



Design Note

From: DEMI R & D Dept.

DN#: 022

Date: May, 28, 2008

Re: 1 watt output of AH215 in 1296 transverter

PREFACE: The newest design 1296 MHz. transverters, the DEM1296-144 and 1296-28 are factory stock, kit or assembled, at the ½ watt power level. This power level is more than adequate to drive any power amplifier now produced by DEMI. In the transverter, we utilize a AH215 power amplifier that is capable of delivering +1 watt output at 1296 MHz. The reason the transverter will not deliver this maximum power output level is because of the AH215's gain dropping off above 1.2 GHz. This coupled with the insertion loss of the 3-pole filter, and the resistive biasing of the IC7 MIMIC's, maximum output power seldom exceeds 600 mW. Bottom line is the base transverter cannot drive the AH215 hard enough. If you require more output power than the basic ½ watt, this simple modification to the bias circuit of IC7 can be made and the output power will increase by over 2-3 dB. Please note that if your transverter is less than 400 mw to start with, something is not correct within your system. It is suggested to explore and trouble shoot the TX circuit to increase the power to the specified level. It is recommended not to use this modification to cure an out of spec transverter.

CIRCUIT MODIFICATION: The modification is comprised of adding a RF choke and bypass capacitor between IC7 and R25. The RF Choke can be wound out of small enamel wire #26 -#30 and should be between about 5 turns close wound of approximately .05" in diameter. This choke is forgiving. A little larger, smaller, more turns or less should not matter much. You are just looking for a good RFC at 1.3 GHz so think small. L10 on the transverter is a heavier gauge version of what you require. One end of this choke attaches directly to the output lead of IC7 where R25 was connected. R25 now connects to the other end of the choke. A bypass capacitor should be installed between the choke and R25 to ground. Use something left over in the kit or a higher quality microwave type cap of just about any value of .1uf down to 22 pf. The higher quality caps are a bit heavier in construction and can hold up physically being soldered one end to ground and the other end being the support of the junction of the new RFC and R25. The attached picture shows a modification. It is a 6 turn coil and a 33 pf capacitor. The only caution is that the higher value the cap is, the requirement of better quality component increases. Keep the choke close to the circuit board. If elevated, radiated signal may couple into the circuit and cause oscillation. If you have trouble with oscillations, suspect the bypass capacitors quality and or increase the value.

TESTING: Testing is simple. Just check for an increase in output power and verify that there are no stray oscillations. You may be able to achieve a few more mW's of output by adjusting the band pass filter slightly.

FURTHER DISCUSSION: Yes, there is a 2-watt component that will drop in. It is called AH312. It will suffer the same problem as the AH215. **Low gain at 1.3 GHz!** It will draw more power and create more heat inside of the transverter. We may use it in the future if we come up with an additional amount of drive. The AH215 requires >+17 dBm of drive to produce 1 watt of power. The AH312 requires +20 dBm to produce 2 watts. This is being researched for future implementation.

