

NOKINO Programming and Assembly Guide

Programming

Introduction

This guide explains how to load a bootloader to the NOKINO board. This applies if you have soldered the board yourself. If you bought a pre-assembled board, it will already have a bootloader.

What You Will Need

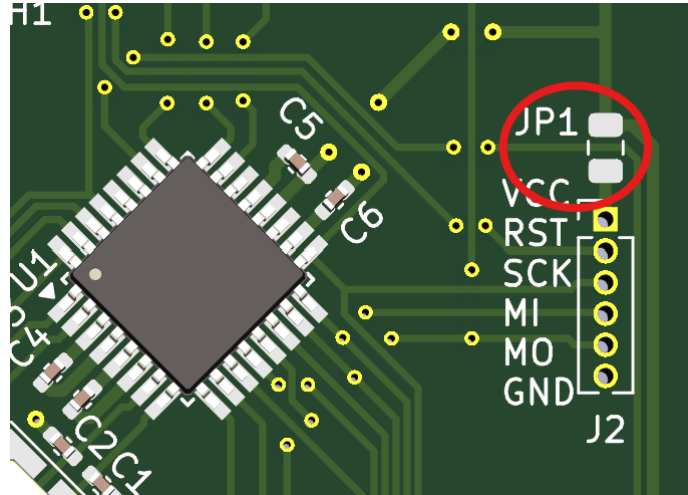
1. A populated PCB
2. An Arduino and some jumper cables¹
3. A 6 pin, 1.27 mm pitch header²
4. Arduino IDE 1.8.19³
5. The bootloader (`gamebuino_boot.hex`)
6. A 2 GB⁴ MicroSD card to hold games

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- 1 This example uses an Arduino UNO R3. Guides for wiring using other Arduino boards can be found [here](#). It should also be possible to program using some sort of USBISP programmer if you know what you're doing.
 - 2 I used a pogo pin board to save soldering and de-soldering. Alternatives are temporarily soldering a 6-pin header or some wires.
 - 3 This example uses Arduino IDE 1.8.19. Other versions may work, but I did not have success with 2.x.
 - 4 Apparently the Gamebuino SDCard library [cannot handle more than 2 GB](#). Presumably smaller cards would be compatible, but 2 GB is known to work.

Programming Steps

1. Bridge JP1

You will need to bridge JP1 to power the microcontroller when programming.



The footprint fits a 2012 (0805 imperial) 0 Ohm resistor, but you could also try bridging it with solder, conductive paint, or wire.

2. Copy Bootloader to Your Arduino directory

Copy the `gamebuino_boot.hex` (found in `MAKERbuino.zip`) to the Arduino directory.

In Windows 11 this may be found in:

`%LOCALAPPDATA%\Arduino15\packages\arduino\hardware\avr\1.8.6\bootloaders\`

3. Edit Boards

Locate `boards.txt` in your AppData directory:

`%LOCALAPPDATA%\Arduino15\packages\arduino\hardware\avr\1.8.6\boards.txt`

Add the following section:

```
gamebuino.name=NOKINO
gamebuino.upload.protocol=arduino
gamebuino.upload.maximum_size=30592
gamebuino.upload.speed=115200
gamebuino.bootloader.low_fuses=0xff
gamebuino.bootloader.high_fuses=0xda
gamebuino.bootloader.extended_fuses=0x05
gamebuino.bootloader.path=gamebuino_boot
gamebuino.bootloader.file=gamebuino_boot.hex
gamebuino.bootloader.unlock_bits=0x3F
gamebuino.bootloader.lock_bits=0x0F
gamebuino.bootloader.tool=arduino:avrdude
```

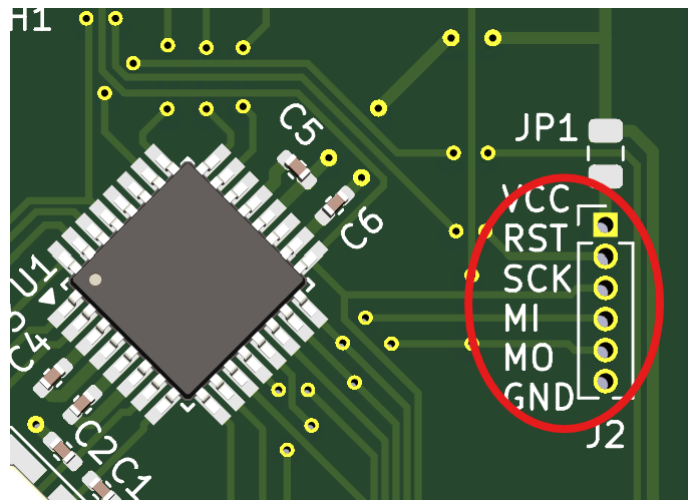
```
gamebuino.build.mcu=atmega328p
gamebuino.build.f_cpu=16000000L
gamebuino.build.core=arduino
gamebuino.build.variant=standard
```

4. Modify and Upload ArduinoISP sketch

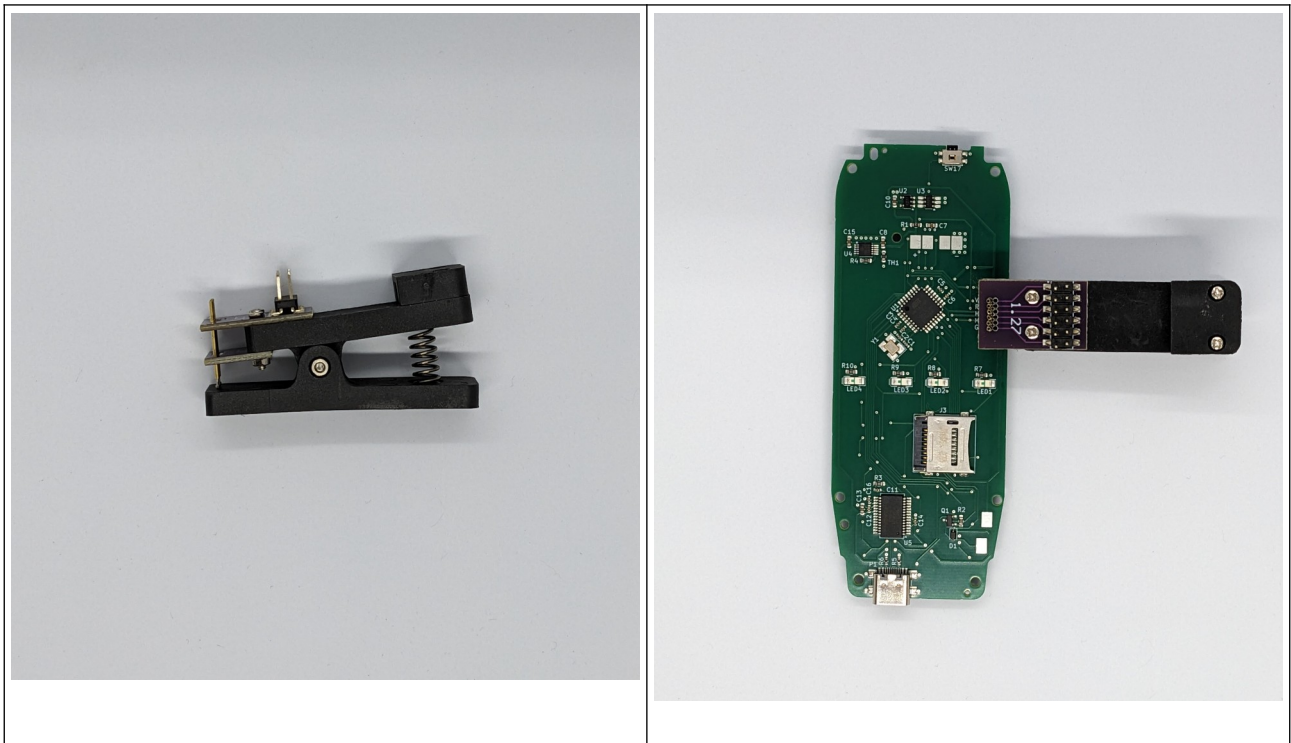
- Open the Arduino IDE
- Select File → Examples → 11. ArduinoISP → ArduinoISP
- Uncomment line 81. It should read `#define USE_OLD_STYLE_WIRING`
- Upload the sketch to the Arduino

5. Connect PCB to Programmer (Arduino)

Note that NOKINO V1.0 is missing a label for SCK. Header J2 should be labelled like this:



You will need a way to connect to the header, such as by temporarily soldering a 6-pin header (1.27 mm pitch) or some wires. I used a 6 pin pogo board to connect, like this:



Wire the NOKINO board to the Arduino as follows

NOKINO	ARDUINO
VCC	3V3
RST	10
SCK	13
MI	12
MO	11
GND	GND

6. Burn the bootloader

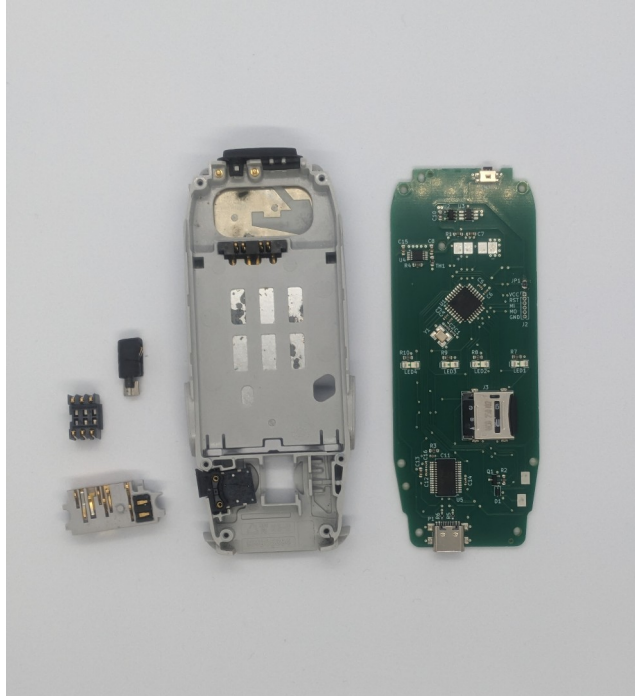
- Select the NOKINO board (Tools → Board)
- Select Android as ISP (Tools → Programmer)
- Burn Bootloader (Tools → Burn Bootloader)

7. Add MicroSD card with games

- Format the MicroSD using FAT16.
- Copy over games. A collection can be found [here](#)

Assembly

When swapping out the PCB, remove the SIM contacts, audio jack/connector assembly, and vibration motor. Leave the buzzer (speaker) in place.



The MicroSD card holder is unlatched by sliding backwards. The MicroSD is then placed inside before closing and latching (there is a small arrow on the retaining clip).

