L2/17-435

2017-12-22

Universal Multiple-Octet Coded Character Set
International Organization for Standardization
Organisation Internationale de Normalisation
Международная организация по стандартизации

Doc Type: **Working Group Document**
Title: **Proposal to add characters from legacy computers and teletext to the UCS**
Source: **Terminals Working Group**
Authors: **Doug Ewell, Rebecca Bettencourt, Michael Everson, Eduardo Marín Silva, Elias Mårtenson, Mark Shoulson, Shawn Steele, and Rebecca Turner**
Status: **Individual Contribution**
Action: **For consideration by JTC1/SC2/WG2 and UTC**
Date: **2017-12-22**

1. Introduction. This document proposes the addition to the UCS of 207 new graphic characters and 198 new variation sequences, to provide compatibility with a wide range of home computers, or "microcomputers," manufactured approximately from the mid-1970s to the mid-1980s, and with the teletext broadcasting standard originally developed in the early 1970s.

2. History. Box-drawing characters, solid and shaded blocks, and similar graphic characters were encoded in the UCS in 1991 (Unicode 1.0) for compatibility with established character sets, both in popular microcomputers—particularly the IBM PC—and in terminal-emulation software. The set of block characters was augmented in 1999 (Unicode 3.0) and in 2002 (Unicode 3.2) to cover additional platforms, due largely to proposals by Frank da Cruz (L2/98-353 through -355, L2/98-413, and L2/00-159), which also included C1 and EBCDIC control pictures, hex byte pictures, and some other graphic characters that were not accepted.

Over the years that followed, suggestions were occasionally made on the Unicode public mailing list to add characters from legacy platforms, but few formal proposals emerged. One that did was "Proposal to create a new block for missing Block Element characters," by Eduardo Marín Silva (L2/17-194), which proposed five characters from the Sinclair ZX80 and ZX81 character sets.

A list discussion in April 2017 concerning the "PETSCII" character set, used in various forms by Commodore home computers ranging from the PET (1977) to the C128 (1985), led to the formation of an ad-hoc Terminals Working Group, which is responsible for this document.

Computers of this era enjoyed a great deal of popularity—the Commodore 64 is *still*, to this day, the largest-selling single computer model of all time—and spawned a large number of computer clubs and user groups devoted to these machines. Some of the original user groups are still in existence, and new ones, often online-only, have emerged more recently. The characters proposed here are intended to benefit these users and hobbyists, by providing round-trip convertibility of character data between legacy platforms and the UCS. They may also facilitate the creation of software for these platforms, such as emulators and cross-assemblers.

3. Microcomputer platforms. The group considered the following platforms and character sets:

- Apple 8-bit computers (II, II Plus, IIe, III, and the 16-bit IIGS), including MouseText
- Atari 8-bit computers (400, 800, XL, XE) ("ATASCII")
- Atari 16-bit computers (ST, STE, TT, Falcon), including the GEM windowing system
- Commodore 8-bit computers (PET, VIC-20, 64, 128) ("PETSCII")
- Commodore Amiga (500, 1000, etc.)
- Sinclair 8-bit computers (ZX80, ZX81, ZX Spectrum, and Timex Sinclair equivalents)
- Tandy TRS-80 computers (TRS-80 Model I, Model III, Model 4, Color Computer)
- Texas Instruments TI-99/4A

For many of these platforms, information about the character sets and text and graphics modes was available only through scanned copies of user manuals and photographs of screens showing a full or partial character dump. The group considered additional, lesser-used platforms, such as the Mattel Aquarius, but found even less supporting information; in some cases, it was impossible to identify certain characters used by these machines.

4. Teletext. Teletext was a service invented in the United Kingdom in the early 1970s for broadcasting pages of information, generally text and simple block graphics, to analog television receivers via the vertical blanking interval. Teletext found its greatest popularity in Europe, where it was commonplace until the adoption of digital television; almost all analog television sets sold in Europe since the early 1980s had built-in teletext decoders.

Several different 7-bit character sets were defined for teletext, including a complete set of 2 × 3 block graphics (64 in all), analogous to the block quadrants found in other platforms, as well as additional mosaic graphics. There was also a set of 27 control characters which could be used to select foreground and background color, character height (single or double), and other attributes, similar to those found in the ISO 6429 (ANSI X3.64) standard which was introduced later. Figure 9 illustrates several of these display techniques used on a single page. At least one line of microcomputers (the BBC Model B Microcomputer, manufactured by Acorn) supported a teletext display mode.

Later versions of the teletext specification included features such as (relatively) high-resolution graphics and dynamically redefinable character sets (DRCS), which are not considered in this document.

5. Graphic characters. Most of the characters proposed in this document are *semigraphics*: block-style symbols which could be combined to simulate an all-points-addressable graphic display. Many platforms used these text characters to support a so-called "graphics mode": small blocks could be "plotted" at various coordinates, and the appropriate full-sized block character consisting of the necessary "on" and "off" blocks would be displayed in text mode (Figure 8). The set also includes numerous box-drawing and shading characters, and some miscellaneous characters such as arrows and stick figures, which were present in the target platforms.

The word "sextant" is used in this document, by analogy with "quadrant"—a term used for certain UCS characters since 1999—to refer to a semigraphics block consisting of six smaller blocks or "cells" arranged in two columns and three rows. In the teletext specification, characters in this group could be displayed either with the cells joined together, as with the existing quadrant characters, or with a narrow space between cells. A teletext emulator could interpret the control character U+001A ("separated

graphics") to display space between cells, or U+0019 ("contiguous graphics") to revert to the default, joined appearance (Figure 11).

Four of the 64 sextant block characters were unified with existing characters: the left and right half blocks and full block were unified with the visually identical U+258C, U+2590, and U+2588, while the empty block can be mapped to an existing space character with suitable properties, such as U+00A0 NO-BREAK SPACE.

Other line-drawing and partial-block characters proposed in this document were determined not to be unifiable with existing characters. For example, the horizontal one-eighth blocks are similar in nature to the horizontal scan line characters at U+23BA through U+23BD and U+2500, but are defined strictly in terms of an 8-row cell, just as the horizontal scan lines are defined in terms of a 9-row cell. In a similar way, and additionally because of source separation, the two 4 × 4 checkerboards from PETSCII could not be unified with U+2592 MEDIUM SHADE or with the proposed U+1FBA4 INVERSE MEDIUM SHADE. New semigraphics characters proposed here are intended to "fit together" visually, the same way the existing ones do.

Some of the graphic characters are intended to be used together, to represent line-drawing images that would not fit within a single character block. Examples include LEFT, MIDDLE, and RIGHT THIRD WHITE RIGHT POINTING INDEX from the TRS-80 Model III and Model 4, and LEFT and RIGHT HALF RUNNING MAN from MouseText on the Apple IIc. These are analogous to U+2320 TOP HALF INTEGRAL and U+2321 BOTTOM HALF INTEGRAL, which like the present characters were encoded for compatibility.

6. BORDER-COLOURED FULL BLOCK. Microcomputers typically displayed video output on a television instead of a monitor, and usually displayed a visible border around the text or graphics content. Because this border was often prominent, many microcomputers defined a separate "border color" in addition to foreground and background colors. The TI-99/4A, uniquely, had a text character that displayed as a full block in the same color as the border (Figure 5), called the *edge character* in Texas Instruments documentation; U+1FBFF BORDER-COLOURED FULL BLOCK is proposed as the functional equivalent of this character.

7. Variation sequences. Many of the characters found on microcomputers are visual variants of other characters, most commonly those in each computer's basic 7-bit character set. These 7-bit repertoires often included non-Latin letters and box-drawing characters, and almost never conformed exactly to any standard variety of ISO 646.

The group considered encoding these visual variants as atomic characters (e.g. "INVERSE COMMERCIAL AT"), but eventually determined that variation sequences would be most appropriate for the use cases involved. Variation sequences are intended for visual distinctions, not semantic, which is true for all of the characters proposed here. Variation selectors are default-ignorable, so the sequences proposed here will likely be implemented only by processes designed to work with legacy microcomputer data. Finally, the set of base characters presented here is likely incomplete (an Arabic-language Atari XE was identified, but not included here), and adding new variation sequences in the future, using the proposed model, seemed to have less impact than encoding additional atomic characters.

Representatives of the Atari ST user community have indicated that they would support variation selectors, particularly in cross-assemblers.

a. **Reverse video.** Microcomputers of the 1970s and 1980s, unable to display text in boldface or italics without special tricks, made heavy use of so-called "reverse" or "inverse video" mode, in which the foreground and background colors of a character were swapped (usually by toggling a bit in display memory). This technique was also used to create complementary semigraphics block characters, making optimal use of small character sets. Much of the extant character and semigraphics data from these early machines demonstrates the use of reverse video.

   Because reverse video is a defining feature of all of the target platforms, and to avoid proposing a large and possibly open-ended set of reverse-video clones of existing characters, a set of variation sequences involving U+FE0D VARIATION SELECTOR-14 is proposed here instead, to suggest that the base character in the sequence should be rendered in reverse video. Base characters in this list of variation sequences are those that were identified as part of one or more target platform character sets; the list is almost certainly not exhaustive.

   This mechanism is intended specifically for round-tripping fidelity and for special-purpose emulators, not as a general-purpose markup tool. Semigraphics block characters, and other characters like INVERSE CHECK MARK that did not originally appear as the reverse-video variant of another character, do not use this mechanism; these are encoded atomically.

   The value FE0D was chosen for reverse video because it precedes FE0E and FE0F, which are already used for "text style" and "emoji style" respectively.

b. **Styled digits.** The character set for Atari 16-bit machines (ST and successors) defined clones of the ASCII digits 0 through 9, styled as upright (i.e. not oblique) seven-segment digits, in the code space below 0x20. These styled digits were particularly popular in Atari ST applications. The existing character U+FE01 VARIATION SELECTOR-2 is proposed to suggest this display style. Sequences are defined only for the Basic Latin digits U+0030 through U+0039.

   The value FE01 was chosen for segmented digits because 0030 FE00 is already a standardized variation sequence for a slashed zero. The use of FE01 here does not conflict with its existing use for CJK compatibility ideographs.

8. Characters not proposed. Not all characters identified in the target platforms were deemed suitable for encoding. For example, the character set for Atari 16-bit machines included two characters for the left and right halves of the Atari logo, and four which could be arranged to form an image of the fictional character J.R. "Bob" Dobbs (see Wikipedia article). Both of these symbols, like the existing Apple logo, were determined to be IP-encumbered and thus are not proposed here.

Glyphs from lesser-used platforms that the group observed but could not identify are also not proposed, as described above.

Characters that could not be attested in any of the target platforms are not proposed. One code point, U+1FBA7, was left unassigned in this proposal as a placeholder for the as-yet unattested *LEFT HALF BLOCK AND RIGHT HALF INVERSE MEDIUM SHADE, which would be the reverse-video equivalent of U+1FBA1 RIGHT HALF MEDIUM SHADE from the Aquarius.

Control characters from microcomputer platforms and teletext were considered, but determined to be out of scope for the UCS. These characters were located in what would today be considered the C0 control

range (0x00–0x1F) or the C1 control range (0x7F–0x9F). Processes that need to interchange these codes should simply interchange the binary C0 or C1 value, extended to the UCS code space but without further mapping. Emulators should treat these control codes as appropriate for the targeted environment. For example, a teletext emulator encountering the character U+0002 would display subsequent text on that line in green, until it encounters another control character that requests a color change, or starts a new line.

9. Character names. At least since the 1970s, international SDOs such as ECMA and national bodies such as ANSI and BSI have assigned names to the elements of coded character sets. By contrast, vendors of microcomputers, and even the developers of the teletext standard, tended to provide at best a code chart or image of a screen showing the character set, usually without names. We have attempted to invent names for these characters that are meaningful, unique, and conformant to WG2 and UTC guidelines.

10. Ordering and code point assignment. The proposed characters are presented roughly in groups: block sextants are together, followed by other mosaic graphics, and so forth. Although the exact order of these characters within their groups is not an overriding concern, it seems reasonable that the groups should be kept together.

All characters (with the exception of two arrows which seemed to fit logically within an existing block) are shown here with a suggested code point in a new block (1FB00..1FBFF) that is unassigned and adjacent to existing symbol blocks, according to the "Roadmap to the SMP," version 10.0.0. A placeholder block name, "Graphics for Legacy Computing," is listed in the summary form. However, it is understood that final assignment of blocks, code points, and block and character names is completely at the discretion of UTC and/or WG2.

11. Implementation. To assist implementers of emulators and conversion tools with the variety of mechanisms discussed in this proposal—existing and new block graphics characters, variation sequences for reverse video, control codes, and so forth—the group has developed an extensive set of mapping tables, providing suggested mappings from the legacy character sets and the UCS. The group is also drafting a Unicode Technical Note to explain the mechanisms and recommended techniques for working with them.

12. Unicode character properties.

```
2B96;ARROW POINTING UPWARDS THEN NORTH WEST;So;0;ON;;;;;N;;;;;
2B97;ARROW POINTING RIGHTWARDS THEN CURVING SOUTH WEST;So;0;ON;;;;;N;;;;;
1FB01;BLOCK SEXTANT-1;So;0;ON;;;;;N;;;;;
1FB02;BLOCK SEXTANT-2;So;0;ON;;;;;N;;;;;
1FB03;BLOCK SEXTANT-12;So;0;ON;;;;;N;;;;;
1FB04;BLOCK SEXTANT-3;So;0;ON;;;;;N;;;;;
1FB05;BLOCK SEXTANT-13;So;0;ON;;;;;N;;;;;
1FB06;BLOCK SEXTANT-23;So;0;ON;;;;;N;;;;;
1FB07;BLOCK SEXTANT-123;So;0;ON;;;;;N;;;;;
1FB08;BLOCK SEXTANT-4;So;0;ON;;;;;N;;;;;
1FB09;BLOCK SEXTANT-14;So;0;ON;;;;;N;;;;;
1FB0A;BLOCK SEXTANT-24;So;0;ON;;;;;N;;;;;
1FB0B;BLOCK SEXTANT-124;So;0;ON;;;;;N;;;;;
1FB0C;BLOCK SEXTANT-34;So;0;ON;;;;;N;;;;;
1FB0D;BLOCK SEXTANT-134;So;0;ON;;;;;N;;;;;
1FB0E;BLOCK SEXTANT-234;So;0;ON;;;;;N;;;;;
1FB0F;BLOCK SEXTANT-1234;So;0;ON;;;;;N;;;;;
1FB10;BLOCK SEXTANT-5;So;0;ON;;;;;N;;;;;
1FB11;BLOCK SEXTANT-15;So;0;ON;;;;;N;;;;;
1FB12;BLOCK SEXTANT-25;So;0;ON;;;;;N;;;;;
1FB13;BLOCK SEXTANT-125;So;0;ON;;;;;N;;;;;
1FB14;BLOCK SEXTANT-35;So;0;ON;;;;;N;;;;;
```

```
1FB16;BLOCK SEXTANT-235;So;0;ON;;;;;N;;;;;
1FB17;BLOCK SEXTANT-1235;So;0;ON;;;;;N;;;;;
1FB18;BLOCK SEXTANT-45;So;0;ON;;;;;N;;;;;
1FB19;BLOCK SEXTANT-145;So;0;ON;;;;;N;;;;;
1FB1A;BLOCK SEXTANT-245;So;0;ON;;;;;N;;;;;
1FB1B;BLOCK SEXTANT-1245;So;0;ON;;;;;N;;;;;
1FB1C;BLOCK SEXTANT-345;So;0;ON;;;;;N;;;;;
1FB1D;BLOCK SEXTANT-1345;So;0;ON;;;;;N;;;;;
1FB1E;BLOCK SEXTANT-2345;So;0;ON;;;;;N;;;;;
1FB1F;BLOCK SEXTANT-12345;So;0;ON;;;;;N;;;;;
1FB20;BLOCK SEXTANT-6;So;0;ON;;;;;N;;;;;
1FB21;BLOCK SEXTANT-16;So;0;ON;;;;;N;;;;;
1FB22;BLOCK SEXTANT-26;So;0;ON;;;;;N;;;;;
1FB23;BLOCK SEXTANT-126;So;0;ON;;;;;N;;;;;
1FB24;BLOCK SEXTANT-36;So;0;ON;;;;;N;;;;;
1FB25;BLOCK SEXTANT-136;So;0;ON;;;;;N;;;;;
1FB26;BLOCK SEXTANT-236;So;0;ON;;;;;N;;;;;
1FB27;BLOCK SEXTANT-1236;So;0;ON;;;;;N;;;;;
1FB28;BLOCK SEXTANT-46;So;0;ON;;;;;N;;;;;
1FB29;BLOCK SEXTANT-146;So;0;ON;;;;;N;;;;;
1FB2B;BLOCK SEXTANT-1246;So;0;ON;;;;;N;;;;;
1FB2C;BLOCK SEXTANT-346;So;0;ON;;;;;N;;;;;
1FB2D;BLOCK SEXTANT-1346;So;0;ON;;;;;N;;;;;
1FB2E;BLOCK SEXTANT-2346;So;0;ON;;;;;N;;;;;
1FB2F;BLOCK SEXTANT-12346;So;0;ON;;;;;N;;;;;
1FB30;BLOCK SEXTANT-56;So;0;ON;;;;;N;;;;;
1FB31;BLOCK SEXTANT-156;So;0;ON;;;;;N;;;;;
1FB32;BLOCK SEXTANT-256;So;0;ON;;;;;N;;;;;
1FB33;BLOCK SEXTANT-1256;So;0;ON;;;;;N;;;;;
1FB34;BLOCK SEXTANT-356;So;0;ON;;;;;N;;;;;
1FB35;BLOCK SEXTANT-1356;So;0;ON;;;;;N;;;;;
1FB36;BLOCK SEXTANT-2356;So;0;ON;;;;;N;;;;;
1FB37;BLOCK SEXTANT-12356;So;0;ON;;;;;N;;;;;
1FB38;BLOCK SEXTANT-456;So;0;ON;;;;;N;;;;;
1FB39;BLOCK SEXTANT-1456;So;0;ON;;;;;N;;;;;
1FB3A;BLOCK SEXTANT-2456;So;0;ON;;;;;N;;;;;
1FB3B;BLOCK SEXTANT-12456;So;0;ON;;;;;N;;;;;
1FB3C;BLOCK SEXTANT-3456;So;0;ON;;;;;N;;;;;
1FB3D;BLOCK SEXTANT-13456;So;0;ON;;;;;N;;;;;
1FB3E;BLOCK SEXTANT-23456;So;0;ON;;;;;N;;;;;
1FB40;LOWER LEFT BLOCK DIAGONAL LOWER MIDDLE LEFT TO LOWER CENTRE;So;0;ON;;;;;N;;;;;
1FB41;LOWER LEFT BLOCK DIAGONAL LOWER MIDDLE LEFT TO LOWER RIGHT;So;0;ON;;;;;N;;;;;
1FB42;LOWER LEFT BLOCK DIAGONAL UPPER MIDDLE LEFT TO LOWER CENTRE;So;0;ON;;;;;N;;;;;
1FB43;LOWER LEFT BLOCK DIAGONAL UPPER MIDDLE LEFT TO LOWER RIGHT;So;0;ON;;;;;N;;;;;
1FB44;LOWER LEFT BLOCK DIAGONAL UPPER LEFT TO LOWER CENTRE;So;0;ON;;;;;N;;;;;
1FB45;LOWER RIGHT BLOCK DIAGONAL UPPER MIDDLE LEFT TO UPPER CENTRE;So;0;ON;;;;;N;;;;;
1FB46;LOWER RIGHT BLOCK DIAGONAL UPPER MIDDLE LEFT TO UPPER RIGHT;So;0;ON;;;;;N;;;;;
1FB47;LOWER RIGHT BLOCK DIAGONAL LOWER MIDDLE LEFT TO UPPER CENTRE;So;0;ON;;;;;N;;;;;
1FB48;LOWER RIGHT BLOCK DIAGONAL LOWER MIDDLE LEFT TO UPPER RIGHT;So;0;ON;;;;;N;;;;;
1FB49;LOWER RIGHT BLOCK DIAGONAL LOWER LEFT TO UPPER CENTRE;So;0;ON;;;;;N;;;;;
1FB4A;LOWER RIGHT BLOCK DIAGONAL LOWER MIDDLE LEFT TO UPPER MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FB4B;LOWER RIGHT BLOCK DIAGONAL LOWER CENTRE TO LOWER MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FB4C;LOWER RIGHT BLOCK DIAGONAL LOWER LEFT TO LOWER MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FB4D;LOWER RIGHT BLOCK DIAGONAL LOWER CENTRE TO UPPER MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FB4E;LOWER RIGHT BLOCK DIAGONAL LOWER LEFT TO UPPER MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FB4F;LOWER RIGHT BLOCK DIAGONAL LOWER CENTRE TO UPPER RIGHT;So;0;ON;;;;;N;;;;;
1FB50;LOWER LEFT BLOCK DIAGONAL UPPER CENTRE TO UPPER MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FB51;LOWER LEFT BLOCK DIAGONAL UPPER LEFT TO UPPER MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FB52;LOWER LEFT BLOCK DIAGONAL UPPER CENTRE TO LOWER MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FB53;LOWER LEFT BLOCK DIAGONAL UPPER LEFT TO LOWER MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FB54;LOWER LEFT BLOCK DIAGONAL UPPER CENTRE TO LOWER RIGHT;So;0;ON;;;;;N;;;;;
1FB55;LOWER LEFT BLOCK DIAGONAL UPPER MIDDLE LEFT TO LOWER MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FB56;UPPER RIGHT BLOCK DIAGONAL LOWER MIDDLE LEFT TO LOWER CENTRE;So;0;ON;;;;;N;;;;;
1FB57;UPPER RIGHT BLOCK DIAGONAL LOWER MIDDLE LEFT TO LOWER RIGHT;So;0;ON;;;;;N;;;;;
1FB58;UPPER RIGHT BLOCK DIAGONAL UPPER MIDDLE LEFT TO LOWER CENTRE;So;0;ON;;;;;N;;;;;
1FB59;UPPER RIGHT BLOCK DIAGONAL UPPER MIDDLE LEFT TO LOWER RIGHT;So;0;ON;;;;;N;;;;;
1FB5A;UPPER RIGHT BLOCK DIAGONAL UPPER LEFT TO LOWER CENTRE;So;0;ON;;;;;N;;;;;
1FB5B;UPPER LEFT BLOCK DIAGONAL UPPER MIDDLE LEFT TO UPPER CENTRE;So;0;ON;;;;;N;;;;;
1FB5C;UPPER LEFT BLOCK DIAGONAL UPPER MIDDLE LEFT TO UPPER RIGHT;So;0;ON;;;;;N;;;;;
1FB5D;UPPER LEFT BLOCK DIAGONAL LOWER MIDDLE LEFT TO UPPER CENTRE;So;0;ON;;;;;N;;;;;
1FB5E;UPPER LEFT BLOCK DIAGONAL LOWER MIDDLE LEFT TO UPPER RIGHT;So;0;ON;;;;;N;;;;;
1FB5F;UPPER LEFT BLOCK DIAGONAL LOWER LEFT TO UPPER CENTRE;So;0;ON;;;;;N;;;;;
1FB60;UPPER LEFT BLOCK DIAGONAL LOWER MIDDLE LEFT TO UPPER MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FB61;UPPER LEFT BLOCK DIAGONAL LOWER CENTRE TO LOWER MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
```

```
1FB62;UPPER LEFT BLOCK DIAGONAL LOWER LEFT TO LOWER MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FB63;UPPER LEFT BLOCK DIAGONAL LOWER CENTRE TO UPPER MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FB64;UPPER LEFT BLOCK DIAGONAL LOWER LEFT TO UPPER MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FB65;UPPER LEFT BLOCK DIAGONAL LOWER CENTRE TO UPPER RIGHT;So;0;ON;;;;;N;;;;;
1FB66;UPPER RIGHT BLOCK DIAGONAL UPPER CENTRE TO UPPER MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FB67;UPPER RIGHT BLOCK DIAGONAL UPPER LEFT TO UPPER MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FB68;UPPER RIGHT BLOCK DIAGONAL UPPER CENTRE TO LOWER MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FB69;UPPER RIGHT BLOCK DIAGONAL UPPER LEFT TO LOWER MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FB6A;UPPER RIGHT BLOCK DIAGONAL UPPER CENTRE TO LOWER RIGHT;So;0;ON;;;;;N;;;;;
1FB6B;UPPER RIGHT BLOCK DIAGONAL UPPER MIDDLE LEFT TO LOWER MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FB6C;UPPER AND RIGHT AND LOWER TRIANGULAR THREE QUARTERS BLOCK;So;0;ON;;;;;N;;;;;
1FB6D;LEFT AND LOWER AND RIGHT TRIANGULAR THREE QUARTERS BLOCK;So;0;ON;;;;;N;;;;;
1FB6E;UPPER AND LEFT AND LOWER TRIANGULAR THREE QUARTERS BLOCK;So;0;ON;;;;;N;;;;;
1FB6F;LEFT AND UPPER AND RIGHT TRIANGULAR THREE QUARTERS BLOCK;So;0;ON;;;;;N;;;;;
1FB70;LEFT TRIANGULAR ONE QUARTER BLOCK;So;0;ON;;;;;N;;;;;
1FB71;UPPER TRIANGULAR ONE QUARTER BLOCK;So;0;ON;;;;;N;;;;;
1FB72;RIGHT TRIANGULAR ONE QUARTER BLOCK;So;0;ON;;;;;N;;;;;
1FB73;LOWER TRIANGULAR ONE QUARTER BLOCK;So;0;ON;;;;;N;;;;;
1FB74;VERTICAL ONE EIGHTH BLOCK-2;So;0;ON;;;;;N;;;;;
1FB75;VERTICAL ONE EIGHTH BLOCK-3;So;0;ON;;;;;N;;;;;
1FB76;VERTICAL ONE EIGHTH BLOCK-4;So;0;ON;;;;;N;;;;;
1FB77;VERTICAL ONE EIGHTH BLOCK-5;So;0;ON;;;;;N;;;;;
1FB78;VERTICAL ONE EIGHTH BLOCK-6;So;0;ON;;;;;N;;;;;
1FB79;VERTICAL ONE EIGHTH BLOCK-7;So;0;ON;;;;;N;;;;;
1FB7A;HORIZONTAL ONE EIGHTH BLOCK-2;So;0;ON;;;;;N;;;;;
1FB7B;HORIZONTAL ONE EIGHTH BLOCK-3;So;0;ON;;;;;N;;;;;
1FB7C;HORIZONTAL ONE EIGHTH BLOCK-4;So;0;ON;;;;;N;;;;;
1FB7D;HORIZONTAL ONE EIGHTH BLOCK-5;So;0;ON;;;;;N;;;;;
1FB7E;HORIZONTAL ONE EIGHTH BLOCK-6;So;0;ON;;;;;N;;;;;
1FB7F;HORIZONTAL ONE EIGHTH BLOCK-7;So;0;ON;;;;;N;;;;;
1FB80;LEFT AND LOWER ONE EIGHTH BLOCK;So;0;ON;;;;;N;;;;;
1FB81;LEFT AND UPPER ONE EIGHTH BLOCK;So;0;ON;;;;;N;;;;;
1FB82;RIGHT AND UPPER ONE EIGHTH BLOCK;So;0;ON;;;;;N;;;;;
1FB83;RIGHT AND LOWER ONE EIGHTH BLOCK;So;0;ON;;;;;N;;;;;
1FB84;UPPER AND LOWER ONE EIGHTH BLOCK;So;0;ON;;;;;N;;;;;
1FB85;HORIZONTAL ONE EIGHTH BLOCK-1358;So;0;ON;;;;;N;;;;;
1FB86;UPPER ONE QUARTER BLOCK;So;0;ON;;;;;N;;;;;
1FB87;UPPER THREE EIGHTHS BLOCK;So;0;ON;;;;;N;;;;;
1FB88;UPPER FIVE EIGHTHS BLOCK;So;0;ON;;;;;N;;;;;
1FB89;UPPER THREE QUARTERS BLOCK;So;0;ON;;;;;N;;;;;
1FB8A;UPPER SEVEN EIGHTHS BLOCK;So;0;ON;;;;;N;;;;;
1FB8B;RIGHT ONE QUARTER BLOCK;So;0;ON;;;;;N;;;;;
1FB8C;RIGHT THREE EIGHTHS BLOCK;So;0;ON;;;;;N;;;;;
1FB8D;RIGHT FIVE EIGHTHS BLOCK;So;0;ON;;;;;N;;;;;
1FB8E;RIGHT THREE QUARTERS BLOCK;So;0;ON;;;;;N;;;;;
1FB8F;RIGHT SEVEN EIGHTHS BLOCK;So;0;ON;;;;;N;;;;;
1FB90;UPPER RIGHT SEVEN EIGHTHS BLOCK;So;0;ON;;;;;N;;;;;
1FB91;LOWER RIGHT SEVEN EIGHTHS BLOCK;So;0;ON;;;;;N;;;;;
1FB92;LOWER LEFT SEVEN EIGHTHS BLOCK;So;0;ON;;;;;N;;;;;
1FB93;UPPER LEFT SEVEN EIGHTHS BLOCK;So;0;ON;;;;;N;;;;;
1FB94;LEFT ONE EIGHTH BLOCK AND RIGHT THREE QUARTERS BLOCK;So;0;ON;;;;;N;;;;;
1FB95;LEFT ONE QUARTER BLOCK AND RIGHT FIVE EIGHTHS BLOCK;So;0;ON;;;;;N;;;;;
1FB96;LEFT THREE EIGHTHS BLOCK AND RIGHT HALF BLOCK;So;0;ON;;;;;N;;;;;
1FB97;LEFT HALF BLOCK AND RIGHT THREE EIGHTHS BLOCK;So;0;ON;;;;;N;;;;;
1FB98;LEFT FIVE EIGHTHS BLOCK AND RIGHT ONE QUARTER BLOCK;So;0;ON;;;;;N;;;;;
1FB99;LEFT THREE QUARTERS BLOCK AND RIGHT ONE EIGHTH BLOCK;So;0;ON;;;;;N;;;;;
1FB9A;UPPER ONE EIGHTH BLOCK AND LOWER THREE QUARTERS BLOCK;So;0;ON;;;;;N;;;;;
1FB9B;UPPER ONE QUARTER BLOCK AND LOWER FIVE EIGHTHS BLOCK;So;0;ON;;;;;N;;;;;
1FB9C;UPPER THREE EIGHTHS BLOCK AND LOWER HALF BLOCK;So;0;ON;;;;;N;;;;;
1FB9D;UPPER HALF BLOCK AND LOWER THREE EIGHTHS BLOCK;So;0;ON;;;;;N;;;;;
1FB9E;UPPER FIVE EIGHTHS BLOCK AND LOWER ONE QUARTER BLOCK;So;0;ON;;;;;N;;;;;
1FB9F;UPPER THREE QUARTERS BLOCK AND LOWER ONE EIGHTH BLOCK;So;0;ON;;;;;N;;;;;
1FBA0;LEFT HALF MEDIUM SHADE;So;0;ON;;;;;N;;;;;
1FBA1;RIGHT HALF MEDIUM SHADE;So;0;ON;;;;;N;;;;;
1FBA2;UPPER HALF MEDIUM SHADE;So;0;ON;;;;;N;;;;;
1FBA3;LOWER HALF MEDIUM SHADE;So;0;ON;;;;;N;;;;;
1FBA4;INVERSE MEDIUM SHADE;So;0;ON;;;;;N;;;;;
1FBA5;UPPER HALF BLOCK AND LOWER HALF INVERSE MEDIUM SHADE;So;0;ON;;;;;N;;;;;
1FBA6;UPPER HALF INVERSE MEDIUM SHADE AND LOWER HALF BLOCK;So;0;ON;;;;;N;;;;;
1FBA8;LEFT HALF INVERSE MEDIUM SHADE AND RIGHT HALF BLOCK;So;0;ON;;;;;N;;;;;
1FBA9;FOUR-BY-FOUR CHECKER BOARD;So;0;ON;;;;;N;;;;;
1FBAA;REVERSE FOUR-BY-FOUR CHECKER BOARD;So;0;ON;;;;;N;;;;;
1FBAB;UPPER LEFT TO LOWER RIGHT FILL;So;0;ON;;;;;N;;;;;
1FBAC;INVERSE UPPER LEFT TO LOWER RIGHT FILL;So;0;ON;;;;;N;;;;;
```

```
1FBAD;UPPER RIGHT TO LOWER LEFT FILL;So;0;ON;;;;;N;;;;;
1FBAE;INVERSE UPPER RIGHT TO LOWER LEFT FILL;So;0;ON;;;;;N;;;;;
1FBAF;INVERSE CHECK MARK;So;0;ON;;;;;N;;;;;
1FBB0;BOX DRAWINGS LIGHT DIAGONAL UPPER CENTRE TO MIDDLE LEFT TO LOWER CENTRE;So;0;ON;;;;;N;;;;;
1FBB1;BOX DRAWINGS LIGHT DIAGONAL UPPER CENTRE TO MIDDLE RIGHT TO LOWER CENTRE;So;0;ON;;;;;N;;;;;
1FBB2;BOX DRAWINGS LIGHT DIAGONAL MIDDLE LEFT TO LOWER CENTRE TO MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FBB3;BOX DRAWINGS LIGHT DIAGONAL MIDDLE LEFT TO UPPER CENTRE TO MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FBB4;BOX DRAWINGS LIGHT DIAGONAL UPPER CENTRE TO MIDDLE LEFT;So;0;ON;;;;;N;;;;;
1FBB5;BOX DRAWINGS LIGHT DIAGONAL UPPER CENTRE TO MIDDLE RIGHT;So;0;ON;;;;;N;;;;;
1FBB6;BOX DRAWINGS LIGHT DIAGONAL MIDDLE LEFT TO LOWER CENTRE;So;0;ON;;;;;N;;;;;
1FBB7;BOX DRAWINGS LIGHT DIAGONAL MIDDLE RIGHT TO LOWER CENTRE;So;0;ON;;;;;N;;;;;
1FBB8;INVERSE BOX DRAWINGS LIGHT DIAGONAL CROSS;So;0;ON;;;;;N;;;;;
1FBB9;INVERSE BOX DRAWINGS LIGHT DIAGONAL MIDDLE RIGHT TO LOWER CENTRE;So;0;ON;;;;;N;;;;;
1FBBA;INVERSE BOX DRAWINGS LIGHT DIAGONAL DIAMOND;So;0;ON;;;;;N;;;;;
1FBC0;ARROWHEAD-SHAPED POINTER;So;0;ON;;;;;N;;;;;
1FBC1;LEFT HALF RUNNING MAN;So;0;ON;;;;;N;;;;;
1FBC2;RIGHT HALF RUNNING MAN;So;0;ON;;;;;N;;;;;
1FBC3;INVERSE DOWNWARDS ARROW WITH TIP LEFTWARDS;So;0;ON;;;;;N;;;;;
1FBC4;LEFTWARDS ARROW AND UPPER AND LOWER ONE EIGHTH BLOCK;So;0;ON;;;;;N;;;;;
1FBC5;RIGHTWARDS ARROW AND UPPER AND LOWER ONE EIGHTH BLOCK;So;0;ON;;;;;N;;;;;
1FBC6;DOWNWARDS ARROW AND RIGHT ONE EIGHTH BLOCK;So;0;ON;;;;;N;;;;;
1FBC7;UPWARDS ARROW AND RIGHT ONE EIGHTH BLOCK;So;0;ON;;;;;N;;;;;
1FBC8;LEFT HALF FOLDER;So;0;ON;;;;;N;;;;;
1FBC9;RIGHT HALF FOLDER;So;0;ON;;;;;N;;;;;
1FBCA;VOIDED GREEK CROSS;So;0;ON;;;;;N;;;;;
1FBCB;RIGHT OPEN SQUARED DOT;So;0;ON;;;;;N;;;;;
1FBCC;TWO PAIRS OF DIAGONAL LINES CROSSING;So;0;ON;;;;;N;;;;;
1FBCD;LEFT THIRD WHITE RIGHT POINTING INDEX;So;0;ON;;;;;N;;;;;
1FBCE;MIDDLE THIRD WHITE RIGHT POINTING INDEX;So;0;ON;;;;;N;;;;;
1FBCF;RIGHT THIRD WHITE RIGHT POINTING INDEX;So;0;ON;;;;;N;;;;;
1FBD0;NEGATIVE SQUARED QUESTION MARK;So;0;ON;;;;;N;;;;;
1FBD1;STICK FIGURE;So;0;ON;;;;;N;;;;;
1FBD2;STICK FIGURE WITH DRESS;So;0;ON;;;;;N;;;;;
1FBD3;WHITE UP-POINTING CHEVRON;So;0;ON;;;;;N;;;;;
1FBD4;HEAVY HORIZONTAL FILL;So;0;ON;;;;;N;;;;;
1FBD5;INVERSE HEAVY HORIZONTAL FILL;So;0;ON;;;;;N;;;;;
1FBFF;BORDER-COLOURED FULL BLOCK;So;0;ON;;;;;N;;;;;
```

13. Standardized variation sequences.

```
# Styled digits

0030 FE01; seven-segment appearance; # DIGIT ZERO
0031 FE01; seven-segment appearance; # DIGIT ONE
0032 FE01; seven-segment appearance; # DIGIT TWO
0033 FE01; seven-segment appearance; # DIGIT THREE
0034 FE01; seven-segment appearance; # DIGIT FOUR
0035 FE01; seven-segment appearance; # DIGIT FIVE
0036 FE01; seven-segment appearance; # DIGIT SIX
0037 FE01; seven-segment appearance; # DIGIT SEVEN
0038 FE01; seven-segment appearance; # DIGIT EIGHT
0039 FE01; seven-segment appearance; # DIGIT NINE

# Reverse video

0020 FE0D; reverse video; # SPACE
0021 FE0D; reverse video; # EXCLAMATION MARK
0022 FE0D; reverse video; # QUOTATION MARK
0023 FE0D; reverse video; # NUMBER SIGN
0024 FE0D; reverse video; # DOLLAR SIGN
0025 FE0D; reverse video; # PERCENT SIGN
0026 FE0D; reverse video; # AMPERSAND
0027 FE0D; reverse video; # APOSTROPHE
0028 FE0D; reverse video; # LEFT PARENTHESIS
0029 FE0D; reverse video; # RIGHT PARENTHESIS
002A FE0D; reverse video; # ASTERISK
002B FE0D; reverse video; # PLUS SIGN
002C FE0D; reverse video; # COMMA
002D FE0D; reverse video; # HYPHEN-MINUS
002E FE0D; reverse video; # FULL STOP
002F FE0D; reverse video; # SOLIDUS
0030 FE0D; reverse video; # DIGIT ZERO
```

```
0031 FE0D; reverse video; # DIGIT ONE
0032 FE0D; reverse video; # DIGIT TWO
0033 FE0D; reverse video; # DIGIT THREE
0034 FE0D; reverse video; # DIGIT FOUR
0035 FE0D; reverse video; # DIGIT FIVE
0036 FE0D; reverse video; # DIGIT SIX
0037 FE0D; reverse video; # DIGIT SEVEN
0038 FE0D; reverse video; # DIGIT EIGHT
0039 FE0D; reverse video; # DIGIT NINE
003A FE0D; reverse video; # COLON
003B FE0D; reverse video; # SEMICOLON
003C FE0D; reverse video; # LESS-THAN SIGN
003D FE0D; reverse video; # EQUALS SIGN
003E FE0D; reverse video; # GREATER-THAN SIGN
003F FE0D; reverse video; # QUESTION MARK
0040 FE0D; reverse video; # COMMERCIAL AT
0041 FE0D; reverse video; # LATIN CAPITAL LETTER A
0042 FE0D; reverse video; # LATIN CAPITAL LETTER B
0043 FE0D; reverse video; # LATIN CAPITAL LETTER C
0044 FE0D; reverse video; # LATIN CAPITAL LETTER D
0045 FE0D; reverse video; # LATIN CAPITAL LETTER E
0046 FE0D; reverse video; # LATIN CAPITAL LETTER F
0047 FE0D; reverse video; # LATIN CAPITAL LETTER G
0048 FE0D; reverse video; # LATIN CAPITAL LETTER H
0049 FE0D; reverse video; # LATIN CAPITAL LETTER I
004A FE0D; reverse video; # LATIN CAPITAL LETTER J
004B FE0D; reverse video; # LATIN CAPITAL LETTER K
004C FE0D; reverse video; # LATIN CAPITAL LETTER L
004D FE0D; reverse video; # LATIN CAPITAL LETTER M
004E FE0D; reverse video; # LATIN CAPITAL LETTER N
004F FE0D; reverse video; # LATIN CAPITAL LETTER O
0050 FE0D; reverse video; # LATIN CAPITAL LETTER P
0051 FE0D; reverse video; # LATIN CAPITAL LETTER Q
0052 FE0D; reverse video; # LATIN CAPITAL LETTER R
0053 FE0D; reverse video; # LATIN CAPITAL LETTER S
0054 FE0D; reverse video; # LATIN CAPITAL LETTER T
0055 FE0D; reverse video; # LATIN CAPITAL LETTER U
0056 FE0D; reverse video; # LATIN CAPITAL LETTER V
0057 FE0D; reverse video; # LATIN CAPITAL LETTER W
0058 FE0D; reverse video; # LATIN CAPITAL LETTER X
0059 FE0D; reverse video; # LATIN CAPITAL LETTER Y
005A FE0D; reverse video; # LATIN CAPITAL LETTER Z
005B FE0D; reverse video; # LEFT SQUARE BRACKET
005C FE0D; reverse video; # REVERSE SOLIDUS
005D FE0D; reverse video; # RIGHT SQUARE BRACKET
005E FE0D; reverse video; # CIRCUMFLEX ACCENT
005F FE0D; reverse video; # LOW LINE
0060 FE0D; reverse video; # GRAVE ACCENT
0061 FE0D; reverse video; # LATIN SMALL LETTER A
0062 FE0D; reverse video; # LATIN SMALL LETTER B
0063 FE0D; reverse video; # LATIN SMALL LETTER C
0064 FE0D; reverse video; # LATIN SMALL LETTER D
0065 FE0D; reverse video; # LATIN SMALL LETTER E
0066 FE0D; reverse video; # LATIN SMALL LETTER F
0067 FE0D; reverse video; # LATIN SMALL LETTER G
0068 FE0D; reverse video; # LATIN SMALL LETTER H
0069 FE0D; reverse video; # LATIN SMALL LETTER I
006A FE0D; reverse video; # LATIN SMALL LETTER J
006B FE0D; reverse video; # LATIN SMALL LETTER K
006C FE0D; reverse video; # LATIN SMALL LETTER L
006D FE0D; reverse video; # LATIN SMALL LETTER M
006E FE0D; reverse video; # LATIN SMALL LETTER N
006F FE0D; reverse video; # LATIN SMALL LETTER O
0070 FE0D; reverse video; # LATIN SMALL LETTER P
0071 FE0D; reverse video; # LATIN SMALL LETTER Q
0072 FE0D; reverse video; # LATIN SMALL LETTER R
0073 FE0D; reverse video; # LATIN SMALL LETTER S
0074 FE0D; reverse video; # LATIN SMALL LETTER T
0075 FE0D; reverse video; # LATIN SMALL LETTER U
0076 FE0D; reverse video; # LATIN SMALL LETTER V
0077 FE0D; reverse video; # LATIN SMALL LETTER W
0078 FE0D; reverse video; # LATIN SMALL LETTER X
0079 FE0D; reverse video; # LATIN SMALL LETTER Y
007A FE0D; reverse video; # LATIN SMALL LETTER Z
```

```
007B FE0D; reverse video; # LEFT CURLY BRACKET
007C FE0D; reverse video; # VERTICAL LINE
007D FE0D; reverse video; # RIGHT CURLY BRACKET
007E FE0D; reverse video; # TILDE
00A1 FE0D; reverse video; # INVERTED EXCLAMATION MARK
00A3 FE0D; reverse video; # POUND SIGN
00A4 FE0D; reverse video; # CURRENCY SIGN
00A6 FE0D; reverse video; # BROKEN BAR
00A7 FE0D; reverse video; # SECTION SIGN
00A8 FE0D; reverse video; # DIAERESIS
00AC FE0D; reverse video; # NOT SIGN
00B0 FE0D; reverse video; # DEGREE SIGN
00B1 FE0D; reverse video; # PLUS-MINUS SIGN
00B4 FE0D; reverse video; # ACUTE ACCENT
00B5 FE0D; reverse video; # MICRO SIGN
00BF FE0D; reverse video; # INVERTED QUESTION MARK
00C3 FE0D; reverse video; # LATIN CAPITAL LETTER A WITH TILDE
00C4 FE0D; reverse video; # LATIN CAPITAL LETTER A WITH DIAERESIS
00C5 FE0D; reverse video; # LATIN CAPITAL LETTER A WITH RING ABOVE
00C6 FE0D; reverse video; # LATIN CAPITAL LETTER AE
00C7 FE0D; reverse video; # LATIN CAPITAL LETTER C WITH CEDILLA
00C9 FE0D; reverse video; # LATIN CAPITAL LETTER E WITH ACUTE
00D1 FE0D; reverse video; # LATIN CAPITAL LETTER N WITH TILDE
00D5 FE0D; reverse video; # LATIN CAPITAL LETTER O WITH TILDE
00D6 FE0D; reverse video; # LATIN CAPITAL LETTER O WITH DIAERESIS
00D8 FE0D; reverse video; # LATIN CAPITAL LETTER O WITH STROKE
00DC FE0D; reverse video; # LATIN CAPITAL LETTER U WITH DIAERESIS
00DF FE0D; reverse video; # LATIN SMALL LETTER SHARP S
00E0 FE0D; reverse video; # LATIN SMALL LETTER A WITH GRAVE
00E1 FE0D; reverse video; # LATIN SMALL LETTER A WITH ACUTE
00E2 FE0D; reverse video; # LATIN SMALL LETTER A WITH CIRCUMFLEX
00E3 FE0D; reverse video; # LATIN SMALL LETTER A WITH TILDE
00E4 FE0D; reverse video; # LATIN SMALL LETTER A WITH DIAERESIS
00E5 FE0D; reverse video; # LATIN SMALL LETTER A WITH RING ABOVE
00E6 FE0D; reverse video; # LATIN SMALL LETTER AE
00E7 FE0D; reverse video; # LATIN SMALL LETTER C WITH CEDILLA
00E8 FE0D; reverse video; # LATIN SMALL LETTER E WITH GRAVE
00E9 FE0D; reverse video; # LATIN SMALL LETTER E WITH ACUTE
00EA FE0D; reverse video; # LATIN SMALL LETTER E WITH CIRCUMFLEX
00EB FE0D; reverse video; # LATIN SMALL LETTER E WITH DIAERESIS
00EC FE0D; reverse video; # LATIN SMALL LETTER I WITH GRAVE
00EE FE0D; reverse video; # LATIN SMALL LETTER I WITH CIRCUMFLEX
00EF FE0D; reverse video; # LATIN SMALL LETTER I WITH DIAERESIS
00F1 FE0D; reverse video; # LATIN SMALL LETTER N WITH TILDE
00F2 FE0D; reverse video; # LATIN SMALL LETTER O WITH GRAVE
00F3 FE0D; reverse video; # LATIN SMALL LETTER O WITH ACUTE
00F4 FE0D; reverse video; # LATIN SMALL LETTER O WITH CIRCUMFLEX
00F5 FE0D; reverse video; # LATIN SMALL LETTER O WITH TILDE
00F6 FE0D; reverse video; # LATIN SMALL LETTER O WITH DIAERESIS
00F8 FE0D; reverse video; # LATIN SMALL LETTER O WITH STROKE
00F9 FE0D; reverse video; # LATIN SMALL LETTER U WITH GRAVE
00FA FE0D; reverse video; # LATIN SMALL LETTER U WITH ACUTE
00FB FE0D; reverse video; # LATIN SMALL LETTER U WITH CIRCUMFLEX
00FC FE0D; reverse video; # LATIN SMALL LETTER U WITH DIAERESIS
0192 FE0D; reverse video; # LATIN SMALL LETTER F WITH HOOK
02DC FE0D; reverse video; # SMALL TILDE
03C0 FE0D; reverse video; # GREEK SMALL LETTER PI
2190 FE0D; reverse video; # LEFTWARDS ARROW
2191 FE0D; reverse video; # UPWARDS ARROW
2192 FE0D; reverse video; # RIGHTWARDS ARROW
2193 FE0D; reverse video; # DOWNWARDS ARROW
2211 FE0D; reverse video; # N-ARY SUMMATION
221A FE0D; reverse video; # SQUARE ROOT
23B8 FE0D; reverse video; # LEFT VERTICAL BOX LINE
23B9 FE0D; reverse video; # RIGHT VERTICAL BOX LINE
23BA FE0D; reverse video; # HORIZONTAL SCAN LINE-1
23BD FE0D; reverse video; # HORIZONTAL SCAN LINE-9
240D FE0D; reverse video; # SYMBOL FOR CARRIAGE RETURN
241B FE0D; reverse video; # SYMBOL FOR ESCAPE
2425 FE0D; reverse video; # SYMBOL FOR DELETE FORM TWO
2500 FE0D; reverse video; # BOX DRAWINGS LIGHT HORIZONTAL
2502 FE0D; reverse video; # BOX DRAWINGS LIGHT VERTICAL
250C FE0D; reverse video; # BOX DRAWINGS LIGHT DOWN AND RIGHT
2510 FE0D; reverse video; # BOX DRAWINGS LIGHT DOWN AND LEFT
```

```
2514 FE0D; reverse video; # BOX DRAWINGS LIGHT UP AND RIGHT
2518 FE0D; reverse video; # BOX DRAWINGS LIGHT UP AND LEFT
251C FE0D; reverse video; # BOX DRAWINGS LIGHT VERTICAL AND RIGHT
2524 FE0D; reverse video; # BOX DRAWINGS LIGHT VERTICAL AND LEFT
252C FE0D; reverse video; # BOX DRAWINGS LIGHT DOWN AND HORIZONTAL
2534 FE0D; reverse video; # BOX DRAWINGS LIGHT UP AND HORIZONTAL
253C FE0D; reverse video; # BOX DRAWINGS LIGHT VERTICAL AND HORIZONTAL
256D FE0D; reverse video; # BOX DRAWINGS LIGHT ARC DOWN AND RIGHT
256E FE0D; reverse video; # BOX DRAWINGS LIGHT ARC DOWN AND LEFT
256F FE0D; reverse video; # BOX DRAWINGS LIGHT ARC UP AND LEFT
2570 FE0D; reverse video; # BOX DRAWINGS LIGHT ARC UP AND RIGHT
2571 FE0D; reverse video; # BOX DRAWINGS LIGHT DIAGONAL UPPER RIGHT TO LOWER LEFT
2572 FE0D; reverse video; # BOX DRAWINGS LIGHT DIAGONAL UPPER LEFT TO LOWER RIGHT
2573 FE0D; reverse video; # BOX DRAWINGS LIGHT DIAGONAL CROSS
25AD FE0D; reverse video; # WHITE RECTANGLE
25B6 FE0D; reverse video; # BLACK RIGHT-POINTING TRIANGLE
25C0 FE0D; reverse video; # BLACK LEFT-POINTING TRIANGLE
2660 FE0D; reverse video; # BLACK SPADE SUIT
2663 FE0D; reverse video; # BLACK CLUB SUIT
2665 FE0D; reverse video; # BLACK HEART SUIT
2666 FE0D; reverse video; # BLACK DIAMOND SUIT
2B96 FE0D; reverse video; # ARROW POINTING UPWARDS THEN NORTH WEST
2B97 FE0D; reverse video; # ARROW POINTING RIGHTWARDS THEN CURVING SOUTH WEST
```

14. References.

3d@galax.xyz. 2014. “Teletext Character Set.” http://www.galax.xyz/TELETEXT/CHARSET.HTM

Bettencourt, Rebecca. 2008. “The Ultimate Apple II Font.” http://www.kreativekorp.com/software/fonts/apple2.shtml

Bettencourt, Rebecca. 2012. “The Ultimate Commodore Font.” http://www.kreativekorp.com/software/fonts/c64.shtml

Bettencourt, Rebecca. 2014. “The Ultimate TRS-80 Font.” http://www.kreativekorp.com/software/fonts/trs80.shtml

British Broadcasting Corporation. 1984. “BBC Microcomputer System User Guide.”

Covington, Michael A. Compute! issue 42. 1983. “All About The TI Character Set.” http://www.atarimagazines.com/compute/issue42/082_1_ALL_ABOUT_THE_TI_CHARACTER_SET.php

da Cruz, Frank. 2000. “Supplemental Terminal Graphics for Unicode.” ftp://ftp.kermit.columbia.edu/kermit/ucsterminal/ucsterminal.txt

European Broadcasting Union. 1997. “Enhanced Teletext specification.” http://www.etsi.org/deliver/etsi_i_ets/300700_300799/300706/01_60/ets_300706e01p.pdf

Independent Broadcasting Authority. 1977. “IBA Technical Review #2: Technical Reference Book,” 3rd Edition. http://www.ntlpa.org.uk/wp-content/uploads/2013/06/IBA_TechnicalReviews1-24_PDF/IBA_TechnicalReview2_TechnicalReferenceBook2750.pdf

Little, Gary B. 1985. “Inside the Apple IIe.” Bowie, MD: Brady Communications Company, Ltd.

Marín Silva, Eduardo, 2017. “Proposal to create a new block for missing Block Element characters.” UTC document L2/17-194. http://www.unicode.org/L2/L2017/17194-block-elements.pdf

Niwatori, Shiroi. 2017. “Typvs Litterarvm Nisiciae.” http://hwm3.gyao.ne.jp/shiroi-niwatori/nishiki-teki.htm

Oy, Aivosto. 2014. “Commodore PETSCII character sets.” http://www.aivosto.com/vbtips/petscii.pdf

Phillips, George. 2014. “TRS-80 Fonts and Unicode.” http://48k.ca/fonts.html

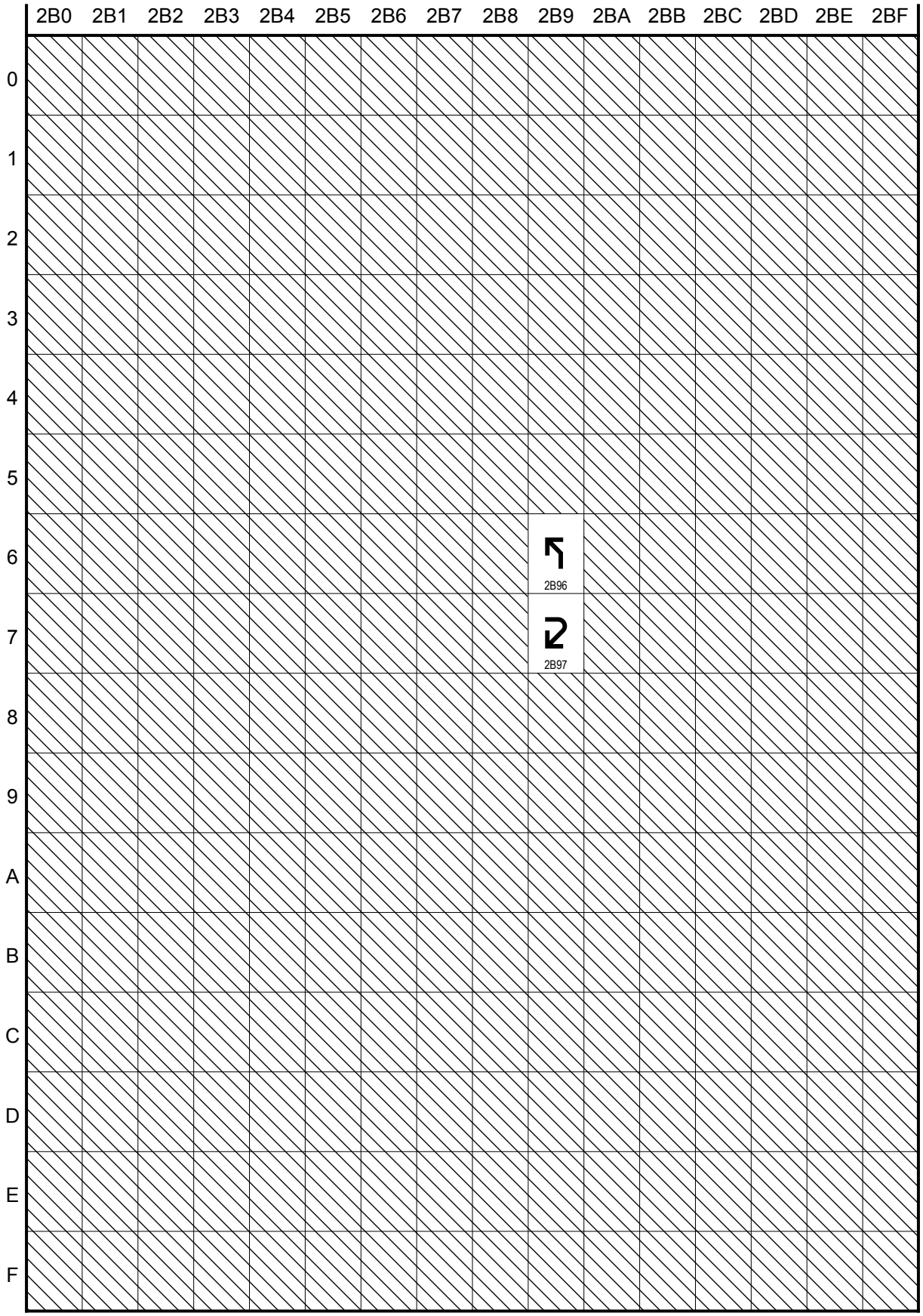
Teletext Art Research Lab. 2017. http://teletextart.co.uk/

Texas Instruments Incorporated. 1981. “TI Extended BASIC for the TI-99/4 home computer.” http://www.digitpress.com/library/manuals/ti994a/ti%20extended%20basic.pdf

Texas Instruments Incorporated. 1979. “User's Reference Guide.” http://www.99er.net/files/docs/TI994_User_Guide.pdf

Texas Instruments Incorporated. 1981. “User's Reference Guide.” http://www.99er.net/files/userrefguide.pdf
Wikipedia. 2017. “Atari ST character set.” https://en.wikipedia.org/wiki/Atari_ST_character_set
Wikipedia. 2017. “ATASCII.” https://en.wikipedia.org/wiki/ATASCII
Wikipedia. 2017. “PETSCII.” https://en.wikipedia.org/wiki/PETSCII
Wikipedia. 2017. “Semigraphics.” https://en.wikipedia.org/wiki/Semigraphics
Wikipedia. 2017. “World System Teletext.” https://en.wikipedia.org/wiki/World_System_Teletext
Wikipedia. 2017. “ZX Spectrum character set.” https://en.wikipedia.org/wiki/ZX_Spectrum_character_set
Wikipedia. 2017. “ZX80 character set.” https://en.wikipedia.org/wiki/ZX80_character_set
Wikipedia. 2017. “ZX81 character set.” https://en.wikipedia.org/wiki/ZX81_character_set

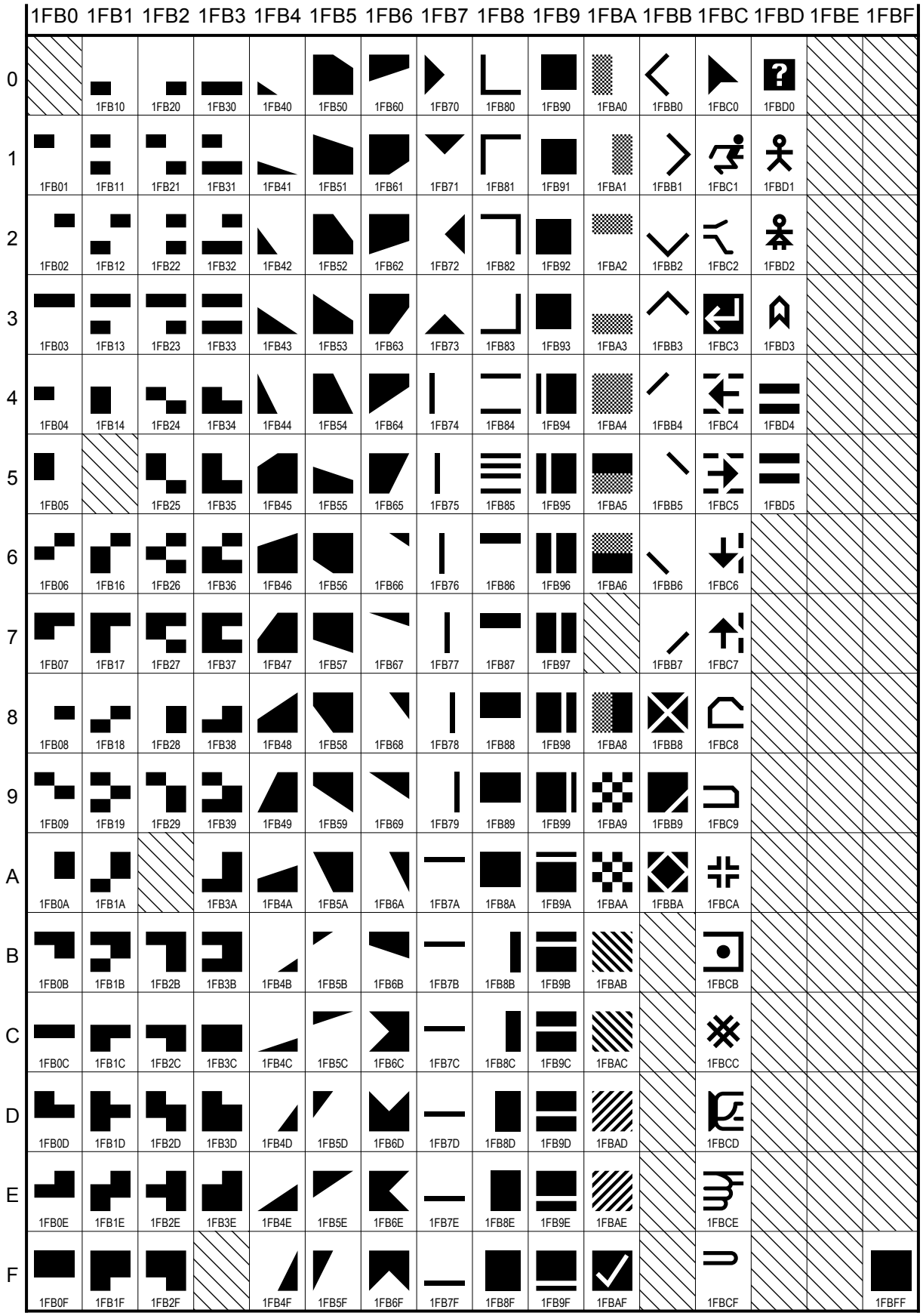
15. Disclaimer. All trademarks and registered trademarks mentioned herein are the property of their respective owners. The company and product names used in this document are for identification purposes only.


2B0 2B1 2B2 2B3 2B4 2B5 2B6 2B7 2B8 2B9 2BA 2BB 2BC 2BD 2BE 2BF
0
1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
2B96
2B97

Arrows for legacy computing

2B96 ↰ ARROW POINTING UPWARDS THEN NORTH WEST

2B97 ↲ ARROW POINTING RIGHTWARDS THEN CURVING SOUTH WEST


1FB0 1FB1 1FB2 1FB3 1FB4 1FB5 1FB6 1FB7 1FB8 1FB9 1FBA 1FBB 1FBC 1FBD 1FBE 1FBF
0 1FB10 1FB20 1FB30 1FB40 1FB50 1FB60 1FB70 1FB80 1FB90 1FBA0 1FBB0 1FBC0 1FBD0
1 1FB01 1FB11 1FB21 1FB31 1FB41 1FB51 1FB61 1FB71 1FB81 1FB91 1FBA1 1FBB1 1FBC1 1FBD1
2 1FB02 1FB12 1FB22 1FB32 1FB42 1FB52 1FB62 1FB72 1FB82 1FB92 1FBA2 1FBB2 1FBC2 1FBD2
3 1FB03 1FB13 1FB23 1FB33 1FB43 1FB53 1FB63 1FB73 1FB83 1FB93 1FBA3 1FBB3 1FBC3 1FBD3
4 1FB04 1FB14 1FB24 1FB34 1FB44 1FB54 1FB64 1FB74 1FB84 1FB94 1FBA4 1FBB4 1FBC4 1FBD4
5 1FB05 1FB25 1FB35 1FB45 1FB55 1FB65 1FB75 1FB85 1FB95 1FBA5 1FBB5 1FBC5 1FBD5
6 1FB06 1FB16 1FB26 1FB36 1FB46 1FB56 1FB66 1FB76 1FB86 1FB96 1FBA6 1FBB6 1FBC6
7 1FB07 1FB17 1FB27 1FB37 1FB47 1FB57 1FB67 1FB77 1FB87 1FB97 1FBB7 1FBC7
8 1FB08 1FB18 1FB28 1FB38 1FB48 1FB58 1FB68 1FB78 1FB88 1FB98 1FBA8 1FBB8 1FBC8
9 1FB09 1FB19 1FB29 1FB39 1FB49 1FB59 1FB69 1FB79 1FB89 1FB99 1FBA9 1FBB9 1FBC9
A 1FB0A 1FB1A 1FB3A 1FB4A 1FB5A 1FB6A 1FB7A 1FB8A 1FB9A 1FBAA 1FBBA 1FBCA
B 1FB0B 1FB1B 1FB2B 1FB3B 1FB4B 1FB5B 1FB6B 1FB7B 1FB8B 1FB9B 1FBAB 1FBCB
C 1FB0C 1FB1C 1FB2C 1FB3C 1FB4C 1FB5C 1FB6C 1FB7C 1FB8C 1FB9C 1FBAC 1FBCC
D 1FB0D 1FB1D 1FB2D 1FB3D 1FB4D 1FB5D 1FB6D 1FB7D 1FB8D 1FB9D 1FBAD 1FBCD
E 1FB0E 1FB1E 1FB2E 1FB3E 1FB4E 1FB5E 1FB6E 1FB7E 1FB8E 1FB9E 1FBAE 1FBCE
F 1FB0F 1FB1F 1FB2F 1FB4F 1FB5F 1FB6F 1FB7F 1FB8F 1FB9F 1FBAF 1FBCF 1FBFF

Block mosaic terminal graphic characters

1FB00 <reserved>
→ 0020 space
→ 00A0 no-break space
→ 3000 ideographic space
1FB01 BLOCK SEXTANT-1
1FB02 BLOCK SEXTANT-2
1FB03 BLOCK SEXTANT-12
= upper one third block
1FB04 BLOCK SEXTANT-3
1FB05 BLOCK SEXTANT-13
1FB06 BLOCK SEXTANT-23
1FB07 BLOCK SEXTANT-123
1FB08 BLOCK SEXTANT-4
1FB09 BLOCK SEXTANT-14
1FB0A BLOCK SEXTANT-24
1FB0B BLOCK SEXTANT-124
1FB0C BLOCK SEXTANT-34
= middle one third block
1FB0D BLOCK SEXTANT-134
1FB0E BLOCK SEXTANT-234
1FB0F BLOCK SEXTANT-1234
= upper two thirds block
1FB10 BLOCK SEXTANT-5
1FB11 BLOCK SEXTANT-15
1FB12 BLOCK SEXTANT-25
1FB13 BLOCK SEXTANT-125
1FB14 BLOCK SEXTANT-35
1FB15 <reserved>
→ 258C left half block
1FB16 BLOCK SEXTANT-235
1FB17 BLOCK SEXTANT-1235
1FB18 BLOCK SEXTANT-45
1FB19 BLOCK SEXTANT-145
1FB1A BLOCK SEXTANT-245
1FB1B BLOCK SEXTANT-1245
1FB1C BLOCK SEXTANT-345
1FB1D BLOCK SEXTANT-1345
1FB1E BLOCK SEXTANT-2345
1FB1F BLOCK SEXTANT-12345
1FB20 BLOCK SEXTANT-6
1FB21 BLOCK SEXTANT-16
1FB22 BLOCK SEXTANT-26
1FB23 BLOCK SEXTANT-126
1FB24 BLOCK SEXTANT-36
1FB25 BLOCK SEXTANT-136
1FB26 BLOCK SEXTANT-236
1FB27 BLOCK SEXTANT-1236
1FB28 BLOCK SEXTANT-46
1FB29 BLOCK SEXTANT-146
1FB2A <reserved>
→ 2590 right half block
1FB2B BLOCK SEXTANT-1246
1FB2C BLOCK SEXTANT-346
1FB2D BLOCK SEXTANT-1346
1FB2E BLOCK SEXTANT-2346
1FB2F BLOCK SEXTANT-12346
1FB30 BLOCK SEXTANT-56
= lower one third block
1FB31 BLOCK SEXTANT-156
1FB32 BLOCK SEXTANT-256
1FB33 BLOCK SEXTANT-1256
= upper and lower one third block
1FB34 BLOCK SEXTANT-356
1FB35 BLOCK SEXTANT-1356
1FB36 BLOCK SEXTANT-2356
1FB37 BLOCK SEXTANT-12356
1FB38 BLOCK SEXTANT-456
1FB39 BLOCK SEXTANT-1456
1FB3A BLOCK SEXTANT-2456
1FB3B BLOCK SEXTANT-12456
1FB3C BLOCK SEXTANT-3456
= lower two thirds block
1FB3D BLOCK SEXTANT-13456
1FB3E BLOCK SEXTANT-23456
1FB3F <reserved>
→ 2588 full block

Smooth mosaic terminal graphic characters

1FB40 LOWER LEFT BLOCK DIAGONAL LOWER MIDDLE LEFT TO LOWER CENTRE
1FB41 LOWER LEFT BLOCK DIAGONAL LOWER MIDDLE LEFT TO LOWER RIGHT
1FB42 LOWER LEFT BLOCK DIAGONAL UPPER MIDDLE LEFT TO LOWER CENTRE
1FB43 LOWER LEFT BLOCK DIAGONAL UPPER MIDDLE LEFT TO LOWER RIGHT
1FB44 LOWER LEFT BLOCK DIAGONAL UPPER LEFT TO LOWER CENTRE
1FB45 LOWER RIGHT BLOCK DIAGONAL UPPER MIDDLE LEFT TO UPPER CENTRE
1FB46 LOWER RIGHT BLOCK DIAGONAL UPPER MIDDLE LEFT TO UPPER RIGHT
1FB47 LOWER RIGHT BLOCK DIAGONAL LOWER MIDDLE LEFT TO UPPER CENTRE
1FB48 LOWER RIGHT BLOCK DIAGONAL LOWER MIDDLE LEFT TO UPPER RIGHT
1FB49 LOWER RIGHT BLOCK DIAGONAL LOWER LEFT TO UPPER CENTRE
1FB4A LOWER RIGHT BLOCK DIAGONAL LOWER MIDDLE LEFT TO UPPER MIDDLE RIGHT
1FB4B LOWER RIGHT BLOCK DIAGONAL LOWER CENTRE TO LOWER MIDDLE RIGHT
1FB4C LOWER RIGHT BLOCK DIAGONAL LOWER LEFT TO LOWER MIDDLE RIGHT
1FB4D LOWER RIGHT BLOCK DIAGONAL LOWER CENTRE TO UPPER MIDDLE RIGHT
1FB4E LOWER RIGHT BLOCK DIAGONAL LOWER LEFT TO UPPER MIDDLE RIGHT
1FB4F LOWER RIGHT BLOCK DIAGONAL LOWER CENTRE TO UPPER RIGHT
1FB50 LOWER LEFT BLOCK DIAGONAL UPPER CENTRE TO UPPER MIDDLE RIGHT
1FB51 LOWER LEFT BLOCK DIAGONAL UPPER LEFT TO UPPER MIDDLE RIGHT
1FB52 LOWER LEFT BLOCK DIAGONAL UPPER CENTRE TO LOWER MIDDLE RIGHT
1FB53 LOWER LEFT BLOCK DIAGONAL UPPER LEFT TO LOWER MIDDLE RIGHT
1FB54 LOWER LEFT BLOCK DIAGONAL UPPER CENTRE TO LOWER RIGHT
1FB55 LOWER LEFT BLOCK DIAGONAL UPPER MIDDLE LEFT TO LOWER MIDDLE RIGHT
1FB56 UPPER RIGHT BLOCK DIAGONAL LOWER MIDDLE LEFT TO LOWER CENTRE
1FB57 UPPER RIGHT BLOCK DIAGONAL LOWER MIDDLE LEFT TO LOWER RIGHT
1FB58 UPPER RIGHT BLOCK DIAGONAL UPPER MIDDLE LEFT TO LOWER CENTRE
1FB59 UPPER RIGHT BLOCK DIAGONAL UPPER MIDDLE LEFT TO LOWER RIGHT
1FB5A UPPER RIGHT BLOCK DIAGONAL UPPER LEFT TO LOWER CENTRE
1FB5B UPPER LEFT BLOCK DIAGONAL UPPER MIDDLE LEFT TO UPPER CENTRE
1FB5C UPPER LEFT BLOCK DIAGONAL UPPER MIDDLE LEFT TO UPPER RIGHT

1FB5D UPPER LEFT BLOCK DIAGONAL LOWER MIDDLE LEFT TO UPPER CENTRE
1FB5E UPPER LEFT BLOCK DIAGONAL LOWER MIDDLE LEFT TO UPPER RIGHT
1FB5F UPPER LEFT BLOCK DIAGONAL LOWER LEFT TO UPPER CENTRE
1FB60 UPPER LEFT BLOCK DIAGONAL LOWER MIDDLE LEFT TO UPPER MIDDLE RIGHT
1FB61 UPPER LEFT BLOCK DIAGONAL LOWER CENTRE TO LOWER MIDDLE RIGHT
1FB62 UPPER LEFT BLOCK DIAGONAL LOWER LEFT TO LOWER MIDDLE RIGHT
1FB63 UPPER LEFT BLOCK DIAGONAL LOWER CENTRE TO UPPER MIDDLE RIGHT
1FB64 UPPER LEFT BLOCK DIAGONAL LOWER LEFT TO UPPER MIDDLE RIGHT
1FB65 UPPER LEFT BLOCK DIAGONAL LOWER CENTRE TO UPPER RIGHT
1FB66 UPPER RIGHT BLOCK DIAGONAL UPPER CENTRE TO UPPER MIDDLE RIGHT
1FB67 UPPER RIGHT BLOCK DIAGONAL UPPER LEFT TO UPPER MIDDLE RIGHT
1FB68 UPPER RIGHT BLOCK DIAGONAL UPPER CENTRE TO LOWER MIDDLE RIGHT
1FB69 UPPER RIGHT BLOCK DIAGONAL UPPER LEFT TO LOWER MIDDLE RIGHT
1FB6A UPPER RIGHT BLOCK DIAGONAL UPPER CENTRE TO LOWER RIGHT
1FB6B UPPER RIGHT BLOCK DIAGONAL UPPER MIDDLE LEFT TO LOWER MIDDLE RIGHT
1FB6C UPPER AND RIGHT AND LOWER TRIANGULAR THREE QUARTERS BLOCK
1FB6D LEFT AND LOWER AND RIGHT TRIANGULAR THREE QUARTERS BLOCK
1FB6E UPPER AND LEFT AND LOWER TRIANGULAR THREE QUARTERS BLOCK
1FB6F LEFT AND UPPER AND RIGHT TRIANGULAR THREE QUARTERS BLOCK
1FB70 LEFT TRIANGULAR ONE QUARTER BLOCK
1FB71 UPPER TRIANGULAR ONE QUARTER BLOCK
1FB72 RIGHT TRIANGULAR ONE QUARTER BLOCK
1FB73 LOWER TRIANGULAR ONE QUARTER BLOCK

Block elements

1FB74 VERTICAL ONE EIGHTH BLOCK-2
→ 258F left one eighth block
1FB75 VERTICAL ONE EIGHTH BLOCK-3
1FB76 VERTICAL ONE EIGHTH BLOCK-4
1FB77 VERTICAL ONE EIGHTH BLOCK-5
1FB78 VERTICAL ONE EIGHTH BLOCK-6
1FB79 VERTICAL ONE EIGHTH BLOCK-7
→ 2595 right one eighth block
1FB7A HORIZONTAL ONE EIGHTH BLOCK-2
→ 2594 upper one eighth block
1FB7B HORIZONTAL ONE EIGHTH BLOCK-3
1FB7C HORIZONTAL ONE EIGHTH BLOCK-4
1FB7D HORIZONTAL ONE EIGHTH BLOCK-5
1FB7E HORIZONTAL ONE EIGHTH BLOCK-6
1FB7F HORIZONTAL ONE EIGHTH BLOCK-7
→ 2581 lower one eighth block
1FB80 LEFT AND LOWER ONE EIGHTH BLOCK
1FB81 LEFT AND UPPER ONE EIGHTH BLOCK
1FB82 RIGHT AND UPPER ONE EIGHTH BLOCK
1FB83 RIGHT AND LOWER ONE EIGHTH BLOCK
1FB84 UPPER AND LOWER ONE EIGHTH BLOCK
1FB85 HORIZONTAL ONE EIGHTH BLOCK-1358
1FB86 UPPER ONE QUARTER BLOCK
→ 2582 lower one quarter block
1FB87 UPPER THREE EIGHTHS BLOCK
→ 2583 lower three eighths block
1FB88 UPPER FIVE EIGHTHS BLOCK
→ 2585 lower five eighths block
1FB89 UPPER THREE QUARTERS BLOCK
→ 2586 lower three quarters block
1FB8A UPPER SEVEN EIGHTHS BLOCK
→ 2587 lower seven eighths block
1FB8B RIGHT ONE QUARTER BLOCK
→ 258E left one quarter block
1FB8C RIGHT THREE EIGHTHS BLOCK
→ 258D left three eighths block
1FB8D RIGHT FIVE EIGHTHS BLOCK
→ 258B left five eighths block
1FB8E RIGHT THREE QUARTERS BLOCK
→ 258A left three quarters block
1FB8F RIGHT SEVEN EIGHTHS BLOCK
→ 2589 left seven eighths block
1FB90 UPPER RIGHT SEVEN EIGHTHS BLOCK
• a rectangle seven eighths the width and seven eighths the height of the character cell
1FB91 LOWER RIGHT SEVEN EIGHTHS BLOCK
1FB92 LOWER LEFT SEVEN EIGHTHS BLOCK
1FB93 UPPER LEFT SEVEN EIGHTHS BLOCK
1FB94 LEFT ONE EIGHTH BLOCK AND RIGHT THREE QUARTERS BLOCK
1FB95 LEFT ONE QUARTER BLOCK AND RIGHT FIVE EIGHTHS BLOCK
1FB96 LEFT THREE EIGHTHS BLOCK AND RIGHT HALF BLOCK
1FB97 LEFT HALF BLOCK AND RIGHT THREE EIGHTHS BLOCK
1FB98 LEFT FIVE EIGHTHS BLOCK AND RIGHT ONE QUARTER BLOCK
1FB99 LEFT THREE QUARTERS BLOCK AND RIGHT ONE EIGHTH BLOCK
1FB9A UPPER ONE EIGHTH BLOCK AND LOWER THREE QUARTERS BLOCK
1FB9B UPPER ONE QUARTER BLOCK AND LOWER FIVE EIGHTHS BLOCK
1FB9C UPPER THREE EIGHTHS BLOCK AND LOWER HALF BLOCK
1FB9D UPPER HALF BLOCK AND LOWER THREE EIGHTHS BLOCK
1FB9E UPPER FIVE EIGHTHS BLOCK AND LOWER ONE QUARTER BLOCK
1FB9F UPPER THREE QUARTERS BLOCK AND LOWER ONE EIGHTH BLOCK

Shade characters

1FBA0 LEFT HALF MEDIUM SHADE
1FBA1 RIGHT HALF MEDIUM SHADE
1FBA2 UPPER HALF MEDIUM SHADE
1FBA3 LOWER HALF MEDIUM SHADE
1FBA4 INVERSE MEDIUM SHADE
→ 2592 medium shade
1FBA5 UPPER HALF BLOCK AND LOWER HALF INVERSE MEDIUM SHADE
1FBA6 UPPER HALF INVERSE MEDIUM SHADE AND LOWER HALF BLOCK
1FBA7 <reserved>
= left half block and right half inverse medium shade
1FBA8 LEFT HALF INVERSE MEDIUM SHADE AND RIGHT HALF BLOCK

Terminal graphic characters

1FBA9 FOUR-BY-FOUR CHECKER BOARD
→ 1F67E checker board

1FBAA REVERSE FOUR-BY-FOUR CHECKER BOARD
→ 1F67F • reverse checker board
1FBAB UPPER LEFT TO LOWER RIGHT FILL
→ 25A7 ▧ square with upper left to lower right fill
1FBAC INVERSE UPPER LEFT TO LOWER RIGHT FILL
1FBAD UPPER RIGHT TO LOWER LEFT FILL
→ 25A8 ▨ square with upper right to lower left fill
1FBAE INVERSE UPPER RIGHT TO LOWER LEFT FILL

Dingbat

1FBAF INVERSE CHECK MARK
→ 2713 ✓ check mark

Character cell diagonals

1FBB0 BOX DRAWINGS LIGHT DIAGONAL UPPER CENTRE TO MIDDLE LEFT TO LOWER CENTRE
1FBB1 BOX DRAWINGS LIGHT DIAGONAL UPPER CENTRE TO MIDDLE RIGHT TO LOWER CENTRE
1FBB2 BOX DRAWINGS LIGHT DIAGONAL MIDDLE LEFT TO LOWER CENTRE TO MIDDLE RIGHT
1FBB3 BOX DRAWINGS LIGHT DIAGONAL MIDDLE LEFT TO UPPER CENTRE TO MIDDLE RIGHT
1FBB4 BOX DRAWINGS LIGHT DIAGONAL UPPER CENTRE TO MIDDLE LEFT
1FBB5 BOX DRAWINGS LIGHT DIAGONAL UPPER CENTRE TO MIDDLE RIGHT
1FBB6 BOX DRAWINGS LIGHT DIAGONAL MIDDLE LEFT TO LOWER CENTRE
1FBB7 BOX DRAWINGS LIGHT DIAGONAL MIDDLE RIGHT TO LOWER CENTRE

Terminal graphic characters

1FBB8 INVERSE BOX DRAWINGS LIGHT DIAGONAL CROSS
→ 2573 ╳ box drawings light diagonal cross
1FBB9 INVERSE BOX DRAWINGS LIGHT DIAGONAL MIDDLE RIGHT TO LOWER CENTRE
1FBBA INVERSE BOX DRAWINGS LIGHT DIAGONAL DIAMOND

Terminal graphic characters

1FBC0 ARROWHEAD-SHAPED POINTER
1FBC1 LEFT HALF RUNNING MAN
• faces right whereas 1F3C3 ‥ faces left
• Running Man is the name for these characters in documentation for the Apple II
→ 1F3C3 ‥ runner
1FBC2 RIGHT HALF RUNNING MAN

Arrows

1FBC3 INVERSE DOWNWARDS ARROW WITH TIP LEFTWARDS
→ 21B2 ↲ downwards arrow with tip leftwards
1FBC4 LEFTWARDS ARROW AND UPPER AND LOWER ONE EIGHTH BLOCK
1FBC5 RIGHTWARDS ARROW AND UPPER AND LOWER ONE EIGHTH BLOCK
1FBC6 DOWNWARDS ARROW AND RIGHT ONE EIGHTH BLOCK
1FBC7 UPWARDS ARROW AND RIGHT ONE EIGHTH BLOCK

Terminal graphic characters

1FBC8 LEFT HALF FOLDER
→ 1F4C1 🗀 file folder
→ 1F5C0 🗀 folder
1FBC9 RIGHT HALF FOLDER
1FBCA VOIDED GREEK CROSS
→ 0023 # number sign
→ 256C ╬ box drawings double vertical and horizontal
→ 2719 ✙ outlined greek cross
→ 271A ✚ heavy greek cross
→ 1F7A3 • medium greek cross
1FBCB RIGHT OPEN SQUARED DOT
→ 2ACE ⊐ square right open box operator
1FBCC TWO PAIRS OF DIAGONAL LINES CROSSING
→ 2A33 ⨳ smash product
1FBCD LEFT THIRD WHITE RIGHT POINTING INDEX
→ 261E ☞ white right pointing index
1FBCE MIDDLE THIRD WHITE RIGHT POINTING INDEX
1FBCF RIGHT THIRD WHITE RIGHT POINTING INDEX
1FBD0 NEGATIVE SQUARED QUESTION MARK
→ 003F ? question mark
→ FFFD ? replacement character
1FBD1 STICK FIGURE
→ 1F6B9 • mens symbol
1FBD2 STICK FIGURE WITH DRESS
→ 1F6BA • womens symbol
1FBD3 WHITE UP-POINTING CHEVRON
→ 2302 ⌂ house
→ 1F530 • japanese symbol for beginner

Block elements

1FBD4 HEAVY HORIZONTAL FILL
= upper middle and lower one quarter block
→ 3013 〓 geta mark
1FBD5 INVERSE HEAVY HORIZONTAL FILL
= upper and lower middle one quarter block

Colored block element

1FBFF BORDER-COLOURED FULL BLOCK
→ 2588 ▉ full block

Figures.

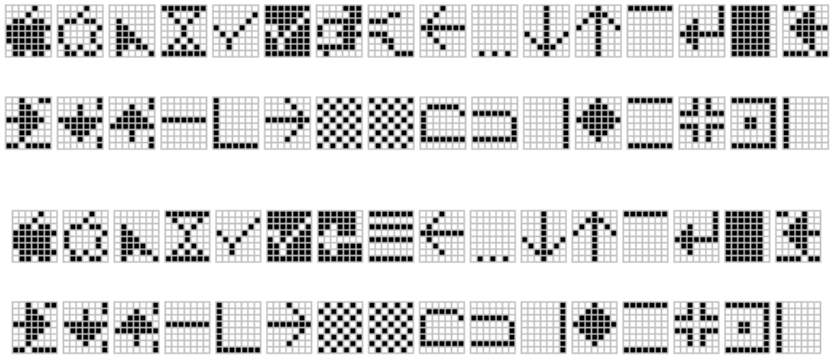


Figure 1. MouseText as implemented on the Apple IIc (above, with RUNNING MAN) and IIGS (below, with replacement characters). (Wikipedia)

Figure 2. Character dump of ATASCII glyphs. Note the use of inverse characters for emphasis (row, column, and section headers) in plain text.

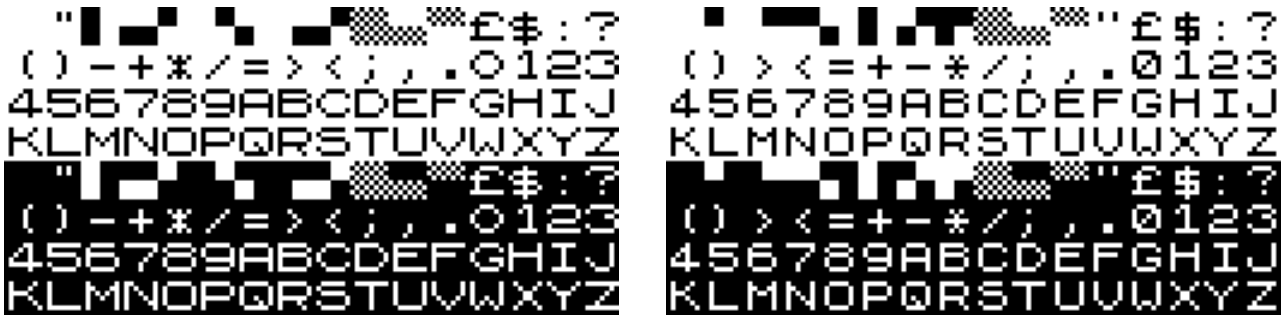


Figure 3. Sinclair ZX80 (left) and ZX81 (right) character dumps. (Wikipedia, CCO 1.0)

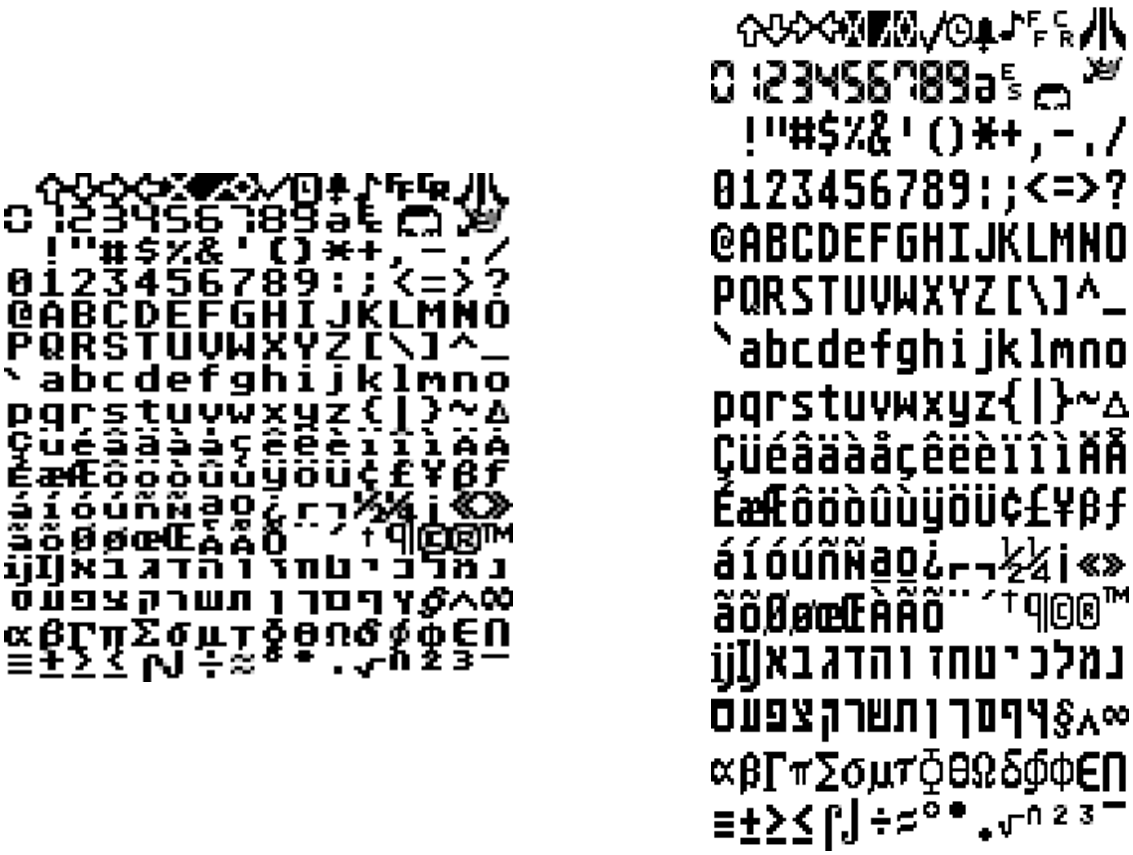


Figure 4. Atari ST glyphs, 8 pixels high (left) and 16 pixels high (right). Note 7-segment styled digits at 0x10 through 0x19 (proposed), and Atari logo at 0x0E–0x0F and J.R. “Bob” Dobbs image at 0x1C–0x1F (not proposed). (Wikipedia, CCO 1.0)

Figure 5. TI-99/4A character dump, generated by Rebecca Bettencourt using a JavaScript-based emulator, showing BORDER-COLOURED FULL BLOCK (the yellow square under the U of RUN).

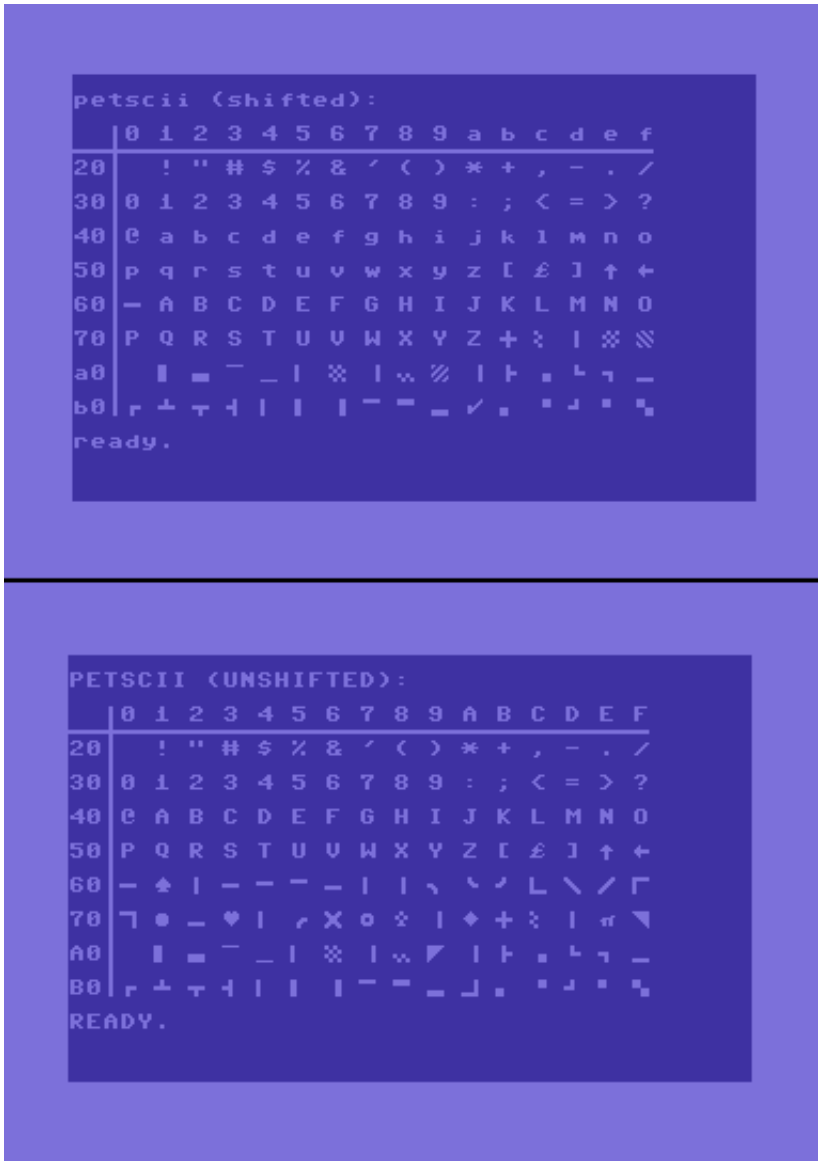


Figure 6. PETSCII as displayed on the Commodore 64. Other Commodore models used slightly different versions of this set. (Wikipedia)

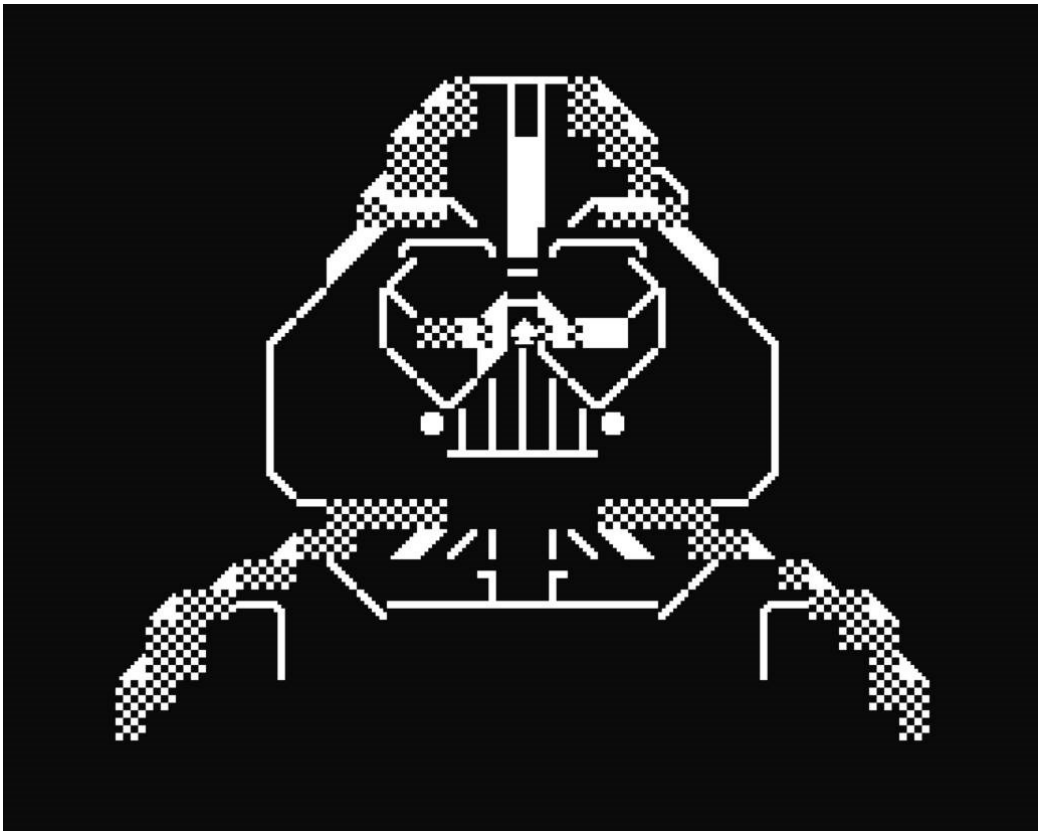


Figure 7. Image created on the Commodore 64 using semigraphics. Many other microcomputer platforms were, and continue to be, used to create this type of text-mode artwork.

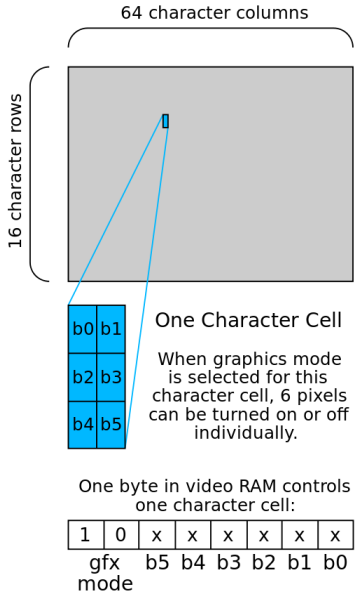


Figure 8. Example of the use of semigraphics to plot "pixels" on the TRS-80 by displaying the appropriate 2 × 3 block graphic. (Wikipedia)

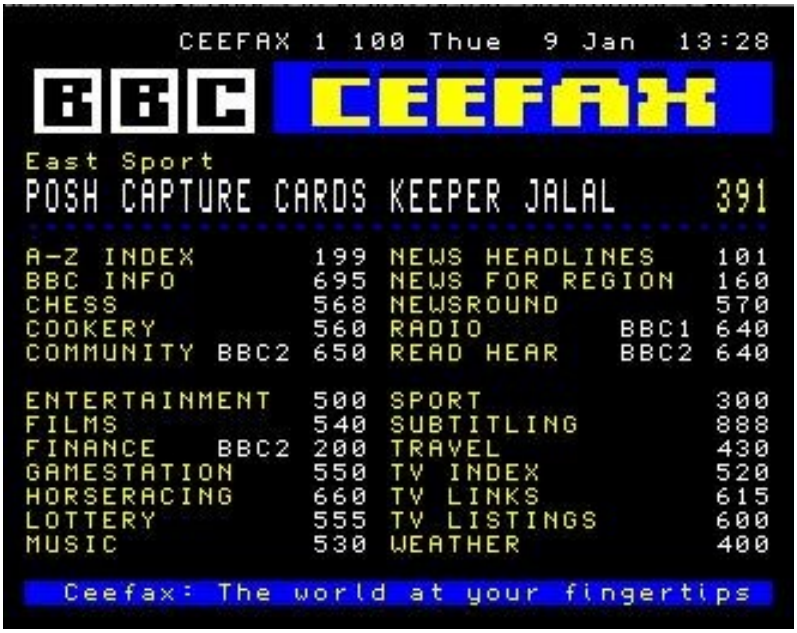


Figure 9. Screen shot from Ceefax, the world's first teletext information service. Note the use of foreground and background colors, double-height text, and semigraphics.

Figure 10. A different example of the color and semigraphics capabilities of teletext. (Teletext Art Research Lab)

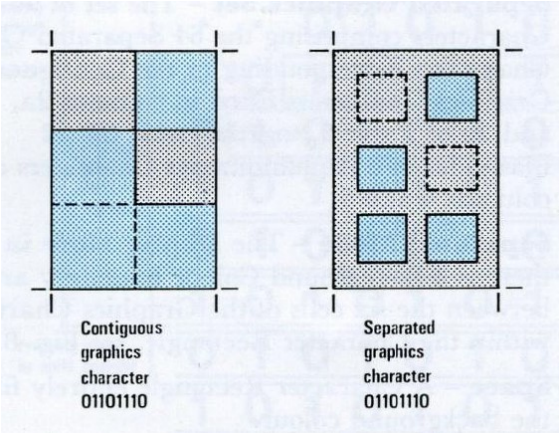


Figure 11. Illustration of "contiguous mode" versus "separated mode" 2 × 3 block graphics in teletext. (IBA Technical Review #2)

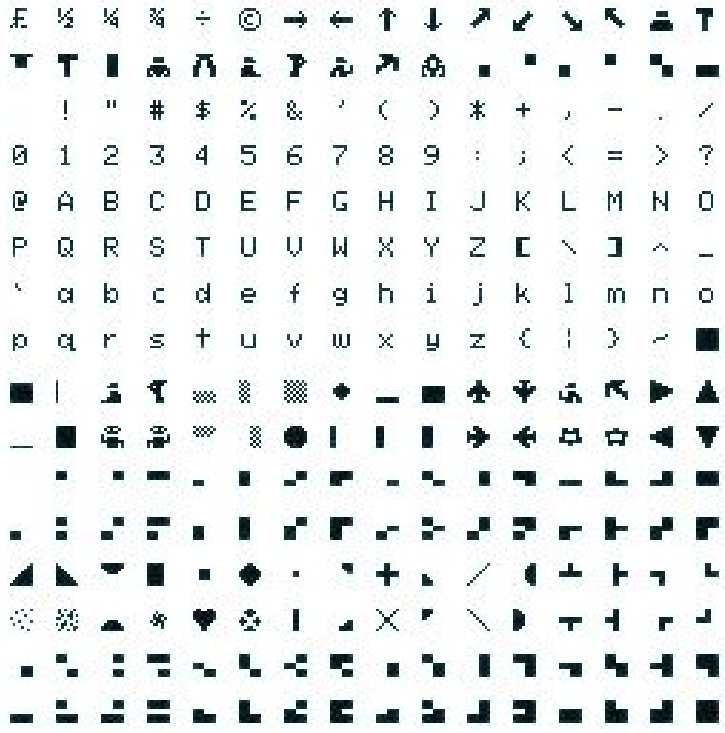


Figure 12. Mattel Aquarius character set. Several of the glyphs in this collection could not be identified, and hence this platform was not used as input to this proposal (except for U+1FBA1 RIGHT HALF MEDIUM SHADE).

A. Administrative

1. Title
Proposal to add characters from legacy computers and teletext to the UCS
2. Requester's name
Terminals Working Group (Doug Ewell et al.)
3. Requester type (Member body/Liaison/Individual contribution)
Individual contribution.
4. Submission date
2017-12-22
5. Requester's reference (if applicable)
6. Choose one of the following:
6a. This is a complete proposal
Yes.
6b. More information will be provided later
No.

B. Technical – General

1. Choose one of the following:
1a. This proposal is for a new script (set of characters)
Yes.
1b. Proposed name of script
Graphics for Legacy Computing.
1c. The proposal is for addition of character(s) to an existing block
No.
1d. Name of the existing block
2. Number of characters in proposal
207, plus 198 variation sequences.
3. Proposed category (A-Contemporary; B.1-Specialized (small collection); B.2-Specialized (large collection); C-Major extinct; D-Attested extinct; E-Minor extinct; F-Archaic Hieroglyphic or Ideographic; G-Obscure or questionable usage symbols)
Category B.1.
4a. Is a repertoire including character names provided?
Yes.
4b. If YES, are the names in accordance with the "character naming guidelines" in Annex L of P&P document?
Yes.
4c. Are the character shapes attached in a legible form suitable for review?
Yes.
5a. Who will provide the appropriate computerized font (ordered preference: True Type, or PostScript format) for publishing the standard?
Rebecca Bettencourt
5b. If available now, identify source(s) for the font (include address, e-mail, ftp-site, etc.) and indicate the tools used:
Rebecca Bettencourt, FontForge.
6a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided?
Yes.
6b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached?
Yes.
7. Does the proposal address other aspects of character data processing (if applicable) such as input, presentation, sorting, searching, indexing, transliteration etc. (if yes please enclose information)?
Yes.
8. Submitters are invited to provide any additional information about Properties of the proposed Character(s) or Script that will assist in correct understanding of and correct linguistic processing of the proposed character(s) or script.
See above.

C. Technical – Justification

1. Has this proposal for addition of character(s) been submitted before? If YES, explain.
No, except for 5 characters proposed by Eduardo Marín Silva in L2/17-194.
2a. Has contact been made to members of the user community (for example: National Body, user groups of the script or characters, other experts, etc.)?
Yes.
2b. If YES, with whom?
comp.sys.apple2 (Apple II newsgroup); Atari ST user community; TRS-80 user community (George Phillips).
2c. If YES, available relevant documents
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included?

Contemporary use by specialists and hobbyists.
4a. The context of use for the proposed characters (type of use; common or rare)
Rare.
4b. Reference
5a. Are the proposed characters in current use by the user community?
Yes.
5b. If YES, where?
Worldwide, but particularly in North America and Europe.
6a. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP?
No.
6b. If YES, is a rationale provided?
6c. If YES, reference
7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)?
Mostly yes, but this is not required.
8a. Can any of the proposed characters be considered a presentation form of an existing character or character sequence?
Yes, variation sequences are included.
8b. If YES, is a rationale for its inclusion provided?
Yes
8c. If YES, reference
9a. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters?
No.
9b. If YES, is a rationale for its inclusion provided?
9c. If YES, reference
10a. Can any of the proposed character(s) be considered to be similar (in appearance or function) to an existing character?
Yes.
10b. If YES, is a rationale for its inclusion provided?
Yes.
10c. If YES, reference
The proposal document describes new semigraphics which are superficially similar to existing characters.
11a. Does the proposal include use of combining characters and/or use of composite sequences (see clauses 4.12 and 4.14 in ISO/IEC 10646-1: 2000)?
Yes, variation sequences are included.
11b. If YES, is a rationale for such use provided?
Yes
11c. If YES, reference
The proposal document explains and provides justification for the variation sequences.
11d. Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided?
No.
11e. If YES, reference
12a. Does the proposal contain characters with any special properties such as control function or similar semantics?
No.
12b. If YES, describe in detail (include attachment if necessary)
13a. Does the proposal contain any Ideographic compatibility character(s)?
No.
13b. If YES, is the equivalent corresponding unified ideographic character(s) identified?

Targeted Platforms

Platform	Links
Teletext	1 2 3
TRS-80 Model I / Color Computer	1 2
TRS-80 Model III / Model 4	1 2 3
PETSCII	1 2 3 4
Apple II	1 2 3 (p24)
Sinclair ZX80 / ZX81 / ZX Spectrum	1 2 3
TI-99/4A	1 2 (p118) 3 (p165) 4 (p157)
ATASCII	1
Atari ST	1
VT100, etc.	1

Proposed Graphic Characters in Existing Blocks

CP	G	Name	Source
2B96		Arrow Pointing Upwards Then North West	ATASCII
2B97		Arrow Pointing Rightwards Then Curving South West	TRS-80

Proposed Graphic Characters in a New Block

CP	G	Name	Source
1FB00		(unified with U+00A0 NO-BREAK SPACE)	Teletext, TRS-80
1FB01		Block Sextant-1	Teletext, TRS-80
1FB02		Block Sextant-2	Teletext, TRS-80
1FB03		Block Sextant-12	Teletext, TRS-80
1FB04		Block Sextant-3	Teletext, TRS-80
1FB05		Block Sextant-13	Teletext, TRS-80
1FB06		Block Sextant-23	Teletext, TRS-80
1FB07		Block Sextant-123	Teletext, TRS-80
1FB08		Block Sextant-4	Teletext, TRS-80
1FB09		Block Sextant-14	Teletext, TRS-80
1FB0A		Block Sextant-24	Teletext, TRS-80
1FB0B		Block Sextant-124	Teletext, TRS-80
1FB0C		Block Sextant-34	Teletext, TRS-80
1FB0D		Block Sextant-134	Teletext, TRS-80
1FB0E		Block Sextant-234	Teletext, TRS-80
1FB0F		Block Sextant-1234	Teletext, TRS-80
1FB10		Block Sextant-5	Teletext, TRS-80
1FB11		Block Sextant-15	Teletext, TRS-80
1FB12		Block Sextant-25	Teletext, TRS-80
1FB13		Block Sextant-125	Teletext, TRS-80

1FB14		Block Sextant-35	Teletext, TRS-80
1FB15		(unified with U+258C LEFT HALF BLOCK)	Teletext, TRS-80
1FB16		Block Sextant-235	Teletext, TRS-80
1FB17		Block Sextant-1235	Teletext, TRS-80
1FB18		Block Sextant-45	Teletext, TRS-80
1FB19		Block Sextant-145	Teletext, TRS-80
1FB1A		Block Sextant-245	Teletext, TRS-80
1FB1B		Block Sextant-1245	Teletext, TRS-80
1FB1C		Block Sextant-345	Teletext, TRS-80
1FB1D		Block Sextant-1345	Teletext, TRS-80
1FB1E		Block Sextant-2345	Teletext, TRS-80
1FB1F		Block Sextant-12345	Teletext, TRS-80
1FB20		Block Sextant-6	Teletext, TRS-80
1FB21		Block Sextant-16	Teletext, TRS-80
1FB22		Block Sextant-26	Teletext, TRS-80
1FB23		Block Sextant-126	Teletext, TRS-80
1FB24		Block Sextant-36	Teletext, TRS-80
1FB25		Block Sextant-136	Teletext, TRS-80
1FB26		Block Sextant-236	Teletext, TRS-80
1FB27		Block Sextant-1236	Teletext, TRS-80
1FB28		Block Sextant-46	Teletext, TRS-80
1FB29		Block Sextant-146	Teletext, TRS-80
1FB2A		(unified with U+2590 RIGHT HALF BLOCK)	Teletext, TRS-80
1FB2B		Block Sextant-1246	Teletext, TRS-80
1FB2C		Block Sextant-346	Teletext, TRS-80
1FB2D		Block Sextant-1346	Teletext, TRS-80
1FB2E		Block Sextant-2346	Teletext, TRS-80
1FB2F		Block Sextant-12346	Teletext, TRS-80
1FB30		Block Sextant-56	Teletext, TRS-80
1FB31		Block Sextant-156	Teletext, TRS-80
1FB32		Block Sextant-256	Teletext, TRS-80
1FB33		Block Sextant-1256	Teletext, TRS-80
1FB34		Block Sextant-356	Teletext, TRS-80
1FB35		Block Sextant-1356	Teletext, TRS-80
1FB36		Block Sextant-2356	Teletext, TRS-80
1FB37		Block Sextant-12356	Teletext, TRS-80
1FB38		Block Sextant-456	Teletext, TRS-80
1FB39		Block Sextant-1456	Teletext, TRS-80
1FB3A		Block Sextant-2456	Teletext, TRS-80
1FB3B		Block Sextant-12456	Teletext, TRS-80
1FB3C		Block Sextant-3456	Teletext, TRS-80
1FB3D		Block Sextant-13456	Teletext, TRS-80

1FB3E		Block Sextant-23456	Teletext, TRS-80
1FB3F		(unified with U+2588 FULL BLOCK)	Teletext, TRS-80
1FB40		Lower Left Block Diagonal Lower Middle Left to Lower Centre	Teletext
1FB41		Lower Left Block Diagonal Lower Middle Left to Lower Right	Teletext
1FB42		Lower Left Block Diagonal Upper Middle Left to Lower Centre	Teletext
1FB43		Lower Left Block Diagonal Upper Middle Left to Lower Right	Teletext
1FB44		Lower Left Block Diagonal Upper Left to Lower Centre	Teletext
1FB45		Lower Right Block Diagonal Upper Middle Left to Upper Centre	Teletext
1FB46		Lower Right Block Diagonal Upper Middle Left to Upper Right	Teletext
1FB47		Lower Right Block Diagonal Lower Middle Left to Upper Centre	Teletext
1FB48		Lower Right Block Diagonal Lower Middle Left to Upper Right	Teletext
1FB49		Lower Right Block Diagonal Lower Left to Upper Centre	Teletext
1FB4A		Lower Right Block Diagonal Lower Middle Left to Upper Middle Right	Teletext
1FB4B		Lower Right Block Diagonal Lower Centre to Lower Middle Right	Teletext
1FB4C		Lower Right Block Diagonal Lower Left to Lower Middle Right	Teletext
1FB4D		Lower Right Block Diagonal Lower Centre to Upper Middle Right	Teletext
1FB4E		Lower Right Block Diagonal Lower Left to Upper Middle Right	Teletext
1FB4F		Lower Right Block Diagonal Lower Centre to Upper Right	Teletext
1FB50		Lower Left Block Diagonal Upper Centre to Upper Middle Right	Teletext
1FB51		Lower Left Block Diagonal Upper Left to Upper Middle Right	Teletext
1FB52		Lower Left Block Diagonal Upper Centre to Lower Middle Right	Teletext
1FB53		Lower Left Block Diagonal Upper Left to Lower Middle Right	Teletext
1FB54		Lower Left Block Diagonal Upper Centre to Lower Right	Teletext
1FB55		Lower Left Block Diagonal Upper Middle Left to Lower Middle Right	Teletext
1FB56		Upper Right Block Diagonal Lower Middle Left to Lower Centre	Teletext
1FB57		Upper Right Block Diagonal Lower Middle Left to Lower Right	Teletext
1FB58		Upper Right Block Diagonal Upper Middle Left to Lower Centre	Teletext
1FB59		Upper Right Block Diagonal Upper Middle Left to Lower Right	Teletext
1FB5A		Upper Right Block Diagonal Upper Left to Lower Centre	Teletext
1FB5B		Upper Left Block Diagonal Upper Middle Left to Upper Centre	Teletext
1FB5C		Upper Left Block Diagonal Upper Middle Left to Upper Right	Teletext
1FB5D		Upper Left Block Diagonal Lower Middle Left to Upper Centre	Teletext
1FB5E		Upper Left Block Diagonal Lower Middle Left to Upper Right	Teletext
1FB5F		Upper Left Block Diagonal Lower Left to Upper Centre	Teletext
1FB60		Upper Left Block Diagonal Lower Middle Left to Upper Middle Right	Teletext
1FB61		Upper Left Block Diagonal Lower Centre to Lower Middle Right	Teletext
1FB62		Upper Left Block Diagonal Lower Left to Lower Middle Right	Teletext
1FB63		Upper Left Block Diagonal Lower Centre to Upper Middle Right	Teletext
1FB64		Upper Left Block Diagonal Lower Left to Upper Middle Right	Teletext
1FB65		Upper Left Block Diagonal Lower Centre to Upper Right	Teletext
1FB66		Upper Right Block Diagonal Upper Centre to Upper Middle Right	Teletext
1FB67		Upper Right Block Diagonal Upper Left to Upper Middle Right	Teletext

1FB68		Upper Right Block Diagonal Upper Centre to Lower Middle Right	Teletext
1FB69		Upper Right Block Diagonal Upper Left to Lower Middle Right	Teletext
1FB6A		Upper Right Block Diagonal Upper Centre to Lower Right	Teletext
1FB6B		Upper Right Block Diagonal Upper Middle Left to Lower Middle Right	Teletext
1FB6C		Upper and Right and Lower Triangular Three Quarters Block	Teletext
1FB6D		Left and Lower and Right Triangular Three Quarters Block	Teletext
1FB6E		Upper and Left and Lower Triangular Three Quarters Block	Teletext
1FB6F		Left and Upper and Right Triangular Three Quarters Block	Teletext
1FB70		Left Triangular One Quarter Block	Teletext
1FB71		Upper Triangular One Quarter Block	Teletext
1FB72		Right Triangular One Quarter Block	Teletext
1FB73		Lower Triangular One Quarter Block	Teletext
1FB74		Vertical One Eighth Block-2	PETSCII, Teletext
1FB75		Vertical One Eighth Block-3	PETSCII
1FB76		Vertical One Eighth Block-4	PETSCII
1FB77		Vertical One Eighth Block-5	PETSCII
1FB78		Vertical One Eighth Block-6	PETSCII
1FB79		Vertical One Eighth Block-7	PETSCII, Teletext
1FB7A		Horizontal One Eighth Block-2	PETSCII
1FB7B		Horizontal One Eighth Block-3	PETSCII
1FB7C		Horizontal One Eighth Block-4	PETSCII
1FB7D		Horizontal One Eighth Block-5	PETSCII
1FB7E		Horizontal One Eighth Block-6	PETSCII
1FB7F		Horizontal One Eighth Block-7	PETSCII
1FB80		Left and Lower One Eighth Block	PETSCII, Apple II
1FB81		Left and Upper One Eighth Block	PETSCII
1FB82		Right and Upper One Eighth Block	PETSCII
1FB83		Right and Lower One Eighth Block	PETSCII
1FB84		Upper and Lower One Eighth Block	Apple II
1FB85		Horizontal One Eighth Block-1358	Apple II
1FB86		Upper One Quarter Block	PETSCII
1FB87		Upper Three Eighths Block	PETSCII
1FB88		Upper Five Eighths Block	PETSCII
1FB89		Upper Three Quarters Block	PETSCII
1FB8A		Upper Seven Eighths Block	PETSCII
1FB8B		Right One Quarter Block	PETSCII
1FB8C		Right Three Eighths Block	PETSCII
1FB8D		Right Five Eighths Block	PETSCII
1FB8E		Right Three Quarters Block	PETSCII
1FB8F		Right Seven Eighths Block	PETSCII
1FB90		Upper Right Seven Eighths Block	PETSCII
1FB91		Lower Right Seven Eighths Block	PETSCII

1FB92		Lower Left Seven Eighths Block	PETSCII
1FB93		Upper Left Seven Eighths Block	PETSCII
1FB94		Left One Eighth Block and Right Three Quarters Block	PETSCII
1FB95		Left One Quarter Block and Right Five Eighths Block	PETSCII
1FB96		Left Three Eighths Block and Right Half Block	PETSCII
1FB97		Left Half Block and Right Three Eighths Block	PETSCII
1FB98		Left Five Eighths Block and Right One Quarter Block	PETSCII
1FB99		Left Three Quarters Block and Right One Eighth Block	PETSCII
1FB9A		Upper One Eighth Block and Lower Three Quarters Block	PETSCII
1FB9B		Upper One Quarter Block and Lower Five Eighths Block	PETSCII
1FB9C		Upper Three Eighths Block and Lower Half Block	PETSCII
1FB9D		Upper Half Block and Lower Three Eighths Block	PETSCII
1FB9E		Upper Five Eighths Block and Lower One Quarter Block	PETSCII
1FB9F		Upper Three Quarters Block and Lower One Eighth Block	PETSCII
1FBA0		Left Half Medium Shade	PETSCII
1FBA1		Right Half Medium Shade	Mattel Aquarius
1FBA2		Upper Half Medium Shade	Sinclair
1FBA3		Lower Half Medium Shade	PETSCII, Sinclair
1FBA4		Inverse Medium Shade	PETSCII, Apple II, Sinclair
1FBA5		Upper Half Block and Lower Half Inverse Medium Shade	PETSCII, Sinclair
1FBA6		Upper Half Inverse Medium Shade and Lower Half Block	Sinclair
1FBA7		(unattested: Left Half Block and Right Half Inverse Medium Shade)	
1FBA8		Left Half Inverse Medium Shade and Right Half Block	PETSCII
1FBA9		Four-by-Four Checker Board	PETSCII
1FBAA		Reverse Four-by-Four Checker Board	PETSCII
1FBAB		Upper Left to Lower Right Fill	PETSCII
1FBAC		Inverse Upper Left to Lower Right Fill	PETSCII
1FBAD		Upper Right to Lower Left Fill	PETSCII
1FBAE		Inverse Upper Right to Lower Left Fill	PETSCII
1FBAF		Inverse Check Mark	PETSCII, Apple II
1FBB0		Box Drawings Light Diagonal Upper Centre to Middle Left to Lower Centre	Teletext
1FBB1		Box Drawings Light Diagonal Upper Centre to Middle Right to Lower Centre	Teletext
1FBB2		Box Drawings Light Diagonal Middle Left to Lower Centre to Middle Right	Teletext
1FBB3		Box Drawings Light Diagonal Middle Left to Upper Centre to Middle Right	Teletext
1FBB4		Box Drawings Light Diagonal Upper Centre to Middle Left	Teletext
1FBB5		Box Drawings Light Diagonal Upper Centre to Middle Right	Teletext
1FBB6		Box Drawings Light Diagonal Middle Left to Lower Centre	Teletext
1FBB7		Box Drawings Light Diagonal Middle Right to Lower Centre	Teletext
1FBB8		Inverse Box Drawings Light Diagonal Cross	Atari ST
1FBB9		Inverse Box Drawings Light Diagonal Middle Right to Lower Centre	Atari ST
1FBBA		Inverse Box Drawings Light Diagonal Diamond	Atari ST

1FBC0		Arrowhead-Shaped Pointer	Apple II
1FBC1		Left Half Running Man	Apple II
1FBC2		Right Half Running Man	Apple II
1FBC3		Inverse Downwards Arrow with Tip Leftwards	Apple II
1FBC4		Leftwards Arrow and Upper and Lower One Eighth Block	Apple II
1FBC5		Rightwards Arrow and Upper and Lower One Eighth Block	Apple II
1FBC6		Downwards Arrow and Right One Eighth Block	Apple II
1FBC7		Upwards Arrow and Right One Eighth Block	Apple II
1FBC8		Left Half Folder	Apple II
1FBC9		Right Half Folder	Apple II
1FBCA		Voided Greek Cross	Apple II
1FBCB		Right Open Squared Dot	Apple II
1FBCC		Two Pairs of Diagonal Lines Crossing	TRS-80
1FBCD		Left Third White Right Pointing Index	TRS-80
1FBCE		Middle Third White Right Pointing Index	TRS-80
1FBCF		Right Third White Right Pointing Index	TRS-80
1FBD0		Negative Squared Question Mark	TRS-80
1FBD1		Stick Figure	TRS-80
1FBD2		Stick Figure With Dress	TRS-80
1FBD3		White Up-Pointing Chevron	TRS-80
1FBD4		Heavy Horizontal Fill	TRS-80
1FBD5		Inverse Heavy Horizontal Fill	TRS-80
1FBD6		(unidentified character)	TRS-80
1FBD7		(unidentified character)	TRS-80
1FBD8		(inverse unidentified character)	TRS-80
1FBFF		Border-Coloured Full Block	TI-99/4A

Proposed Variation Sequences for Segmented Digits

CP	Name	Source
0030+FE01	DIGIT ZERO	Atari ST
0031+FE01	DIGIT ONE	Atari ST
0032+FE01	DIGIT TWO	Atari ST
0033+FE01	DIGIT THREE	Atari ST
0034+FE01	DIGIT FOUR	Atari ST
0035+FE01	DIGIT FIVE	Atari ST
0036+FE01	DIGIT SIX	Atari ST
0037+FE01	DIGIT SEVEN	Atari ST
0038+FE01	DIGIT EIGHT	Atari ST
0039+FE01	DIGIT NINE	Atari ST

Proposed Variation Sequences for Reverse Video Variants of Existing Characters

CP	Name	Source
0020+FE0D	SPACE	PETSCII, Apple II, TRS-80, ATASCII
0021+FE0D	EXCLAMATION MARK	PETSCII, Apple II, TRS-80, ATASCII
0022+FE0D	QUOTATION MARK	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0023+FE0D	NUMBER SIGN	PETSCII, Apple II, TRS-80, ATASCII
0024+FE0D	DOLLAR SIGN	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0025+FE0D	PERCENT SIGN	PETSCII, Apple II, TRS-80, ATASCII
0026+FE0D	AMPERSAND	PETSCII, Apple II, TRS-80, ATASCII
0027+FE0D	APOSTROPHE	PETSCII, Apple II, TRS-80, ATASCII
0028+FE0D	LEFT PARENTHESIS	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0029+FE0D	RIGHT PARENTHESIS	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
002A+FE0D	ASTERISK	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
002B+FE0D	PLUS SIGN	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
002C+FE0D	COMMA	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
002D+FE0D	HYPHEN-MINUS	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
002E+FE0D	FULL STOP	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
002F+FE0D	SOLIDUS	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0030+FE0D	DIGIT ZERO	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0031+FE0D	DIGIT ONE	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0032+FE0D	DIGIT TWO	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0033+FE0D	DIGIT THREE	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0034+FE0D	DIGIT FOUR	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0035+FE0D	DIGIT FIVE	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0036+FE0D	DIGIT SIX	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0037+FE0D	DIGIT SEVEN	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0038+FE0D	DIGIT EIGHT	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0039+FE0D	DIGIT NINE	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
003A+FE0D	COLON	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
003B+FE0D	SEMICOLON	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
003C+FE0D	LESS-THAN SIGN	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
003D+FE0D	EQUALS SIGN	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
003E+FE0D	GREATER-THAN SIGN	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
003F+FE0D	QUESTION MARK	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0040+FE0D	COMMERCIAL AT	PETSCII, Apple II, TRS-80, ATASCII
0041+FE0D	LATIN CAPITAL LETTER A	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0042+FE0D	LATIN CAPITAL LETTER B	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0043+FE0D	LATIN CAPITAL LETTER C	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0044+FE0D	LATIN CAPITAL LETTER D	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0045+FE0D	LATIN CAPITAL LETTER E	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0046+FE0D	LATIN CAPITAL LETTER F	PETSCII, Apple II, TRS-80, ATASCII, Sinclair

0047+FE0D	LATIN CAPITAL LETTER G	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0048+FE0D	LATIN CAPITAL LETTER H	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0049+FE0D	LATIN CAPITAL LETTER I	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
004A+FE0D	LATIN CAPITAL LETTER J	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
004B+FE0D	LATIN CAPITAL LETTER K	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
004C+FE0D	LATIN CAPITAL LETTER L	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
004D+FE0D	LATIN CAPITAL LETTER M	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
004E+FE0D	LATIN CAPITAL LETTER N	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
004F+FE0D	LATIN CAPITAL LETTER O	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0050+FE0D	LATIN CAPITAL LETTER P	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0051+FE0D	LATIN CAPITAL LETTER Q	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0052+FE0D	LATIN CAPITAL LETTER R	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0053+FE0D	LATIN CAPITAL LETTER S	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0054+FE0D	LATIN CAPITAL LETTER T	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0055+FE0D	LATIN CAPITAL LETTER U	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0056+FE0D	LATIN CAPITAL LETTER V	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0057+FE0D	LATIN CAPITAL LETTER W	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0058+FE0D	LATIN CAPITAL LETTER X	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
0059+FE0D	LATIN CAPITAL LETTER Y	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
005A+FE0D	LATIN CAPITAL LETTER Z	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
005B+FE0D	LEFT SQUARE BRACKET	PETSCII, Apple II, TRS-80, ATASCII
005C+FE0D	REVERSE SOLIDUS	PETSCII, Apple II, TRS-80, ATASCII
005D+FE0D	RIGHT SQUARE BRACKET	PETSCII, Apple II, TRS-80, ATASCII
005E+FE0D	CIRCUMFLEX ACCENT	PETSCII, Apple II, TRS-80, ATASCII
005F+FE0D	LOW LINE	PETSCII, Apple II, TRS-80, ATASCII
0060+FE0D	GRAVE ACCENT	PETSCII, Apple II, TRS-80
0061+FE0D	LATIN SMALL LETTER A	PETSCII, Apple II, TRS-80, ATASCII
0062+FE0D	LATIN SMALL LETTER B	PETSCII, Apple II, TRS-80, ATASCII
0063+FE0D	LATIN SMALL LETTER C	PETSCII, Apple II, TRS-80, ATASCII
0064+FE0D	LATIN SMALL LETTER D	PETSCII, Apple II, TRS-80, ATASCII
0065+FE0D	LATIN SMALL LETTER E	PETSCII, Apple II, TRS-80, ATASCII
0066+FE0D	LATIN SMALL LETTER F	PETSCII, Apple II, TRS-80, ATASCII
0067+FE0D	LATIN SMALL LETTER G	PETSCII, Apple II, TRS-80, ATASCII
0068+FE0D	LATIN SMALL LETTER H	PETSCII, Apple II, TRS-80, ATASCII
0069+FE0D	LATIN SMALL LETTER I	PETSCII, Apple II, TRS-80, ATASCII
006A+FE0D	LATIN SMALL LETTER J	PETSCII, Apple II, TRS-80, ATASCII
006B+FE0D	LATIN SMALL LETTER K	PETSCII, Apple II, TRS-80, ATASCII
006C+FE0D	LATIN SMALL LETTER L	PETSCII, Apple II, TRS-80, ATASCII
006D+FE0D	LATIN SMALL LETTER M	PETSCII, Apple II, TRS-80, ATASCII
006E+FE0D	LATIN SMALL LETTER N	PETSCII, Apple II, TRS-80, ATASCII
006F+FE0D	LATIN SMALL LETTER O	PETSCII, Apple II, TRS-80, ATASCII
0070+FE0D	LATIN SMALL LETTER P	PETSCII, Apple II, TRS-80, ATASCII

0071+FE0D	LATIN SMALL LETTER Q	PETSCII, Apple II, TRS-80, ATASCII
0072+FE0D	LATIN SMALL LETTER R	PETSCII, Apple II, TRS-80, ATASCII
0073+FE0D	LATIN SMALL LETTER S	PETSCII, Apple II, TRS-80, ATASCII
0074+FE0D	LATIN SMALL LETTER T	PETSCII, Apple II, TRS-80, ATASCII
0075+FE0D	LATIN SMALL LETTER U	PETSCII, Apple II, TRS-80, ATASCII
0076+FE0D	LATIN SMALL LETTER V	PETSCII, Apple II, TRS-80, ATASCII
0077+FE0D	LATIN SMALL LETTER W	PETSCII, Apple II, TRS-80, ATASCII
0078+FE0D	LATIN SMALL LETTER X	PETSCII, Apple II, TRS-80, ATASCII
0079+FE0D	LATIN SMALL LETTER Y	PETSCII, Apple II, TRS-80, ATASCII
007A+FE0D	LATIN SMALL LETTER Z	PETSCII, Apple II, TRS-80, ATASCII
007B+FE0D	LEFT CURLY BRACKET	Apple II, TRS-80
007C+FE0D	VERTICAL LINE	Apple II, TRS-80
007D+FE0D	RIGHT CURLY BRACKET	Apple II, TRS-80
007E+FE0D	TILDE	Apple II, TRS-80
00A1+FE0D	INVERTED EXCLAMATION MARK	Apple II, ATASCII
00A3+FE0D	POUND SIGN	PETSCII, Apple II, TRS-80, ATASCII, Sinclair
00A4+FE0D	CURRENCY SIGN	TRS-80
00A6+FE0D	BROKEN BAR	TRS-80
00A7+FE0D	SECTION SIGN	PETSCII, Apple II, TRS-80
00A8+FE0D	DIAERESIS	PETSCII, Apple II, TRS-80
00AC+FE0D	NOT SIGN	TRS-80
00B0+FE0D	DEGREE SIGN	PETSCII, Apple II, TRS-80
00B1+FE0D	PLUS-MINUS SIGN	TRS-80
00B4+FE0D	ACUTE ACCENT	PETSCII
00B5+FE0D	MICRO SIGN	PETSCII
00BF+FE0D	INVERTED QUESTION MARK	Apple II
00C3+FE0D	LATIN CAPITAL LETTER A WITH TILDE	TRS-80
00C4+FE0D	LATIN CAPITAL LETTER A WITH DIAERESIS	PETSCII, Apple II, TRS-80, ATASCII
00C5+FE0D	LATIN CAPITAL LETTER A WITH RING ABOVE	PETSCII, Apple II, TRS-80, ATASCII
00C6+FE0D	LATIN CAPITAL LETTER AE	Apple II, TRS-80
00C7+FE0D	LATIN CAPITAL LETTER C WITH CEDILLA	TRS-80
00C9+FE0D	LATIN CAPITAL LETTER E WITH ACUTE	TRS-80, ATASCII
00D1+FE0D	LATIN CAPITAL LETTER N WITH TILDE	Apple II, TRS-80, ATASCII
00D5+FE0D	LATIN CAPITAL LETTER O WITH TILDE	TRS-80
00D6+FE0D	LATIN CAPITAL LETTER O WITH DIAERESIS	PETSCII, Apple II, TRS-80, ATASCII
00D8+FE0D	LATIN CAPITAL LETTER O WITH STROKE	Apple II, TRS-80
00DC+FE0D	LATIN CAPITAL LETTER U WITH DIAERESIS	PETSCII, Apple II, TRS-80, ATASCII
00DF+FE0D	LATIN SMALL LETTER SHARP S	PETSCII, Apple II, TRS-80
00E0+FE0D	LATIN SMALL LETTER A WITH GRAVE	PETSCII, Apple II, TRS-80, ATASCII
00E1+FE0D	LATIN SMALL LETTER A WITH ACUTE	ATASCII
00E2+FE0D	LATIN SMALL LETTER A WITH CIRCUMFLEX	PETSCII, TRS-80, ATASCII
00E3+FE0D	LATIN SMALL LETTER A WITH TILDE	TRS-80

00E4+FE0D	LATIN SMALL LETTER A WITH DIAERESIS	PETSCII, Apple II, TRS-80, ATASCII
00E5+FE0D	LATIN SMALL LETTER A WITH RING ABOVE	PETSCII, Apple II, TRS-80, ATASCII
00E6+FE0D	LATIN SMALL LETTER AE	Apple II, TRS-80
00E7+FE0D	LATIN SMALL LETTER C WITH CEDILLA	PETSCII, Apple II, TRS-80, ATASCII
00E8+FE0D	LATIN SMALL LETTER E WITH GRAVE	PETSCII, Apple II, TRS-80, ATASCII
00E9+FE0D	LATIN SMALL LETTER E WITH ACUTE	PETSCII, Apple II, TRS-80, ATASCII
00EA+FE0D	LATIN SMALL LETTER E WITH CIRCUMFLEX	PETSCII, TRS-80, ATASCII
00EB+FE0D	LATIN SMALL LETTER E WITH DIAERESIS	PETSCII, TRS-80
00EC+FE0D	LATIN SMALL LETTER I WITH GRAVE	PETSCII, Apple II, ATASCII
00EE+FE0D	LATIN SMALL LETTER I WITH CIRCUMFLEX	PETSCII, TRS-80, ATASCII
00EF+FE0D	LATIN SMALL LETTER I WITH DIAERESIS	PETSCII, TRS-80, ATASCII
00F1+FE0D	LATIN SMALL LETTER N WITH TILDE	Apple II, TRS-80, ATASCII
00F2+FE0D	LATIN SMALL LETTER O WITH GRAVE	PETSCII, Apple II, ATASCII
00F3+FE0D	LATIN SMALL LETTER O WITH ACUTE	TRS-80, ATASCII
00F4+FE0D	LATIN SMALL LETTER O WITH CIRCUMFLEX	PETSCII, TRS-80, ATASCII
00F5+FE0D	LATIN SMALL LETTER O WITH TILDE	TRS-80
00F6+FE0D	LATIN SMALL LETTER O WITH DIAERESIS	PETSCII, Apple II, TRS-80, ATASCII
00F8+FE0D	LATIN SMALL LETTER O WITH STROKE	Apple II, TRS-80
00F9+FE0D	LATIN SMALL LETTER U WITH GRAVE	PETSCII, Apple II, TRS-80, ATASCII
00FA+FE0D	LATIN SMALL LETTER U WITH ACUTE	ATASCII
00FB+FE0D	LATIN SMALL LETTER U WITH CIRCUMFLEX	PETSCII, TRS-80, ATASCII
00FC+FE0D	LATIN SMALL LETTER U WITH DIAERESIS	PETSCII, Apple II, TRS-80, ATASCII
0192+FE0D	LATIN SMALL LETTER F WITH HOOK	TRS-80
02DC+FE0D	SMALL TILDE	TRS-80
03C0+FE0D	GREEK SMALL LETTER PI	PETSCII
2190+FE0D	LEFTWARDS ARROW	PETSCII, TRS-80, ATASCII
2191+FE0D	UPWARDS ARROW	PETSCII, TRS-80, ATASCII
2192+FE0D	RIGHTWARDS ARROW	ATASCII
2193+FE0D	DOWNWARDS ARROW	ATASCII
2211+FE0D	N-ARY SUMMATION	PETSCII
221A+FE0D	SQUARE ROOT	PETSCII
23B8+FE0D	LEFT VERTICAL BOX LINE	ATASCII
23B9+FE0D	RIGHT VERTICAL BOX LINE	ATASCII
23BA+FE0D	HORIZONTAL SCAN LINE-1	ATASCII
23BD+FE0D	HORIZONTAL SCAN LINE-9	ATASCII
240D+FE0D	SYMBOL FOR CARRIAGE RETURN	TRS-80
241B+FE0D	SYMBOL FOR ESCAPE	ATASCII
2425+FE0D	SYMBOL FOR DELETE FORM TWO	Apple II
2500+FE0D	BOX DRAWINGS LIGHT HORIZONTAL	PETSCII, ATASCII
2502+FE0D	BOX DRAWINGS LIGHT VERTICAL	PETSCII, ATASCII
250C+FE0D	BOX DRAWINGS LIGHT DOWN AND RIGHT	PETSCII, ATASCII
2510+FE0D	BOX DRAWINGS LIGHT DOWN AND LEFT	PETSCII, ATASCII

2514+FE0D	BOX DRAWINGS LIGHT UP AND RIGHT	PETSCII, ATASCII
2518+FE0D	BOX DRAWINGS LIGHT UP AND LEFT	PETSCII, ATASCII
251C+FE0D	BOX DRAWINGS LIGHT VERTICAL AND RIGHT	PETSCII, ATASCII
2524+FE0D	BOX DRAWINGS LIGHT VERTICAL AND LEFT	PETSCII, ATASCII
252C+FE0D	BOX DRAWINGS LIGHT DOWN AND HORIZONTAL	PETSCII, ATASCII
2534+FE0D	BOX DRAWINGS LIGHT UP AND HORIZONTAL	PETSCII, ATASCII
253C+FE0D	BOX DRAWINGS LIGHT VERTICAL AND HORIZONTAL	PETSCII, ATASCII
256D+FE0D	BOX DRAWINGS LIGHT ARC DOWN AND RIGHT	PETSCII
256E+FE0D	BOX DRAWINGS LIGHT ARC DOWN AND LEFT	PETSCII
256F+FE0D	BOX DRAWINGS LIGHT ARC UP AND LEFT	PETSCII
2570+FE0D	BOX DRAWINGS LIGHT ARC UP AND RIGHT	PETSCII
2571+FE0D	BOX DRAWINGS LIGHT DIAGONAL UPPER RIGHT TO LOWER LEFT	PETSCII, ATASCII
2572+FE0D	BOX DRAWINGS LIGHT DIAGONAL UPPER LEFT TO LOWER RIGHT	PETSCII, ATASCII
2573+FE0D	BOX DRAWINGS LIGHT DIAGONAL CROSS	PETSCII
25AD+FE0D	WHITE RECTANGLE	TRS-80
25B6+FE0D	BLACK RIGHT-POINTING TRIANGLE	ATASCII
25C0+FE0D	BLACK LEFT-POINTING TRIANGLE	ATASCII
2660+FE0D	BLACK SPADE SUIT	PETSCII, ATASCII
2663+FE0D	BLACK CLUB SUIT	PETSCII, ATASCII
2665+FE0D	BLACK HEART SUIT	PETSCII, ATASCII
2666+FE0D	BLACK DIAMOND SUIT	PETSCII, ATASCII

Proposed Variation Sequences for Reverse Video Variants of Proposed Characters

CP	Name	Source
2B96+FE0D	Arrow Pointing Upwards Then North West	ATASCII
2B97+FE0D	Arrow Pointing Rightwards Then Curving South West	TRS-80