Ham Radio & Kit Building

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Ham Radio & Kit Building

Outline

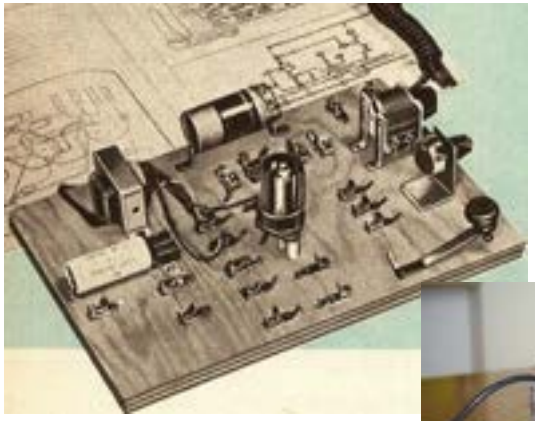
- Motivation
- History
- Types of Kits
  - Easy Beginner – No Soldering
  - Intermediate – Soldering required but no high voltages
  - Advanced – May require SMD skills, adequate test bench
- Basic Tools

Motivation

- Learning how things work
- Learning new skills (soldering, interfacing, programming, etc.)
- The satisfaction of making something from components and have it work as planned
- Customizing devices to meet personal needs/goals
- Becoming better at troubleshooting
- Being able to repair it if/when it breaks
- Saving money – kits are usually cheaper than factory-made

History

- Ham radio was born out of experimentation. Early hobbyists would scrap old radios and TVs for parts or fabricate their own components and build their own equipment.
- In the 1940s and 1950s, a number of companies arose that catered to hobbyists who wanted to build their own ham radios. This included Allied/Knight, Ameco, Eico, Globe, Heathkit, etc.



Easy – Beginner Kits

- Learning about electronic components

"40 in One Kit"

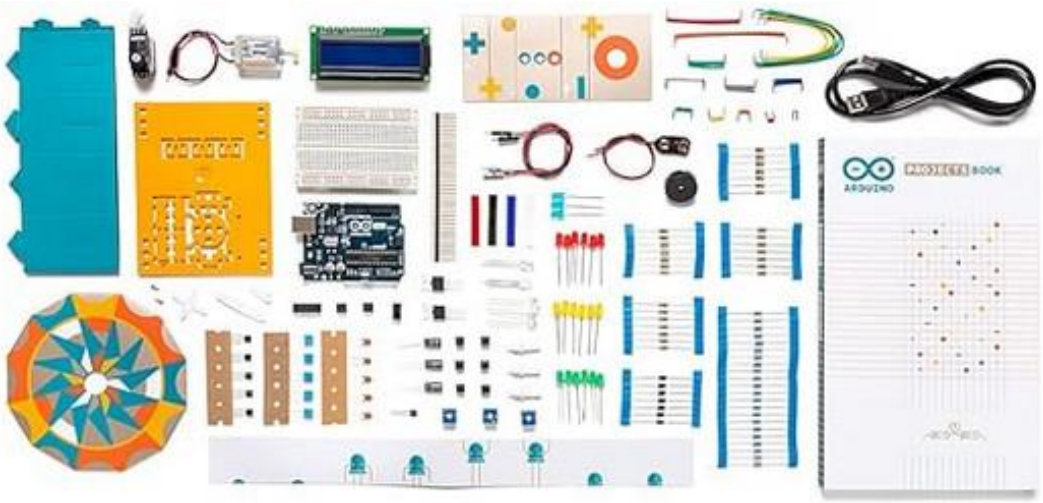
US $54.61

- Learn basics by building burglar alarm, siren, moisture detector, Morse code oscillator, electronic organ, etc.
- Comes with package of resistors, capacitors, LEDs, transistors, diodes, NE555 timer, potentiometer, speaker, breadboard, battery, wires, manual
- Many favourable reviews, especially for the manual

Easy – Beginner Kits

- The Arduino Path…

C $129.20



About this item

- Parts and instructions are included for 15 projects involving a DC motor, servo motor, tilt sensor, LEDs and other basic electronic components.
- Projects you can make:
- Light the RAM in - create a musical Instrument you play by waving your hands
- Knock lock - tap out the Secret code to open the door
- Digital hourglass - a light-up hourglass that can stop you from working too much

- Microcontroller UNO R3 included
- Requires connection to PC for programming in version of C++ language (sketches)
- Numerous add-on kits, books, on-line resources – can become a hobby by itself

Intermediate Kits

Learn to Solder

Gikfun Electronic Game Machine Soldering Projects Soldering Practice Kit with 4 Retro Classic Games for School Learning Project EK1987

Brand: Gikfun

4.3 ★★★★½ 45 ratings

Amazon's Choice

$19.98

About this item

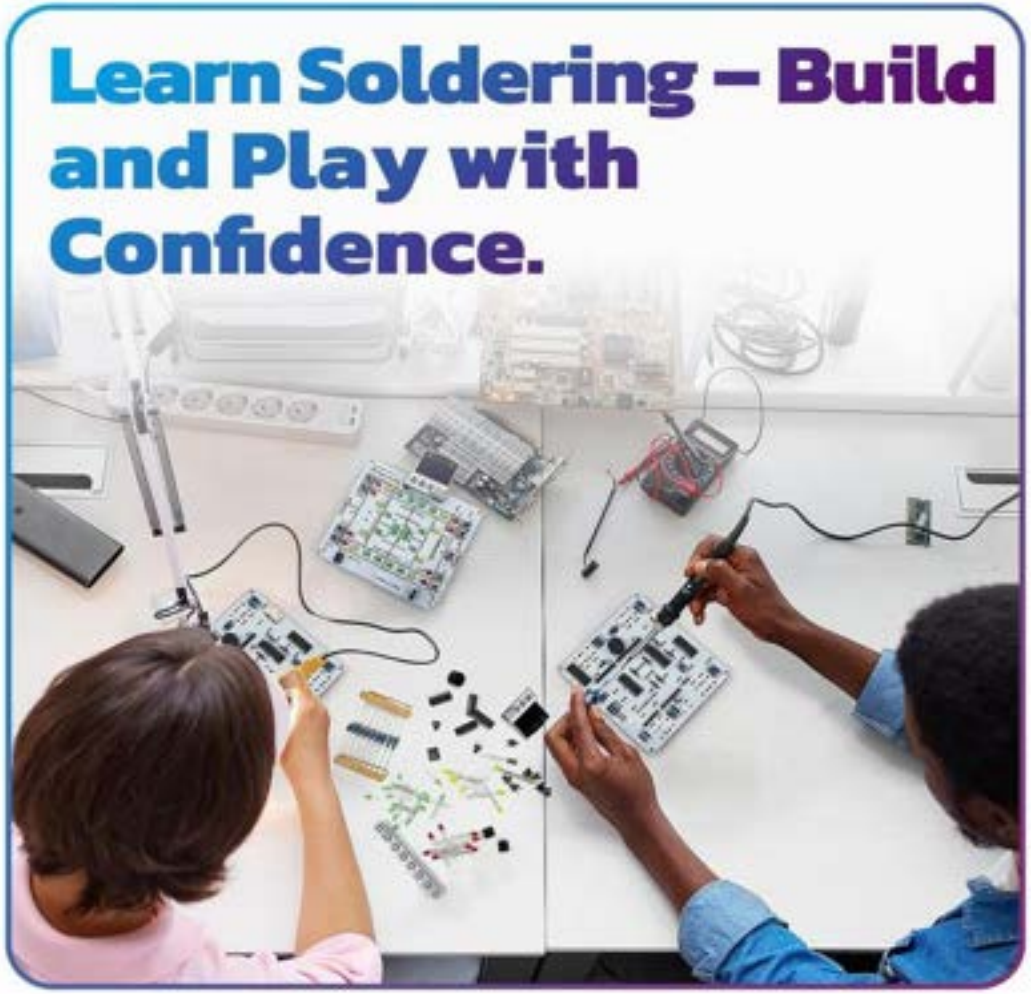
- DIY Soldering Project Game Kit, 4 classic games, with USB cable and battery box
- The brightness is adjustable and the background music can be switched on and off.
- Humanized keypad arrangement, big button, better feel.
- The console kit contains the following games: 1, Tetris 2, Snake 3, Race cars 4, Slot machines
- Comes with user manual and online PDF file, which will guide you how to finish step by step, perfect for school basic electronics experiment projects.

- Requires your own soldering station

C$159.00

Intermediate Kits

Learn to Solder – Many more kits!



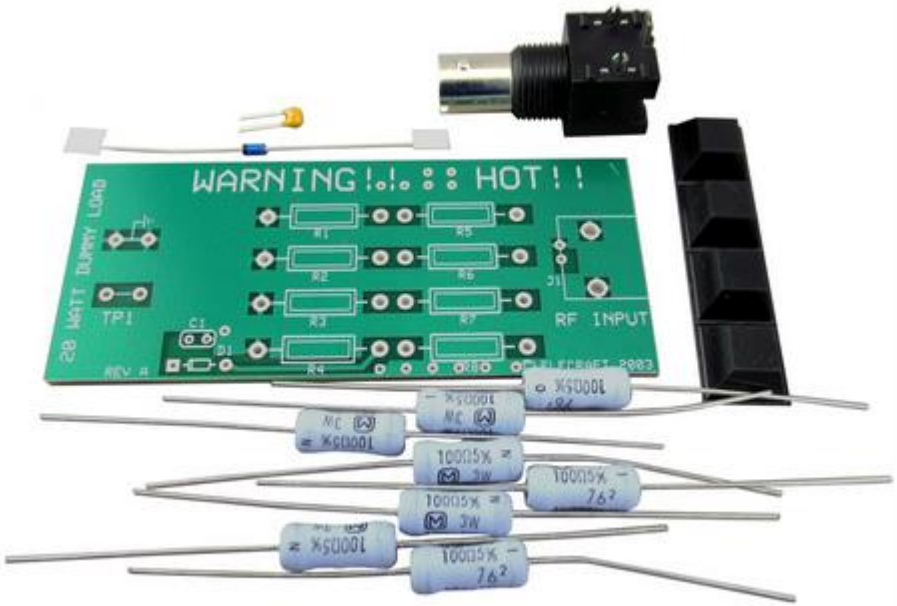
C$18.49

amomii Neon Tennis - Soldering Practice Kit for Arduino UNO, 2-Player LED Game Shield with OLED Display and RGB Strip, DIY Electronics Project for Adults...

- Compatible with Arduino UNO: Designed as a shield for Arduino UNO and other compatible boards, it ensures plug-and-play convenience for seamless integration into your existing projects.
- Send and Receive IR Signals with Ease: Explore infrared communication with a built-in IR receiver and transmitter. Clone remote controls, send commands, and create custom IR-based devices for real-world automation.

Intermediate Kits

Learn to Solder – Easy 100W Dummy Load



C47.38

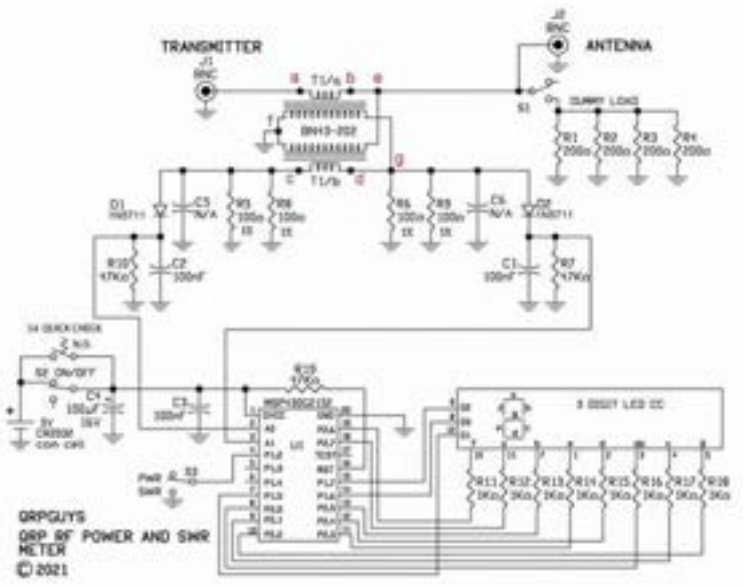
Elecraft DL1 Wideband Dummy Load

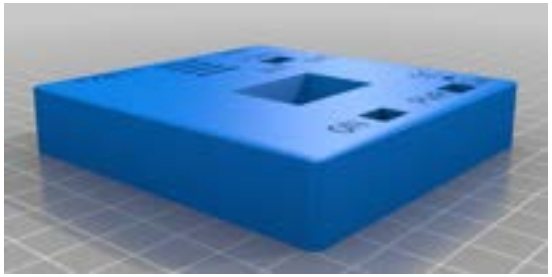
- 20W Continuous
- 100W Momentary
- 0-255 MHz Range

Intermediate Kits

QRP Guys – 12W Power/SWR Meter with internal Dummy Load

US $40.00

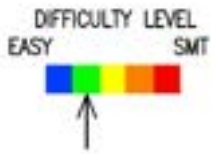




- Will show power 200mW to 10W
- SWR range 1:1 to 15:1
- Free download of files for 3D printed case

Intermediate Kits

QRP Guys – No Tune End Fed Half Wave Antenna



- Toroid transformer rated at 20W
- Feedline is counterpoise
- Broadband 10-80m, with user supplying ½λ wire

Advanced Kits

QRP Labs – QDX Digital Transceiver

US $69.00

- Five bands version 80, 60, 40, 30 and 20m or six high-bands version 20, 17, 15, 12, 11 and 10m
- 5W output at 9V supply (can be built for 4-5W at 12V supply)
- Single signal transmission (zero unwanted sideband, zero residual carrier, zero intermodulation distortion) Solid-state band switching and transmit/receive switching under CAT control
- High performance embedded SDR SSB receiver with 60-70dB of unwanted sideband cancellation
- Built-in 24-bit 48ksps USB sound card
- Built-in USB Virtual COM Serial port for CAT control – interfaces to PC (Win10) + WSJT-X
- Si5351A Synthesized VFO with 25MHz TCXO as standard
- Easy to build single-board design, Professional quality double-sided, through-hole plated, silk-screen printed PCBs
- All SMD components factory assembled
- Built-in test signal generator and testing tools Receive current 100mA, Transmit current 1.0-1.1A for 5W output with 9V supply (around 0.7A for 5W with 13V supply)

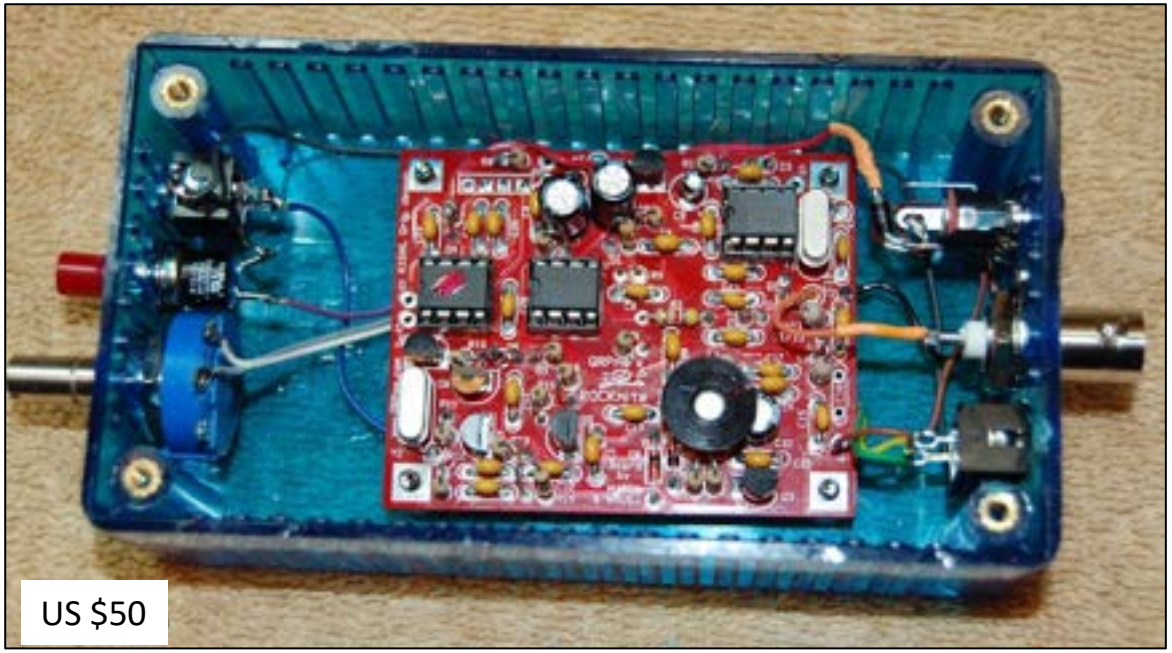
Advanced Kits

QRP Labs – 50W Amp for QCX/QDX Series

- Up to 50W power output on 40m with 20V supply, falling to around 25W at 13.8V supply
- 50-ohm input and output
- Fast clean solid-state Tx/Rx switching provides full break-in operation (QSK)
- Can be built for one of 80, 40, 30m or 20m bands with the supplied components (or other bands with suitable choice of Low Pass Filter components)
- Uses two low-cost IRF510 transistors as the power amplifier in push-pull configuration
- On-board 7-element Low Pass Filter for harmonic attenuation
- Through-hole plated PCB, all through-hole components (no Surface Mount Devices)
- All connectors board-mounted: two BNC, one 2.1mm barrel power connector, one 3.5mm jack connector for keying PCB
- Standard inexpensive components throughout (easy to replace)
- Optional black anodized aluminum enclosure (63w x 25h x 130d mm plus another 25mm for the heatsinks installed on top)

Advanced Kits

QRPme - Rockmite Single Band CW Transceiver

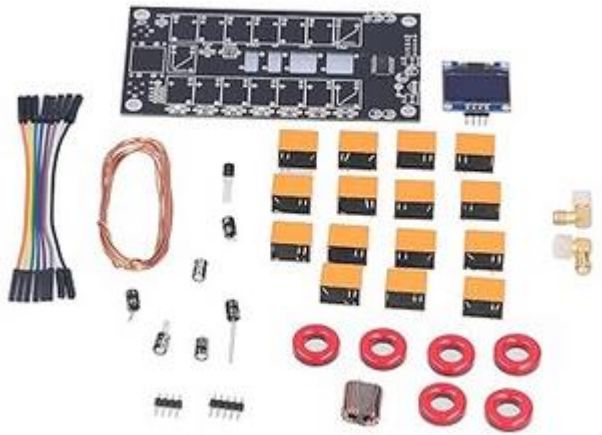


The author's 80m Rockmite

- 0.5W power output at 13V supply
- Available for single bands 10m through 80m
- Automatic T/R offset, reversible
- Built-in custom version of Ham Gadgets PicoKeyer-RM Iambic keyer, 5-40 WPM
- Built in side tone, approx. 700Hz
- Includes assembly instructions and operating tips
- Enclosure available by special request ($30.00?)
- ALL on-board parts, input/output connectors and wiring to connect them together are supplied
- ALL parts for the keyer SPEED, audio VOLUME and power ON/OFF switch & LED mods are also NOW included

Advanced Kits

N7DCC ATU-100 100W Antenna Tuner Kit



Amazon - CDN $33.49 kit

Amazon - CDN $122.51 (built)

- 1.8-50 MHz
- Requires 12-15VDC at “400mA maximum”
- No memories for settings but automatically keys when SWR > 1.3:1
- Experienced kit builder claimed it took him 6 hours over 3 days to build (K9YA Telegraph, Dec 2024)
- All SMD components pre-installed
- Comes with SMA jacks but will probably want to supply your own SO-239 jacks
- Items shown made in China

Advanced Kits

K1EL Ham Radio Kits – OpenQRP CW Transceiver

- Single Band : 40 meters (other bands with component changes)
- Transmitter: Final Amplifier IRF510 MOSFET, 6-8 watts output at 13.5 volts
- CPU: ATmega168 @ 16.384 MHz based on Arduino microcontroller platform
- Open source software, written entirely in ‘C’
- 5 to 55 wpm internal iambic keyer, Iambic A and B, keyer emulation modes
- 16 character by 2 line LCD display
- Relative signal strength indicator
- Built in CW decoder
- Painted Aluminum Enclosure with silkscreened legends
- Power supply voltage: 9 volts minimum, 16 volts maximum.

Tools

- Variable temperature soldering iron and solder
- Steel wool for cleaning soldering iron tip
- Helping hands and/or PCB holder
- Desoldering pump and desoldering braid
- Small screwdrivers and nutdrivers
- Exacto knife
- Flush cutters & Needle-nose pliers
- Caliper for measuring
- Multimeter
- Wire strippers
- Jeweler’s loupe
- A workspace/mat with good lighting

More Tools

Self-adjusting wire stripper

Tweezers

Dental Picks

Retractable magnetic pick-up tool

PCB Holder

Allen key set

Extra long needle-nose pliers