

QRP to 30-35W HF Packer Amp miniHFPA Edition

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

The miniHFPA is a 5th generation HF PackerAmp optimized for your HF Packing adventure.

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.

New Circuit Protections: This miniHFPA design includes new circuit protections in the form of SWR detect and fold-back current limiting if over-drive sensed. These new features provide additional operational protection for the miniHFPA.

Full Battery Use: The miniHFPA assembly consists of a class AB1 linear amplifier circuit board with two IRF510 MOSFETs attached to the heat sink, 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 operate 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 build time for 1, 2.5 or 5W full-scale RF input.

The Kit: You will receive all the circuit boards and parts as a kit. The miniHFPA kit includes a fabricated and finished case (black anodized with white silkscreen text). It is light weight but strong, aluminum (6x6x2.2 inch) with a fabricated low-profile heat sink attached to the top cover. The front and rear covers attach to each other by a set of flush mount screws in the corners of each panel. The side panels provide internal access to plug-in modules. The top and rear covers have folded up edges for additional strength. All hardware included. All of the surface mount components are pre-installed. You install only the through-hole components. All of the heat producing components are screw attached to the heat sink. The heatsink has a thermal connection to the case. *No internal cables or special tools are required to complete this amp.*



The Case Design: The indicators and controls are on the front cover. The toggle switches protected from physical abuse by an optional transparent U-channel protector. The bottom cover also serves as the rear panel where the RF connections, control, and power connections made. The two halves of the case join at the front and rear with screws. The miniHFPA circuit board attaches to the top cover and heat sink by screws. Two hex cap 6-32 screws secure the MOSFETs to the heat sink.

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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 high SWR. A mode switch selects CW/SSB with appropriate post carrier delays. Power control with the Standby/On switch. You may key the amp by RF sense or PTT. If PTT operation desired, plug into the PTT jack from the transceiver PTT output. The amp timing will slave to the transceiver timing using PTT timing.

Smart Switching: Your transceiver setting will control the miniHFPA timing sequence. The miniHFPA controller chip controls the internal timing of the T/R relays to provide the proper activation sequences. Standby current reduced to a minimum during the Standby state.



Rear View: RF Connections, Control and DC Power Input

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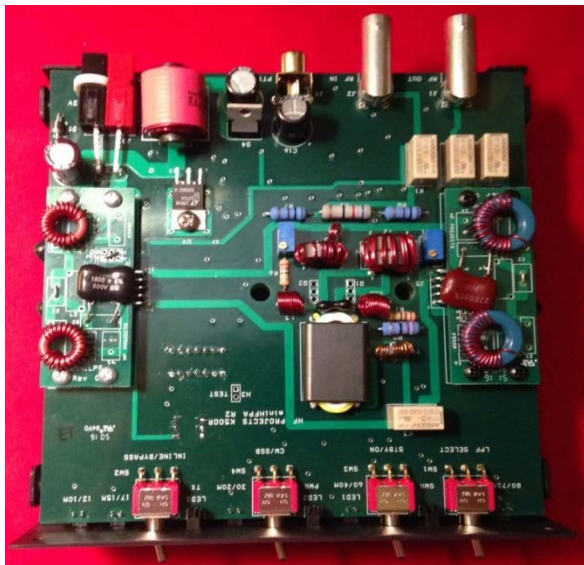
New LPF Filter Module Concept: On the left and right side of the miniHFPA circuit board are two plug-in LPF modules. Mating card guides allow the LPF to slide in from the sides properly spaced to plug into the circuit board.

LPF Configurations: The LPF (low pass filter) design supports two 2-adjacent-band-segments per LPF module except for 160M. The choices are 160, 80/75, 60/40, 30/20, 17/15 and 12/10M. Included are the assembled and tested 60/40M and 30/20M LPF modules. The assembled and tested LPF Modules are supplied removing the requirement for an LC meter! The remaining ranges are available as fabricated and tested purchase options. The LPF modules are 2x1 inch plug-in circuit boards that are interchangeable in the field. The modules have a unique ID jumper installed. The panel LEDs inform you which LPF module is active by lighting the appropriate LED. Select between two installed modules using the LPF toggle switch. Field replacement consists of removing a side panel, unplugging an LPF module and sliding in a different LPF module. The selected LPF module guides into the receiving jack on the miniHFPA circuit board.



Above, an LPF Module is tilted up to show both top and bottom views. Six LPF models are available.

Construction and Support: You download a comprehensive construction manual with step-by-step instructions, pictures, and theory of operation and test. We are here to help you have a positive building experience with our email support and safety net service. *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 handles pass through the front panel. The circuit board is attached to the heat sink at five locations. The rear panel connectors pass through the rear panel and the bottom, and top covers join. Removable side panels allow access to plug-in LPF Modules.

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Specifications

- Drive: 1 - 5W RF max 160-10M (build option)
- Input impedance: 50 ohms
- Control: Carrier operated or PTT (RCA jack)
- DC Input: 12VDC, 10A max (9-16V range)
- 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 8 oz.
- Case Size: 6 x 6 x 2.2 inch (excluding knobs and connectors)
- Heat sink; Black Anodize, low profile, 0.8 inch
- LP Filter Switch: 2 position band segment select
- Front panel mode switch: ON/BYPASS
- TX LED Indicator
- Aluminum case with LPF access on each side.
- Rubber Feet
- Power Cable, un-terminated user end, two ft
- 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 fold-back current limit
- Controller quiet operation is utilizing sleep technology in standby.

Store: <http://www.hfprojects.com>

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 transceiver and Power Supply (10A min) or 12VDC battery.

To order, go to www.hfprojects.com store and look for Store at the bottom. Select the miniHFPA and choose additional options, as may be appropriate.