

Black Paint Functional Specification

Drawing No	1303/009/FS/3P95
Issue	1/3P95
Date	27/07/94
Author	Jonathan Coxhead
Sheets	
Last Issue	None

History

1.00 MRC 21/3/95 Updated for Developer pack.

Contents

Introduction

Paint will be extended to edit 32K or 16M colour sprites and to allow JPEG files to be imported as sprites. The Black Sprite Extend will supply the engine to do the latter: it provides JPEG rendering and decompressing SWI's. No facilities are provided to allow a sprite to be compressed back into JPEG using Paint, so this conversion is strictly a one way process.

Background

It is desirable that Paint should track the new facilities introduced into the operating system. For Black these are:

- rounding off the functionality provided in Sprite Extend and ColourTrans for deep (15- and 24-bit) sprites;
- adding OS support for JPEG files.

Therefore, Paint will be extended to edit deep sprites, and to allow the import of JPEG files.

User interface

Deep sprite support

The Medusa release of Paint will be extended so that deep sprites are supported fully. Although this provides many new facilites to the user, and is a significant increase in the functionality of the programme, it has a very simple specification: all Paint tools will work fully with all combinations of deep and shallow sprites. Wherever possible, no attempt will be made in Paint to disallow combinations that are illegal or have been illegal under older operating systems (e g, adding a palette to a deep sprite, shearing a new format sprite): instead, the error detection will be left to the underlying calls so that Paint can support these features as they are added.

The colours window of deep sprites will be represented by a "toolbox"-style colour picker dbox.

This will mean that the same version of Paint will continue to run under all operating systems, as at present. For a list of the facilities that this will make obvious to the user, the reader should refer to the Black Video Software Functional Specification 1303,005/FS; however, in brief they are:

- sprite operations on new-format sprites with masks (including insertion/deletion of columns and rows);
- support for palettes on these sprites;
- support for wide translation tables, as produced by ColourTrans.

JPEG support

Paint will provide the new facility of a JPEG to sprite converter.

The double-click action of a JPEG file will not be modified by Paint. If ChangeFSI has been seen, it will be loaded and the image displayed; if not, the usual error message will be displayed.

If a JPEG file is dragged to Paint's icon, it will be converted to a sprite file and opened. In order to reduce the complexity of Paint's user interface in this case, a further change will be made: when a single-sprite file is loaded into Paint, in addition to the sprite file viewer, a sprite window will be opened containing the sprite in the file (along with its colours window, if required). So in particular, the effect of dragging a JPEG to Paint will be that the image is immediately displayed in an editable form.

The JPEG generated will be converted as follows: the sprite produced will be in the current mode, and its size will be the same as the size of the JPEG (in OS units): this uses the assumption that JPEG pixels are 2OSU squares. It will have no gamma correction.

There will be no facilities to export JPEG images.

Robustness

The following input verification will be made to any sprite when it is loaded into Paint. (There is no need to do this on output, since Paint maintains the correctness of a sprite as it manipulates it, faults excepted.) The code for the following is to be implemented in Sprite Extend: Paint will call it from there.

The offset to the first sprite must lie within the "used" part of the sprite area
The offset to the free area must lie within the sprite area
FOR each sprite
DO the offset to the next sprite must lie within the "used" part of the sprite area
the first bit used must be in the range [0; 32) (0 for a new

```
            format sprite)
        the last bit must lie in the range [0; 32]
        the offset to the image must lie within this sprite
        the offset to the mask must lie within this sprite
        the size of an image with this many bpp and this width and
              height must fit within the space allowed for the image
        the size of a mask with this many bpp (1 for new format) and
              this width and height must fit within the space allowed
              for themask
    OD
```

Also, all offsets must be multiples of 4 - everything is word aligned. Although offsets are also normally positive, it is assumed they are unsigned numbers, and no upper bound is imposed.

If any of these tests fail, the image will not be loaded. Note that the mode number is not checked: sprites with illegal modes are explicitly allowed, since they can usefully occur in sprite files. An illegal mode number will be assumed to have 1bpp for the purposes of the image and mask size checks. These checks do not include facts which are "usually true" for sprites, but are not guaranteed by the sprite file definition: in particular, they allow an extension area, and they allow palettes of any size.

Development testing

Two standard files are used for developement testing, which contain each combination of depth and palette presence/absence, and each combination of x and y resolution. These will be used to ensure that each code path is exercised before the code is released.

Acceptance tests

The version of Paint produced by this work should be no slower than the Medusa release in all areas that are shared, i e, in the absence of JPEG objects. The size of the new code should be less than 10K squeezed.

External dependencies

None of the above can be tested properly until the Sprite Extend module is enhanced to provide the OSJPEG SWI's. A lot of the user-interface code can be written before then, however.