

Anleitung

Artikel RBS11701

2,2" TFT LCD Display Modul ILI9225 176x220



Technische Daten	1
Datenblatt ILI9225 IC	1
Abmessungen	1
Schaltplan	2
Pinbelegung	2
Arduino Bibliothek	3
Anschluss an Arduino	3
Image Converter	3
Arduino Demo	4

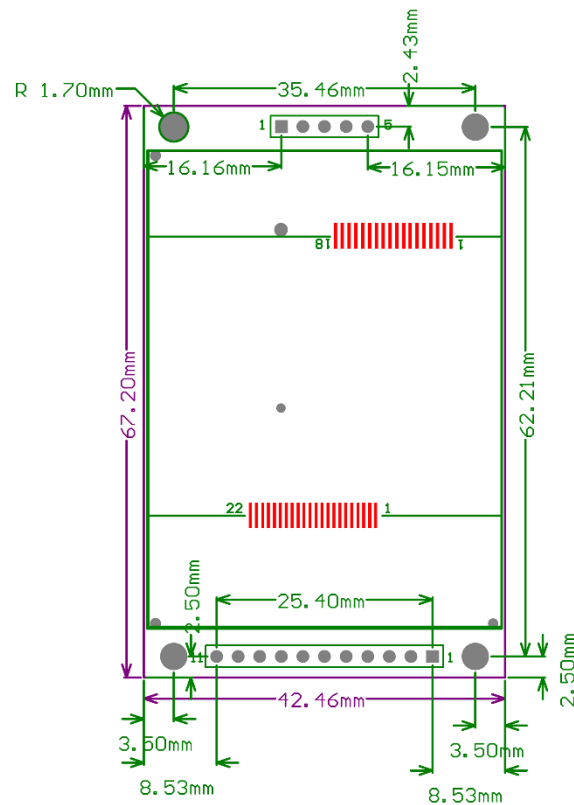
Technische Daten

- SPI-Schnittstelle
- SD Card Slot
- ILI9225 TFT Controller
- Versorgungsspannung 5V - 3.3V
- LED-Hintergrundbeleuchtung
- Auflösung 176x220 Pixel
- TTL Logik Pegel
- Größe 67x42 mm

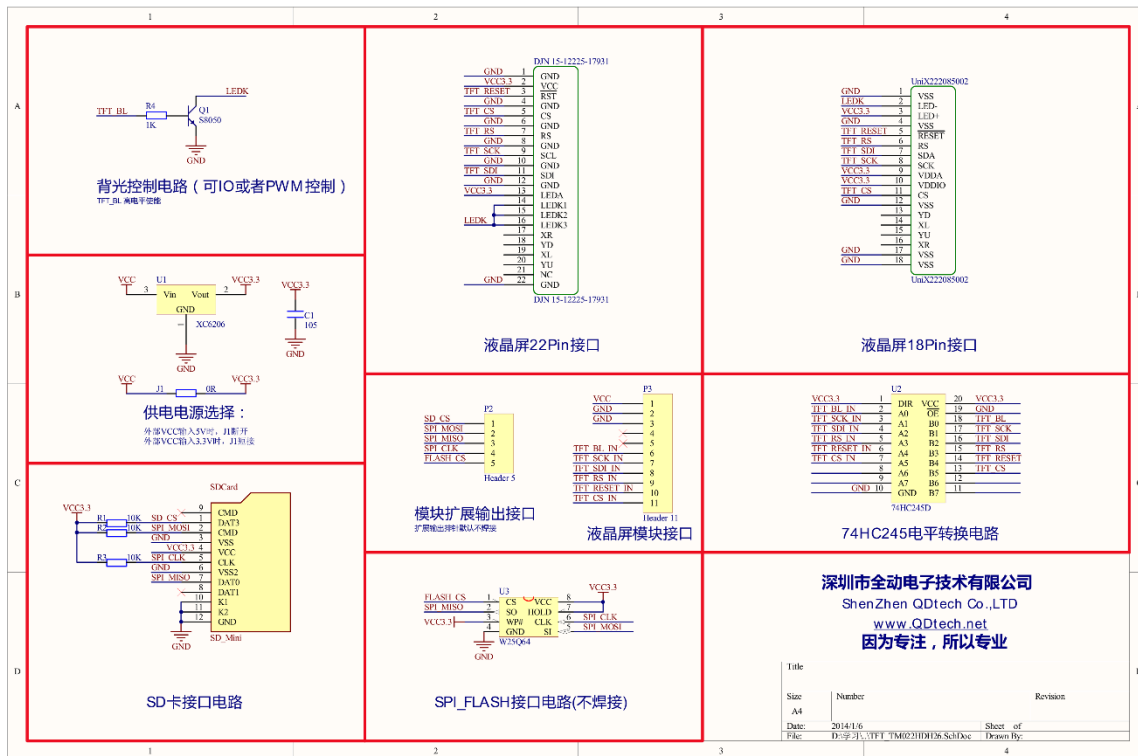
Datenblatt ILI9225 IC

[Download hier.](#)

Abmessungen



Schaltplan



Pinbelegung

Number	Pin Label	Description
1	VCC	LCD Power positive (3.3V~5V)
2	GND	LCD Power ground
3	GND	LCD Power ground
4	NC	Not defined, reserved
5	NC	Not defined, reserved
6	LED	Backlight control, high level lighting, if not controlled, connect 3.3V always brigh
7	CLK	LCD SPI bus clock signal
8	SDI	LCD SPI bus write data signal
9	RS	LCD register / data selection signal, high level: register, low level: data
10	RST	LCD reset signal, low level reset
11	CS	LCD chip select signal, low level enable

Arduino Bibliothek

Um das Display einfach ansteuern zu können, empfehlen wir die [TFT_22_ILI9225.h Bibliothek von Nkawu](#). Sie können die Bibliothek auch einfach über den Bibliotheksverwalter in der Arduino IDE suchen und installieren. Eine Übersicht der Befehle für die Bibliothek finden Sie ebenfalls auf [Github \(ILI9225 Wiki\)](#).

Anschluss an Arduino

Das Display kann mit folgender Pinbelegung einfach auf den Arduino aufgesteckt werden:

- CS-A5
- RST-A4
- RS-A3
- SDA-A2
- CLK-A1
- VCC- 5V
- GND-GND

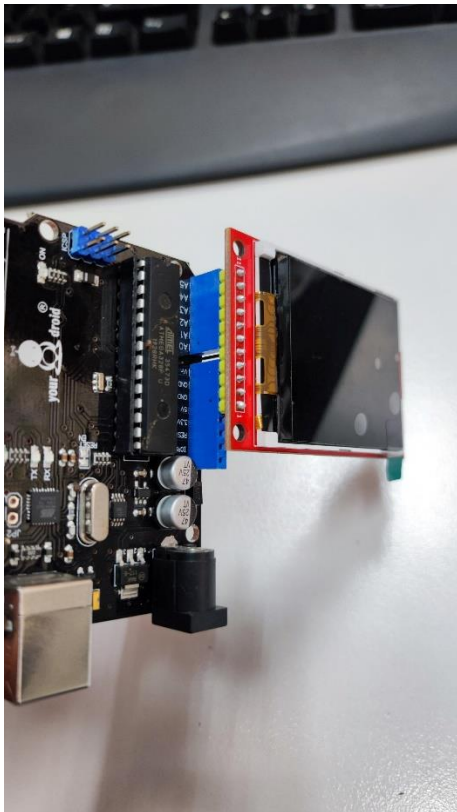


Image Converter

Um eigene Bilder auf dem Display anzeigen zu lassen, müssen diese zuerst in eine Bitmap konvertiert werden. Hierfür eignet sich der [LCD Image Converter](#) (kostenlos & einfach).

[illegible]

```

0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0x0,0x0,0x0,0x7,0xfe,0x0,0x0,0x1f,0
fff,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0x1,0xf8,0x0,0xf,0xff,0x0,0x0,0x1f,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0x3,0xfc,0x0,0x1f,0xff,0x80,0x0,0x1
f,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0x7,0xfe,0x0,0x1f,0xff,0xc0,0x0,0x1
f,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0x7,0xfe,0x0,0x3f,0xff,0xc0,0x0,0x1
f,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0xf,0xff,0x0,0x3f,0xff,0xe0,0x0,0x1
f,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0xf,0xff,0x0,0x7f,0xf,0xe0,0x0,0xf,
0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0xf,0xbf,0x80,0x7e,0x7,0xf0,0x0,0xf
,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0xf,0xf,0x80,0x7c,0x7,0xf0,0x0,0xf,
0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0xe,0x7,0x80,0x78,0x3,0xf0,0x0,0xf,
0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0xe,0x7,0x80,0x78,0x3,0xf0,0x0,0xf,
0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0xe,0x7,0x80,0x78,0x3,0xf0,0x0,0xf,
0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0xe,0x3,0x0,0x38,0x3,0xf0,0x0,0xf,0
xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0xe,0x0,0x0,0x0,0x3,0xf0,0x0,0xf,0x
ff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0xe,0x0,0xff,0xc0,0x3,0xe0,0x0,0xf,
0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0x6,0x1,0xff,0xf8,0x3,0xe0,0x0,0xf,
0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0x7,0x7,0xff,0xfc,0x7,0xe0,0x0,0xf,
0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0x3,0x8f,0xff,0xff,0x7,0xc0,0x0,0xf
,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0x3,0x1f,0xff,0xff,0xc0,0x80,0x0,0x
f,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0x0,0x3f,0xff,0xff,0xf8,0x0,0x0,0xf
,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0x0,0xff,0xff,0xff,0xff,0x0,0x0,0xf
,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0x1,0xff,0xff,0xff,0xff,0xc0,0x0,0x
f,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0x3,0xff,0xff,0xff,0xff,0xe0,0x0,0x
f,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf,0xff,0xff,0xff,0xff,0xf0,0x0,0x
f,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0xf,0xff,0xff,0xff,0xfe,0xf0,0x0,0x
f,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0x19,0xff,0xff,0xff,0xf8,0x70,0x0,0
xf,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0x18,0xff,0xff,0xff,0xe0,0xf0,0x0,0
xf,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0x1c,0x7f,0xff,0xff,0x87,0xf0,0x0,0
xf,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0xe,0x3f,0xff,0xff,0xf,0xe0,0x0,0x7
,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,

```



```

0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0x7,0x1f,0xff,0xfc,0x3f,0xc0,0x0,0x
7,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0x7,0x87,0xff,0xf0,0xff,0x80,0x0,0x
7,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfc,0x3,0xe1,0xff,0xc3,0xff,0x10,0x0,0x
3,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfc,0x0,0xf0,0x38,0xf,0xfe,0x38,0x0,0x3
,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xfc,0x0,0x7e,0x0,0x3f,0xf8,0x78,0x0,0x3
,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf8,0x2,0x1f,0xe7,0xff,0xc1,0xf8,0x0,0x
1,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf8,0x3,0x8f,0xff,0xff,0x7,0xfc,0x0,0x1
,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf8,0x3,0xc7,0xff,0xfe,0x3f,0xfc,0x0,0x
0,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,0x3,0xe3,0xff,0xf8,0x7f,0xfc,0x0,0x
0,0x7f,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,0x7,0xf0,0xff,0xe1,0xff,0xfe,0x0,0x
0,0x7f,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,0x7,0xfc,0x3f,0x7,0xff,0xfe,0x0,0x0
,0x3f,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xe0,0x7,0xfe,0x0,0x1f,0xff,0xfe,0x0,0x0
,0x3f,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xe0,0x7,0xff,0xc0,0xff,0xff,0xff,0x0,0x
0,0x1f,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xc0,0x7,0xff,0xff,0xff,0xff,0xff,0x0,0x
0,0xf,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0x80,0xf,0xff,0xff,0xff,0xff,0xff,0x0,0x
0,0x7,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0x80,0xf,0xff,0xff,0xff,0xff,0xff,0x80,0
x0,0x7,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0x0,0xf,0xff,0xff,0xff,0xff,0xff,0x80,0x
0,0x3,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0x0,0x1f,0xff,0xff,0xff,0xff,0xff,0x80,0
x0,0x1,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0x0,0x1f,0xff,0xff,0xff,0xff,0xff,0xc0,0
x0,0x0,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xfc,0x0,0x1f,0xff,0xff,0xff,0xff,0xff,0xc0,0
x0,0x0,0x7f,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xf8,0x0,0x3f,0xff,0xff,0xff,0xff,0xff,0xc0,0
x0,0x0,0x7f,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xf0,0x0,0x3f,0xff,0xff,0xff,0xff,0xff,0xe0,0
x0,0x0,0x3f,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xe0,0x0,0x3f,0xff,0xff,0xff,0xff,0xff,0xe0,0
x0,0x0,0x1f,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xe0,0x0,0x7f,0xff,0xff,0xff,0xff,0xff,0xf0,0
x0,0x0,0xf,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xc0,0x0,0x7f,0xff,0xff,0xff,0xff,0xff,0xf0,0
x0,0x0,0x7,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0x80,0x0,0x7f,0xff,0xff,0xff,0xff,0xff,0xf8,0
x0,0x0,0x7,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0x0,0x0,0xff,0xff,0xff,0xff,0xff,0xff,0xf8,0x
0,0x0,0x3,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0x0,0x0,0xff,0xff,0xff,0xff,0xff,0xff,0xf8,0x
0,0x0,0x1,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xfe,0x0,0x1,0xff,0xff,0xff,0xff,0xff,0xff,0xfc,0x
0,0x0,0x0,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xfc,0x0,0x1,0xff,0xff,0xff,0xff,0xff,0xff,0xfc,0x
2,0x0,0x0,0xff,0xff,0xff,0xff,0xf0,

```

```

0xff,0xff,0xff,0xff,0xff,0xfc,0x0,0x1,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0x
1,0x0,0x0,0x7f,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xf8,0x0,0x3,0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0x
0,0x80,0x0,0x3f,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xf0,0x0,0x3,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0x
0,0x40,0x0,0x3f,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xf0,0x0,0x7,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0x
0,0x20,0x0,0x1f,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xe0,0x0,0x7,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0x
80,0x0,0x0,0xf,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xc0,0x0,0xf,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0x
80,0x10,0x0,0xf,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xc0,0x10,0xf,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0
xc0,0x8,0x0,0x7,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0x80,0x20,0x1f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,
0xc0,0x0,0x0,0x7,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0x0,0x20,0x1f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0
xe0,0x4,0x0,0x3,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0x0,0x40,0x1f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0
xe0,0x2,0x0,0x1,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xfe,0x0,0x40,0x3f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0
xf0,0x2,0x0,0x1,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xfe,0x0,0x80,0x3f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0
xf0,0x1,0x0,0x0,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xfc,0x0,0x80,0x7f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0
xf8,0x1,0x0,0x0,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xfc,0x1,0x0,0x7f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0x
f8,0x1,0x80,0x0,0x7f,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xf8,0x1,0x0,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
c,0x0,0x80,0x0,0x7f,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xf8,0x2,0x0,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
c,0x0,0xc0,0x0,0x7f,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xf0,0x2,0x1,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
c,0x0,0xc0,0x0,0x3f,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xf0,0x6,0x1,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
e,0x0,0x40,0x0,0x3f,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xe0,0x4,0x3,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
e,0x0,0x60,0x0,0x1f,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xe0,0x4,0x3,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
ff,0x0,0x60,0x0,0x1f,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xc0,0xc,0x3,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
ff,0x0,0x60,0x0,0x1f,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xc0,0xc,0x7,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
ff,0x0,0x60,0x0,0xf,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xc0,0x8,0x7,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
ff,0x80,0x30,0x0,0xf,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0x80,0x8,0x8,0x7,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0x
ff,0x80,0x30,0x0,0xf,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0x80,0x18,0xf,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
ff,0x80,0x30,0x0,0x7,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0x80,0x18,0xf,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
ff,0xc0,0x30,0x0,0x7,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0x0,0x18,0xf,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
ff,0xc0,0x30,0x0,0x7,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0x0,0x18,0xf,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
ff,0xc0,0x30,0x0,0x7,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0x0,0x18,0x1f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
ff,0xe0,0x70,0x0,0x7,0xff,0xff,0xf0,
0xff,0xff,0xff,0xfe,0x0,0x18,0x1f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
ff,0xe0,0x70,0x0,0x3,0xff,0xff,0xf0,

```

```

0xff,0xff,0xff,0xfe,0x0,0x18,0x1f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0
fff,0xe0,0x70,0x0,0x3,0xff,0xff,0xf0,
0xff,0xff,0xff,0xfe,0x0,0x18,0x1f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0
fff,0xe0,0x70,0x0,0x3,0xff,0xff,0xf0,
0xff,0xff,0xff,0xfe,0x0,0x18,0x3f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0
fff,0xe0,0xf0,0x0,0x3,0xff,0xff,0xf0,
0xff,0xff,0xff,0xfc,0x0,0x18,0x3f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0
fff,0xff,0xf0,0x0,0x3,0xff,0xff,0xf0,
0xff,0xff,0xff,0xfc,0x0,0x1c,0x3f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0
fff,0xff,0xf0,0x0,0x3,0xff,0xff,0xf0,
0xff,0xff,0xff,0xfc,0x0,0x1c,0x3f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0
fff,0xff,0xf8,0x0,0x3,0xff,0xff,0xf0,
0xff,0xff,0xff,0xfc,0x0,0x1c,0x3f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0
fff,0x80,0x3e,0x0,0x3,0xff,0xff,0xf0,
0xff,0xff,0xff,0xfc,0x0,0x1e,0x3f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0
fff,0x0,0x7,0x80,0x3,0xff,0xff,0xf0,
0xff,0xff,0xff,0xfc,0x0,0xe,0x3f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
e,0x1e,0x1,0xe0,0x3,0xff,0xff,0xf0,
0xff,0xff,0xff,0xfc,0x0,0xf,0x3f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
e,0x3f,0xc0,0x70,0x3,0xff,0xff,0xf0,
0xff,0xff,0xff,0xfc,0x0,0x7,0x7f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
e,0x7f,0xf0,0x38,0x3,0xff,0xff,0xf0,
0xff,0xff,0xff,0xfc,0x0,0x7,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
c,0x7f,0xf8,0xc,0x3,0xff,0xff,0xf0,
0xff,0xff,0xff,0xfc,0x0,0x3,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
c,0xff,0xfe,0x6,0x3,0xff,0xff,0xf0,
0xff,0xff,0xff,0xfc,0x0,0x3,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
0,0xff,0xff,0x2,0x7,0xff,0xff,0xf0,
0xff,0xff,0xff,0xfc,0x0,0x1,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
e0,0xff,0xff,0x3,0x7,0xff,0xff,0xf0,
0xff,0xff,0xff,0xfc,0x0,0x0,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
c0,0x7f,0xff,0x3,0x7,0xff,0xff,0xf0,
0xff,0xff,0xff,0xfc,0x1e,0x0,0x7f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
x84,0x7f,0xff,0x3,0x7,0xff,0xff,0xf0,
0xff,0xff,0xff,0xf8,0x7f,0x80,0x3f,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0
xc,0x7f,0xfe,0x2,0xf,0xff,0xff,0xf0,
0xff,0xff,0xff,0xf0,0xff,0xe0,0xf,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
1e,0x7f,0xfe,0x0,0xf,0xff,0xff,0xf0,
0xff,0xff,0xff,0xe1,0xff,0xf0,0x7,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
e,0x3f,0xfc,0x0,0x3,0xff,0xff,0xf0,
0xff,0xff,0xff,0xc3,0xff,0xf8,0x1,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
e,0x3e,0x1f,0xf0,0x0,0x1,0xff,0xff,0xf0,
0xff,0xff,0xff,0xc7,0xff,0xfc,0x0,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xf
c,0x3e,0xf,0xe0,0xf,0xe0,0xff,0xff,0xf0,
0xff,0xff,0xff,0x87,0xff,0xfe,0x0,0x3f,0xff,0xff,0xff,0xff,0xff,0xff,0xf
c,0x7f,0x2,0x0,0x1f,0xf8,0x7f,0xff,0xf0,
0xff,0xff,0xff,0xf,0xff,0xfe,0x0,0x1f,0xff,0xff,0xff,0xff,0xff,0xff,0xf
c,0x7f,0x80,0x0,0x3f,0xfc,0x7f,0xff,0xf0,
0xff,0xff,0xfe,0x1f,0xff,0xff,0x0,0xf,0xff,0xff,0xff,0xff,0xff,0xff,0xf
c,0x7f,0x80,0x0,0xff,0xfc,0x3f,0xff,0xf0,
0xff,0xff,0xf8,0x3f,0xff,0xff,0x80,0x3,0xff,0xff,0xff,0xff,0xff,0xff,0xf
8,0x7f,0xc0,0x3,0xff,0xfe,0x3f,0xff,0xf0,
0xff,0xff,0xc0,0x7f,0xff,0xff,0x80,0x1,0xff,0xff,0xff,0xff,0xff,0xff,0xf
8,0xff,0xf0,0xf,0xff,0xfe,0x3f,0xff,0xf0,
0xff,0xff,0x0,0xff,0xff,0xff,0xc0,0x0,0xff,0xff,0xff,0xff,0xff,0xff,0xf
8,0xff,0xff,0xff,0xff,0x1f,0xff,0xf0,
0xff,0xfc,0x3,0xff,0xff,0xff,0xc0,0x0,0x7f,0xff,0xff,0xff,0xff,0xff,0xf
8,0xff,0xff,0xff,0xff,0x1f,0xff,0xf0,
0xff,0xf0,0x1f,0xff,0xff,0xff,0xe0,0x0,0x3f,0xff,0xff,0xff,0xff,0xf8,0
fff,0xff,0xff,0xff,0xff,0x1f,0xff,0xf0,

```

```

0xff,0xe0,0xff,0xff,0xff,0xff,0xe0,0x0,0x1f,0xff,0xff,0xff,0xff,0xff,0xf8,0
fff,0xff,0xff,0xff,0xff,0xf,0xff,0xf0,
0xff,0xe1,0xff,0xff,0xff,0xff,0xf0,0x0,0x1f,0xff,0xff,0xff,0xff,0xff,0xf8,0
fff,0xff,0xff,0xff,0xff,0x8f,0xff,0xf0,
0xff,0xc3,0xff,0xff,0xff,0xff,0xf0,0x0,0xf,0xff,0xff,0xff,0xff,0xff,0xf8,0x
fff,0xff,0xff,0xff,0xff,0x8f,0xff,0xf0,
0xff,0xc7,0xff,0xff,0xff,0xff,0xf8,0x0,0x7,0xff,0xff,0xff,0xff,0xff,0xf0,0x
fff,0xff,0xff,0xff,0xff,0x8f,0xff,0xf0,
0xff,0x87,0xff,0xff,0xff,0xff,0xf8,0x0,0x7,0xff,0xff,0xff,0xff,0xff,0xf1,0x
fff,0xff,0xff,0xff,0xff,0x87,0xff,0xf0,
0xff,0x8f,0xff,0xff,0xff,0xff,0xfc,0x0,0x3,0xff,0xff,0xff,0xff,0xff,0xf1,0x
fff,0xff,0xff,0xff,0xff,0xc7,0xff,0xf0,
0xff,0x8f,0xff,0xff,0xff,0xff,0xfc,0x0,0x3,0xff,0xff,0xff,0xff,0xff,0xf1,0x
fff,0xff,0xff,0xff,0xff,0xc3,0xff,0xf0,
0xff,0x8f,0xff,0xff,0xff,0xff,0xfe,0x0,0x1,0xff,0xff,0xff,0xff,0xff,0xf1,0x
fff,0xff,0xff,0xff,0xff,0xe1,0xff,0xf0,
0xff,0x8f,0xff,0xff,0xff,0xff,0xfe,0x0,0x1,0xff,0xff,0xff,0xff,0xff,0xf1,0x
fff,0xff,0xff,0xff,0xff,0xe1,0xff,0xf0,
0xff,0x8f,0xff,0xff,0xff,0xff,0xff,0x0,0x1,0xff,0xff,0xff,0xff,0xff,0xf1,0x
fff,0xff,0xff,0xff,0xff,0xf0,0xff,0xf0,
0xff,0x8f,0xff,0xff,0xff,0xff,0xff,0x80,0x1,0xff,0xff,0xff,0xff,0xff,0xf1,0
fff,0xff,0xff,0xff,0xff,0xf8,0x7f,0xf0,
0xff,0x8f,0xff,0xff,0xff,0xff,0xff,0xc0,0x1,0xff,0xff,0xff,0xff,0xff,0xf1,0
fff,0xff,0xff,0xff,0xff,0xfc,0x3f,0xf0,
0xff,0x87,0xff,0xff,0xff,0xff,0xff,0xc0,0x3,0xff,0xff,0xff,0xff,0xff,0xe1,0
fff,0xff,0xff,0xff,0xff,0xfe,0x3f,0xf0,
0xff,0xc7,0xff,0xff,0xff,0xff,0xff,0xe0,0x7,0xff,0xff,0xff,0xff,0xff,0xe1,0
fff,0xff,0xff,0xff,0xff,0xfe,0x1f,0xf0,
0xff,0xc7,0xff,0xff,0xff,0xff,0xff,0xf0,0xf,0xff,0xff,0xff,0xff,0xff,0xe3,0
fff,0xff,0xff,0xff,0xff,0xff,0x1f,0xf0,
0xff,0xc7,0xff,0xff,0xff,0xff,0xff,0xf8,0x7f,0xff,0xff,0xff,0xff,0xff,0xe3,
0xff,0xff,0xff,0xff,0xff,0xff,0xf,0xf0,
0xff,0xc7,0xff,0xff,0xff,0xff,0xff,0xf8,0x7f,0xff,0xff,0xff,0xff,0xff,0xc3,
0xff,0xff,0xff,0xff,0xff,0xff,0x8f,0xf0,
0xff,0xc7,0xff,0xff,0xff,0xff,0xff,0xfc,0x3f,0xff,0xff,0xff,0xff,0xff,0xc7,
0xff,0xff,0xff,0xff,0xff,0xff,0x8f,0xf0,
0xff,0xc7,0xff,0xff,0xff,0xff,0xff,0xfe,0x1f,0xff,0xff,0xff,0xff,0xff,0xc7,
0xff,0xff,0xff,0xff,0xff,0xff,0x8f,0xf0,
0xff,0xc7,0xff,0xff,0xff,0xff,0xff,0xff,0xf,0xff,0xff,0xff,0xff,0xff,0xc7,0
fff,0xff,0xff,0xff,0xff,0xff,0xf,0xf0,
0xff,0xc7,0xff,0xff,0xff,0xff,0xff,0xff,0xf8,0xff,0xff,0xff,0xff,0xff,0x7,0
fff,0xff,0xff,0xff,0xff,0xff,0x1f,0xf0,
0xff,0x8f,0xff,0xff,0xff,0xff,0xff,0xff,0x87,0xff,0xff,0xff,0xff,0xfe,0xf,0
fff,0xff,0xff,0xff,0xff,0xfe,0x1f,0xf0,
0xff,0x8f,0xff,0xff,0xff,0xff,0xff,0xff,0xc3,0xff,0xff,0xff,0xff,0xf8,0xf,0
fff,0xff,0xff,0xff,0xff,0xf8,0x3f,0xf0,
0xff,0x8f,0xff,0xff,0xff,0xff,0xff,0xff,0xe1,0xff,0xff,0xff,0xff,0xe0,0xf,0
fff,0xff,0xff,0xff,0xff,0xff,0xf0,0x7f,0xf0,
0xff,0xf,0xff,0xff,0xff,0xff,0xff,0xff,0xe0,0x7f,0xff,0xff,0xff,0x80,0x1f,0
fff,0xff,0xff,0xff,0xff,0xc0,0xff,0xf0,
0xff,0x1f,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,0x1f,0xff,0xff,0xfe,0x0,0x1f,0
fff,0xff,0xff,0xff,0xff,0x3,0xff,0xf0,
0xff,0x1f,0xff,0xff,0xff,0xff,0xff,0xff,0xf0,0x3,0xff,0xff,0xf0,0x0,0x1f,0x
fff,0xff,0xff,0xff,0xfc,0x7,0xff,0xf0,
0xff,0x1f,0xff,0xff,0xff,0xff,0xff,0xff,0xf8,0x0,0x3f,0xfe,0x0,0x0,0x1f,0xf
f,0xff,0xff,0xff,0xf0,0x1f,0xff,0xf0,
0xff,0x1f,0xff,0xff,0xff,0xff,0xff,0xff,0xf8,0x0,0x0,0x0,0x0,0x0,0x3f,0xff,
0xff,0xff,0xc0,0x7f,0xff,0xf0,
0xff,0x1f,0xff,0xff,0xff,0xff,0xff,0xff,0xfc,0x0,0x0,0x0,0x0,0x0,0x3f,0xff,
0xff,0xff,0xff,0x1,0xff,0xff,0xf0,

```

```

0xff,0x1f,0xff,0xff,0xff,0xff,0xff,0xff,0xfc,0x0,0x0,0x0,0x0,0x0,0x3f,0xff,
0xff,0xff,0xfc,0x7,0xff,0xff,0xf0,
0xff,0x8f,0xff,0xff,0xff,0xff,0xff,0xff,0xfc,0x0,0x0,0x0,0x0,0x0,0x3f,0xff,
0xff,0xff,0xf8,0x1f,0xff,0xff,0xf0,
0xff,0x87,0xff,0xff,0xff,0xff,0xff,0xff,0xfc,0x0,0x0,0x0,0x0,0x0,0x3f,0xff,
0xff,0xff,0xf0,0x7f,0xff,0xff,0xf0,
0xff,0xc1,0xff,0xff,0xff,0xff,0xff,0xff,0xfc,0x0,0x0,0x0,0x0,0x0,0x3f,0xff,
0xff,0xff,0xe0,0xff,0xff,0xff,0xf0,
0xff,0xe0,0xf,0xff,0xff,0xff,0xff,0xff,0xff,0xfc,0x0,0x0,0x0,0x0,0x0,0x3f,0xff,0
fff,0xff,0xc3,0xff,0xff,0xff,0xf0,
0xff,0xf0,0x0,0xf,0xff,0xff,0xff,0xff,0xff,0xf8,0x0,0x0,0x0,0x0,0x0,0x3f,0xff,0x
ff,0xff,0x87,0xff,0xff,0xff,0xf0,
0xff,0xfc,0x0,0x0,0x7f,0xff,0xff,0xff,0xff,0xf8,0x0,0x1f,0xff,0xf0,0x0,0x3f,0xff
,0xff,0xff,0xf,0xff,0xff,0xff,0xf0,
0xff,0xff,0xe0,0x0,0x7,0xff,0xff,0xff,0xf8,0x7,0xff,0xff,0xff,0xfe,0x1f,0xf
f,0xff,0xfe,0x1f,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xc0,0x0,0xff,0xff,0xff,0xf1,0xff,0xff,0xff,0xff,0xff,0x1f,0
fff,0xff,0xfc,0x3f,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0x0,0x3f,0xff,0xff,0xe1,0xff,0xff,0xff,0xff,0xff,0xf,0x
ff,0xff,0xf8,0x7f,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xf0,0xf,0xff,0xff,0xc3,0xff,0xff,0xff,0xff,0xff,0x8f,0
fff,0xff,0xf0,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xfe,0x3,0xff,0xff,0x87,0xff,0xff,0xff,0xff,0xff,0x87,0
fff,0xff,0xc1,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0x80,0x3f,0xfe,0xf,0xff,0xff,0xff,0xff,0xff,0xc3,0
fff,0xff,0x83,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xe0,0x0,0x0,0x1f,0xff,0xff,0xff,0xff,0xff,0xe1,0x
ff,0xfe,0x7,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xf8,0x0,0x0,0x3f,0xff,0xff,0xff,0xff,0xff,0xf0,0x
7f,0xf8,0x1f,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0x80,0x1,0xff,0xff,0xff,0xff,0xff,0xf8,0
xf,0x80,0x3f,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0x3f,0xff,0xff,0xff,0xff,0xff,0xfc,
0x0,0x0,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,
0x0,0x3,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,
0xf0,0x3f,0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,
0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,
0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,
0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,
0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,
0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,
0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,
0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,
0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,
0xff,0xff,0xff,0xff,0xff,0xf0,
0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,
0xff,0xff,0xff,0xff,0xff,0xf0
};

```

```
// Setup
void setup() {
  #if defined(ESP32)
    hspi.begin();
    tft.begin(hspi);
  #else
    tft.begin();
  #endif
  Serial.begin(9600);
}

// Loop
void loop() {

  tft.drawRect(0, 0, tft.maxX() - 1, tft.maxY() - 1, COLOR_WHITE);
  tft.setFont(Terminal6x8);
  tft.drawText(10, 10, "hello!");
  delay(1000);

  tft.clear();
  tft.drawText(10, 20, "clear");
  delay(1000);

  tft.drawText(10, 30, "text small");
  tft.setBackgroundColor(COLOR_YELLOW);
  tft.setFont(Terminal12x16);
  tft.drawText(90, 30, "BIG", COLOR_RED);
  tft.setBackgroundColor(COLOR_BLACK);
  tft.setFont(Terminal6x8);
  delay(1000);

  tft.drawText(10, 40, "setBacklight off");
  delay(500);
  tft.setBacklight(LOW);
  delay(500);
  tft.setBacklight(HIGH);
  tft.drawText(10, 50, "setBacklight on");
  delay(1000);

  tft.drawRect(10, 10, 110, 110, COLOR_BLUE);
  tft.drawText(10, 60, "rectangle");
  delay(1000);

  tft.fillRect(20, 20, 120, 120, COLOR_RED);
  tft.drawText(10, 70, "solidRectangle");
  delay(1000);

  tft.drawCircle(80, 80, 50, COLOR_YELLOW);
  tft.drawText(10, 80, "circle");
  delay(1000);

  tft.fillCircle(90, 90, 30, COLOR_GREEN);
  tft.drawText(10, 90, "solidCircle");
  delay(1000);

  tft.drawLine(0, 0, tft.maxX() - 1, tft.maxY() - 1, COLOR_CYAN);
  tft.drawText(10, 100, "line");
  delay(1000);

  for (uint8_t i = 0; i < 127; i++)
```

```
tft.drawPixel(random(tft.maxX()), random(tft.maxY()), random(0xffff));
tft.drawText(10, 110, "point");
delay(1000);

for (uint8_t i = 0; i < 4; i++) {
    tft.clear();
    tft.setOrientation(i);
    tft.drawRect(0, 0, tft.maxX() - 1, tft.maxY() - 1, COLOR_WHITE);
    tft.drawText(10, 10, "setOrientation (" + String("0123").substring(i, i
+ 1) + ")");
    tft.drawRect(10, 20, 50, 60, COLOR_GREEN);
    tft.drawCircle(70, 80, 10, COLOR_BLUE);
    tft.drawLine(30, 40, 70, 80, COLOR_YELLOW);
    delay(1000);
}

tft.setOrientation(0);
tft.clear();
tft.drawText(10, 100, "drawing bitmap");
delay(1000);
tft.clear();
tft.setBackgroundColor(COLOR_BLACK);
tft.drawBitmap(0, 0, tux, 180, 220, COLOR_WHITE);
delay(5000);

tft.setOrientation(0);
tft.clear();
tft.setFont(Terminal12x16);
tft.setBackgroundColor(COLOR_YELLOW);
tft.drawText(10, 40, "bye!", COLOR_RED);
tft.setBackgroundColor(COLOR_BLACK);
tft.setFont(Terminal6x8);
delay(1000);

tft.drawText(10, 60, "off");
delay(1000);

tft.setBacklight(false);
tft.setDisplay(false);

while(true);
}
```