

Beat the downturn in HF conditions! Make your SOTA/NPOTA/WWF activations a success every time!

The miniHFPA2 is a 5th generation HF Packer Amp optimized for your HF Packing adventure.

This new model goes a step further than the original miniHFPA. This kit version does not require mission-critical electronic assembly, test or calibration. It does require minimal hardware assembly.

A sleek new design ergonomically fashioned to fit in your backpack or on a picnic table near you. The goal: give your signal a boost and start making memorable contacts under marginal conditions. The reward is a clean more powerful output signal from your QRP transceiver with a good balance between output power, physical size, and weight. The battery can be minimal such as a 4.2AH lifepo4 battery. Battery life will typically exceed one or two days depending upon use.

Circuit Protections: This miniHFPA2 design includes SWR detect and current limiting if over-drive sensed. These features provide additional operational protection for the miniHFPA2.

Full Battery Use: The miniHFPA2 assembly consists of a class AB1 linear amplifier circuit board with two IRF510 MOSFETs attached to a heat sink plate, an RF activated Power Supply module is integral to the design and boosts 12V to 29.5VDC 10A max from a 12VDC supply. The module requires very low standby and operating current. The amplifier provides a full output with as little as 9VDC battery making it very tolerant for battery operation. The amp design is set up to deliver full output power with 5W RF input but may be user configured at order time for 1, 2.5 or 5W full-scale RF input. We customize the build for you. The design yields a quiet receive environment because the controller is asleep until the command to transmit.

The Kit: You will receive all the circuit boards and parts as a kit. All of the mission-critical electronics are installed, aligned and tested. You install only mechanical hardware, switches and connectors to complete your project. The miniHFPA2 includes a fabricated and finished case, black anodized with white silkscreen text. The case is lightweight but strong, aluminum construction and includes an integral heat sink plate top where the internal heat producing components are thermally attached. The right angle front and rear panels attach to each other using flush mount screws in the corners of each panel. Two side panels permit access to the plug-in LPF modules. An assembled power cable to mate with your power source is standard.

No internal cables or special tools are required to complete this amp

The Case Design: The indicators and low profile controls are on the front cover, and the connections are on the rear cover. The miniHFPA2 circuit board attached to the top heat sink plate by screws.

More than a kit:

This project is designed to be fun and educational. You will get out of it what you put into it. Take your time and savor the experience. There is a certain amount of pride knowing that you participated in the construction of your amplifier. There is technical knowledge gained with the confidence that you know how it functions and how to troubleshoot it, in case of problems. The HF Projects HF Packer Amp has evolved model by model since 2001 to reach this current benchmark.

Low Profile Heat Sink Plate



6 x 6 x 1.6 inch (152 x 152 x 40.6 mm); Weight: 1lb, 10oz (.74kg)

Front View: Toggle switches with LED indicators

Controls: A front panel switch selects Bypass or Inline, allowing you to operate QRP to tune your antenna without subjecting the amp to a possible high SWR during tuning. A mode switch selects CW/SSB providing appropriate post carrier delays. Power control by the Standby/On switch. You may key the amp by RF sensing or PTT. The amp timing slaves to the transceiver timing.

Smart Switching: Your transceiver setting will control the miniHFPA timing sequence. The miniHFPA2 controller chip regulates the internal timing of the T/R relays to provide the proper activation sequences. The input current is minimal in the Standby state.



HF Packer Amp miniHFPA2 Edition

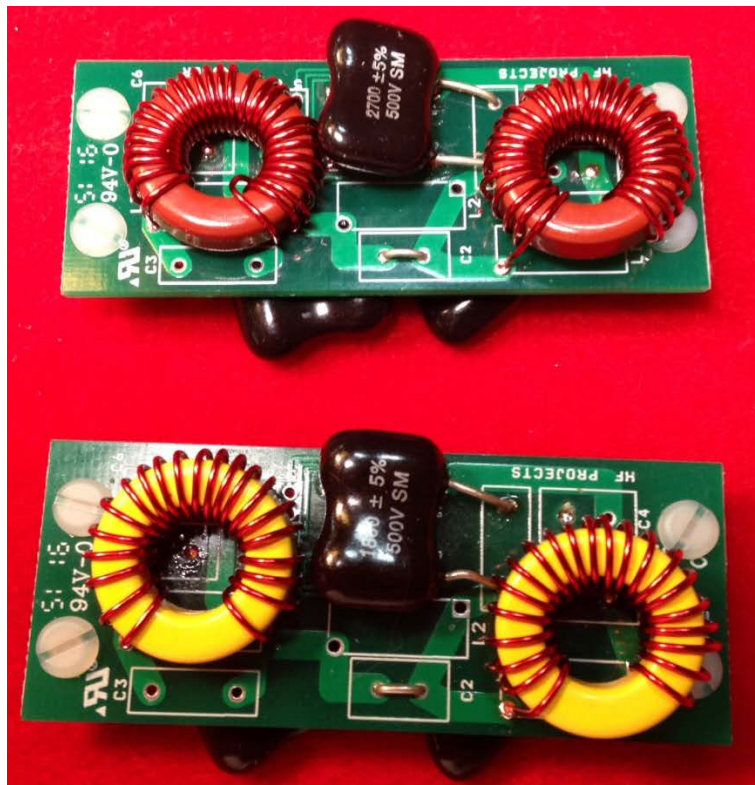
Rear View: DC Power Input, Control, and RF Connections

On the left and right side of the miniHFPA2 circuit board are two plug-in LPF (low pass filter modules). Guidance posts aid insertion of an LPF into the circuit board without opening the case.

LPF Configurations: The LPF design supports up to two 2-adjacent-band-segments per LPF. The choices are 160, 80/75, 60/40, 30/20, 17/15 and 12/10M. Included in the basic kit are the 60/40M and 30/20M LPF.

The remaining ranges are available as fabricated and tested purchase options. An LPF is a 2x1 inch plug-in circuit board that is interchangeable in the field with the entire family of same size modules. Each LPF has a unique ID, and the panel LEDs inform you which LPF is active. Select using the LPF toggle switch. Field replacement consists of removing a side panel, unplugging an LPF and sliding in a different LPF. The LPF inserts on either side.

160M LPF option

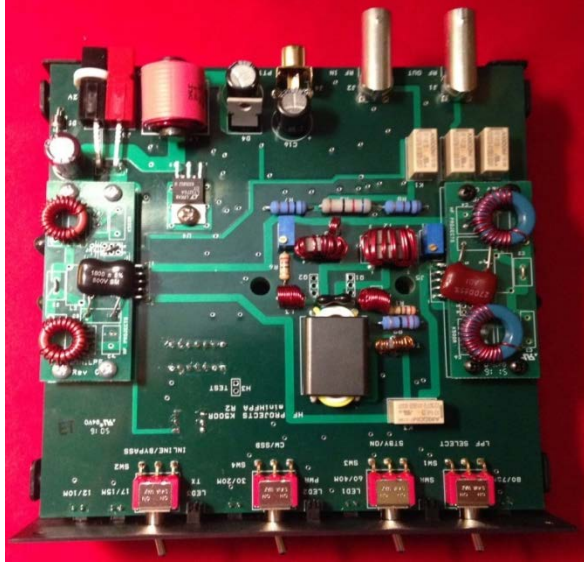


80/75M LPF option

Six LPF circuit boards are available. The photo shows the 160M and 80/75M LPF.

HF Packer Amp miniHFPA2 Edition

The requirement for special tools and test equipment eliminated in this design.



The circuit board is a four-layer design employing a ground plane just below the top layer. There is a total of three routing layers to make all the necessary connections. The toggle switch bat handles are accessible on the front panel. The circuit board is attached to the heat sink. The controls and connectors are visible on the front and rear panels.

Tools for Assembly and Test Recommendations

Philips Screwdriver, Diagonal Cutters, Soldering Iron and Solder, Multimeter capable of measuring current up to 10A or an appropriate shunt circuit for current measurements, Watt meter / 50-ohm dummy load, BNC type RF connection cables and your HF transmitter and Power Supply (10A min) or 12VDC battery.

Specifications:

- Drive: 1 - 5W RF max 160-10M
- Max RF Input: 1W or 2.5W or 5W (specify at order time)
- Input impedance: 50 ohms
- Control: Carrier operated or PTT (RCA jack)
- DC Input: 12VDC, 10A max (9-16V range)
- Electronic circuit breaker, thermal, auto reset
- Standby current: <50mA; Operate: 6A average
- Chassis mount Power Pole Connector 30A contacts
- Power Switch: Toggle Switch
- RF In: BNC; RF Out: BNC
- Power Out: nominal 30-35W Average 160 - 10M.
- 100% Modulation without distortion (according to 2-tone tests)
- Weight: less than 1 lb 10 oz.
- Case Size: 6 x 6 x 1.6 inch (excluding knobs and connectors)
- Heat Sink Plate: 6 x 6 x 0.25 inch painted aluminum
- LP Filter Switch: 2 position band segment select
- Front panel mode switch: INLINE/BYPASS
- TX LED Indicator
- Aluminum case with LPF access on each side.
- Rubber Feet (4)
- Power Cable, un-terminated user end, two-foot length.
- CW/SSB switch for optimum hold time of T/R relay
- Digital control, 0.1W RF sensitivity RF sensing or PTT sequencing of T/R relay and Intelligent Power Switch.
- Amplifier: High Voltage IRF510 MOSFET Push-Pull Class AB1 Linear Amplifier.
- Bias set to 100mA per transistor. Easy pot adjustment. Test jumper activated.
- Spurious products -40 dB or better @ 35 watts
- Harmonic content -45 dB or better @ 35 watts
- Load tolerance 2:1 or better SWR recommended
- SWR shutdown and current limiting
- Controller quiet operation is utilizing sleep mode while in the standby state.

Construction and Support: You will receive a comprehensive construction manual download with step-by-step instructions, pictures, the theory of operation and test. We are here to help you have a positive building experience with our email support and safety net service. No mission critical electronics assembly is required by you to be installed and tested. We offer a DropBox connection for instant access to project information. The construction manual is detailed and complete, **but your assembly for this model is a small subset of the entire assembly instructions.**

To order: Scroll down to the bottom where the store items are listed. Click on the miniHFPA2 HF Packer Amp box to see the contents. Click on the options you desire, and the price adjusts with each selection. The base amplifier includes the case, circuit board, two low pass filters and kit components. A comprehensive construction manual delivered online provided. See the deliverables list below.

Deliverables:

Finished black anodize four piece case, white silkscreened lettering front and back, integral panel nuts
All hardware (screws and spacers)
Painted heatsink plate with masked MOSFET mounting area
Fabricated and installed magnetics (RF transformers, RF coils, inductors)
Two Fabricated, tested and aligned LPF (60/40M and 30/20M)
Installed through-hole electronic components (ICs, diodes, potentiometers, resistors, LEDs, capacitors) and power input connector and electronic fuse assembly.
Installed and tested all surface mount components
Complete Test and Calibration of the Electronics
Board Cleaning
Assembled 2 foot Red/Black #12 Power Cable (One end unterminated for user's battery termination)
30-day warranty for parts and labor, shipping not included.
Electronic delivery, comprehensive construction manual with the theory of operation and troubleshooting sections.

Kit Assembly by user:

Install four-panel switches, two RF connectors, and eight guide bumpers on the circuit board.
Insert four rubber feet to the bottom panel.
Attach the painted heat sink plate to the case with four screws.
Apply a thin layer of thermal grease to two ceramic washers on the heat sink plate and the metal mating surfaces of the MOSFETs.
Install four threaded standoff spacers into the heat sink plate threaded holes.
Insert completed circuit board in the case with switches and LEDs pass through the front panel.
Attach circuit board using eight screws to the heat sink plate.
Attach two MOSFET transistors to the heat sink plate using supplied screws through access holes.
Attach the DC/DC IC with a finned radiator using a single screw to the heat sink plate spacer.
Mate the front and rear panels with switches and connectors passing through panel holes. Join top and bottom pieces with eight flat head panel screws.
Attach side access panels with four screws each side.

The link is <http://hfprojects.com/> Click on the **miniHFPA2 Brochure** and **Construction Manual** links for more details.