0660 9E1F        NONHEX    LDX   XHI
0662 301F                  LEAX  -1,X
0664 9F1F                  STX   XHI
0666 20BC                  BRA   CHA51       BACK IT UP AND TRY AGAIN
0668 301E        CHA71     LEAX  -2,X
066A 8CFFFF                CMPX  #$FFFF
066D 270B                  BEQ   LOLIMT
066F 9F1F                  STX   XHI
0671 20B1                  BRA   CHA51       LOOP FOR MORE
         *
0673 8C4000      CHA81     CMPX  #BUFFHI     SEE IF OUTSIDE OF BUFFER LIMIT
0676 270F                  BEQ   HILIMT
0678 20AA                  BRA   CHA51       O.K....GET NEXT ONE
067A 3001        LOLIMT    LEAX  1,X
067C 9F1F                  STX   XHI          MOVE FORWARD TO '0000'
067E 308D041D    BUFLMT    LEAX  MERMSG,PCR 'BUFFER LIMITS EXCEEDED'
0682 170266                LBSR  PDATA2
0685 209D                  BRA   CHA51       RE-PRINT CURRENT LINE
0687 301F        HILIMT    LEAX  -1,X
0689 9F1F                  STX   XHI          BACK UP TO TOP LIMIT OF BUFFE
068B 20F1                  BRA   BUFLMT
         *
068D 9E1F        CHA61     LDX   XHI
068F 301F                  LEAX  -1,X
0691 170294                LBSR  RITEBUFF    STORE NEW DATA
0694 208E                  BRA   CHA51       AND GET NEXT
         *
         ************************************
         *                                  *
         * VERIFY EPROM AGAINST THE BUFFER *
         *                                  *
         ************************************
         *
0696             FUNCT3    EQU   *
         *
0696 308D1133    VERPRM    LEAX  VERMSG,PCR GET VERIFY EPROM MESAGE
069A 17024E                LBSR  PDATA2      PRINT IT
069D 308D0A77              LEAX  PLEPRM,PCR GET PLACE EPROM MSG
06A1 170247                LBSR  PDATA2      PRINT IT
```

```
06A4 308D072F            LEAX  MSG12,PCR  GET READY TO CONTINUE MSG
06A8 170240              LBSR  PDATA2     PRINT IT
06AB 170244              LBSR  INCH       GET REPLY
06AE 8159                CMPA  #'Y
06B0 260C                BNE   XMENU      RETURN TO MENU IF NOT 'Y'
06B2 170191              LBSR  CRLF
06B5 17FE0C              LBSR  VERIFY     DO VERIFY ROUTINE (WILL EXIT I
06B8 17FE9D              LBSR  STOP       CLEAR LATCH
06BB 17FEAE              LBSR  SAYDUN
06BE 16FB3E     XMENU    LBRA  MENUX
     *
     ********************************
     *                              *
     * COPY AN EPROM INTO THE BUFFER *
     *                              *
     ********************************
     *
06C1            FUNCT2   EQU   *
     *
06C1 308D10D4   CPYPRM   LEAX  CPYMSG,PCR GET COPY EPROM MESAGE
06C5 170223              LBSR  PDATA2     PRINT IT
06C8 308D0A4C            LEAX  PLEPRM,PCR GET PLACE EPROM MSG
06CC 17021C              LBSR  PDATA2     PRINT IT
06CF 308D0704            LEAX  MSG12,PCR  GET READY TO CONTINUE MSG
06D3 170215              LBSR  PDATA2     PRINT IT
06D6 170219              LBSR  INCH       GET REPLY
06D9 8159                CMPA  #'Y
06DB 260C                BNE   YMENU      RETURN TO MENU IF NOT 'Y'
06DD 170166              LBSR  CRLF
06E0 17FDD2              LBSR  READ
06E3 17FE72              LBSR  STOP       CLR LATCH
06E6 17FE83              LBSR  SAYDUN
06E9 16FB13     YMENU    LBRA  MENUX
     *
     ******************
     *                *
     * FORMATTED DUMP *
     *                *
     ******************
     *
06EC 308D03AF   OUTLIM   LEAX  MERMSG,PCR 'BUFFER LIMITS EXCEEDED'
06F0 1701F8              LBSR  PDATA2
06F3 308D056B   DUMP     LEAX  DMPMSG,PCR
06F7 1701F1              LBSR  PDATA2
06FA 8E4000              LDX   #BUFFHI
06FD 9F0A                STX   LIMIT      SET LIMIT TO END OF BUFFER
06FF 17014C              LBSR  BADDR
0702 0D1D                TST   ERFLG
0704 2674                BNE   TRYAGN
0706 9F0F                STX   SAVEXA     SAVE START ADDRESS
0708 9F1A                STX   STLINE     ASCII LINE START
070A 1701C3              LBSR  LIMCHK
070D 25DD                BCS   OUTLIM
070F 170134              LBSR  CRLF
0712 8D6F       MORE     BSR   LINEF
0714 8610                LDA   #$10
0716 9715                STA   COUNT
0718 8610       LINLOP   LDA   #$10       DO 16 X 16 DUMP
071A 9716                STA   COUNT+1
     *
```

```
        * CHECK TO SEE IF DUMP REMAINS WITHIN BUFFER LIMITS
        *
071C 8E000F                LDX   #$000F      NUMBER OF BYTES TO BE DUMPED
071F 9F08                  STX   SAVEX       STORE IT FOR 16 BIT ADD
0721 9E0F                  LDX   SAVEXA      GET CURRENT ADDRESS POINTER
0723 9F23                  STX   XSTORE      STORE IT FOR 16 BIT ADD
0725 1701B5                LBSR  ADDEM       DO 16 BIT ADD
0728 1701A5                LBSR  LIMCHK      OUT OF LIMITS?
072B 25BF                  BCS   OUTLIM      YES!
        *
072D 304F                  LEAX  SAVEXA,U
072F 170196                LBSR  OUT4HS
0732 9E0F        BINLOP    LDX   SAVEXA
0734 1701E5                LBSR  READBUFF
0737 3001                  LEAX  1,X
0739 9F0F                  STX   SAVEXA
073B 170182                LBSR  OUT2HAS
073E 0A16                  DEC   COUNT+1     OUT PUT HEX BYTE AND SPACE
0740 26F0                  BNE   BINLOP      DO 16 BYTES PER LINE
0742 8D4A        ASCII     BSR   SPACES
0744 9E1A        GTSTRT    LDX   STLINE      GET START OF LINE
0746 C610                  LDB   #$10        16 CHARS
0748 1701D1      OUT       LBSR  READBUFF    GET FIRST CHAR
074B 8120                  CMPA  #$20
074D 2D04                  BLT   NOPRNT      NOT PRINTABLE
074F 817E                  CMPA  #$7E
0751 2D02                  BLT   OUT1        PRINT CHAR.
0753 862E        NOPRNT    LDA   #'.         PRINT A '.'
0755 1701B1      OUT1      LBSR  OUTCH       PRINT ASCII
0758 3001                  LEAX  1,X
075A 5A          OUT2      DECB
075B 26EB                  BNE   OUT         LOOP BACK FOR MORE
075D 9F1A                  STX   STLINE
075F 8D22        CONTIN    BSR   LINEF
0761 0A15                  DEC   COUNT       FOR 16 LINES
0763 26B3                  BNE   LINLOP
0765 308D0326              LEAX  MORMSG,PCR
0769 17017F                LBSR  PDATA2
076C 170183                LBSR  INCH
076F 8159                  CMPA  #'Y
0771 1026FA8A              LBNE  MENUX
0775 1700CE                LBSR  CRLF
0778 2098                  BRA   MORE        PLAY IT AGAIN SAM!
        *
077A 1700C9      TRYAGN    LBSR  CRLF
077D 1700C6                LBSR  CRLF
0780 16FF70                LBRA  DUMP
        *
0783 860D        LINEF     LDA   #$0D
0785 170181                LBSR  OUTCH
0788 860A                  LDA   #$0A
078A 17017C                LBSR  OUTCH
078D 39                    RTS
        *
078E 8620        SPACES    LDA   #$20
0790 170176                LBSR  OUTCH
0793 8620        SPACE     LDA   #$20
0795 170171                LBSR  OUTCH
0798 39                    RTS
        *
```

```
01142          ***************************
01143          * MOVE DATA WITHIN BUFFER *
01144          ***************************
01145          *
01146    0799                FUNCT1   EQU   *
01147          *
01148    0799 308D110A       MOVE     LEAX  MVMSG1,PCR PROMPT FOR SOURCE
01149    079D 17014B                  LBSR  PDATA2
01150    07A0 8E4000                  LDX   #BUFFHI
01151    07A3 9F0A                    STX   LIMIT      SET UP LIMITS
01152    07A5 1700A6                  LBSR  BADDR      GET ADDRESS
01153    07A8 9F0F                    STX   SAVEXA     STORE AS 'FROM ADDRESS'
01154    07AA 0D1D                    TST   ERFLG
01155    07AC 26EB                    BNE   MOVE
01156    07AE 17011F                  LBSR  LIMCHK
01157    07B1 240A                    BCC   TOADD
01158    07B3 308D0350                LEAX  MSG3,PCR
01159    07B7 170131                  LBSR  PDATA2
01160  W 07BA 16FFDC                 LBRA  MOVE       OUT OF LIMITS...TRY AGAIN
01161    07BD 308D112A       TOADD    LEAX  MVMSG2,PCR PROMPT FOR DESTINATION
01162    07C1 170127                  LBSR  PDATA2
01163    07C4 170087                  LBSR  BADDR      GET ADDRESS
01164    07C7 0D1D                    TST   ERFLG
01165  W 07C9 1026FFCC                LBNE  MOVE       START OVER
01166    07CD 170100                  LBSR  LIMCHK
01167    07D0 240A                    BCC   TOOK
01168    07D2 308D0331                LEAX  MSG3,PCR
01169    07D6 170112                  LBSR  PDATA2
01170  W 07D9 16FFBD                 LBRA  MOVE       START OVER
01171    07DC 9F11           TOOK     STX   SAVEXB     STORE THE 'TO ADDRESS'
01172    07DE 308D111E       MOVSIZ   LEAX  SZMSG1,PCR PROMPT FOR SIZE OF MOVE
01173    07E2 170106                  LBSR  PDATA2
01174  W 07E5 170066                 LBSR  BADDR
01175    07E8 0D1D                    TST   ERFLG
01176  W 07EA 1026FFAB                LBNE  MOVE       START OVER
01177    07EE 9F13                    STX   SAVEXC     STORE COUNT
01178          *
01179          * ENSURE THAT MOVE STAYS WITHIN BUFFER LIMITS
01180          *
01181    07F0 301F           BUFLIM   LEAX  -1,X       ONE LESS BYTE FOR LIMIT CHECK
01182    07F2 9F08                    STX   SAVEX      STORE IT FOR 16 BIT ADD
01183    07F4 9E0F                    LDX   SAVEXA     GET 'FROM' ADDRESS
01184    07F6 9F23                    STX   XSTORE     STORE IT FOR 16 BIT ADD
01185    07F8 1700E2                  LBSR  ADDEM
01186    07FB 1700D2                  LBSR  LIMCHK     CHECK TO SEE IF WITHIN BUFFER
01187    07FE 2512                    BCS   MEROR      OUT OF BUFFER LIMITS
01188    0800 9E13                    LDX   SAVEXC     GET NUMBER OF BYTES TO BE MOVE
01189    0802 301F                    LEAX  -1,X       ONE LESS BYTE FOR LIMIT CHECK
01190    0804 9F08                    STX   SAVEX      STORE IT FOR 16 BIT ADD
01191    0806 9E11                    LDX   SAVEXB     GET 'TO' ADDRESS
01192    0808 9F23                    STX   XSTORE     STORE IT FOR 16 BIT ADD
01193    080A 1700D0                  LBSR  ADDEM
01194    080D 1700C0                  LBSR  LIMCHK     CHECK TO SEE IF WITHIN BUFFER
01195    0810 240A                    BCC   MVLOOP     EVERYTHING IS GO IF IT GOT THI
01196    0812 308D0289       MEROR    LEAX  MERMSG,PCR
01197    0816 1700D2                  LBSR  PDATA2
01198    0819 16FF7D                  LBRA  MOVE
01199    081C 9E0F           MVLOOP   LDX   SAVEXA
01200
01201    081E 1700FB                  LBSR  READBUFF
```

```
0821 3001                LEAX  1,X
0823 9F0F                STX   SAVEXA      MOVE TILL COUNT DONE
0825 9E11                LDX   SAVEXB
0827 8C4000              CMPX  #BUFFHI
082A 27E6                BEQ   MEROR
082C 2000                BRA   STORIT      O.K. TO STORE
082E 1700F7     STORIT   LBSR  RITEBUFF
0831 3001                LEAX  1,X
0833 9F11                STX   SAVEXB
0835 9E13                LDX   SAVEXC
0837 301F                LEAX  -1,X
0839 9F13                STX   SAVEXC
083B 8C0000              CMPX  #0
083E 26DC                BNE   MVLOOP
0840 17FD29     DUNIT    LBSR  SAYDUN
0843 16F9B9              LBRA  MENUX       MOVE AND ASK AGAIN
        *
0846 308D02F8   CRLF     LEAX  CRLF1,PCR
084A 17009E              LBSR  PDATA2
084D 39                  RTS
        *
        ************************
        *                      *
        * BUILD A HEX ADDRESS *
        *                      *
        ************************
        *
084E 8D11       BADDR    BSR   BYTE        READ 2 BYTES
0850 0D1D                TST   ERFLG
0852 260C                BNE   ENDIT       ERROR
0854 971F                STA   XHI
0856 8D09                BSR   BYTE
0858 0D1D                TST   ERFLG
085A 2604                BNE   ENDIT
085C 9720                STA   XLOW
085E 9E1F                LDX   XHI
0860 39         ENDIT    RTS
        *
        ***************
        *             *
        * INPUT BYTE *
        *             *
        ***************
        *
0861 8D2B       BYTE     BSR   INHEX       GET 1'ST CHAR
0863 48                  ASLA
0864 48                  ASLA
0865 48                  ASLA
0866 48                  ASLA
0867 1F89                TFR   A,B
0869 0D1D                TST   ERFLG
086B 2610                BNE   FINIS       ERROR
086D 8D1F                BSR   INHEX       GET 2'ND CHAR
086F 0D1D                TST   ERFLG
0871 260A                BNE   FINIS       ERROR
0873 3404                PSHS  B
0875 ABE0                ADDA  ,S+
0877 1F89                TFR   A,B
0879 DB1C                ADDB  CKSM        UPDATE CKSM.
087B D71C                STB   CKSM
```

```
087D 39          FINIS    RTS
     *
087E 44          OUTHL    LSRA                OUT LEFT DIGIT
087F 44                   LSRA
0880 44                   LSRA
0881 44                   LSRA
0882 840F        OUTHR    ANDA  #$F           OUT HEX RIGHT
0884 8B30                 ADDA  #$30
0886 8139                 CMPA  #$39
0888 2302                 BLS   OUTCH1
088A 8B07                 ADDA  #7
088C 207B        OUTCH1   BRA   OUTCH
     *
     *************************
     *                       *
     * INPUT A HEX CHARACTER *
     *                       *
     *************************
     *
088E 0F1D        INHEX    CLR   ERFLG
0890 8D60                 BSR   INCH
0892 810D                 CMPA  #$0D
0894 1027F967             LBEQ  MENUX         CR THEN BACK TO MENUE
0898 8030        INHEXX   SUBA  #$30
089A 2B0F                 BMI   NOTHEX
089C 8109                 CMPA  #9
089E 2F0A                 BLE   IN1HG
08A0 8111                 CMPA  #$11
08A2 2B07                 BMI   NOTHEX
08A4 8116                 CMPA  #$16
08A6 2E03                 BGT   NOTHEX
08A8 8007                 SUBA  #7
08AA 39          IN1HG    RTS
     *
08AB 308D050A    NOTHEX   LEAX  NOHEXM,PCR
08AF 8D3A                 BSR   PDATA2
08B1 8D93                 BSR   CRLF
08B3 031D                 COM   ERFLG
08B5 39                   RTS
     *
08B6 A680        OUT2H    LDA   ,X+           O/P 2 HEX CHAR
08B8 3402                 PSHS  A
08BA 8DC2                 BSR   OUTHL
08BC 3502                 PULS  A
08BE 20C2                 BRA   OUTHR
     *
08C0 3412        OUT2HAS  PSHS  A,X
08C2 30E4                 LEAX  ,S
08C4 8D04                 BSR   OUT2HS
08C6 3592                 PULS  A,X,PC
     *
08C8 8DEC        OUT4HS   BSR   OUT2H
08CA 8DEA        OUT2HS   BSR   OUT2H
08CC 8620        OUTS     LDA   #$20
08CE 20BC                 BRA   OUTCH1
     *
     ************************************************************
     *                                                          *
     * CHECK 16 BIT LIMIT IN 'LIMIT', CARRY SET IF X REG > OR = *
     *                                                          *
```

```
        ************************************************************
        *
08D0 9F08        LIMCHK   STX   SAVEX
08D2 3406                 PSHS  D
08D4 DC0A                 LDD   LIMIT
08D6 830001               SUBD  #1
08D9 9308                 SUBD  SAVEX
08DB 3586                 PULS  D,PC
        *
        * 16 BIT ADD
        *
08DD 3406        ADDEM    PSHS  D
08DF DC23                 LDD   XSTORE
08E1 D308                 ADDD  SAVEX
08E3 1F01                 TFR   D,X
08E5 3586                 PULS  D,PC
        *
                          USE   UPRM3D
                          TTL   EPROM PROGRAMMER PART THREE
        *
        *********************************************
        *                                           *
        * PRINT DATA POINTED TO BY INDEX REGISTER *
        *                                           *
        *********************************************
        *
08E7 8D20        PDATA1   BSR   OUTCH
08E9 3001                 LEAX  1,X
08EB A684        PDATA2   LDA   0,X
08ED 8104                 CMPA  #4          END OF STRING CHAR.
08EF 26F6                 BNE   PDATA1
08F1 39                   RTS
        *
        ************************************************
        *
        *
08F2 3432        INCH     PSHS  A,X,Y
08F4 30E4                 LEAX  ,S
08F6 108E0001             LDY   #1
08FA 8602                 LDA   #2
08FC 103F89               OS9   I$READ
08FF 1025F9B7             LBCS  SYSERR
0903 3502                 PULS  A
0905 847F                 ANDA  #$7F
0907 35B0                 PULS  X,Y,PC
        *
0909 3432        OUTCH    PSHS  A,X,Y
090B 30E4                 LEAX  ,S
090D 108E0001             LDY   #1
0911 8602                 LDA   #2
0913 103F8A               OS9   I$WRIT
0916 1025F9A0             LBCS  SYSERR
091A 35B2                 PULS  A,X,Y,PC
        *
091C 3424        READBUFF PSHS  B,Y
091E 31C901D6             LEAY  BUFFER,U
0922 1F10                 TFR   X,D
0924 A6AB                 LDA   D,Y
0926 35A4                 PULS  B,Y,PC
        *
```

```
0928 3426        RITEBUFF PSHS  A,B,Y
092A 31C901D6             LEAY  BUFFER,U
092E 1F10                 TFR   X,D
0930 31AB                 LEAY  D,Y
0932 3502                 PULS  A
0934 A7A4                 STA   ,Y
0936 35A4                 PULS  B,Y,PC
     *
0938 8D4E        FUNCTR   BSR   READNAME
093A 2607                 BNE   FR2
093C 8601                 LDA   #READ.
093E 103F84               OS9   I$OPEN
0941 2536                 BCS   ERRFX
0943 8D7A        FR2      BSR   SEEKOFFS
0945 103F89               OS9   I$READ
0948 252F                 BCS   ERRFX
094A 17FC1F               LBSR  SAYDUN
094D 16F8AF               LBRA  MENUX
     *
0950 8D36        FUNCTW   BSR   READNAME
0952 2618                 BNE   FW2
0954 3410                 PSHS  X
0956 8603                 LDA   #UPDAT.
0958 103F84               OS9   I$OPEN
095B 3510                 PULS  X
095D 240D                 BCC   FW2
095F C1D8                 CMPB  #E$PNNF
0961 2616                 BNE   ERRFX
0963 8603                 LDA   #UPDAT.
0965 C60B                 LDB   #PREAD.+UPDAT.
0967 103F83               OS9   I$CREA
096A 250D                 BCS   ERRFX
096C 8D51        FW2      BSR   SEEKOFFS
096E 103F8A               OS9   I$WRIT
0971 2506                 BCS   ERRFX
0973 17FBF6               LBSR  SAYDUN
0976 16F886               LBRA  MENUX
     *
0979 8602        ERRFX    LDA   #2
097B 103F0F               OS9   F$PERR
097E 1025F938             LBCS  SYSERR
0982 17FBEE               LBSR  ENDEX
0985 16F877               LBRA  MENUX
     *
0988 308D00A2    READNAME LEAX  FNAMEQ,PCR
098C 17FF5C               LBSR  PDATA2
098F 30C90186             LEAX  NBUFF,U
0993 108E0050             LDY   #NBUFFL
0997 8602                 LDA   #2
0999 103F8B               OS9   I$RDLN
099C 1025F91A             LBCS  SYSERR
09A0 108C0001             CMPY  #1
09A4 2606                 BNE   RN1
09A6 A684                 LDA   ,X
09A8 810D                 CMPA  #$0D
09AA 270E                 BEQ   RN9
09AC 9627        RN1      LDA   FILE
09AE 2709                 BEQ   RN2
09B0 103F8F               OS9   I$CLOS
09B3 1025F903             LBCS  SYSERR
```

```
09B7 0F27                  CLR   FILE
09B9 39          RN2       RTS
     *
09BA 9627        RN9       LDA   FILE
09BC 27CA                  BEQ   READNAME
09BE 39                    RTS
     *
09BF 9727        SEEKOFFS  STA   FILE
09C1 3410                  PSHS  X
09C3 308D0080    SK1       LEAX  FOFFS,PCR
09C7 17FF21                LBSR  PDATA2
09CA 17FE81                LBSR  BADDR
09CD 0D1D                  TST   ERFLG
09CF 26F2                  BNE   SK1
09D1 9627                  LDA   FILE
09D3 3440                  PSHS  U
09D5 1F13                  TFR   X,U
09D7 8E0000                LDX   #0
09DA 103F88                OS9   I$SEEK
09DD 3540                  PULS  U
09DF 1025F8D7              LBCS  SYSERR
09E3 3402                  PSHS  A
09E5 9E0A                  LDX   LIMIT
09E7 3410                  PSHS  X
09E9 8E4000                LDX   #BUFFHI
09EC 9F0A                  STX   LIMIT
09EE 308D006D    SK3       LEAX  BOFFS,PCR
09F2 17FEF6                LBSR  PDATA2
09F5 17FE56                LBSR  BADDR
09F8 0D1D                  TST   ERFLG
09FA 26F2                  BNE   SK3
09FC 17FED1                LBSR  LIMCHK
09FF 25ED                  BCS   SK3
0A01 1F10                  TFR   X,D
0A03 3406                  PSHS  D
0A05 30C901D6              LEAX  BUFFER,U
0A09 308B                  LEAX  D,X
0A0B AF65                  STX   5,S
0A0D 308D0066    SK5       LEAX  BSIZS,PCR
0A11 17FED7                LBSR  PDATA2
0A14 17FE37                LBSR  BADDR
0A17 0D1D                  TST   ERFLG
0A19 26F2                  BNE   SK5
0A1B 1F12                  TFR   X,Y
0A1D 3506                  PULS  D
0A1F 308B                  LEAX  D,X
0A21 301F                  LEAX  -1,X
0A23 17FEAA                LBSR  LIMCHK
0A26 25C6                  BCS   SK3
0A28 3510                  PULS  X
0A2A 9F0A                  STX   LIMIT
0A2C 3592                  PULS  A,X,PC
     *
     *
     ***********************************************
     *
     *
0A2E 0D0A0A      FNAMEQ    FCB   $0D,$0A,$0A
0A31 454E5445              FCC   'ENTER NAME OF FILE  :'
0A46 04                    FCB   $04
```

```
        *
0A47 0D0A       FOFFS    FCB   $0D,$0A
0A49 454E5445            FCC   'ENTER  FILE  OFFSET $'
0A5E 04                  FCB   $04
        *
0A5F 0D0A       BOFFS    FCB   $0D,$0A
0A61 454E5445            FCC   'ENTER BUFFER OFFSET $'
0A76 04                  FCB   $04
        *
0A77 0D0A       BSIZS    FCB   $0D,$0A
0A79 454E5445            FCC   'ENTER TRANSFER SIZE $'
0A8E 04                  FCB   $04
        *
        *
        ***********************************************
        *
        *
0A8F 0D0A       MORMSG   FCB   $0D,$0A
0A91 4D4F5245            FCC   'MORE?  (Y/N) '
0A9E 04                  FCB   $04
        *
0A9F 0D0A0A07   MERMSG   FCB   $0D,$0A,$0A,$07
0AA3 3C2A3E20            FCC   '<*> BUFFER LIMITS EXCEEDED! CHECK ADDRES
0AD3 0A0A0D04            FCB   $0A,$0A,$0D,$04
        *
0AD7 0D0A       MSG1     FCB   $0D,$0A
0AD9 454E5445            FCC   'ENTER START ADDRESS $'
0AEE 04                  FCB   $04
        *
0AEF 0D0A       MSG2     FCB   $0D,$0A
0AF1 454E5445            FCC   'ENTER  END  ADDRESS $'
0B06 04                  FCB   $04
        *
0B07 0A0A0D07   MSG3     FCB   $0A,$0A,$0D,$07
0B0B 3C2A3E20            FCC   '<*> THE ADDRESS INPUT IS OUT OF RANGE! R
0B3F 0D0A04              FCB   $0D,$0A,$04
        *
0B42 0A0D04     CRLF1    FCB   $0A,$0D,$04
        *
0B45 0D0A0A07   MSG4     FCB   $0D,$0A,$0A,$07
0B49 3C2A3E20            FCC   '<*> PROM NOT ERASED AT ADDRESS  $'
0B6A 04                  FCB   $04
        *
0B6B 0D0A0A07   MSG5     FCB   $0D,$0A,$0A,$07
0B6F 3C2A3E20            FCC   '<*> VERIFY FAILED AT ADDRESS    $'
0B90 04                  FCB   $04
        *
0B91 0D0A       MSG6     FCB   $0D,$0A
0B93 50524F47            FCC   'PROGRAM ANYWAY?    (Y/N) '
0BAC 04                  FCB   $04
        *
0BAD 0D0A0A     MSG8     FCB   $0D,$0A,$0A
0BB0 45524153            FCC   'ERASE  CHECK  O.K.'
0BC2 0D0A       MSG8A    FCB   $0D,$0A
0BC4 53544152            FCC   'START PROGRAMMING? (Y/N) '
0BDD 04                  FCB   $04
        *
0BDE 0D0A0A     MSG9     FCB   $0D,$0A,$0A
0BE1 2A2A2A2A            FCC   '****************************************
0C09 0A0D                FCB   $0A,$0D
```

```
0C0B 2A205052              FCC   '* PROGRAMMING & VERIFICATION COMPLETED *
0C33 0A0D                  FCB   $0A,$0D
0C35 2A2A2A2A              FCC   '****************************************
0C5D 0A0A0D07              FCB   $0A,$0A,$0D,$07,$04
           *
0C62 0A0A0D       DMPMSG   FCB   $0A,$0A,$0D
0C65 2A2A2A2A              FCC   '******************'
0C77 0A0D                  FCB   $0A,$0D
0C79 2A20464F              FCC   '* FORMATTED DUMP *'
0C8B 0A0D                  FCB   $0A,$0D
0C8D 2A2A2A2A              FCC   '******************'
0C9F 0D0A0A                FCB   $0D,$0A,$0A
0CA2 454E5445              FCC   'ENTER START ADDRESS $'
0CB7 04                    FCB   $04
           *
0CB8 0D0A0A       FILMES   FCB   $0D,$0A,$0A
0CBB 2A2A2A2A              FCC   '***************'
0CCA 0A0D                  FCB   $0A,$0D
0CCC 2A204649              FCC   '* FILL BUFFER *'
0CDB 0A0D                  FCB   $0A,$0D
0CDD 2A2A2A2A              FCC   '***************'
0CEC 0D0A0A                FCB   $0D,$0A,$0A
0CEF 454E5445              FCC   'ENTER HEX FILL BYTE $'
0D04 04                    FCB   $04
           *
0D05 0A0A0D       INSMSG   FCB   $0A,$0A,$0D
0D08 2A2A2A2A              FCC   '***************************'
0D23 0A0D                  FCB   $0A,$0D
0D25 2A204558              FCC   '* EXAMINE & CHANGE BUFFER *'
0D40 0A0D                  FCB   $0A,$0D
0D42 2A2A2A2A              FCC   '***************************'
0D5D 0A0D0A                FCB   $0A,$0D,$0A
0D60 22535041              FCC   '"SPACE" TO STEP, "U" OR "^" FOR PREV'
0D84 0A0D                  FCB   $0A,$0D
0D86 22432F52              FCC   '"C/R" TO RETURN TO MAIN MENU.'
0DA3 0A0A0D                FCB   $0A,$0A,$0D
0DA6 53544152              FCC   'STARTING ADDRESS $'
0DB8 04                    FCB   $04
           *
0DB9 20203C2A     NOHEXM   FCC   '  <*> NOT A HEX NUMBER <*>'
0DD3 070D0A04              FCB   $07,$0D,$0A,$04
           *
0DD7 0D0A0A       MSG12    FCB   $0D,$0A,$0A
0DDA 52454144              FCC   'READY TO CONTINUE?  (Y/N) '
0DF4 04                    FCB   $04
           *
0DF5 0D0A0A0A     BANNER   FCB   $0D,$0A,$0A,$0A,$0A,$0A,$0A,$0A
0DFD 20202020              FCC   '              WINDRUSH MICRO SYSTEMS'
0E1F 0A0A0D                FCB   $0A,$0A,$0D
0E22 20202020              FCC   '    UNIVERSAL EPROM PROGRAMMER VERSION 2
0E4D 0A0A0A0D              FCB   $0A,$0A,$0A,$0D
0E51 202A2A2A              FCC   ' ***************************************
0E7E 0D0A                  FCB   $0D,$0A
0E80 202A2020              FCC   ' *   DO NOT INSERT EPROM UNTIL PROMPTED
0EAD 0D0A                  FCB   $0D,$0A
0EAF 202A2A2A              FCC   ' ***************************************
0EDC 0D0A04                FCB   $0D,$0A,$04
           *
0EDF 0D0A0A       BADDP    FCB   $0D,$0A,$0A
0EE2 454E5445              FCC   'ENTER EPROM PROGRAMMER PIA BASE ADDRESS
```

```
01622   0F0E 04                 FCB   $04
01623        *
01624   0F0F 0A0A0D     MENU    FCB   $0A,$0A,$0D
01625   0F12 2020202A           FCC   '   ***************'
01626   0F24 0A0D               FCB   $0A,$0D
01627   0F26 2020202A           FCC   '   * EPROM TYPES *'
01628   0F38 0A0D               FCB   $0A,$0D
01629   0F3A 2020202A           FCC   '   ***************'
01630   0F4C 0A0A0D             FCB   $0A,$0A,$0D
01631   0F4F 32353038           FCC   '2508  ( 5.0 VOLT ) = 0'
01632   0F65 0A0D               FCB   $0A,$0D
01633   0F67 32373038           FCC   '2708  ( TRI VOLT ) = 1'
01634   0F7D 0A0D               FCB   $0A,$0D
01635   0F7F 32353136           FCC   '2516  ( 5.0 VOLT ) = 2'
01636   0F95 0A0D               FCB   $0A,$0D
01637   0F97 32373136           FCC   '2716  ( TRI VOLT ) = 3'
01638   0FAD 0A0D               FCB   $0A,$0D
01639   0FAF 32353332           FCC   '2532  ( 5.0 VOLT ) = 4'
01640   0FC5 0A0D               FCB   $0A,$0D
01641   0FC7 32373332           FCC   '2732  ( 5.0 VOLT ) = 5'
01642   0FDD 0A0D               FCB   $0A,$0D
01643   0FDF 32373332           FCC   '2732A ( 5.0 VOLT ) = 6'
01644   0FF5 0A0D               FCB   $0A,$0D
01645   0FF7 32353634           FCC   '2564  ( 5.0 VOLT ) = 7'
01646   100D 0A0D               FCB   $0A,$0D
01647   100F 32373634           FCC   '2764  ( 5.0 VOLT ) = 8'
01648   1025 0A0D               FCB   $0A,$0D
01649   1027 32353238           FCC   '2528  ( 5.0 VOLT ) = 9'
01650   103D 0A0A0D             FCB   $0A,$0A,$0D
01651   1040 53454C45           FCC   'SELECT TYPE BY NUMBER:-'
01652   1057 04                 FCB   $04
01653        *
01654   1058 0A0D       SWPRMT  FCB   $0A,$0D
01655   105A 2A2A2A2A           FCC   '***********************************'
01656   107D 0A0D               FCB   $0A,$0D
01657   107F 2A20414C           FCC   '* ALL SWITCHES ON THE OTHER EPROM *'
01658   10A2 0A0D               FCB   $0A,$0D
01659   10A4 2A20534F           FCC   '* SOCKET MUST BE SET TO THE RIGHT *'
01660   10C7 0A0D               FCB   $0A,$0D
01661   10C9 2A2A2A2A           FCC   '***********************************'
01662   10EC 0D0A0A     SWPMT   FCB   $0D,$0A,$0A
01663   10EF 454E5355           FCC   'ENSURE SWITCHES ARE SET AS INSTRUCTED!'
01664   1115 0D0A0A             FCB   $0D,$0A,$0A
01665   1118 2A2A2A2A   PLEPRM  FCC   '*************************'
01666   1131 0A0D               FCB   $0A,$0D
01667   1133 2A20504C           FCC   '* PLACE EPROM IN SOCKET *'
01668   114C 0A0D               FCB   $0A,$0D
01669   114E 2A2A2A2A           FCC   '*************************'
01670   1167 0D0A04             FCB   $0D,$0A,$04
01671        *
01672   116A 0D0A0A0A   INMSG0  FCB   $0D,$0A,$0A,$0A
01673   116E 2A2A2A2A           FCC   '********'
01674   1176 0D0A               FCB   $0D,$0A
01675   1178 2A203235           FCC   '* 2508 *'
01676   1180 0D0A               FCB   $0D,$0A
01677   1182 2A2A2A2A           FCC   '********'
01678   118A 0D0A0A             FCB   $0D,$0A,$0A
01679   118D 53455420           FCC   'SET SWA = 1,3,6,9,10 LEFT, ALL OTHERS RI
01680   11B9 0D0A04             FCB   $0D,$0A,$04
01681   11BC 0D0A0A0A   INMSG1  FCB   $0D,$0A,$0A,$0A
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11C0 2A2A2A2A            FCC   '********'
11C8 0D0A                FCB   $0D,$0A
11CA 2A203237            FCC   '* 2708 *'
11D2 0D0A                FCB   $0D,$0A
11D4 2A2A2A2A            FCC   '********'
11DC 0D0A0A              FCB   $0D,$0A,$0A
11DF 53455420            FCC   'SET SWA = 10 LEFT, ALL OTHERS RIGHT.'
1203 0D0A04              FCB   $0D,$0A,$04
     *
1206 0D0A0A0A   INMSG2   FCB   $0D,$0A,$0A,$0A
120A 2A2A2A2A            FCC   '********'
1212 0D0A                FCB   $0D,$0A
1214 2A203235            FCC   '* 2516 *'
121C 0D0A                FCB   $0D,$0A
121E 2A2A2A2A            FCC   '********'
1226 0D0A0A              FCB   $0D,$0A,$0A
1229 53455420            FCC   'SET SWA = 1,3,6,9,10 LEFT, ALL OTHERS RI
1255 0D0A04              FCB   $0D,$0A,$04
     *
1258 0D0A0A0A   INMSG3   FCB   $0D,$0A,$0A,$0A
125C 2A2A2A2A            FCC   '********'
1264 0D0A                FCB   $0D,$0A
1266 2A203237            FCC   '* 2716 *'
126E 0D0A                FCB   $0D,$0A
1270 2A2A2A2A            FCC   '********'
1278 0D0A0A              FCB   $0D,$0A,$0A
127B 53455420            FCC   'SET SWA = 10 LEFT, ALL OTHERS RIGHT.'
129F 0D0A                FCB   $0D,$0A
12A1 53455420            FCC   'SET SWB = 8,9 LEFT, ALL OTHERS RIGHT.'
12C6 0D0A04              FCB   $0D,$0A,$04
     *
12C9 0D0A0A0A   INMSG4   FCB   $0D,$0A,$0A,$0A
12CD 2A2A2A2A            FCC   '********'
12D5 0D0A                FCB   $0D,$0A
12D7 2A203235            FCC   '* 2532 *'
12DF 0D0A                FCB   $0D,$0A
12E1 2A2A2A2A            FCC   '********'
12E9 0D0A0A              FCB   $0D,$0A,$0A
12EC 53455420            FCC   'SET SWA = 1,4,7,9,10 LEFT, ALL OTHERS RI
1318 0D0A04              FCB   $0D,$0A,$04
     *
131B 0D0A0A0A   INMSG5   FCB   $0D,$0A,$0A,$0A
131F 2A2A2A2A            FCC   '********'
1327 0D0A                FCB   $0D,$0A
1329 2A203237            FCC   '* 2732 *'
1331 0D0A                FCB   $0D,$0A
1333 2A2A2A2A            FCC   '********'
133B 0D0A0A              FCB   $0D,$0A,$0A
133E 53455420            FCC   'SET SWA = ALL SWITCHES LEFT.'
135A 0D0A04              FCB   $0D,$0A,$04
     *
135D 0D0A0A0A   INMSG6   FCB   $0D,$0A,$0A,$0A
1361 2A2A2A2A            FCC   '*********'
136A 0D0A                FCB   $0D,$0A
136C 2A203237            FCC   '* 2732A *'
1375 0D0A                FCB   $0D,$0A
1377 2A2A2A2A            FCC   '*********'
1380 0D0A0A              FCB   $0D,$0A,$0A
1383 53455420            FCC   'SET SWA = 10 RIGHT, ALL OTHERS LEFT.'
13A7 0D0A04              FCB   $0D,$0A,$04
```

```
        *
13AA 0D0A0A0A   INMSG7   FCB   $0D,$0A,$0A,$0A
13AE 2A2A2A2A            FCC   '********'
13B6 0D0A                FCB   $0D,$0A
13B8 2A203235            FCC   '* 2564 *'
13C0 0D0A                FCB   $0D,$0A
13C2 2A2A2A2A            FCC   '********'
13CA 0D0A0A              FCB   $0D,$0A,$0A
13CD 53455420            FCC   'SET SWB = 10 LEFT, ALL OTHERS RIGHT.'
13F1 0D0A04              FCB   $0D,$0A,$04
        *
13F4 0D0A0A0A   INMSG8   FCB   $0D,$0A,$0A,$0A
13F8 2A2A2A2A            FCC   '********'
1400 0D0A                FCB   $0D,$0A
1402 2A203237            FCC   '* 2764 *'
140A 0D0A                FCB   $0D,$0A
140C 2A2A2A2A            FCC   '********'
1414 0D0A0A              FCB   $0D,$0A,$0A
1417 53455420            FCC   'SET SWB = 8,9,10 RIGHT, ALL OTHERS LEFT.
143F 0D0A04              FCB   $0D,$0A,$04
        *
1442 0D0A0A0A   INMSG9   FCB   $0D,$0A,$0A,$0A
1446 2A2A2A2A            FCC   '********'
144E 0D0A                FCB   $0D,$0A
1450 2A203235            FCC   '* 2528 *'
1458 0D0A                FCB   $0D,$0A
145A 2A2A2A2A            FCC   '********'
1462 0D0A0A              FCB   $0D,$0A,$0A
1465 53455420            FCC   'SET SWB = 2,3,10 LEFT, ALL OTHERS RIGHT.
148D 0D0A04              FCB   $0D,$0A,$04
        *
1490 0D0A0A     FRAME    FCB   $0D,$0A,$0A
1493 20202020            FCC   '        *********************'
14AF 0A0D                FCB   $0A,$0D
14B1 20202020            FCC   '        * '
14BA 04                  FCB   $04
        *
14BB 202A       FMENU    FCC   ' *'
14BD 0A0D                FCB   $0A,$0D
14BF 20202020            FCC   '        *********************'
14DB 0D0A                FCB   $0D,$0A
14DD 20202020            FCC   '        *  OPERATIONS MENU  *'
14F9 0D0A                FCB   $0D,$0A
14FB 20202020            FCC   '        *********************'
1517 0A0A0D              FCB   $0A,$0A,$0D
151A 46494C4C            FCC   'FILL BUFFER AREA WITH A HEX CHAR = 0'
153E 0A0D                FCB   $0A,$0D
1540 4D4F5645            FCC   'MOVE  DATA   WITHIN  THE  BUFFER = 1'
1564 0A0D                FCB   $0A,$0D
1566 434F5059            FCC   'COPY  A  PROM  TO   THE   BUFFER = 2'
158A 0A0D                FCB   $0A,$0D
158C 56455249            FCC   'VERIFY A PROM AGAINST THE BUFFER = 3'
15B0 0A0D                FCB   $0A,$0D
15B2 50524F47            FCC   'PROGRAM  A  PROM FROM THE BUFFER = 4'
15D6 0A0D                FCB   $0A,$0D
15D8 4558414D            FCC   'EXAMINE  OR  CHANGE  THE  BUFFER = 5'
15FC 0A0D                FCB   $0A,$0D
15FE 464F524D            FCC   'FORMATTED  DUMP  OF  THE  BUFFER = 6'
1622 0A0D                FCB   $0A,$0D
1624 52455455            FCC   'RETURN   TO   EPROM  SELECT MENU = 7'
```

```
1648 0A0D                 FCB   $0A,$0D
164A 52455455             FCC   'RETURN TO  DISK OPERATING SYSTEM = 9'
166E 0D0A                 FCB   $0D,$0A
1670 52454144             FCC   'READ BUFFER AREA FROM  DISC FILE = R'
1694 0D0A                 FCB   $0D,$0A
1696 57524954             FCC   'WRITE BUFFER AREA  TO  DISC FILE = W'
16BA 0D0A0A               FCB   $0D,$0A,$0A
16BD 53454C45             FCC   'SELECT OPERATION BY NUMBER OR LETTER :-'
16E4 04                   FCB   $04
     *
16E5 32353038   H2508     FCC   '2508  $0000-$03FF'
16F6 04                   FCB   $04
16F7 32373038   H2708     FCC   '2708  $0000-$03FF'
1708 04                   FCB   $04
1709 32353136   H2516     FCC   '2516  $0000-$07FF'
171A 04                   FCB   $04
171B 32373136   H2716     FCC   '2716  $0000-$07FF'
172C 04                   FCB   $04
172D 32353332   H2532     FCC   '2532  $0000-$0FFF'
173E 04                   FCB   $04
173F 32373332   H2732     FCC   '2732  $0000-$0FFF'
1750 04                   FCB   $04
1751 32373332   H2732A    FCC   '2732A $0000-$0FFF'
1762 04                   FCB   $04
1763 32353634   H2564     FCC   '2564  $0000-$1FFF'
1774 04                   FCB   $04
1775 32373634   H2764     FCC   '2764  $0000-$1FFF'
1786 04                   FCB   $04
1787 32353238   H2528     FCC   '2528  $0000-$3FFF'
1798 04                   FCB   $04
     *
1799 0A0A0D     CPYMSG    FCB   $0A,$0A,$0D
179C 2A2A2A2A             FCC   '**************'
17AA 0A0D                 FCB   $0A,$0D
17AC 2A20434F             FCC   '* COPY EPROM *'
17BA 0A0D                 FCB   $0A,$0D
17BC 2A2A2A2A             FCC   '**************'
17CA 0A0D04               FCB   $0A,$0D,$04
     *
17CD 0A0A0D     VERMSG    FCB   $0A,$0A,$0D
17D0 2A2A2A2A             FCC   '****************'
17E0 0A0D                 FCB   $0A,$0D
17E2 2A205645             FCC   '* VERIFY EPROM *'
17F2 0A0D                 FCB   $0A,$0D
17F4 2A2A2A2A             FCC   '****************'
1804 0A0D04               FCB   $0A,$0D,$04
     *
1807 0D0A0A     PFRAME    FCB   $0D,$0A,$0A
180A 2A2A2A2A             FCC   '*****************'
181B 0D0A                 FCB   $0D,$0A
181D 04                   FCB   $04
     *
181E 0D0A       PRGMSG    FCB   $0D,$0A
1820 2A2A2A2A             FCC   '*****************'
1831 0A0D                 FCB   $0A,$0D
1833 2A205052             FCC   '* PROGRAM EPROM *'
1844 0A0D                 FCB   $0A,$0D
1846 2A2A2A2A             FCC   '*****************'
1857 0A0D04               FCB   $0A,$0D,$04
     *
```

```
185A 0D0A0A     DUNMSG   FCB   $0D,$0A,$0A
185D 2A2A2A2A            FCC   '**********************'
1873 0A0D                FCB   $0A,$0D
1875 2A204655            FCC   '* FUNCTION COMPLETED *'
188B 0A0D                FCB   $0A,$0D
188D 2A2A2A2A            FCC   '**********************'
18A3 0A0D0704            FCB   $0A,$0D,$07,$04
     *
18A7 0A0A0D     MVMSG1   FCB   $0A,$0A,$0D
18AA 2A2A2A2A            FCC   '*************'
18B7 0D0A                FCB   $0D,$0A
18B9 2A204D4F            FCC   '* MOVE DATA *'
18C6 0D0A                FCB   $0D,$0A
18C8 2A2A2A2A            FCC   '*************'
18D5 0D0A0A              FCB   $0D,$0A,$0A
18D8 46524F4D            FCC   'FROM    ADDRESS? $'
18EA 04                  FCB   $04
     *
18EB 0D0A       MVMSG2   FCB   $0D,$0A
18ED 544F2020            FCC   'TO      ADDRESS? $'
18FF 04                  FCB   $04
     *
1900 0D0A       SZMSG1   FCB   $0D,$0A
1902 4E554D42            FCC   'NUMBER OF BYTES? $'
1914 04                  FCB   $04
     *
1915 0D0A0A     CONMSG   FCB   $0D,$0A,$0A
1918 48495420            FCC   'HIT ANY KEY TO CONTINUE'
192F 0D0A04              FCB   $0D,$0A,$04
     *
1932 0D0A0A     MSG08    FCB   $0D,$0A,$0A
1935 4E4F2041            FCC   'NO ADDRESS RANGE OPTIONS'
194D 0D0A04              FCB   $0D,$0A,$04
     *
1950 0D0A0A0A   MSGPGM   FCB   $0D,$0A,$0A,$0A
1954 2A2A2A2A            FCC   '****************************'
196F 0A0D                FCB   $0A,$0D
1971 2A205052            FCC   '* PROGRAMMING IN PROGRESS *'
198C 0A0D                FCB   $0A,$0D
198E 2A2A2A2A            FCC   '****************************'
19A9 0D0A04              FCB   $0D,$0A,$04
     *
     *
19AC E7E52D              EMOD
     *
19AF            MODEND   EQU   *
     *
                         END

00000 error(s)
00005 warning(s)
$19AF 06575 program bytes generated
$41D6 16854 data bytes allocated
$2389 09097 bytes used for symbols
```