

LOC OBJECT M STAT E LINE SOURCE LINE

```

1 *****
2 *
3 * GRAPHIC - SUPPORT ROUTINES *
4 * ***** *
5 *
6 *****
7 *
8 *
9 GRHSPT REECT RAM *
10 EXTRN SCRCNT,ORGY,OREX,DOTON,DOTCNT,CX,CY,RADIX,RAOY,X1,Y1,X2 *
11 EXTRN CINC,IMULT,FSTACK,STP,FILSP,GCOLR,FILMOD,MSTACK,HSTBUF *
12 EXTRN FLUSH *
13 *
14 ENTRY PLOT,PLTX,POINT,PNTXY,DRAWTO,POLYG,ORGO,CALADR,SETCLR *
15 ENTRY FILL *
16 *
17 *
18 VRIN MACRO *
19 RST H'28 VIDEO RAM READ *
20 ENDM *
21 *
22 *
23 VROUT MACRO *
24 RST H'30 VIDEO RAM WRITE *
25 ENDM *
26 *
27 *
28 *****
29 *
30 *
31 * PLOT - ROUTINE TO PLOT (OR UNPLOT) A POINT *
32 *
33 *
34 *
35 *
36 * PLTX - PLOT POINT AT IX,IY *
37 *
38 *
39 PLTX PUSH HL APPLY DOT MODE, FOR DRAW, ETC.
40 PXYO LD HL, DOTON
41 LD A, (DOTCNT)
42 INC A
43 LD (DOTCNT), A
44 CP (HL)
45 JR C, PXY1
46 INC HL
47 CP (HL)
48 JR C, PXY2
49 INC HL
50 CP (HL)
51 JR C, PXY1
52 INC HL
53 CP (HL)
54 JR C, PXY2
55 XOR A
56 LD (DOTCNT), A

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000000 ES 1 39 PLTX PUSH HL APPLY DOT MODE, FOR DRAW, ETC.
000001 210000 E 2 40 PXYO LD HL, DOTON
000004 3A0000 E 3 41 LD A, (DOTCNT)
000007 3C 4 42 INC A
000008 320000 E 5 43 LD (DOTCNT), A
000008 BE 6 44 CP (HL)
00000C 3812 7 45 JR C, PXY1
00000E 23 8 46 INC HL
00000F BE 9 47 CP (HL)
000010 3812 10 48 JR C, PXY2
000012 23 11 49 INC HL
000013 BE 12 50 CP (HL)
000014 380A 13 51 JR C, PXY1
000016 23 14 52 INC HL
000017 BE 15 53 CP (HL)
000018 380A 16 54 JR C, PXY2
00001A AF 17 55 XOR A
00001B 320000 E 18 56 LD (DOTCNT), A

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00001E 18E1 19 57 JR PXY0
 000020 3E01 20 58 PXY1 LD A,1
 000022 1803 21 59 JR PLT1
 000024 AF 22 60 PXY2 XOR A
 000025 20 61 DATA H'20'

TRICK TO SKIP (JR NZ,)

000026 ES 23 64 PLOT PUSH HL
 000027 05 24 65 PLT1 PUSH DE
 000028 05 25 66 PUSH BC
 000029 F5 26 67 PUSH AF

ROUTINES TO PLOT (OR UNPLOT) A POINT

00002A CD4000 R 27 68 CALL CALADR
 00002D 3817 28 69 JR C,PLT4

CALCULATE PLOTTING ADDRESS

00002F E1 29 70 POP HL
 000030 CB8F 30 71 RES 7,A

RESET BIT ?

000032 1C 31 72 INC E
 000033 25 32 73 DEC H
 000034 2002 33 74 JR NZ,PLT2

NO, SET BIT !

000036 CBFF 34 75 SET 7,A
 000038 1D 35 76 PLT2 DEC E

ROTATE BACK TO CORRECT SPOT

000039 2803 36 77 JR Z,PLT3
 00003B 0F 37 78 RRCA

00003C 18FA 38 79 JR PLT2
 00003E CD801 R 39 80 PLT3 CALL SETCLR

SET VOP LOCATION

000041 C1 40 81 POP BC
 000042 D1 41 82 POP DE

000043 E1 42 83 POP HL
 000044 AF 43 84 XOR A

000045 C9 44 85 RET
 000046 F1 45 86 PLT4 POP AF

000047 C1 46 87 POP BC
 000048 D1 47 88 POP DE

000049 E1 48 89 POP HL
 00004A AF 49 90 XOR A

CO-ORDINATES OFF SCREEN, RETURN NZ

00004B 3D 50 91 DEC A
 00004C C9 51 92 RET

93 *

94 *

95 *

96 *

97 *

98 *

99 *

CALADR - CALCULATE GRAPHICS ADDRESS, GIVEN BY X,Y IN IX, IY
 (BC, DE FOR CALAD1). RETURN BC AT VRAM ADDRESS,
 A WITH DOT MASK TO APPLY LATER.

00004D 00E5 52 100 CALADR PUSH IX
 00004F C1 53 101 POP BC

000050 FDE5 54 102 PUSH IY
 000052 D1 55 103 POP DE

000053 CD8900 R 56 104 CALAD1 CALL OREGO
 000056 D8 57 105 RET C

GET ONTO SCREEN

000057 218F00 58 106 LD HL,H'BF'
 00005A ED52 59 107 SBC HL,DE

EXIT IF YXH'CO' (192)

00005C D8 60 108 RET C
 00005D 3E07 61 109 LD A,7

00005F 91 62 110 SUB C
 000060 E607 63 111 AND 7

HAVE DOT 1-8

000062 3C 64 112 INC A

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000063 57      65    113    LD      D,A          SAVE DOT COUNT IN D
000064 79      66    114    LD      A,C
000065 E6F8    67    115    AND     H'F8'
000067 4E      68    116    LD      C,A
000068 7D      69    117    LD      A,L
000069 E607    70    118    AND     7
00006B 81      71    119    OR      C
00006C 4F      72    120    LD      C,A          LOW BYTE OF ADDRESS IN C
00006D 7D      73    121    LD      A,L
00006E 0F      74    122    RRCA
00006F 0F      75    123    RRCA
000070 0F      76    124    RRCA
000071 E61F    77    125    AND     H'1F'          SET UP HIGH BYTE OF ADDRESS
000073 47      78    126    LD      B,A          IN B
000074 E6F8    79    127    AND     H'F8'
000076 5F      80    128    LD      E,A
000077 3A0000  E    81    129    LD      A,(SCRCNT)      CALCULATE SCROLL OFFSET
00007A 80      82    130    ADD     A,B
00007B E607    83    131    AND     7
00007D 83      84    132    OR      E
00007E 47      85    133    LD      B,A
00007F EF      86    134    VRIN
00007F EF      86    +    RST     H'2B'          VIDEO RAM READ
00007F EF      86    +    ENOM
000080 1E08    87    135    LD      E,B          HAVE DOT COUNT IN D
000082 0F      88    136    CALAD2 RRCA
000083 1D      89    137    DEC     E
000084 15      90    138    DEC     D
000085 20F8    91    139    JR      NZ,CALAD2
000087 B7      92    140    OR      A
000088 C9      93    141    RET
000089 2A0000  E    94    142 *
000089 2A0000  E    94    143 *
000089 2A0000  E    94    144 ORGCO LD      HL,(ORGY)      ADD ORIGIN VALUE FOR CORRECT SCREEN POSITION
00008C 19      95    145    ADD     HL,DE
00008D EB      96    146    EX      DE,HL
00008E 2A0000  E    97    147    LD      HL,(ORGI)
000091 09      98    148    ADD     HL,BC
000092 44      99    149    LD      B,H
000093 4D      100   150    LD      C,L
000094 AF      101   151    XOR     A
000095 88      102   152    CP      B          EXIT IF X>H'100' (256)
000096 C9      103   153    RET
000097 00E5    104   154 *
000097 00E5    104   155 *
000097 00E5    104   156 *          PNTXY - RETURN POINT AT IX, IY (BC, DE FOR POINT)
000097 00E5    104   157 *
000097 00E5    104   158 *
000097 00E5    104   159 PNTXY PUSH    IX
000099 C1      105   160    POP     BC
00009A F0E5    106   161    PUSH    IY
00009C 01      107   162    POP     DE
00009D C05300  R    108   163 POINT CALL    CALAD1          FIND BYTE IN VRAM HOLDING POINT
0000A0 3807    109   164    JR      C,PTOFF      JUMP IF OFF SCREEN
0000A2 C87F    110   165    BIT     7,A
0000A4 3ED0    111   166    LD      A,Q          RETURN 0 IF BACKGROUND

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0000A2 C37F 110 165 BIT 7,A
 0000A4 3ED0 111 166 LD A,0 RETURN 0 IF BACKGROUND

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0000A6 C8	112	167	RET	Z	
0000A7 3C	113	168	INC	A	RETURN 1 IF FOREGROUND
0000A8 C9	114	169	RET		
0000A9 AF	115	170	PTOFF	XOR	A
0000AA 3D	116	171	DEC	A	RETURN 255 IF OFF SCREEN
0000AB C9	117	172	RET		
		173 *			
		174 *			
		175 *			
		176 *			
		177 *			
0000AC C00000	R 118	178	DRAWTO	CALL	PLTX
0000AF E5	119	179	PUSH	HL	
0000B0 C5	120	180	PUSH	BC	
0000B1 ED480000	E 121	181	LD	BC, (X1)	HAVE END POINT
0000B5 ED580000	E 122	182	LD	DE, (Y1)	IN BC, DE
0000B9 FDE5	123	183	PUSH	IX	
0000BB E1	124	184	POP	HL	
0000BC C03701	R 125	185	CALL	CHKEND	
0000BF D9	126	186	EXX		
0000C0 5F	127	187	LD	E, A	
0000C1 C601	128	188	ADD	A, 1	
0000C3 9F	129	189	SBC	A, A	
0000C4 57	130	190	LD	D, A	YS IN DE'
0000C5 09	131	191	EXX		
0000C6 0DE5	132	192	PUSH	IX	
0000C8 E3	133	193	EX	(SP), HL	SAVE DY
0000C9 50	134	194	LD	D, B	
0000CA 59	135	195	LD	E, C	
0000CB C03701	R 136	196	CALL	CHKEND	
0000CE 09	137	197	EXX		
0000CF 4F	138	198	LD	C, A	
0000D0 C601	139	199	ADD	A, 1	
0000D2 9F	140	200	SBC	A, A	
0000D3 47	141	201	LD	B, A	XS IN BC'
0000D4 09	142	202	EXX		
0000D5 01	143	203	POP	DE	RETRIEVE DY IN DE
0000D6 87	144	204	OR	A	
0000D7 ED52	145	205	SBC	HL, DE	
0000D9 19	146	206	ADD	HL, DE	
0000DA 44	147	207	LD	B, H	
0000DB 4D	148	208	LD	C, L	DX IN BC, DY IN DE
0000DC 210000	149	209	LD	HL, D	R IN HL
0000DF FA0801	R 150	210	JP	M, DRAMS	
		211 *			
		212 *			
0000E2 05	151	213	DRAW2	PUSH	DE
0000E3 0DE5	152	214	PUSH	IX	
0000E5 E3	153	215	EX	(SP), HL	
0000E6 ED580000	E 154	216	LD	DE, (X1)	SEE IF X=X1
0000EA 87	155	217	OR	A	
0000EB ED52	156	218	SBC	HL, DE	
0000ED E1	157	219	POP	HL	
0000EE 01	158	220	POP	DE	
0000EF 2843	159	221	JR	Z, DRAW8	
0000F1 09	160	222	EXX		

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0000F2 0009      161  223      ADD    IX,BC      ADD XS TO X
0000F4 09        162  224      EXX
0000F5 19        163  225      ADD    HL,DE      ADD DY TO R
0000F6 E5        164  226      PUSH   HL
0000F7 29        165  227      ADD    HL,HL
0000F8 3802      166  228      JR     C,DRAW3
0000FA ED42      167  229      SBC    HL,BC      SEE IF R+R>=0X
0000FC E1        168  230 DRAW3 POP     HL
0000FD 3807      169  231      JR     C,DRAW4
0000FF 09        170  232      EXX
000100 FD19      171  233      ADD    IX,DE      ADD YS TO Y
000102 09        172  234      EXX
000103 87        173  235      OR     A
000104 ED42      174  236      SBC    HL,BC      SUBTRACT DX FROM R
000106 C00000    R 175  237 DRAW4 CALL   PLTXY
000109 1807      176  238      JR     DRAW2

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      239 *
      240 *
000108 05        177  241 DRAW5 PUSH   DE
00010C F0E5      178  242      PUSH   IX
00010E E3        179  243      EX      (SP),HL
00010F EDS80000 E 180  244      LD     DE,(Y1)  SEE IF Y=Y1
000113 87        181  245      OR     A
000114 ED52      182  246      SBC    HL,DE
000116 E1        183  247      POP     HL
000117 01        184  248      POP     DE
000118 281A      185  249      JR     Z,DRAW8
00011A 09        186  250      EXX
00011B FD19      187  251      ADD    IX,DE      ADD YS TO Y
00011D 09        188  252      EXX
00011E 09        189  253      ADD    HL,BC      ADD DX TO R
00011F E5        190  254      PUSH   HL
000120 29        191  255      ADD    HL,HL
000121 3802      192  256      JR     C,DRAW6
000123 ED52      193  257      SBC    HL,DE      SEE IF R+R>=0Y
000125 E1        194  258 DRAW6 POP     HL
000126 3807      195  259      JR     C,DRAW7
000128 09        196  260      EXX
000129 0009      197  261      ADD    IX,BC
00012B 09        198  262      EXX
00012C 87        199  263      OR     A
00012D ED52      200  264      SBC    HL,DE      SUBTRACT DY FROM R
00012F C00000    R 201  265 DRAW7 CALL   PLTXY
000132 1807      202  266      JR     DRAW5
000134 C1        203  267 DRAW8 POP     BC      RESTORE BC,HL
000135 E1        204  268      POP     HL
000136 C9        205  269      RET

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270 *

271 *

272 *

273 *

274 *

CHKEND - RETURN SIGN (DE-HL) IN A, MAGNITUDE (DE+HL) IN HL

```

000137 EB        206  275- CHKEND EX    DE,HL
000138 AF        207  276      XOR     A
000139 ED52      208  277      SBC    HL,DE
00013B C8        209  278      RET     Z

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CALCULATE DIFFERENCES & SIGNS FOR
X- AND Y- MOVES

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00013C 19 210 279 ADD HL,DE
00013D F24401 R 211 280 JP P,CK1
000140 EB 212 281 EX OE,HL
000141 3D 213 282 DEC A -VE
000142 1801 214 283 JR CK2
000144 3C 215 284 CK1 INC A +VE
000145 87 216 285 CK2 OR A
000146 ED52 217 286 SBC HL,DE
000148 C9 218 287 RET

288 *

289 *

290 *

291 *

292 *

293 *

294 *

FILL - FILL ENCLOSED SHAPE, GIVEN START POINT IN IX, IY,
MODE IN "FILMOD". N.B. THIS ROUTINE DOES NOT WORK
IF CALLED FROM MONITOR

000149 210000 E 219 295 FILL LD HL,FSTACK INITIALISE FILL STACK
00014C 220000 E 220 296 LD (STP),HL
00014F C00000 E 221 297 CALL FLUSH ENSURE DISC BUFFER EMPTY
000152 C08202 R 222 298 FIL1 CALL FREN0 MAIN PART OF FILL
000155 00220000 E 223 299 LD (X2),IX SAVE RIGHT END
000159 C08801 R 224 300 CALL HDRAW FIND LEFT END X1 & DRAW X1,Y TO X2,Y
00015C F023 225 301 INC IY
00015E 00E5 226 302 PUSH IX
000160 C0E001 R 227 303 CALL FSERCH FIND LINE ABOVE
000163 00E1 228 304 POP IX
000165 08 229 305 RET C
000166 F02B 230 306 DEC IY
000168 F02B 231 307 DEC IY
00016A C0E001 R 232 308 CALL FSERCH FIND LINE BELOW
00016D 08 233 309 RET C
00016E ED730000 E 234 310 LD (FILSP),SP
000172 2A0000 E 235 311 LD HL,(STP)
000175 F9 236 312 LD SP,HL
000176 00E1 237 313 POP IX POP OLD LINE INFORMATION
000178 F0E1 238 314 POP IY
00017A ED730000 E 239 315 LD (STP),SP
00017E ED780000 E 240 316 LD SP,(FILSP)
000182 110000 E 241 317 LD OE,FSTACK
000185 87 242 318 OR A
000186 ED52 243 319 SBC HL,DE
000188 20C8 244 320 JR NZ,FIL1 DONE WHEN STP=STACK
00018A C9 245 321 RET

322 *

323 *

324 *

325 *

326 *

327 *

HDRAW - SPECIAL MODE OF "DRAW" FOR FILL, WHEN WE KNOW THAT
ONLY HORIZONTAL LINES ARE NEEDED.

000188 C04000 R 246 328 HDRAW CALL CALADR SEE WHERE WE ARE !
00018E C0E301 R 247 329 CALL CHKFM0
000191 C8FF 248 330 SET 7,A PLOT FIRST POINT
000193 1C 249 331 INC E
000194 1D 250 332 HDRE DEC E
000195 280E 251 333 JR 7,HDRE
000197 0F 252 334 RRCA

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000198 C8FF      253 335 SET 7,A      PLOT POINT
00019A 0029      254 336 DEC IX
00019C 30F6      255 337 JR NC,H0R5      LOOP WHILE STILL SOME TO DO
00019E 37        256 338 H0R4 SCF
00019F 10        257 339 DEC E
0001A0 2803      258 340 JR Z,H0R5
0001A2 0F        259 341 RRCA
0001A3 18F9      260 342 JR H0R4
0001A5 F5        261 343 H0R5 PUSH AF
0001A6 C00501    R 262 344 CALL FILCOL
0001A9 F1        263 345 POP AF
0001AA 3003      264 346 JR NC,H0R6      DONE IF END POINT FOUND
0001AC 0023      265 347 INC IX
0001AE C9        266 348 RET
0001AF 11F3FF    267 349 H0R6 LD DE,H'FFF8'
0001B2 79        268 350 LD A,C
0001B3 83        269 351 ADD A,E      MOVE TO NEXT LOCATION
0001B4 4F        270 352 LD C,A
0001B5 00        271 353 RET NC      DONE IF MOVING OFF SCREEN
0001B6 C0E201    R 272 354 CALL VINFIL
0001B9 2008      273 355 JR NZ,H0R7      SEE IF 8-DOT SEGMENT EMPTY
0001BB 0019      274 356 ADD IX,DE      MOVE LEFT 8 POINTS
0001BD 1F        275 357 CPL      NEGATE SEGMENT
0001BE C00501    R 276 358 CALL FILCOL      FILL 8-DOT SEGMENT
0001C1 185C      277 359 JR H0R6
0001C3 C847      278 360 H0R7 BIT D,A      RETURN IF DOT ON EDGE
0001C5 C0        279 361 RET NZ
0001C6 1600      280 362 LD D,D
0001C8 0023      281 363 INC IX
0001CA 14        282 364 H0R6 INC D
0001CB 37        283 365 SCF      PLOT POINT
0001CC 1F        284 366 RRA
0001CD 0029      285 367 DEC IX
0001CF 30F9      286 368 JR NC,H0R5      FILL UNTIL END POINT FOUND
0001D1 07        287 369 H0R5 RLCA
0001D2 15        288 370 DEC D
0001D3 20FC      289 371 JR NZ,H0R9
372 +
373 +
0001D5 C0E301    R 290 374 FILCOL CALL CHKPMO      FILL VOP LOCATION ACCORDING TO FILL MODE
375 SETCLR VROUT      SET VOP LOCATION AND COLOUR IT
0001D8 F7        291 + RST H'30'      VIDEO RAM WRITE
+
+ ENOM
0001D9 CBE8      292 376 SET S,B
0001DB 3A0000    E 293 377 LD A,(GCCLR
378 VROUT
0001DE F7        294 + RST H'30'      VIDEO RAM WRITE
+
+ ENOM
0001DF CBA8      295 379 RES S,B
0001E1 C9        296 380 RET
381 +
382 +
383 +      CHKPMO.- CHECK FILL MODE, NEGATE VALUE IN A IF NECESSARY
384 +
385 +
386 VINFIL VRIN      GET FROM VOP FIRST

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0001E2 EF		297	+	RST	H'28'	VIDEO RAM READ
				ENDM		
0001E3 E5		298		387 CHAFMO	PUSH	HL
0001E4 210000	E	299		388	LD	HL, FILMOD
0001E7 AE		300		389	XOR	(HL)
0001E8 EEFF		301		390	XOR	H'FF'
0001EA E1		302		391	POP	HL
0001EB C9		303		392	RET	
				393 *		
				394 *		
				395 *		FSEARCH - SEE IF MORE TO FILL IN ABOVE/BELOW CURRENT LINE
				396 *		
				397 *		
0001EC C09700	R	304		398 FSEARCH	CALL	PNTXY
0001EF FEFF		305		399	CP	H'FF'
0001F1 C8		306		400	RET	Z
0001F2 3D		307		401	DEC	A
0001F3 C0E301	R	308		402	CALL	CHAFMO
0001F6 28C5		309		403	JR	Z, FS1
0001F8 C08202	R	310		404	CALL	FREN0
0001FB 1803		311		405	JR	FS2
0001FD C05902	R	312		406 FS1	CALL	FREN0Z
000200 E0580000	E	313		407 FS2	LD	DE, (X2)
000204 00E5		314		408	PUSH	IX
000206 E1		315		409	POP	HL
000207 B7		316		410	OR	A
000208 E052		317		411	SBC	HL, DE
00020A F21802	R	318		412	JP	P, FS3
00020D C02902	R	319		413	CALL	XYP5H
000210 08		320		414	RET	C
000211 0023		321		415	INC	IX
000213 C05902	R	322		416	CALL	FREN0Z
000216 18E8		323		417	JR	FS2
000218 05		324		418 FS3	PUSH	DE
000219 00E1		325		419	POP	IX
00021B C09700	R	326		420	CALL	PNTXY
00021E FEFF		327		421	CP	H'FF'
000220 C8		328		422	RET	Z
000221 3D		329		423	DEC	A
000222 C0E301	R	330		424	CALL	CHAFMO
000225 C8		331		425	RET	Z
000226 C08202	R	332		426	CALL	FREN0
				427 *		
				428 *		
				429 *		XYP5H - PUSH X & Y ONTO STACK AND CHECK FOR OVERFLOW
				430 *		
				431 *		
000229 00E5		333		432 XYP5H	PUSH	IX
00022B 01		334		433	POP	DE
00022C F0E5		335		434	PUSH	IY
00022E C1		336		435	POP	BC
00022F E0730000	E	337		436	LD	(FILSP), SP
000233 E0780000	E	338		437	LD	SP, (STP)
000237 E1		339		438	POP	HL
000238 E5		340		439	PUSH	HL
000239 B7		341		440	OR	A

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00023A	ED52		342	441	SBC	HL,DE	
00023C	2009		343	442	JR	NZ,XP1	
00023E	E1		344	443	POP	HL	OLD X (=NEW X) IN DE
00023F	E1		345	444	POP	HL	GET OLD Y
000240	ED42		346	445	SBC	HL,BC	
000242	09		347	446	ADD	HL,BC	
000243	2802		348	447	JR	Z,XP1	
000245	E5		349	448	PUSH	HL	PUSH BACK OLD Y
000246	05		350	449	PUSH	DE	AND OLD X
000247	C5		351	450	PUSH	BC	PUSH NEW Y
000248	05		352	451	PUSH	DE	AND NEW X
000249	210800	E	353	452	LD	HL,HSTBUF+8	CHECK BOTTOM OF FILL STACK AREA
00024C	87		354	453	OR	A	
00024D	ED72		355	454	SBC	HL,SP	ENSURE STACK DOES'NT OVERFLOW
00024F	3F		356	455	CCF		
000250	E0730000	E	357	456	LD	(STP),SP	
000254	E0790000	E	358	457	LD	SP,(FILSP)	
000258	C9		359	458	RET		
				459 *			
				460 *			
				461 *			
				462 *			
				463 *			
				464 *			
000259	004000	R	360	465	FRENDZ CALL	CALAOR	
00025C	0023		361	466	FR1 INC	IX	
00025E	C5		362	467	FR11 PUSH	BC	
00025F	C09700	R	363	468	CALL	PNTXY	
000262	E1		364	469	POP	HL	
000263	110800		365	470	LD	DE,8	
000266	FEFF		366	471	CP	H'FF'	
000268	2840		367	472	JR	Z,FR6	
00026A	3D		368	473	DEC	A	
00026B	C0E301	R	369	474	CALL	CHKFMD	
00026E	2012		370	475	JR	NZ,FREND	
000270	ED42		371	476	SBC	HL,BC	
000272	09		372	477	ADD	HL,BC	
000273	28E7		373	478	JR	Z,FR1	
000275	C0E201	R	374	479	FR2 CALL	VINFIL	
000278	3C		375	480	INC	A	
000279	20E3		376	481	JR	NZ,FR11	
00027B	0019		377	482	ADD	IX,DE	
00027D	79		378	483	LD	A,C	
00027E	83		379	484	ADD	A,E	
00027F	4F		380	485	LD	C,A	
000280	30F3		381	486	JR	NC,FR2	
000282	C04000	R	382	487	FREND CALL	CALAOR	
000285	0023		383	488	FR3 INC	IX	
000287	C5		384	489	FR4 PUSH	BC	
000288	C09700	R	385	490	CALL	PNTXY	
00028B	E1		386	491	POP	HL	
00028C	110800		387	492	LD	DE,8	
00028F	FEFF		388	493	CP	H'FF'	
000291	2817		389	494	JR	Z,FR6	
000293	3D		390	495	DEC	A	
000294	C0E301	R	391	496	CALL	CHKFMD	

FRENDZ - FIND NEW RIGHT END OF INTERRUPTED LINE
 FREND - FIND RIGHT END OF UNINTERRUPTED LINE

000293 3D 390 495 DEC A
000294 CDE301 R 391 496 CALL CHKFMD

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LOC OBJECT M STAT E LINE SOURCE LINE

000297 2811 392 497 JR Z,FR6
000299 ED42 393 498 SBC HL,BC
000298 09 394 499 ADD HL,BC
00029C 28E7 395 500 JR Z,FR3
00029E CDE201 R 396 501 FR5 CALL VINFIL
0002A1 20E4 397 502 JR NZ,FR4
0002A3 0019 398 503 ADD IX,DE
0002A5 79 399 504 LD A,C
0002A6 83 400 505 ADD A,E
0002A7 4F 401 506 LD C,A
0002A8 30F4 402 507 JR NC,FR5
0002AA 002B 403 508 FR6 DEC IX
0002AC C9 404 509 RET

510 *

511 *

512 *

513 *

514 *

515 *

516 *

517 *

518 *

519 *

520 *

POLG - GO ELLIPSE/POLYGON

VALUES AS FOLLOWS:-

CX,CY - CENTRE COORDINATES

RADX,RADY - X,Y RADII

CINC - STEP FOR DRAWING

BC,DE - START & END ANGLES (0, 1024 FOR 1 REV.)

CARRY FLAG - SET FOR DRAWING FROM ENDS TO MIDDLE

0002A0 08 405 521 POLYG DEC BC DECREMENT END ANGLE FOR COMPARE
0002A2 08 406 522 DEC BC
0002AF F5 407 523 PUSH AF
0002B0 CDE602 R 408 524 CALL CHKARC CHECK START & END ANGLES
0002B3 AF 409 525 XOR A
0002B4 320000 E 410 526 LD (DOTCNT),A INITIALISE DOT COUNT
0002B7 EB 411 527 EX DE,HL
0002B8 C00603 R 412 528 CALL CALPT WORK OUT FIRST POINT
0002B8 F1 413 529 POP AF
0002BC F5 414 530 PUSH AF
0002B0 0C0802 R 415 531 CALL C,DRWEND
0002C0 002A0000 E 416 532 ELL3 LD IX,(X1) SET OLD END AS NEW START POINT
0002C4 F02A0000 E 417 533 LD IY,(Y1)
0002C8 ED5B0000 E 418 534 LD DE,(CINC) ADD INCREMENT TO COUNT
0002CC 19 419 535 ADD HL,DE
0002C0 C00603 R 420 536 CALL CALPT
0002D0 C0AC00 R 421 537 CALL DRAWTO DRAW LINE FROM PREVIOUS POINT
0002D3 87 422 538 OR A
0002D4 ED42 423 539 SBC HL,BC SEE IF REACHED END
0002D6 09 424 540 ADD HL,BC
0002D7 38E7 425 541 JR C,ELL3
0002D9 F1 426 542 POP AF
0002DA 00 427 543 RET NC
0002D8 002A0000 E 428 544 DRWEND LD IX,(CX) DRAW FROM CENTRE TO ENDS IF NEEDED
0002DF F02A0000 E 429 545 LD IY,(CY)
0002E3 C3AC00 R 430 546 JP DRAWTO

547 *

548 *

549 *

550 *

551 *

CHKARC - ENSURE ANGLES POSITIVE, INCREASE END ANGLE IF START>END

0002E5 C87A

431

552 CHKARC BIT

7,0

SEE IF NEGATIVE START ANGLE

LOC OBJECT M STATE LINE SOURCE LINE

0002E8	2806	432	553	JR	Z, CKA1	
0002EA	14	433	554	INC	D	
0002EB	14	434	555	INC	D	ADD REVOLUTIONS UNTIL POSITIVE
0002EC	14	435	556	INC	D	
0002ED	14	436	557	INC	D	
0002EE	18F6	437	558	JR	CHKARC	
0002F0	C878	438	559	CKA1 BIT	7,8	SEE IF NEGATIVE END ANGLE
0002F2	2806	439	560	JR	Z, CKA2	
0002F4	04	440	561	INC	B	ADD REVOLUTIONS UNTIL POSITIVE
0002F5	04	441	562	INC	B	
0002F6	04	442	563	INC	B	
0002F7	04	443	564	INC	B	
0002F8	18F6	444	565	JR	CKA1	
0002FA	60	445	566	CKA2 LD	H, B	GET END ANGLE INTO HL
0002FB	69	446	567	LD	L, C	
0002FC	87	447	568	OR	A	
0002FD	ED52	448	569	SBC	HL, DE	
0002FF	00	449	570	RET	NC	BIGGER - JUST RETURN
000300	04	450	571	INC	B	ADD REVOLUTIONS UNTIL GREATER
000301	04	451	572	INC	B	
000302	04	452	573	INC	B	
000303	04	453	574	INC	B	
000304	18F4	454	575	JR	CKA2	
			576 *			
			577 *			
			578 *			
			579 *			
			580 *			
						CALPT - CALCULATE POINT ON CIRCUMFERENCE, GIVEN ANGLE IN HL
000306	25	455	581	CALPT PUSH	HL	
000307	05	456	582	PUSH	BC	
000308	110004	457	583	LD	DE, 1024	GET HL INTO RANGE 0-1023 (0 TO 2*PI)
000308	87	458	584	OR	A	
00030C	ED52	459	585	CLP1 SBC	HL, DE	
00030E	3DFC	460	586	JR	NC, CLP1	
000310	19	461	587	ADD	HL, DE	
000311	110002	462	588	LD	DE, 512	
000314	C03701	463	589	CALL	CHKEND	HAVE TY IN HL
000317	F5	464	590	PUSH	AF	SAVE YS
000318	EB	465	591	EX	DE, HL	
000319	210001	466	592	LD	HL, 256	
00031C	C03701	467	593	CALL	CHKEND	HAVE TX IN HL
00031F	C1	468	594	POP	BC	
000320	4F	469	595	LD	C, A	HAVE YS IN B, XS IN C
000321	EB	470	596	EX	DE, HL	
000322	210001	471	597	LD	HL, 256	
000325	87	472	598	OR	A	
000326	ED52	473	599	SBC	HL, DE	
000328	EB	474	600	EX	DE, HL	HAVE TY IN DE
000329	05	475	601	PUSH	DE	SAVE TY
00032A	05	476	602	PUSH	BC	
00032B	79	477	603	LD	A, C	XS IN A
00032C	ED580000	478	604	LD	DE, (CX)	
000330	ED480000	479	605	LD	BC, (RADX)	
000334	C04E03	480	606	CALL	CALCIR	DO X-COORD
000337	220000	481	607	LD	(X1), HL	
00033A	C1	482	608	POP	BC	

000334	CD4E03	N	480	606	CALL	CALCIR	DO X-COORD
000337	220000	E	481	607	LD	(X1),HL	
00033A	C1		482	608	POP	BC	

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LOC OBJECT M STAT E LINE SOURCE LINE

000338	E1		483	609	POP	HL	RETRIEVE TY
00033C	78		484	610	LD	A,B	YS IN A
00033D	ED580000	E	485	611	LD	DE,(CY)	
000341	ED480000	E	486	612	LD	BC,(RADY)	
000345	CD4E03	R	487	613	CALL	CALCIR	DO Y-COORD
000348	220000	E	488	614	LD	(Y1),HL	
000348	C1		489	615	POP	BC	
00034C	E1		490	616	POP	HL	RESTORE COUNT
00034D	C9		491	617	RET		
				618 *			
				619 *			
00034E	05		492	620	CALCIR	PUSH DE	
00034F	F5		493	621	PUSH	AF	DO X+XS*(RX*SN(TX))/256
000350	24		494	622	INC	H	
000351	25		495	623	DEC	H	
000352	2026		496	624	JR	NZ,CCR3	
000354	2C		497	625	INC	L	
000355	2D		498	626	DEC	L	
000356	110000		499	627	LD	DE,0	RETURN 0 IF SIN(TX)=0
000359	2814		500	628	JR	Z,CCR1	
00035B	E3		501	629	EX	DE,HL	
00035C	217E03	R	502	630	LD	HL,SNBTL	CALCULATE SINE BY LOOK-UP
00035F	19		503	631	ADD	HL,DE	
000360	1E00		504	632	LD	E,0	
000362	56		505	633	LD	0,(HL)	
000363	14		506	634	INC	0	IF 0=0 THEN ASSUME 1
000364	15		507	635	DEC	0	
000365	2813		508	636	JR	Z,CCR3	
000367	000000	E	509	637	CALL	IMULT	CALCULATE RX*SN(TX)
00036A	CB7C		510	638	BIT	7,H	
00036C	2801		511	639	JR	Z,CCR1	ROUND RESULT
00036E	13		512	640	INC	DE	
00036F	F1		513	641	CCR1	POP AF	HAVE RESULT IN DE
000370	B7		514	642	OR	A	TEST XS
000371	E1		515	643	POP	HL	GET START COORDINATE
000372	FA7703	R	516	644	JP	M,CCR2	
000375	19		517	645	ADD	HL,DE	XS>0 : ADD
000376	C9		518	646	RET		
000377	ED52		519	647	CCR2	SBC HL,DE	XS<0 : SUBTRACT
000379	C9		520	648	RET		
00037A	5D		521	649	CCR3	LD 0,B	SPECIAL CASE FOR SIN(TX)=1
00037B	59		522	650	LD	E,C	
00037C	18F1		523	651	JR	CCR1	
				652 *			
				653 *			
				654 *			
				655 *			
				656 *			
00037E	00020305			657	SNBTL	DATA	H'00',H'02',H'03',H'05',H'06',H'08',H'09',H'09'
	06080908						
000386	000E1011			658	DATA		H'00',H'0E',H'10',H'11',H'13',H'14',H'16',H'18'
	13141618						
00038E	19181C1E			659	DATA		H'19',H'18',H'1C',H'1E',H'1F',H'21',H'22',H'24'
	1F212224						
000396	2627292A			660	DATA		H'26',H'27',H'29',H'2A',H'2C',H'2D',H'2F',H'30'
	2C2D2F30						

SNBTL - TABLE OF SINES, TO 1 PART IN 256

LOC OBJECT M STATE LINE SOURCE LINE

00039E	32333537 383A383D		661	DATA	H'32', H'33', H'35', H'37', H'38', H'3A', H'3B', H'3D'
0003A6	3E404143 44464749		662	DATA	H'3E', H'40', H'41', H'43', H'44', H'46', H'47', H'49'
0003AE	4A4C4D4F 50525355		663	DATA	H'4A', H'4C', H'4D', H'4F', H'50', H'52', H'53', H'55'
0003B6	5658595B 5C5E5F61		664	DATA	H'56', H'58', H'59', H'5B', H'5C', H'5E', H'5F', H'61'
0003BE	52636566 68696B6C		665	DATA	H'62', H'63', H'65', H'66', H'68', H'69', H'6B', H'6C'
0003C6	606F7072 73757677		666	DATA	H'6D', H'6F', H'70', H'72', H'73', H'75', H'76', H'77'
0003CE	797A7B7D 7E808182		667	DATA	H'79', H'7A', H'7B', H'7D', H'7E', H'80', H'81', H'82'
0003D6	84858688 898A8C8D		668	DATA	H'84', H'85', H'86', H'88', H'89', H'8A', H'8C', H'8D'
0003DE	8E909192 93959697		669	DATA	H'8E', H'90', H'91', H'92', H'93', H'95', H'96', H'97'
0003E6	989A9B9C 9D9FA0A1		670	DATA	H'98', H'9A', H'9B', H'9C', H'9D', H'9F', H'AD', H'A1'
0003EE	A2A4A5A6 A7A8AAAB		671	DATA	H'A2', H'A4', H'A5', H'A6', H'A7', H'A8', H'AA', H'AB'
0003FE	ACA0AEAF B1B2B3B4		672	DATA	H'AC', H'AD', H'AE', H'AF', H'B1', H'B2', H'B3', H'B4'
0003FE	B5B6B7B8 B9BABCB0		673	DATA	H'B5', H'B6', H'B7', H'B8', H'B9', H'BA', H'BC', H'BD'
000406	BEBC0C01 C2C3C4C5		674	DATA	H'BE', H'BF', H'CD', H'C1', H'C2', H'C3', H'C4', H'C5'
00040E	C6C7C8C9 CACBCC0D		675	DATA	H'C6', H'C7', H'C8', H'C9', H'CA', H'CB', H'CC', H'CD'
000416	CECF0F00 01020304		676	DATA	H'CE', H'CF', H'CF', H'D0', H'D1', H'D2', H'D3', H'D4'
00041E	05060707 08090A0B		677	DATA	H'D5', H'D6', H'D7', H'D7', H'D8', H'D9', H'DA', H'DB'
000426	0C0C0D0E 0F0E0E01		678	DATA	H'DC', H'DC', H'DD', H'DE', H'DF', H'ED', H'ED', H'E1'
00042E	E2E3E3E4 E5E5E6E7		679	DATA	H'E2', H'E3', H'E3', H'E4', H'E5', H'E5', H'E6', H'E7'
000436	E7E8E9E9 EAE8EBEC		680	DATA	H'E7', H'E8', H'E9', H'E9', H'EA', H'EB', H'EB', H'EC'
00043E	E0E0E0E0 E0E0E0E1		681	DATA	H'ED', H'ED', H'EE', H'EE', H'EF', H'EF', H'FO', H'F1'
000446	F1F2F2F3 F3F4F4F5		682	DATA	H'F1', H'F2', H'F2', H'F3', H'F3', H'F4', H'F4', H'F5'
00044E	F5F5F6F6 F7F7F8F8		683	DATA	H'F5', H'F5', H'F6', H'F6', H'F7', H'F7', H'F8', H'F8'
000456	F8F9F9F9 FAFAFAFB		684	DATA	H'F8', H'F9', H'F9', H'F9', H'FA', H'FA', H'FA', H'FB'
00045E	F8FBFCFC FCFCFDFD		685	DATA	H'FB', H'FB', H'FC', H'FC', H'FC', H'FC', H'FD', H'FD'
000466	F0F0FEFE FEFEFEFF		686	DATA	H'FD', H'FD', H'FE', H'FE', H'FE', H'FE', H'FE', H'FF'
00046E	FFFFFFF FFFF0000		687	DATA	H'FF', H'FF', H'FF', H'FF', H'FF', H'FF', H'00', H'00'
000476	00000000 00000000		688	DATA	H'00', H'00', H'00', H'00', H'00', H'00', H'00', H'00'

000476 00000000 688 DATA H'00',H'00',H'00',H'00',H'00',H'00',H'00',H'00'

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LOC OBJECT M STAT E LINE SOURCE LINE

00047E 689 END

NO ERRORS DETECTED