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.

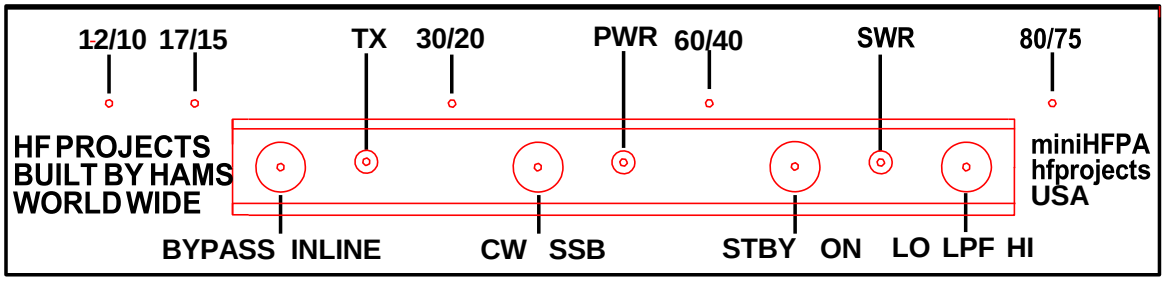
A sleek new design ergonomically fashioned to fit in your backpack or on a picnic table near you. The goal: give your signal a boost and start making memorable contacts under marginal conditions. You are rewarded with a clean more powerful output signal from your QRP transceiver with a good balance between output power, physical size and weight. 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 excess drive is 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, a 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 full output on 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 inch) with a fabricated low-profile heat sink attached to the top cover. The front and rear covers are attached 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 is 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 heat sink properties are enhanced through thermal connection to the case. *No internal cables or special tools are required to complete this amp*.

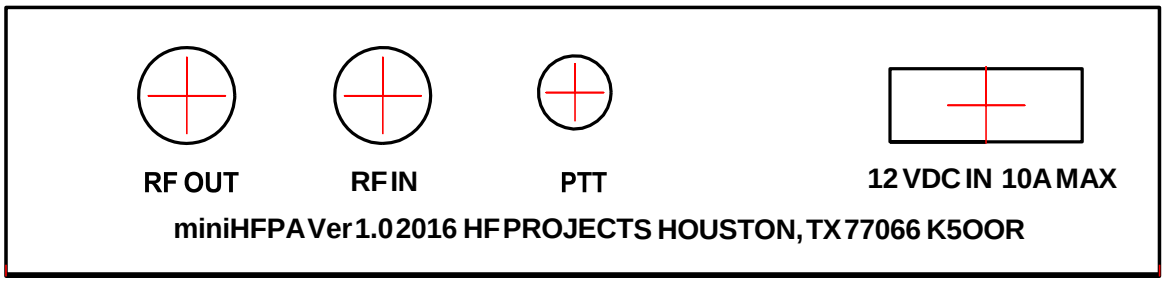
The Case Design: The aluminum case has a top cover and a bottom cover and two removable side panels for access to plug-in LPF modules. The indicators and controls are on the front cover (see pictorial below). The toggle switches are protected from physical abuse by a transparent U-channel protector. The bottom cover also serves as the rear panel where the RF connections, control and power connections are made. The two halves of the case join together at the front and rear with screws. The miniHFPA circuit board is attached to the top cover and heat sink by screws. Two hex cap 6-32 screws secure the MOSFETs to the heat sink.



Front View: Toggle switches nestled in a transparent U-channel 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 while power is controlled by the standby/On switch. You may key the amp by RF sense or PTT. If PTT is desired, plug into the PTT jack from the transceiver PTT output. The amp timing will slave to the transceiver timing using PTT timing.

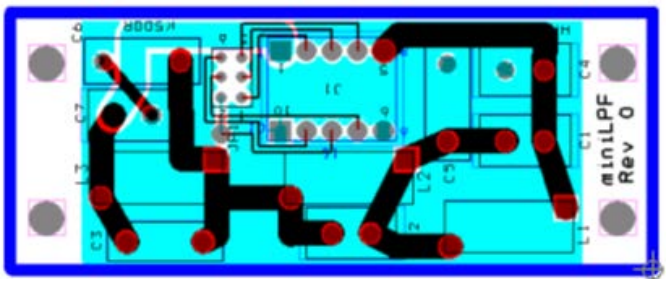
Smart Switching: Your transceiver setting will control the miniHFPA timing sequence. The miniHFPA controller chip controls the internal timing of the T/R relays to provide the proper activation sequences. Standby current is reduced to a minimum during receive mode.



Rear View: RF Connections, Control and DC Power Input

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.

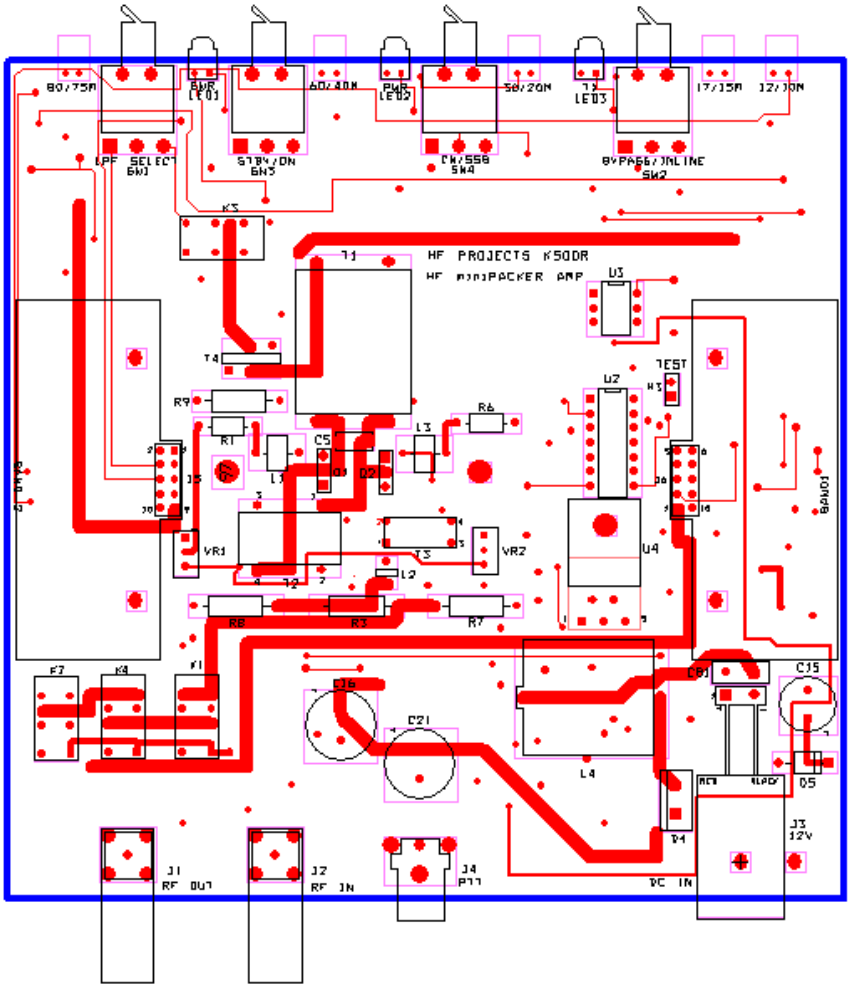
LPF Configurations: The LPF (low pass filter) design supports two 2-adjacent-band-segments per LPF module. The choices are (a) 80/75; (b) 60/40M; (c) 30/20M; (d) 17/15M and (e) 12/10M. You choose any two of the five band segments as standard. The adjusted coils are supplied removing the requirement for a LC meter! The remaining 3 ranges are available as fabricated purchase options. The LPF modules are 2x1 inch plug-in circuit boards that can be interchanged in the field. The modules have a unique ID jumper installed. The panel LEDs inform you which LPF modules are currently installed by lighting the appropriate LED set when selected by the LPF toggle switch. Field replacement consists of removing a side panel, unplugging the current LPF and sliding in a different LPF module that is aligned and guided into the receiving jack on the miniHFPA circuit board.



LPF Module typical of 5

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 have been eliminated in this design.*

miniHFPA Circuit Board Top View



Switches and LEDs

Four point mechanical connection of the circuit board to the heat sink below provides a stable platform environment.

Plug-In LPF Modules (Left and Right side)

RF In/Out, PTT, Power Input Connections

Back Edge of miniHFPA circuit board

The circuit board is a four-layer design employing a ground plane just below the top layer. There are a total of three routing layers to make all the necessary connections. The front panel switch handles pass through the front panel. The rear panel connectors pass through the rear panel as the bottom and top covers are joined together.

Specifications

- Drive: 1 - 5W RF max 80-10M (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 80 - 10M.
- 100% Modulation without distortion (according to 2-tone tests)
- Weight: less than 1 lb.
- Case Size: 6 x 6 x 2 inch (excluding knobs and connectors)
- Heat sink; Black Anodize, low profile, 0.6 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, unterminated, 3 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 utilizing sleep technology in standby.

Store: http://www.hfprojects.com 9/5/16

Options

- miniHFPA circuit board coil and transformer set ready for installation.
  - Fabricated and inductance adjusted for you.
- Choose any two LPF plug-in Modules to be included in your basic kit. Finished coil sets included.
- Choose additional **Fabricated LPF plug-in Modules**. The choices are:
  - (a) 80/75M
  - (b) 60/40M
  - (c) 30/20M
  - (d) 17/15M
  - (e) 12/10M.

Tools for Assembly and Test Recommendations

- Philips Screw driver
- Diagonal Cutters
- Soldering Iron and Solder
- Multi-meter 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
- Power Supply (10A min) or 12VDC battery

Note: This is draft brochure to be revised when pictures are available.