

MX-P50M HF Amplifier

Tests and findings

by Peter VK2EHQ



Specifications of the MX-P50M HF Amplifier:

Frequency Bands:	80m 40m 30m to 17m 15m to 10m
Operating Modes:	SSB, CW, AM, RTTY, FM
RF input:	5W
Out power:	45W
Band mode:	Manual
Power requirement:	13.8DCV @ 8A
Cooling method:	Passive air cooling
Antenna connector:	SO-239 50Ω

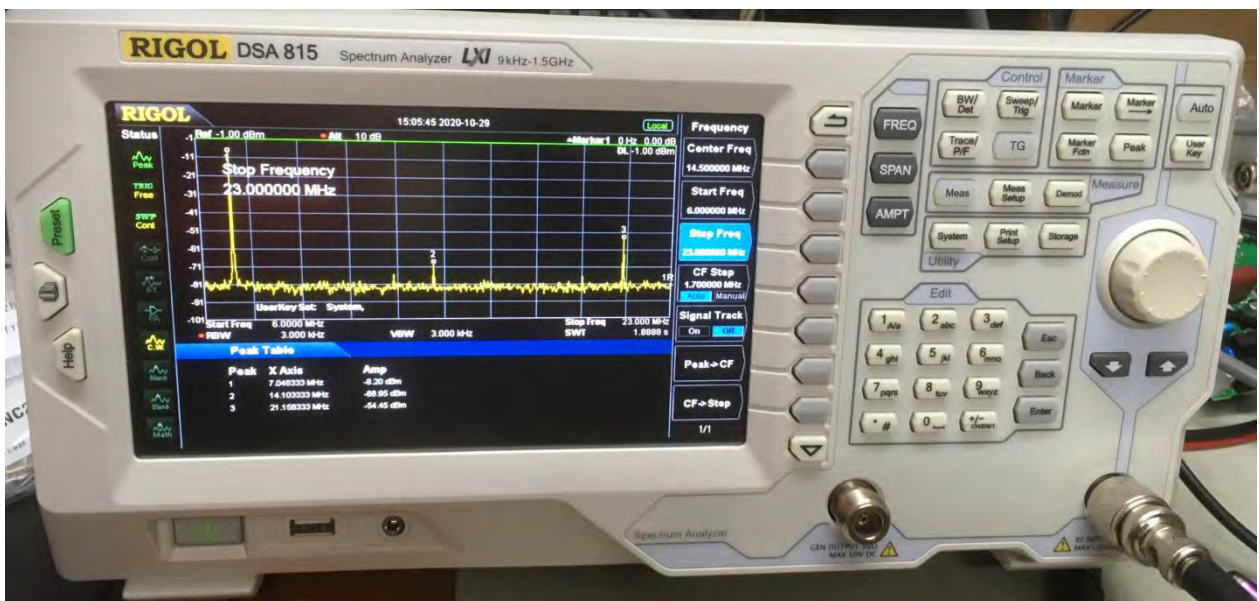
Disclaimer: I am not promoting this amp or the purchase and usage of it. I was just curious as to how good or bad it was for HF digital modes. I will leave the interpretation of my test results up to you.

Having purchased an Icom IC-705 for Karen VK2AKB and having heard good comments on the MX-P50M HF amplifier, I decided to purchase a unit to evaluate my own findings and pass them on. The cost of an alternative amplifier for portable use is over 600% dearer.



The IC-705 will primarily be utilized for WICEN HF data activities as well as portable use. Reports I read, indicated that the MX-P50M didn't create splatter and the signal was readable and without apparent issues. This is possibly fine for SSB on VHF/UHF but HF data is a "little" more demanding. The transceiver may meet all the criteria of frequency accuracy, stability and signal drive level, but an amp can change that ideal scenario.

The test equipment used was a Rigol DSA-815-TG spectrum analyser. The signal was coupled from the IC-705 via a Coaxial Dynamics directional coupler and associated RF 50 Ohm load.



Rigol DSA-815-TG spectrum analyser

These couplers can vary the attenuation between 35-65dB as well as the variable attenuation built into the Rigol. Better safe than sorry as a direct RF signal into bench test equipment could end up letting the smoke out.



Coaxial Dynamics directional coupler and associated RF 50 Ohm load

Testing of the amp was conducted at 40 and 100% output power from the IC-705. Bands tested were all HF bands except 160m, as this band is not covered by the amp.

The signal injection into the amp was modulated with JS8Call tuning tones, this being an 8 tone FSK signal. Transceiver ALC drive level was 25-30% maximum for the main purpose of showing the worst scenario of amp performance. Ideally for HF data, zero or absolute minimal ALC indication is preferred. Opinions can and do vary. The way I look at it, it's your signal, not mine. As a comparison, testing was also conducted on the IC-705 "barefoot" at a full 10 watt output.

Out of curiosity, I tested a Yaesu VX-8 on 2m as a comparison to the IC-705.

An ideal spreadsheet calculator to aid in working out how many dB down from the fundamental frequency the harmonics are, using a little maths, can be found at:

<https://www.thefoa.org/tech/ref/testing/test/Calc-dB-W-dB.xls>

I calculated a couple of random bands and found the 2nd and 3rd harmonic appeared to be -50 to -55dB down, which for a relatively affordable unit, is reasonable and within FCC criteria, if I recall correctly. I'll leave it to you to look up ACMA's requirements.

Keep in mind, my reason for acquiring this unit, was for testing and actually observation of the results.

Amplifier RF output with a 3.25w input (IC-705) is as follows:

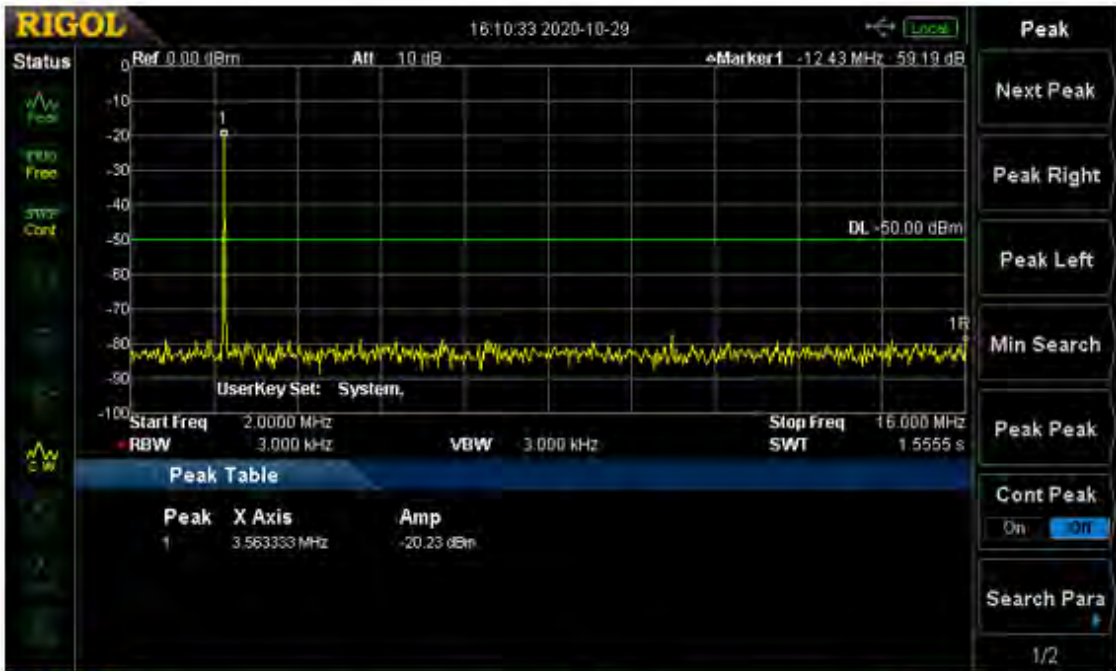
80m -	25w
40m -	28w
30m -	28w
20m -	28w
15m -	28w
10m -	22w

Test results are as follows:

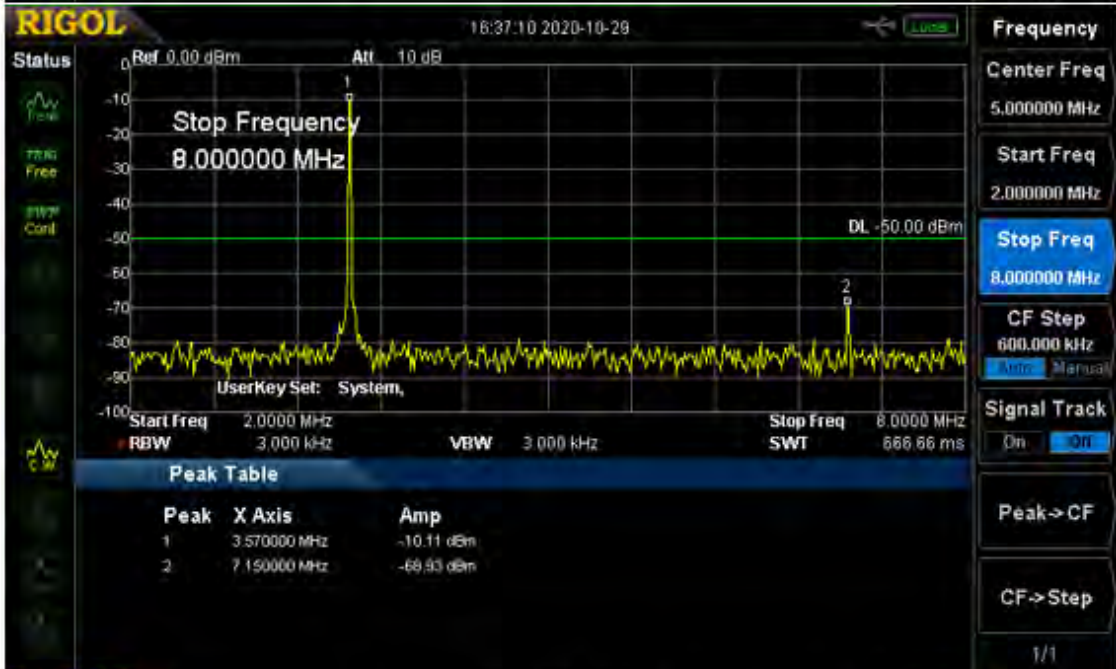
There are 9 sets of test groups, each with 3 screenshots.

The top screenshot indicates the IC-705 without the amp inline, the second with the amp driven by the 705 at 40% power output, while the third is with the amp and the IC-705 at 100% (10w) output. In all cases, the IC-705 and amp were powered by a 13.8DC linear supply.

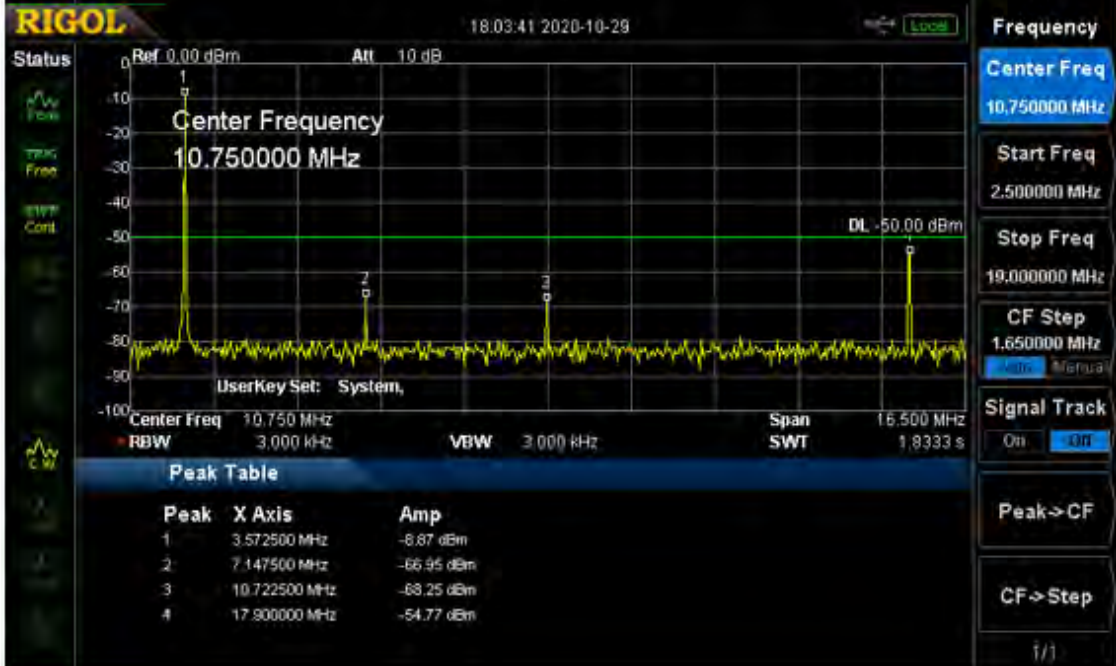
80m - 40% output



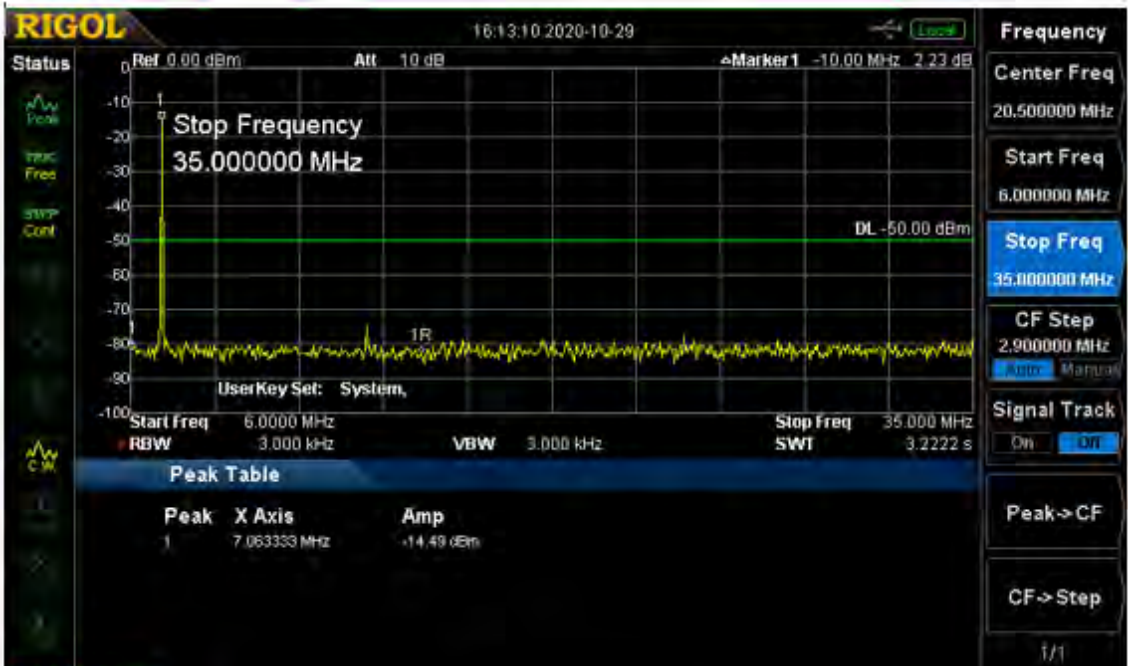
80m - 40% output & amp



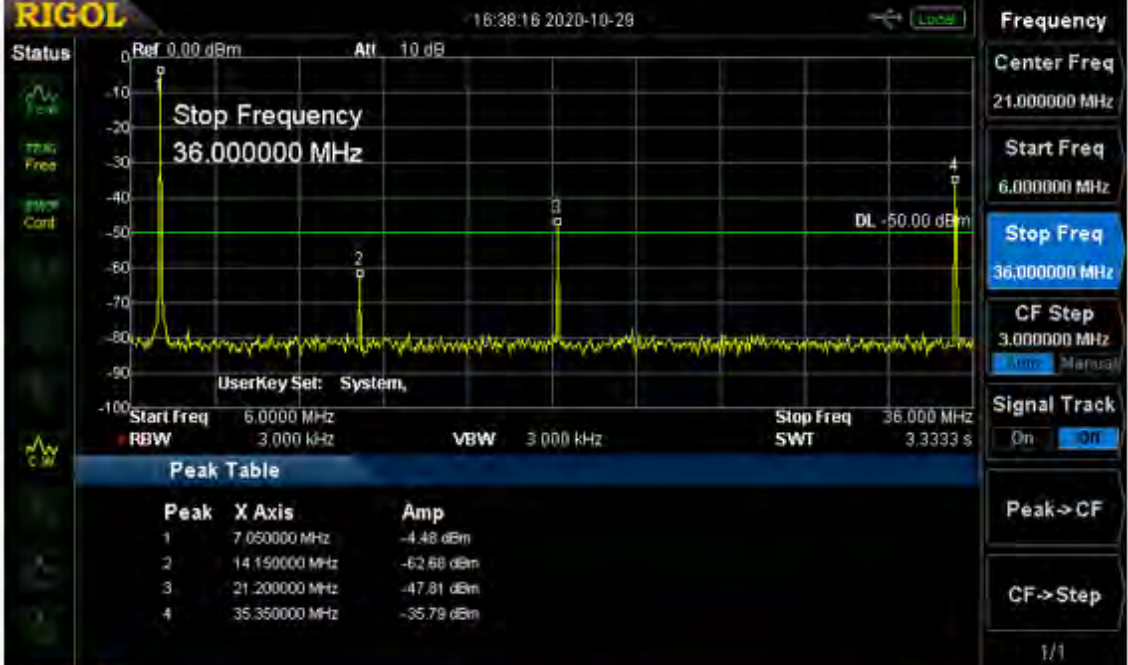
80m - 100% output & amp



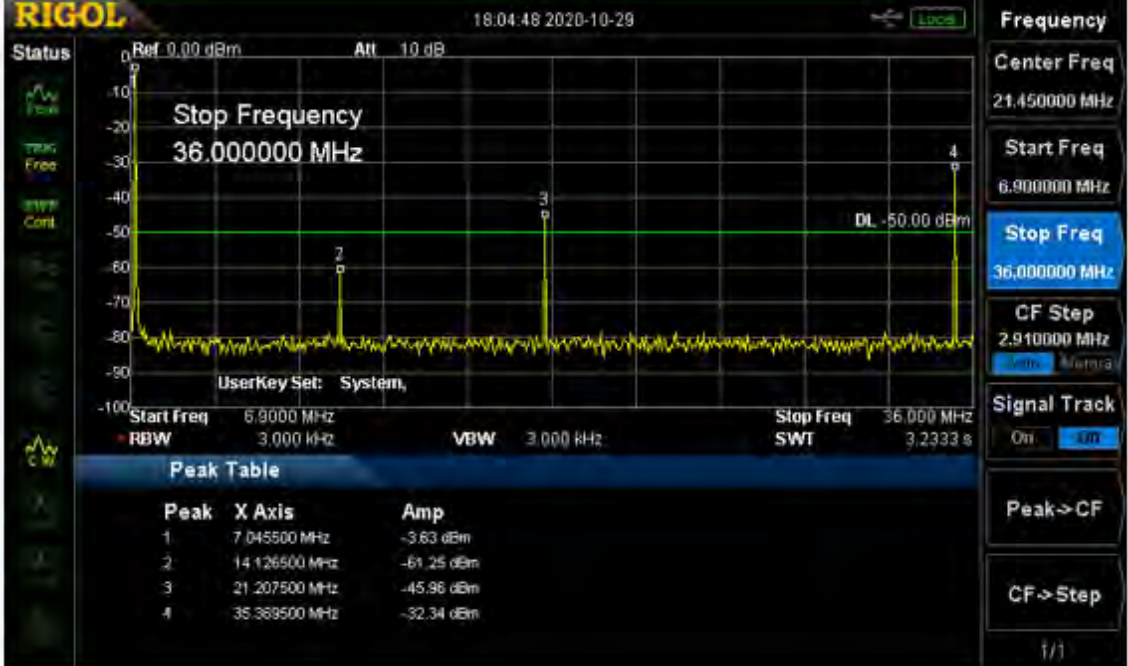
40m - 40% output



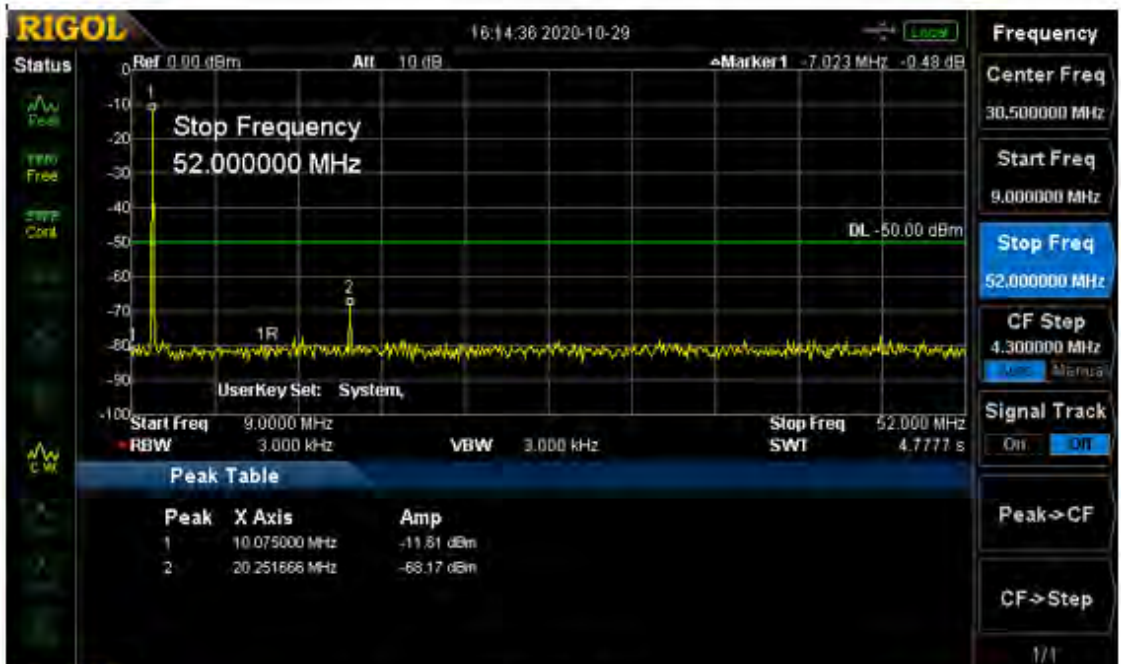
40m - 40% output & amp



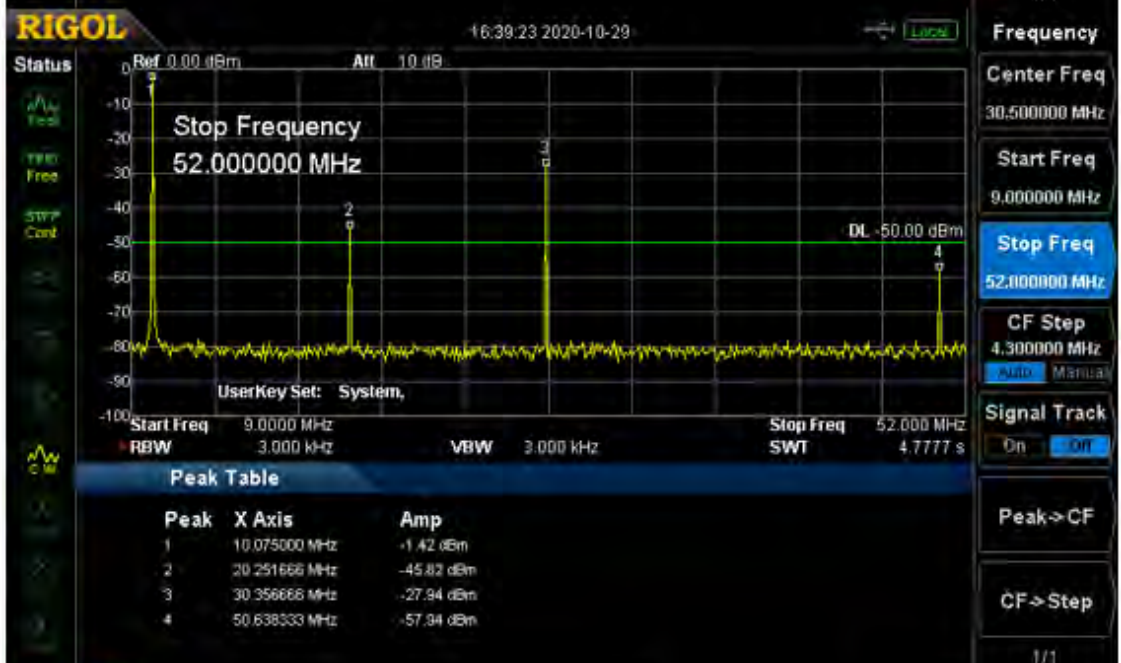
40m - 100% output & amp



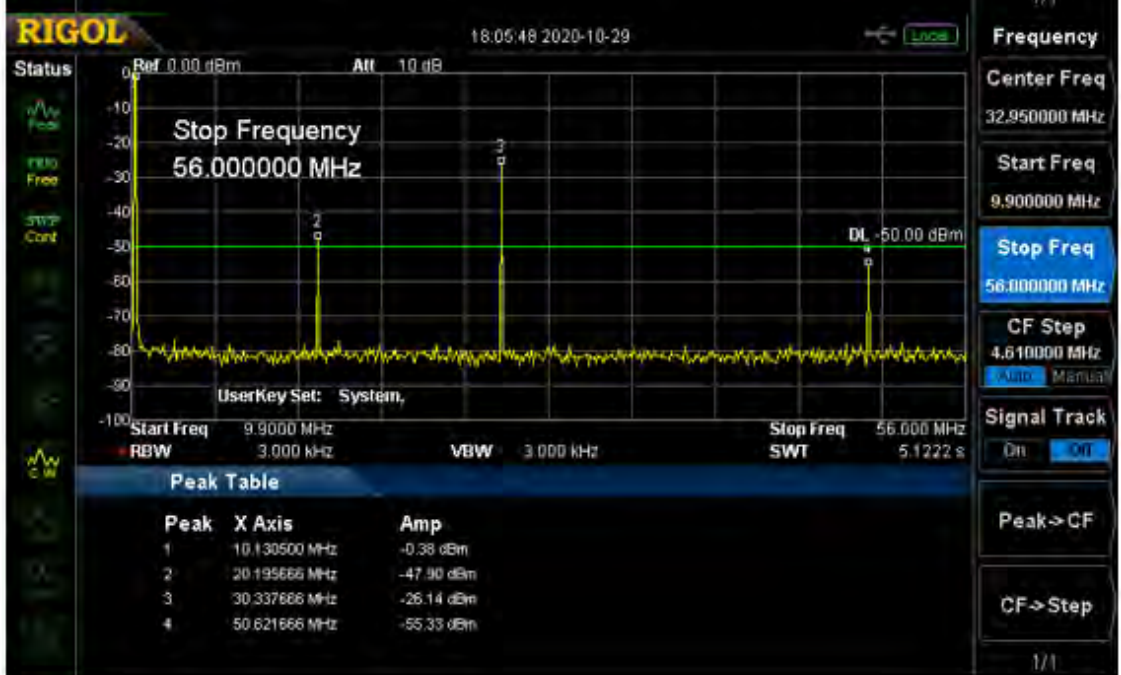
30m - 40% output



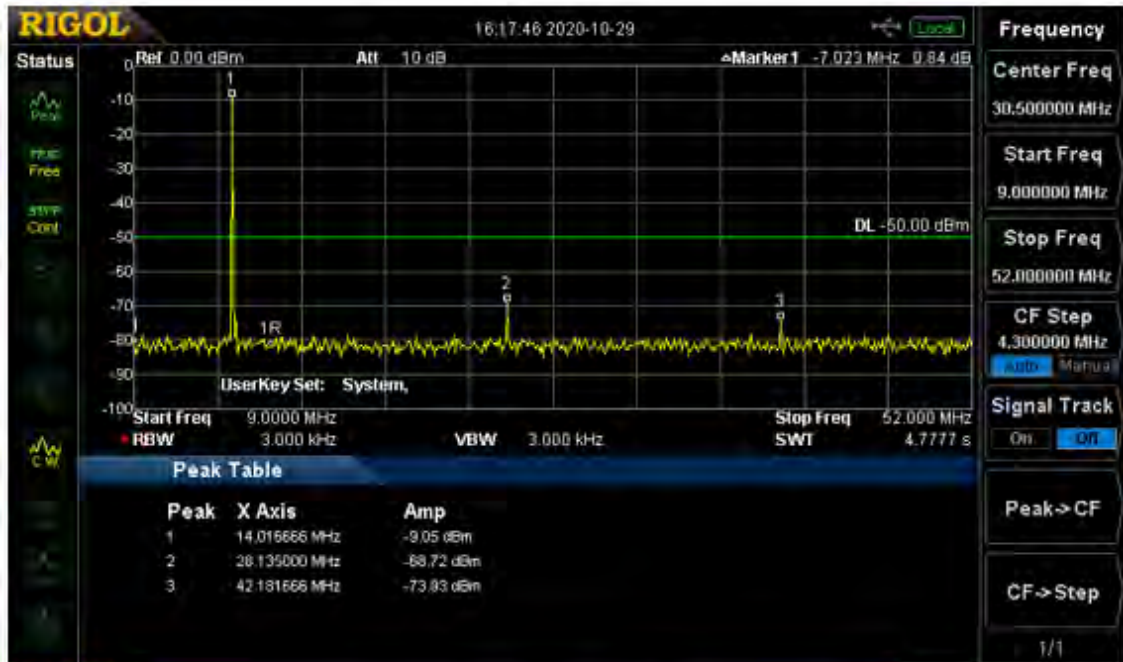
30m - 40% output & amp



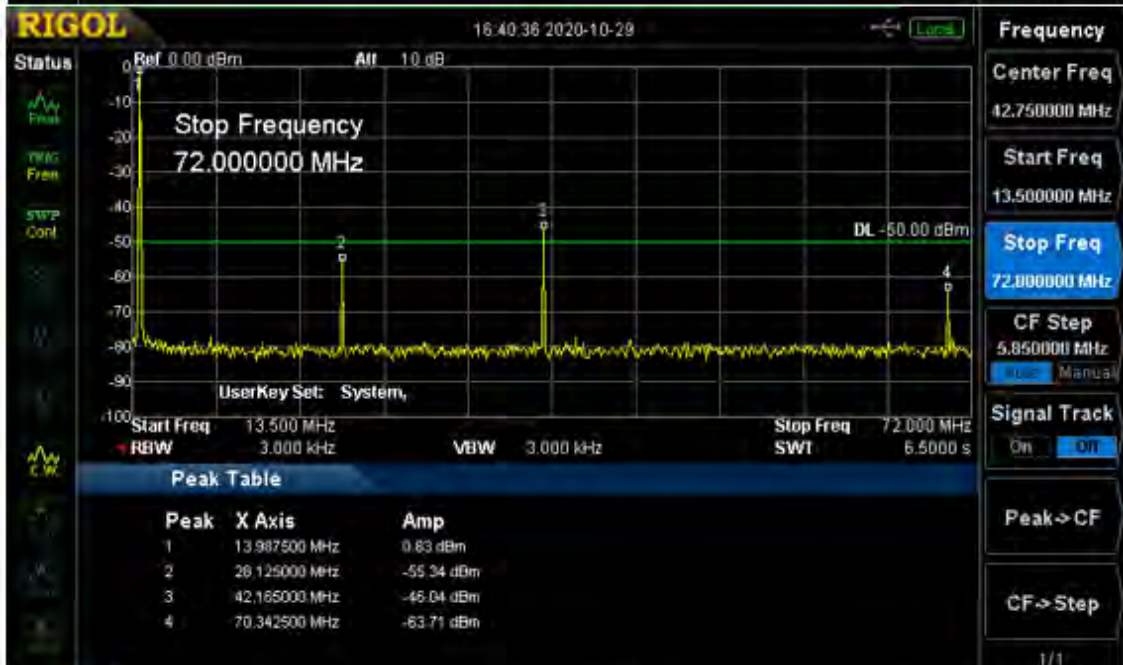
30m - 100% output & amp



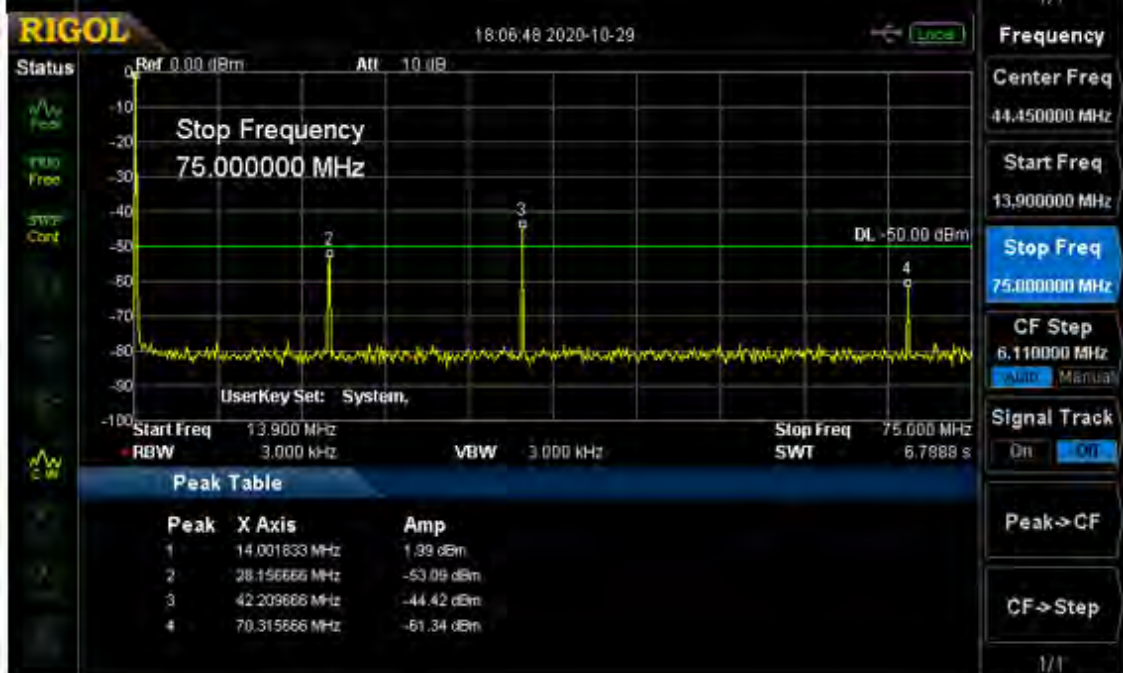
20m - 40% output



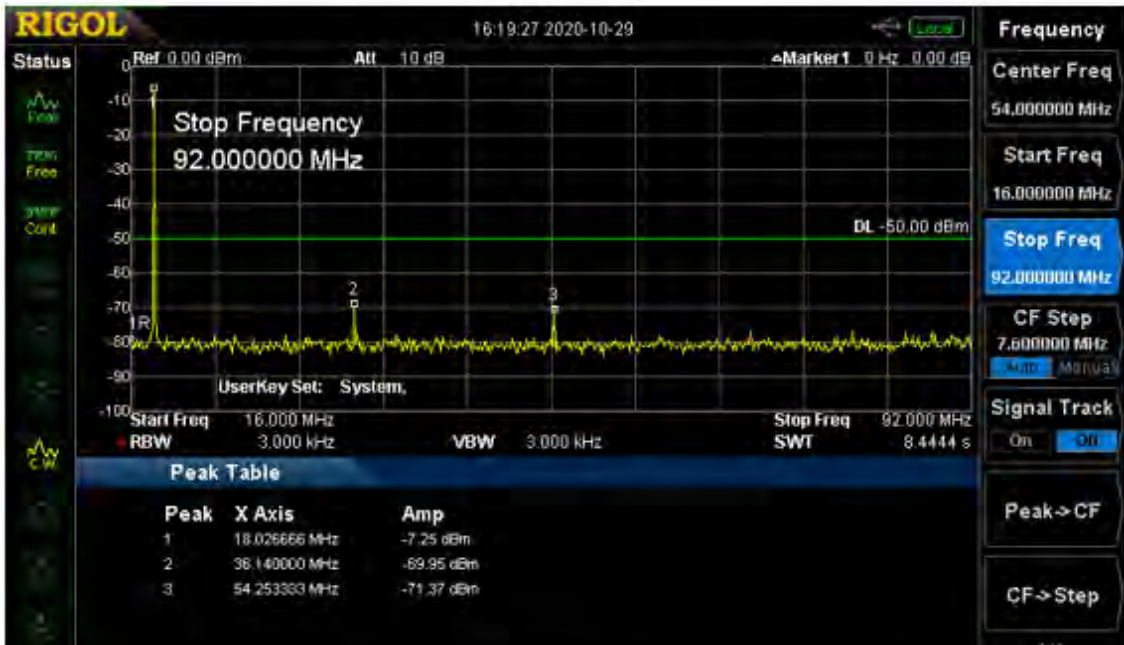
20m - 40% output & amp



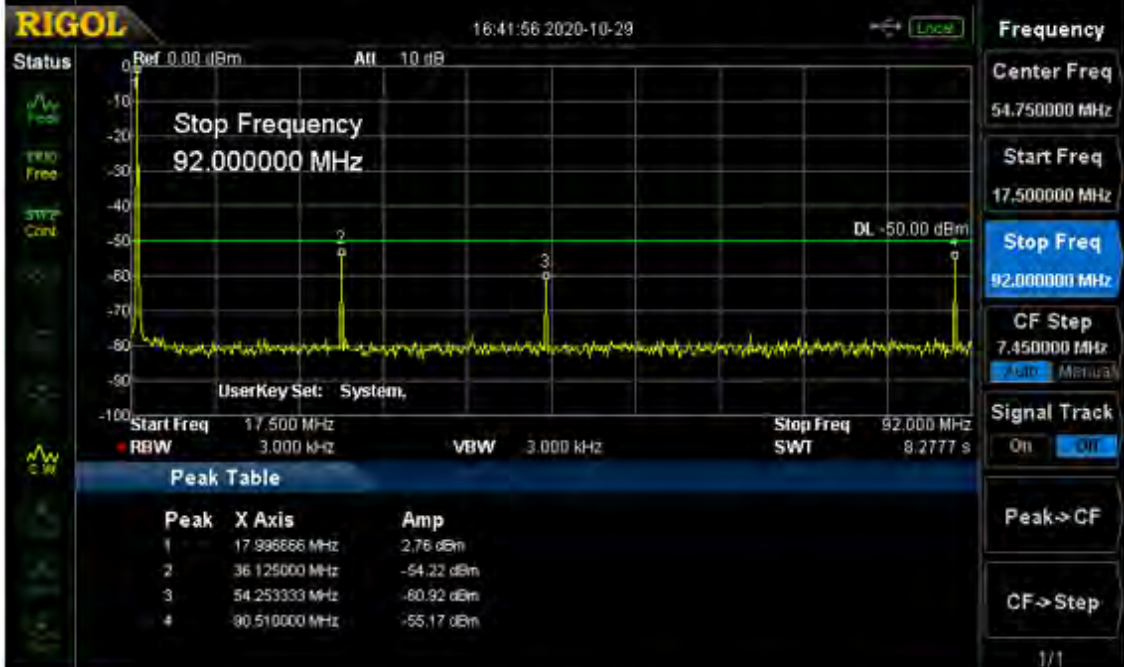
20m - 100% output & amp



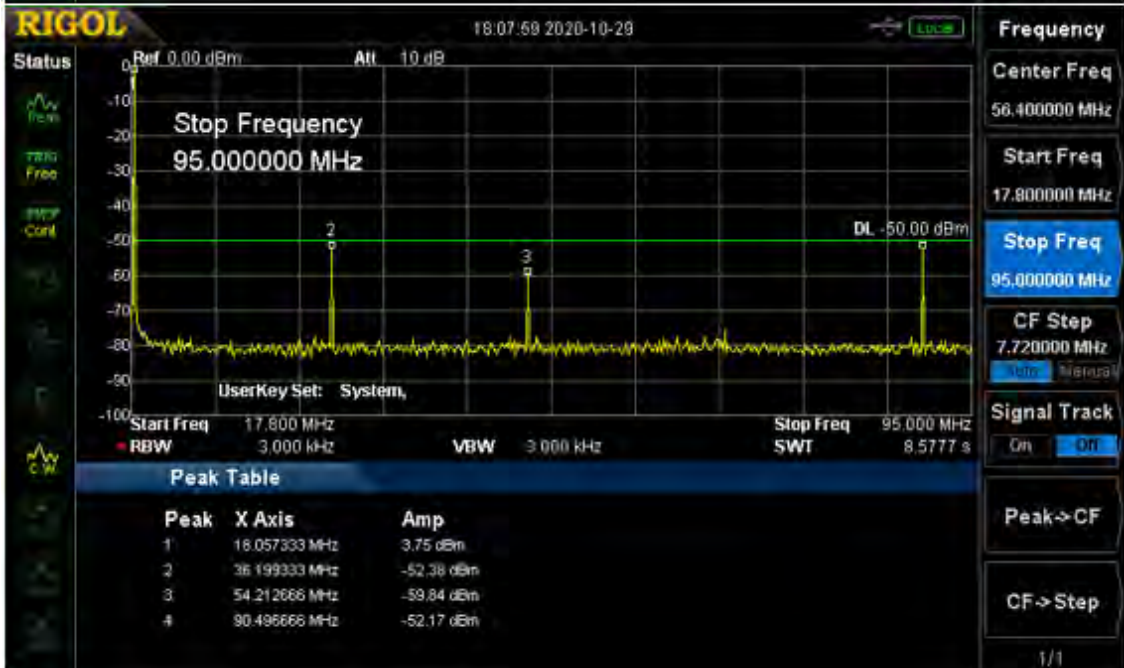
17m - 40% output



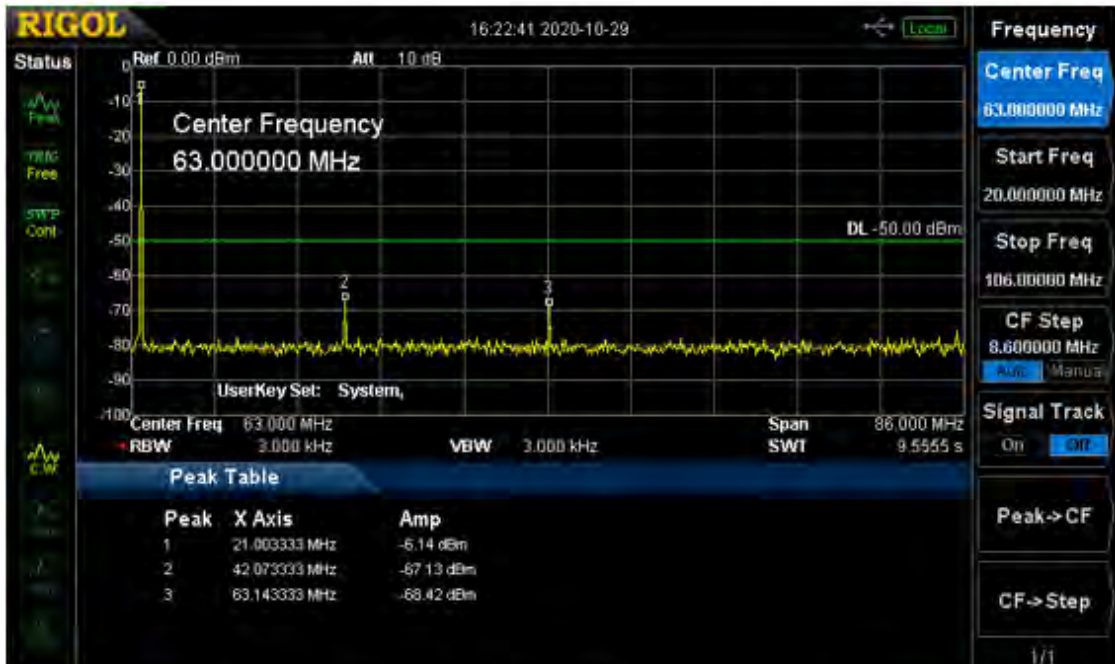
17m - 40% output & amp



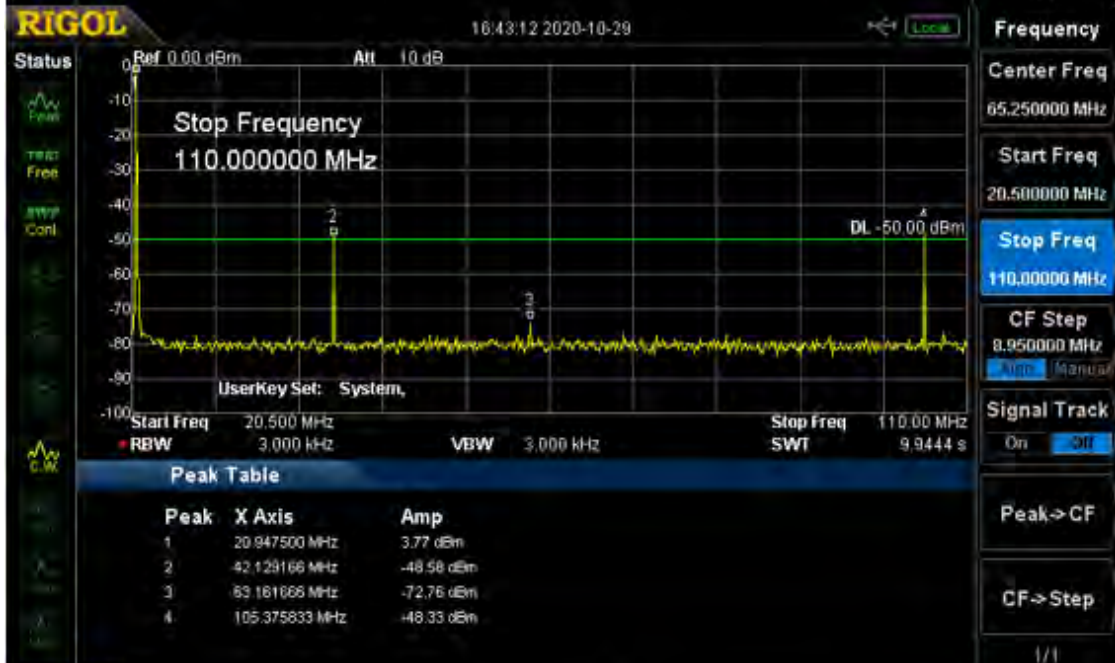
17m - 100% output & amp



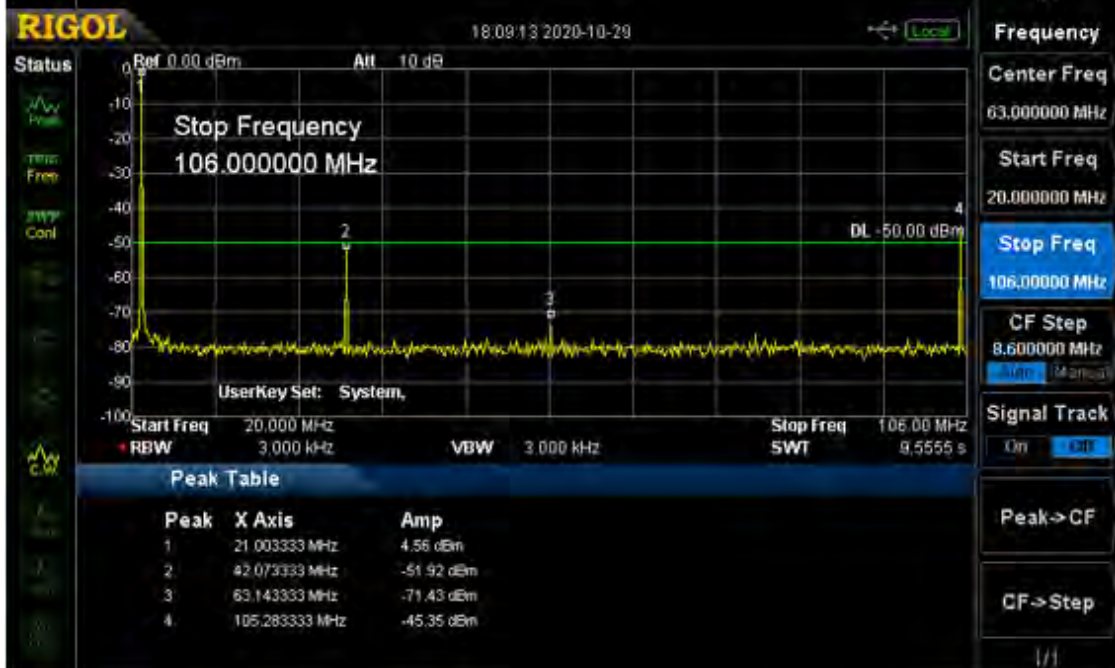
15m - 40% output



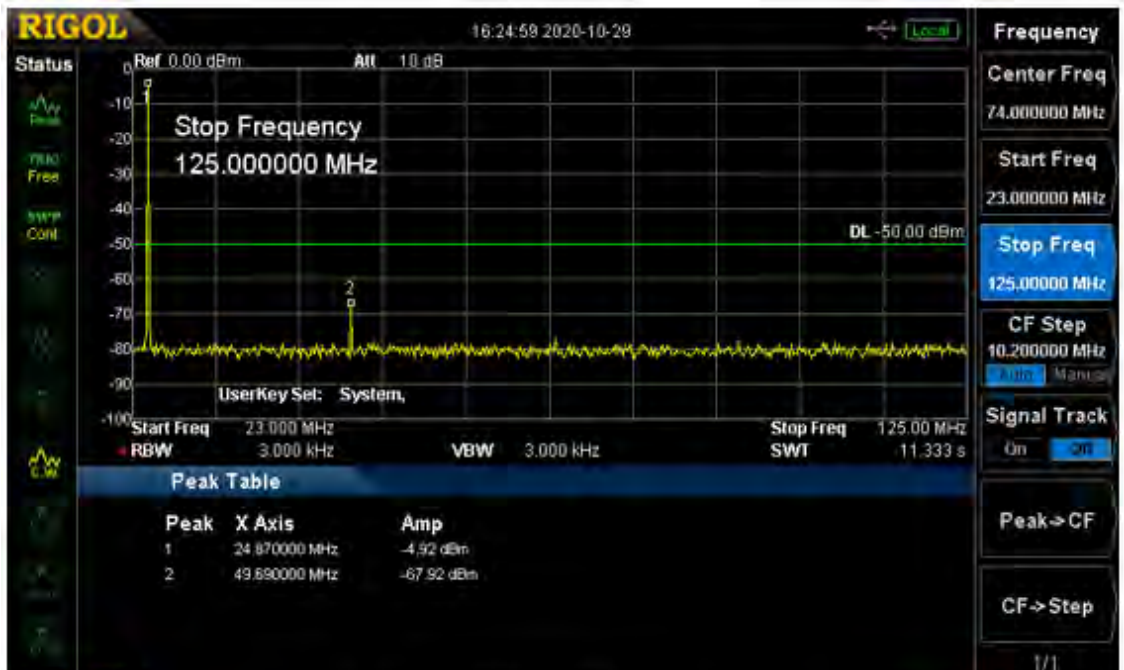
15m - 40% output & amp



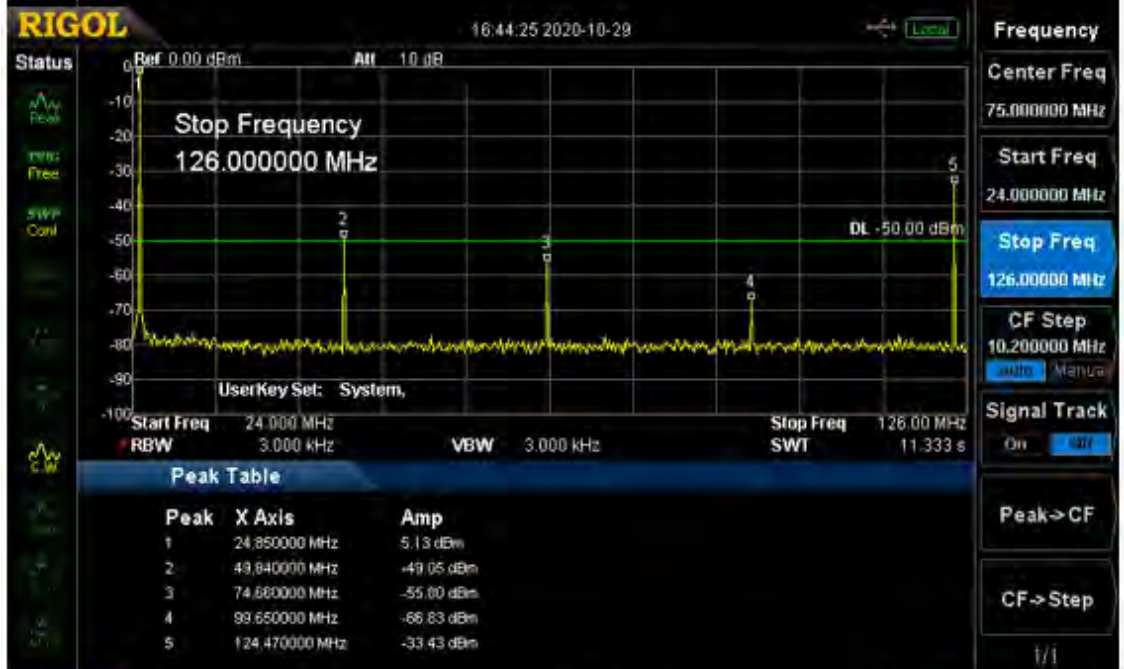
15m - 100% output & amp



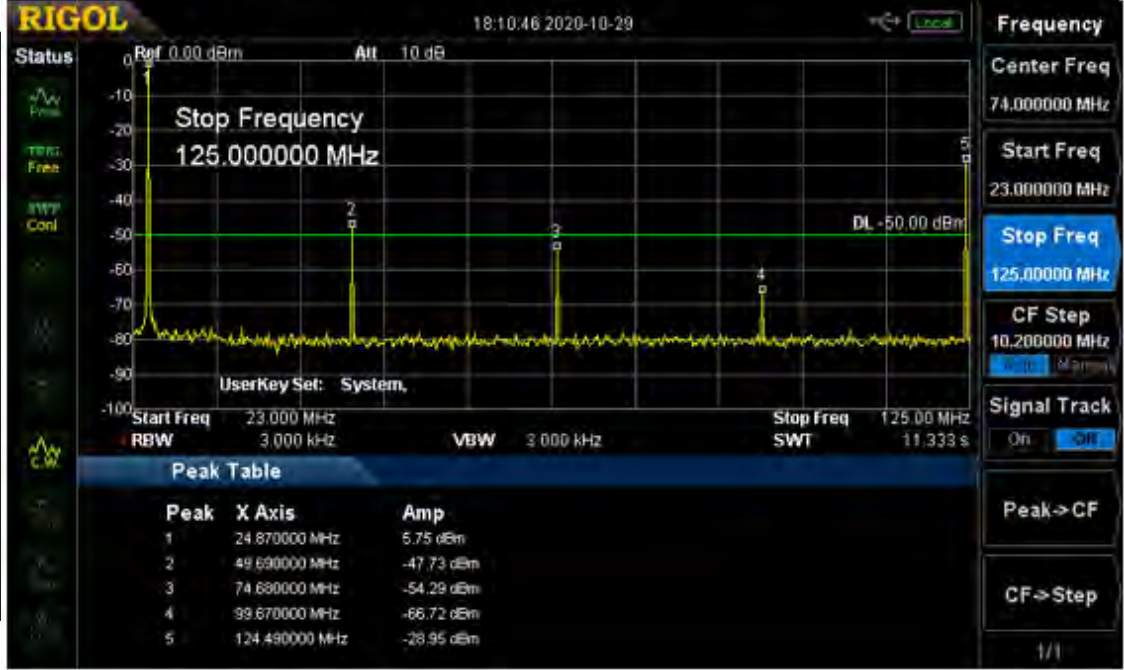
12m - 40% output



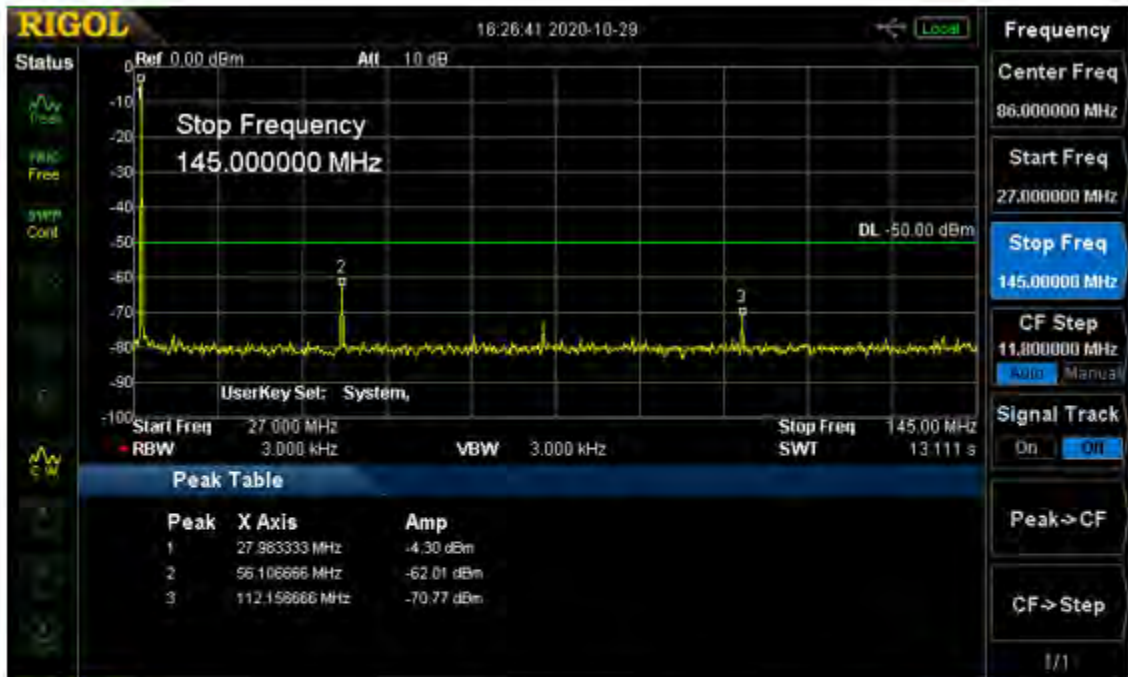
12m - 40% output & amp



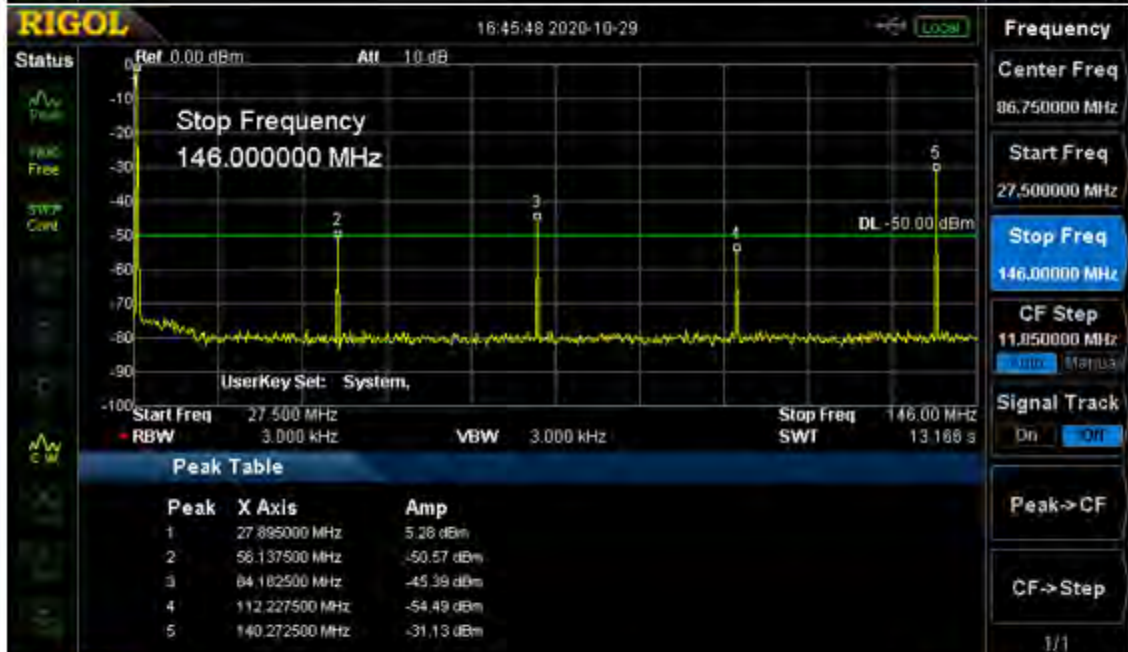
12m - 100% output & amp



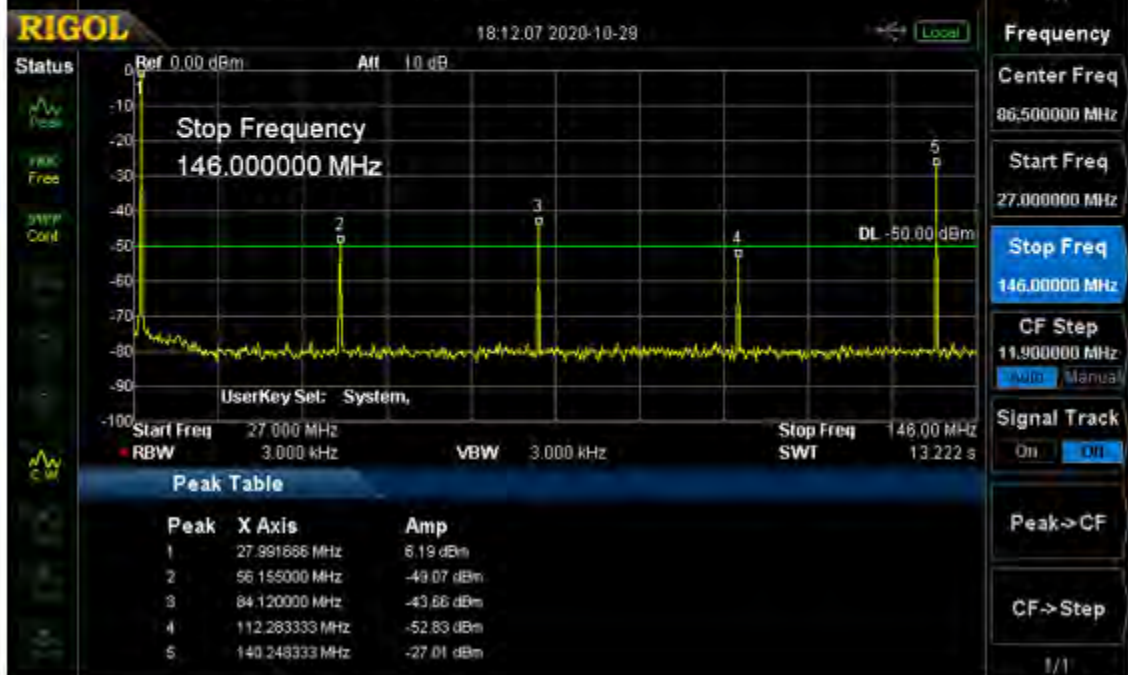
10m - 40% output



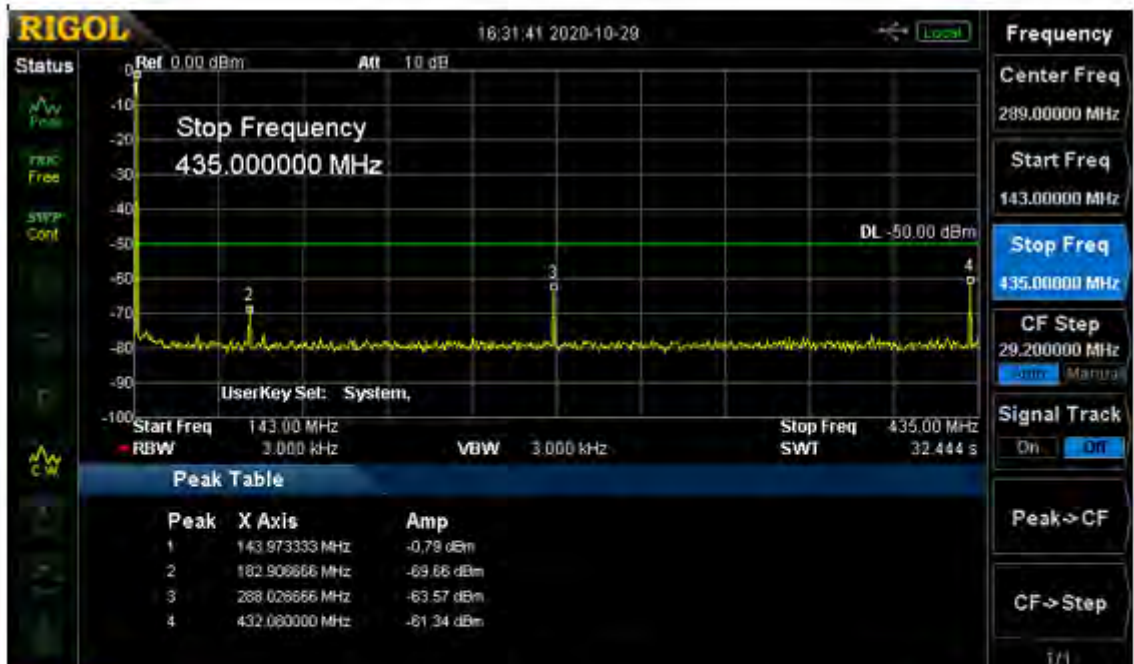
10m - 40% output & amp



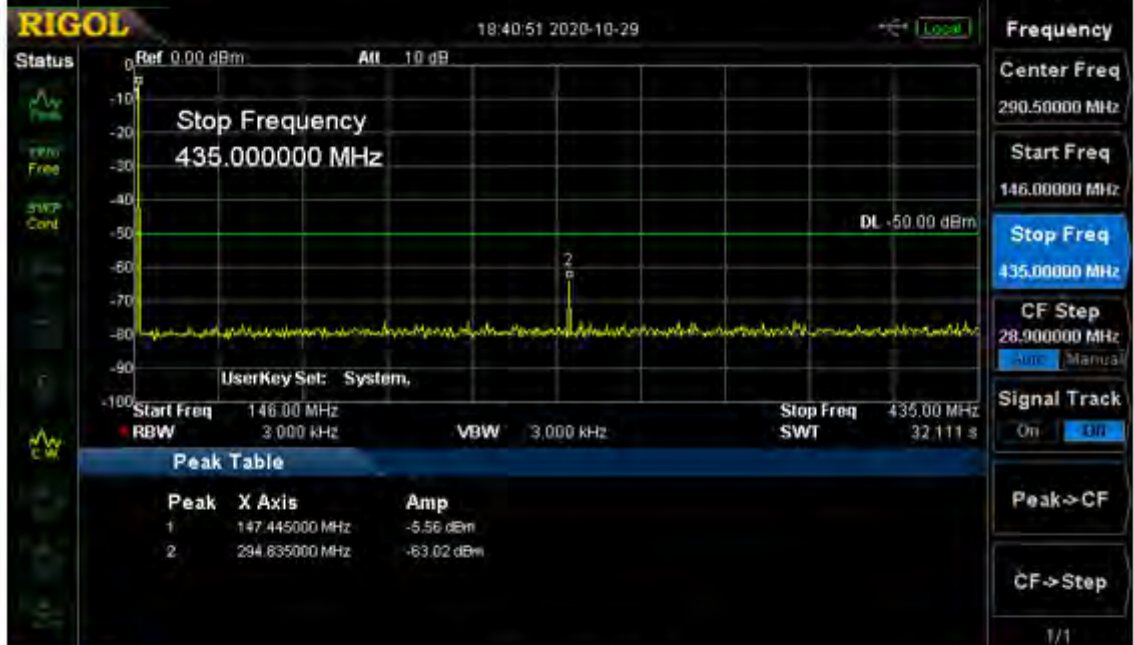
10m - 100% output & amp



2m IC-705



2m Yaesu VX-8



6m IC-705

