ARDUINO HACKING 101:

IMPORTING THE UNIVERSE

FEDERICO LUCIFREDI
DISCLAIMER

WHILE THE FOLLOWING WAS CONSCIENTIOUSLY RESEARCHED AND VERIFIED, NEITHER THE ORGANIZERS NOR THE AUTHOR WILL ACCEPT ANY LIABILITY IF YOU RENDER YOUR DEVICE INOPERABLE AS A RESULT OF THESE INSTRUCTIONS.

PROCEED AT YOUR OWN RISK.
ARDUINO
COMMUNITY
SENSORS
ACTUATORS
MOTORS

Power Driver Shield
Adafruit Industries 81 $19.50

2 5V “hobby” servo connections
4 bridges
4.5 V to 36 V, 0.6A each (1.2 A peak)

External power hookup
POWER

Power Driver Shield
Sparkfun DEV-10618 $19.95

6 PWM outputs (screw terminals)
Powered by ATX PSU

12 V 8 A
REAL POWER

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REAL POWER

Relay Shield
Seed Studio Bazaar POW113B1P $20

4 mechanical relays

Max switching power 90 V DC, 360 V AC

RFBee Socket

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GCODE

Grbl Shield
Synthetos $ 69.99

3 stepper drivers,
2.5 Amps each, 12V-30V motor voltage
Subset of rs274/ngc standard gcode

Grbl 0.6 compatible
Makerbot and RepRap compatibility
Solenoid

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Solenoid

36V Solenoid
Sparkfun ROB-10456 $7.95

Really heavy duty body
mounting holes

throw: 10 mm
36V
INTERTUBES
Solenoid Valve
Sparkfun ROB-10456 $7.95

3/4” threaded inlet and outlet
Default closed
12V 300 mA

3 PSI minimum pressure required
Pilot-assisted (not bidirectional)
WATER PUMP

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WATER PUMP

Liquid Pump
Sparkfun ROB-10455 $14.95

Submersible thermoplastic body
3/4” un-threaded
350 GPH (that’s 1324 liters)
12V 1.5 A
VACUUM PUMP

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VACUUM PUMP

Vacuum Pump
Sparkfun ROB-10398 $14.95

12V 1A

16” Hg vacuum
INPUT
JOYSTICK
JOYSTICK

Joystick Shield Kit
Sparkfun DEV-09760 $12.95

2-Axis Joystick
5 momentary push buttons

Pushbuttons are digital-in
Joystick position is analog voltage
NUNCHUK

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NUNCHUK

Nintendo Wii Nunchuk
Nunchuky breakout board
Adafruit 345 $3

Sony Playstation 2
PS2 Controller Breakout
Lynxmotion PS2C-1 $4.95
SERIOUSLY

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SERIOUSLY

Arcade Joystick, short handle
Sparkfun COM-09182 $14.95

Ridiculously solid, rugged unit
Metal + Plastic
Spring return to center

4 microswitches (digital contact)
2, 4, and 8-way modes
TOUCH
TOUCH

TFT Touch Shield for Arduino
Adafruit Industries 376 $59

2.8” TFT Touch Shield
18-bit color
240x320 resolution
MicroSD built-in
resistive touchscreen
OUTPUT
READOUTS
READOUTS

Digit Shield
Nootropic Design $22.95

4 digit, 7-segment display
decimal point

Green, red and ultra-bright blue
VIDEO

Video Experimenter Kit
Nootropic Design $24.95

LM1881 video sync separator
NTSC and PAL Supported

TVout library

Will not work with the Mega

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MUSIC

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MUSIC

Music Shield
Seeed Studio Bazaar $27.50

MP3 Media Player
2 push buttons, 1 knob switch
1 headphone line-out
1 line in

MP3, WMA, WAV, MIDI, Ogg, FLAC
AUDIO
Audio

Voice Shield Slim
Spikenzie Labs SPL-005010 $ 45.95

input and output jacks

4-minutes of audio

optional 15mm speaker
PRINTING

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PRINTING

Thermal Paper Printer
Sparkfun COM-10438 $49.95
Paper (34') COM-10560 $1.95

57mm paper output, 50Km print life
19200 bps (default) serial
5V 1A (but heard reports up to 2A)
POWER
4-WHEEL DRIVE

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4-WHEEL DRIVE

4WD Arduino Compatible Mobile Platform
Maker Shed MKSEED8 $59

Aluminum chassis, plastic and rubber tires
200mmX170mmX105mmX660g

3-12V DC motors - 90 cm/sec
100 RPM at 3V, 60mA
1.92Kgcm torque at 6V
WIRELESS
GSM
GSM

GPRS Shield  
Seeed Studio Bazaar SLD33149P $59

GSM/GPRS 850/900/1800/1900MHz
SMS, Data, and Fax

AT command set

Low power sleep mode 1.5 mA
ANDROID

Freeduino USB Host Board
Modern Device MD0FHB $65

Android ADK firmware support
Accessory is USB Host
Delivers charging 500 mA 5V
6-9V external power

CC-SA Open Source Hardware
MULTIPLEXING
ANALOG

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ANALOG

Monster Analog Shield
Critical Velocity MMUX32 $22.95

32 Analog channels into 1 arduino pin

Block connectors for easy wiring
INSPIRATION
CONCLUSIONS

A wondrous Hacking Platform

A ridiculous number of extensions

Many interfaces already HOWTO’d

Join us in finding new great uses for it!
RESOURCES

The Arduino Cookbook

Adafruit Industries Tutorials

Sparkfun forums

Arduino Shield List (http://shieldlist.org)
QUESTIONS

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