Graphic Device Interface Version 2

This document describes the patches to the QDOS console driver and extended environment.

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1 General

The GD2 screen driver is a hybrid of the QDOS/SMSQ EE screen driver which maintains a high level of compatibility with existing QDOS/SMSQ software and very few modifications to the internal data structures.

1.1 Limitations.

- The modifications limit the colour depth for normal colour stippled colour definitions to 16 bit. Plain colours are limited to 32 bits.
- The modifications limit the colour depth for stippled borders to 8 bit. Plain border colours are limited to 16 bits.
- The calls to specify the colours can only handle
  - QL 8 (or 4 of 8) colour definition,
  - 256 palette mapped colour definition,
  - true colour (24 bit),
  - native colour.
- Sprites (patterns and blobs) can be handled in
  - QL 8 (or 4 of 8) colour definition,
  - 256 palette mapped colour definition,
  - 256 grbgrbgm colour definition,
  - native colour.
- The operating system mode call does not change the display mode.

2 Extended colour SBASIC procedures.

All the normal SBASIC procedures that set or use colours can work with any of the three "standard" SBASIC colour definitions.

1. QL colour: a value from 0 to 7.
2. Palette mapped colour: a value from 0 to 255.
3. True colour: red (0-255) * 65536 + green (0-255) * 256 + blue (0-255).

They can also work with the "native" colour definition.

Note that, for ease of programming, the true colour definition used in SBASIC is not the same as used for the device driver interface.

NB The BGOLOUR_xx, BGIMAGE, COLOUR_xx and PALETTE_xx procedures described below all require a valid window channel ID. The default is the same as PRINT: #1 or #0 for mini SBASICs that have only #0 open.

2.1 Wallpaper

A plain or stippled background can be defined using either QL colours or true colours.

BGCOLOUR_QL *QL colour* sets the background to the *QL colour* (0-255).

BGCOLOUR_24 *full colour* sets the background colour to the plain *true colour*.

```
100 BGCOLOUR_QL 255 : REMark set background to black / white check
110 BGCOLOUR_QL 0,7 : REMark set background to black / white check
120 BGCOLOUR_QL 0,7,3 : REMark set background to black / white check
130 BGCOLOUR_24 40 : REMark set the background to deep blue
```

You can get stippled extended colours by cheating. Set two of the QL palette entries (see below) to the colours you require before calling BGCOLOUR_QL.

BGIMAGE *filename* loads a background image from file.

```
150 BGIMAGE win1_wallpaper : REMark load my wallpaper
```

Background images must be in the form of a screen snapshot. It is relatively simple to create background images.

```
500 WINDOW SCR_XLIM, SCR_YLIM, 0, 0 : REMark whole screen window
510 …… draw the wallpaper on the screen
520 SBYTES_0 win1_wallpaper, SCR_BASE, SCR_LLEN * SCR_YSIZE
```

2.2 Palette maps

The colours used to display the QL colours 0 to 7 are not necessarily the boring old black, blue, red, magenta, green, cyan, yellow and white. They can be set to other colours if you wish. The palette mapped colours can also be changed although they have been pre-defined to put the most useful colours first.

PALETTE_QL *start, true colour 1, true colour 2, …* sets QL palette entries starting with the *start* entry.

PALETTE_8 *start, true colour 1, true colour 2, …* sets 256 colour (8 bit) palette entries starting with the *start* entry.

On hardware that does not have a true palette map, palette map changes do not affect the information already drawn on screen.

There is a practical reason for changing the QL palette map entries. Many programs define some of the colours displayed as "white-colour" on a 4 colour QL display, white-red appears as green. White-red, however, is really cyan, not green. As a result, many QL mode 4 programs take on rainbow hues when displayed on a 256, 65536 or full colour display.

This can be "fixed" by redefining the colours so that colour 2 is a bright crimson and colour 4 is a bright sea green. This will ensure that colour 2 + colour 4 = colour 7. We also need to ensure that colour 0 = colour 1, colour 2 = colour 3, etc.

```
600 crimson = 255 * 65536 + 100 : REMark crimson is red + a bit of blue
610 sea = 255 * 256 + 155 : REMark: sea green is green + the rest of blue
620 white = crimson + sea
630 PALETTE_QL 0, 0, 0, crimson, crimson, sea, sea, white, white : REMark set 8 colours
```

The following program can be used to display the current 256 colour palette using the up and down arrow keys. The table of standard colours is given at the end of this document. If new colours are required, they should replace colours towards the top of the table so that the low colours remain unchanged. You change palette entry 0 at your own risk.

```
100 OPEN #0,con: out = 0
110 WINDOW #out, 16*10+2,16*10+2,50,50
120 COLOUR_PAL: BORDER #out,1,0,1
130 bottom=-16
140 FOR i = 1 TO 16: up
150 REPeat
160  BGET #0,a
170  IF a=$D0: IF bottom < 255-16: up
180  IF a=$D8: IF bottom > 0: down
190 END REPeat

210 DEFine PROCedure up
220   bottom = bottom+1
230   PAPER bottom+15 : SCROLL -10
250   l = bottom+1015 : l$ = l
270   PAPER #out, l&&1 : INK #out, (l+1)&&1
280   AT #out, 15,0 : PRINT #out; l$(2 TO 4);
300 END DEFine

320 DEFine PROCedure down
330   bottom = bottom-1
340   PAPER bottom : SCROLL 10
360   l = bottom+1000 : l$ = l
380   PAPER #out, l&&1 : INK #out, (l+1)&&1
390   AT #out, 0,0 : PRINT #out; l$(2 TO 4);
410 END DEFine
```

2.3 SBASIC colour definition selection

SBASIC has a new set of procedures for selecting colour definition used by INK, PAPER, STRIP, BORDER, BLOCK.

COLOUR_QL selects the standard QL colour definitions (the QL colours can be mapped to colours other than the standard black, blue, red, magenta, green, cyan, yellow and white).

COLOUR_PAL selects the 256 colour palette mapped definition.

COLOUR_24 selects the true colour (24 bit) definition.

COLOUR_NATIVE selects the native colour definition - the significance of the colour numbers specified by INK, PAPER, etc. depends on the hardware.

```
200 COLOUR_24 : REMark select true colour mode
210 BORDER 2, 128*65536 + 128*256 +128 : REMark grey border
220 BORDER 2,$808080 : REMark grey border for hexadecimal hackers
```

The commands have no effect on any other programs executing. When an SBASIC program starts executing, it is set to QL colour definition.

3 Extended colour operating system calls

All the extended colour operating system calls are standard window output calls, with the conventional values for D3 (timeout) and A0 (channel ID).

3.1 Extended colours

The standard calls recognise three different "standard" colour definitions.

1. QL colour: a value from 0 to 7.
2. Palette mapped colour: a value from 0 to 255.
3. True colour: 8 bit red, 8 bit green, 8 bit blue, 8 bit 0 in a long word.

They also recognise the "native" colour definition, which may be one of the above, or it may be different.

3.2 Wallpaper

There is one call to set the colour of the background or a background picture or both.

iop.wpap	$6b	define screen wallpaper

D1 is -1, if the background colour is not to be changed.

D1 is 0 for a black background.

D1 is 1-255 for a stippled QL colour background.

D1 is n*256 for a 24 bit true colour background.

D2 is -1 for no background image.

D2 is 0 for a background image that is a snapshot of the screen in the current mode and resolution.

A1 points to the background image if there is one.

3.3 Extended colour definition calls

The calls to define extended colours are kept separate from the QL colour definitions.

The new calls for ink, paper, strip and border are in 3 blocks of 4 calls.

iow.papp	$50	define paper colour using palette
iow.strp	$51	define strip colour using palette
iow.inkp	$52	define ink colour using palette
iow.borp	$53	define border using palette
iow.papt	$54	define true paper colour
iow.strt	$55	define true strip colour
iow.inkt	$56	define true ink colour
iow.bort	$57	define true colour border
iow.papn	$58	define paper colour using native colours
iow.strn	$59	define strip colour using native colours
iow.inkn	$5a	define ink colour using native colours
iow.born	$5b	define border using native colours

For all of these calls, D1 is the colour (right justified in a long word, except for true colour which is left justified) and D2 is the stipple key or border width.

Solid colours are defined in a single call, while stipples require two calls.

For the paper, strip and ink colours, if D2 is -1, then D1 is used as a solid colour. If D2 is 0, 1, 2 or 3, then D1 is the stipple colour applied to the existing solid colour.

For borders the operation is more complex as the original QL border call not only sets the colours but also draws the border.

- The stipple key (-1 to 3) is in the most significant word of D2.
- If the least significant word of D2 is negative, then the call serves only to set the colour.
- A solid border may be drawn in one call with -1 in the most significant word of D2 and the width in the least significant word.
- A stippled border is drawn in two calls.
  - For the first call D2 is -1 and the main colour is in D1.
  - For the second call,
    - the stipple key (0 to 3) is in the msw of d2,
    - the border width is in the lsw of D2,
    - the contrast colour is in D1.

3.4 Extended colour block calls

There are three new calls for drawing a block of colour.

iow.blkp	$5c	draw block using palette
iow.blkt	$5d	draw block using true colour
iow.blkn	$5e	draw block using native colour

For all of these calls, A1 points to the block definition and A2 to three long words defining the stipple (colour 1, colour 2, stipple (-1 to 3).

3.5 Extended colour palette calls

The GD2 driver has two palette maps.

The first is used to convert QL colours. This means that old programs can be displayed in new colours.

The second palette map is used with the new operating system calls that use an 8 bit (256 colour) palette definition.

Unlike GD3, GD2 has a single the palette map for all windows. A valid window channel ID must still be given.

iow.palq	$60	define palette for QL definitions
iow.pal8	$61	define 8 bit palette

A1 points to the palette, D1 is the first element to set and D2 is number of elements to set.

The QL palette is defined by a table of 24 bit colours (long word), 8 entries long.

The normal 8 bit palette is defined by a table of 24 bit colours (long word), 256 entries long.

There are no additional calls for defining windows. If an extended colour definition border is required, this should be added as a second call. (The define window call is treated as two calls internally if the border width is non zero.)

4 Blobs and Patterns

The header of a blob, a pattern or a sprite starts with a word identifying the colour scheme used.

For the calls to draw these objects directly, the old QDOS pointer interface tended to ignore this format word: for objects with multiple definitions, therefore, the first definition should be QL mode 4.

The second word was originally defined to be the "adaption rule" (which defined how the sprite was modified for different resolutions. This has never been used, but the least significant byte has been borrowed for dynamic sprite version numbers.

For QL modes 4 and 8, the first byte is 0 and the second byte is 0 for 4 colour and 1 for 8 colour.

For extended colour modes, the first byte is 1 and the second byte has the colour mode number as defined for the GD3 drivers.

Mode number	Colour resolution	Number of bits	Colour definition	Organisation in long word			
0	2 colour	1	1 bit set for white	--------	--------	--------	-------w
4	4 colour	2	1 bit green, 1 bit red/magenta	--------	--------	--------	------gr
7	4 colour	2	palette mapped	--------	--------	--------	------cc
8	16 colour	4	1 bit RGB + 1 bit intensity	--------	--------	--------	----irgb
15	16 colour	4	palette mapped	--------	--------	--------	----cccc
16	256 colour	8	3G, 2R, 2B + 1 bit red/blue	--------	--------	--------	grbgrbgx
31	256 colour	8	palette mapped	--------	--------	--------	cccccccc
32	64k colour	16	6 bit green, 5 bit red, 5 bit blue	--------	--------	rrrrrggg	gggbbbbb
33	64k colour	16	5 bit green, 5 bit red, 5 bit blue	--------	--------	gggggrrr	rrbbbbbw
64	16m colour	24	8 bit RGB	rrrrrrrr	gggggggg	bbbbbbbb	--------

In principle all drivers should support QL mode 4 (0,0), 256 real colour (1,16), 256 colour palette mapped (1,31) and the native colour mode.

Each row in a QL mode pattern or blob occupies one or more and complete 16 bit words. Each row in any extended colour definition pattern or blob occupies one or more complete long words.

For sprites, the mask defines which bits or which pixels will be written into the screen and which bits or which pixels will XORed into the screen.

For each PIXEL in a palette mapped sprite, if the colour in the mask is not 0, then the pattern colour is written into the screen. If the colour in the mask is 0, then the pattern colour is XORed into the screen.

For each BIT in a pixel in a direct colour sprite, if the corresponding bit in the mask is not zero, then the bit from the pattern is written into the screen. If the corresponding bit in the mask is 0, then the bit from the pattern is XORed into the screen.

Note that this was always true! In QL mode drivers, however, the QL colours were not palette mapped, whereas in extended colour drivers, the colours are palette mapped.

Standard palette map - colours $00 to $3f

Colour number		Colour name	Colour value			VGA DAC			8 bit colour	16 bit colour	24 bit		
			R	G	B	R	G	B			R	G	B
0	00	Black	0.00	0.00	0.00	00	00	00	00	0000	00	00	00
1	01	White	1.00	1.00	1.00	3F	3F	3F	FF	FFFF	FF	FF	FF
2	02	Red	1.00	0.00	0.00	3F	00	00	*49*	F800	FF	00	00
3	03	Green	0.00	1.00	0.00	00	3F	00	92	07E0	00	FF	00
4	04	Blue	0.00	0.00	1.00	00	00	3F	*24*	001F	00	00	FF
5	05	Magenta	1.00	0.00	1.00	3F	00	3F	6D	F81F	FF	00	FF
6	06	Yellow	1.00	1.00	0.00	3F	3F	00	*DB*	FFE0	FF	FF	00
7	07	Cyan	0.00	1.00	1.00	00	3F	3F	*B6*	07FF	00	FF	FF
8	08	Dark slate	0,14	0,14	0,14	09	09	09	03	2124	24	24	24
9	09	Slate grey	0,29	0,29	0,29	12	12	12	1C	4A49	49	49	49
10	0A	Dark grey	0,43	0,43	0,43	1B	1B	1B	1F	6B6D	6D	6D	6D
11	0B	Grey	0,57	0,57	0,57	24	24	24	E0	9492	92	92	92
12	0C	Light grey	0,71	0,71	0,71	2D	2D	2D	E3	B5B6	B6	B6	B6
13	0D	Ash grey	0,86	0,86	0,86	36	36	36	FC	DEDB	DB	DB	DB
14	0E	Dark red	0,57	0,00	0,00	24	00	00	40	9000	92	00	00
15	0F	Light green	0,71	1,00	0,71	2D	3F	2D	F3	B7F6	B6	FF	B6
16	10	Mustard	0,57	0,57	0,00	24	24	00	C0	9480	92	92	00
17	11	Dark green	0,00	0,57	0,00	00	24	00	80	0480	00	92	00
18	12	Sea blue	0,00	0,57	0,57	00	24	24	A0	0492	00	92	92
19	13	Dark blue	0,00	0,00	0,57	00	00	24	20	0012	00	00	92
20	14	Purple	0,57	0,00	0,57	24	00	24	60	9012	92	00	92
21	15	Shocking pink	1,00	0,00	0,57	3F	00	24	*69*	F812	FF	00	92
22	16	Orange	1,00	0,57	0,00	3F	24	00	*C9*	FC80	FF	92	00
23	17	Lime green	0,57	1,00	0,00	24	3F	00	D2	97E0	92	FF	00
24	18	Apple green	0,00	1,00	0,57	00	3F	24	B2	07F2	00	FF	92
25	19	Bright blue	0,00	0,57	1,00	00	24	3F	*A4*	049F	00	92	FF
26	1A	Mauve	0,57	0,00	1,00	24	00	3F	*64*	901F	92	00	FF
27	1B	Peach	1,00	0,71	0,71	3F	2D	2D	EB	FDB6	FF	B6	B6
28	1C	Light yellow	1,00	1,00	0,71	3F	3F	2D	FB	FFF6	FF	FF	B6
29	1D	Light blue	0,71	1,00	1,00	2D	3F	3F	F7	B7FF	B6	FF	FF
30	1E	Sky blue	0,71	0,71	1,00	2D	2D	3F	E7	B5BF	B6	B6	FF
31	1F	Rose pink	1,00	0,71	1,00	3F	2D	3F	EF	FDBF	FF	B6	FF
32	20	Pink	1,00	0,71	0,86	3F	2D	36	(EF)	FDBB	FF	B6	DB
33	21	Beige	1,00	0,86	0,71	3F	36	2D	F9	FED6	FF	DB	B6
34	22	Pastel pink	1,00	0,86	0,86	3F	36	36	(F9)	FEDB	FF	DB	DB
35	23	Pastel yellow	1,00	1,00	0,86	3F	3F	36	(FE)	FFFB	FF	FF	DB
36	24	Pastel green	0,86	1,00	0,86	36	3F	36	FE	DFFB	DB	FF	DB
37	25	Pastel cyan	0,86	1,00	1,00	36	3F	3F	(FC)	DFFF	DB	FF	FF
38	26	Pastel blue	0,86	0,86	1,00	36	36	3F	(FC)	DEDF	DB	DB	FF
39	27	Pastel rose	1,00	0,86	1,00	3F	36	3F	FD	FEDF	FF	DB	FF
40	28	Brick	0,71	0,43	0,43	2D	1B	1B	57	B36D	B6	6D	6D
41	29	Light khaki	0,71	0,71	0,43	2D	2D	1B	C7	B5AD	B6	B6	6D
42	2A	Dull green	0,43	0,71	0,43	1B	2D	1B	8F	6DAD	6D	B6	6D
43	2B	Dull cyan	0,43	0,71	0,71	1B	2D	2D	AB	6DB6	6D	B6	B6
44	2C	Steel blue	0,43	0,43	0,71	1B	1B	2D	3B	6B76	6D	6D	B6
45	2D	Dull pink	0,71	0,43	0,71	2D	1B	2D	73	B376	B6	6D	B6
46	2E	Brown	0,43	0,14	0,14	1B	09	09	0B	6924	6D	24	24
47	2F	Khaki	0,43	0,43	0,14	1B	1B	09	1B	6B64	6D	6D	24
48	30	Dusky green	0,14	0,43	0,14	09	1B	09	13	2364	24	6D	24
49	31	Dusky blue	0,14	0,43	0,43	09	1B	1B	17	236D	24	6D	6D
50	32	Midnight blue	0,14	0,14	0,43	09	09	1B	07	212D	24	24	6D
51	33	Plum	0,43	0,14	0,43	1B	09	1B	0F	692D	6D	24	6D
52	34	Dusky pink	0,71	0,29	0,57	2D	12	24	*71*	B252	B6	49	92
53	35	Buff	0,71	0,57	0,29	2D	24	12	*C5*	B489	B6	92	49
54	36	Avocado	0,57	0,71	0,29	24	2D	12	C6	95A9	92	B6	49
55	37	Dull turquoise	0,29	0,71	0,57	12	2D	24	AA	4DB2	49	B6	92
56	38	Dull blue	0,29	0,57	0,71	12	24	2D	*A8*	4C96	49	92	B6
57	39	Faded purple	0,57	0,29	0,71	24	12	2D	*70*	9256	92	49	B6
58	3A	Cerise	0,57	0,00	0,29	24	00	12	44	9009	92	00	49
59	3B	Tan	0,57	0,29	0,00	24	12	00	50	9240	92	49	00
60	3C	Grass green	0,29	0,57	0,00	12	24	00	88	4C80	49	92	00
61	3D	Sea green	0,00	0,57	0,29	00	24	12	84	0489	00	92	49
62	3E	Ultramarine	0,00	0,29	0,57	00	12	24	30	0252	00	49	92
63	3F	Deep purple	0,29	0,00	0,57	12	00	24	28	4812	49	00	92

Standard palette map - colours $40 to $7f

Colour number		Colour name	Colour value			VGA DAC			8 bit colour	16 bit colour	24 bit		
			R	G	B	R	G	B			R	G	B
64	40		0,00	0,00	0,29	00	00	12	04	0009	00	00	49
65	41		0,14	0,00	0,14	09	00	09	01	2004	24	00	24
66	42		0,14	0,00	0,43	09	00	1B	05	200D	24	00	6D
67	43		0,14	0,00	0,71	09	00	2D	21	2016	24	00	B6
68	44		0,14	0,00	1,00	09	00	3F	25	201F	24	00	FF
69	45		0,29	0,00	0,00	12	00	00	08	4800	49	00	00
70	46		0,29	0,00	0,29	12	00	12	0C	4809	49	00	49
71	47		0,29	0,00	0,86	12	00	36	2C	481B	49	00	DB
72	48		0,43	0,00	0,14	1B	00	09	09	6804	6D	00	24
73	49		0,43	0,00	0,43	1B	00	1B	0D	680D	6D	00	6D
74	4A		0,43	0,00	0,71	1B	00	2D	29	6816	6D	00	B6
75	4B		0,43	0,00	1,00	1B	00	3F	2D	681F	6D	00	FF
76	4C		0,71	0,00	0,14	2D	00	09	41	B004	B6	00	24
77	4D		0,71	0,00	0,43	2D	00	1B	45	B00D	B6	00	6D
78	4E		0,71	0,00	0,71	2D	00	2D	61	B016	B6	00	B6
79	4F		0,71	0,00	1,00	2D	00	3F	65	B01F	B6	00	FF
80	50		0,86	0,00	0,00	36	00	00	48	D800	DB	00	00
81	51		0,86	0,00	0,29	36	00	12	4C	D809	DB	00	49
82	52		0,86	0,00	0,57	36	00	24	68	D812	DB	00	92
83	53		0,86	0,00	0,86	36	00	36	6C	D81B	DB	00	DB
84	54		1,00	0,00	0,43	3F	00	1B	4D	F80D	FF	00	6D
85	55		0,00	0,14	0,00	00	09	00	02	0120	00	24	00
86	56		0,00	0,14	0,29	00	09	12	06	0129	00	24	49
87	57		0,00	0,14	0,57	00	09	24	22	0132	00	24	92
88	58		0,00	0,14	0,86	00	09	36	26	013B	00	24	DB
89	59		0,14	0,14	0,71	09	09	2D	23	2136	24	24	B6
90	5A		0,14	0,14	1,00	09	09	3F	27	213F	24	24	FF
91	5B		0,29	0,14	0,00	12	09	00	0A	4920	49	24	00
92	5C		0,29	0,14	0,29	12	09	12	0E	4929	49	24	49
93	5D		0,29	0,14	0,57	12	09	24	2A	4932	49	24	92
94	5E		0,29	0,14	0,86	12	09	36	2E	493B	49	24	DB
95	5F		0,43	0,14	0,71	1B	09	2D	2B	6936	6D	24	B6
96	60		0,43	0,14	1,00	1B	09	3F	2F	693F	6D	24	FF
97	61		0,57	0,14	0,00	24	09	00	42	9120	92	24	00
98	62		0,57	0,14	0,29	24	09	12	46	9129	92	24	49
99	63		0,57	0,14	0,57	24	09	24	62	9132	92	24	92
100	64		0,57	0,14	0,86	24	09	36	66	913B	92	24	DB
101	65		0,71	0,14	0,14	2D	09	09	43	B124	B6	24	24
102	66		0,71	0,14	0,43	2D	09	1B	47	B12D	B6	24	6D
103	67		0,71	0,14	0,71	2D	09	2D	63	B136	B6	24	B6
104	68		0,71	0,14	1,00	2D	09	3F	67	B13F	B6	24	FF
105	69		0,86	0,14	0,00	36	09	00	4A	D920	DB	24	00
106	6A		0,86	0,14	0,29	36	09	12	4E	D929	DB	24	49
107	6B		0,86	0,14	0,57	36	09	24	6A	D932	DB	24	92
108	6C		0,86	0,14	0,86	36	09	36	6E	D93B	DB	24	DB
109	6D		1,00	0,14	0,14	3F	09	09	4B	F924	FF	24	24
110	6E		1,00	0,14	0,43	3F	09	1B	4F	F92D	FF	24	6D
111	6F		1,00	0,14	0,71	3F	09	2D	6B	F936	FF	24	B6
112	70		1,00	0,14	1,00	3F	09	3F	6F	F93F	FF	24	FF
113	71		0,00	0,29	0,00	00	12	00	10	0240	00	49	00
114	72		0,00	0,29	0,29	00	12	12	14	0249	00	49	49
115	73		0,00	0,29	0,86	00	12	36	34	025B	00	49	DB
116	74		0,14	0,29	0,14	09	12	09	11	2244	24	49	24
117	75		0,14	0,29	0,43	09	12	1B	15	224D	24	49	6D
118	76		0,14	0,29	0,71	09	12	2D	31	2256	24	49	B6
119	77		0,14	0,29	1,00	09	12	3F	35	225F	24	49	FF
120	78		0,29	0,29	0,00	12	12	00	18	4A40	49	49	00
121	79		0,29	0,29	0,57	12	12	24	38	4A52	49	49	92
122	7A		0,29	0,29	0,86	12	12	36	3C	4A5B	49	49	DB
123	7B		0,43	0,29	0,14	1B	12	09	19	6A44	6D	49	24
124	7C		0,43	0,29	0,43	1B	12	1B	1D	6A4D	6D	49	6D
125	7D		0,43	0,29	0,71	1B	12	2D	39	6A56	6D	49	B6
126	7E		0,43	0,29	1,00	1B	12	3F	3D	6A5F	6D	49	FF
127	7F		0,57	0,29	0,29	24	12	12	54	9249	92	49	49

Standard palette map - colours $80 to $bf

Colour number		Colour name	Colour value			VGA DAC			8 bit colour	16 bit colour	24 bit		
			R	G	B	R	G	B			R	G	B
128	80		0,57	0,29	0,86	24	12	36	74	925B	92	49	DB
129	81		0,71	0,29	0,14	2D	12	09	51	B244	B6	49	24
130	82		0,71	0,29	0,43	2D	12	1B	55	B24D	B6	49	6D
131	83		0,71	0,29	1,00	2D	12	3F	75	B25F	B6	49	FF
132	84		0,86	0,29	0,00	36	12	00	58	DA40	DB	49	00
133	85		0,86	0,29	0,29	36	12	12	5C	DA49	DB	49	49
134	86		0,86	0,29	0,57	36	12	24	78	DA52	DB	49	92
135	87		0,86	0,29	0,86	36	12	36	7C	DA5B	DB	49	DB
136	88		1,00	0,29	0,14	3F	12	09	59	FA44	FF	49	24
137	89		1,00	0,29	0,43	3F	12	1B	5D	FA4D	FF	49	6D
138	8A		1,00	0,29	0,71	3F	12	2D	79	FA56	FF	49	B6
139	8B		1,00	0,29	1,00	3F	12	3F	7D	FA5F	FF	49	FF
140	8C		0,00	0,43	0,00	00	1B	00	12	0360	00	6D	00
141	8D		0,00	0,43	0,29	00	1B	12	16	0369	00	6D	49
142	8E		0,00	0,43	0,57	00	1B	24	32	0372	00	6D	92
143	8F		0,00	0,43	0,86	00	1B	36	36	037B	00	6D	DB
144	90		0,14	0,43	0,71	09	1B	2D	33	2376	24	6D	B6
145	91		0,14	0,43	1,00	09	1B	3F	37	237F	24	6D	FF
146	92		0,29	0,43	0,00	12	1B	00	1A	4B60	49	6D	00
147	93		0,29	0,43	0,29	12	1B	12	1E	4B69	49	6D	49
148	94		0,29	0,43	0,57	12	1B	24	3A	4B72	49	6D	92
149	95		0,29	0,43	0,86	12	1B	36	3E	4B7B	49	6D	DB
150	96		0,43	0,43	1,00	1B	1B	3F	3F	6B7F	6D	6D	FF
151	97		0,57	0,43	0,00	24	1B	00	52	9360	92	6D	00
152	98		0,57	0,43	0,29	24	1B	12	56	9369	92	6D	49
153	99		0,57	0,43	0,57	24	1B	24	72	9372	92	6D	92
154	9A		0,57	0,43	0,86	24	1B	36	76	937B	92	6D	DB
155	9B		0,71	0,43	0,14	2D	1B	09	53	B364	B6	6D	24
156	9C		0,71	0,43	1,00	2D	1B	3F	77	B37F	B6	6D	FF
157	9D		0,86	0,43	0,00	36	1B	00	5A	DB60	DB	6D	00
158	9E		0,86	0,43	0,29	36	1B	12	5E	DB69	DB	6D	49
159	9F		0,86	0,43	0,57	36	1B	24	7A	DB72	DB	6D	92
160	A0		0,86	0,43	0,86	36	1B	36	7E	DB7B	DB	6D	DB
161	A1		1,00	0,43	0,14	3F	1B	09	5B	FB64	FF	6D	24
162	A2		1,00	0,43	0,43	3F	1B	1B	5F	FB6D	FF	6D	6D
163	A3		1,00	0,43	0,71	3F	1B	2D	7B	FB76	FF	6D	B6
164	A4		1,00	0,43	1,00	3F	1B	3F	7F	FB7F	FF	6D	FF
165	A5		0,14	0,57	0,14	09	24	09	81	2484	24	92	24
166	A6		0,14	0,57	0,43	09	24	1B	85	248D	24	92	6D
167	A7		0,14	0,57	0,71	09	24	2D	A1	2496	24	92	B6
168	A8		0,14	0,57	1,00	09	24	3F	A5	249F	24	92	FF
169	A9		0,29	0,57	0,29	12	24	12	8C	4C89	49	92	49
170	AA		0,29	0,57	0,86	12	24	36	AC	4C9B	49	92	DB
171	AB		0,43	0,57	0,14	1B	24	09	89	6C84	6D	92	24
172	AC		0,43	0,57	0,43	1B	24	1B	8D	6C8D	6D	92	6D
173	AD		0,43	0,57	0,71	1B	24	2D	A9	6C96	6D	92	B6
174	AE		0,43	0,57	1,00	1B	24	3F	AD	6C9F	6D	92	FF
175	AF		0,57	0,57	0,29	24	24	12	C4	9489	92	92	49
176	B0		0,57	0,57	0,86	24	24	36	E4	949B	92	92	DB
177	B1		0,71	0,57	0,14	2D	24	09	C1	B484	B6	92	24
178	B2		0,71	0,57	0,71	2D	24	2D	E1	B496	B6	92	B6
179	B3		0,71	0,57	1,00	2D	24	3F	E5	B49F	B6	92	FF
180	B4		0,86	0,57	0,00	36	24	00	C8	DC80	DB	92	00
181	B5		0,86	0,57	0,29	36	24	12	CC	DC89	DB	92	49
182	B6		0,86	0,57	0,57	36	24	24	E8	DC92	DB	92	92
183	B7		0,86	0,57	0,86	36	24	36	EC	DC9B	DB	92	DB
184	B8		1,00	0,57	0,43	3F	24	1B	CD	FC8D	FF	92	6D
185	B9		1,00	0,57	0,71	3F	24	2D	E9	FC96	FF	92	B6
186	BA		1,00	0,57	1,00	3F	24	3F	ED	FC9F	FF	92	FF
187	BB		0,00	0,71	0,00	00	2D	00	82	05A0	00	B6	00
188	BC		0,00	0,71	0,29	00	2D	12	86	05A9	00	B6	49
189	BD		0,00	0,71	0,57	00	2D	24	A2	05B2	00	B6	92
190	BE		0,00	0,71	0,86	00	2D	36	A6	05BB	00	B6	DB
191	BF		0,14	0,71	0,14	09	2D	09	83	25A4	24	B6	24

Standard palette map - colours $c0 to $ff

Colour number	Colour name	Colour value R	G	B	VGA DAC R	G	B	8 bit colour	16 bit colour	24 bit R	G	B
192	C0		0,14	0,71	0,43	09	2D	1B	87	25AD	24	B6	6D
193	C1		0,14	0,71	0,71	09	2D	2D	A3	25B6	24	B6	B6
194	C2		0,14	0,71	1,00	09	2D	3F	A7	25BF	24	B6	FF
195	C3		0,29	0,71	0,00	12	2D	00	8A	4DA0	49	B6	00
196	C4		0,29	0,71	0,29	12	2D	12	8E	4DA9	49	B6	49
197	C5		0,29	0,71	0,86	12	2D	36	AE	4DBB	49	B6	DB
198	C6		0,43	0,71	0,14	1B	2D	09	8B	6DA4	6D	B6	24
199	C7		0,43	0,71	1,00	1B	2D	3F	AF	6DBF	6D	B6	FF
200	C8		0,57	0,71	0,00	24	2D	00	C2	95A0	92	B6	00
201	C9		0,57	0,71	0,57	24	2D	24	E2	95B2	92	B6	92
202	CA		0,57	0,71	0,86	24	2D	36	E6	95BB	92	B6	DB
203	CB		0,71	0,71	0,14	2D	2D	09	C3	B5A4	B6	B6	24
204	CC		0,86	0,71	0,00	36	2D	00	CA	DDA0	DB	B6	00
205	CD		0,86	0,71	0,29	36	2D	12	CE	DDA9	DB	B6	49
206	CE		0,86	0,71	0,57	36	2D	24	EA	DDB2	DB	B6	92
207	CF		0,86	0,71	0,86	36	2D	36	EE	DDBB	DB	B6	DB
208	D0		1,00	0,71	0,14	3F	2D	09	CB	FDA4	FF	B6	24
209	D1		1,00	0,71	0,43	3F	2D	1B	CF	FDAD	FF	B6	6D
210	D2		0,00	0,86	0,00	00	36	00	90	06C0	00	DB	00
211	D3		0,00	0,86	0,29	00	36	12	94	06C9	00	DB	49
212	D4		0,00	0,86	0,57	00	36	24	B0	06D2	00	DB	92
213	D5		0,00	0,86	0,86	00	36	36	B4	06DB	00	DB	DB
214	D6		0,14	0,86	0,14	09	36	09	91	26C4	24	DB	24
215	D7		0,14	0,86	0,43	09	36	1B	95	26CD	24	DB	6D
216	D8		0,14	0,86	0,71	09	36	2D	B1	26D6	24	DB	B6
217	D9		0,14	0,86	1,00	09	36	3F	B5	26DF	24	DB	FF
218	DA		0,29	0,86	0,00	12	36	00	98	4EC0	49	DB	00
219	DB		0,29	0,86	0,29	12	36	12	9C	4EC9	49	DB	49
220	DC		0,29	0,86	0,57	12	36	24	B8	4ED2	49	DB	92
221	DD		0,29	0,86	0,86	12	36	36	BC	4EDB	49	DB	DB
222	DE		0,43	0,86	0,14	1B	36	09	99	6EC4	6D	DB	24
223	DF		0,43	0,86	0,43	1B	36	1B	9D	6ECD	6D	DB	6D
224	E0		0,43	0,86	0,71	1B	36	2D	B9	6ED6	6D	DB	B6
225	E1		0,43	0,86	1,00	1B	36	3F	BD	6EDF	6D	DB	FF
226	E2		0,57	0,86	0,00	24	36	00	D0	96C0	92	DB	00
227	E3		0,57	0,86	0,29	24	36	12	D4	96C9	92	DB	49
228	E4		0,57	0,86	0,57	24	36	24	F0	96D2	92	DB	92
229	E5		0,57	0,86	0,86	24	36	36	F4	96DB	92	DB	DB
230	E6		0,71	0,86	0,14	2D	36	09	D1	B6C4	B6	DB	24
231	E7		0,71	0,86	0,43	2D	36	1B	D5	B6CD	B6	DB	6D
232	E8		0,71	0,86	0,71	2D	36	2D	F1	B6D6	B6	DB	B6
233	E9		0,71	0,86	1,00	2D	36	3F	F5	B6DF	B6	DB	FF
234	EA		0,86	0,86	0,29	36	36	12	DC	DEC9	DB	DB	49
235	EB		0,86	0,86	0,57	36	36	24	F8	DED2	DB	DB	92
236	EC		1,00	0,86	0,43	3F	36	1B	DD	FECD	FF	DB	6D
237	ED		0,00	1,00	0,29	00	3F	12	96	07E9	00	FF	49
238	EE		0,14	1,00	0,43	09	3F	1B	97	27ED	24	FF	6D
239	EF		0,14	1,00	0,71	09	3F	2D	B3	27F6	24	FF	B6
240	F0		0,29	1,00	0,00	12	3F	00	9A	4FE0	49	FF	00
241	F1		0,29	1,00	0,29	12	3F	12	9E	4FE9	49	FF	49
242	F2		0,29	1,00	0,57	12	3F	24	BA	4FF2	49	FF	92
243	F3		0,29	1,00	0,86	12	3F	36	BE	4FFB	49	FF	DB
244	F4		0,43	1,00	0,14	1B	3F	09	9B	6FE4	6D	FF	24
245	F5		0,43	1,00	0,43	1B	3F	1B	9F	6FED	6D	FF	6D
246	F6		0,43	1,00	0,71	1B	3F	2D	BB	6FF6	6D	FF	B6
247	F7		0,43	1,00	1,00	1B	3F	3F	BF	6FFF	6D	FF	FF
248	F8		0,57	1,00	0,29	24	3F	12	D6	97E9	92	FF	49
249	F9		0,57	1,00	0,57	24	3F	24	F2	97F2	92	FF	92
250	FA		0,57	1,00	0,86	24	3F	36	F6	97FB	92	FF	DB
251	FB		0,71	1,00	0,14	2D	3F	09	D3	B7E4	B6	FF	24
252	FC		0,71	1,00	0,43	2D	3F	1B	D7	B7ED	B6	FF	6D
253	FD		0,86	1,00	0,29	36	3F	12	DE	DFE9	DB	FF	49
254	FE		0,86	1,00	0,57	36	3F	24	FA	DFF2	DB	FF	92
255	FF		1,00	1,00	0,43	3F	3F	1B	DF	FFED	FF	FF	6D

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