

## Globalstar 1.6 GHz PA modification for 1.3 GHz

A power amplifier module originally used in a Globalstar fixed-telephone unit has recently appeared in small quantities. The linear power amplifier was operated in the Globalstar application at a 5 watt output level, although the final stage can be driven to +39 dBm level, according to the module's device specifications. The amplifier unit has a gain of around 34 dB. Kerry Banke, N6IZW and Chuck Houghton, WB6IGP have come up with a very simple conversion to retune the original 1.6 GHz operating region for 1296 MHz use. The module has a part number of FMC1616L1015 as seen in the photo of Figure 1. It measures approx. 0.75 by 2.10 inches.

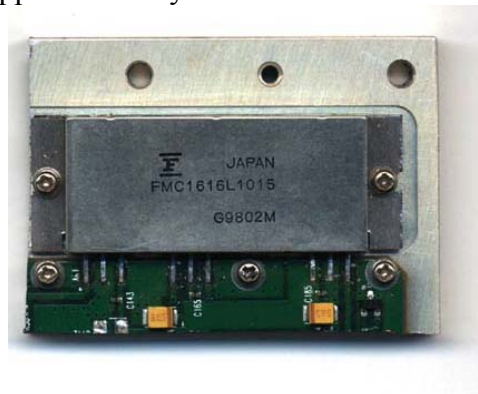


Figure 1. PA Module

Figure 2 shows the module, as "sawed out" of its original housing, with its lid pried off. The photo shows four locations where chip capacitors must be "piggybacked" on or next to the original chip caps to bring the frequency down to the amateur band. The new chip caps must be microwave ATC types and of approximately 50 mil size to fit the original capacitors. You will need one 1.5 pF, two 3.0 pF, and one 6.8 pF cap for the job.

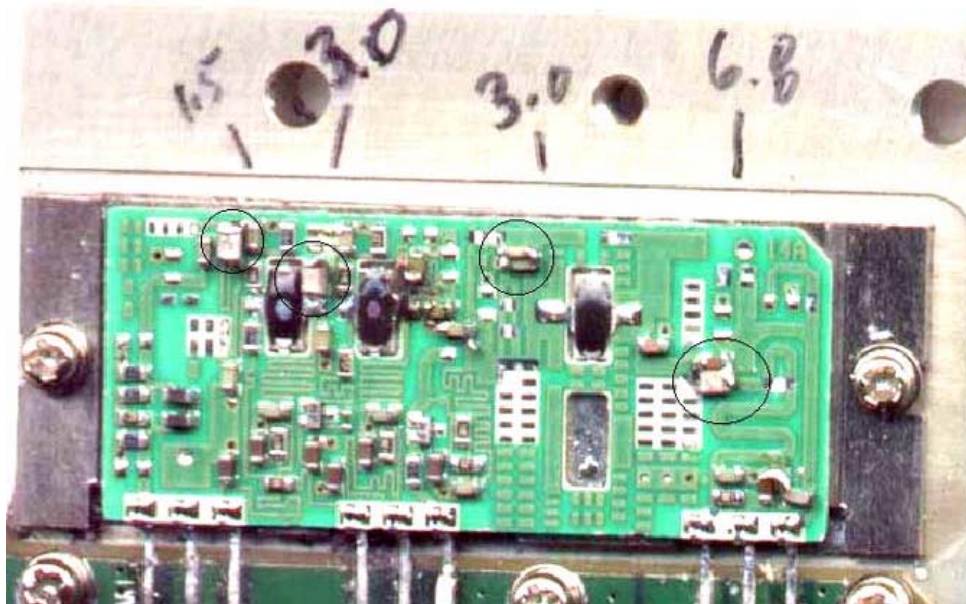


Figure 2.

Figure 3 is a drawing by WB6IGP showing the modifications in more detail, and the external power connections needed to run at the 5 watt level. For higher output, the Q3 +7V Drain connection can be separated and run at +9v with appropriate bypassing. The data sheet (for a FMC1616L1005 module) indicates absolute maximum ratings of -4V for the gate bias, +7 V for Q1 and Q2 drains, and +9v for the Q3 drain. Maximum rf input is +8 dBm but typical operation limit is +5 dBm. Gate current (total) is around 10 ma, and Idling drain current is 2.1 Amps (typical). The gate voltages must be present at all times prior to application of the drain voltages.

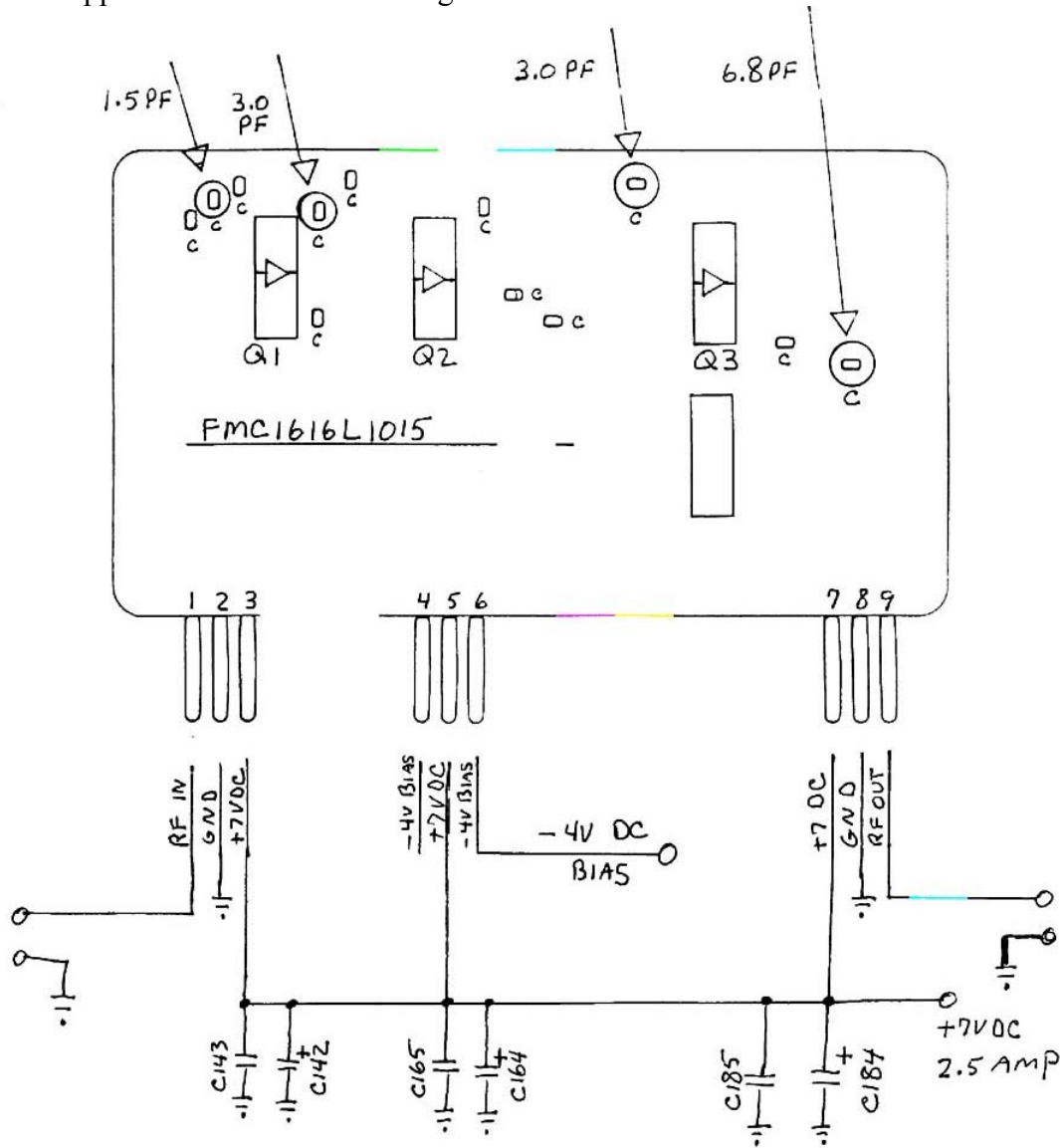


Figure 3.

After completing the modifications, replace the lid over the module to insure stability. The modified amplifier should be packaged in a suitable shielded form with input and output connectors to maintain vswr integrity and stability. The claimed efficiency is 35 percent, so sufficient heat sinking is required. For more information, contact Chuck Houghton, WB6IGP at [clough@pacbell.net](mailto:clough@pacbell.net) or mail to 6345 Badger Lake Dr. San Diego CA 92119