GRAPHICS

AMSTRAD

Andrew Ware with a suite of 13 new graphics commands for the CPC-464.

THIS PROGRAM gives you 13 extra graphics commands. The Inverse and Copychar commands are text-orientated and the others are graphics orientated. The Stipple command affects both graphics and text. After the Ston command has been used all text is stippled as well as all points plotted, all lines drawn and all shapes filled. When using stippled text no text will be printed when the graphics pen and paper are equal since the graphics Tag mode is used to print the text.

Any stippled text may be fully edited provided that the background colour does not appear within the stipple parameters. The Stoff command will return the text and graphics to their original pen and paper colours. If the Paint command is used while the stipple effect is on unpredictable patterns will occur due to the order in which points are plotted. To fill a shape with stipple I would advise the use of the Box, Ellipse and Circle commands with the Fill command on.

Any colour parameters selected in the pen and paper colours currently selected and will respond to mode changes in the same manner as does Amstrad Basic. For example, if the stipple colours are selected by:

STIPPLE,1,2,3,4,5,6,7,8

then in mode 0 all eight colours will be used, however in mode 1 these colours will appear Mod 4 and the stipple will be equivalent to:

STIPPLE,1,2,3,4,0,1,2,3,0

If the incorrect number of parameters for a command have been entered the routine will return to Basic and display an error message.

Type in the data from program 3 followed by program 1. Once program 1 has been run the code can be saved by:

SAVE"CALL 38155",B,37985,2220

To load this data type:

MEMORY 37985:LOAD"CALL 38155"

and to use the new commands type:

CALL 38155

Remember that if you wish to use the Symbol

Program 1.

```
10 DEG:FOR F=0 TO 255:POKE (156*256)+F,SIN(F/255*180)*
255:NEXT
```

Program 3.

```
10 REM Hex loader
20 REM use this program to enter
30 REM the hex dump code
40 REM Type in each line of 20
50 REM hex digits as a single string
60 REM and then the checksum. E.g.:-
70 REM for the first line enter the
80 REM digits from F to 1
90 MEMORY 37985
100 FOR n = 37986 TO 39906 STEP 10
110 LET t=0:PRINT n;":";
120 INPUT a$
130 FOR c = 0 TO 9
140 s = VAL("&"+MID$(a$,c*2+1,2)):POKE (c+n),s
150 t = t + s
160 NEXT
170 PRINT " = ";:INPUT ch
180 IF ch<> t THEN PRINT "input error
    - try again": GOTO 110
190 NEXT
```

Hex dump.

```
37986 : F5D5E54D06085C160021 = 893
37996 : 0000CB39300119CB23CB = 778
38006 : 12052BF4C1D1F1C9F5D5 = 1601
38016 : C5571E00060ED5D521E3 = 957
38026 : F28F94192B2910F4C1D1 = 1304
38036 : F1C9BF94C32E95C3AC95 = 1687
38046 : C3ED6DC3D5D9C3519EC3 = 1538
38056 : F397C30298C39F98C3B4 = 1624
38066 : 98C3E599C3F699C3279A = 1711
38076 : C313A4349C3A34CC3A6 = 999
38086 : 4C4C495C53C547584C5E = 1011
38096 : 475A4154D5D246494CCC = 998
38106 : 4D4F3CB42AFD894AE56 = 1026
38116 : 455253C55041494ED453 = 1022
38126 : 544F46C6535445FCE5354 = 1050
38136 : 495B4CC5C4A5D5E59543 = 938
38146 : 4841D2000007959694E1 = 802
38156 : 9694210795CD01BC21FD = 1375
38166 : 3A2260BB3EC1326JBECD = 1279
38176 : F6993E01CD0EBCCB89B = 1413
38186 : CDE599C9FE85D229FBFE = 1710
38196 : 0420E7CD79C9E5D23DD23 = 1231
38206 : DD4E00DD4681ED4313E6 = 1064
38216 : DD6E02DD6603DD5E04DD = 1199
38226 : 56E5CDB3953D2327395 = 954
38236 : ED43749ED44376953E3F = 1265
38246 : 32A795ED537895227A95 = 1268
38256 : 2A7B95ED537B95227A95 = 1276
38266 : 2300DD7E00CDEBBC9C5 = 1394
38276 : E5D5CDCCBBD53A8522 = 1709
38286 : AA950E1ED5E5D4BAA95 = 1426
38296 : 09EBED4BA8959E9EDCD9 = 1523
38306 : BBE1D1C1C93F000000 = 1078
38316 : F3ED2C09F3E7D3B07CD = 1372
38326 : 7C95DD23DD23DD6E00DD = 1337
38336 : 66D1227695DD6E02DD66 = 1060
38346 : 03274795221A95DE5D4 = 1348
38356 : DD66D5DD5E06DD5607CD = 1160
38366 : 8395ED537895227A953E = 1236
38376 : 7F32A795AF327395ZA74 = 1140
38386 : 95ED5B7695ED52D26E96 = 1533
38396 : 3C19327395EE227495ED = 1170
38406 : 537695186JFE01C220PB = 1121
38416 : C37C95320021000ED5B = 879
38426 : 1396ED5DCDEABBD1E13E = 1733
38436 : FFAA573EFFAB5EDEABB = 1721
38446 : C9CD3296E5D5CDEABBD1 = 1883
38456 : E1E53EFFAA573EFFABF5F = 1611
38466 : D5CDEABBD1E13EFFAC67 = 1865
38476 : 3EFFAD6FC9FE01C22C9E = 1450
38486 : DD7E00326D96FE012804 = 955
38496 : 3EEA18023EFE0132C9E32 = 924
38506 : 4496C0000CD1596ED5B76 = 1241
38516 : 95ED4B7495ZA7695ED42 = 1338
38526 : 2002C5D17AFE0020107B = 1003
38536 : FE3F300B2180000CD7E94 = 1016
38546 : 7DFE00F2002321E1FE0F38 = 801
38556 : 223E0F2C09E2A7495 = 1023
38566 : 232322C196210000222C3 = 709
38576 : 96F132C59667JAA795B4 = 1397
38586 : 2DCE096C3C796022C9E22 = 1012
38596 : 0E04213AC596260D6FED = 920
38606 : 5B7495E5CD0498227695 = 1252
38616 : EBE1D5E5B7CD0A9B = 1638
38626 : 227A95E53A7395FE0128 = 1151
38636 : 1F2A7A95ED5BC3961311 = 1055
38646 : AFED523811812B2B1E1D = 1279
38656 : 5B7895227A95CD2F96D1 = 1276
38666 : 18EA3A6D96FE0120D87A = 927
38676 : 7395FE0020F1E1D1C1F1E3 = 1417
38686 : 2AC1962B2B3E6B8C381B = 932
38696 : AFED523816191E5D52A = 1100
38706 : 7A95A7395FE0020E1EB = 1127
38716 : CD2F96D1E118E5E1D122 = 1557
38726 : 3A95ED537895JA6D96FE = 1316
38736 : 0120405E3795D1281E7 = 727
38746 : 2A7A95ED5BC39613ED52 = 1324
38756 : 30D919ED5B7895CD2F96 = 1091
38766 : 22C3961E3795D1E1E5D5 = 1469
38776 : ED5B7895ZA2C19613ED52 = 1320
38786 : 3B3EED5B7A952A7895CD = 1233
38796 : ZF96CD2C3795D1E1C1F1 = 967
38806 : FE012811ZA7A95ED5B78 = 1073
38816 : 95CD2F962C2196ED53C1 = 1443
38826 : 663A795FE0020E3E0132 = 1049
38836 : 95ED5B7A95CD2F9622C1 = 1377
38846 : 9622C3963AC596673AC0 = 1287
38856 : 968467JAC0968CDAE897 = 1508
38866 : 7C32C596C3C796E56CD = 1602
38876 : 62945C1600E16FCD6294 = 1147
38886 : 19C9ED5BA895ZAAA95CD = 1437
38896 : C9BBC9FE01C22C9BDD7E = 1584
38906 : 00322B9BCD59BCC9FE86 = 1191
38916 : 022C9FBFE8200A0D7E8N = 1057
38926 : CDDEBBDD23DD23DD4E00 = 1425
38936 : CB61DD4681DD5E0DDD56 = 1248
38946 : 0D3DD6E04CB85DD660522 = 1036
38956 : 7A95DD6E06DD666072278 = 1092
38966 : 95C5D5ED5B78952A7A95 = 1469
38976 : CDD395D1C1A6F9EFE00 = 1458
38986 : 2827210000CD5F982323 = 634
38996 : 7DB92807C7CB02BF3C3E8 = 1599
39006 : 97C5D5E511000CDC0BB = 1391
39016 : E1D1D5E5CDF6BBE1D1C1 = 2141
39026 : C9210000D5C511000CD = 866
39036 : C5DBE111000D5CDF6BB = 1488
39046 : E1D1D5CDF6BBD1210000 = 1527
39056 : CDF6BB210000110000CD = 893
39066 : F6BBC3E897FE0122C9E9 = 1659
39076 : DD7E00E601211B398BEC9 = 1332
39086 : 7FC9CBBC90AFE0D12C = 1380
39096 : 9BFE032007CD7C95DD23 = 1185
39106 : DD23DD6E00DD666D1DD5E = 1226
39116 : 0DD5603ED537895227A = 1057
39126 : 95AF32D3993D2D4992353 = 1286
39136 : 99325499325599326B99 = 1038
39146 : 326C99329C99CD11BCFE = 1287
39156 : 2A7A95ED5B78952A7A95 = 764
39166 : 2B326B99F1FE0128103E = 967
39176 : 2332549932559933E2B32 = 765
39186 : 6D9326C99CDE79AF = 1941
39196 : 99327799328C9932A199 = 1182
39206 : 2A7A95ED5B7895CDB89 = 1452
39216 : 3A0499C3C3D4999E2E = 1097
39226 : 905B23562B244E2346ED = 671
39236 : 537895ED473A952A7895 = 1238
39246 : ED5B7A952A7895CDB895 = 1617
39256 : E5CDFDBBE1D1E00CCB6 = 1937
39266 : 992A7895ED5B7A952B00 = 1186
39276 : 2ED3993C3CBEC8CD99BB = 1208
39286 : FE00CCB899ED5B7895ZA = 1434
39296 : 7A95233ED5CDFDBBE1 = 1624
39306 : 2A7A95ED5B7895CDB895 = 1617
39316 : 2A7A952B2BED5CDFDBB = 1473
39326 : D1E1FE00CCB8999AD499 = 1652
39336 : 21D3993C3CBEC8CD99BB = 1308
39346 : DADC99C33099D5E5CDEA = 1868
39356 : BBC1D13AD3993C3C32D3 = 1392
39366 : 99269D6F732732B2471 = 915
39376 : 2378C99000DD7E00CDE4 = 1120
39386 : BBC9FE03C23099C4BBB = 1587
39396 : C9216B0C2E9BDAF322A = 1073
39406 : 9B214A1322D4BDC9215C = 1042
39416 : 9A22E9BD21F59A220FBC = 1279
39426 : 3EC3320EBC3E01322A9B = 819
39436 : 214A9B22D4BDC9DD60E1 = 1223
39446 : DD6E04CD75BDCD6DBDD = 1553
39456 : 6E00DD66E1779060DD = 989
39466 : 7DDE6DC7A8604215B9A = 853
39476 : 0FCBBE3002CBFECBDE23 = 1167
39486 : 10F4C1DD23DD2310E221 = 1240
39496 : 58A9A6D4CBDC2310FBCD = 968
39506 : 11BCCDC99AC955FF0000 = 1306
39516 : E5F5D5C53AB39BFE0220 = 1394
39526 : 067BFE0CA919AAF26B4 = 1064
39536 : ED5B589A2A5A9ACB0130 = 1108
39546 : 0BCB03CB02CB04CB09C3 = 1032
39556 : B39A871EE0ED53589A = 1171
39566 : 225A9AC147D1F1E1C368 = 1516
39576 : 0CCB442802CBC7CB4228 = 1036
39586 : 2BCD7CB45280CB7CB = 1371
39596 : 432B07CBF718D3CB4228 = 1316
39606 : 02CBC7CB4328C9CBE718 = 1373
39616 : C5CB432B1CBC718EDFE = 1569
39626 : 0028108FE0128102IC19A = 755
39636 : 228A9A216F9A260BC921 = 914
39646 : 999A2189A216F9A3602 = 981
39656 : C921B39A22849A216F9A = 1185
39666 : 36D4C9E5CD99AE1CFCA = 1692
39676 : 8A32B39BCFA793D0E1C = 1941
39686 : 8B0019D1F5C5E5D5EB21 = 1514
39696 : 009C160197EE1CDD997 = 1127
39706 : 01C9E2CD0E3EFCADAF6F = 1601
39716 : FFAC67C1F1C900000611 = 1188
39726 : 21399E7CD5ABB2310F9 = 1153
39736 : ED5B7A952D2414D5E5445 = 1213
39746 : 5220455252F520AF53E = 825
39756 : 013203985E5DCCBDED53 = 1354
39766 : BBF1CDFCB02AB69ED5B = 1779
39776 : 00CDC9BBCD6B6BED53B4 = 1683
39786 : 9B22B69BE15C16006229 = 1004
39796 : 2A7A95ED5B7895CDB89C = 1891
39806 : FE0228062EFED1280129 = 680
39816 : EBE5C1218FED1E4D2CDD = 1530
39826 : BBF1CDFCB02AB69ED5B = 1779
39836 : B49BCD0BB2AB29BED5B = 1622
39846 : B09BCD09BBAF32B9BC9 = 1508
39856 : 0000000000000000000 = 15
39866 : 21C59B7E23CD5ABB10F9 = 1293
39876 : C9AA2852353582455854 = 769
39886 : 4545444445FF5241 = 682
39896 : 484943532052AF555449 = 730
39906 : 4E4553204A0D2041E50 = 486
```

S EXTENSIONS

same manner as circle.

¦FILL,integer.¦ FILL,0 turns fill off. ¦FILL,1 turns fill on. FILL responds to the stipple command.

¦GPAPER,graphics paper colour. The background graphics paper is set to the colour specified.

¦GPEN,graphics pen colour. The foreground graphics pen is set to the colour specified.

¦INVERSE,integer. ¦INVERSE,0 turns the inverse mode off and text is printed in the current pen colour on the current paper colour. ¦INVERSE,1 turns the inverse mode on and text is printed in current paper colour on the current pen colour.

Paint responds to stipple

¦MASK,integer. Sets ink mask: ¦MASK,0 Force mode. Pixel plotted over background. ¦MASK,1 XOR mode. Pixel XORed with background pixel. ¦MASK,2 AND mode. Pixel ANDed with background pixel. ¦MASK,3 OR mode. Pixel ORed with background pixel.

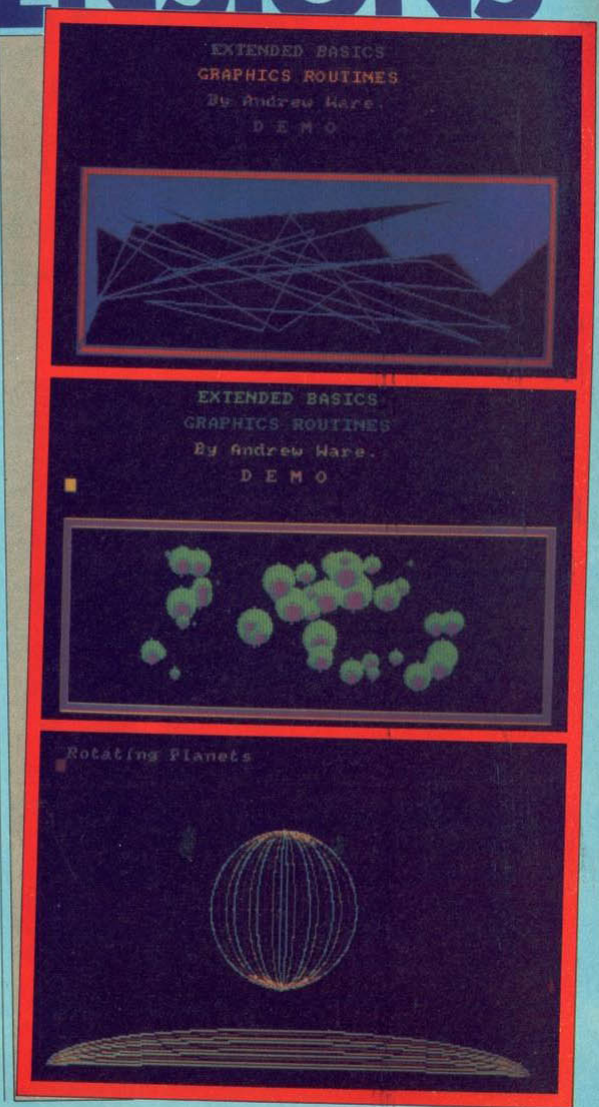
¦PAINT,x co-ordinate,y co-ordinate[,ink]. Paints an enclosed area of the graphics window around the point x,y. This command can be terminated by pressing Ctrl and C keys together. Paint responds to stripple, however the results are unpredictable.

¦STIPPLE,pen 1,pen 2,pen 3,pen 4,pen 5,pen 6,pen 7,pen 8. Sets the order of pixel colour While stipple is activated the current graphics pen colour is ignored. Text will be printed in current stipple colours.

¦STOFF. Turns stipple off.

¦STON. Turns stipple on.

Terms in brackets are optional and all co-ordinates are relative to the current graphics origin. ■

Program 2.

```
10 |MASK,0:INK 0,0:BORDER 0:INK 1,24:INK 2,6:INK 3,1
20 MODE 1:INK 0,19:INK 1,0:|STIPPLE,1,2,1,2,1,2,1,2:|STON
30 LOCATE 11,1:PRINT"EXTENDED BASICS":|STIPPLE,2,3,2,3,2
,3,2,3,2,3,1,3,1,3,1,3:LOCATE 12,2:PRINT"GRAPHICS ROUTINES":|STIPPLE
,3,1,3,1,3,1,3,1,3,1,3:LOCATE 13,3:PRINT"By Andrew Ware
40 |STIPPLE,1,2,1,3,1,3,1,3:LOCATE 14,7:PRINT"D E M O"
50 |STOFF
60 |FILL,0:|BOX,0,0,639,239,1:|BOX,10,10,619,219:|PAIN
T,5,1
70 |FILL,1:FOR f=0 TO 50 x=RND*400-130:y=RND*150+50:r=
RND*25:|CIRCLE,x,y,r,1:|CIRCLE,x,y-r/2,r/2,3:NEXT
80 FOR f=0 TO 20:INK 2,RND*26:INK 3,RND*26:FOR q=0 TO
2000*25:NEXT:NEXT
90 INK 1,24:INK 3,6:INK 1,5:|FILL,1:FOR q=1 TO 3:|MASK
,q:FOR f=0 TO 4:|BOX,12,12,615,216,0
100 FOR f=0 TO 25 DRAW RND*600+20,y:NEXT:NEXT:NEXT
110 |MASK,0:|BOX,12,12,615,216,0
120 FOR f=0 TO 28:x=RND*600+20:y=RND*200+10:IF TEST(x,
y)=0 THEN x=(f MOD 3)+1:|PAINT,x,y,0
130 NEXT
140 |MASK,0:MODE 1:|STON:|STIPPLE,1,2,1,2,1,2,1,2:PRIN
T" Rotating Planets ":|STIPPLE,1,1,1,1,1,1,1,1:|STOFF
150 |FILL,1:|CIRCLE,320,200,180,0:|ELLIPSE,320,0,320,
50,f/10|MOD 3+1:NEXT
160 FOR f=5 TO 50 STEP 5:|ELLIPSE,320,0,320,f,(f/5)MOD
3+1:NEXT
170 FOR f=0 TO 50
180 FOR i=1 TO 2:INK 3,26:GOSUB 190
190 INK 1,6:INK 2,6:INK 3,26:GOSUB 190
200 INK 1,24:INK 2,24:INK 3,6:GOSUB 190
210 INK 1,26:INK 2,26
220 NEXT:GOTO 200
230 FOR q=0 TO 100:NEXT:RETURN
240 FOR q=0 TO 1000:NEXT:EXAMPLE OF STIPPLE
250 CLS:STON:PRINT"EXAMPLE OF FOR b=0 TO 3:FOR i=0 TO
260 FOR f=0 TO 7:FOR q=0 TO 3:PRINT "STIPPLE".
270 |STIPPLE,f,q,b,i,f,q,b,i:PRINT "STIPPLE".
280 |STIPPLE,f,q,b,i:NEXT:NEXT
290 NEXT:NEXT:NEXT:|STIPPLE,1,2,3,4,1,2,3,4:PRINT"In mode 0 up
to 8 stipple colours can be defined."
300 MODE 0:|STIPPLE,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15:PRINT"In mode 0 up
to 8 stipple colours can be defined."
310 |STIPPLE,1,3,5,7,9,11,13,15:PRINT"In mode 1 only four
colours may be used to make up the eight parameters
of the stipple command.
320 |STIPPLE,1,2,1,2,1,2,1,2:PRINT"In mode 2 both
colours may be used to make up the eightcolours of th
e stipple command.
330 |STIPPLE,1,2,1,2,1,2,1,2:PRINT"In mode 2 both
colours may be used to make up the eightcolours of th
e stipple command.
340 FOR f=0 TO 10000:NEXT:INK 0,26:INK 1,5:BORDER 26:I
NK 2,6:INK 3,0:MODE 0:|STIPPLE,1,2,3,4,5,6,7,8:as="IS
TIPPLE,1,2,3,4,5,6,7,8":PRINT as:PRINT"In mode 0":FOR
f=0 TO 2000:NEXT
360 MODE 1:PRINT as:PRINT"In mode 1":FOR f=0 TO 2000:N
EXT:MODE 2:PRINT as:PRINT"In mode 2":FOR f= 0 TO 2000:
NEXT:RUN
```