Character ROMs

Character ROMS are in CC06/CC04 chips (set 1?) and CC05/CC03 chips (set 2?). There are two bits per pixel. One bit plane is CC06 (or CC05 for the other set) and the other is CC04 (or CC03 for the other set) (overlayed on each other - one plane for one color bit, and the other place for the second color bit for a 2-bit color, or 4 possible colors within the character.

Character Size

Each ROM size is 2048 bytes. These are arranged as 256 characters with each character being 8x8 pixels (realized by 8 bytes). There are two ROMs per character set, so each of the 256 characters x 8 bytes per character have two bits for color. This give 4096 bytes per character set.

Screen RAM

Characters are written to screen ram, which starts at $9000 and goes to $93FF. There are 32 characters per row. The first part of screen ram is not visible, from the range of $9000 - $907F. The visible screen RAM starts at $9080 and ends at $93FF. This gives 28 rows by 32 columns of screen RAM.

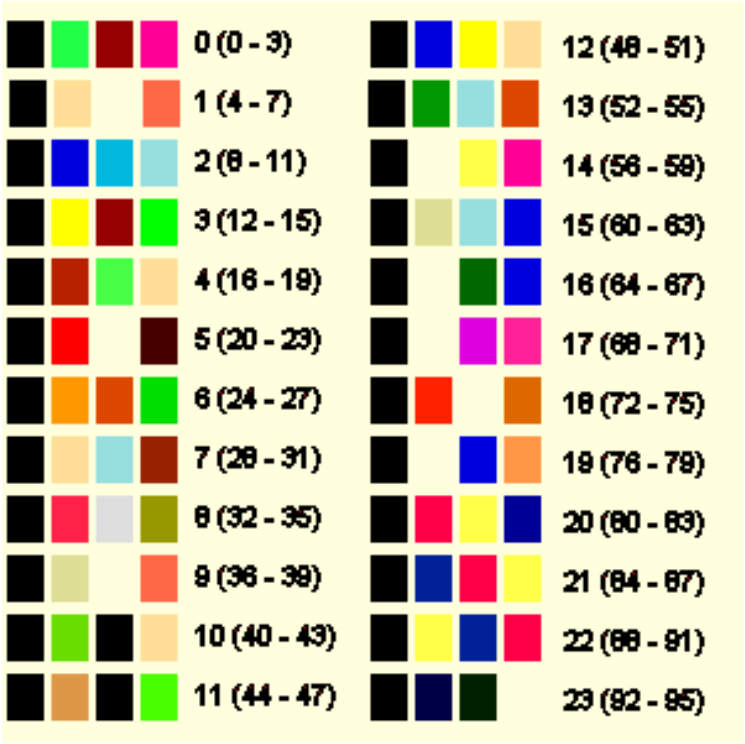
Color RAM

Color / attribute information is written to the color RAM. This begins at $9C00 and ends at $9FFF. Each location corresponds to a screen RAM location (i.e. $9C00 corresponds to $9000, and $9FFF corresponds to $93FF). The color byte works as follows:
Bits 7-5 are not used
Bit 4 is the character set to use (0 - set 1, 1 = set 2)
Bits 3-0 is the palette scheme color

As you can see, the character set to use is set by selecting bit 4 in the color RAM. The palette scheme color selected (0 - F) will allow the character written to screen RAM to use one of four colors for that selected palette (each palette has four colors to choose from). The character to write is selected by choosing the character index value (0 - $FF) for one of the 256 characters.

Palette

The palette for crazy climber is shown below:



Character / Sprite Color Selection

The palette value is selected by the color RAM byte (bits 3-0). This selects a group of four colors for a palette index of 0 - 15. The color within the palette group is selected by the two bits (four colors) of the character set being used (written to screen RAM).

Big Sprite Color Selection

TBD - it's rumored that the colors are selected at index 16 - 23.

Sprites

Sprite Data

Sprite data uses the character ROMS (CC06/CC04 or CC05/CC03 set). These are arranged as described in the characters section above.

Each sprite is 16 bits (2 bytes) per row with 16 rows. This gives 2 bytes x 16 rows, or 32 bytes per sprite. The ROM size for CC05 and CC03 is 2048 bytes. This gives 64 32-byte sprites with 2-bit color (4 possible colors).

Sprite Control

Sprite control begins at memory address $9880 and continues for 32 bytes (to $989F). Each sprite control is 4 bytes, which gives control over 8 sprites. Each 4-byte sprite control is defined below:

Byte 0 (Code / Attribute)

Bit 7: Y invert
Bit 6: X invert
Bits 5 - 0: Sprite code (0 - 31 for our 32 possible sprites)

Byte 1 (Color)
Bit 7 - 5: Not used
Bit 4: 0 = Character set 1, 1 = Character set 2
Bits 3-0: Color (Palette scheme 0 - 15)

Byte 2 (Y Position)

Byte 3 (X Position)

If the character set is 1, then the sprite code references the first 64 sprites. If the character set is 2, then the sprite code references the last 64 sprites.

Big Sprites

Big Sprite ROMS are in CC02 and CC01 chips. These are arranged as 256 sprites with 8 rows per sprite in each chip.