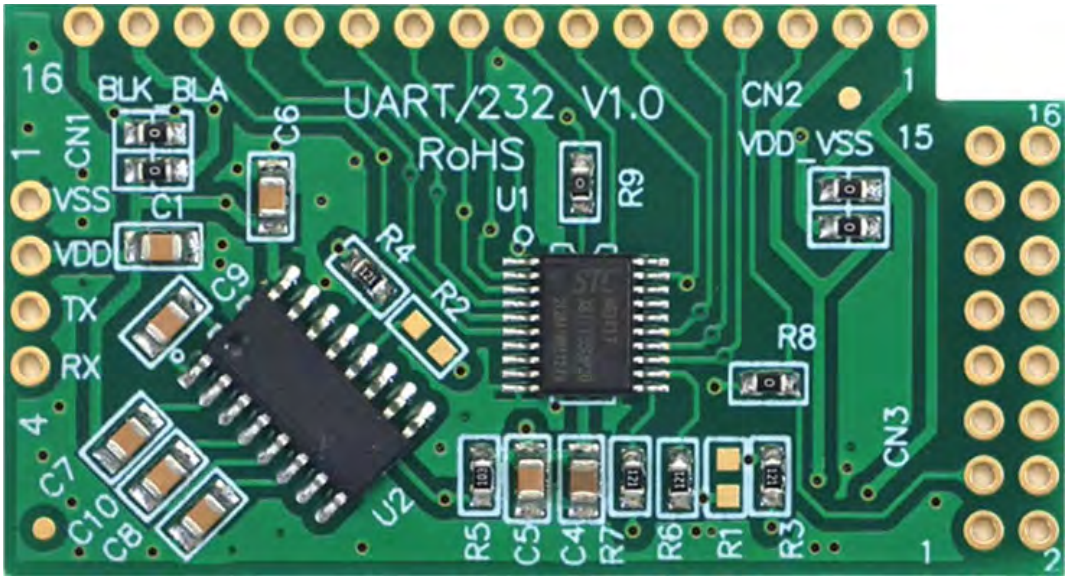
UART/RS232 Shield

for Surenoo Character LCD Module

USER MANUAL

Please click the following image to buy the sample



Shenzhen Surenoo Technology Co.,Ltd.
www.surenoo.com

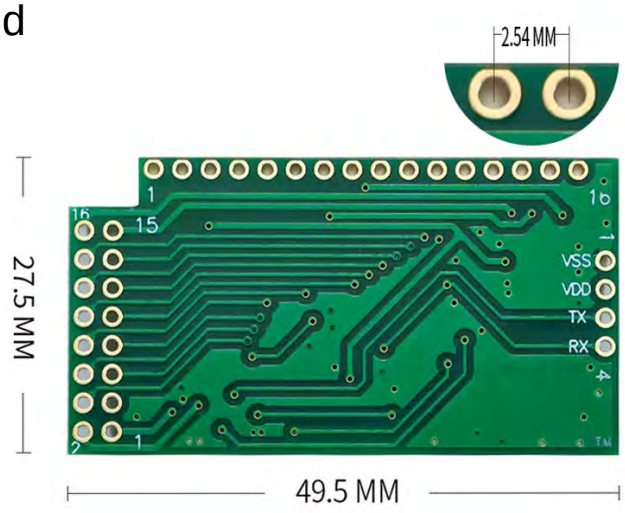
Reference Datasheet

SSCOM V5.13.1

Surenoo Character LCD Selection Guide

MENU

Introduce for UART/RS232 Shield



>> RS232 & UART Convert

RS232 Singal in default, if you need UART(TTL) Signal, please revise the board as following steps:

1. Remove U2;
2. Remove R5;
3. Move R3 to R1;
4. Move R4 to R2.

>> CN1: RS232/UART Interface

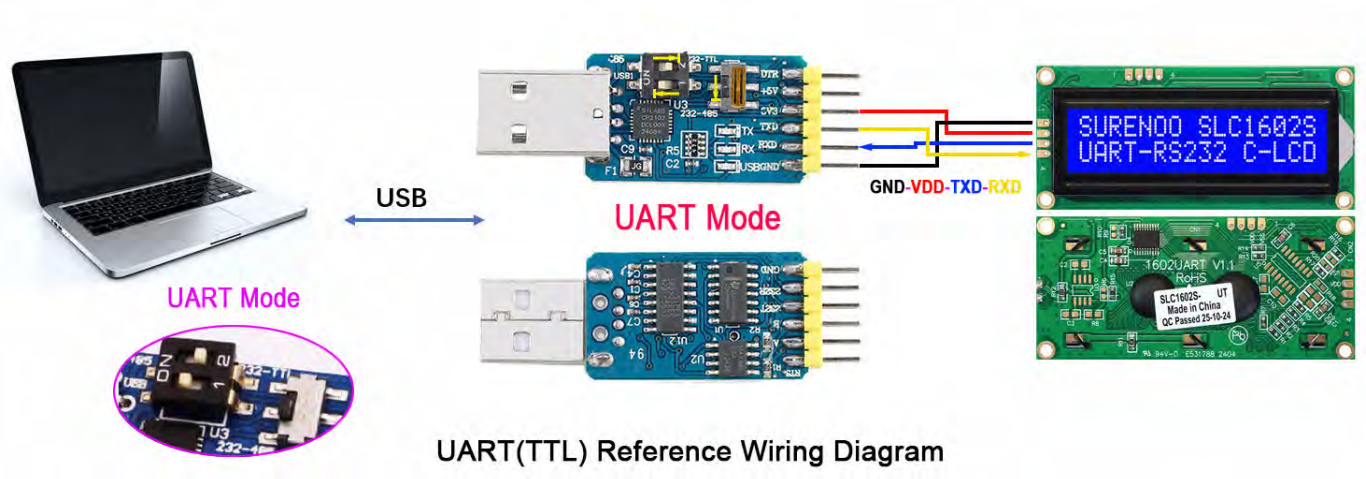
Pin No	Pin Name	Descriptions
1	VSS	Ground, 0V
2	VDD	Logic Power Supply, +5V
3	TXD	Transmit Data
4	RXD	Receive Data

>> CN2/CN3: LCD Parallel Interface

Pin No	Pin Name	Descriptions
1	VSS	Ground, 0V
2	VDD	Logic Power Supply, +5V
3	V0	Operating voltage for LCD
4	RS	Data / Instruction Register Select (H: Data Signal, L: Instruction Signal)
5	R/W	Read / Write (H: Read Mode, L: Write Mode)
6	E	Enable Signal
7-14	DB0-7	Data Bit 0-7
15	LED_A	Backlight Anode
16	LED_K	Backlight Cathode

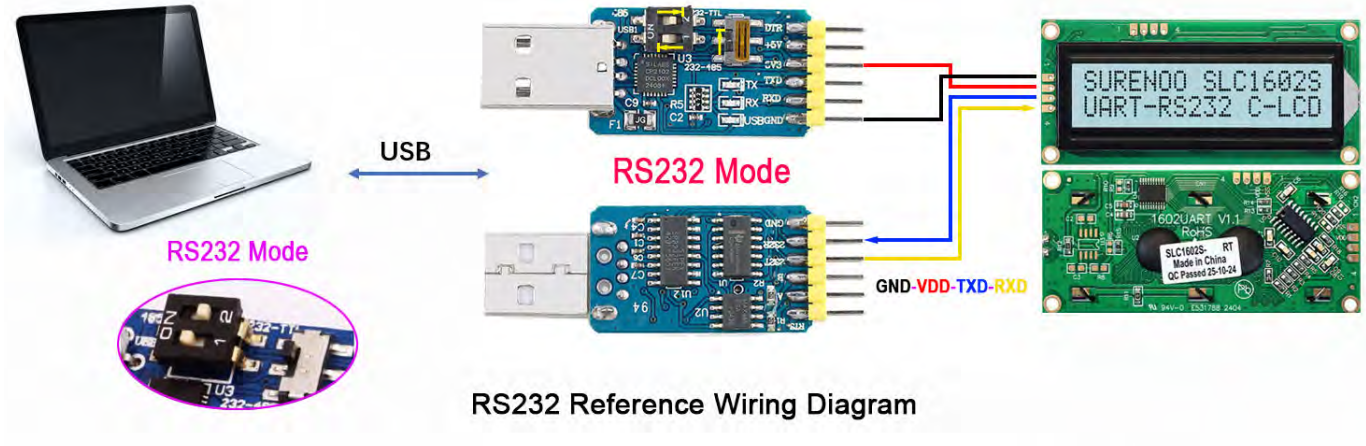
1. LCD Communication Wiring Diagram

1.1 UART Communication Interface Wiring Diagram



UART(TTL) Reference Wiring Diagram

1.2 RS232 Communication Interface Wiring Diagram

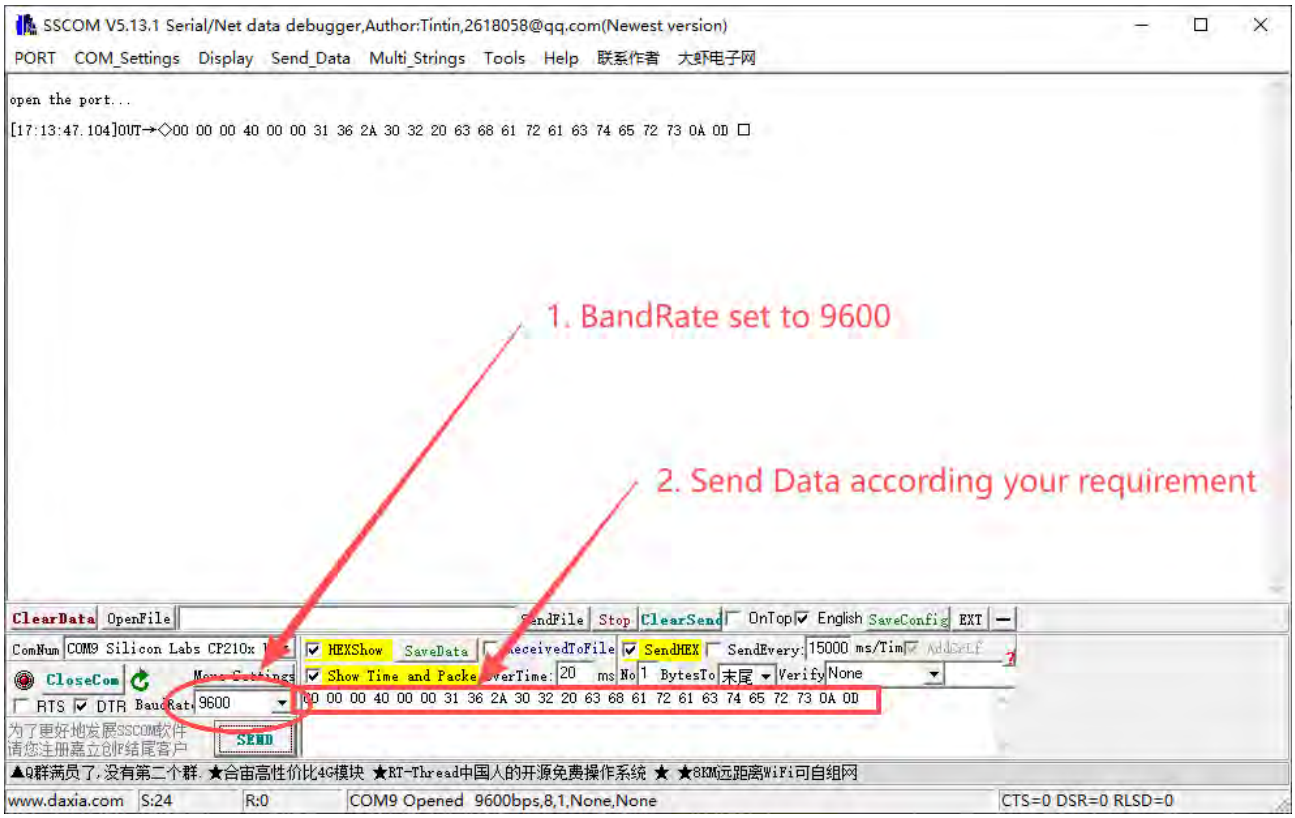


RS232 Reference Wiring Diagram

Note: Wiring is for reference only, please wire according to the converter you use.

2. Host Computer Software Operation Introduction

Note: Baud rate selection: 9600



reset,thecursorisonposition0x00.

3. LCD Programming Commands and Usage

3.1 Test Command:

0	1	2	3	4	5
00	00	00	cmd	0A	0D

0~2: Start Address
3: cmd=11 Controls the LCD to automatically display internal preset screens
4~5: End Address

3.2 Display “On/Off” Command:

0	1	2	3	4	5
00	00	00	cmd	0A	0D

0~2: Start Address
3: cmd=41 Controls the LCD to turn on the display.
cmd=42 Controls the LCD to turn off the display.
4~5: End Address

3.3 Backspace Command:

0	1	2	3	4	5
00	00	00	cmd	0A	0D

0~2: Start Address
3: "cmd=4E" Clear one character forward.
4~5: End Address

3.4 Shift Display Left/Right Command:

0	1	2	3	4	5
00	00	00	cmd	0A	0D

0~2: Start Address
3: "cmd=55" for shift display left,
"cmd=56" for shift display right
4~5: End Address

3.5 Set Cursor Position Command:

0	1	2	3	4	5
00	00	00	cmd	0A	0D

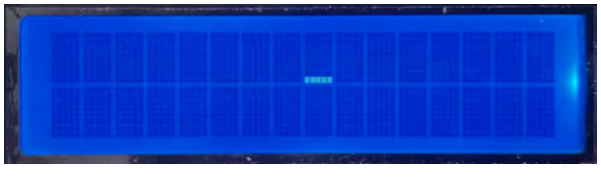
0~2: Start Address
3: "cmd=45" Reset cursor position (default: Row 0, Column 0)
"cmd=46" Move cursor to "Row 1, Column 1"
"cmd=47" Turn on cursor
"cmd=48" Turn off cursor
"cmd=49" Move cursor left
"cmd=4A" Move cursor right
"cmd=4B" Enable cursor blinking
"cmd=4C" Disable cursor blinking
4~5: End Address

3.4 For Example:

By writing 00 00 00 55 0A 0D,
shift the entire displayed characters to the left by 1 bit.

3.5 For Example:

Set the cursor to move left by one digit by writing
00 00 00 49 0A 0D



3.6 Clear Display Command:

0	1	2	3	4	5	6
00	00	00	cmd	Row	0A	0D

0~2: Start Address
3: "cmd=51" Display Clear command.
4: "Row=01" Clear the entire screen.
"Row=02" Clear the 1st line.
"Row=03" Clear the 2nd line.
5~6: End Address

3.6 For Example:

Write 00 00 00 51 02 0A 0D to clear the displayed characters on the first line.

3.7 Contrast Setting Command:

0	1	2	3	4	5	6
00	00	00	cmd	Contrast	0A	0D

0~2: Start Address
3: "cmd=52" LCD contrast setting command.
4: "Contrast = 01~08" Contrast rate.
01 is the lightest display, 08 is the darkest display.
5~6: End Address

3.7 For Example:

00 00 00 52 04 0A 0D （The display is faint）

00 00 00 52 07 0A 0D （The display is dark/intense）

3.8 Backlight Setting Command:

0	1	2	3	4	5	6
00	00	00	cmd	Backlight	0A	0D

0~2: Start Address
3: "cmd=53" Backlight setting command.
4: "Backlight=01~08" Backlight setting rate.
01 is min brightness, 08 is max brightness.
5~6: End Address

3.8 For Example:

00 00 00 53 02 0A 0D （The backlight is relatively dim）

00 00 00 52 06 0A 0D （The backlight is relatively bright）

3.9 Baud rate setting Command (modification not recommended):

0	1	2	3	4	5	6
00	00	00	cmd	Baud rate	0A	0D

0~2: Start address.
3: "cmd=61" Baud rate setting command.
4: "Baud rate = 01~08" Baud rate parameter, default is 04 (9600).
01: 1200 03: 4800 05: 19200 07: 57600
02: 2400 04: 9600 06: 38400 08: 115200
5~6: End address.

3.10 Set Cursor Position Command:

0	1	2	3	4	5	6	7
00	00	00	cmd	column	row	0A	0D

0~2: Start Address
3: "cmd=45" controls the LCD to display characters.
4: "column=00~0F" indicates the column address of the display cursor.
5: "row=00~01" indicates the row address of the display cursor.
6~7: End Address

For Example:

Display at Row 1, Column 10

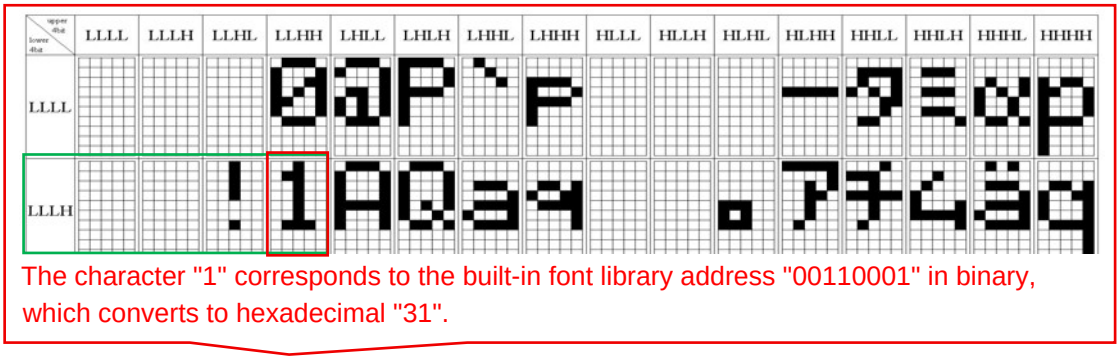
00 00 00 45 09 00 0A 0D

3.11 Display Character Command:

0	1	2	3	4	5	6~26	27	28
00	00	00	cmd	column	row	Character address	0A	0D

0~2: Start address.
3: "cmd=40" controls the LCD to display characters.
4: "column=00~0F" indicates the starting column address for character display.
5: "row=00~01" indicates the row address for character display.
6~26: "Character address" corresponds to the built-in font library address of the character to be displayed and must be filled in sequence.
27~28: End Address

For Example:



The character "1" corresponds to the built-in font library address "00110001" in binary, which converts to hexadecimal "31".

00 00 00 40 00 00 31 36 2A 30 32 20 63 68 61 72 61 63 74 65 72 73 0A 0D

Start displaying from Row 1, Column 1: 16×02 characters

00 00 00 40 03 01 55 41 52 54 28 54 54 4C 29 0A 0D

Display starting from Row 2, Column 4: UART (TTL)

Note: To display other characters, you must send a screen clear command first before writing character data. Failure to execute the clear screen command will result in overlapping display.

3.12 Display Custom Characters Command:

0	1	2	3	4	5	6	7-14	15	16
00	00	00	cmd	column	row	address	Character data	0A	0D

0~2: Start Address

3: "cmd=54" Display Custom Characters Command.

4: "column = 00~0F" indicates the column address of the displayed character.

5: "row = 00~01" indicates the row address of the displayed character.

6: "address = 00~07" indicates the storage address of the custom character; only 8 custom characters are supported.

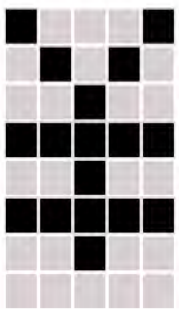
7~14: Character data = 5×8, representing the display data of one character.

15~16: End Address

For Example:

Display the custom "¥" symbol.

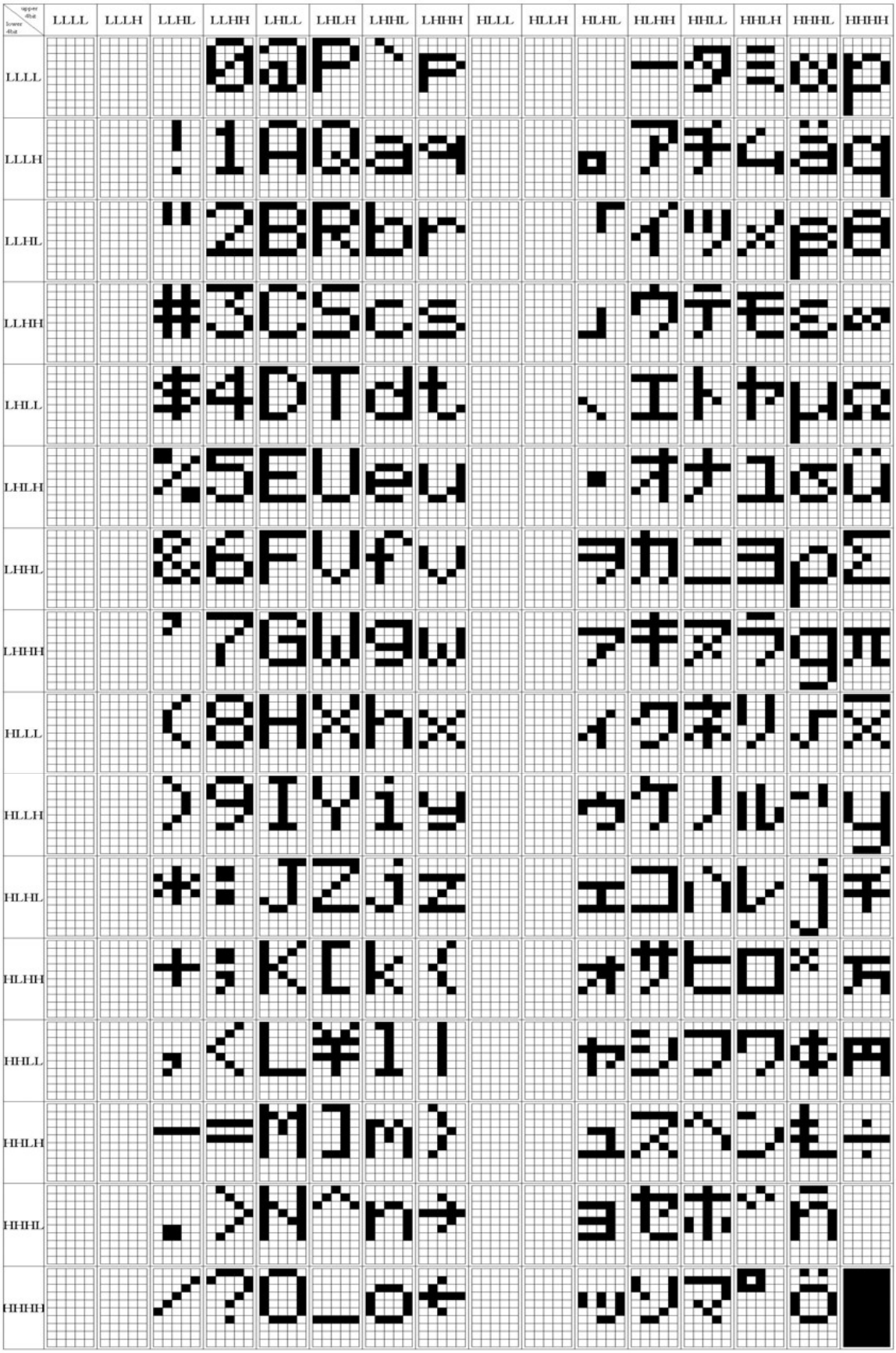
00 00 00 54 00 00 00 11 0A 04 1F 04 1F 04 00 0A 0D



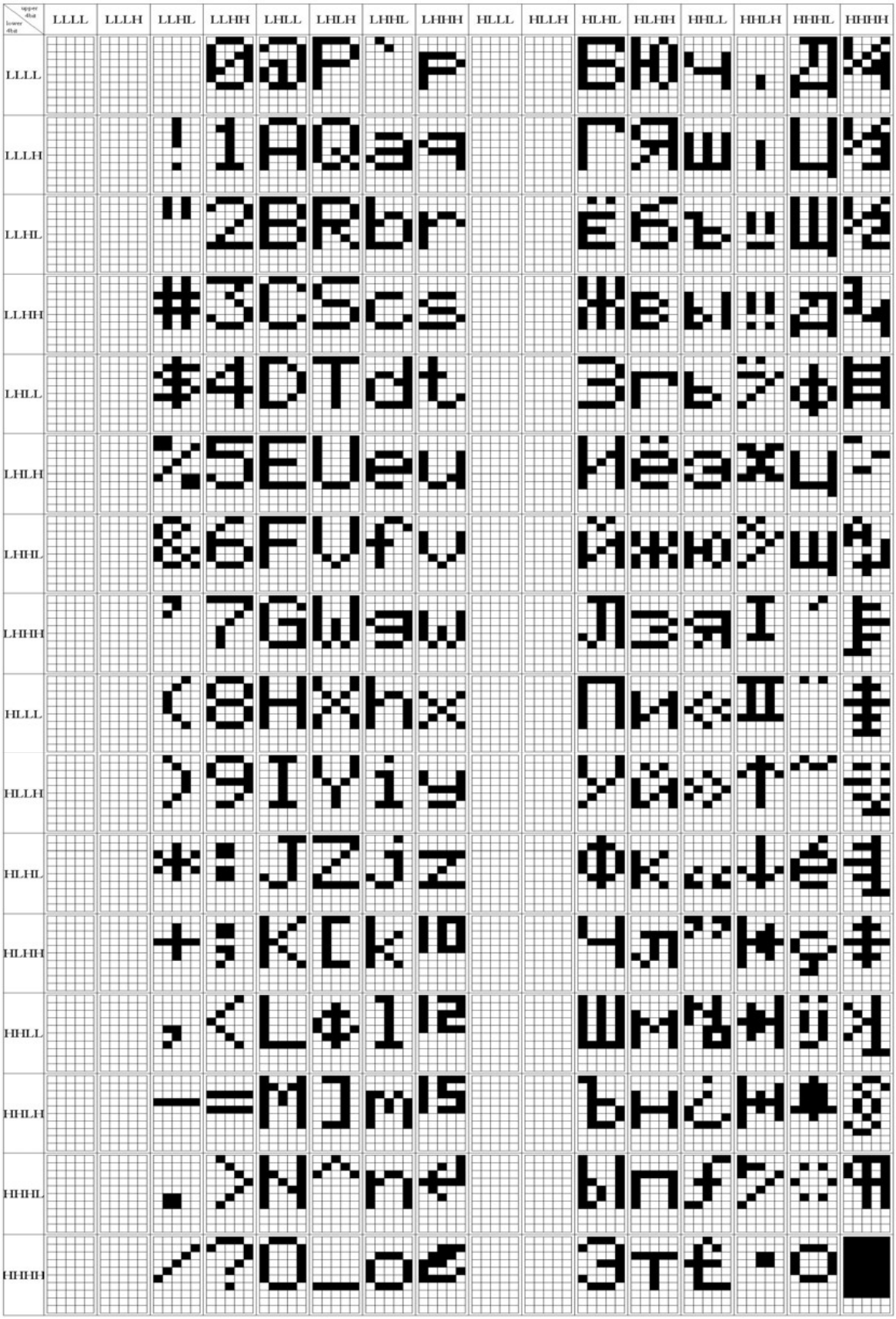
- line 0: 10001 → 11
- line 1: 01010 → 0A
- line 2: 00100 → 04
- line 3: 11111 → 1F
- line 4: 00100 → 04
- line 5: 11111 → 1F
- line 6: 00100 → 04
- line 7: 00000 → 00

4. Reference Font Table

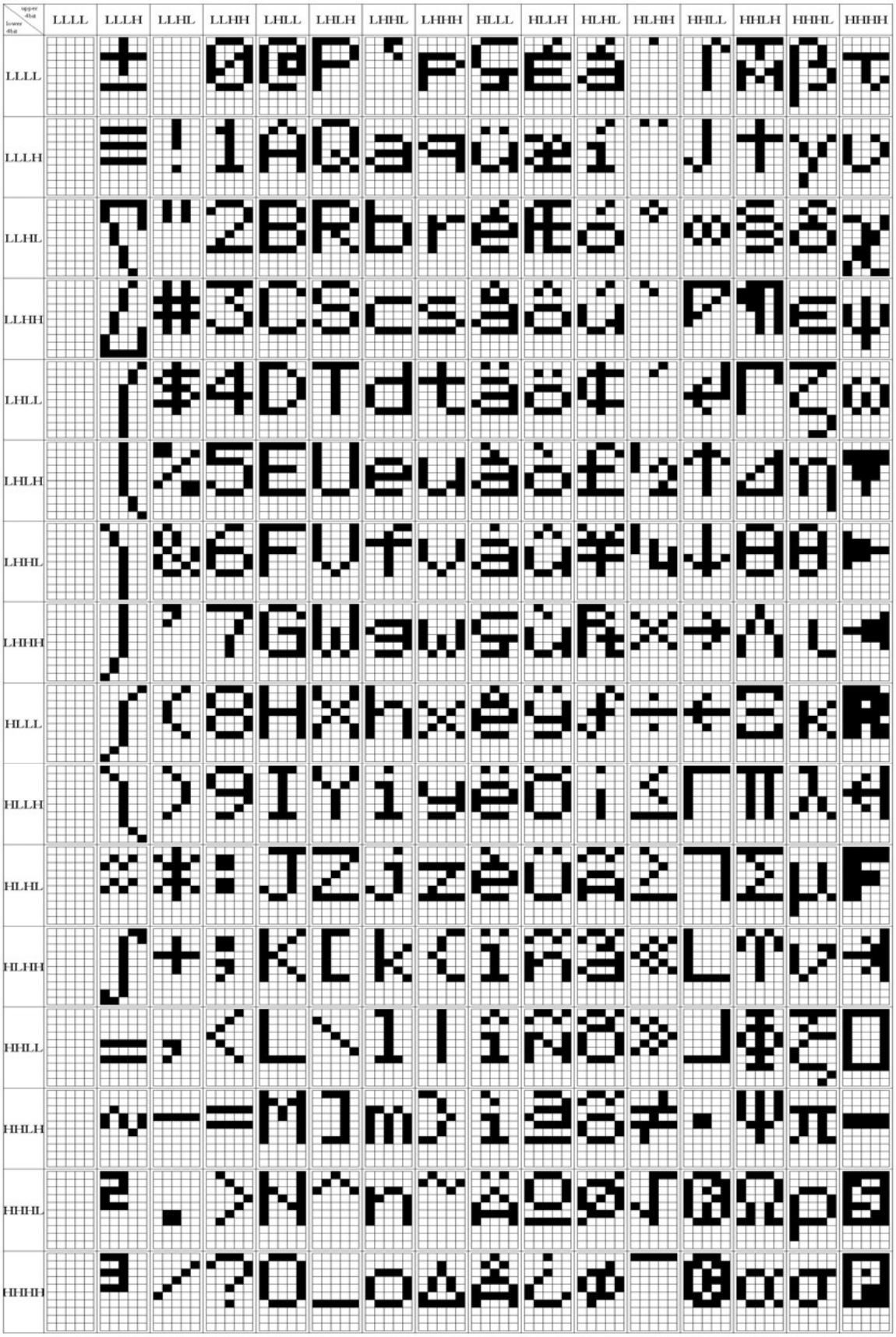
001 - English & Japanese Font Library



002 - English & Russian Font Library



003 - English & European Font Library



Appendix 1

Character Code (DDRAM data)								CGRAM address						CGRAM Data								Pattern number
D7	D6	D5	D4	D3	D2	D1	D0	A5	A4	A3	A2	A1	A0	P7	P6	P5	P4	P3	P2	P1	P0	
0	0	0	0	×	0	0	0	0	0	0	0	0	0	×	×	×	0	1	1	1	0	pattern1
											0	0	1				0	0	1	0	0	
											0	1	0				0	0	1	0	0	
											0	1	1				0	0	1	0	0	
											1	0	0				0	0	1	0	0	
											1	0	1				0	0	1	0	0	
											1	1	0				0	1	1	1	0	
											1	1	1				0	0	0	0	0	
0	0	0	0	×	0	0	1	0	0	1	0	0	0	×	×	×	0	1	1	1	0	pattern2
											0	0	1				1	0	0	0	1	
											0	1	0				1	0	0	0	0	
											0	1	1				1	0	0	0	0	
											1	0	0				1	0	0	0	0	
											1	0	1				1	0	0	0	1	
											1	1	0				0	1	1	1	0	
											1	1	1				0	0	0	0	0	
* * * * *								* * * *						* * * *								
0	0	0	0	×	1	1	1	1	1	1	0	0	0	×	×	×	1	1	1	1	1	pattern8
											0	0	1				1	0	0	0	0	
											0	1	0				1	0	0	0	0	
											0	1	1				1	1	1	1	0	
											1	0	0				1	0	0	0	0	
											1	0	1				1	0	0	0	1	
											1	1	0				1	1	1	1	0	
											1	1	1				0	0	0	0	0	

Appendix 2

```
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, // - -
0x20,0x20,0x20,0x20,0x20,0x00,0x20,0x00, // -!-
0x50,0x50,0x50,0x00,0x00,0x00,0x00,0x00, // -"-
0x50,0x50,0xF8,0x50,0xF8,0x50,0x50,0x00, // -#-
0x20,0x78,0xC0,0x70,0x28,0xF0,0x20,0x00, // -$-
0xC0,0xC8,0x10,0x20,0x40,0x98,0x18,0x00, // -%-
0x40,0xA0,0xA0,0x40,0xA8,0x90,0x68,0x00, // -&-
0x30,0x20,0x40,0x00,0x00,0x00,0x00,0x00, // -'-
0x10,0x20,0x40,0x40,0x40,0x20,0x10,0x00, // -(-
0x40,0x20,0x10,0x10,0x10,0x20,0x40,0x00, // -)-
0x20,0xA8,0x70,0x20,0x70,0xA8,0x20,0x00, // -*-
0x20,0x20,0x20,0xF8,0x20,0x20,0x20,0x00, // -+-
0x00,0x00,0x00,0x00,0x60,0x40,0x80,0x00, // -,-
0x00,0x00,0x00,0xF8,0x00,0x00,0x00,0x00, // ---
0x00,0x00,0x00,0x00,0x00,0x60,0x60,0x00, // -.-
0x00,0x08,0x10,0x20,0x40,0x80,0x00,0x00, // -/-
0x00,0x60,0x60,0x00,0x60,0x60,0x00,0x00, // -:-
0x00,0x60,0x60,0x00,0x60,0x60,0x80,0x00, // -;-
0x10,0x20,0x40,0x80,0x40,0x20,0x10,0x00, // -<-
0x00,0x00,0xF8,0x00,0xF8,0x00,0x00,0x00, // -=-
0x40,0x20,0x10,0x08,0x10,0x20,0x40,0x00, // ->-
0x70,0x88,0x10,0x20,0x20,0x00,0x20,0x00, // -?-
0x70,0x88,0xB8,0xA8,0xB8,0x80,0x78,0x00, // -@-
0xF0,0xC0,0xC0,0xC0,0xC0,0xC0,0xF0,0x00, // -[-
0x00,0x80,0x40,0x20,0x10,0x08,0x00,0x00, // -\-
0x78,0x18,0x18,0x18,0x18,0x18,0x78,0x00, // -]-
0x20,0x70,0xA8,0x20,0x20,0x20,0x20,0x00, // -^-
0x00,0x20,0x40,0xF8,0x40,0x20,0x00,0x00, // -_-
0x20,0x10,0x08,0x00,0x00,0x00,0x00,0x00, // -`-
0x00,0x00,0xE0,0x10,0x70,0x90,0x68,0x00, // -a-
0x80,0x80,0xB0,0xC8,0x88,0xC8,0xB0,0x00, // -b-
0x00,0x00,0x70,0x88,0x80,0x80,0x70,0x00, // -c-
0x08,0x08,0x68,0x98,0x88,0x98,0x68,0x00, // -d-
0x00,0x00,0x70,0x88,0xF0,0x80,0x70,0x00, // -e-
0x30,0x48,0x40,0xF0,0x40,0x40,0x40,0x00, // -f-
0x00,0x00,0x70,0x88,0x88,0x78,0x08,0xF0, // -g-
0x80,0x80,0xB0,0xC8,0x88,0x88,0x88,0x00, // -h-
0x20,0x00,0x00,0x20,0x20,0x20,0x20,0x00, // -i-
0x10,0x00,0x00,0x30,0x10,0x10,0x10,0x60, // -j-
0x80,0x80,0x90,0xA0,0xC0,0xA0,0x98,0x00, // -k-
0x60,0x20,0x20,0x20,0x20,0x20,0x70,0x00, // -l-
0x00,0x00,0x50,0xA8,0xA8,0xA8,0xA8,0x00, // -m-
0x00,0x00,0xB0,0x48,0x48,0x48,0x48,0x00, // -n-
0x00,0x00,0x70,0x88,0x88,0x88,0x70,0x00, // -o-
0x00,0x00,0xF0,0x88,0x88,0xF0,0x80,0x80, // -p-
0x00,0x00,0x78,0x88,0x88,0x78,0x08,0x08, // -q-
0x00,0x00,0xB0,0x48,0x40,0x40,0x40,0x00, // -r-
0x00,0x00,0x78,0x80,0x70,0x08,0xF0,0x00, // -s-
0x40,0x40,0xF8,0x40,0x40,0x48,0x30,0x00, // -t-
0x00,0x00,0x90,0x90,0x90,0x90,0x68,0x00, // -u-
0x00,0x00,0x88,0x88,0x88,0x50,0x20,0x00, // -v-
0x00,0x00,0xA8,0xA8,0xA8,0xA8,0x50,0x00, // -w-
0x00,0x00,0x88,0x50,0x20,0x50,0x88,0x00, // -x-
0x00,0x00,0x88,0x88,0x98,0x68,0x08,0xF0, // -y-
0x00,0x00,0xF8,0x10,0x20,0x40,0xF8,0x00, // -z-
0x20,0x40,0x40,0x80,0x40,0x40,0x20,0x00, // -{-
0x20,0x20,0x20,0x00,0x20,0x20,0x20,0x00, // -|-
0x20,0x10,0x10,0x08,0x10,0x10,0x20,0x00, // -}-
0x00,0x00,0x40,0xA8,0x10,0x00,0x00,0x00, // -~-
0xA8,0x50,0xA8,0x50,0xA8,0x50,0xA8,0x00, // -□-
```