

**ISO/IEC JTC 1/SC 2/WG 2
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646¹**

Please fill all the sections A, B and C below.

Please read Principles and Procedures Document (P & P) from <http://www.dkuug.dk/JTC1/SC2/WG2/docs/principles.html> for guidelines and details before filling this form.

Please ensure you are using the latest Form from <http://www.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html>.

See also <http://www.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html> for latest Roadmaps.

A. Administrative

1. Title: *Preliminary Proposal to Encode Characters from the STIX PUA Collection*

2. Requester's name: *Deborah Anderson, Laurentiu Iancu, Murray Sargent*

3. Requester type (Member body/Liaison/Individual contribution): *Individual contribution*

4. Submission date: *2009-May-10*

5. Requester's reference (if applicable):

6. Choose one of the following:

This is a complete proposal:

(or) More information will be provided later:

Yes

B. Technical – General

1. Choose one of the following:

a. This proposal is for a new script (set of characters):

No

Proposed name of script:

b. The proposal is for addition of character(s) to an existing block:

Yes

Name of the existing block:

*Miscellaneous Symbols; Miscellaneous Mathematical Symbols-A;
Miscellaneous Symbols and Arrows; Supplemental Punctuation*

2. Number of characters in proposal:

32 = 2 + 3 + 24 + 3

3. Proposed category (select one from below - see section 2.2 of P&P document):

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

4. Is a repertoire including character names provided?

a. If YES, are the names in accordance with the "character naming guidelines"

in Annex L of P&P document?

Yes

b. Are the character shapes attached in a legible form suitable for review?

Yes

5. Who will provide the appropriate computerized font (ordered preference: True Type, or PostScript format) for publishing the standard?

If available now, identify source(s) for the font (include address, e-mail, ftp-site, etc.) and indicate the tools used:

The authors

6. References:

a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided?

Yes

b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached?

7. Special encoding issues:

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)?

Suggested UCD character properties are included.

8. Additional Information:

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. Examples of such properties are: Casing information, Numeric information, Currency information, Display behaviour information such as line breaks, widths etc., Combining behaviour, Spacing behaviour, Directional behaviour, Default Collation behaviour, relevance in Mark Up contexts, Compatibility equivalence and other Unicode normalization related information. See the Unicode standard at <http://www.unicode.org> for such information on other scripts. Also see <http://www.unicode.org/Public/UNIDATA/UCD.html> and associated Unicode Technical Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode Standard.

¹ Form number: N3152-F (Original 1994-10-14; Revised 1995-01, 1995-04, 1996-04, 1996-08, 1999-03, 2001-05, 2001-09, 2003-11, 2005-01, 2005-09, 2005-10, 2007-03, 2008-05)

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before? If YES explain	No
2. Has contact been made to members of the user community (for example: National Body, user groups of the script or characters, other experts, etc.)? If YES, with whom? If YES, available relevant documents:	Yes <i>Barbara Beeton, AMS; Lorna Priest, SIL</i> <i>Examples in proposal</i>
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included? Reference:	
4. The context of use for the proposed characters (type of use; common or rare) Reference:	Common
5. Are the proposed characters in current use by the user community? If YES, where? Reference:	
6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP? If YES, is a rationale provided? If YES, reference:	
7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)?	No
8. Can any of the proposed characters be considered a presentation form of an existing character or character sequence? If YES, is a rationale for its inclusion provided? If YES, reference:	No
9. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters? If YES, is a rationale for its inclusion provided? If YES, reference:	
10. Can any of the proposed character(s) be considered to be similar (in appearance or function) to an existing character? If YES, is a rationale for its inclusion provided? If YES, reference:	
11. Does the proposal include use of combining characters and/or use of composite sequences? If YES, is a rationale for such use provided? If YES, reference: Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided? If YES, reference:	Yes Yes <i>Combining diacritics from STIX PUA collection.</i>
12. Does the proposal contain characters with any special properties such as control function or similar semantics? If YES, describe in detail (include attachment if necessary)	No
13. Does the proposal contain any Ideographic compatibility character(s)? If YES, is the equivalent corresponding unified ideographic character(s) identified? If YES, reference:	No

1. Introduction

TODO: Add introductory text about the STIX project and the STIX PUA characters remaining to encode.

Contents of this proposal

The STIX PUA set consists of 336 characters, allocated in the PUA at code points in the range U+E000–U+E153, of which range four code points are unassigned (U+E058 and U+E09C–U+E09E). Many of these characters can already be represented in Unicode, some are eligible to be encoded, and others are unsuitable for encoding. Of the characters eligible for encoding, a subset is being proposed at this time. The rest require further investigation and will be proposed later.

In this document, the STIX PUA set is partitioned in several subsets, each in its own mapping table, as follows:

- STIX PUA characters already encoded as Unicode code points or variation-selector sequences;
- STIX PUA characters that can be represented as Unicode (combining) character sequences;
 - Per UTC recommendations, all negated math characters use only one code per orientation: 0338 for forward slant, 20D2 for vertical, 20E5 for backward slant;
 - Cancellation stroke is shorter, but considered a glyph variant;
 - Since the entries E061...E067 are combining marks, their representation in Unicode as sequences of two combining diacritics should be adequate;
- Proposed code points;
- Proposed variation-selector sequences;
- STIX PUA characters requiring further investigation;
 - All tilde characters are in this section and will be examined as a set;
- STIX PUA characters deemed unsuitable for encoding.

All tables are sorted in increasing order by STIX PUA code point.

The last sections of this document provide supporting evidence, a consolidated mapping from STIX PUA to Unicode, UniBook code charts, and references.

TODO: Adjust proposed code points and append UniBook code charts.

Notes

- VS1 through VS3 are abbreviations of U+FE00 VARIATION SELECTOR-1 through U+FE02 VARIATION SELECTOR-3;
- Code points are written without the ‘U+’ prefix to save space;
- Code-point sequences are enclosed within angle brackets: <cp1, cp2, ...>;
- STIX descriptions are prefixed with ‘stix-’ and come from the last column in the [STIX] table at <http://www.ams.org/STIX/bnb/stix-tbl.ascii-2006-10-20>;
- In all tables, the glyphs are from the STIXNonUnicode font. Please refer to the Unicode code charts for comparison to Unicode representative glyphs.

2. STIX PUA characters already encoded as Unicode code points or variation sequences

STIX		STIX Description <i>Comments</i>	Unicode	
Glyph	PUA		Code point(s)	Name; (<i>Comments</i>)
∪	E006	stix-union, serifs	<222A, VS1>	UNION with serifs
∩	E007	stix-intersection, serifs	<2229, VS1>	INTERSECTION with serifs
⊔	E008	stix-square union, serifs	<2294, VS1>	SQUARE CAP with serifs
⊓	E009	stix-square intersection, serifs	<2293, VS1>	SQUARE CAP with serifs
≧	E00C	stix-gt, vert, not double equals	<2269, VS1>	GREATER-THAN BUT NOT EQUAL TO with vertical stroke
≦	E00D	stix-less, vert, not double equals	<2268, VS1>	LESS-THAN BUT NOT EQUAL TO with vertical stroke
⊆	E01A	stix-subset not double equals, variant	<2ACB, VS1>	SUBSET OF ABOVE NOT EQUAL TO variant with stroke through bottom members
⊄	E01B	stix-subset, not equals, variant	<228A, VS1>	SUBSET OF WITH NOT EQUAL TO variant with overlapping stroke
⊇	E01C	stix-superset, not equals, variant	<228B, VS1>	SUPERSET OF WITH NOT EQUAL TO variant with overlapping stroke
⊈	E01D	stix-superset not double equals, variant	<2ACC, VS1>	SUPERSET OF ABOVE NOT EQUAL TO variant with stroke through bottom members
≧	E030	stix-less, equal, slanted, greater	<22DA, VS1>	LESS-THAN EQUAL TO OR GREATER-THAN with slanted equal
≧	E031	stix-greater, equal, slanted, less	<22DB, VS1>	GREATER-THAN EQUAL TO OR LESS-THAN with slanted equal
≧	E032	stix-smaller than or equal, slanted	<2AAC, VS1>	SMALLER THAN OR EQUAL TO with slanted equal
≧	E033	stix-larger than or equal, slanted	<2AAD, VS1>	LARGER THAN OR EQUAL TO with slanted equal
ℎ	E041	stix-modifier letter small h turned, superscript	1DA3	MODIFIER LETTER SMALL TURNED H
ℵ	E042	stix-modifier letter small a (one-story) turned, superscript	1D9B	MODIFIER LETTER SMALL TURNED ALPHA
⊕	E05F	stix-two horizontal bars in circle	<229C, VS1>	CIRCLED EQUALS with equal sign touching the circle
=	E060	stix-double underbar	0347 (<i>after errata</i>)	COMBINING EQUALS SIGN BELOW
⊕	E071	stix-circled plus (with rim)	<2295, VS1>	CIRCLED PLUS with white rim
⊗	E072	stix-circled times (with rim)	<2297, VS1>	CIRCLED TIMES with white rim
⋈	E08A	stix-less-than or (contour) similar	<2272, VS1>	LESS-THAN OR EQUIVALENT TO following the slant of the lower leg
⋉	E08B	stix-greater-than or (contour) similar	<2273, VS1>	GREATER-THAN OR EQUIVALENT TO following the slant of the lower leg

ℵ	E08C	stix-similar (conforming) or less-than	<2A9D, VS1>	SIMILAR OR LESS-THAN with similar following the slant of the upper leg
∞	E08D	stix-similar (conforming) or greater-than	<2A9E, VS1>	SIMILAR OR GREATER-THAN with similar following the slant of the upper leg
∇	E099	stix-narrow sloped nabla <i>Glyph variant from Math Pi fonts.</i>	1D6FB	MATHEMATICAL ITALIC NABLA
h	E0A3	stix-heng (phonetic symbol) <i>Contrast with E068 stix-hooked h.</i>	A727	LATIN SMALL LETTER HENG
-	E0F1	stix-short horizontal line <i>This is [Wolfram]'s extensible \[HorizontalLine] they map to 2500.</i>	2500	2500 BOX DRAWINGS LIGHT HORIZONTAL
☹	E0F3	stix-neutral smiley <i>This is [Wolfram]'s \[NeutralSmiley] that they map to F722 (in the PUA).</i>	1F629	DEADPAN FACE <i>(emoticon from [Emoji])</i>
💡	E0F4	stix-light bulb <i>This is [Wolfram]'s \[LightBulb] that they map to F723 (in the PUA).</i>	1F4A1	ELECTRIC LIGHT BULB <i>(pictographic symbol from [Emoji])</i>

3. STIX PUA characters that can be represented as Unicode (combining) character sequences

STIX		STIX Description <i>Comments</i>	Unicode	
Glyph	PUA		Code points	Description
↗̸	E004	stix-not right arrow-wavy	<219D, 0338>	Negated RIGHTWARDS WAVE ARROW
↘̸	E005	stix-not right arrow-curved	<2933, 0338>	Negated WAVE ARROW POINTING DIRECTLY RIGHT
≠̸	E00E	stix-not greater, double equals	<2267, 0338>	Negated GREATER-THAN OVER EQUAL TO
≧̸	E00F	stix-not greater-or-equal, slanted	<2A7E, 0338>	Negated GREATER-THAN OR SLANTED EQUAL TO
≦̸	E010	stix-not less-or-equal, slanted	<2A7D, 0338>	Negated LESS-THAN OR SLANTED EQUAL TO
≢	E011	stix-not less, double equals	<2266, 0338>	Negated LESS-THAN OVER EQUAL TO
⊄̸	E014	stix-not subset [vertical negation]	<2282, 20D2>	Vertically negated SUBSET OF
⊈	E015	stix-/nsubseteq N: not (vert) subset, equals	<2286, 20D2>	Vertically negated SUBSET OF OR EQUAL TO
⊉	E016	stix-not subset, double equals	<2AC5, 0338>	Negated SUBSET OF ABOVE EQUALS SIGN
⊅	E017	stix-not superset [vertical negation]	<2283, 20D2>	Vertically negated SUPERSET OF
⊅̸	E018	stix-not superset, double equals	<2AC6, 0338>	Negated SUPERSET OF ABOVE EQUALS SIGN
⊉	E019	stix-/nsupseteq N: not (vert) superset, equals	<2287, 20D2>	Vertically negated SUPERSET OF OR EQUAL TO
≉	E01E	stix-not approximately identical to	<224B, 0338>	Negated TRIPLE TILDE
≧̸	E01F	stix-not, vert, less-than-or-equal	<2264, 20D2>	Vertically negated LESS-THAN OR EQUAL TO
≧̸	E020	stix-not, vert, greater-than-or-equal	<2265, 20D2>	Vertically negated GREATER-THAN OR EQUAL TO
≦̸	E021	stix-not, vert, less-than	<003C, 20D2>	Vertically negated LESS-THAN SIGN
≧̸	E022	stix-not, vert, greater-than	<003E, 20D2>	Vertically negated GREATER-THAN SIGN
≢	E023	stix-not congruent, dot	<2A6D, 0338>	Negated CONGRUENT WITH DOT ABOVE
≉	E024	stix-not, vert, approximate	<2248, 20D2>	Vertically negated ALMOST EQUAL TO
≉	E025	stix-not approximately equal or equal to	<2A70, 0338>	Negated APPROXIMATELY EQUAL OR EQUAL TO
≪̸	E026	stix-not, vert, double nested less than	<2AA1, 20D2>	Vertically negated DOUBLE NESTED LESS-THAN
≫̸	E027	stix-not, vert, double nested greater than	<2AA2, 20D2>	Vertically negated DOUBLE NESTED GREATER-THAN
≪̸	E028	stix-not much less than	<226A, 0338>	Negated MUCH LESS-THAN

⚡	E029	stix-not much greater than	<226B, 0338>	Negated MUCH GREATER-THAN
⚡	E02A	stix-not triple less than	<22D8, 0338>	Negated VERY MUCH LESS-THAN
⚡	E02B	stix-not triple greater than	<22D9, 0338>	Negated VERY MUCH GREATER-THAN
⚡	E02C	stix-not, vert, right triangle, equals	<22B5, 20D2>	Vertically negated CONTAINS AS NORMAL SUBGROUP OR EQUAL TO
⚡	E02D	stix-not, vert, left triangle, equals	<22B4, 20D2>	Vertically negated NORMAL SUBGROUP OF OR EQUAL TO
⚡	E02F	stix-not, vert, angle	<2220, 20D2>	Vertically negated ANGLE
⚡	E034	stix-negated (vert) contains	<220B, 20D2>	Vertically negated CONTAINS AS MEMBER
⚡	E035	stix-negated contains	<220D, 0338>	Negated SMALL CONTAINS AS MEMBER
⚡	E036	stix-negated (vert) set membership, variant	<2208, 20D2>	Vertically negated ELEMENT OF
⚡	E037	stix-reverse not equal	<003D, 20E5>	Reverse negated EQUALS SIGN
⚡	E038	stix-not parallel, slanted	<2AFD, 20E5>	Reverse negated DOUBLE SOLIDUS OPERATOR
⚡	E039	stix-not equal, dot	<2250, 0338>	Negated APPROACHES THE LIMIT
⚡	E03A	stix-not partial differential	<2202, 0338>	Negated PARTIAL DIFFERENTIAL
⚡	E03B	stix-negated set membership, dot above	<22F5, 0338>	Negated ELEMENT OF WITH DOT ABOVE
⚡	E03C	stix-negated set membership, two horizontal strokes	<22F9, 0338>	Negated ELEMENT OF WITH TWO HORIZONTAL STROKES
⚡	E03D	stix-negated (slash) set membership	<220A, 0338>	Negated SMALL ELEMENT OF
⚡	E03E	stix-not, vert, greater, similar	<2273, 20D2>	Vertically negated SMALL ELEMENT OF
⚡	E03F	stix-not, vert, less, similar	<2272, 20D2>	Vertically negated LESS-THAN OR EQUIVALENT TO
⚡	E043	stix-two-line slanted equal to or less-than - with vertical stroke	<2A9B, 20D2>	Vertically negated DOUBLE-LINE SLANTED EQUAL TO OR LESS-THAN
⚡	E044	stix-two-line slanted equal to or greater-than with vertical stroke	<2A9C, 20D2>	Vertically negated DOUBLE-LINE SLANTED EQUAL TO OR GREATER-THAN
⚡	E045	stix-two-line slanted equal to or less-than - with slash	<2A9B, 0338>	Negated DOUBLE-LINE SLANTED EQUAL TO OR LESS-THAN
⚡	E046	stix-two-line slanted equal to or greater-than with slash	<2A9C, 0338>	Negated DOUBLE-LINE SLANTED EQUAL TO OR GREATER-THAN
⚡	E048	stix-not, vert, similar <i>Cancellation stroke is shorter than 20D2 but considered a glyph variant. Do not use 20D3. See canonical decomposition of 2241.</i>	<223C, 20D2>	Cancelled TILDE OPERATOR

⚭	E04B	stix-not precedes, single equals	<2AAF, 0338>	Negated PRECEDES ABOVE SINGLE-LINE EQUALS SIGN
⚮	E04C	stix-not precedes, double equals	<2AB3, 0338>	Negated PRECEDES ABOVE EQUALS SIGN
⚰	E04D	stix-not, vert, equal or similar	<2242, 20D2>	Vertically negated MINUS TILDE
⚱	E04E	stix-not succeeds, double equals	<2AB4, 0338>	Negated SUCCEEDS ABOVE EQUALS SIGN
⚲	E04F	stix-not succeeds, single equals	<2AB0, 0338>	Negated SUCCEEDS ABOVE SINGLE-LINE EQUALS SIGN
⚳	E050	stix-not, square subset	<228F, 0338>	Negated SQUARE IMAGE OF
⚴	E051	stix-not, square superset	<2290, 0338>	Negated SQUARE ORIGINAL OF
⚵	E052	stix-not bumpy equals	<224E, 0338>	Negated ASYMPTOTICALLY EQUAL TO
ɑ	E054	stix-Latin letter small a (one-story) with rhotic hook	<0251, 02DE>	LATIN SMALL LETTER ALPHA with (rhotic) hook
ɛ	E055	stix-Latin letter small open e with rhotic hook	<025B, 02DE>	LATIN SMALL LETTER OPEN E with (rhotic) hook
ɔ	E056	stix-Latin letter small open o with rhotic hook	<0254, 02DE>	LATIN SMALL LETTER OPEN O with (rhotic) hook
⚶	E059	stix-not precedes, similar	<227E, 0338>	Negated PRECEDES OR EQUIVALENT TO
⚷	E05A	stix-not succeeds, similar	<227F, 0338>	Negated SUCCEEDS OR EQUIVALENT TO
⚸	E05B	stix-stix-not bumpy single equals	<224F, 0338>	Negated DIFFERENCE BETWEEN
⚹	E05C	stix-stix-not equal or similar	<2242, 0338>	Negated MINUS TILDE
⋗	E063	stix-accent caret over dot	<0307, 0302>	COMBINING DOT ABOVE and CIRCUMFLEX ACCENT
⋘	E064	stix-tilde over bar over	<0304, 0303>	COMBINING MACRON and TILDE
⋙	E065	stix-straight over wavy underline	<0331, 0330>	COMBINING MACRON BELOW and TILDE BELOW
⋚	E066	stix-double dot over bar over	<0304, 0308>	COMBINING MACRON and DIAERESIS
⋛	E067	stix-wavy over straight underline	<0330, 0331>	COMBINING TILDE BELOW and MACRON BELOW
⚷̅	E069	stix-not, vert, less, greater	<2276, 20D2>	Vertically negated LESS-THAN OR GREATER-THAN
⚷̅̅	E06A	stix-not, vert, greater, less	<2277, 20D2>	Vertically negated GREATER-THAN OR LESS-THAN
⚷̅̅̅	E06B	stix-small not (vert) member <i>"small" explicitly labelled in both Unicode and STIX names</i>	<220A, 20D2>	Vertically negated SMALL ELEMENT OF
⚷̅̅̅̅	E06C	stix-small not (vert) contains <i>"small" explicitly labelled in both Unicode and STIX names</i>	<220D, 20D2>	Vertically negated SMALL CONTAINS AS MEMBER
⚷̅̅̅̅̅	E06D	stix-not equal to or member	<22F6, 0338>	Negated ELEMENT OF WITH OVERBAR








⚡	E06E	stix-not equal to or contains	<22FD, 0338>	Negated CONTAINS WITH OVERBAR
⚡	E06F	stix-Not (vert) equals or member	<22F6, 20D2>	Vertically negated ELEMENT OF WITH OVERBAR
⚡	E070	stix-not (vert) equals or contains	<22FD, 20D2>	Vertically negated CONTAINS WITH OVERBAR
⚡	E073	stix-not (vert) similar or equal	<2243, 20D2>	Vertically negated ASYMPTOTICALLY EQUAL TO
⚡	E074	stix-not (vert) similar over two-line equals	<2245, 20D2>	Vertically negated APPROXIMATELY EQUAL TO
⚡	E075	stix-not (slash) similar minus similar	<2A6C, 0338>	Negated SIMILAR MINUS SIMILAR
⚡	E076	stix-not (vert) similar minus similar	<2A6C, 20D2>	Vertically negated SIMILAR MINUS SIMILAR
⚡	E077	stix-not (vert) double similar over two-line equals	<2A70, 20D2>	Vertically negated APPROXIMATELY EQUAL OR EQUAL TO
⚡	E078	stix-not (vert) asymptotically equal to	<224D, 20D2>	Vertically negated EQUIVALENT TO
⚡	E07A	stix-not (vert) equals	<003D, 20D2>	Vertically negated EQUALS SIGN
⚡	E07B	stix-not (vert) three-line equals	<2261, 20D2>	Vertically negated IDENTICAL TO
⚡	E07C	stix-not (slash) four-line equals (not strictly equivalent to)	<2263, 0338>	Negated STRICTLY EQUIVALENT TO
⚡	E07D	stix-not (vert) four-line equals	<2263, 20D2>	Vertically negated STRICTLY EQUIVALENT TO
⚡	E07E	stix-not (vert) less-than slanted equal	<2A7D, 20D2>	Vertically negated LESS-THAN OR SLANTED EQUAL TO
⚡	E07F	stix-not (vert) greater-than slanted equal	<2A7E, 20D2>	Vertically negated GREATER-THAN OR SLANTED EQUAL TO
⚡	E080	stix-not (vert) less-than or two-line equal	<2266, 20D2>	Vertically negated LESS-THAN OVER EQUAL TO
⚡	E081	stix-not (vert) greater-than or two-line equal	<2267, 20D2>	Vertically negated GREATER-THAN OVER EQUAL TO
⚡	E082	stix-not (slash) equal (slant) or less-than	<2A95, 0338>	Negated SLANTED EQUAL TO OR LESS-THAN
⚡	E083	stix-not (slash) equal (slant) or greater-than	<2A96, 0338>	Negated SLANTED EQUAL TO OR GREATER-THAN
⚡	E084	stix-not (vert) equals (slant) or less-than	<2A95, 20D2>	Vertically negated SLANTED EQUAL TO OR LESS-THAN
⚡	E085	stix-not (vert) equals (slant) or greater-than	<2A96, 20D2>	Vertically negated SLANTED EQUAL TO OR GREATER-THAN
⚡	E086	stix-not (slash) two-line equal or less-than	<2A99, 0338>	Negated DOUBLE-LINE EQUAL TO OR LESS-THAN
⚡	E087	stix-not (slash) two-line equal or greater-than	<2A9A, 0338>	Negated DOUBLE-LINE EQUAL TO OR GREATER-THAN
⚡	E088	stix-not (vert) two-line equals or less-than	<2A99, 20D2>	Vertically negated DOUBLE-LINE EQUAL TO OR LESS-THAN
⚡	E089	stix-not (vert) two-line equals or	<2A9A, 20D2>	Vertically negated DOUBLE-LINE

		greater-than		EQUAL TO OR GREATER-THAN
⋈	E08E	stix-not (vert) precedes	<227A, 20D2>	Vertically negated PRECEDES
⋉	E08F	stix-not (vert) succeeds	<227B, 20D2>	Vertically negated SUCCEEDS
⋊	E090	stix-not (vert) precedes or contour equals	<227C, 20D2>	Vertically negated PRECEDES OR EQUAL TO
⋋	E091	stix-not (vert) succeeds or contour equals	<227D, 20D2>	Vertically negated SUCCEEDS OR EQUAL TO
⋌	E092	stix-not (vert) equals (contour) or precedes	<22DE, 20D2>	Vertically negated EQUAL TO OR PRECEDES
⋍	E093	stix-not (vert) equals (contour) or succeeds	<22DF, 20D2>	Vertically negated EQUAL TO OR SUCCEEDS
⋎	E094	stix-not (slash) equals (contour) or precedes	<22DE, 0338>	Negated EQUAL TO OR PRECEDES
⋏	E095	stix-not (slash) equals (contour) or succeeds	<22DF, 0338>	Negated EQUAL TO OR SUCCEEDS
⋐	E096	stix-not (vert) subset or two-line equals	<2AC5, 20D2>	Vertically negated SUBSET OF ABOVE EQUALS SIGN
⋑	E097	stix-not (vert) superset or two-line equals	<2AC6, 20D2>	Vertically negated SUPERSET OF ABOVE EQUALS SIGN
⋒	E098	stix-triple vertical, slash cancellation	<2AF4, 0338>	Cancelled TRIPLE VERTICAL BAR BINARY RELATION
()	E09A	stix-parentheses around thin space	<0028, 2009, 0029>	THIN SPACE enclosed within PARENTHESES
(·)	E09B	stix-center dot in parentheses	<0028, 22C5, 0029>	DOT OPERATOR enclosed within PARENTHESES
↑	E0A8	stix-modifier letter high-rise tone bar	<02E6, 02E5>	MODIFIER LETTER HIGH EXTRA-HIGH CONTOUR TONE BAR
↓	E0AB	stix-modifier letter low-rise tone bar	<02E9, 02E8>	MODIFIER LETTER EXTRA-LOW LOW CONTOUR TONE BAR
↗	E0AD	stix-modifier letter rise-fall tone bar	<02E6, 02E5, 02E6>	MODIFIER LETTER HIGH EXTRA-HIGH HIGH CONTOUR TONE BAR
↖	E0AE	stix-modifier letter rise tone bar	<02E9, 02E5>	MODIFIER LETTER EXTRA-LOW EXTRA-HIGH CONTOUR TONE BAR
↘	E0AF	stix-modifier letter fall tone bar	<02E5, 02E9>	MODIFIER LETTER EXTRA-HIGH EXTRA-LOW CONTOUR TONE BAR
fj	E0B3	stix-small fj ligature <i>See notes on p. 540 of TUS 5.0.</i>	<0066, 200D, 006A>	LATIN SMALL LIGATURE FJ
⋈	E0BB	stix-equal sign above tilde operator, vertical negation	<2A73, 20D2>	Vertically negated EQUALS SIGN ABOVE TILDE OPERATOR
⋉	E0BC	stix-times sign with dash through it <i>Decide which stroke diacritic to use.</i>	<00D7, 0335> or <00D7, 0336>	MULTIPLICATION SIGN with stroke
<i>f</i>	E0BD	stix-lowercase italic f with horizontal bar touching its upper edge <i>From IEEE, created for convenience.</i>	<1D453, 0304>	MATHEMATICAL ITALIC SMALL F with MACRON
<i>f^T</i>	E0BE	stix-lowercase italic f with horizontal bar touching its upper edge and	<1D453, 0304, 1D447>	MATHEMATICAL ITALIC SMALL F with MACRON and superscripted

		superscript u/c italic T <i>From IEEE, created for convenience.</i>		MATHEMATICAL ITALIC CAPITAL T
°	E0D8	stix-arc-degrees (degree with dot below)	<00B0, 0323>	DEGREE SIGN with DOT BELOW
′	E0D9	stix-arc-minutes (prime with dot below)	<2032, 0323>	PRIME with DOT BELOW
″	E0DA	stix-arc-seconds (double prime with dot below)	<2033, 0323>	DOUBLE PRIME with DOT BELOW
ḍ	E0DD	stix-days (roman d with dot below) <i>Not a phonetic modifier letter.</i>	<0064, 0323>	LATIN SMALL LETTER D with DOT BELOW
ḥ	E0DE	stix-hours (roman h with dot below) <i>Not a phonetic modifier letter.</i>	<0068, 0323>	LATIN SMALL LETTER H with DOT BELOW
ṃ	E0DF	stix-minutes (roman m with dot below) <i>Not a phonetic modifier letter.</i>	<006D, 0323>	LATIN SMALL LETTER M with DOT BELOW
p̣	E0E0	stix-period (roman p with dot below) <i>Not a phonetic modifier letter.</i>	<0050, 0323>	LATIN CAPITAL LETTER P with DOT BELOW
ṣ	E0E1	stix-seconds (roman s with dot below) <i>Not a phonetic modifier letter.</i>	<0073, 0323>	LATIN SMALL LETTER S with DOT BELOW
ỵ	E0E2	stix-years (roman y with dot below) <i>Not a phonetic modifier letter.</i>	<0079, 0323>	LATIN SMALL LETTER Y with DOT BELOW
⚭	E14C	stix-not left triangle, vertical bar	<29CF, 0338>	Negated LEFT TRIANGLE BESIDE VERTICAL BAR
⚮	E14D	stix-not vertical bar, right triangle	<29D0, 0338>	Negated VERTICAL BAR BESIDE RIGHT TRIANGLE
⚭	E14E	stix-not double less-than sign	<2AA1, 0338>	Negated DOUBLE NESTED LESS-THAN
⚮	E14F	stix-not double greater-than sign	<2AA2, 0338>	Negated DOUBLE NESTED GREATER-THAN

4. Proposed code points

STIX		STIX Description <i>Comments</i>	Unicode	
Glyph	PUA		Code	Proposed name
	E002	stix-"shaw": large operator with three parallel vertical lines topped by a horizontal	27CB	N-ARY SHAW <i>(N-ARY because of large size)</i>
	E0E3	stix-eclipse	26E4	ECLIPSE
	E0E4	stix-Uranus <i>Disunify and cross-reference 2645 URANUS.</i>	26E5	ASTRONOMICAL SYMBOL FOR URANUS
	E0E5	stix-dashed solidus <i>This is not 22F0.</i>	2E32	DASHED SOLIDUS
	E0E6	stix-dashed backslash <i>This is not 22F1.</i>	2E33	DASHED REVERSE SOLIDUS
	E0E7	stix-narrow down-triangle <i>Propose four code points: up/down pointers that form a set with 25BA, 25BB, 25C4, 25C5. See also 22B2, 22B3. Need the other three glyphs.</i>	2B5A 2B5B 2B5C 2B5D	BLACK UP-POINTING POINTER WHITE UP-POINTING POINTER BLACK DOWN-POINTING POINTER WHITE DOWN-POINTING POINTER
	E0E9	stix-outline plus sign	27CE	OUTLINE PLUS SIGN
	E0EA	stix-diamond with lines from corners	2B5F	WHITE DIAMOND WITH TICKS FROM CORNERS
	E0EB	stix-square with lines from corners	2B5E	WHITE SQUARE WITH TICKS FROM CORNERS
	E0EC	stix-equal with exclamation over	27CD	EXCLAIMED EQUAL TO
	E0ED	stix-five vertical dots	2E34	VERTICAL FIVE DOTS
	E112	stix-northeast arrow with dashed stem <i>Forms a set with 21E0...21E3.</i>	2B61	NORTH EAST DASHED ARROW
	E113	stix-southeast arrow with dashed stem <i>Forms a set with 21E0...21E3.</i>	2B62	SOUTH EAST DASHED ARROW
	E114	stix-northwest arrow with dashed stem <i>Forms a set with 21E0...21E3.</i>	2B60	NORTH WEST DASHED ARROW
	E115	stix-southwest arrow with dashed stem <i>Forms a set with 21E0...21E3.</i>	2B63	SOUTH WEST DASHED ARROW
	E11A	stix-up arrow with dotted stem <i>Forms a set with 2911, 2B38.</i>	2B64	UPWARDS ARROW WITH DOTTED STEM
	E11B	stix-down arrow with dotted stem <i>Forms a set with 2911, 2B38.</i>	2B65	DOWNWARDS ARROW WITH DOTTED STEM
	E11C	stix-northeast arrow with dotted stem <i>Forms a set with 2911, 2B38.</i>	2B67	NORTH EAST ARROW WITH DOTTED STEM
	E11D	stix-southeast arrow with dotted stem <i>Forms a set with 2911, 2B38.</i>	2B68	SOUTH EAST ARROW WITH DOTTED STEM
	E11E	stix-northwest arrow with dotted stem <i>Forms a set with 2911, 2B38.</i>	2B66	NORTH WEST ARROW WITH DOTTED STEM
	E11F	stix-southwest arrow with dotted stem <i>Forms a set with 2911, 2B38.</i>	2B69	SOUTH WEST ARROW WITH DOTTED STEM
	E124	stix-up arrow with dot-dash stem	2B6B	UPWARDS ARROW WITH DOT-DASH STEM

	E125	stix-down arrow with dot-dash stem	2B6D	DOWNWARDS ARROW WITH DOT-DASH STEM
	E126	stix-left arrow with dot-dash stem	2B6A	LEFTWARDS ARROW WITH DOT-DASH STEM
	E127	stix-right arrow with dot-dash stem (E238)	2B6C	RIGHTWARDS ARROW WITH DOT-DASH STEM
	E128	stix-northeast arrow with dot-dash stem	2B6F	NORTH EAST ARROW WITH DOT-DASH STEM
	E129	stix-southeast arrow with dot-dash stem	2B70	SOUTH EAST ARROW WITH DOT-DASH STEM
	E12A	stix-northwest arrow with dot-dash stem	2B6E	NORTH WEST ARROW WITH DOT-DASH STEM
	E12B	stix-southwest arrow with dot-dash stem	2B71	SOUTH WEST ARROW WITH DOT-DASH STEM





5. Proposed variation sequences














STIX		STIX Description	Unicode	
Glyph	PUA	Comments	Variation seq.	Proposed name
\hbar	E02E	stix-/hbar – Planck's over 2pi <i>[STIX] glyph name is "210F.var"</i>	<210F, VS1>	PLANCK CONSTANT OVER TWO PI variant with horizontal stroke












6. STIX PUA characters requiring further investigation

STIX		STIX Description	Comments
Glyph	PUA		
	E003	stix-"shaw" (<i>just like E002</i>)	Unified with STIX E002 as glyph variant. Is a variation sequence needed to distinguish E003 from E002?
₪	E00A	stix-reverse most positive, line below	Currently a glyph variant of 22CD. [STIX] glyph name implies <223E, 0332> reversed, which is a typo in [STIX] (cf. next entry in [STIX]). Sequence <223D, 0332> might work, but research disunification as LAZY S EQUALS.
℔	E00B	stix-most positive, two lines below	[STIX] glyph name implies <223E, 0333>. Consider disunification as INVERTED LAZY S ABOVE EQUALS SIGN.
⋈	E012	stix-negated short mid	Glyph variant of 2224 DOES NOT DIVIDE created for compounding in the center of taller fence-posts. Sometimes used in super/subscripts. Explore <2224, VS1>. See E0BA.
⋈	E013	stix-not short parallel	Glyph variant of 2226 NOT PARALLEL TO created for compounding in the center of taller fence-posts. Sometimes used in super/subscripts. Explore <2226, VS1>.
₪	E040	stix-congruence sign (lazy S)	Currently a glyph variant of 223D. [STIX] glyph name is "223E.reversed". Research disunification as LAZY S. Barbara commented "this is recorded in the AFIL register with the note "not alternate rendition of similar to", so unification with 223D, even via VS1, is not appropriate."
~	E047	stix-most positive	Currently a glyph variant of 223E. [STIX] glyph name is "223E.var". Consider new variation sequence <223E, VS1>. STIX notes imply that it can also be negated.
└	E049	stix-vert, low bar to right from base	[STIX] glyph name implies <2A3D, VS1>. See also: <230A>; <231E>; <23BF>.
└	E04A	stix-vert, low bar to left from base	[STIX] glyph name implies <2A3C, VS1>. See also: <230B>; <231F>; <23CC>.
⋈	E053	stix-Latin letter small-cap K, reversed	[STIX] glyph name is "1D0B.reversed". Consider new LATIN LETTER SMALL CAPITAL REVERSED K. [Pullum] turned small capital K. No mapping in [PeterCon]. Comments from Peter and Lorna: "Not used, but specifically mentioned in <i>Principles</i> as having been suggested for use as a 'general symbol' for any consonant that has no current IPA symbol. For this reason, the symbol is included in the LaserIPA font marketed by Linguist's Software." Update: Lorna is working on encoding the remaining [Pullum] characters and her list includes the small capital reversed K.
ω	E057	stix-Latin letter small omega, inverted	Need evidence for encoding a LATIN SMALL LETTER TURNED OMEGA. Otherwise, it's a nonce glyph. Update: Lorna is working on encoding the remaining [Pullum] characters and her list includes the turned omega.
₪	E05D	stix-barred ess	[STIX] glyph name implies <0073, 0336>. Consider <0073, 0335> or a new code point (non-decomposable) LATIN SMALL LETTER S WITH STROKE. Originates from AIP, not phonetics; follow up with Barbara for samples.
-	E05E	stix-double macron	Non-joining. [STIX] glyph name implies <0304, 0304>. This is

			a combining diacritic and not the superscript (modifier) equals. Strong textual evidence needed to justify encoding of a combining double macron, instead of using a sequence of two 0304. Glyph needs a dotted circle. Originates from AIP, not phonetics; follow up with Barbara for samples.
≡	E061	stix-triple underbar	Non-joining. [STIX] glyph name implies <0331, 0331, 0331>. Strong textual evidence needed to justify encoding of a combining triple macron below, instead of using a sequence of three 0331. Glyph needs a dotted circle. Originates from AIP, not phonetics; follow up with Barbara for samples.
≡	E062	stix-quadruple underbar	Non-joining. [STIX] glyph name implies <0331, 0331, 0331, 0331>. Strong textual evidence needed to justify encoding of a combining quadruple macron below, instead of using a sequence of four 0331. Glyph needs a dotted circle. From AIP, not phonetics; follow up with Barbara for samples.
ḥ	E068	stix-hooked h	[STIX] glyph name implies <0068, 0321>. Barbara said it originates from AIP and is not the same as E0A3 "stix-heng (phonetic symbol)", which is a true heng. See E0A3. Follow up with Barbara for samples.
Ɔ	E079	stix-reverse sine wave	Possible new code point REVERSED SINE WAVE, part of the tilde disunification proposal.
/	E09F	stix-rising diagonal	<2215>? <2571>? <29F8>? <002F>? Need usage context.
\	E0A0	stix-falling diagonal	<29F5>? <2572>? <29F9>? <005C>? Need usage context.
€	E0A1	stix-capital C with stroke	Originates from [Elsevier]. If it is the CAMBRIAN SYMBOL, then encode only an upper-case letter-like symbol. See http://www.briancoad.com/dictionary/symbols.htm and Cambrian on Wikipedia. If it has other semantics, a case pair may be justified due to Unicode case-folding stability policy (LATIN CAPITAL / SMALL LETTER C WITH BAR). Consider also <0043, 0335> and research [Pullum] barred c (no mapping in [PeterCon]). Update: Lorna is working on encoding the remaining [Pullum] characters and her list might include the lower case. To follow up with Lorna.
g	E0A2	stix-barred open gee	[Pullum] crossed g. [PeterCon] "glyph variant of 01E5 (unless the 0067 vs 0261 distinction should be kept for barred/crossed forms)". Need (contrastive) usage context to decide between 01E5; <0261, 0337>; or a possible new (non-decomposable) LATIN SMALL LETTER SCRIPT G WITH DIAGONAL STROKE THROUGH DESCENDER. Originates from AIP, not phonetics; follow up with Barbara for samples.
ɿ	E0A4	stix-Latin letter small r-fishhook, reversed, with descender stem	027F LATIN SMALL LETTER REVERSED R WITH FISHHOOK was adjusted in the Unicode code charts to have a longer leg. However, there is no consensus between reviewers whether E0A4 is 027F or a new code point or variation sequence is needed. [Elsevier] lists two different symbols: "fish-hook r, reversed" (entry Pjr) mapped to 027F and "reversed fish-hook r, long leg (variant of Pjr)" (entry Plr). Needs further research and evidence of contrastive use. Ask Barbara.
























˘	E0A7	stix-modifier letter level-rise contour tone bar	STIX name indicates not a diacritic. Maybe <0020, 1DC4>.
⌊	E0A9	stix-retracted (in-line diacritic)	Seems a glyph variant of 02D7 with larger serifs (unless there is evidence of contrastive use). Recommend 02D7 instead of variation sequence. See [Pullum] minus sign.
˘	E0AA	stix-modifier letter fall-level contour tone bar	STIX name indicates not a diacritic. Maybe <0020, 1DC5>.
˘	E0AC	stix-modifier letter fall-rise-fall contour tone bar	STIX name indicates not a diacritic. Maybe <0020, 1DC8>.
⌋	E0B0	stix-left overangle (combining)	Is it really "left"? Glyphs looks rather "right". Existing combining angles (031A, 0349, 20E7) do not seem adequate. Propose <1DE7> COMBINING RIGHT ANGLE ABOVE. Glyph needs a dotted circle.
˘	E0B1	stix-left underangle (combining)	Existing combining angles (031A, 0349, 20E7) do not seem adequate. Propose <1DE8> COMBINING INVERTED LEFT ANGLE BELOW. Glyph needs a dotted circle.
˘	E0B2	stix-right underangle (combining)	Existing combining angles (031A, 0349, 20E7) do not seem adequate. Propose <1DE9> COMBINING INVERTED RIGHT ANGLE BELOW. Glyph needs a dotted circle.
•	E0B7	stix-bold center dot (very small filled square)	Meant for compatibility with old documents that may have used a square glyph where round was intended. Either 2219 or 22C5 should work; remains only to find out exactly which.
$\sqrt{2}$	E0B8	stix-square root of 2	<221A, 0032> should be fine, with no need for a <221A, VS1>. However, Barbara noted that the surd 221A is used without a vinculum, often followed by parenthesized expression, and asked how to distinguish the form with vinculum. Is it a function of mark-up? Follow up with Murray to inform the MathML group. See also E13A.
$\sqrt{3}$	E0B9	stix-square root of 3	<221A, 0033> SQUARE ROOT of DIGIT THREE and the same comment as for E0B8.
+	E0BA	stix-short mid negated by backslash	Glyph variant of 2AEE DOES NOT DIVIDE WITH REVERSED NEGATION SLASH created for compounding in the center of taller fence-posts. Sometimes used in super/subscripts. Explore <2AEE, VS1> DOES NOT ... short variant. See E012.
	E0D2	stix-six carbon ring, corner down, double bonds lower left etc	Propose <232C, VS1> BENZENE RING reversed variant, unless the shape is significant to justify a new code point.
	E0D3	stix-six carbon ring, edge down, double bonds bottom edge etc	Propose <232C, VS2> BENZENE RING horizontal variant with double bonds from bottom, unless the shape is significant to justify a new code point.
	E0D4	stix-six carbon ring, edge down, double bonds top edge etc	Propose <232C, VS3> BENZENE RING horizontal variant with double bonds from top, unless the shape is significant to justify a new code point.
○	E0D7	stix-donut	Originates from AIP; ring weight is 3/5 of diameter. No samples. Unification with 2B58 HEAVY CIRCLE (in FDAM6) seems adequate. Otherwise, propose new HEAVY MEDIUM CIRCLE.
	E0DB	stix-boxed communication link	A unitary non-decomposable symbol is preferred to using 20DE, but not sure what to use for the inside. See E0DC.

	E0DC	stix-communication link	Flowcharting symbol, hence probably inadequate for encoding. See p. 10 in Standard ECMA-4 Flow Charts and pp. 241–242 in an IIS paper . 2301 ELECTRIC ARROW is the ISO 2047 graphical symbol for 0004 END OF TRANSMISSION and might not work.
	E0E8	stix-precedes sign followed by plus sign	Originates from IEEE. Propose <227A, 002B>. Does it need to be a built-up symbol? Follow up with Barbara for samples.
	E0EE	stix-I-beam shape with bullet overprinted in middle	Seems in a set with E0EF. Consider new code point VERTICAL BEAM WITH BULLET OVERLAY. See also <237F>.
	E0EF	stix-plus with bullet overprinted in middle	Seems in a set with E0EE. Consider new code point PLUS SIGN WITH BULLET OVERLAY. See also <237F>.
	E0F0	stix-round space indicator	From [Wolfram], who distinguishes between 2423 <code>\[SpaceIndicator]</code> and their F3B2 <code>\[RoundSpaceIndicator]</code> . Collect contrastive usage samples and propose <2423, VS1>. Not the 23D1 METRICAL BREVE, which is spacing inline, rather than at or below baseline.
	E0F2	stix-freaked smiley	[Wolfram]'s <code>\[FreakedSmiley]</code> also typed :-@ and mapped to F721. Propose unification with emoticon 1F602 ASTONISHED FACE or maybe 1F61F FACE SCREAMING IN FEAR from [Emoji].
	E0F5	stix-gray-filled circle	Propose unification with 1F568 or 1F569 [Emoji]. See also <2591>, <2592>, <2593>, and <25A9>. Possibly cross-ref with 25CD CIRCLE WITH VERTICAL FILL.
	E0F8	stix-AliasDelimiter	Fence? <2506>? Unify with E0FA below? Need usage context.
	E0F9	stix-ErrorIndicator	This is [Wolfram]'s <code>\[ErrorIndicator]</code> that they map to F767 (in the PUA). Indicates the presence of a syntax error. Consider encoding a unitary symbol rather than <2227, 20DE> or <2303, 20DE>. Unrelated to 2353 APL FUNCTIONAL SYMBOL QUAD UP CARET.
	E0FA	stix-AliasIndicator	Fence? <2506>? Unify with E0F8 above? Need usage context.
	E0FB	stix-ControlKey	This is [Wolfram]'s <code>\[ControlKey]</code> that they map to F763 (in the PUA). Represents a keycap. Consider new code point CONTROL KEYCAP. Precedent: 1F546 KEYCAP TEN in [Emoji].
	E0FC	stix-ReturnKey	This is [Wolfram]'s <code>\[ReturnKey]</code> that they map to F766 (in the PUA). Represents a keycap. Consider new code point RETURN KEYCAP. Precedent: 1F546 KEYCAP TEN in [Emoji].
	E0FD	stix-EscapeKey	This is [Wolfram]'s <code>\[EscapeKey]</code> that they map to F769 (in the PUA). Represents a keycap. Consider new code point ESCAPE KEYCAP. Precedent: 1F546 KEYCAP TEN in [Emoji].
	E0FE	stix-CommandKey	This is [Wolfram]'s <code>\[CommandKey]</code> that they map to F76A (in the PUA). Represents a keycap. Consider new code point COMMAND KEYCAP. Precedent: 1F546 KEYCAP TEN [Emoji].
	E0FF	stix-TabKey	This is [Wolfram]'s <code>\[TabKey]</code> that they map to F7BE (in the PUA). Represents a keycap. Consider new code point TAB KEYCAP. Precedent: 1F546 KEYCAP TEN in [Emoji].
	E100	stix-SpaceKey	This is [Wolfram]'s <code>\[SpaceKey]</code> that they map to F7BF (in the













			PUA). Represents a keycap. Consider new code point SPACE KEYCAP. Precedent: 1F546 KEYCAP TEN in [Emoji]. Resize glyph to fit in code chart.
	E101	stix-DeleteKey	This is [Wolfram]'s <code>\[DeleteKey]</code> that they map to F7D0 (in the PUA). Represents a keycap. Consider new code point DELETE KEYCAP. Precedent: 1F546 KEYCAP TEN in [Emoji].
	E102	stix-AltKey	This is [Wolfram]'s <code>\[AltKey]</code> that they map to F7D1 (in the PUA). Represents a keycap. Consider new code point ALT KEYCAP. Precedent: 1F546 KEYCAP TEN in [Emoji].
	E103	stix-OptionKey	This is [Wolfram]'s <code>\[OptionKey]</code> that they map to F7D2 (in the PUA). Represents a keycap. Consider new code point OPTION KEYCAP. Precedent: 1F546 KEYCAP TEN in [Emoji]. Resize glyph to fit in code chart.
	E104	stix-KeyBar	This is [Wolfram]'s <code>\[KeyBar]</code> that they map to F7D3 (in the PUA). Not clear if it needs mapping to a character (such as 2578, 257A, 2043, or some other dash) at all.
	E105	stix-EnterKey	[Wolfram] has two characters with this glyph: <code>\[EnterKey]</code> and <code>\[SystemEnterKey]</code> , respectively mapped to F7D4 and F75F. Consider encoding a single new code point ENTER KEYCAP. Precedent: 1F546 KEYCAP TEN in [Emoji]. Resize glyph to fit in code chart.
	E106	stix-ShiftKey	[Wolfram]'s <code>\[ShiftKey]</code> mapped to F7D5 (in the PUA). Represents a keycap. Consider new code point SHIFT KEYCAP. Precedent: 1F546 KEYCAP TEN in [Emoji]. Resize glyph to fit in code chart.
	E107	stix-Mod1Key	[Wolfram]'s <code>\[Mod1Key]</code> mapped to F7D6 (in the PUA). Represents a keycap. Consider new code point MOD1 KEYCAP. Precedent: 1F546 KEYCAP TEN in [Emoji].
	E108	stix-Mod2Key	[Wolfram]'s <code>\[Mod2Key]</code> mapped to F7D7 (in the PUA). Represents a keycap. Consider new code point MOD2 KEYCAP. Precedent: 1F546 KEYCAP TEN in [Emoji].
	E109	stix-LeftModified	This is [Wolfram]'s <code>\[LeftModified]</code> that they map to F76B (in the PUA). Used in documenting control and command characters: <code>key\[LeftModified]char\[RightModified]</code> is used to indicate that char should be typed while key is being pressed. Differs from 005B. Not sure if it needs encoding.
	E10A	stix-RightModified	This is [Wolfram]'s <code>\[RightModified]</code> that they map to F76C (in the PUA). Used in documenting control and command characters: <code>key\[LeftModified]char\[RightModified]</code> is used to indicate that char should be typed while key is being pressed. Differs from 005D. Not sure if it needs encoding.
	E13A	stix-radical with horizontal (for single character under the radical)	Maybe a glyph variant of 221A, but Barbara commented that <code><221A, VS1></code> would help for MathML. If a variation sequence is acceptable, corresponding sequences would apply to the other roots too: 221B, 221C; 0606, 0607. See E0B8, E0B9.

7. STIX PUA characters deemed unsuitable for encoding

STIX		STIX Description	Comments
Glyph	PUA		
	E000	stix-radical symbol vertical extender	Glyph piece (extender). See also http://vt100.net/charsets/technical.html , which lists 2502 BOX DRAWINGS LIGHT VERTICAL.
┌	E001	stix-radical symbol top corner piece	Glyph piece. See also http://vt100.net/charsets/technical.html , which lists 250C BOX DRAWINGS LIGHT DOWN AND RIGHT.
ˆ	E0A5	stix-hooktop (phonetic symbol)	Glyph piece. See 0188, 0199, ...
˘	E0A6	stix-curly tail (phonetic symbol)	Glyph piece. See 0234...0236, ...
◁	E0B4	stix-arrow hookleft	Glyph piece. See 21A9, 21AA.
▷	E0B5	stix-arrow hookright	Glyph piece. See 21A9, 21AA.
↳	E0B6	stix-maps-to relation tail	Glyph piece. See 27FC alias "maps to".
≧	E0BF	stix-2 lines falling over 1 line rising	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME.
≧	E0C0	stix-1 line falling over 2 lines rising	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME.
≦	E0C1	stix-2 lines rising over 1 line falling	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME.
≦	E0C2	stix-1 line rising over 2 lines falling	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME.
≡	E0C3	stix-dashed line over line	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME.
≡	E0C4	stix-dashed line over two lines	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME.
≡	E0C5	stix-two lines over dashed line	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME.
—	E0C6	stix-single line, medium length	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME.
⋯	E0C7	stix-dotted (3 dots) line over line	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME.
==	E0C8	stix-two long horizontal lines	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME.
≡	E0C9	stix-three long horizontal lines	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME.
≡	E0CA	stix-four long horizontal lines	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME.
=	E0CB	stix-two medium horizontal lines	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME.
≡	E0CC	stix-three medium horizontal lines	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME.
≡	E0CD	stix-four medium horizontal lines	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME.

	E0CE	stix-rising line, horizontal line, falling line	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME. Cross-reference to 269F THREE LINES CONVERGING LEFT from the ARIB set.
	E0CF	stix-falling line, horizontal line, rising line	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME. Cross-reference to 269E THREE LINES CONVERGING RIGHT from the ARIB set.
	E0D0	stix-rising line, falling line	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME.
	E0D1	stix-falling line, rising line	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME.
	E0D5	stix-single long chemical bond	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME.
	E0D6	stix-long chemical bond, line over dashed line	Covalent chemical bond. Unsuitable unless potentially useful for a chemistry IME.
	E0F6	stix-Kernellcon	[Wolfram]'s \[Kernellcon] mapped to F756. Logo, a trademark of Wolfram Research.
	E0F7	stix-Mathematicalcon	[Wolfram]'s \[Mathematicalcon] mapped to F757. Logo, a trademark of Wolfram Research.
	E10B	stix-extender for horizontal solid (normal) arrow	Glyph piece (extender) inappropriate for encoding. Alternatively, use <23AF>.
	E10C	stix-extender for se/nw solid (normal) arrow	Glyph piece (extender).
	E10D	stix-extender for sw/ne solid (normal) arrow	Glyph piece (extender).
	E10E	stix-extender for vertical double arrow	Glyph piece (extender).
	E10F	stix-extender for horizontal double arrow	Glyph piece (extender).
	E110	stix-extender for se/nw double arrow	Glyph piece (extender).
	E111	stix-extender for sw/ne double arrow	Glyph piece (extender).
	E116	stix-extender for vertical dashed arrow	Glyph piece (extender).
	E117	stix-extender for horizontal dashed arrow	Glyph piece (extender).
	E118	stix-extender for se/nw dashed arrow	Glyph piece (extender).
	E119	stix-extender for sw/ne dashed arrow	Glyph piece (extender).
	E120	stix-extender for vertical dotted arrow	Glyph piece (extender).
	E121	stix-extender for horizontal dotted arrow	Glyph piece (extender).
	E122	stix-extender for se/nw dotted arrow	Glyph piece (extender).
	E123	stix-extender for sw/ne dotted arrow	Glyph piece (extender).
	E12C	stix-extender for dot-dash up arrow	Glyph piece (extender).

⋮	E12D	stix-extender for dot-dash down arrow	Glyph piece (extender).
⋮	E12E	stix-extender for dot-dash left arrow	Glyph piece (extender).
⋮	E12F	stix-extender for dot-dash right arrow	Glyph piece (extender).
↖	E130	stix-extender for nw dot-dash arrow	Glyph piece (extender).
↘	E131	stix-extender for se dot-dash arrow	Glyph piece (extender).
↗	E132	stix-extender for ne dot-dash arrow	Glyph piece (extender).
↙	E133	stix-extender for sw dot-dash arrow	Glyph piece (extender).
≡	E134	stix-extender for triple horizontal arrow	Glyph piece (extender).
≡	E135	stix-extender for triple vertical arrow	Glyph piece (extender).
≡	E136	stix-extender for quadruple horizontal arrow	Glyph piece (extender).
≡	E137	stix-extender for quadruple vertical arrow	Glyph piece (extender).
—	E138	stix-horizontal extender for multiple character over accent arrows, harpoons, line	Glyph piece (extender).
—	E139	stix-horizontal extender for multiple character under accent arrows, harpoons, line	Glyph piece (extender).
⌒	E13B	stix-left end of extensible overbrace (CMEX10 x3A rotated 90deg)	Use extensible horizontal brackets 23DC...23E1. However, if text-level compatibility with CMEX10 is needed, it might qualify for addition as "presentation form for vertical *" where * is 239B...23B1; see also blocks FE10 and FE30, and http://www.math.union.edu/~dpvc/jsMath/symbols/cmex10.html .
⌒	E13C	stix-right end of extensible overbrace (CMEX10 x38 rotated 90deg)	See comment for E31B.
⌒	E13D	stix-left end of extensible underbrace (CMEX10 x3B rotated 90deg)	See comment for E31B.
⌒	E13E	stix-right end of extensible underbrace (CMEX10 x39 rotated 90deg)	See comment for E31B.
⌒	E13F	stix-extensible horizontal for curly over and under braces (CMEX10 x3E rotated 90deg)	See comment for E31B.
⌒	E140	stix-center of extensible overbrace (CMEX10 x3C rotated 90deg)	See comment for E31B.
⌒	E141	stix-center of extensible underbrace (CMEX10 x3D rotated 90deg)	See comment for E31B.
⌒	E142	stix-left end of extensible overparen (CMEX10 x40 rotated 90deg)	See comment for E31B.
⌒	E143	stix-right end of extensible overparen (CMEX10 x30 rotated 90deg)	See comment for E31B.

	E144	stix-left end of extensible underparen (CMEX10 x41 rotated 90deg)	See comment for E31B.
	E145	stix-right end of extensible underparen (CMEX10 x31 rotated 90deg)	See comment for E31B.
	E146	stix-left end of extensible over square bracket (CMEX10 x34 rotated 90deg)	See comment for E31B.
	E147	stix-right end of extensible over square bracket (CMEX10 x32 rotated 90deg)	See comment for E31B.
	E148	stix-left end of extensible under square bracket (CMEX10 x35 rotated 90deg)	See comment for E31B.
	E149	stix-right end of extensible under square bracket (CMEX10 x33 rotated 90deg)	See comment for E31B.
	E14A	stix-extensible horizontal for over paren or square bracket (CMEX10 x42 rotated 90deg)	See comment for E31B.
	E14B	stix-extensible horizontal for under paren or square bracket (CMEX10 x43 rotated 90deg)	See comment for E31B.
	E150	stix-horizontal brace, down left piece	See comment for E31B.
	E151	stix-horizontal brace, down right piece	See comment for E31B.
	E152	stix-horizontal brace, upper left piece	See comment for E31B.
	E153	stix-horizontal brace, upper right piece	See comment for E31B.

8. Supporting evidence

TODO: Add samples showing the proposed characters in use.

9. Consolidated mapping from STIX PUA to Unicode

TODO: For ease of reference, add a table similar to the Excel spreadsheet, mapping all characters from STIX PUA to Unicode.

10. UniBook Code charts



Please refer to the separate PDF file. (The two files will be eventually merged.) The allocations are temporary and will be adjusted before submission to reflect the latest changes in both repertory of this proposal and the Unicode pipeline.

11. References

- [Elsevier] Simon Pepping, Rob Schrauwen, “Elsevier Science Grid in Unicode”, <http://info.sciencedirect.com/techsupport/xmlsgml/dtd50/esgrid.pdf>, 2004.
- [Emoji] Expanded code charts in proposal <http://std.dkuug.dk/jtc1/sc2/wg2/docs/n3607.pdf>, which includes the set of alchemical symbols.
- [PeterCon] Peter Constable, Lorna Priest, “Symbols in [Pullum] Phonetic Symbol Guide 2nd ed. in relation to Unicode 5.1”, <http://scripts.sil.org/PSGSymbolsVsTUS4>.
- [Pullum] Geoffrey K. Pullum, William A. Ladusaw, “Phonetic Symbol Guide”, 2nd ed., University of Chicago Press, 1996.
- [STIX] STIX table at <http://www.ams.org/STIX/bnb/stix-tbl.ascii-2006-10-20> and font glyph names.
- [Wolfram] Wolfram Research Mathematica, Listing of Named Characters <http://reference.wolfram.com/mathematica/guide/ListingOfNamedCharacters.html>, and Character Set <http://www.mathmlcentral.com/characters/>.

12. Questions and Action Items

- Follow up with Lorna (who is working on a proposal to encode the remaining phonetic symbols from [Pullum]) on the phonetic symbols, especially turned omega, small capital reversed K, c with bar, and s with stroke, as well as the two reversed r with fishhook symbols in [Elsevier].
- Decide what to do with the keycaps and other [Wolfram] Mathematica glyphs, which they map to Unicode code points in the PUA.
- Rick pointed out that it is OK to encode glyph pieces if they appear in-line as part of a discussion. Verify if the glyph pieces (such as E10B and ff.) actually do.
- Transfer the remaining applicable notes from the Excel spreadsheet to the introduction section.
- The glyphs of the STIX combining marks vanish when exporting to PDF.
- Once mapping to Unicode is complete (either to existing or proposed characters and sequences), it would probably be a good idea to post the mapping somewhere for future reference.
- An updated, comprehensive chart of geometric shapes might also be useful.
- Should we provide named character sequences for the STIX PUA characters that can be represented as Unicode (combining) character sequences? See UAX #34.

	260	261	262	263	264	265	266	267	268	269	26A	26B	26C	26D	26E	26F
0																
1																
2																
3																
4																
5																
6																
7																
8																
9																
A																
B																
C																
D																
E																
F																




Astronomical symbols from STIX PUA

26E4 ☉ ECLIPSE






















26E5 ♅ ASTRONOMICAL SYMBOL FOR URANUS

- not the astrological symbol

→ 2645 ♁ uranus

	27C	27D	27E
0			
1			
2			
3			
4			
5			
6			
7			
8			
9			
A			
B	 27CB		
C			
D	 27CD		
E	 27CE		
F			

Large operator from STIX PUA27CB \amalg N-ARY SHAW**Miscellaneous symbols from STIX PUA**27CD $\stackrel{\perp}{=}$ EXCLAIMED EQUAL TO27CE \oplus OUTLINE PLUS SIGN




	2B0	2B1	2B2	2B3	2B4	2B5	2B6	2B7	2B8	2B9	2BA	2BB	2BC	2BD	2BE	2BF			
0							 2B60	 2B70											
1							 2B61	 2B71											
2							 2B62												
3							 2B63												
4							 2B64												
5							 2B65												
6							 2B66												
7							 2B67												
8							 2B68												
9							 2B69												
A							 2B6A												
B							 2B6B												
C							 2B6C												
D						 2B5D	 2B6D												
E						 2B5E	 2B6E												
F						 2B5F	 2B6F												

Miscellaneous geometric shapes from STIX PUA

2B5A	▴	BLACK UP-POINTING POINTER
		• need font
2B5B	◻	WHITE UP-POINTING POINTER
		• need font
2B5C	▾	BLACK DOWN-POINTING POINTER
		• need font
2B5D	◻	WHITE DOWN-POINTING POINTER
2B5E	◻	WHITE SQUARE WITH TICKS FROM CORNERS
2B5F	◊	WHITE DIAMOND WITH TICKS FROM CORNERS

Miscellaneous arrows from STIX PUA

2B60	↖	NORTH WEST DASHED ARROW
2B61	↗	NORTH EAST DASHED ARROW
2B62	↘	SOUTH EAST DASHED ARROW
2B63	↙	SOUTH WEST DASHED ARROW
2B64	↑	UPWARDS ARROW WITH DOTTED STEM
2B65	↓	DOWNWARDS ARROW WITH DOTTED STEM
2B66	↖	NORTH WEST ARROW WITH DOTTED STEM
2B67	↗	NORTH EAST ARROW WITH DOTTED STEM
2B68	↘	SOUTH EAST ARROW WITH DOTTED STEM
2B69	↙	SOUTH WEST ARROW WITH DOTTED STEM
2B6A	←	LEFTWARDS ARROW WITH DOT-DASH STEM
2B6B	↑	UPWARDS ARROW WITH DOT-DASH STEM
2B6C	→	RIGHTWARDS ARROW WITH DOT-DASH STEM
2B6D	↓	DOWNWARDS ARROW WITH DOT-DASH STEM
2B6E	↖	NORTH WEST ARROW WITH DOT-DASH STEM
2B6F	↗	NORTH EAST ARROW WITH DOT-DASH STEM
2B70	↘	SOUTH EAST ARROW WITH DOT-DASH STEM
2B71	↙	SOUTH WEST ARROW WITH DOT-DASH STEM

	2E0	2E1	2E2	2E3	2E4	2E5	2E6	2E7
0								
1								
2								
3				 2E33				
4				 2E34				
5				 2E35				
6								
7								
8								
9								
A								
B								
C								
D								
E								
F								

Miscellaneous delimiters from STIX**PUA**

2E33 / DASHED SOLIDUS
→ 002F / solidus

2E34 \ DASHED REVERSE SOLIDUS
→ 005C \ reverse solidus

2E35 ⋮ VERTICAL FIVE DOTS