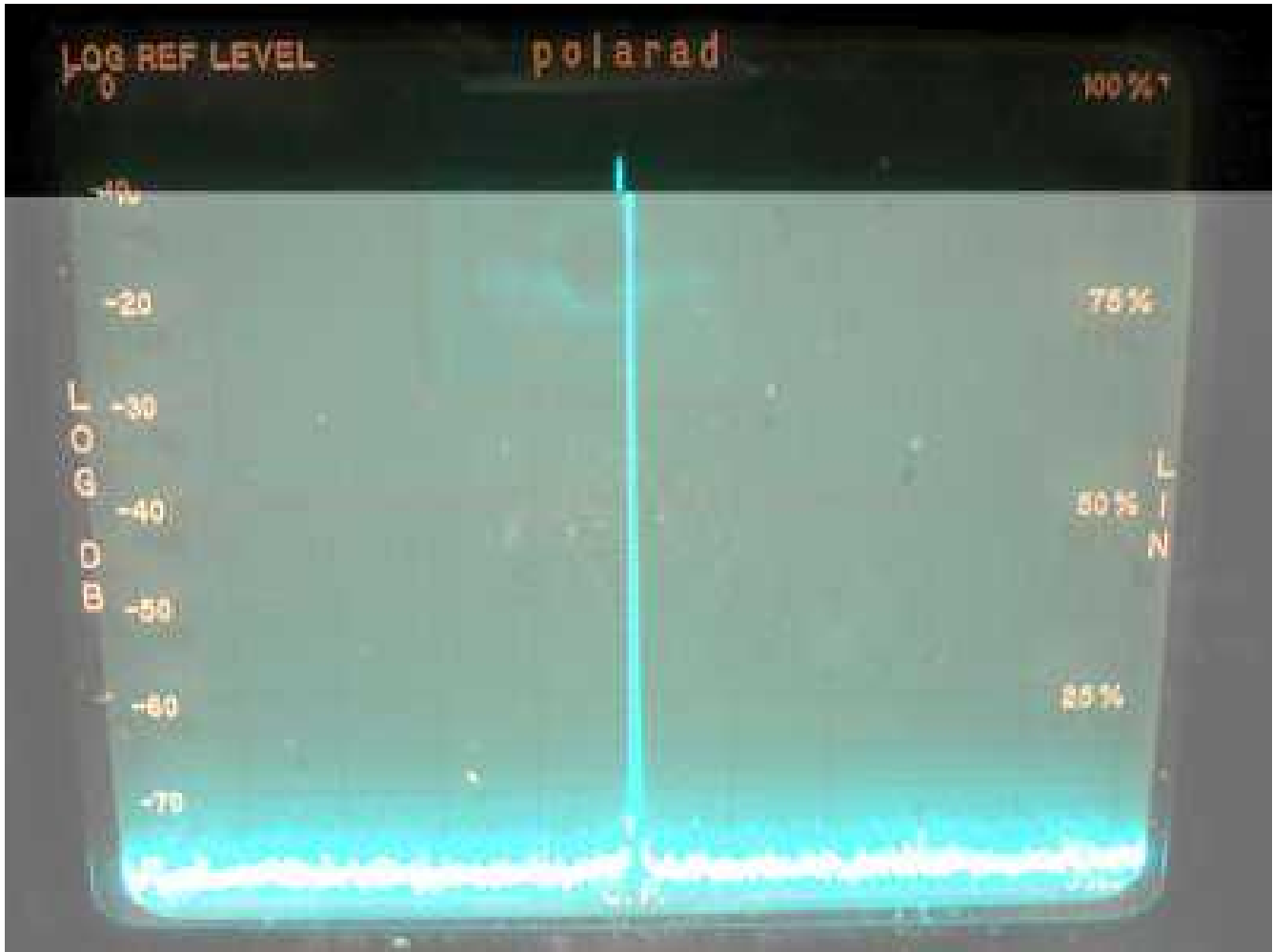


Demystifying The VX-2R Hardware Free-Band Modification



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Introduction

Do not ever transmit outside of the amateur bands that the Yaesu VX-2R was designed for. Do not modify your radio. Performance may differ from radio to radio; you have no reason to expect that these measurements hold true for all VX-2Rs. You may cause unintended interference using modified radios, which is illegal. Measurements were performed with a hardware jumper modified Yaesu VX-2R (purchased in March 2006), Polarad 632C-1-6 2GHz spectrum analyzer, and a SMA male to N male RF cable. All testing was performed with minimal audio input, fully charged battery power ranging from 4.2V to 4.1V, radio transmit power set to low, and otherwise default radio settings. All RF output from the radio was safely dissipated as heat by the dummy load in the spectrum analyzer and no energy was radiated into the environment. The log scale in the spectrum analyzer photos is relative to the reference level of 30dBm, which is 1000mW or 1W.

Amateur Band Performance and Spectra

The following four shots were taken in the two amateur bands that this radio was designed for. The radio output at 145MHz is -9dB of the reference 30dBm (21dBm or 125mW). The radio output is -7dB of the reference 30dBm (24dBm or 250mW) level at 446MHz.

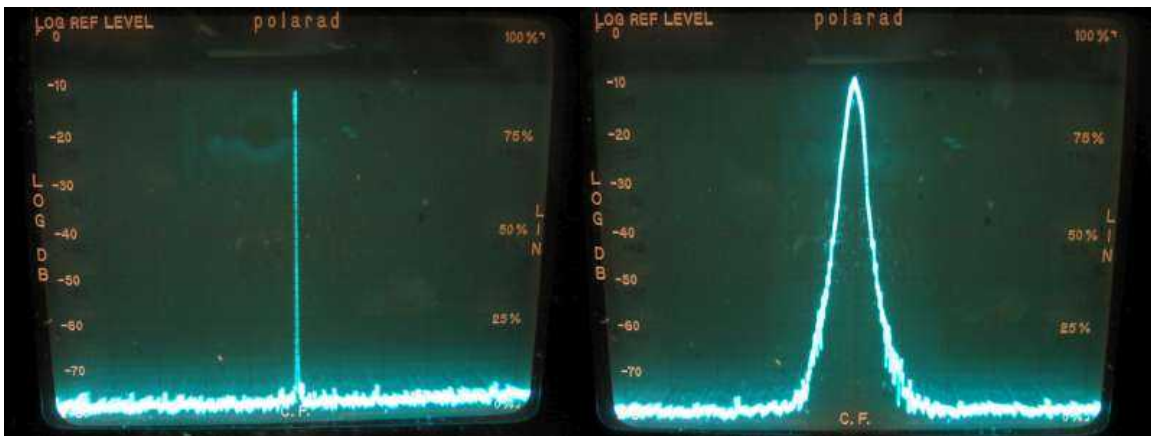


Illustration 1: 145MHz 30dBm 1MHz/div

Illustration 2: 145MHz 30dBm 5KHz/div

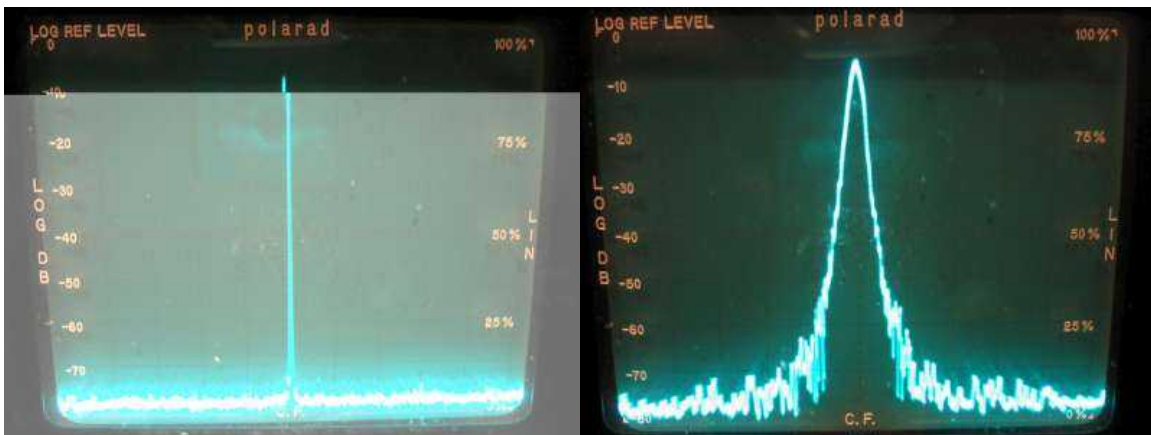


Illustration 3: 446MHz 30dBm 1MHz/div

Illustration 4: 446MHz 30dBm 5KHz/div

Free-Band Transmit Ranges and Spectra

The usable transmit range (illegal, emergency only, life and death situation) is 120MHz to 221.950MHz and 300MHz to 548MHz inclusive. Output at 119MHz and below was not detected even though the red TX light was on. Output at 549MHz and above was also not detected; the red TX light pulsed for less than one second when PTT was pressed and then went out.

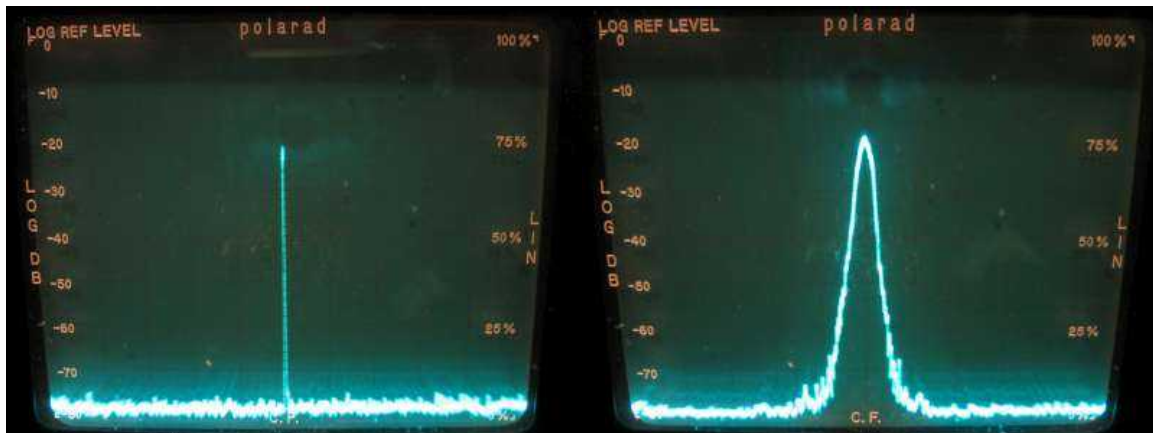


Illustration 5: 120MHz 30dBm 1MHz/div *Illustration 6: 120MHz 30dBm 5KHz/div*

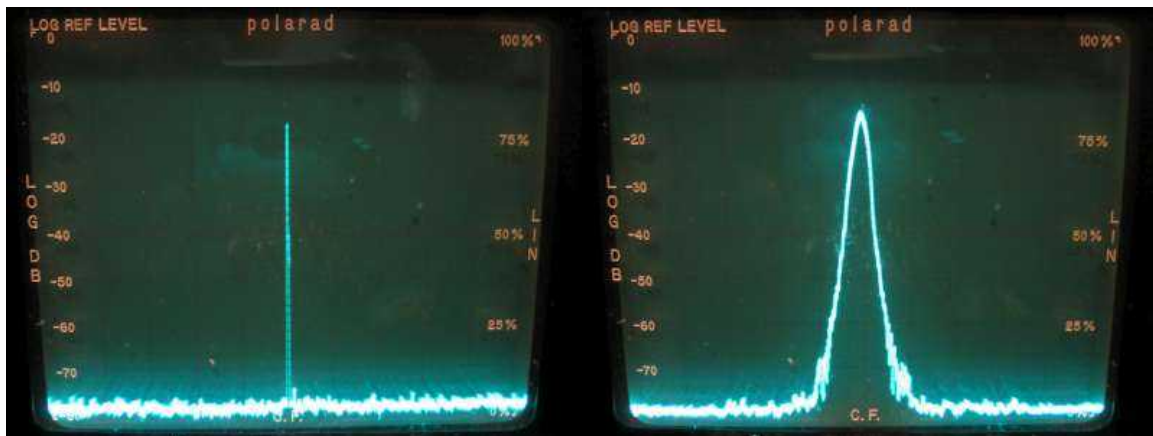


Illustration 7: 151.820MHz 30dBm 1MHz/div *Illustration 8: 151.820MHz 30dBm 5KHz/div*

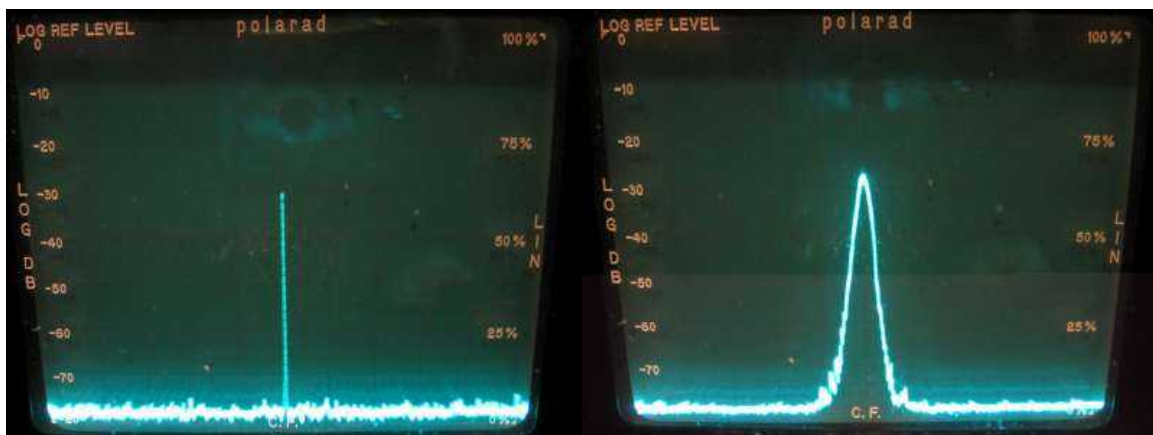


Illustration 9: 221MHz 30dBm 1MHz/div *Illustration 10: 221MHz 30dBm 5KHz/div*

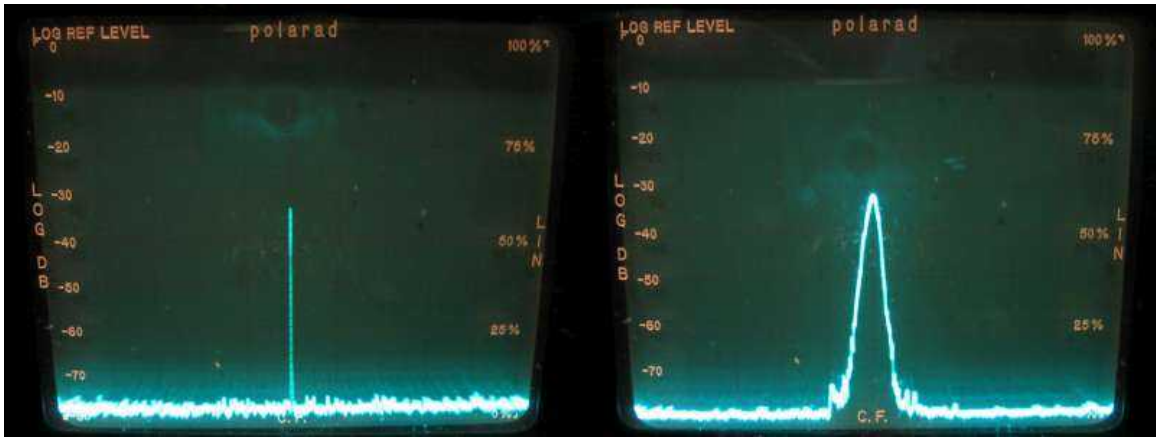


Illustration 11: 300MHz 30dBm 1MHz/div Illustration 12: 300MHz 30dBm 5KHz/div

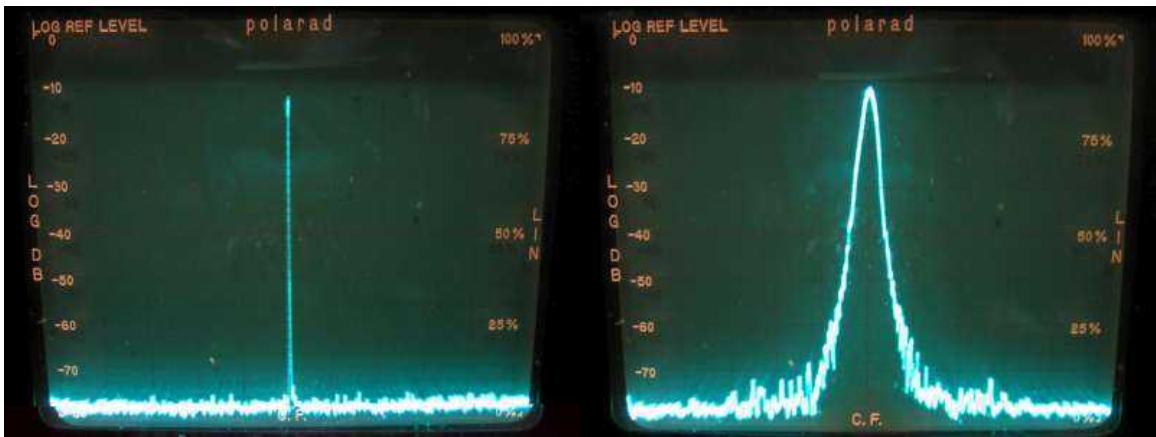


Illustration 13: 462.5625MHz 30dBm 1MHz/div Illustration 14: 462.5625MHz 30dBm 5KHz/div

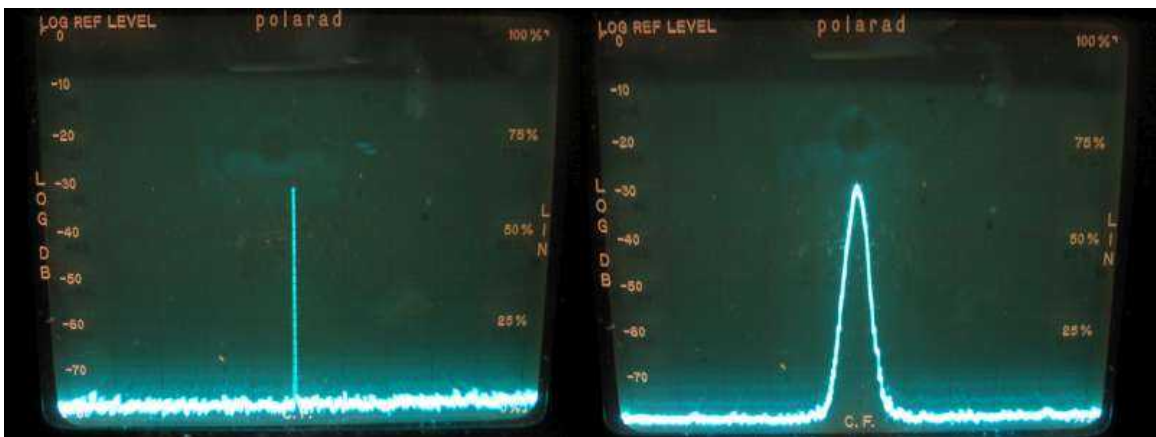
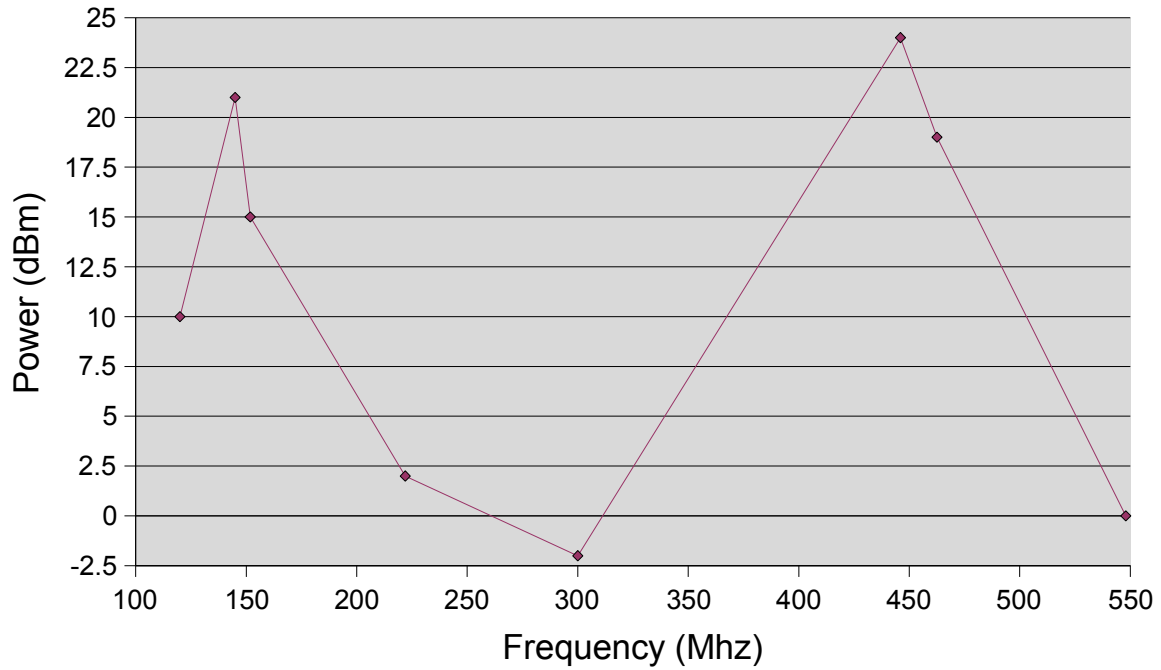


Illustration 15: 548MHz 30dBm 1MHz/div Illustration 16: 548MHz 30dBm 5KHz/div

Power Output Summary

These power output numbers come from the peak values on the 5KHz/div spectra. The value is computed by 30 dBm reference – peak value (dB) = dBm. Power in mW = $10^{(dBm/10)}$.

Power Output



Power Output

