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23 CM 600 Watt Amplifier

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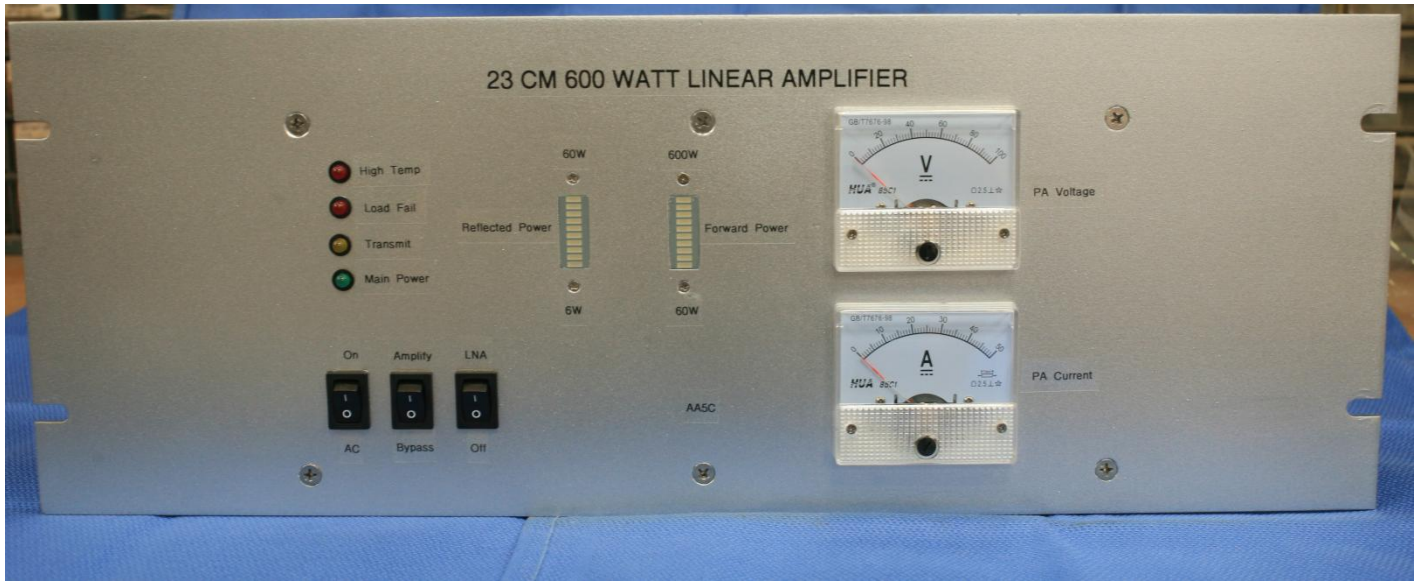
Front View



- Built on 4U (7 inch) rack panel
- Panel meters for PA Voltage and Current
- LED Bars for reflected and forward power (relative but calibrated)
- Remote power supply switch
- LEDs for power and fault indications
- Switch for 12V to LNA

Amp with Cover

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- Main Chassis is 12 inches x 12 inches x 6 inches
- Light enough that a support tray is not required for rack mounting

Back Panel

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- Four 60 mm fans
- Anderson Powerpole for power and remote power supply switching

Under the Hood – From Back

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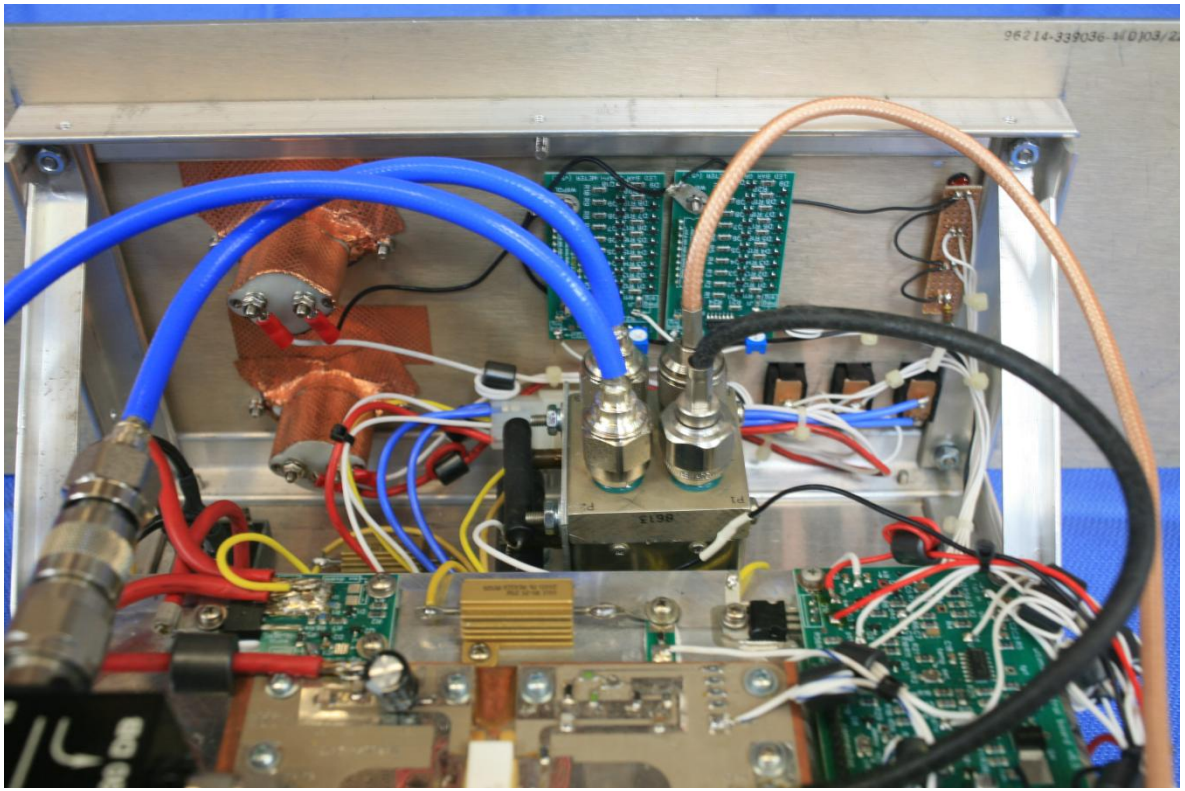
- W6PQL RF Deck
  - MRF13750
- RG401 for high power runs
- Control Board (lower right)
- High current FET switch (lower left)
- Shielding around panel meters
- Ferrite chokes on most wires



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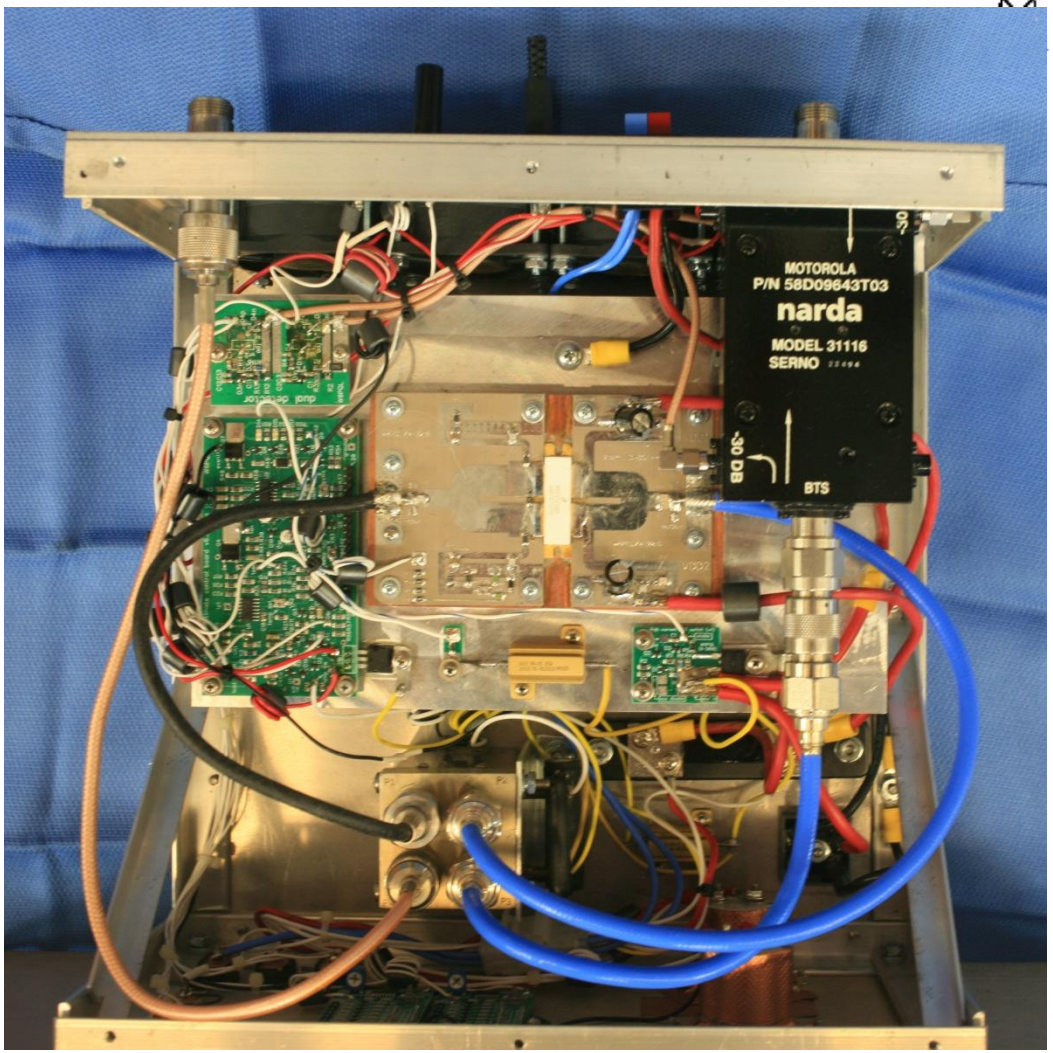
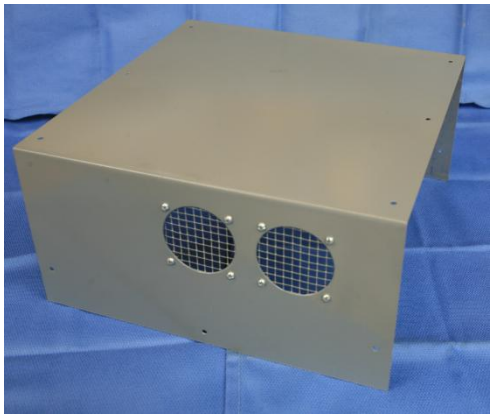
Under the Hood – Top View

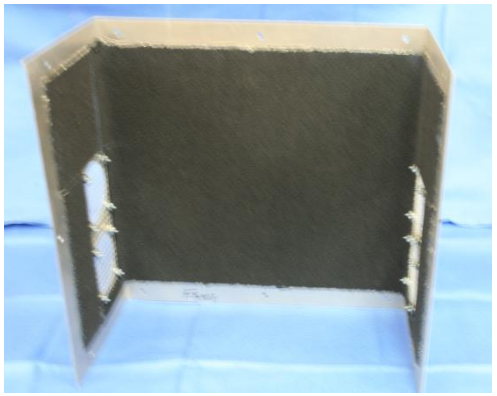
- Transfer Relay for T/R
- 30 dB dual directional coupler for measuring forward and reflected power (upper right)
- Dual detector (upper left)



Cover

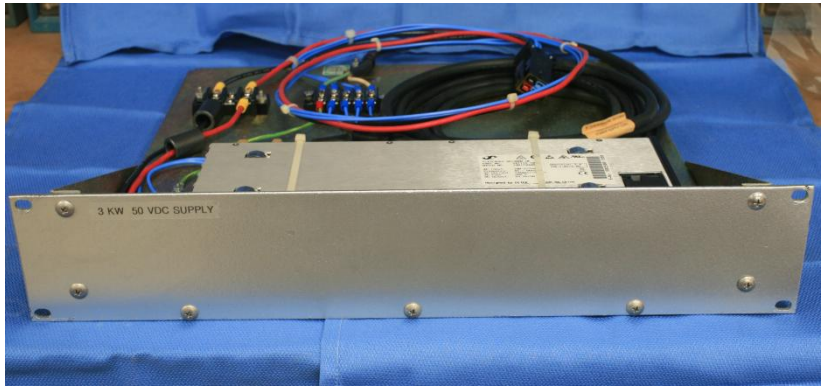
- Two 2 ¼ inch vents each side
  - Sized for 60 mm fan if needed
  - Shielded with hardware cloth
- Inside of cover lined with Eccosorb
  - 1/8 inch thick Laird LS-30
  - 24 dB/cm attenuation at 3 GHz
  - Dampens cavity resonances



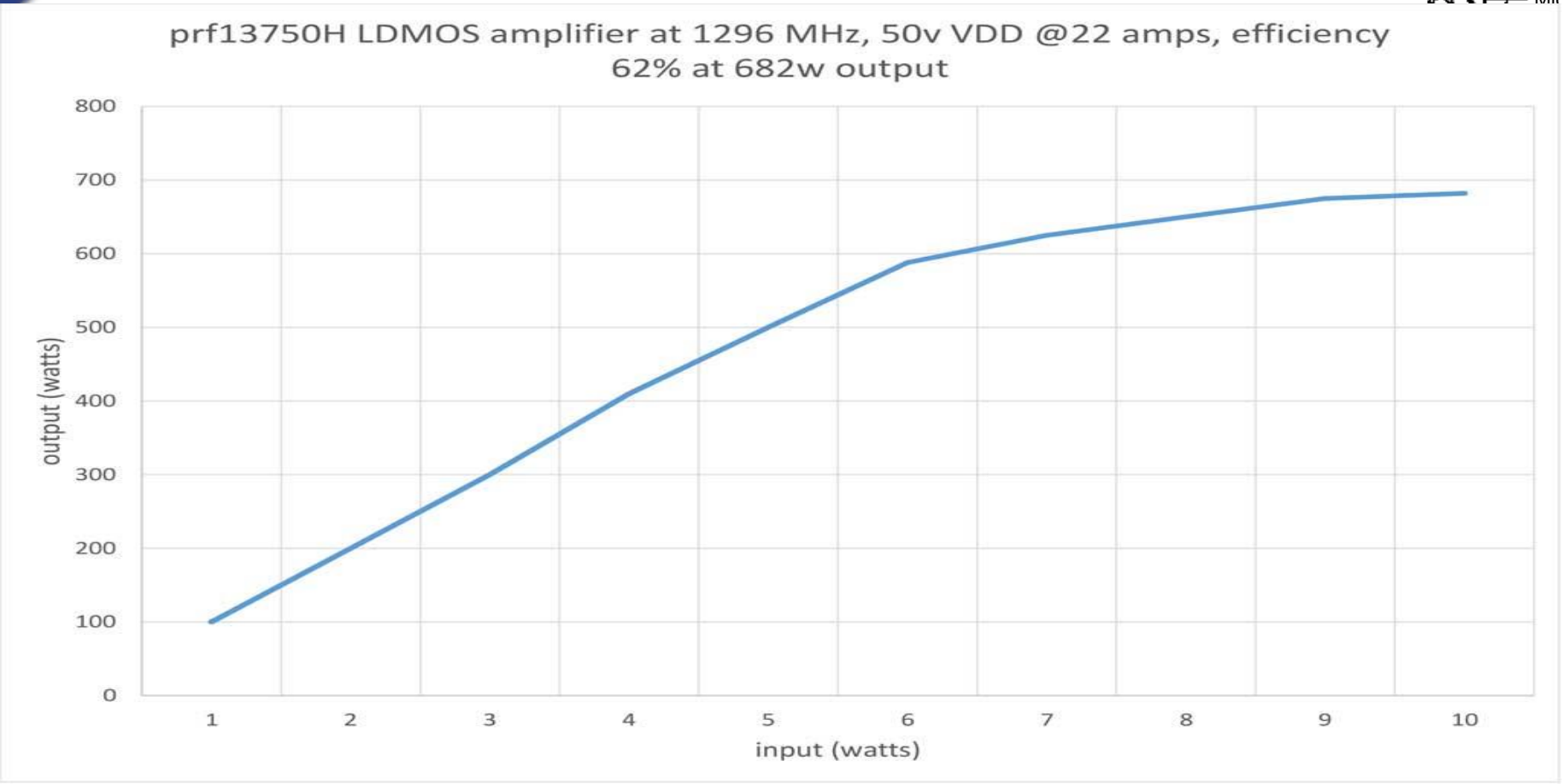


Power Supply

- Built on 2U (3 ½ inch) rack tray
- Eltek Flatpack2 48V/3000W HE power supply
  - 85-305 VAC input (20 amps max)
  - 109 x 41.5 x 327 mm
  - < 2 lbs.
- 0.062 in FR4 board to connect AC input and DC output (cut and peel)
- Input power switched at PA front panel



W6PQL Prototype Results



Pout vs. Pin

Summary

- High power out with almost 20 dB gain
  - I measured +58 dBm out with +40 dBm in
  - Driver was “spiking” so I did not risk taking more data points
- Project was mainly metal working and wiring
  - Bought built and tested RF deck and control board from W6PQL
  - Need to calibrate the Forward and Reflected LED readouts
- Wavelength small enough that Eccosorb needed for “insurance” against cavity resonances
- Protection circuits for
  - Thermal overload
  - High output VSWR
- RG401 coax cable for the high power connections inside the chassis
  - e.g., RG214 not rated for this much power at 1.3 GHz!