Pts. stored at Hex 7,000 = 28,672 decimal.

Boundary String Descriptor Routine

START : Select Start twice to begin.

CONFIRM : Move pen to appropriate point before confirming

CONTINUE : Differs from START in that it does not re-initialise pointers i.e. just continue from where one has exited.

EXIT : Just exit not end. To be used for calling other commands e.g. change display screen, colours etc. Use CONTINUE to carry on from where exited.

INHIBIT : Set inhibit display bit in byte 2. ⎫ Always reset after CONFIRMing
NEWLINE : Set Newline bit in byte 2. ⎭ which are treated as defaults

CLOSE : Closes the current boundary.

END : Finishes off by inserting header of length (byte no.)

Start	Confirm
Continue	Exit
Inhibit	Newline
Close	End
X	X

2x

```
+++ASSASM09
???ASM09,DIGIT2,+FABGPU

SWTPC 6809 ASSEMBLER --- VERSION 3.2:3


Heading:
```

Southwest Technical Products M6809 Assembler

Version 3.2:3 of 01/10/80

IMPORTANT NOTE

Although every effort has been made to make the supplied software and its documentation as accurate and functional as possible, Southwest Technical Products Corporation specifically disclaims any responsibility for any damages incurred or generated by such material. Southwest Technical Products reserves the right to change or revise this material at any time without obligation to notify any person of such changes or revisions.

PASS 1: SYMBOL TABLE.
PASS 2: CODE GENERATION.

```
                                1.      "
                                2.      "
                                3.      "       EQU'S  AND  FCB'S
                                4.      "
     E004                       5.      ACIAC  EQU $E004       ACIA CONTROL REG.
     E005                       6.      ACIAD  EQU ACIAC+1     ACIA DATA REG.
                                7.      "
                                8.      "
                                9.      "
                                10.     "  FLEX AIDS
                                11.     "
     CD0F                       12.     OUTCH  EQU $CD0F       OUTPUTS A CHAR TO SCREEN.
     CD15                       13.     GETCHR EQU $CD15       GET A CHAR FROM KEYBD.
     CD4E                       14.     STAT   EQU $CD4E       CHECK KEYBD. STATUS
     CD03                       15.     WARMS  EQU $CD03       WARM START.
                                16.     "
                                17.     "
                                18.     "   ASCII CHAR.
                                19.     "
     000A                       20.     LF     EQU $0A         LINE-FEED.
     000D                       21.     CR     EQU $0D         CARRIAGE-RETURN.
     001B                       22.     ESC    EQU $1B         ESCAPE CHAR.
     003D                       23.     EQSIGN EQU $3D         EQUAL SIGN.
     002B                       24.     PLUS   EQU $2B         PLUS SIGN.
     002D                       25.     MINUS  EQU $2D         MINUS SIGN.
                                26.     "
                                27.     "
     6000                       28.            ORG $6000
                                29.     "
                                30.     "
     6000   7E 62 32            31.     ENTRY  JMP START
                                32.     "
     6003                       33.            RMB 50  FOR LOAD PROGRAM
                                34.     "
                                35.     "
     6035                       36.     DVCNT  RMB 1           DIVISION COUNT(BITS NO. IN DVEND)
     6036                       37.     DVEND  RMB 2           DIVIDEND
     6038                       38.     DVSOR  RMB 1           DIVISOR
     6039                       39.     QUOT   RMB 2           QUOTIENT
     603B   00                  40.     REMC   FCB 0           AID FOR 16-BIT ARITHMETIC
     603C                       41.     REMD   RMB 1           USING THIS REMAINDER.
                                42.     "
     603D                       43.     MXTEM  RMB 2           TEMP. VAR. FOR MULTIPLY RTS.
                                44.     "
                                45.     "   TEST ONLY
                                46.     "
     603F   00                  47.     SDCMD  FCB 0
     6040   00 00               48.     SDLEN  FDB 0
     6042   00 00               49.     TOPX   FDB 0
     6044   00 00               50.     FSTAD  FDB 0
     6046   00                  51.     FSTBY  FCB 0
     6047   00                  52.     CLOSEF FCB 0
     6048   00                  53.     STARTF FCB 0
     6049   00                  54.     ENDF   FCB 0
     604A   00                  55.     GOTPT  FCB 0
```

```
  7   604B   00              56.   CONFM  FCB 0
  8   604C   00              57.   INHBF  FCB 0
  9   604D   00              58.   NEWLF  FCB 0
 10   604E   00              59.   SDCOLR FCB 0
 11   604F   00              60.   SDBYTE FCB 0
 12   6050   00              61.   PREVBY FCB 0
 13   6051   00  00          62.   PREVAD FDB 0
 14   6053   00  00          63.   PREVY  FDB 0
 15   6055   00              64.   ALTF   FCB 0
 16   6056   00              65.   PTSF   FCB 0
 17   6057   00              66.   NLINE  FCB 0 NEW LINE FLAG
 18   6058   00              67.   LINEF  FCB 0
 19   6059   00              68.   TTXF   FCB 0           EXIT TO FLEX,TTX FLAG
 20   605A   00              69.   BOXF   FCB 0           FLAG FOR DIAMOND BOX
 21   605B   00              70.   CLRFLG FCB 0           FLAG FOR CLEAR SCREEN COMMAND.
 22   605C   00  00          71.   YVAL1  FDB 0           STORE PREV. VALUE
 23   605E   00  00          72.   XVAL1  FDB 0           STORE PREV. VALUE
 24   6060   00              73.   PXRSET FCB 0           RESET PIXEL :BLACK
 25   6061   00              74.   POFF   FCB 0
 26   6062   00              75.   PXBYTE FCB 0           NEW PIXEL BYTE.
 27   6063   00              76.   TSCF   FCB 0
 28   6064   00              77.   REPTF  FCB 0
                             78.   "
 30   6065   80              79.   COLOUR FCB $80         COLOUR FOR PIXEL:INIT. RED
 31   6066   00              80.   SRNF   FCB 0           CURRENT SCREEN WRITE:0=G1,1=G2,-1=G1&G2
 32   6067   80              81.   COLOR1 FCB $80         INIT. COLOR FOR G1: RED
 33   6068   40              82.   COLOR2 FCB $40         INIT. COLOR FOR G2: GREEN
 34   E000                   83.   G1SA   EQU $E000       G1 START ADDRESS
 35   FFFF                   84.   G1EA   EQU $FFFF       G1 END ADDRESS
 36   8000                   85.   G2SA   EQU $8000       G2 START ADDRESS
 37   9FFF                   86.   G2EA   EQU $9FFF       G2 END ADDRESS
 38   8000                   87.   GSA    EQU $8000       GRAPHICS SCREEN START ADDRESS.
 39   9FFF                   88.   GEA    EQU $9FFF       GRAPHICS SCREEN END ADDRESS.
                             89.   "
 41   7000                   90.   SSA    EQU $7000
 42   70F5                   91.   SEA    EQU $70F5
                             92.   "
 44   6069                   93.   SPTR   RMB 2
 45   0140                   94.   XMAX   EQU 320         = 240x(4/3)
                             95.   .........................i.e.X....x(DSCALE/XSCALE)
 47   00CD                   96.   YMAX   EQU 205
                             97.   .........................i.e.YPXNO
 49   00D7                   98.   CMDS   EQU 215         START OF COMMAND AREA
 50   00A0                   99.   XHALF  EQU 160
 51   0067                  100.   YHALF  EQU 103
                            101.   "   SCALE = XSCALE/DSCALE  CO-ORDS. SCALE FACTOR
 53   0003                  102.   XSCALE EQU 3           SCALE NUMERATOR :MULTIPLY BY.
 54   0004                  103.   DSCALE EQU 4           SCALE DENOMINATOR :DIVIDE BY.
 55   0002                  104.   DSCALH EQU 2           HALF OF DSCALE.
 56   0007                  105.   RNOFF  EQU 7           ROUND OFF TO L.S.B =(DSCALE/XSCALE)x5
                            106.   "
                            107.   "
 58   00F0                  108.   XPHYSC EQU 240         PHYSICAL SCALE NUMERATOR
 59   00A5                  109.   DPHYSC EQU 165         PHYSICAL SCALE DENOMINATOR
 60                         110.   DPHYSH EQU 83          HALF OF DPHYSC
```

```
                               111.   "
                               112.   "
00F0                           113.   XPXNO  EQU 240     NO. OF PIXELS ACROSS. G(240)
00CC                           114.   YPXNO  EQU 204     NO. OF PIXELS DOWN.
                               115.   "
                               116.   "
606B  1B                       117.   XMIT   FCB ESC          NOT USED.
606C  3D                       118.          FCB EQSIGN       NOT USED
606D  00 00                    119.   XVAL   FCB 0,0          X-CO-ORD.
606F  00 00                    120.   YVAL   FCB 0,0          Y-CO-ORD.
6071  2A                       121.   SYMB   FCC "*"          NOT USED
6072                           122.   XMITE  EQU *            NOT USED
                               123.   "
                               124.   "
6072                           125.   JPTR   RMB 2
6074                           126.   PPTR   RMB 2
6076                           127.   PSA    EQU *
6076                           128.          RMB 400
6206                           129.   PEA    EQU *
                               130.   "
                               131.   "
6206                           132.   BPTR   RMB 2            BFR POINTER
6208                           133.   BST    EQU *            BFR AREA FOR INCOMING DGTISED..
6208                           134.          RMB 15           ...POINTS.
                               135.   "
6217  52 45 41 44 59           136.   READY  FCC "READY"      PRINTS READY
621C                           137.   READYE EQU *
                               138.   "
                               139.   "
621C                           140.   XTEM   RMB 2            X-TIMES TEMP.
621E  64 0A 01                 141.   XTENS  FCB 100,10,1     X-TIMES VALUES.
6221                           142.   XTENSE EQU *
                               143.   "
                               144.   "
                               145.   "  FLAGS & VARIABLES FOR PXLINE
                               146.   "
6221  00                       147.   XNEG   FCB 0            -VE X FLAG
6222  00                       148.   YNEG   FCB 0            -VE Y FLAG
6223  00                       149.   XYSWAP FCB 0            SWAP X,Y FLAG
6224  00 00                    150.   XSUB   FDB 0            (X1-X0)
6226  00 00                    151.   YSUB   FDB 0            (Y1-Y0)
6228  00 00                    152.   X0     FDB 0            1ST X-COORD
622A  00 00                    153.   Y0     FDB 0            1ST Y-COORD
622C  00 00                    154.   X1     FDB 0            2ND X-COORD
622E  00 00                    155.   Y1     FDB 0            2ND Y-COORD
                               156.   "
6230  00 00                    157.   RADIUS FDB 0            CIRCLE RADIUS
                               158.   "
0012                           159.   SWI18N EQU 18           SOFT-WARE INTRP. NO. 18
6002                           160.   SWI18B EQU $6002        INPUT P1 : DISPLAY G1(240) & G2(240)
                               161.   "
6232  7E 62 E0                 162.   START  JMP DGZTST
                               163.   "
                               164.   "  INITIALISE ACIA REGS.
                               165.   "
```

```
6235  39              166.   INITR  RTS
6236  86 30           167.          LDA #$30
6238  B7 E0 04        168.          STA ACIAC        MASTER RESET.
623B  86 11           169.          LDA #$11         1/16 CLOCK DIVIDE RATIO, RTS = LOW.
623D  B7 E0 04        170.          STA ACIAC        7 B+ODD PRTY+2 STOP B,XMIT INT. DIS.
6240  39              171.          RTS
                      172.      "
                      173.      "
                      174.      "  GET A NUMERIC CHARACTER "
                      175.      "
6241  17 00 2D        176.   GETCH  BSR SIGN         CHECK FOR SIGN CHAR
6244  16 00 17        177.          BRA GETCH5
6247  17 00 1F        178.   GETCH0 BSR INCH
624A  81 20           179.          CMPA #$20
624C  27 F3           180.          BEQ GETCH
624E  81 0D           181.          CMPA #CR
6250  10 27 00 14     182.          BEQ GETCHE
6254  81 30           183.   GETCH3 CMPA #$30
6256  2D EF           184.          BLT GETCH0       IGNORE NON----
6258  81 39           185.          CMPA #$39
625A  2E EB           186.          BGT GETCH0       ---NUMERIC CHARS.
625C  80 30           187.          SUBA #$30        MINUS OFFSET OF ASCII 0
625E  BE 62 06        188.   GETCH5 LDX BPTR         SET POINTER
6261  A7 80           189.          STA 0,X+         STORE NUMBER
6263  BF 62 06        190.          STX BPTR         SAVE POINTER
6266  20 DF           191.          BRA GETCH0
6268                  192.   GETCHE EQU *            IGNORE #LF CHAR.
6268  39              193.          RTS
                      194.      "
6269  3F              195.   INCH   SWI
626A  39              196.          FCB 57
626B  4D              197.          TSTA
626C  27 FB           198.          BEQ INCH
626E  84 7F           199.          ANDA #$7F
6270  39              200.          RTS
                      201.      "
                      202.      "
6271  8D F6           203.   SIGN   BSR INCH
6273  81 2B           204.          CMPA #PLUS
6275  10 27 00 07     205.          BEQ SIGN1
6279  81 2D           206.          CMPA #MINUS
627B  26 F4           207.          BNE SIGN
627D  86 80           208.          LDA #$80
627F  39              209.          RTS
                      210.      "
6280  4F              211.   SIGN1  CLRA
6281  39              212.          RTS
                      213.      "
                      214.      "
                      215.      "
                      216.      "
6282  8E 62 08        217.   INPTR  LDX #BST         INIT. POINTER..
6285  BF 62 06        218.          STX BPTR         ..TO START OF BUFFER AREA.
6288  8D B7           219.          BSR GETCH        GO GET CO-ORDS.
628A  BE 62 06        220.          LDX BPTR
```

```
628D  8C 62 12       221.         CMPX #BST+10       CHECK FOR EXACTLY 10 VALUES
6290  26 F0          222.         BNE  INPTR
6292  8E 62 08       223.         LDX  #BST          CHECK SIGNS : ...
6295  A6 84          224.         LDA  0,X           .
6297  2B E9          225.         BMI  INPTR         ..MINUS IGNORE DATA.
6299  A6 05          226.         LDA  5,X
629B  2B E5          227.         BMI  INPTR         ..MINUS IGNORE DATA.
629D  8E 62 09       228.         LDX  #BST+1
62A0  17 00 0D       229.         BSR  MULX          GET DECIMAL VALUE FOR Y
62A3  FD 60 6F       230.         STD  YVAL          SAVE VALUE
62A6  8E 62 0E       231.         LDX  #BST+6
62A9  17 00 04       232.         BSR  MULX          GET DECIMAL VALUE FOR X
62AC  FD 60 6D       233.         STD  XVAL          SAVE VALUE
62AF  39             234.         RTS
                     235.   "
                     236.   "
                     237.   "
                     238.   "
62B0  7F 62 1C       239.   MULX  CLR  XTEM          CLR TEMP. VARIABLES
62B3  7F 62 1D       240.         CLR  XTEM+1
62B6  10 8E 62 1E    241.         LDY  #XTENS        GET X-TIMES ADDRESS
62BA  A6 80          242.   MULX0 LDA  0,X+          GET CHAR.
62BC  E6 A0          243.         LDB  0,Y+          GET X-TIMES VALUE
62BE  3D             244.         MUL                MULTIPLY TO GET DECIMAL
62BF  F3 62 1C       245.         ADDD XTEM          ADD TO PREV.
62C2  FD 62 1C       246.         STD  XTEM          SAVE
62C5  10 8C 62 21    247.         CMPY #XTENSE       DONE ?
62C9  25 EF          248.         BLO  MULX0         NO...ELSE
62CB  A6 84          249.         LDA  0,X           ..GET LAST CHAR.
62CD  81 07          250.         CMPA #RNOFF
62CF  10 2D 00 09    251.         BLT  MULX1
62D3  FC 62 1C       252.         LDD  XTEM
62D6  C3 00 01       253.         ADDD #1            AND ROUND OFF VALUE.
62D9  FD 62 1C       254.         STD  XTEM
62DC  FC 62 1C       255.   MULX1 LDD  XTEM
62DF  39             256.         RTS
                     257.   "
                     258.   "
                     259.   "
                     260.   " ************************************************
                     261.   "
                     262.   " TEST PROGRAM FOR DIGITISER..
                     263.   "
62E0                 264.   DGZTST EQU *
62E0  3F             265.         SWI
62E1  2C             266.         FCB  44            SWITCH TO MEMORY MAP 2
62E2  CC 60 02       267.         LDD  #SWI18B       LOAD SWI PARAMETER.
62E5  3F             268.         SWI
62E6  12             269.         FCB  SWI18N        PERFORM SWI 18.
62E7  7F 60 60       270.         CLR  PXRSET        CLEAR PIXEL RESET FLAG
62EA  7F 60 58       271.         CLR  CLRFLG        CLEAR CLR SCREEN COMMAND FLAG
62ED  7F 60 5A       272.         CLR  BOXF          CLEAR BOX FLAG I.E. DRAW CIRCLES
62F0  7F 60 59       273.         CLR  TTXF          CLEAR EXIT TO FLEX FLAG
62F3  7F 60 63       274.         CLR  TSCF
62F6  7F 60 64       275.         CLR  REPTF
```

```
62F9  7F 60 66        276.          CLR SKNF
62FC  7F 60 56        277.          CLR PTSF
62FF  7F 60 61        278.          CLR POFF
                      279.    "
                      280.    "
6302  BD 62 82        281.  DGZT0   JSR INPTR     GET CO-ORDS. RETURNS IN DECIMAL
6305  FC 60 6D        282.          LDD XVAL      CHECK X BOUNDS.
6308  10 83 01 40     283.          CMPD #XMAX
630C  2E F4           284.          BGT DGZT0
630E  FC 60 6F        285.          LDD YVAL
6311  10 83 00 CD     286.          CMPD #YMAX    CHECK IF Y>=YMAX. IF SO.....
6315  10 2D 00 09     287.          BLT DZ2
6319  10 83 00 D7     288.          CMPD #CMDS
631D  2D E3           289.          BLT DGZT0
631F  7E 65 1F        290.          JMP COMMAND   GO TO COMMAND CHECK-LIST.
6322  BD 63 3C        291.  DZ2     JSR DGZT1     WRITE TO SCREEN
6325  20 DB           292.          BRA DGZT0
                      293.    "
                      294.    "
                      295.    "
                      296.    "     SCALE VALUE IN D BY XCALE/DSCALE
6327                  297.  SCALXY  EQU *
6327  34 06           298.          PSHS D
6329  58              299.          ASLB
632A  49              300.          ROLA
632B  E3 E1           301.          ADDD ,S++
632D  44              302.          LSRA
632E  56              303.          RORB
632F  44              304.          LSRA
6330  56              305.          RORB
6331  10 24 00 03     306.          BCC SCALX4
6335  C3 00 01        307.          ADDD #1
6338  FD 60 39        308.  SCALX4  STD QUOT
633B  39              309.          RTS
                      310.    "
                      311.    "
                      312.    "
                      313.    "
                      314.    "
                      315.    "     DISPLAY PIXEL ON/OFF
                      316.    "
633C                  317.  DGZT1   EQU *
633C  BD 63 43        318.          JSR SCALC
633F  BD 63 63        319.          JSR SCREEN
6342  39              320.          RTS
                      321.    "
                      322.    "
                      323.    "
6343  FC 60 6D        324.  SCALC   LDD XVAL
6346  BD 63 27        325.          JSR SCALXY    SCALE X-VALUE
6349  FD 60 6D        326.          STD XVAL
634C  FD 60 5E        327.          STD XVAL1
634F  FC 60 6F        328.          LDD YVAL
6352  BD 64 5B        329.          JSR M40       MUL. BY 40 TO GET PIXEL BYTE ADDR.
6355  34 06           330.          PSHS D        SAVE IT IN D.
```

```
6357  FC 60 6D        331.              LDD XVAL
635A  BD 64 C0        332.              JSR DIV6         DIVIDE BY 6 (NO ROUNDING OFF WANTED!!)
635D  FC 60 39        333.              LDD QUOT
6360  E3 E1           334.              ADDD ,S++        ADD X-BYTE OFFSET TO PIXEL
6362  39              335.              RTS
                      336.        "
                      337.        "
                      338.        "
6363                  339.    SCREEN EQU *
6363  7D 60 66        340.              TST SRNF
6366  10 26 00 3F     341.    SCREN2    BNE SCREN2
636A  34 06           342.    SCREN0    PSHS D
636C  B6 60 67        343.              LDA COLOR1
636F  B7 60 65        344.              STA COLOUR
6372  35 06           345.              PULS D
6374  8E E0 00        346.              LDX #$E000
6377  10 8E FF FF     347.              LDY #$FFFF
637B  17 00 71        348.              BSR WSCREN
637E  7D 60 55        349.              TST ALTF
6381  10 27 00 23     350.              BEQ SCREN1
6385  7D 60 66        351.              TST SRNF
6388  10 27 00 1C     352.              BEQ SCREN1
638C  7D 60 61        353.              TST POFF
638F  10 27 00 15     354.              BEQ SCREN1
6393  34 02           355.              PSHS A
6395  1E 01           356.              EXG D,X
6397  83 60 00        357.              SUBD #$6000
639A  1E 01           358.              EXG D,X
639C  35 02           359.              PULS A
639E  84 3F           360.              ANDA #$3F
63A0  BB 60 68        361.              ADDA COLOR2
63A3  A7 84           362.              STA 0,X
63A5  7F 60 61        363.              CLR POFF
63A8  39              364.    SCREN1    RTS
                      365.        "
63A9  10 2B 00 39     366.    SCREN2    BMI SCREN4
63AD  34 06           367.    SCREN3    PSHS D
63AF  B6 60 68        368.              LDA COLOR2
63B2  B7 60 65        369.              STA COLOUR
63B5  35 06           370.              PULS D
63B7  8E 80 00        371.              LDX #$8000
63BA  10 8E 9F FF     372.              LDY #$9FFF
63BE  17 00 2E        373.              BSR WSCREN
63C1  7D 60 55        374.              TST ALTF
63C4  27 E2           375.              BEQ SCREN1
63C6  7D 60 66        376.              TST SRNF
63C9  2A DD           377.              BPL SCREN1
63CB  7D 60 61        378.              TST POFF
63CE  27 D8           379.              BEQ SCREN1
63D0  34 02           380.              PSHS A
63D2  1E 01           381.              EXG D,X
63D4  C3 60 00        382.              ADDD #$6000
63D7  1E 01           383.              EXG D,X
63D9  35 02           384.              PULS A
63DB  84 3F           385.              ANDA #$3F
```

```
630B  84 3F          385.              ANDA #$3F

63DD  BB 60 67        386.              ADDA COLOR1
63E0  A7 84           387.              STA 0,X
63E2  7F 60 61        388.              CLR POFF
63E5  39              389.              RTS
                      390.        "
63E6  34 06           391.    SCREN4 PSHS D
63E8  8D 80           392.              BSR SCREN0
63EA  35 06           393.              PULS D
63EC  8D BF           394.              BSR SCREN3
63EE  39              395.              RTS
                      396.        "
                      397.        "
                      398.        "
63EF  34 06           399.    WSCREN PSHS D        BYTE ADDRESS & SAVE IT.
63F1  86 20           400.              LDA #$20
63F3  F6 60 3C        401.              LDB REMD       SET-UP PIXEL POS. TO BE SWITCHED
63F6  10 27 00 04     402.              BEQ Z2         ON/OFF.
63FA  44              403.    Z1        LSRA
63FB  5A              404.              DECB
63FC  26 FC           405.              BNE Z1
63FE  BB 60 65        406.    Z2        ADDA COLOUR    ADD IN THE COLOUR
6401  B7 60 62        407.              STA PXBYTE     SAVE BYTE STATUS
6404  35 06           408.              PULS D         GET ADDRESS OFFSET
6406  34 10           409.              PSHS X         GET SCREEN START ADDRESS
6408  30 8B           410.              LEAX D,X       GET THE SCREEN BYTE ADDRESS
640A  AC E1           411.              CMPX ,S++      CHECK THAT ADDRESS IS VALID..
640C  10 25 00 31     412.              BLO ZX         FOR THE GRAPHICS SCREEN
6410  34 20           413.              PSHS Y
6412  AC E1           414.              CMPX ,S++      CHOSEN CURRENTLY.
6414  10 22 00 29     415.              BHI ZX         EXIT IF INVALID.
6418  B6 60 62        416.              LDA PXBYTE     GET BYTE
641B  7D 60 60        417.    Z21       TST PXRSET     TEST FOR BLACK
641E  10 27 00 0A     418.              BEQ Z3
6422  84 3F           419.              ANDA #$3F      YES,PRESERVE CURRENT PIXELS STATUSES
6424  43              420.              COMA
6425  A4 84           421.              ANDA 0,X       & COLOUR, AND
6427  A7 84           422.              STA 0,X        SWITCH PIXEL CONCERNED OFF.
6429  16 00 15        423.              BRA ZX
642C  E6 84           424.    Z3        LDB 0,X        NOT BLACK :
642E  34 04           425.              PSHS B
6430  C4 C0           426.              ANDB #$C0      MASK TO GET COLOUR BITS
6432  F1 60 65        427.              CMPB COLOUR    = CURRENT COLOUR ?
6435  35 04           428.              PULS B
6437  10 26 00 0A     429.              BNE Z5         NO,SWITCH ALL OTHER PIXELS OFF.
                      430.        "                   YES PRESERVE CURRENT PIXELS STATUSES
643B  34 04           431.              PSHS B         SAVE B
643D  AA E0           432.              ORA ,S+        ADD IN SAME COLOUR & TURN PIXEL
643F  A7 84           433.    Z4        STA 0,X        CONCERNED ON.
6441  7F 60 61        434.    ZX        CLR POFF
6444  39              435.              RTS
                      436.        "
6445  7D 60 61        437.    Z5        TST POFF
6448  26 F5           438.              BNE Z4
644A  7C 60 61        439.              INC POFF
644D  A7 84           440.              STA 0,X
```

```
6446F   39              441.            RTS
                        442.        "
                        443.        "
                        444.        "
                        445.        "
                        446.        "
                        447.        "
                        448.        "   MULTIPLY (D) BY 5
6450    34 04           449.    M5      PSHS B
6452    34 02           450.            PSHS A
6454    58              451.            ASLB
6455    49              452.            ROLA        x2
6456    58              453.            ASLB
6457    49              454.            ROLA        x4
6458    E3 E1           455.            ADDD  ,S++      x5
645A    39              456.            RTS
                        457.        "
                        458.        "
                        459.        "
                        460.        "   MULTIPLY (D) BY 40
                        461.        "   RESULT IN A:B
645B    34 04           462.    M40     PSHS B
645D    34 02           463.            PSHS A
645F    58              464.            ASLB
6460    49              465.            ROLA            x2
6461    58              466.            ASLB
6462    49              467.            ROLA            x4
6463    E3 E1           468.            ADDD  ,S++      x5
6465    58              469.            ASLB
6466    49              470.            ROLA            x10
6467    58              471.            ASLB
6468    49              472.            ROLA            x20
6469    58              473.            ASLB
646A    49              474.            ROLA            x40
646B    39              475.            RTS
                        476.        "
                        477.        "
                        478.        "   MULTIPLY (D) BY 80
                        479.        "
646C    8D ED           480.    M80     BSR M40         x40
646E    58              481.            ASLB
646F    49              482.            ROLA            x80
6470    39              483.            RTS
                        484.        "
                        485.        "
                        486.        "   DIVIDES 16-BIT NO. BY AN 8-BIT ONE
                        487.        "   DVEND/DVSOR = QUOT+REMD  "
                        488.        "
6471                    489.    DIVIDE EQU *
6471    7F 60 3B        490.            CLR REMC
6474    7F 60 3C        491.            CLR REMD
6477    B6 60 38        492.            LDA DVSOR
647A    10 27 00 3B     493.            BEQ DIVZ        DIVISOR = 0....
647E    34 02           494.            PSHS A
6480    86 10           495.            LDA #16
```

```
6482  B7 60 35        496.            STA DVCNT        SET DIVIDEND BIT NO.
6485  4F              497.            CLRA
6486  34 02           498.            PSHS A           SET DVSOR INTO
6488  10 AE E1        499.            LDY ,S++         Y REGISTER
648B  78 60 37        500.   DIV1     ASL DVEND+1      SHIFT LEFT DIVIDEND INTO CARRY
648E  79 60 36        501.            ROL DVEND        (WHICH ACTS AS THE QUOTIENT ALSO)
6491  79 60 3C        502.            ROL REMD         ROTATE WITH CARRY LEFT THE
6494  79 60 3B        503.            ROL REMC         REMAINDER.
6497  FC 60 3B        504.            LDD REMC
649A  34 20           505.            PSHS Y
649C  10 A3 E1        506.            CMPD ,S++        IS REMAINDER >= DIVISOR...?
649F  10 25 00 0A     507.            BCS DIVCHK       NO,..
64A3  34 20           508.            PSHS Y           YES, SUBTRACT DIVISOR
64A5  A3 E1           509.            SUBD ,S++        FROM IT.
64A7  FD 60 3B        510.            STD REMC         SAVE IN REMC,REMD.
64AA  7C 60 37        511.            INC DVEND+1      INCREMENT QUOTIENT
64AD  7A 60 35        512.   DIVCHK   DEC DVCNT        DECR. SHIFT COUNT
64B0  26 D9           513.            BNE DIV1         DONE ? NO,..
64B2  BE 60 36        514.            LDX DVEND
64B5  BF 60 39        515.            STX QUOT         YES, SAVE QUOTIENT
64B8  39              516.            RTS
                      517.            "
                      518.            "
                      519.            " DIVZ IS BRANCHED TO IF DIVISOR = 0
64B9                  520.   DIVZ     EQU *
64B9  8E 00 00        521.            LDX #0000
64BC  BF 60 39        522.            STX QUOT         ZERO QUOTIENT
64BF  39              523.            RTS
                      524.            "
                      525.            "
                      526.            " DIVISION BY SIX (D)=DIVIDEND
                      527.            " !! NO ROUNDING OFF WANTED !!!!
                      528.            "
64C0  FD 60 36        529.   DIV6     STD DVEND        SET DIVIDEND
64C3  86 06           530.            LDA #6           & DIVISOR
64C5  B7 60 38        531.            STA DVSOR
64C8  8D A7           532.            BSR DIVIDE       GO DIVIDE
64CA  39              533.   DIV6X    RTS
                      534.            "
                      535.            "
                      536.            " DIVISION BY 20 DEC.
                      537.            "
64CB  FD 60 36        538.   DIV20    STD DVEND        SET DIVIDEND,
64CE  86 14           539.            LDA #20
64D0  B7 60 38        540.            STA DVSOR        & DIVISOR
64D3  8D 9C           541.            BSR DIVIDE       DO DIVISION
64D5  39              542.   DIV20X   RTS
                      543.            "
                      544.            "
                      545.            " DIVISION BY 165 DEC. (D)=DIVIDEND
                      546.            " USED TO SCALE VALUES TO SREEN PHYSICAL SIZE.
64D6  FD 60 36        547.   DVPXL    STD DVEND        SET DIVIDEND
64D9  86 A5           548.            LDA #165
64DB  B7 60 38        549.            STA DVSOR        & DIVISOR
64DE  8D 91           550.            BSR DIVIDE
```

```
64E0   FC 60 3B         551.            LDD REMC        GET REMAINDER
64E3   10 83 00 53      552.            CMPD #83
64E7   10 2D 00 05      553.            BLT DVPXLX      AND ROUND OFF VALUE
64EB   30 01            554.            INX             ..X-REG HAS QUOT ON RTS
64ED   BF 60 39         555.            STX QUOT
64F0   39               556.   DVPXLX   RTS
                        557.        "
                        558.        "
                        559.        "  MULTIPLYS D BY 240,RESULT IN D
                        560.        "
64F1   FC 60 6F         561.   MXPXL    LDD YVAL
64F4   BD 64 6C         562.            JSR M80         x80
64F7   34 06            563.            PSHS D
64F9   58               564.            ASLB
64FA   49               565.            ROLA            x160
64FB   E3 E1            566.            ADDD ,S++       x160 + x80 = x240
64FD   39               567.            RTS
                        568.        "
                        569.        "
                        570.        "
                        571.        "
                        572.        "
                        573.        "  WRITE TO SCREEN ;CHAR IN A
64FE   3F               574.   ZOUTCH   SWI
64FF   05               575.            FCB 5
6500   39               576.            RTS
                        577.        "
                        578.        "
                        579.        "
6501   CC 20 00         580.   DG1      LDD #$2000      DISP. G1
6504   16 00 0F         581.            BRA DGXX
6507   CC 00 02         582.   DG2      LDD #$0002      DISP. G2
650A   16 00 09         583.            BRA DGXX
650D   CC 20 02         584.   DG1G2P   LDD #$2002      DISP. G1 & G2 P.
6510   16 00 03         585.            BRA DGXX
6513   CC 60 02         586.   DG1G2M   LDD #$6002      DISP. G1 & G2 MIX.
6516   7F 60 56         587.   DGXX     CLR PTSF
6519   7F 60 5B         588.            CLR CLRFLG
651C   3F               589.            SWI
651D   12               590.            FCB 18
651E   39               591.            RTS
                        592.        "
                        593.        "
                        594.        "
                        595.        "  COMMANDS or MENU LIST
000C                    596.   CMAX     EQU 12          CURRENT NO. OF COMMANDS PRESENT.
                        597.        "
651F                    598.   COMMAND  EQU *
651F   FC 60 6D         599.   CMD0     LDD XVAL
6522   BD 64 CB         600.            JSR DIV20       DIVIDE BY 20
6525   FC 60 39         601.            LDD QUOT
6528   C1 0C            602.            CMPB #CMAX      TO GET COMMAND TYPE
652A   10 2D 00 5C      603.            BLT CMD1
652E   C1 0D            604.            CMPB #13
6530   10 2E 00 91      605.            BGT TTX80W
```

```
Page  13   06/16/81    1.DIGIT2.TXT


   6534  BD 65 3A              606.           JSR CM1
   6537  7E 63 02              607.           JMP DGZTO
                               608.      "
                               609.      "
   653A  10 BE 60 6F           610.   CM1     LDY YVAL
   653E  10 8C 00 EB           611.           CMPY #235
   6542  10 2E 00 12           612.           BGT CM4
   6546  C1 0C                 613.           CMPB #12
   6548  10 2E 00 06           614.           BGT CM2
   654C  BD 65 01              615.           JSR DG1
   654F  16 00 37              616.           BRA C5
   6552  BD 65 07              617.   CM2     JSR DG2
   6555  16 00 31              618.           BRA C5
   6558  10 8C 00 FF           619.   CM4     CMPY #255
   655C  10 2E 00 12           620.           BGT CM6
   6560  C1 0C                 621.           CMPB #12
   6562  10 2E 00 06           622.           BGT CM5
   6566  BD 65 0D              623.           JSR DG1G2P
   6569  16 00 1D              624.           BRA C5
   656C  BD 65 13              625.   CM5     JSR DG1G2M
   656F  16 00 17              626.           BRA C5
   6572  7D 60 5B              627.   CM6     TST CLRFLG      GO CLEAR SCREEN IF VALUE >=CMAX .
   6575  10 26 00 06           628.           BNE C0          & THE CLEAR COMMAND WAS RQSED TWICE.
   6579  F7 60 5B              629.           STB CLRFLG      FIRST TIME, SET FLAG.
   657C  16 00 0A              630.           BRA C5
   657F  4F                    631.   C0      CLRA            SECOND TIME,
   6580  B7 60 5B              632.           STA CLRFLG      CLEAR FLAG &
   6583  B7 60 56              633.           STA PTSF
   6586  BD 66 50              634.           JSR CLR240      DO SCREEN CLEAR
   6589  39                    635.   C5      RTS
                               636.      "
                               637.      "
                               638.      "
   658A  30 8D 00 09           639.   CMD1    LEAX CMDTBL,PCR  GET COMMAND TABLE ADDRESS
   658E  4F                    640.           CLRA
   658F  58                    641.           ASLB            DOUBLE B TO GET OFFSET TO ADDRESS
   6590  AD 9B                 642.           JSR [D,X]       PERFORM COMMAND
   6592  25 0B                 643.           BCS CMD0        HAS HIT COMMAND AREA REPEAT.
   6594  7E 63 02              644.           JMP DGZTO       RETURN FOR NEXT.
                               645.      "
                               646.      "
                               647.      "  TABLE OF COMMANDS or MENUS
                               648.      "
   6597  65 E2                 649.   CMDTBL  FDB BLACK       RESET PIXEL
   6599  66 1B                 650.           FDB BLUE        SET BLUE PIXEL
   659B  66 20                 651.           FDB GREEN       SET GREEN PIXEL
   659D  66 25                 652.           FDB RED         SET RED PIXEL
   659F  66 2A                 653.           FDB WHITE       SET WHITE PIXEL
   65A1  6A 55                 654.           FDB TSCP
   65A3  6A 75                 655.           FDB REPEAT
   65A5  68 8D                 656.           FDB PPOINT      SWITCH ON/OFF PIXEL
   65A7  66 7F                 657.           FDB PXLINE      DRAW A "PIXEL" LINE
   65A9  69 51                 658.           FDB PXCIR       DRAW A "PIXEL" CIRCLE
   65AB  6A 47                 659.           FDB DIAMND      DRAW DIAMONDS.
   65AD  65 AF                 660.           FDB BASIC       EXIT TO BASIC
```

```
                                    661.    "
                                    662.    "
                                    663.    "
        65AF                        664.    BASIC   EQU *
        65AF  3F                    665.            SWI
        65B0  2B                    666.            FCB 43      SWITCH TO MAP 1
        65B1  32 62                 667.            LEAS 2,S
        65B3  39                    668.            RTS
                                    669.    "
                                    670.    "
                                    671.    "
        65B4  7F 60 5B              672.    TTX80   CLR CLRFLG
        65B7  7F 60 5A              673.            CLR BOXF
        65BA  7F 60 56              674.            CLR PTSF
        65BD  86 01                 675.            LDA #1
        65BF  B7 60 59              676.            STA TTXF
        65C2  1C FE                 677.            ANDCC #$FE      CLEAR CARRY
        65C4  39                    678.            RTS
                                    679.    "
                                    680.    "
        65C5  10 BE 60 6F           681.    TTX80W  LDY YVAL
        65C9  10 8C 01 27           682.            CMPY #295
        65CD  10 2E 00 06           683.            BGT TTX80X
        65D1  BD 6B 02              684.            JSR SDLINE
        65D4  7E 63 02              685.            JMP DGZTO
                                    686.    "
        65D7  7F 60 59              687.    TTX80X  CLR TTXF
        65DA  CC 1E 18              688.            LDD #$1E18      SET TTX80 WHITE ON RED BKGRN.
        65DD  3F                    689.            SWI
        65DE  12                    690.            FCB 18
        65DF  7E CD 03              691.            JMP $CD03       EXIT TO FLEX
                                    692.    "
                                    693.    "
                                    694.    "
                                    695.    "
        65E2                        696.    BLACK   EQU *
        65E2  FC 60 6F              697.            LDD YVAL
        65E5  10 83 00 FF           698.            CMPD #255
        65E9  10 2D 00 0C           699.            BLT BLK1
        65ED  10 83 01 18           700.    BLK0    CMPD #280
        65F1  10 2E 00 12           701.            BGT BLK3
        65F5  4F                    702.            CLRA
        65F6  16 00 02              703.            BRA BLK2
        65F9  86 01                 704.    BLK1    LDA #1
        65FB  B7 60 60              705.    BLK2    STA PXRSET      SET PIXEL RESET FLAG
        65FE  7F 60 56              706.    BLKX    CLR PTSF
        6601  7F 60 5B              707.            CLR CLRFLG      CLEAR CLR SCREEN CMD FLAG
        6604  1C FE                 708.            ANDCC #$FE      CLEAR CARRY
        6606  39                    709.            RTS
                                    710.    "
        6607  10 83 01 27           711.    BLK3    CMPD #295
        660B  10 2E 00 05           712.            BGT BLK4
        660F  7F 60 55              713.            CLR ALTF
        6612  20 EA                 714.            BRA BLKX
        6614  86 01                 715.    BLK4    LDA #1
```

```
6614  86 01          715.    BLK4    LDA #1
```

```
6616  B7 60 55       716.            STA ALTF
6619  20 E3          717.            BRA BLKX
                     718.    "
                     719.    "
                     720.    "
661B  86 00          721.    BLUE    LDA #$00
661D  16 00 0C       722.            BRA SCOLOR
                     723.    "
                     724.    "
6620  86 40          725.    GREEN   LDA #$40
6622  16 00 07       726.            BRA SCOLOR
                     727.    "
                     728.    "
6625  86 80          729.    RED     LDA #$80
6627  16 00 02       730.            BRA SCOLOR
                     731.    "
                     732.    "
662A  86 C0          733.    WHITE   LDA #$C0
                     734.    "
                     735.    "
662C                 736.    SCOLOR  EQU *           STORE SELECTED COLOUR
662C  34 02          737.            PSHS A
662E  FC 60 6F       738.            LDD YVAL
6631  10 83 00 FF    739.            CMPD #255
6635  35 02          740.            PULS A
6637  10 2E 00 06    741.            BGT SCOL2
663B  B7 60 67       742.    SCOL1   STA COLOR1
663E  16 00 03       743.            BRA SCOL3
6641  B7 60 68       744.    SCOL2   STA COLOR2
6644  7F 60 60       745.    SCOL3   CLR PXRSET      CLEAR PIXEL RESET FLAG
6647  7F 60 5B       746.            CLR CLRFLG      AND THE CLR SCREEN CMD FLAG
664A  7F 60 56       747.            CLR PTSF
664D  1C FE          748.            ANDCC #$FE      CLEAR CARRY
664F  39             749.            RTS
                     750.    "
                     751.    "
                     752.    "   CLEARS THE G1(240) OR G2(240) ,OR BOTH SCREENS
6650                 753.    CLR240  EQU *
6650  3F             754.            SWI
6651  13             755.            FCB 19
6652  85 20          756.            BITA #$20
6654  10 27 00 03    757.            BEQ CLR20
6658  17 00 0A       758.            BSR CLRG1
665B  C5 02          759.    CLR20   BITB #$02
665D  10 27 00 03    760.            BEQ CLR22
6661  17 00 0F       761.            BSR CLRG2
6664  39             762.    CLR22   RTS
                     763.    "
                     764.    "
6665  4F             765.    CLRG1   CLRA
6666  8E E0 00       766.            LDX #G1SA
6669  A7 80          767.    CLRG1X  STA ,X+
666B  8C FF FF       768.            CMPX #G1EA
666E  25 F9          769.            BLO CLRG1X
6670  A7 84          770.            STA ,X
```

```
6672  39            771.         RTS
                    772.    "
                    773.    "
6673  4F            774.    CLRG2  CLRA
6674  8E 80 00      775.           LDX  #G2SA
6677  A7 80         776.    CLRG2X STA  ,X+
6679  8C 9E FF      777.           CMPX #G2EA
667C  23 F9         778.           BLS  CLRG2X
667E  39            779.           RTS
                    780.    "
                    781.    "    PIXEL LINE DRAWING ROUTINE
                    782.    "
                    783.    "
667F  7F 60 5B      784.    PXLINE CLR  CLRFLG      CLEAR CLR SCREEN CMD FLAG
6682  7F 60 56      785.           CLR  PTSF
6685  7F 60 57      786.           CLR  NLINE
6688  FC 60 6F      787.           LDD  YVAL
668B  10 83 00 FF   788.           CMPD #255
668F  10 2D 00 05   789.           BLT  PXL2
6693  86 01         790.           LDA  #1
6695  B7 60 57      791.           STA  NLINE
6698  BD 67 93      792.    PXL2   JSR  ONESET       GO GET ONE SET OF CO-ORDS. INTO X,Y REGS.
669B  BD 66 EF      793.           JSR  SCALN
669E  BF 62 28      794.           STX  X0           SAVE X0
66A1  10 BF 62 2A   795.           STY  Y0           SAVE Y0
66A5  BD 63 63      796.           JSR  SCREEN       DISPLAY POINT
66A8  BD 67 93      797.    PXL3   JSR  ONESET       GET ANOTHER SET OF CO-ORDS.
66AB  BD 66 EF      798.           JSR  SCALN
66AE  BF 62 2C      799.           STX  X1           SAVE X1
66B1  10 BF 62 2E   800.           STY  Y1           SAVE Y1
66B5  BD 63 63      801.           JSR  SCREEN       DISPLAY POINT
66B8  BD 67 14      802.           JSR  DLINE        DO LINE DRAWING
66BB  7D 60 57      803.           TST  NLINE        CHECK FOR NEW LINE
66BE  26 D8         804.           BNE  PXL2
66C0  7D 60 63      805.           TST  TSCF
66C3  26 E3         806.           BNE  PXL3
66C5  7D 60 64      807.    PXL4   TST  REPTF
66C8  10 27 00 15   808.           BEQ  PXL5
66CC  BD 67 93      809.           JSR  ONESET
66CF  BD 66 EF      810.           JSR  SCALN
66D2  BF 62 28      811.           STX  X0
66D5  10 BF 62 2A   812.           STY  Y0
66D9  BD 63 63      813.           JSR  SCREEN
66DC  BD 67 5F      814.           JSR  VLINE
66DF  20 E4         815.           BRA  PXL4
66E1                816.    PXL5   EQU  *
66E1  BE 62 2C      817.           LDX  X1           GET PREVIOUS SECOND CO-ORDS.
66E4  BF 62 28      818.           STX  X0
66E7  BE 62 2E      819.           LDX  Y1           AND MAKE IT CURRENT
66EA  BF 62 2A      820.           STX  Y0           FIRST CO-ORDS.
66ED  20 B9         821.           BRA  PXL3         REPEAT FOR NEXT CO-ORDS.
                    822.    "
                    823.    "
                    824.    "
66EF  FC 60 6D      825.    SCALN  LDD  XVAL
```

```
  66EF   FC 60 6D      825.   SCALN  LDD   XVAL
```

```
  66F2   BD 63 27      826.          JSR   SCALXY
  66F5   FD 60 6D      827.          STD   XVAL
  66F8   34 06         828.          PSHS  D
  66FA   FC 60 6F      829.          LDD   YVAL
  66FD   34 06         830.          PSHS  D
  66FF   BD 64 5B      831.          JSR   M40
  6702   34 06         832.          PSHS  D
  6704   FC 60 6D      833.          LDD   XVAL
  6707   BD 64 C0      834.          JSR   DIV6
  670A   FC 60 39      835.          LDD   QUOT
  670D   E3 E1         836.          ADDD  ,S++
  670F   35 20         837.          PULS  Y
  6711   35 10         838.          PULS  X
  6713   39            839.          RTS
                       840.    "
                       841.    "
                       842.    "
                       843.    "                   CLEAR
  6714   7F 62 21      844.   DLINE  CLR   XNEG     -VE X FLAG,
  6717   7F 62 22      845.          CLR   YNEG     -VE Y FLAG,
  671A   7F 62 23      846.          CLR   XYSWAP   SWAP X,Y FLAG
  671D   FC 62 2C      847.          LDD   X1
  6720   B3 62 28      848.          SUBD  X0       D=X1-X0
  6723   10 2A 00 08   849.          BPL   DL2
  6727   43            850.          COMA           -VE,
  6728   53            851.          COMB           GET 2'S COMPLEMENT
  6729   C3 00 01      852.          ADDD  #1
  672C   7C 62 21      853.          INC   XNEG     SET -VE X FLAG
  672F   FD 62 24      854.   DL2    STD   XSUB     SAVE
  6732   FC 62 2E      855.          LDD   Y1
  6735   B3 62 2A      856.          SUBD  Y0       D=Y1-Y0
  6738   10 2A 00 08   857.          BPL   DL4
  673C   43            858.          COMA           -VE,
  673D   53            859.          COMB           GET 2'S COMPLEMENT
  673E   C3 00 01      860.          ADDD  #1
  6741   7C 62 22      861.          INC   YNEG     SET -VE Y FLAG
  6744   FD 62 26      862.   DL4    STD   YSUB     SAVE
  6747   10 B3 62 24   863.          CMPD  XSUB     IS (Y1-Y0) > (X1-X0)
  674B   10 23 00 0C   864.          BLS   DL6      NO,..
  674F   BE 62 24      865.          LDX   XSUB     YES,
  6752   FD 62 24      866.          STD   XSUB     SWAP X WITH Y
  6755   BF 62 26      867.          STX   YSUB
  6758   7C 62 23      868.          INC   XYSWAP   SET THE FLAG
  675B   BD 67 5F      869.   DL6    JSR   VLINE    GET DO VECTORED DRAWING
  675E   39            870.          RTS
                       871.    "
                       872.    "
                       873.    "  VECTOR DRAWING
                       874.    "
  675F   8E 00 00      875.   VLINE  LDX   #$00     INIT. X.
  6762   10 8E 00 00   876.          LDY   #$00     INIT. Y.
  6766   FC 62 24      877.          LDD   XSUB     GET (X1-X0)
  6769   44            878.          LSRA           DIVIDE BY
  676A   56            879.          RORB           TWO
  676B   43            880.          COMA           AND
```

```
676C  53              881.          COMB            2'S COMPLEMENT
676D  C3 00 01        882.          ADDD #1           THE VALUE.
6770  BC 62 24        883.    VLO   CMPX XSUB       FINAL POINT REACHED ?
6773  10 2E 00 1B     884.          BGT VLX         YES, EXIT.
6777  7C 60 58        885.          INC LINEF
677A  BD 68 13        886.          JSR PPLOT       ELSE GO PLOT POINT
677D  7F 60 58        887.          CLR LINEF
6780  F3 62 26        888.          ADDD YSUB       D=D+(Y1-Y0)
6783  30 01           889.          LEAX 1,X        X=X+1
6785  10 83 00 00     890.          CMPD #0         >0
6789  2F E5           891.          BLE VLO         NO,...
678B  B3 62 24        892.          SUBD XSUB       YES, D=D-(X1-X0)
678E  31 21           893.          LEAY 1,Y        Y=Y+1
6790  20 DE           894.          BRA VLO         CONTINUE.
                      895.    "
6792  39              896.    VLX   RTS             EXIT
                      897.    "
                      898.    "
                      899.    "
                      900.    "
                      901.    "   RETURNS ONE SET OF CO-ORDS ;IF IN COMMAND REGION SET CARRY &
                      902.    "     PERFORM THE REQUIRED COMMAND.
6793  BD 62 82        903.    ONESET JSR INPTR      GET CO-ORDS.
6796  BE 60 6D        904.          LDX XVAL        CHECK.....
6799  8C 01 40        905.          CMPX #XMAX
679C  2E F5           906.          BGT ONESET
679E  10 BE 60 6F     907.          LDY YVAL
67A2  10 8C 00 CD     908.          CMPY #YMAX      ....BOUNDS.
67A6  10 2D 00 68     909.          BLT ONEX        O.K. RETURN.
67AA  10 8C 00 D7     910.          CMPY #CMDS
67AE  2D E3           911.          BLT ONESET
67B0  1F 10           912.          TFR X,D
67B2  BD 64 CB        913.          JSR DIV20
67B5  FC 60 39        914.          LDD QUOT
67B8  10 27 00 16     915.          BEQ ONE2
67BC  C1 05           916.          CMPB #5
67BE  10 2E 00 1A     917.          BGT ONE5
67C2  10 27 00 11     918.          BEQ ONE4
67C6  C0 01           919.          SUBB #1
67C8  54              920.          LSRB
67C9  56              921.          RORB
67CA  56              922.          RORB
67CB  1E 89           923.          EXG A,B
67CD  BD 66 2C        924.          JSR SCOLOR
67D0  20 C1           925.          BRA ONESET
67D2                  926.    ONE2  EQU *
67D2  BD 65 E2        927.          JSR BLACK
67D5  20 BC           928.          BRA ONESET
67D7  BD 6A 55        929.    ONE4  JSR TSCP
67DA  20 B7           930.          BRA ONESET
67DC  C1 06           931.    ONE5  CMPB #6
67DE  10 26 00 05     932.          BNE ONE6
67E2  BD 6A 75        933.          JSR REPEAT
67E5  20 AC           934.          BRA ONESET
                      935.    "
```

```
67E5  20 AC        934.            BRA UNESET
                   935.        "

```

```
67E7  C1 07        936.    ONE6    CMPB #7
67E9  10 26 00 10  937.            BNE ONE7
67ED  FC 60 6F     938.            LDD YVAL
67F0  10 83 01 13  939.            CMPD #275
67F4  10 2E 00 05  940.            BGT ONE7
67F8  BD 68 8D     941.            JSR PPOINT
67FB  20 96        942.            BRA ONESET
                   943.        "
67FD  C1 0C        944.    ONE7    CMPB #CMAX
67FF  10 2D 00 0B  945.            BLT ONE8
6803  C1 0D        946.            CMPB #13
6805  10 2E 00 05  947.            BGT ONE8
6809  BD 6S 3A     948.            JSR CM1
680C  20 85        949.            BRA ONESET
                   950.        "
                   951.        "
                   952.        "
680E  32 62        953.    ONE8    LEAS 2,S        IN COMMAND AREA, INCR. STACK PTR TWICE
6810  1A 01        954.            ORCC #$01       SET CARRY BEFORE EXIT.
6812  39           955.    ONEX    RTS
                   956.        "
                   957.        "  ACTUAL PLOT THE POINTS ROUTINE
                   958.        "
6813  34 36        959.    PPLOT   PSHS D,X,Y      SAVE D,X,Y
6815  7D 62 23     960.            TST XYSWAP      SWAP X,Y ??
6818  10 27 00 02  961.            BEQ PPL2        NO,..
681C  1E 12        962.            EXG X,Y         YES, DO IT.
681E  1F 20        963.    PPL2    TFR Y,D
6820  7D 62 22     964.            TST YNEG        -VE Y ??
6823  10 27 00 05  965.            BEQ PPL4        NO,..
6827  43           966.            COMA            YES, GET
6828  53           967.            COMB
6829  C3 00 01     968.            ADDD #1         2'S COMPLEMENT VALUE
682C  F3 62 2A     969.    PPL4    ADDD YO         D=Y+YO
682F  1F 02        970.            TFR D,Y         SAVE D I.E Y=Y+YO
6831  1F 10        971.            TFR X,D
6833  7D 62 21     972.            TST XNEG        -VE X ??
6836  10 27 00 05  973.            BEQ PPL6        NO,..
683A  43           974.            COMA            YES, GET
683B  53           975.            COMB
683C  C3 00 01     976.            ADDD #1         2'S COMPLEMENT VALUE
683F  F3 62 28     977.    PPL6    ADDD XO         D=X+XO
6842  1F 01        978.            TFR D,X         I.E X=X+XO
6844  BD 68 4A     979.            JSR PXPLOT      GO WRITE TO SCREEN
6847  35 36        980.            PULS D,X,Y      RESTORE REGS.
6849  39           981.            RTS
                   982.        "
                   983.        "
                   984.        "
684A  BF 60 6D     985.    PXPLOT  STX XVAL        SET X VALUE
684D  10 2B 00 24  986.            BMI PXPX        CHECK BOUNDS FOR
6851  8C 01 40     987.            CMPX #XMAX      X-COORD.
6854  10 2E 00 1D  988.            BGT PXPX
6858  10 BF 60 6F  989.            STY YVAL        SET Y VALUE
685C  10 2B 00 15  990.            BMI PXPX        CHECK BOUNDS FOR
```

```
6860   10 8C 00 CD      991.              CMPY #YMAX        Y-COORD.
6864   10 2C 00 0D      992.              BGE PXPX
6868   7D 60 5B         993.              TST LINEF
686B   10 26 00 07      994.              BNE ABSCRN
686F   BD 66 EF         995.              JSR SCALN
6872   BD 63 63         996.              JSR SCREEN         SCREEN WRITE
6875   39               997.      PXPX    RTS
                        998.          "
                        999.          "
6876   FC 60 6F         1000.     ABSCRN  LDD YVAL
6879   BD 64 5B         1001.             JSR M40
687C   34 06            1002.             PSHS D
687E   FC 60 6D         1003.             LDD XVAL
6881   BD 64 C0         1004.             JSR DIV6
6884   FC 60 39         1005.             LDD QUOT
6887   E3 E1            1006.             ADDD ,S++
6889   BD 63 63         1007.             JSR SCREEN
688C   39               1008.             RTS
                        1009.         "
                        1010.         "
                        1011.         "
688D   7F 60 5B         1012.     PPOINT  CLR CLRFLG        CLEAR CLR SCREEN CMD FLAG
6890   FC 60 6F         1013.             LDD YVAL
6893   10 83 01 13      1014.             CMPD #275
6897   10 2D 00 92      1015.             BLT PPNT1
689B   7D 60 56         1016.             TST PTSF
689E   10 26 00 3F      1017.             BNE JPTS
68A2   4F               1018.     PP01    CLRA
68A3   8E 60 76         1019.             LDX #PSA
68A6   BF 60 74         1020.             STX PPTR
68A9   A7 80            1021.     PP02    STA ,X+
68AB   8C 62 06         1022.             CMPX #PEA
68AE   25 F9            1023.             BLO PP02
68B0   7C 60 56         1024.             INC PTSF
68B3   BD 67 93         1025.     PP04    JSR ONESET
68B6   BD 66 EF         1026.             JSR SCALN
68B9   34 06            1027.             PSHS D
68BB   1F 10            1028.             TFR X,D
68BD   BE 60 74         1029.             LDX PPTR
68C0   ED 81            1030.             STD ,X++
68C2   10 AF 81         1031.             STY ,X++
68C5   BF 60 74         1032.             STX PPTR
68C8   8C 62 06         1033.             CMPX #PEA
68CB   35 06            1034.             PULS D
68CD   10 24 00 05      1035.             BHS PP05
68D1   BD 63 63         1036.             JSR SCREEN
68D4   20 DD            1037.             BRA PP04
68D6   BD 67 93         1038.     PP05    JSR ONESET
68D9   BD 66 EF         1039.             JSR SCALN
68DC   BD 63 63         1040.             JSR SCREEN
68DF   20 F5            1041.             BRA PP05
                        1042.         "
                        1043.         "
68E1   7F 60 56         1044.     JPTS    CLR PTSF
68E4   8E 60 76         1045.             LDX #PSA
```

```
68E1   7F 60 56         1044.   JPTS  CLR PTSF
68E4   BE 60 76         1045.         LDX #PSA
```

```
68E7   BF 60 72         1046.         STX JPTR
68EA   BC 60 74         1047.         CMPX PPTR
68ED   10 27 00 39      1048.         BEQ JPT4
68F1   EC 81            1049.         LDD ,X++
68F3   FD 62 28         1050.         STD X0
68F6   EC 81            1051.         LDD ,X++
68F8   FD 62 2A         1052.         STD Y0
68FB   BC 60 74         1053.         CMPX PPTR
68FE   10 27 00 28      1054.         BEQ JPT4
6902   EC 81            1055.   JPT2  LDD ,X++
6904   FD 62 2C         1056.         STD X1
6907   EC 81            1057.         LDD ,X++
6909   FD 62 2E         1058.         STD Y1
690C   BF 60 72         1059.         STX JPTR
690F   BD 67 14         1060.         JSR DLINE
6912   BE 60 72         1061.         LDX JPTR
6915   BC 60 74         1062.         CMPX PPTR
6918   10 24 00 0E      1063.         BHS JPT4
691C   FC 62 2C         1064.         LDD X1
691F   FD 62 28         1065.         STD X0
6922   FC 62 2E         1066.         LDD Y1
6925   FD 62 2A         1067.         STD Y0
6928   20 D8            1068.         BRA JPT2
692A   16 FF 75         1069.   JPT4  BRA PP01
                        1070.    "
                        1071.    "
692D   7F 60 56         1072.   PPNT1 CLR PTSF
6930   10 83 00 FF      1073.         CMPD #255
6934   10 2D 00 05      1074.         BLT PPNT2
6938   86 80            1075.         LDA #$80
693A   16 00 0E         1076.         BRA PPNT5
693D   10 83 00 EB      1077.   PPNT2 CMPD #235
6941   10 2D 00 05      1078.         BLT PPNT3
6945   86 01            1079.         LDA #1
6947   16 00 01         1080.         BRA PPNT5
694A   4F               1081.   PPNT3 CLRA
694B   B7 60 66         1082.   PPNT5 STA SRNF
694E   1C FE            1083.         ANDCC #$FE
6950   39               1084.         RTS
                        1085.    "
                        1086.    "
                        1087.    "
                        1088.    "
                        1089.    "
                        1090.    "     DRAWS A "PIXEL" CIRCLE
6951   7F 60 5B         1091.   PXCIR CLR CLRFLG      CLEAR CLR SCREEN CMD FLAG
6954   7F 60 56         1092.         CLR PTSF
6957   7F 60 5A         1093.         CLR BOXF
695A   7F 60 58         1094.   PXC1  CLR LINEF
695D   FC 60 6F         1095.         LDD YVAL
6960   10 83 00 FF      1096.         CMPD #255
6964   10 2D 00 05      1097.         BLT PXC2
6968   86 01            1098.         LDA #1
696A   B7 60 58         1099.         STA LINEF
696D   BD 67 93         1100.   PXC2  JSR ONESET      GET CENTER
```

```
6970   BF 62 28          1101.           STX XO        SAVE XO
6973   10 BF 62 2A       1102.           STY YO        SAVE YO
6977   BD 66 EF          1103.           JSR SCALN
697A   BD 63 63          1104.           JSR SCREEN    DISPLAY POINT
697D   BD 67 93          1105.   PXC3     JSR ONESET     GET A DIAMETER
6980   1F 10             1106.           TFR X,D
6982   B3 62 28          1107.           SUBD XO
6985   10 2A 00 05       1108.           BPL PXC4
6989   43                1109.           COMA
698A   53                1110.           COMB
698B   C3 00 01          1111.           ADDD #1
698E   34 06             1112.   PXC4     PSHS D
6990   1F 20             1113.           TFR Y,D
6992   B3 62 2A          1114.           SUBD YO
6995   10 2A 00 05       1115.           BPL PXC6
6999   43                1116.           COMA
699A   53                1117.           COMB
699B   C3 00 01          1118.           ADDD #1
699E   10 A3 E4          1119.   PXC6     CMPD ,S
69A1   35 20             1120.           PULS Y
69A3   10 2E 00 02       1121.           BGT PXC8
69A7   1E 02             1122.           EXG D,Y
69A9   FD 62 30          1123.   PXC8     STD RADIUS
69AC   BD 69 CB          1124.   PXC9     JSR XCIR       START PLOTTING
69AF   7D 60 63          1125.           TST TSCF
69B2   26 C9             1126.           BNE PXC3
69B4   7D 60 64          1127.           TST REPTF
69B7   27 B4             1128.           BEQ PXC2
69B9   BD 67 93          1129.           JSR ONESET
69BC   BF 62 28          1130.           STX XO
69BF   10 BF 62 2A       1131.           STY YO
69C3   BD 66 EF          1132.           JSR SCALN
69C6   BD 63 63          1133.           JSR SCREEN
69C9   20 E1             1134.           BRA PXC9
                         1135.   .
                         1136.   .
                         1137.   . FOR TRUE & FALSE VALUES OF XNEG DO YCIR
69CB   7F 62 21          1138.   XCIR     CLR XNEG
69CE   BD 69 D8          1139.           JSR YCIR
69D1   7C 62 21          1140.           INC XNEG
69D4   BD 69 D8          1141.           JSR YCIR
69D7   39                1142.           RTS
                         1143.   .
                         1144.   . FOR TRUE & FALSE VALUES OF YNEG DO XYCIR
69D8   7F 62 22          1145.   YCIR     CLR YNEG
69DB   BD 69 E5          1146.           JSR XYCIR
69DE   7C 62 22          1147.           INC YNEG
69E1   BD 69 E5          1148.           JSR XYCIR
69E4   39                1149.           RTS
                         1150.   .
                         1151.   . FOR TRUE & FALSE VALUES OF XYSWAP DO SECTOR ROUTINE.
69E5   7F 62 23          1152.   XYCIR    CLR XYSWAP
69E8   BD 69 F2          1153.           JSR SCIR
69EB   7C 62 23          1154.           INC XYSWAP
69EE   BD 69 F2          1155.           JSR SCIR
```

```
69E8  BD 69 F2     1153.              JSR SCIR
69EB  7C 62 23     1154.              INC XYSWAP
69EE  BD 69 F2     1155.              JSR SCIR
```

```
69F1  39           1156.              RTS
                   1157.    "
                   1158.    "
                   1159.    "  SECTOR ROUTINE.
69F2  BE 62 30     1160.    SCIR   LDX RADIUS      GET RADIUS(R)
69F5  10 BE 00 00  1161.           LDY #$00        SET Y
69F9  1F 10        1162.           TFR X,D         D=X=R
69FB  43           1163.           COMA
69FC  53           1164.           COMB
69FD  C3 00 01     1165.           ADDD #1         D= -R
6A00  34 10        1166.    SC2    PSHS X
6A02  10 AC E1     1167.           CMPY ,S++       CHECK FOR END PT.
6A05  10 2E 00 3D  1168.           BGT SCX         YES, EXIT.
6A09  BD 68 13     1169.           JSR PPLOT       GO PLOT PTS.
6A0C  34 26        1170.           PSHS D,Y
6A0E  1F 20        1171.           TFR Y,D
6A10  31 AB        1172.           LEAY D,Y        Y=2Y
6A12  1F 20        1173.           TFR Y,D
6A14  E3 E4        1174.           ADDD ,S         D(=Y)=2Y+D
6A16  C3 00 01     1175.           ADDD #1         D(=Y)=2Y+D+1
6A19  35 20        1176.           PULS Y          IGNORE OLD D ON STACK
6A1B  35 20        1177.           PULS Y
6A1D  31 21        1178.           LEAY 1,Y
6A1F  7D 60 5A     1179.           TST BOXF        DRAW DIAMONDS ?
6A22  10 26 00 06  1180.           BNE SC4         YES,,
6A26  10 83 00 00  1181.           CMPD #0         >0 ?
6A2A  2F D4        1182.           BLE SC2         NO,,,
6A2C  34 16        1183.    SC4    PSHS D,X        YES,
6A2E  1F 10        1184.           TFR X,D
6A30  30 8B        1185.           LEAX D,X        X=2X
6A32  1F 10        1186.           TFR X,D
6A34  43           1187.           COMA
6A35  53           1188.           COMB
6A36  C3 00 01     1189.           ADDD #1         2X= -2X
6A39  E3 E4        1190.           ADDD ,S         D=D-2X
6A3B  C3 00 02     1191.           ADDD #2         D=D-2X+2
6A3E  35 10        1192.           PULS X          IGNORE OLD D ON STACK
6A40  35 10        1193.           PULS X
6A42  30 1F        1194.           LEAX -1,X       X=X-1
6A44  20 BA        1195.           BRA SC2         CONTINUE
                   1196.    "
6A46  39           1197.    SCX    RTS
                   1198.    "
                   1199.
                   1200.    "
6A47  7F 60 5B     1201.    DIAMND CLR CLRFLG
6A4A  7F 60 56     1202.           CLR PTSF
6A4D  86 01        1203.           LDA #1
6A4F  B7 60 5A     1204.           STA BOXF
6A52  7E 69 5A     1205.           JMP PXC1
                   1206.    "
                   1207.    "
6A55  7F 60 5B     1208.    TSCP   CLR CLRFLG
6A58  7F 60 56     1209.           CLR PTSF
6A5B  7F 60 64     1210.           CLR REPTF
```

```
6A5E  FC 60 6F        1211.           LDD YVAL
6A61  10 83 00 FF     1212.           CMPD #255
6A65  10 2D 00 06     1213.           BLT TSCP2
6A69  7F 60 63        1214.           CLR TSCF
6A6C  16 00 05        1215.           BRA TSCPX
6A6F  86 01           1216.   TSCP2   LDA #1
6A71  B7 60 63        1217.           STA TSCF
6A74  39              1218.   TSCPX   RTS
                      1219.           "
                      1220.           "
6A75  7F 60 5B        1221.   REPEAT  CLR CLRFLG
6A78  7F 60 56        1222.           CLR PTSF
6A7B  7F 60 63        1223.           CLR TSCF
6A7E  FC 60 6F        1224.           LDD YVAL
6A81  10 83 00 FF     1225.           CMPD #255
6A85  10 2D 00 06     1226.           BLT REPT2
6A89  7F 60 64        1227.           CLR REPTF
6A8C  16 00 05        1228.           BRA REPTX
6A8F  86 01           1229.   REPT2   LDA #1
6A91  B7 60 64        1230.           STA REPTF
6A94  39              1231.   REPTX   RTS
                      1232.           "
                      1233.           "
                      1234.           "
                      1235.           OPT L
6A95  BD 62 82        1236.   GETPTS  JSR INPTR
6A98  BE 60 6D        1237.           LDX XVAL
6A9B  8C 01 40        1238.           CMPX #XMAX
6A9E  2E F5           1239.           BGT GETPTS
6AA0  10 BE 60 6F     1240.           LDY YVAL
6AA4  10 8C 00 CD     1241.           CMPY #YMAX
6AA8  10 2D 00 4C     1242.           BLT GETPTX
6AAC  10 8C 00 D7     1243.           CMPY #CMDS
6AB0  2D E3           1244.           BLT GETPTS
6AB2  7F 60 3F        1245.           CLR SDCMD
6AB5  1F 10           1246.           TFR X,D
6AB7  BD 64 CB        1247.           JSR DIV20
6ABA  FC 60 39        1248.           LDD QUOT
6ABD  86 01           1249.           LDA #1
6ABF  C1 0E           1250.           CMPB #14
6AC1  10 2D 00 30     1251.           BLT GETPT6
6AC5  10 27 00 07     1252.           BEQ GETPT2
6AC9  C1 0F           1253.           CMPB #15
6ACB  10 26 00 26     1254.           BNE GETPT6
6ACF  4C              1255.           INCA
6AD0  10 BE 60 6F     1256.   GETPT2  LDY YVAL
6AD4  10 8C 00 EB     1257.           CMPY #235
6AD8  10 2D 00 16     1258.           BLT GETPT4
6ADC  8B 02           1259.           ADDA #2
6ADE  10 8C 00 FF     1260.           CMPY #255
6AE2  10 2D 00 0C     1261.           BLT GETPT4
6AE6  8B 02           1262.           ADDA #2
6AE8  10 8C 01 13     1263.           CMPY #275
6AEC  10 2D 00 02     1264.           BLT GETPT4
6AF0  8B 02           1265.           ADDA #2
```

```
6AEC   10 2D 00 02      1264.          BLT  GETPT4
6AF0   8B 02            1265.          ADDA *2
```

```
6AF2   B7 60 3F         1266.   GETPT4 STA  SDCMD
6AF5   1A 01            1267.   GETPT6 ORCC *$01
6AF7   39               1268.          RTS

6AF8   BF 60 5E         1270.   GETPTX STX  XVAL1
6AFB   10 BF 60 5C      1271.          STY  YVAL1
6AFF   1C FE            1272.          ANDCC *$FE
6B01   39               1273.          RTS
                        1274.       "
                        1275.       "
                        1276.       "
6B02   10 BE 60 6F      1277.   SDLINE LDY  YVAL
6B06   10 8C 00 EB      1278.          CMPY *235
6B0A   10 2E 00 9D      1279.          BGT  SDL9
                        1280.       "
6B0E   8E 70 00         1281.          LDX  *$SA
6B11   6F 80            1282.          CLR  0,X+
6B13   6F 80            1283.          CLR  0,X+
6B15   BF 60 69         1284.          STX  SPTR
6B18   7F 60 40         1285.          CLR  SDLEN
6B1B   7F 60 41         1286.          CLR  SDLEN+1
6B1E   7F 60 47         1287.          CLR  CLOSEF
6B21   7F 60 4D         1288.          CLR  NEWLF
6B24   7F 60 4C         1289.          CLR  INHBF
6B27   7D 60 49         1290.          TST  ENDF
6B2A   10 27 00 01      1291.          BEQ  SDL2
6B2E   39               1292.          RTS
                        1293.       "
6B2F   BD 6A 95         1294.   SDL2    JSR  GETPTS
6B32   24 FB            1295.          BCC  SDL2
6B34   B6 60 3F         1296.          LDA  SDCMD
6B37   27 F6            1297.          BEQ  SDL2
6B39   81 04            1298.          CMPA *4
6B3B   10 26 00 0A      1299.          BNE  SDL4
6B3F   39               1300.          RTS
                        1301.       "
6B40   BE 60 51         1302.   SDL2X   LDX  PREVAD
6B43   B6 60 50         1303.          LDA  PREVBY
6B46   A7 84            1304.          STA  0,X
6B48   39               1305.          RTS
                        1306.       "
                        1307.       "
6B49   81 01            1308.   SDL4    CMPA *1
6B4B   26 E2            1309.          BNE  SDL2
6B4D   BD 6C B9         1310.          JSR  STARTX
6B50   BD 6A 95         1311.   SDL6    JSR  GETPTS
6B53   10 24 00 10      1312.          BCC  SDL8
6B57   B6 60 3F         1313.          LDA  SDCMD
6B5A   81 04            1314.          CMPA *4
6B5C   27 E2            1315.          BEQ  SDL2X
6B5E   81 05            1316.          CMPA *5
6B60   26 EE            1317.          BNE  SDL6
6B62   BD 6C CF         1318.          JSR  INHIBIT
6B65   20 E9            1319.          BRA  SDL6
                        1320.
```

```
6B67   7F 60 4A           1321.   SDL8    CLR GOTPT
6B6A   BD 6C C9           1322.           JSR NEWLINE
6B6D   BD 6C FE           1323.   SDL82   JSR SDWRT
6B70   BD 6A 95           1324.   SDL83   JSR GETPTS
6B73   10 25 00 0A        1325.           BCS SDL85
6B77   BE 60 51           1326.           LDX PREVAD
6B7A   B6 60 50           1327.           LDA PREVBY
6B7D   A7 84              1328.           STA 0,X
6B7F   20 EC              1329.           BRA SDL82
                          1330.           "
6B81   B6 60 3F           1331.   SDL85   LDA SDCMD
6B84   81 02              1332.           CMPA #2
6B86   10 27 00 0D        1333.           BEQ SDL87
6B8A   81 04              1334.           CMPA #4
6B8C   27 B2              1335.           BEQ SDL2X
6B8E   81 05              1336.           CMPA #5
6B90   26 DE              1337.           BNE SDL83
6B92   BD 6C CF           1338.           JSR INHIBIT
6B95   20 D9              1339.           BRA SDL83
                          1340.           "
6B97   BE 60 69           1341.   SDL87   LDX SPTR
6B9A   BF 60 42           1342.           STX TOPX
6B9D   BD 6C 68           1343.           JSR CONFIRM
6BA0   BF 60 44           1344.           STX FSTAD
6BA3   B7 60 46           1345.           STA FSTBY
                          1346.           "    CLR CLOSEF
                          1347.           "    CLR NEWLF
                          1348.           "    CLR INHBF
                          1349.           "    CLR CONFM
6BA6   C6 01              1350.           LDB #1
6BA8   F7 60 4A           1351.           STB GOTPT
6BAB   BD 6A 95           1352.   SDL9    JSR GETPTS
6BAE   10 24 00 24        1353.           BCC SDL98
6BB2   B6 60 3F           1354.           LDA SDCMD
6BB5   81 07              1355.           CMPA #7
6BB7   10 27 00 09        1356.           BEQ SDL92
6BBB   10 2E 00 12        1357.           BGT SDL94
6BBF   BD 6C 1C           1358.           JSR SDL9X0
6BC2   20 E7              1359.           BRA SDL9
                          1360.           "
6BC4   7D 60 47           1361.   SDL92   TST CLOSEF
6BC7   26 E2              1362.           BNE SDL9
6BC9   BD 6C DD           1363.           JSR CLOSEB
6BCC   BD 6C C9           1364.           JSR NEWLINE
6BCF   20 C6              1365.           BRA SDL87
                          1366.           "
6BD1   BD 6C 4A           1367.   SDL94   JSR ENDX
6BD4   20 D5              1368.           BRA SDL9
                          1369.           "
                          1370.           "
6BD6                      1371.   SDL98   EQU *
6BD6   BD 6C FE           1372.           JSR SDWRT
6BD9   BD 6A 95           1373.   SDL99   JSR GETPTS
6BDC   10 24 00 32        1374.           BCC SDL9B2
6BE0   B6 60 3F           1375.           LDA SDCMD
```

```
6BDC   10 24 00 32      1374.           BCC SDL9B2
6BE0   B6 60 3F          1375.          LDA SDCMD
```

```
6BE3   81 02            1376.           CMPA #2
6BE5   10 26 00 08      1377.           BNE SDL9A4
6BE9   BD 6C 68         1378.           JSR CONFIRM
6BEC   7F 60 47         1379.           CLR CLOSEF
6BEF   20 BA            1380.           BRA SDL9
                        1381.     "
6BF1   81 07            1382.  SDL9A4   CMPA #7
6BF3   10 27 00 0E      1383.           BEQ SDL9A6
6BF7   10 2E 00 05      1384.           BGT SDL9A5
6BFB   BD 6C 1C         1385.           JSR SDL9X0
6BFE   20 D9            1386.           BRA SDL99
                        1387.     "
6C00   BD 6C 4A         1388.  SDL9A5   JSR ENDX
6C03   20 D4            1389.           BRA SDL99
                        1390.     "
                        1391.
6C05   7D 60 47         1392.  SDL9A6   TST CLOSEF
6C08   26 CF            1393.           BNE SDL99
6C0A   BD 6C DD         1394.           JSR CLOSEB
6C0D   BD 6C C9         1395.           JSR NEWLINE
6C10   20 85            1396.           BRA SDL87
                        1397.     "
6C12   BE 60 51         1398.  SDL9B2   LDX PREVAD
6C15   B6 60 50         1399.           LDA PREVBY
6C18   A7 84            1400.           STA 0,X
6C1A   20 BA            1401.           BRA SDL98
                        1402.     "
                        1403.     "
6C1C   B6 60 3F         1404.  SDL9X0   LDA SDCMD
6C1F   81 04            1405.           CMPA #4
6C21   10 2D 00 19      1406.           BLT SDL9XX
6C25   10 27 00 16      1407.           BEQ SDL9XZ
6C29   81 05            1408.           CMPA #5
6C2B   10 26 00 06      1409.           BNE SDL9X2
6C2F   BD 6C CF         1410.           JSR INHIBIT
6C32   16 00 09         1411.           BRA SDL9XX
                        1412.     "
6C35   81 06            1413.  SDL9X2   CMPA #6
6C37   10 26 00 03      1414.           BNE SDL9XX
6C3B   BD 6C C9         1415.           JSR NEWLINE
6C3E   39               1416.  SDL9XX   RTS
                        1417.     "
6C3F   BE 60 51         1418.  SDL9XZ   LDX PREVAD
6C42   B6 60 50         1419.           LDA PREVBY
6C45   A7 84            1420.           STA 0,X
6C47   32 62            1421.           LEAS 2,S
6C49   39               1422.           RTS
                        1423.     "
                        1424.     "
                        1425.     "
6C4A   7D 60 48         1426.  ENDX     TST STARTF
6C4D   10 27 00 16      1427.           BEQ ENDXX
6C51   7D 60 4A         1428.           TST GOTPT
6C54   10 27 00 0F      1429.           BEQ ENDXX
6C58   FC 60 40         1430.           LDD SDLEN
```

```
6C5B  34 04           1431.            PSHS B
6C5D  59              1432.            ROLB
6C5E  EB E0           1433.            ADDB ,S+
6C60  8E 70 00        1434.            LDX #SSA
6C63  ED 84           1435.            STD 0,X
6C65  32 62           1436.            LEAS 2,S
6C67  39              1437.   ENDXX    RTS
                      1438.            "
                      1439.            "
6C68                  1440.   CONFIRM EQU *
6C68  7D 60 47        1441.            TST CLOSEF
6C6B  10 26 00 0C     1442.            BNE CONFX
6C6F  BD 6C 7C        1443.            JSR SAVPTS
6C72  7F 60 4D        1444.   CONF2    CLR NEWLF
6C75  7F 60 4C        1445.            CLR INHBF
6C78  7F 60 47        1446.            CLR CLOSEF
6C7B  39              1447.   CONFX    RTS
                      1448.            "
                      1449.            "
6C7C  BE 60 69        1450.   SAVPTS LDX SPTR
6C7F  8C 70 F2        1451.            CMPX #SEA-3
6C82  10 24 00 32     1452.            BHS SAVPTX
6C86  7D 60 4A        1453.            TST GOTPT
6C89  10 27 00 0E     1454.            BEQ SAVPT2
6C8D  B6 60 5D        1455.            LDA YVAL1+1
6C90  B1 60 53        1456.            CMPA PREVY
6C93  10 25 00 42     1457.            BLO RIGHTB
6C97  10 22 00 3A     1458.            BHI LEFTB
6C9B  5F              1459.   SAVPT2 CLRB
6C9C  B6 60 5D        1460.   SAVPT3 LDA YVAL1+1
6C9F  B7 60 53        1461.            STA PREVY
6CA2  FA 60 4D        1462.            ORB NEWLF
6CA5  FA 60 4C        1463.            ORB INHBF
6CA8  BE 60 69        1464.            LDX SPTR
6CAB  ED 81           1465.            STD ,X++
6CAD  B6 60 5F        1466.            LDA XVAL1+1
6CB0  A7 80           1467.            STA ,X+
6CB2  BF 60 69        1468.            STX SPTR
6CB5  7C 60 41        1469.            INC SDLEN+1
6CB8  39              1470.   SAVPTX RTS
                      1471.            "
                      1472.            "
6CB9  7D 60 48        1473.   STARTX TST STARTF
6CBC  10 26 00 05     1474.            BNE STARTZ
6CC0  C6 01           1475.            LDB #1
6CC2  F7 60 48        1476.            STB STARTF
6CC5  7F 60 49        1477.   STARTZ CLR ENDF
6CC8  39              1478.            RTS
                      1479.            "
                      1480.            "
6CC9  C6 04           1481.   NEWLINE LDB #$04
6CCB  F7 60 4D        1482.            STB NEWLF
6CCE  39              1483.            RTS
                      1484.            "
6CCF  C6 02           1485.   INHIBIT LDB #$02
```

```
6CD1    F7 60 4C        1486.           STB  INHBF
6CD4    39              1487.           RTS
                        1488.       "
                        1489.       "
6CD5    C6 40           1490.  LEFTB    LDB  #$40
6CD7    20 C3           1491.           BRA  SAVPT3
                        1492.       "
6CD9    C6 20           1493.  RIGHTB LDB  #$20
6CDB    20 BF           1494.           BRA  SAVPT3
                        1495.       "
                        1496.       "
6CDD    7D 60 4A        1497.  CLOSEB TST  GOTPT
6CE0    10 27 00 19     1498.           BEQ  CLOSEX
6CE4    86 01           1499.           LDA  #1
6CE6    B7 60 47        1500.           STA  CLOSEF
6CE9    BE 60 42        1501.           LDX  TOPX
6CEC    4F              1502.           CLRA
6CED    E6 84           1503.           LDB  0,X
6CEF    FD 60 5C        1504.           STD  YVAL1
6CF2    E6 02           1505.           LDB  2,X
6CF4    FD 60 5E        1506.           STD  XVAL1
6CF7    7F 60 4D        1507.           CLR  NEWLF
6CFA    BD 6C 7C        1508.           JSR  SAVPTS
6CFD    39              1509.  CLOSEX RTS
                        1510.       "
                        1511.       "
                        1512.       "
6CFE    BD 63 43        1513.  SDWRT   JSR  SCALC
6D01    34 06           1514.           PSHS D
6D03    7D 60 66        1515.           TST  SRNF
6D06    10 26 00 0D     1516.           BNE  SDWR2
6D0A    F6 60 67        1517.           LDB  COLOR1
6D0D    BE E0 00        1518.           LDX  #$E000
6D10    10 8E FF FF     1519.           LDY  #$01EA
6D14    16 00 0A        1520.           BRA  SDWR4
                        1521.       "
6D17    F6 60 68        1522.  SDWR2   LDB  COLOR2
6D1A    8E 80 00        1523.           LDX  #$02SA
6D1D    10 8E 9F FF     1524.           LDY  #$02EA
                        1525.       "
6D21    F7 60 4E        1526.  SDWR4   STB  SDCOLR
6D24    35 06           1527.           PULS D
6D26    BD 6D 2A        1528.           JSR  SDSRN
6D29    39              1529.           RTS
                        1530.       "
                        1531.       "
6D2A    34 06           1532.  SDSRN   PSHS D
6D2C    86 20           1533.           LDA  #$20
6D2E    F6 60 3C        1534.           LDB  REMD
6D31    10 27 00 04     1535.           BEQ  SDS2
6D35    44              1536.  SDS1    LSRA
6D36    5A              1537.           DECB
6D37    26 FC           1538.           BNE  SDS1
6D39    BB 60 4E        1539.  SDS2    ADDA SDCOLR
6D3C    B7 60 4F        1540.           STA  SDBYTE
```

```
6D3F   35 06           1541.              PULS D
6D41   34 10           1542.              PSHS X
6D43   30 8B           1543.              LEAX D,X
6D45   AC E1           1544.              CMPX ,S++
6D47   10 25 00 29     1545.              BLO SDSX
6D4B   34 20           1546.              PSHS Y
6D4D   AC E1           1547.              CMPX ,S++
6D4F   10 22 00 21     1548.              BHI SDSX
6D53   B6 60 4F        1549.              LDA SDBYTE
6D56   E6 84           1550.              LDB 0,X
6D58   F7 60 50        1551.              STB PREVBY
6D5B   BF 60 51        1552.              STX PREVAD
6D5E   34 04           1553.              PSHS B
6D60   C4 C0           1554.              ANDB #$C0
6D62   F1 60 4E        1555.              CMPB SDCOLR
6D65   35 04           1556.              PULS B
6D67   10 26 00 04     1557.              BNE SDS4
6D6B   34 04           1558.              PSHS B
6D6D   AA E0           1559.              ORA ,S+
6D6F   A7 84           1560.      SDS4    STA 0,X
6D71   1C FE           1561.              ANDCC #$FE
6D73   39              1562.              RTS
                       1563.          "
6D74   1A 01           1564.      SDSX    ORCC #$01
6D76   39              1565.              RTS
                       1566.          "
                       1567.          "
                       1568.          "
                       1569.          "
6000                   1570.              END ENTRY
```

--- NO ERRORS THIS ASSEMBLY.

Formatted Assembler Dictionary

--- Procedure: MAIN

6876 ABSCRN	6000 ABSOLUTE - PC	E004 ACIAC	E005 ACIAD - U	6055 ALTF	65AF BASIC
65E2 BLACK	65ED BLK0 - U	65F9 BLK1	65FB BLK2	6607 BLK3	6614 BLK4
65FE BLKX	661B BLUE	605A BOXF	6206 BPTR	6208 BST	657F C0
6589 C5	6CDD CLOSEB	6047 CLOSEF	6CFD CLOSEX	665B CLR20	6664 CLR22
6650 CLR240	605B CLRFLG	6665 CLRG1	6669 CLRG1X	6673 CLRG2	6677 CLRG2X
653A CM1	6552 CM2	6558 CM4	656C CM5	6572 CM6	000C CMAX
651F CMD0	658A CMD1	00D7 CMDS	6597 CMDTBL	6067 COLOR1	6068 COLOR2
6065 COLOUR	651F COMMAND	6C72 CONF2 - U	6C68 CONFIRM	604B CONFM - U	6C7B CONFX
000D CR	3136 DAY - S,P,U	6501 DG1	6513 DG1G2M	650D DG1G2P	6507 DG2
6516 DGXX	6302 DGZT0	633C DGZT1	62E0 DGZTST	6A47 DIAMND	648B DIV1
64CB DIV20	64D5 DIV20X - U	64C0 DIV6	64CA DIV6X - U	64AD DIVCHK	6471 DIV1DE
64B9 DIVZ	672F DL2	6744 DL4	675B DL6	6714 DLINE	00A5 DPHYSC - U
0053 DPHYSH - U	0004 DSCALE - U	0002 DSCALH - U	6035 DVCNT	6036 DVEND	64D6 DVPXL - U
64F0 DVPXLX	6038 DVSOR	6322 DZ2	6049 ENDF	6C4A ENDX	6C67 ENDXX
6000 ENTRY	003D EQSIGN	001B ESC	0000 FALSE - P,U	6044 FSTAD	6046 FSTBY
FFFF G1EA	E000 G1SA	9FFF G2EA	8000 G2SA	9FFF GEA - U	6241 GETCH
6247 GETCH0	6254 GETCH3 - U	625E GETCH5	6268 GETCH6	CD15 GETCHR - U	6AD0 GETPT2
6AF2 GETPT4	6AF5 GETPT6	6A95 GETPTS	6AF8 GETPTX	604A GOTPT	6620 GREEN
8000 GSA - U	6269 INCH	604C INHBF	6CCF INHIBIT	6235 INITR - U	6282 INPTR
6902 JPT2	692A JPT4	6072 JPTR	68E1 JPTS	6CD5 LEFTB	000A LF - U
6058 LINEF	645B M40	6450 M5 - U	646C M80	002D MINUS	3036 MONTH - S,P,U
62B0 MULX	62BA MULX0	620C MULX1	64F1 MXPXL - U	603D MXTEM - U	604D NEWLF
6CC9 NEWLINE	6057 NLINE	67D2 ONE2	67D7 ONE4	67DC ONE5	67E7 ONE6
67FD ONE7	680E ONE8	6793 ONESET	6812 ONEX	CD0F OUTCH - U	6206 PEA
002B PLUS	6061 POFF	681E PPL2	682C PPL4	683F PPL6	6813 PPLOT
692D PPNT1	693D PPNT2	694A PPNT3	694B PPNT5	68A2 PPO1	68A9 PPO2
68B3 PPO4	68D6 PPO5	688D PPOINT	6074 PPTR	6051 PREVAD	6050 PREVBY
6053 PREVY	6076 PSA	6056 PTSF	6062 PXBYTE	695A PXC1	696D PXC2
697D PXC3	698E PXC4	699E PXC6	69A9 PXC8	69AC PXC9	6951 PXC1R
6698 PXL2	66A8 PXL3	66C5 PXL4	66E1 PXL5	667F PXLINE	684A PXPLOT
6875 PXPX	6060 PXRSET	6039 QUOT	6230 RADIUS	6217 READY - U	621C READYE - U
6625 RED	603B REMC	603C REMD	6A75 REPEAT	6A8F REPT2	6064 REPTF
6A94 REPTX	6CD9 RIGHTB	0007 RNOFF	6C9B SAVPT2	6C9C SAVPT3	6C7C SAVPTS
6CB8 SAVPTX	6A00 SC2	6A2C SC4	6343 SCALC	66EF SCALN	6338 SCALX4
6327 SCALXY	69F2 SCIR	663B SCOL1 - U	6641 SCOL2	6644 SCOL3	662C SCOLOR
6363 SCREEN	636A SCREN0	63A8 SCREN1	63A9 SCREN2	63AD SCREN3	63E6 SCREN4
6A46 SCX	604F SDBYTE	603F SDCMD	604E SDCOLR	6B2F SDL2	6B40 SDL2X
6B49 SDL4	6B50 SDL6	6B67 SDL8	6B6D SDL82	6B70 SDL83	6B81 SDL85
6B97 SDL87	6BAB SDL9	6BC4 SDL92	6BD1 SDL94	6BD6 SDL98	6BD9 SDL99
6BF1 SDL9A4	6C00 SDL9A5	6C05 SDL9A6	6C12 SDL9B2	6C1C SDL9X0	6C35 SDL9X2
6C3E SDL9XX	6C3F SDL9XZ	6040 SDLEN	6B02 SDLINE	6D35 SDS1	6D39 SDS2
6D6F SDS4	6D2A SDSRN	6D74 SDSX	6D17 SDWR2	6D21 SDWR4	6CFE SDWRT
70F5 SEA	6271 SIGN	6280 SIGN1	6069 SPTR	6066 SRNF	7000 SSA
6232 START	6048 STARTF	6CB9 STARTX	6CC5 STARTZ	CD4E STAT - U	6002 SW118B
0012 SW118N	6071 SYMB - U	6042 TOPX	0001 TRUE - P,U	6063 TSCF	6A55 TSCP
6A6F TSCP2	6A74 TSCPX	65B4 TTX80 - U	65C5 TTX80W	65D7 TTX80X	6059 TTXF
6770 VL0	675F VLINE	6792 VLX	CD03 WARMS - U	662A WHITE	63EF WSCREN
6228 X0	622C X1	69CB XCIR	00A0 XHALF - U	0140 XMAX	606B XMIT - U
6072 XMITE - U	6221 XNEG	00F0 XPHYSC - U	00F0 XPXNO - U	0003 XSCALE - U	6224 XSUB
621C XTEM	621E XTENS	6221 XTENSE	606D XVAL	605E XVAL1	69E5 XYCIR
6223 XYSWAP	622A Y0	622E Y1	69D8 YCIR	3831 YEAR - S,P,U	0067 YHALF - U

```
00C0 YMAX        6222 YNEG        00CC YPXN0 - U    6226 YSUB        606F YVAL        605C YVAL1

63FA Z1          63FE Z2          641B Z21 - U       642C Z3          643F Z4          6445 Z5
```