BuiLDING THE AR313 AMPLIFIER KIT

THE AR313 ASSEMBLY Manual PROVIDED BY COMMUNICATIONS CONCEPTS is... UMMM... SPARSE and lacking in detail.

THIS WEB PAGE FILLS IN THE GAP.

Made on a Mac

Communications Concepts, a small company located near Dayton, OH, offers a wide array of kits for HF and VHF amplifiers, all based on Application Notes published by Motorola, with circuits designed and tested by Motorola engineers. For any ham operator willing to undertake the building of a kit that doesn’t come within miles of Heathkit or Elecraft standards of documentation, these kits offer great value and performance. However, they require not only considerable circuit board and soldering skills (including ubiquitous use of tiny SMD components), but also metal fabrication skills to build cabinets, heat spreaders, etc. Moreover, the kits are “incomplete” in the sense that they don’t include a cabinet, RF input and output connectors, power connectors, power supply or FCC-required low pass filters to suppress harmonic emissions. (LPF filter kits are offered separately for HF bands, but for 6 meters and above, you’re on your own.) The AR313 kit was particularly appealing for me, because it offers 300 watts output when driven by only 15 watts and powered with 28VDC at 22 amps, covering ham bands from 20 through 2 meter. The 28VDC power requirement can be met by my rover station platform, a military surplus vehicle with a 24VDC vehicle electrical system. I built the 313 amplifier specifically for use in VHF contesting, configured with I/O and output filters for only 6 meters and 2 meters. It works wonderfully, and the added signal strength makes a big difference, especially working 6 meter sporadic-E contacts. There are three documents of interest available to anyone considering building the AR313 amplifier: The original article describing the AR313 by H.O. Granberg of Motorola, published in the February 1988 issue of RF Design magazine, and reprinted by Motorola, available from the Communications Concepts web site. An earlier article by Granberg describing the 50-volt AR305 version of the same amplifier, worth reading because it covers some details that are skipped over in the AR313 article, also on the Communications Concepts web site. Data sheet for the MRF141G dual (Gemini) power amplifier transistor. This portion of my web site provides discussion of four challenges presented to anyone building the AR313 kit. Circuit board construction details not discussed in the provided documentation LPF filter alternatives for 6 meters and 2 meters Band switching alternatives for I/O control Metal fabrication challenges – the heavy copper heat spreader, an amplifier case, and LPF filters, including a novel means of heat sinking using an all-copper chassis rather than conventional aluminum heat sinks. Thanks to Mark Kennard, ZL2WHO of New Zealand, for many useful tips on construction of the AR313. A word about Communication Concepts: Some hams have complained about non-responsiveness to emails and phone calls from this company. I have found that to be somewhat valid. If you want to reach them immediately, call the phone number on their web site rather than using email. They are quite responsive once you reach them, and the people who answer the phone seem technologically knowledgeable. If you have any questions that this web site doesn’t answer, email me at k6lmp (at) me (dot) com. Lew K6LMP