

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

**Doc Type:** Working Group Document**Title:** Considerations regarding a normalized Cypro-Minoan reference font**Source:** Michael Everson**Status:** Liaison Contribution**Action:** For consideration by JTC1/SC2/WG2 and UTC**Date:** 2020-12-31

**1. Cypro-Minoan font glyphs.** The standard modern glyphs for Linear B were first drawn by architect Michael Ventris, who had training in careful lettering and indeed whose ordinary handwriting was meticulously neat. Standard shapes for Linear B, and for Cypriot and for Linear A, follow the style which he set and are implemented in fonts with a crisp monoline and with regularity between related characters.

It appears that before now, no one has tried to apply such a technique to Cypro-Minoan. This is not surprising, since most work hitherto has been focused on discerning what signs are characters and what are glyph variants. Nevertheless, as I was making some requested changes to the code chart using a font provided by the late Jean-Pierre Olivier's, it became clear that some sort of typographic order had to be imposed if the script is to be encoded in an international Standard. Olivier's Cypro-Minoan fonts, it must be admitted, are not very clear, tending towards a representation of the rounded "blobbiness" of a stylus pressed into clay, but often failing to do this well in font outlines. Since the other Aegean scripts have a clear typographic form, it makes good sense now to apply typographic conventions to Cypro-Minoan. Here is an example of some of the glyphs in Olivier's font:



Earlier this year I prepared a simple monoline font on the basis of what I could glean from Olivier's chart font. This was reviewed by some of our Cypro-Minoanist colleagues. The more conservative preferred the glyphs they are used to, which is fair enough. It is not good enough for the Universal Character Set, however. My saying so is not an indictment of Olivier's work; not everyone is a font designer and font design was not Jean-Pierre's intent. (Nor were his glyphs intended to be displayed at 60 points.) I misread the ductus and strokes that I tried to glean from Olivier's glyphs, but if that font were to be used in the code charts, the errors which I made—and worse ones—could easily be made by other designers trying to follow the same model. It's simply unavoidable that we devise a typographically reasonable font for Cypro-Minoan. The charts below show Olivier's original font, my attempt at normalizing it, Maurizio Del Freo and Massimo Perna's hand-written chart, and my final font which I recommend for use in the standard.

**2. Additional Cypro-Minoan character.** As the glyph repertoire for Cypro-Minoan was being finalized it became clear that there was a character which had been missed out in previous studies. Earlier analyses had given CM075 with a glyph looking like a box with a cross in it, and unified that with a glyph looking like an empty box. In fact the most common form of CM075 is an empty box, and now some Cypro-Minoan experts have agreed that the box-with-cross character should be added to repertoire as CM075B, following the character to which it is related. The new character has been highlighted in Figure 4 below; it did not appear in Figures 1–3, and so while it looks as though a new empty-box character has been added, in fact the glyph for CM075 has had its cross removed, and the new character CM075B has the cross. In the corpus of Cypro-Minoan texts the CM075 is attested at least 56 times in 7 texts, and CM075B is attested 4 times in 3 texts (on clay balls only).

### 3. Unicode Character Properties

12F90;CYPRO-MINOAN SIGN CM001;Lo;0;L;;;;N;;;;;	12FC1;CYPRO-MINOAN SIGN CM062;Lo;0;L;;;;N;;;;;
12F91;CYPRO-MINOAN SIGN CM002;Lo;0;L;;;;N;;;;;	12FC2;CYPRO-MINOAN SIGN CM063;Lo;0;L;;;;N;;;;;
12F92;CYPRO-MINOAN SIGN CM004;Lo;0;L;;;;N;;;;;	12FC3;CYPRO-MINOAN SIGN CM064;Lo;0;L;;;;N;;;;;
12F93;CYPRO-MINOAN SIGN CM005;Lo;0;L;;;;N;;;;;	12FC4;CYPRO-MINOAN SIGN CM066;Lo;0;L;;;;N;;;;;
12F94;CYPRO-MINOAN SIGN CM006;Lo;0;L;;;;N;;;;;	12FC5;CYPRO-MINOAN SIGN CM067;Lo;0;L;;;;N;;;;;
12F95;CYPRO-MINOAN SIGN CM007;Lo;0;L;;;;N;;;;;	12FC6;CYPRO-MINOAN SIGN CM068;Lo;0;L;;;;N;;;;;
12F96;CYPRO-MINOAN SIGN CM008;Lo;0;L;;;;N;;;;;	12FC7;CYPRO-MINOAN SIGN CM069;Lo;0;L;;;;N;;;;;
12F97;CYPRO-MINOAN SIGN CM009;Lo;0;L;;;;N;;;;;	12FC8;CYPRO-MINOAN SIGN CM070;Lo;0;L;;;;N;;;;;
12F98;CYPRO-MINOAN SIGN CM010;Lo;0;L;;;;N;;;;;	12FC9;CYPRO-MINOAN SIGN CM071;Lo;0;L;;;;N;;;;;
12F99;CYPRO-MINOAN SIGN CM011;Lo;0;L;;;;N;;;;;	12FCA;CYPRO-MINOAN SIGN CM072;Lo;0;L;;;;N;;;;;
12F9A;CYPRO-MINOAN SIGN CM012;Lo;0;L;;;;N;;;;;	12FCB;CYPRO-MINOAN SIGN CM073;Lo;0;L;;;;N;;;;;
12F9B;CYPRO-MINOAN SIGN CM012B;Lo;0;L;;;;N;;;;;	12FCC;CYPRO-MINOAN SIGN CM074;Lo;0;L;;;;N;;;;;
12F9C;CYPRO-MINOAN SIGN CM013;Lo;0;L;;;;N;;;;;	12FCD;CYPRO-MINOAN SIGN CM075;Lo;0;L;;;;N;;;;;
12F9D;CYPRO-MINOAN SIGN CM015;Lo;0;L;;;;N;;;;;	12FCB;CYPRO-MINOAN SIGN CM075B;Lo;0;L;;;;N;;;;;
12F9E;CYPRO-MINOAN SIGN CM017;Lo;0;L;;;;N;;;;;	12FCF;CYPRO-MINOAN SIGN CM076;Lo;0;L;;;;N;;;;;
12F9F;CYPRO-MINOAN SIGN CM019;Lo;0;L;;;;N;;;;;	12FD0;CYPRO-MINOAN SIGN CM078;Lo;0;L;;;;N;;;;;
12FA0;CYPRO-MINOAN SIGN CM021;Lo;0;L;;;;N;;;;;	12FD1;CYPRO-MINOAN SIGN CM079;Lo;0;L;;;;N;;;;;
12FA1;CYPRO-MINOAN SIGN CM023;Lo;0;L;;;;N;;;;;	12FD2;CYPRO-MINOAN SIGN CM080;Lo;0;L;;;;N;;;;;
12FA2;CYPRO-MINOAN SIGN CM024;Lo;0;L;;;;N;;;;;	12FD3;CYPRO-MINOAN SIGN CM081;Lo;0;L;;;;N;;;;;
12FA3;CYPRO-MINOAN SIGN CM025;Lo;0;L;;;;N;;;;;	12FD4;CYPRO-MINOAN SIGN CM082;Lo;0;L;;;;N;;;;;
12FA4;CYPRO-MINOAN SIGN CM026;Lo;0;L;;;;N;;;;;	12FD5;CYPRO-MINOAN SIGN CM083;Lo;0;L;;;;N;;;;;
12FA5;CYPRO-MINOAN SIGN CM027;Lo;0;L;;;;N;;;;;	12FD6;CYPRO-MINOAN SIGN CM084;Lo;0;L;;;;N;;;;;
12FA6;CYPRO-MINOAN SIGN CM028;Lo;0;L;;;;N;;;;;	12FD7;CYPRO-MINOAN SIGN CM085;Lo;0;L;;;;N;;;;;
12FA7;CYPRO-MINOAN SIGN CM029;Lo;0;L;;;;N;;;;;	12FD8;CYPRO-MINOAN SIGN CM086;Lo;0;L;;;;N;;;;;
12FA8;CYPRO-MINOAN SIGN CM030;Lo;0;L;;;;N;;;;;	12FD9;CYPRO-MINOAN SIGN CM087;Lo;0;L;;;;N;;;;;
12FA9;CYPRO-MINOAN SIGN CM033;Lo;0;L;;;;N;;;;;	12FDA;CYPRO-MINOAN SIGN CM088;Lo;0;L;;;;N;;;;;
12FAA;CYPRO-MINOAN SIGN CM034;Lo;0;L;;;;N;;;;;	12FDB;CYPRO-MINOAN SIGN CM089;Lo;0;L;;;;N;;;;;
12FAB;CYPRO-MINOAN SIGN CM035;Lo;0;L;;;;N;;;;;	12FDC;CYPRO-MINOAN SIGN CM090;Lo;0;L;;;;N;;;;;
12FAC;CYPRO-MINOAN SIGN CM036;Lo;0;L;;;;N;;;;;	12FDD;CYPRO-MINOAN SIGN CM091;Lo;0;L;;;;N;;;;;
12FAD;CYPRO-MINOAN SIGN CM037;Lo;0;L;;;;N;;;;;	12FDE;CYPRO-MINOAN SIGN CM092;Lo;0;L;;;;N;;;;;
12FAE;CYPRO-MINOAN SIGN CM038;Lo;0;L;;;;N;;;;;	12FDF;CYPRO-MINOAN SIGN CM094;Lo;0;L;;;;N;;;;;
12FAF;CYPRO-MINOAN SIGN CM039;Lo;0;L;;;;N;;;;;	12FE0;CYPRO-MINOAN SIGN CM095;Lo;0;L;;;;N;;;;;
12FB0;CYPRO-MINOAN SIGN CM040;Lo;0;L;;;;N;;;;;	12FE1;CYPRO-MINOAN SIGN CM096;Lo;0;L;;;;N;;;;;
12FB1;CYPRO-MINOAN SIGN CM041;Lo;0;L;;;;N;;;;;	12FE2;CYPRO-MINOAN SIGN CM097;Lo;0;L;;;;N;;;;;
12FB2;CYPRO-MINOAN SIGN CM044;Lo;0;L;;;;N;;;;;	12FE3;CYPRO-MINOAN SIGN CM098;Lo;0;L;;;;N;;;;;
12FB3;CYPRO-MINOAN SIGN CM046;Lo;0;L;;;;N;;;;;	12FE4;CYPRO-MINOAN SIGN CM099;Lo;0;L;;;;N;;;;;
12FB4;CYPRO-MINOAN SIGN CM047;Lo;0;L;;;;N;;;;;	12FE5;CYPRO-MINOAN SIGN CM100;Lo;0;L;;;;N;;;;;
12FB5;CYPRO-MINOAN SIGN CM049;Lo;0;L;;;;N;;;;;	12FE6;CYPRO-MINOAN SIGN CM101;Lo;0;L;;;;N;;;;;
12FB6;CYPRO-MINOAN SIGN CM050;Lo;0;L;;;;N;;;;;	12FE7;CYPRO-MINOAN SIGN CM102;Lo;0;L;;;;N;;;;;
12FB7;CYPRO-MINOAN SIGN CM051;Lo;0;L;;;;N;;;;;	12FE8;CYPRO-MINOAN SIGN CM103;Lo;0;L;;;;N;;;;;
12FB8;CYPRO-MINOAN SIGN CM052;Lo;0;L;;;;N;;;;;	12FE9;CYPRO-MINOAN SIGN CM104;Lo;0;L;;;;N;;;;;
12FB9;CYPRO-MINOAN SIGN CM053;Lo;0;L;;;;N;;;;;	12FEA;CYPRO-MINOAN SIGN CM105;Lo;0;L;;;;N;;;;;
12FBA;CYPRO-MINOAN SIGN CM054;Lo;0;L;;;;N;;;;;	12FEB;CYPRO-MINOAN SIGN CM107;Lo;0;L;;;;N;;;;;
12FBB;CYPRO-MINOAN SIGN CM055;Lo;0;L;;;;N;;;;;	12FEC;CYPRO-MINOAN SIGN CM108;Lo;0;L;;;;N;;;;;
12FBC;CYPRO-MINOAN SIGN CM056;Lo;0;L;;;;N;;;;;	12FED;CYPRO-MINOAN SIGN CM109;Lo;0;L;;;;N;;;;;
12FBD;CYPRO-MINOAN SIGN CM058;Lo;0;L;;;;N;;;;;	12FEE;CYPRO-MINOAN SIGN CM110;Lo;0;L;;;;N;;;;;
12FBE;CYPRO-MINOAN SIGN CM059;Lo;0;L;;;;N;;;;;	12FEF;CYPRO-MINOAN SIGN CM112;Lo;0;L;;;;N;;;;;
12FBF;CYPRO-MINOAN SIGN CM060;Lo;0;L;;;;N;;;;;	12FF0;CYPRO-MINOAN SIGN CM114;Lo;0;L;;;;N;;;;;
12FC0;CYPRO-MINOAN SIGN CM061;Lo;0;L;;;;N;;;;;	12FF1;CYPRO-MINOAN SIGN CM301;Po;0;L;;;;N;;;;;
	12FF2;CYPRO-MINOAN SIGN CM302;Po;0;L;;;;N;;;;;

	1270	1271	1272	1273	1274	1275	1276
0	I	𠂇	𠂆	𠂈	𠂉	𠂊	𠂋
12700	12710	12720	12730	12740	12750	12760	
1	𠂄	𠂅	𠂃	𠂇	𠂆	𠂈	𠂋
12701	12711	12721	12731	12741	12751	12761	
2	𠂎	𠂆	𠂃	𠂇	𠂆	𠂃	
12702	12712	12722	12732	12742	12752		
3	𠂄	𠂅	𠂃	𠂇	𠂆	𠂃	
12703	12713	12723	12733	12743	12753		
4	𠂄	𠂅	𠂃	𠂇	𠂆	𠂃	
12704	12714	12724	12734	12744	12754		
5	𠂄	𠂅	𠂃	𠂇	𠂆	𠂃	
12705	12715	12725	12735	12745	12755		
6	𠂄	𠂅	𠂃	𠂇	𠂆	𠂃	
12706	12716	12726	12736	12746	12756		
7	𠂄	𠂅	𠂃	𠂇	𠂆	𠂃	
12707	12717	12727	12737	12747	12757		
8	𠂄	𠂅	𠂃	𠂇	𠂆	𠂃	
12708	12718	12728	12738	12748	12758		
9	𠂄	𠂅	𠂃	𠂇	𠂆	𠂃	
12709	12719	12729	12739	12749	12759		
A	𠂄	𠂅	𠂃	𠂇	𠂆	𠂃	
1270A	1271A	1272A	1273A	1274A	1275A		
B	𠂄	𠂅	𠂃	𠂇	𠂆	𠂃	
1270B	1271B	1272B	1273B	1274B	1275B		
C	𠂄	𠂅	𠂃	𠂇	𠂆	𠂃	
1270C	1271C	1272C	1273C	1274C	1275C		
D	𠂄	𠂅	𠂃	𠂇	𠂆	𠂃	
1270D	1271D	1272D	1273D	1274D	1275D		
E	𠂄	𠂅	𠂃	𠂇	𠂆	𠂃	
1270E	1271E	1272E	1273E	1274E	1275E		
F	𠂄	𠂅	𠂃	𠂇	𠂆	𠂃	
1270F	1271F	1272F	1273F	1274F	1275F		

**Figure 1.** Code chart using a font provided by Jean-Paul Olivier.

	1270	1271	1272	1273	1274	1275	1276
0	工	𠂔	𠂓	𠂔	𠂔	𠂔	𠂔
	12700	12710	12720	12730	12740	12750	12760
1	𠂎	𠂔	𠂑	𠂔	𠂔	𠂔	𠂔
	12701	12711	12721	12731	12741	12751	12761
2	𠂆	𠂔	𠂔	𠂔	𠂔	𠂔	
	12702	12712	12722	12732	12742	12752	
3	𠂊	𠂔	𠂔	𠂔	𠂔	𠂔	
	12703	12713	12723	12733	12743	12753	
4	𠂉	𠂔	𠂔	𠂔	𠂔	𠂔	
	12704	12714	12724	12734	12744	12754	
5	𠂉	𠂔	𠂔	𠂔	𠂔	𠂔	
	12705	12715	12725	12735	12745	12755	
6	𠂈	𠂔	𠂔	𠂔	𠂔	𠂔	
	12706	12716	12726	12736	12746	12756	
7	𠂉	𠂔	𠂔	𠂔	𠂔	𠂔	
	12707	12717	12727	12737	12747	12757	
8	𠂉	𠂔	𠂔	𠂔	𠂔	𠂔	
	12708	12718	12728	12738	12748	12758	
9	𠂉	𠂔	𠂔	𠂔	𠂔	𠂔	
	12709	12719	12729	12739	12749	12759	
A	𠂔	𠂔	𠂔	𠂔	𠂔	𠂔	
	1270A	1271A	1272A	1273A	1274A	1275A	
B	𠂔	𠂔	𠂔	𠂔	𠂔	𠂔	
	1270B	1271B	1272B	1273B	1274B	1275B	
C	𠂔	𠂔	𠂔	𠂔	𠂔	𠂔	
	1270C	1271C	1272C	1273C	1274C	1275C	
D	𠂔	𠂔	𠂔	𠂔	𠂔	𠂔	
	1270D	1271D	1272D	1273D	1274D	1275D	
E	𠂔	𠂔	𠂔	𠂔	𠂔	𠂔	
	1270E	1271E	1272E	1273E	1274E	1275E	
F	𠂔	𠂔	𠂔	𠂔	𠂔	𠂔	
	1270F	1271F	1272F	1273F	1274F	1275F	

**Figure 2.** Code chart using a font by Michael Everson, attempting to follow the ductus used in Jean-Paul Olivier's font as shown in Figure 1.

	1270	1271	1272	1273	1274	1275	1276
0	I 12700	Λ 12710	-<)- 12720	₩ 12730	₪ 12740	₪ 12750	₪ 12760
1	₪ 12701	₪ 12711	₪ 12721	₪ 12731	₪ 12741	₪ 12751	₪ 12761
2	₪ 12702	₪ 12712	₪ 12722	₪ 12732	₪ 12742	₪ 12752	
3	₪ 12703	₪ 12713	₪ 12723	₪ 12733	₪ 12743	₪ 12753	
4	₪ 12704	₪ 12714	₪ 12724	₪ 12734	₪ 12744	₪ 12754	
5	₪ 12705	₪ 12715	₪ 12725	₪ 12735	₪ 12745	₪ 12755	
6	₪ 12706	₪ 12716	₪ 12726	₪ 12736	₪ 12746	₪ 12756	
7	₪ 12707	₪ 12717	₪ 12727	₪ 12737	₪ 12747	₪ 12757	
8	₪ 12708	₪ 12718	₪ 12728	₪ 12738	₪ 12748	₪ 12758	
9	₪ 12709	₪ 12719	₪ 12729	₪ 12739	₪ 12749	₪ 12759	
A	₪ 1270A	₪ 1271A	₪ 1272A	₪ 1273A	₪ 1274A	₪ 1275A	
B	₪ 1270B	₪ 1271B	₪ 1272B	₪ 1273B	₪ 1274B	₪ 1275B	
C	₪ 1270C	₪ 1271C	₪ 1272C	₪ 1273C	₪ 1274C	₪ 1275C	
D	₪ 1270D	₪ 1271D	₪ 1272D	₪ 1273D	₪ 1274D	₪ 1275D	
E	₪ 1270E	₪ 1271E	₪ 1272E	₪ 1273E	₪ 1274E	₪ 1275E	
F	₪ 1270F	₪ 1271F	₪ 1272F	₪ 1273F	₪ 1274F	₪ 1275F	

**Figure 3.** Code chart with glyphs drawn by hand by Maurizio Del Freo and Massimo Perna.

	12F9	12FA	12FB	12FC	12FD	12FE	12FF
0	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ
	12F90	12FA0	12FB0	12FC0	12FD0	12FE0	12FF0
1	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ
	12F91	12FA1	12FB1	12FC1	12FD1	12FE1	12FF1
2	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ
	12F92	12FA2	12FB2	12FC2	12FD2	12FE2	12FF2
3	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ
	12F93	12FA3	12FB3	12FC3	12FD3	12FE3	
4	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	
	12F94	12FA4	12FB4	12FC4	12FD4	12FE4	
5	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	
	12F95	12FA5	12FB5	12FC5	12FD5	12FE5	
6	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	
	12F96	12FA6	12FB6	12FC6	12FD6	12FE6	
7	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	
	12F97	12FA7	12FB7	12FC7	12FD7	12FE7	
8	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	
	12F98	12FA8	12FB8	12FC8	12FD8	12FE8	
9	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	
	12F99	12FA9	12FB9	12FC9	12FD9	12FE9	
A	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	
	12F9A	12FAA	12FBA	12FCA	12FDA	12FEA	
B	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	
	12F9B	12FAB	12FBB	12FCB	12FDB	12FEB	
C	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	
	12F9C	12FAC	12FBC	12FCC	12FDC	12FEC	
D	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	
	12F9D	12FAD	12FBD	12FCD	12FDD	12FED	
E	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	
	12F9E	12FAE	12FBE	12FCE	12FDE	12FEE	
F	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	ꝑ	
	12F9F	12FAF	12FBF	12FCF	12FDF	12FEF	

**Figure 4.** Code chart using a font by Michael Everson, attempting to follow the ductus used by Maurizio Del Freo and Massimo Perna as shown in Figure 3.