L2/21-224

Unicode request for dwarf-planet symbols

Kirk Miller, kirkmiller at gmail.com 2021 October 26

This request is for astronomical/astrological symbols for five recently discovered planetoids of the outer Solar system: the likely dwarf planets Haumea, Makemake, Gonggong, Quaoar and Orcus. It follows on Unicode proposal L2/16-173 that covered the planetoids Eris and Sedna.

Thanks to Deborah Anderson of the Universal Scripts Project for her assistance.

Background

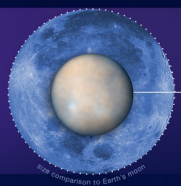
By 2006, the discovery of planetoids in the outer Solar system that rivaled and even surpassed Pluto in size and mass caused a public-relations crisis in the astronomical community over what counted as a planet. In that year the International Astronomical Union (IAU) voted to classify the material orbiting the Sun into three categories: 'planets', which gravitationally dominate their region of space; 'dwarf planets' like Pluto and Ceres that are not regionally dominant (they reside in belts of similar objects) but which still *look* like planets and may be geologically active; and the remainder, 'small Solar system bodies' – small, dead chunks of ice, rock or metal such as comets and most asteroids. As part of a bureaucratic wrangle over who would get to review and certify the names of future maybe-planets, – the Minor Planet Center that certifies comets and asteroids, or the planetary working group of the IAU, – a joint committee was set up for the brightest objects. The joint committee was tasked with objects that had an absolute magnitude less than (i.e. brighter than) +1. This corresponded to a minimum possible diameter of 840 km, which at the time was thought to almost certainly mean that the body was massive enough to meet the IAU criteria for a dwarf planet. Dimmer objects, though they could, if dark, be larger, and which might also be dwarf planets, would be overseen by the Minor Planet Center alone. The two as-yet unnamed bodies that met the joint-committee threshold were subsequently named Haumea and Makemake. The IAU declared that those names would be retained even if the bodies later turned out not to be dwarf planets. However, this subtlety was lost in media releases, with the result that Haumea and Makemake were presented as 'official' dwarf planets and that – by implication – other recent discoveries were not dwarf planets. For the most part, planetary astronomers continued to study such bodies without much concern over which IAU category they fell into, described dwarf planets as planets (or not, depending on which definition was useful for their research), and frequently used the term 'dwarf planet' for large planetoids – such as Orcus, Sedna, Gonggong and Quaoar – whose names had been (or would be) approved by the Minor Planet Center alone rather than by the joint committee (see e.g. Grundy *et al.* 2019).

National Aeronautics and Space Administration

What is a Dwarf Planet?

Dwarf planets are round in shape and orbit the Sun just like the eight major planets. But unlike planets, dwarf planets are not able to clear their orbital path so there are no similar objects at roughly the same distance from the Sun. A dwarf planet is much smaller than a planet (smaller even than Earth's moon), but it is not a moon. The first five recognized dwarf planets are Ceres, Pluto, Eris, Makemake and Haumea and they are all uniquely mysterious.

CERES

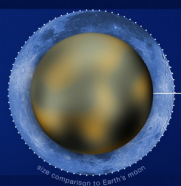


Scientists describe Ceres as an "embryonic planet." Gravitational perturbations from Jupiter billions of years ago prevented it from becoming a full-fledged planet. Ceres ended up among the leftover debris of planetary formation in the main asteroid belt between Mars and Jupiter.

How Ceres Got its Name:
Ceres is named for the ancient Roman goddess of corn and harvests.

Discovered: 1801 **Location**: Asteroid Belt

PLUTO



Pluto was long considered our solar system's ninth planet. But after the discovery of similar intriguing worlds deeper in the distant Kuiper Belt, icy Pluto was reclassified as a dwarf planet.

How Pluto Got its Name:
Pluto is named for the Roman god of the underworld.

Discovered: 1930 **Location**: Kuiper belt

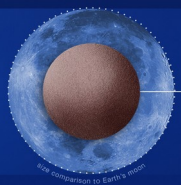
ERIS

The dwarf planet Eris is often so far from the sun that its atmosphere collapses and freezes on the surface in an icy glaze. The coating gleams brightly, reflecting as much sunlight as freshly fallen snow.

How Eris Got its Name:
Eris is named for the ancient Greek goddess of discord and strife.

Discovered: 2003 **Location**: Kuiper Belt

MAKEMAKE

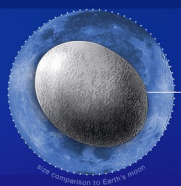


Makemake holds an important place in the solar system because it – along with Eris – was one of the objects whose discovery prompted the International Astronomical Union to reconsider the definition of a planet and to create the new group of dwarf planets.

How Ceres Got its Name:
Makemake is named after the god of fertility in Rapanui mythology.

Discovered: 2005 **Location**: Kuiper Belt

HAUMEA



Oddly-shaped Haumea is one of the fastest rotating large objects in our solar system. The quick spin elongated the dwarf planet into the unique shape. It is roughly the same size as Pluto.

How Haumea got its name:
Haumea is named for the Hawaiian goddess of childbirth and fertility.

Discovered: 2003 **Location**: Kuiper Belt

Figure 1. (preceding page) NASA (2015). A poster published by the NASA Jet Propulsion Laboratory for the *Dawn* orbital mission to the asteroids Vesta and Ceres. It illustrates the new concept of *dwarf planet* with the five large planetoids Ceres, Pluto, Eris, Makemake and Haumea. The five names are accompanied by symbols, which for Pluto is the traditionally *astrological* symbol U+2BD3 ⯓ rather than its planetary symbol U+2647 ♇ – presumably reflecting Pluto's reclassification as a dwarf. The symbol for Eris, ⯰, has since been adopted by Unicode at U+2BF0. The symbols for Haumea and Makemake (𝇦 and 𝇧, tagged with red triangles) are requested in the present proposal.

Astrologers, who had had a minor interest in asteroids since the 1970s, now extended their attempts at divination to these new worlds. Astronomers have little use for symbols for planetary bodies, and the symbols for the asteroids discovered in the 19th century have largely fallen out of astronomical use. But astrologers, with their charts and graphs that often have no room for the full names, do have a need for such symbols. Thus astrologers continue to use the old symbols for asteroids, and have created new symbols for additional asteroids of interest, for centaurs (minor planets orbiting among the gas giants), and for the icy worlds being discovered beyond the gas giants. There is no governing body for astrology, and many proposed symbols are never used by anyone but their proposers. Nonetheless, through popular books and the choices made by the software that astrologers use to generate charts and horoscopes, some of these symbols have come to be widely used. The two most popular software programs are open-source *Astrolog* and commercial *Solar Fire*. Both use symbols proposed here.

Current Unicode characters

Of the five objects most commonly presented as dwarf planets – Ceres, Pluto, Eris, Haumea and Makemake – Ceres has had a symbol ⚳ (U+26B3) since soon after its discovery in 1801. Pluto has a planetary symbol ♇ (U+2647), and in addition several astrological symbols, of which the most common in English-language sources is ⯓ (U+2BD3), seen in Figure 1. Eris has competing astrological symbols ⯰ (U+2BF0) and ⯱ (U+2BF1). In addition, the likely dwarf planet Sedna has a symbol 🜄 (U+2BF2); this and the Eridian symbols were accepted into Unicode with L2/16-173.

Proposed symbols

In the five years since L2/16-173, astrological symbols for Haumea and Makemake have seen increasing use. Two of these, 🝮 for Makemake and 🝻 for Haumea, have been used by NASA. (Figure 1.) The designer of these two symbols, Denis Moskowitz, had also created the symbols that would be adopted as U+2BF0 ERIS FORM ONE ⯰ and U+2BF2 SEDNA ⯲. Moskowitz has created symbols for other large planetoids, several of which are now used in the astrological community, as well as for meteor showers and other astronomical events that were used to illustrate Finlay (2008).

Walter Pullen, creator of the open-source software *Astrolog* (the most popular astrological software, initially released in 1991) said (p.c. 2021 Aug 23), *I'd say the Denis Moskowitz glyphs are the most popular, most consistent, most culturally aware, and best looking. Since the NASA poster uses the Moskowitz glyphs too, I'd agree they're the most 'official' and the best included in a Unicode proposal.*

I request Unicode points for the following characters:

🝻 Haumea, named after the Hawaiian goddess of fertility and childbirth, is an amalgam of Hawaiian petroglyphs for 'woman' and 'childbirth'. The moons and icy fragments of Haumea (the Haumeids) are the only known trans-Neptunian collisional family, and Haumea was named after the goddess partly because her many children, born from various parts of her body, are a metaphor for the these moons and scattered fragments.

Petroglyph at Puako, Hawaii
CC0, Wiki Commons

🝮 Makemake, named after the creator god of Easter Island, is modeled after the phallic eyes-and-nose petroglyphs of that god, and incorporates an abstract initial 'M'.

Makemake petroglyphs, Easter Island
[L] Lee (1992); [R] GFDL, Wiki Commons

🝼 Gonggong, named after a destructive Chinese deity, is composed of the first Chinese character in the name, 共 *gòng*, and a swash for Gonggong's serpent body and tail.

共工 Gonggong
© 明天出版社 Tomorrow Publishing

🝺 Quaoar, named for the Tongva creator *Kwa'uwar*, is the letter Q with its tail stylized as a canoe, and made angular to match Tongva rock art. (An early version of 🝺 was round, and can been seen in Figure 10.)

🝽 Orcus, named for the Etruscan god of the underworld, is a Latin O-R monogram stylized to hint at a skull or orca's gape.

Medieval Orcus in Italy
CC2, Wiki Commons

These symbols are used primarily as labels, but are also found as text for astrological relations such as 🝼☍♃ 'Gonggong in opposition to Jupiter'. (See Figure 7.) For an idea of the graphic variation that can be expected of the proposed symbols, see Figure 3.

A few alternative symbols may be notable, such as ⚲ used by the *Solar Fire* software for Makemake, or ⯓ for Orcus. However, while I did find an instance of ⚲ in use online, in a chart generated with *Solar Fire*, the author of the site used the character ⚯ in the text. (See Figure 9.) For ⯓ Orcus, I haven't found any evidence of independent use:

> The alternative symbol for Makemake resembles the brow and nose of the petroglyphs, surmounted by an orb. I haven't been able to trace its origin. An attractive design for the form is reproduced at right, from the online site Odyssei/Mysticalink.

> The altenative symbol for Orcus is a rotated U+2BD3 ⯓ Pluto. The astronomers who discovered Orcus dubbed it the 'anti-Pluto' for its similarly large moon but out-of-phase orbit compared to Pluto, and so chose the Etruscan equivalent of Pluto as its name. The symbol ⯓ was designed by Melanie Reinhart to reflect this concept.

Moskowitz has come up with symbols for several additional trans-Neptunian objects: ᘎ Varuna, named after a Vedic god of the sky, derives from the Devanagari letter व *va* and Varuna's snake-lasso; ♆ Salacia, named after the consort of Neptune, is represented as a stylized hippocamp. In ⯮ Ixion, named after the ancestor of the centaurs, Moskowitz substitutes the Greek letters I and Ξ for the Latin I and X in a design by Sandy Turnbull, ⯮, which depicts the solar wheel that the eponymous Ixion was bound on in Tartarus. Apart from the occasional mention on astrological sites, these other symbols do not appear to have seen broader use. Others have proposed symbols for additional trans-Neptunian objects, such as ✶ by Zane Stein for Varda, ⯪ for Rhadamanthus, ✳ for Chaos, and ♈ (an aardvark) for G!kún‖'hòmdímà, but attestation of independent usage is lacking.

A note on Eris: L2/16-173 presented a third purported symbol for Eris, a *globus cruciger* (⯰), that 'seems to be only used in the Polish astrology software Urania.' The use of this symbol for Eris is due to a Polish school of astrology that holds that Eris is the hypothetical trans-Plutonian planet Proserpina (Persephone), which they also identify as 'Kora'; the symbol ⯰ is for Proserpina or Kora (Kaminska 2006, Bogdankr 2008a). Regardless, it's not clear that it would be distinct from U+2641 ♁: Bogdankr specifies that the cross terminates in 'smaller perpendicular lines' – that is, that it is a cross potent (U+2629 ☩), but such decoration is a common feature of *globi crucigeri*, with such notable examples as the Imperial Orb of the Holy Roman Empire (right).

The *globus cruciger* of the Holy Roman Empire, with terminal decoration

Chart

The SAH recommended placing these symbols at the end of the alchemical block. The objects are arranged in order of decreasing mass/size.

	...0	...1	...2	...3	...4	...5	...6	...7	...8	...9	...A	...B	...C	...D	...E	...F
Alchemical symbols																
U+1F77x																

Characters

Sample designs of the characters:

 1F77B HAUMEA. Figures 1–9.

 1F77C MAKEMAKE. Figures 1–9.

 1F77D GONGGONG. Figures 2, 4–8.

 1F77E QUAOAR. Figures 2, 4–8, 10.

 1F77F ORCUS. Figures 2, 4–8, 11.

At left and center are the original fixed-width and variable-width designs by Denis Moskowitz.

In the right column are the forms designed by Roberto Corona for his Open Font License font *Astronomicon*.

Properties

These characters are not intended to serve as emoji.

```
1F77B;HAUMEA;So;0;ON;;;;;N;;;;;
1F77C;MAKEMAKE;So;0;ON;;;;;N;;;;;
1F77D;GONGGONG;So;0;ON;;;;;N;;;;;
1F77E;QUAOAR;So;0;ON;;;;;N;;;;;
1F77F;ORCUS;So;0;ON;;;;;N;;;;;
```

References

Bogdankr (2008a) ‘Climate change and Proserpina/Kora.’ Article on the *Urania* software site, astrologyurania.com/2008, 2008 Feb 08.

———— (2008b) ‘How many objects in the wheel?’, *Urania*, 2008 Sept 01.

Roberto Corona (2020), *Astronomicon*. astronomicon.co/en/astronomicon-fonts

Maurice Fernandez (n.d.) *Evolutionary Astrology*, mauricefernandez.com

Alec Finlay (2008) *One Hundred Year Star-diary (2008-2107)*. Platform Projects/Morning Star, UK.

Will Grundy, Keith Noll, Henry Roe, Marc Buie, Simon Porter, Alex Parker, David Nesvorný, Harold Levison, Susan Benecchi, Denise Stephens, Chad Trujillo (2019) ‘Mutual Orbit Orientations of Transneptunian Binaries.’ *Icarus* 334: 62–78.

Jonathan Hull (2009) Jonathan Hull’s Design Blog. www.jonathan-hull.com/swag/planetary_symbols.pdf

Bo Jin, *Gong Gong Destroys Mount Buzhou* (共工怒触不周山). Tomorrow Publishing House, Jinan.

Jan Kampherbeek (2018), *EnigmaAstrology* font. radixpro.com/downloads/font.

Paula Kaminska (2006) ‘Proserpina (2003 UB313) called by astronomers Eris.’ jarekgronert.pl/en

Georgia Lee (1992) *Rock art of Easter Island*. University of California Press.

Denis Moskowitz, ‘Symbols for large trans-Neptunian objects.’ suberic.net/~dmm/astro/tno.html

NASA Jet Propulsion Laboratory (2015) ‘What is a Dwarf Planet?, dawn.jpl.nasa.gov, 2015 April 22. www.jpl.nasa.gov/infographics/what-is-a-dwarf-planet

Walter Pullen (2021) ‘Dwarf Planets.’ *Astrolog*. www.astrolog.org/astrolog/astdwarf.htm

Melanie Reinhart (2007) ‘Symbols for Orcus’. www.melaniereinhart.com/melanie/documents/ORCUSNOTESPDF.pdf

Figures

Moskowitz's symbols for Sedna and Eris are in Unicode; the one for Haumea is used by NASA, *Astrolog* and *Solar Fire*, the one for Makemake by NASA and *Astrolog*, the one for Gonggong by *Astrolog*, and the ones for Quaoar and Orcus by *Astrolog* and *Urania*, though, oddly, in *Urania* the Orcus symbol is used for Makemake. They appear without alternatives in the *Astronomicon* and *EnigmaAstrology* fonts, which are some of the most complete astrology fonts available and generally support alternative characters.

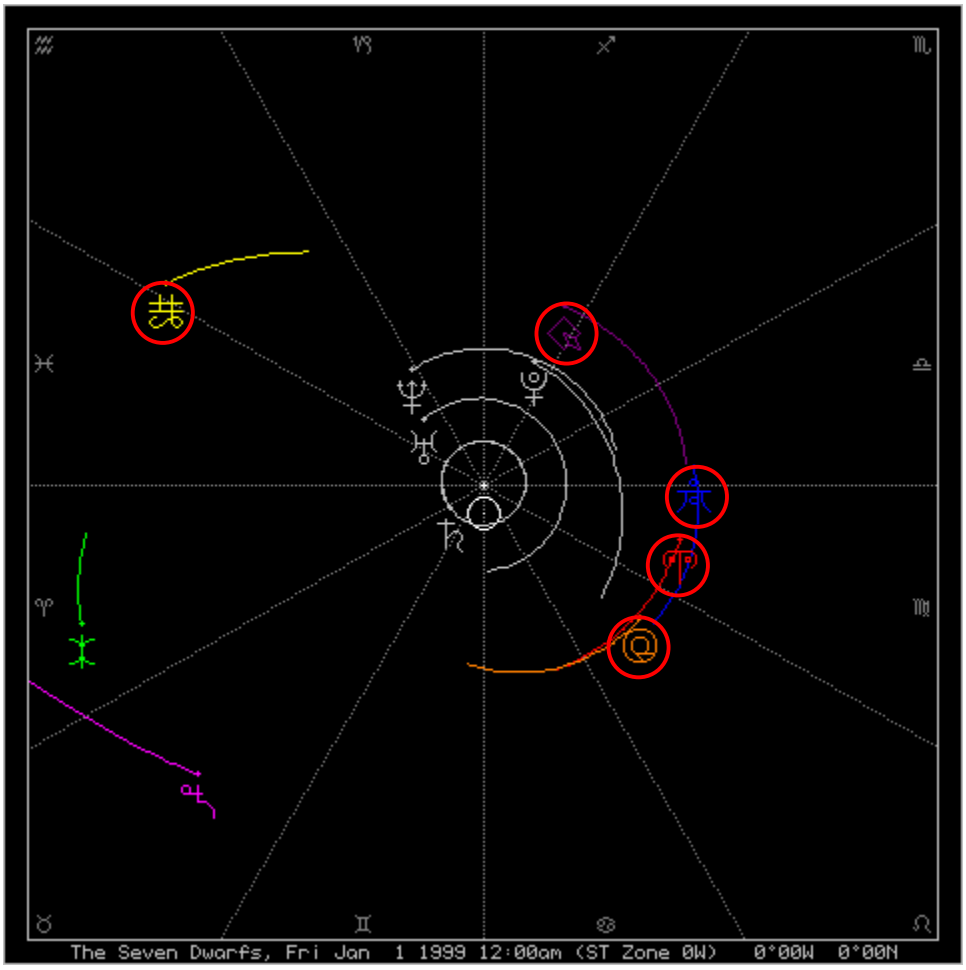


Figure 2. Pullen (2021). An animation still of the orbits of the dwarf planets supported by the *Astrolog* software as of version 7.20. The Sun ☉ and the orbits and symbols of ♄ Saturn, ♅ Uranus, ♆ Neptune and ♇ Pluto are in white. 🝾 Orcus is orange, 🝼 Makemake red, 🝻 Haumea blue, 🝿 Quaoar violet, 🞣 Gonggong yellow, ⯰ Eris green and ⯲ Sedna pink. All the symbols of the trans-Plutonians are Moskowitz's designs.

Figure 3. Hull (2009). Highly stylized planetary symbols: Sun ☉, Moon ☾, Mercury ☿, Venus ♀, Earth ⊕, Mars ♂, Jupiter ♃, Saturn ♄, Uranus (♅ and ♅), Neptune ♆ and the dwarfs Ceres ⚳, Pluto (♇ and ♇), Haumea ⯓, Makemake ⯑ and Eris ⯰. Haumea and Makemake are tagged in red.

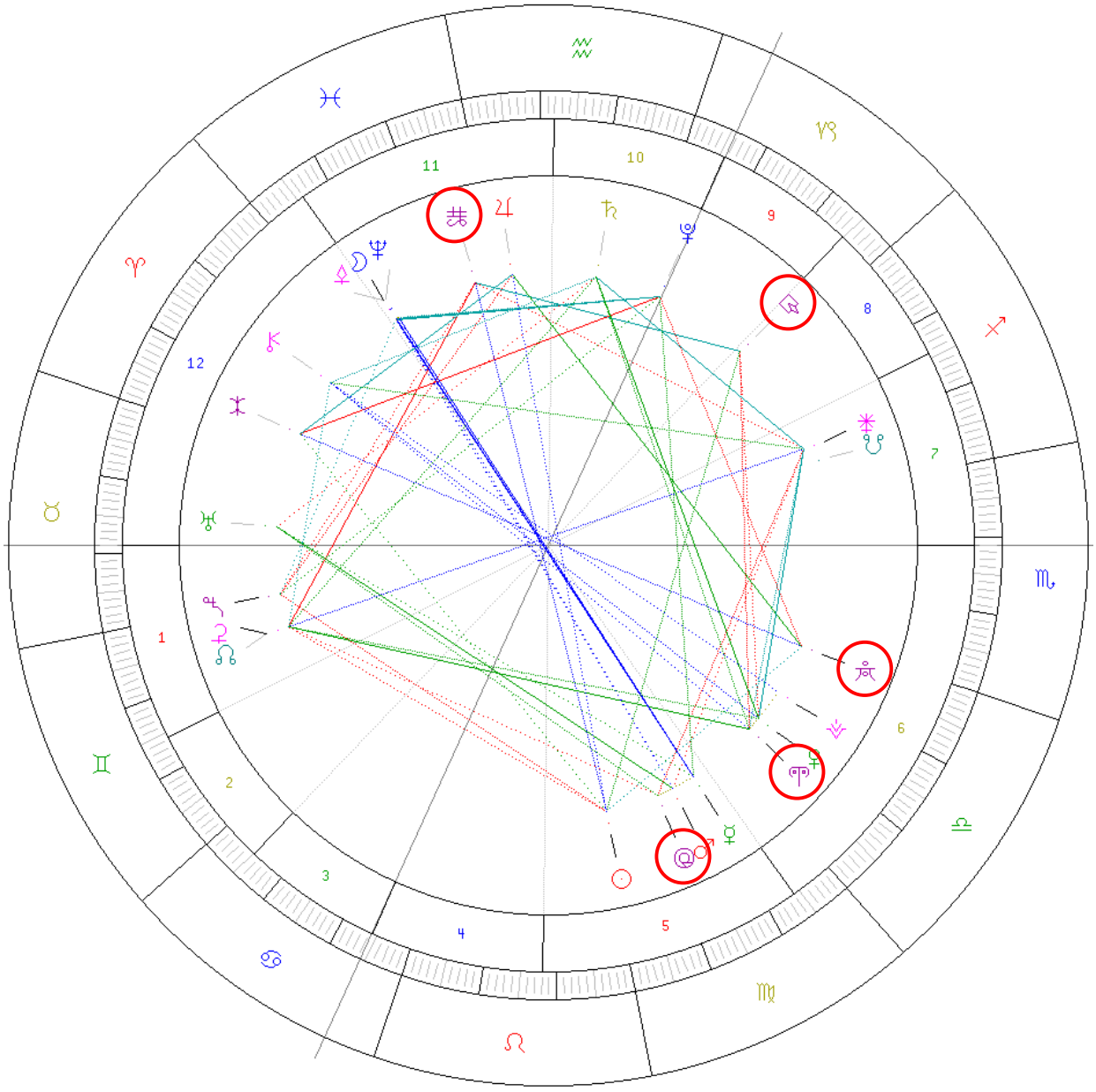


Figure 4. A wheel chart produced by the popular astrological software *Astrolog*, which has been open-source since 1991. Here it displays the traditional planets, main asteroids and (in purple) the trans-Plutonians. Clockwise from 11 o'clock are Gonggong, Quaoar, Haumea, Makemake and Orcus. Also shown are Eris and Sedna, Chiron and the first four asteroids.

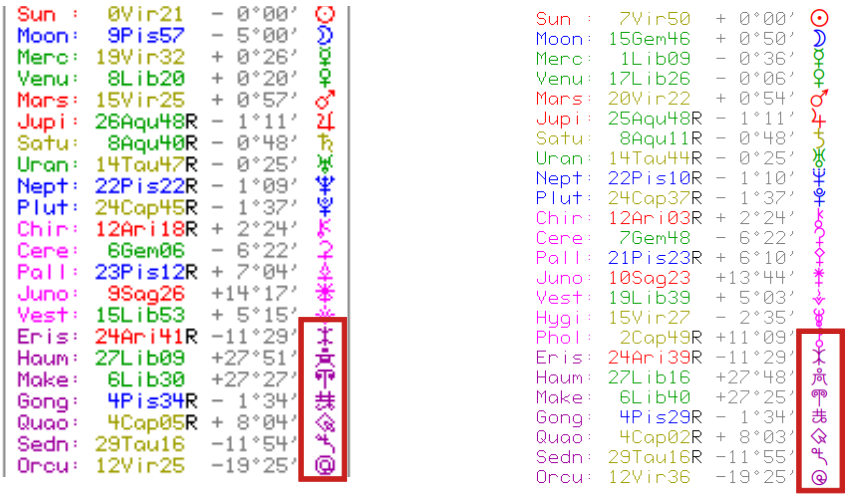


Figure 5. The list of planets from the last figure. The symbols boxed in red are the trans-Neptunian dwarfs, including Eris and Sedna. At left is how they appear as the default pixilated characters that display when no compatible font is installed. At right is how they appear in the *Astronomicon* font, one of four non-Unicode fonts that *Astrolog* supports. *Astrolog* also has a Unicode option.

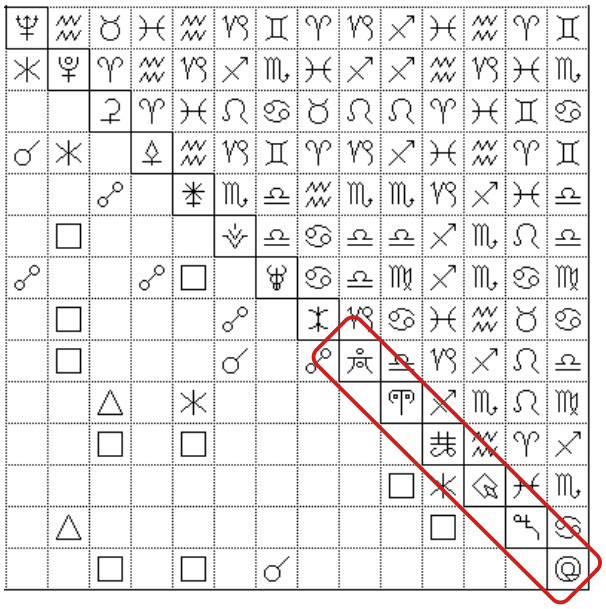


Figure 6. An *Astrolog* aspect chart of the dwarfs, major asteroids and Neptune.

Figure 7. Three calendar dates in *Astrolog* set to display transits, showing the positions of the planets relative to each other and to the signs of the zodiac. In the left cell the planets, the major asteroids and the major trans-Plutonians are shown; the ones relevant for us (marked by red arrows) are ⯑□◎ (Quaoar and Orcus in quartile aspect: 'Quaoar square Orcus'), ⚳⚺⚵ (Ceres and Gonggong in sextile aspect: 'Ceres sextile Gonggong'), ♇→♌ (Makemake enters Leo) and ♓→♌ (Haumea enters Leo). In the middle cell, the selection of objects is restricted to the trans-Plutonians. At right, the list is restricted to relations with the Sun and Moon, such as ☽☌⯑ (Moon and Quaoar in conjunction).

(The three cells have been spliced horizontally to fit into this figure.)

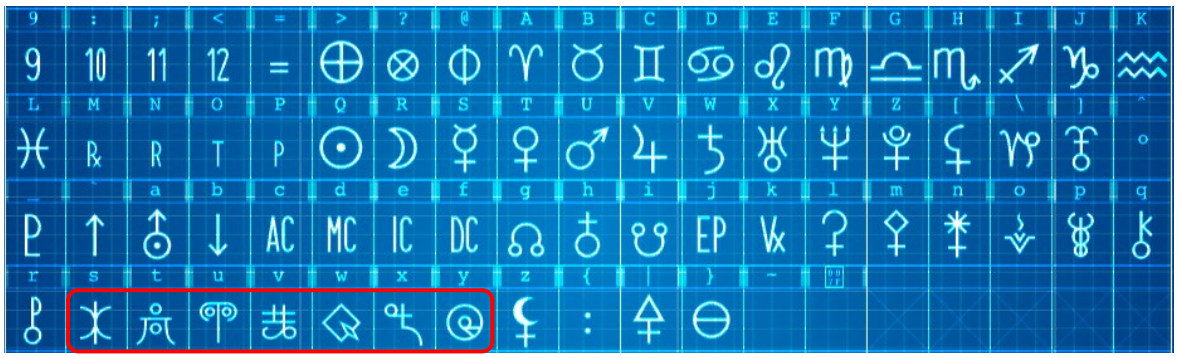


Figure 8. Some of the characters in the *Astronomicon* font. The Moskowitz symbols for the dwarf planets are in the bottom row. The font was designed to be compatible with the *Astrolog* software.

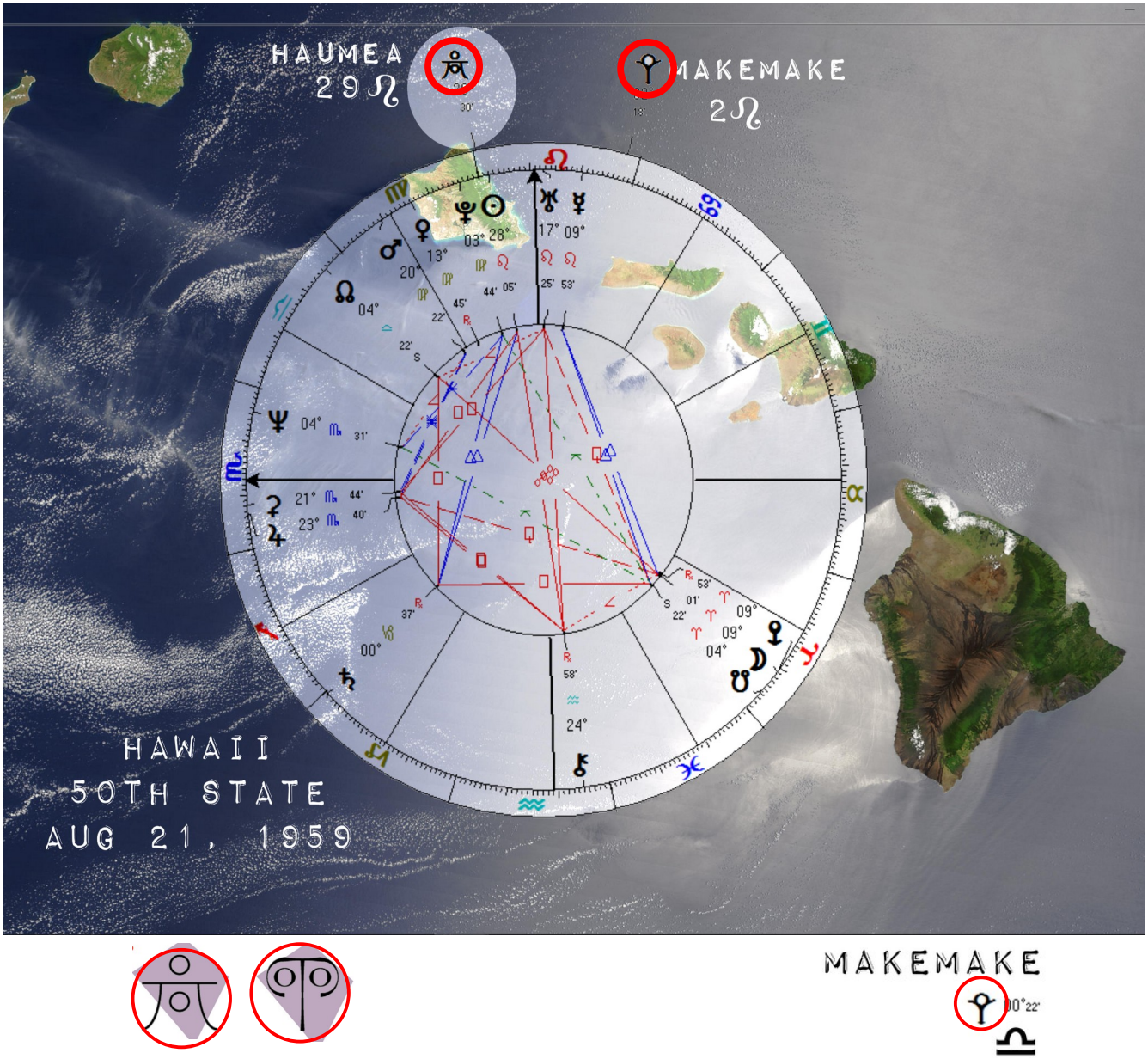


Figure 9. Fernandez (n.d.). A chart produced by the popular pay software *Solar Fire*. It uses the symbols ♵ for Haumea and ♁ for Makemake; the cleaner ♁ at bottom right is clipped from a second chart. However, in the text itself, Fernandez illustrates both bodies with the Moskowitz symbols (bottom left).

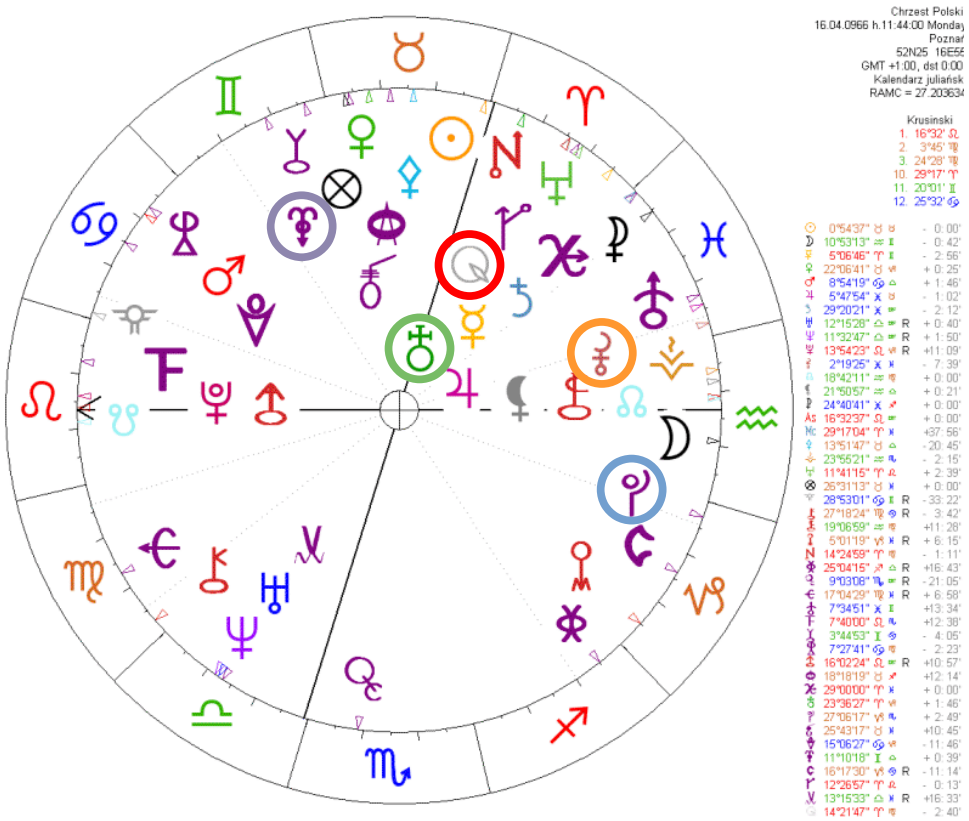


Figure 10. Bogdankr (2008b). A chart with all the bodies supported by the *Urania* software in 2008. Some of these symbols may be unique to *Urania*. For Quaoar (🝾, red ring), *Urania* uses an early version of the Moskowitz glyph. Sedna (🝿, blue ring) is analogous to U+2BF2 🯲, but is based on 🯵 *si* for old Inuktitut ‘Sitna’, rather than on 🯴 *sa* for modern ‘Sanna’. Other idiosyncratic symbols are Proserpina/Kora for Eris (🝽, green ring), Ceres with an orb (🝼, orange ring) and an Orcus that resembles U+2BD4 for Pluto (🯔, violet ring). Two others are monograms of the provisional MPC designations: 🯶 at 6 o’clock for 2000 QC_{243} (now Bienor) and 🯷 at 9 o’clock for 1998 TF_{35} (now 🝻 Cyllarus).

Figure 11. Current *Urania* software. Symbols have been added for Haumea and Makemake, but they are decidedly odd. Makemake takes Moskowitz’s Orcus symbol, 🯔 (an *O-R* monogram), and Haumea an ouroboros symbol, 🯑 (a snake swallowing its tail). There is no mythological connection between Haumea and the ouroboros.

ISO/IEC JTC 1/SC 2/WG 2
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646[1]
Please fill all the sections A, B and C below.
Please read Principles and Procedures Document (P & P) from std.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 std.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html.
See also std.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html for latest *Roadmaps*.

A. Administrative

1. **Title:** *Additional phonetic click letters*
2. Requester's name: *Kirk Miller*
3. Requester type (Member body/Liaison/Individual contribution): *individual*
4. Submission date: *2021 October 26*
5. Requester's reference (if applicable):
6. Choose one of the following:
   This is a complete proposal: *yes*
   (or) More information will be provided later:

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: *Alchemical symbols*
2. Number of characters in proposal: *5*
3. Proposed category (select one from below - see section 2.2 of P&P document):
   A-Contemporary x 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? *yes*
   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. Fonts related:
   a. Who will provide the appropriate computerized font to the Project Editor of 10646 for publishing the standard? *Kirk Miller*
   b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.): *Denis Moskowitz's symbols released to the public domain: suberic.net/~dmm/astro/tno.html ; email: dmm@suberic.net*
   Roberto Corona's Astronomicon font released under the Open Font License: astronomicon.co/en/astronomicon-fonts
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? *yes*
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)? *no*

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 www.unicode.org for such information on other scripts. Also see Unicode Character Database (www.unicode.org/reports/tr44/) and associated Unicode Technical Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode Standard.

1. Form number: N4502-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, 2009-11, 2011-03, 2012-01)

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before? *no*
   If YES explain
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.)? *yes*
   If YES, with whom? *Walter Pullen (author Astrolog software), Denis Moskowitz, Zane Stein*
   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? *yes*
   Reference:
4. The context of use for the proposed characters (type of use; common or rare) *astrology*
   Reference:
5. Are the proposed characters in current use by the user community? *yes*
   If YES, where? Reference: *See figures*
6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP? *no*
   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)? *if possible*
8. Can any of the proposed characters be considered a presentation form of an existing character or character sequence? *no*
   If YES, is a rationale for its inclusion provided?
   If YES, reference:
9. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters? *no*
   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, or could be confused with, an existing character? *no*
    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? *no*
    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:
12. Does the proposal contain characters with any special properties such as control function or similar semantics? *no*
    If YES, describe in detail (include attachment if necessary)
13. Does the proposal contain any Ideographic compatibility characters? *no*
    If YES, are the equivalent corresponding unified ideographic characters identified?
    If YES, reference: