FLYING MIXER/DRIVER

QUESTION: ***Thanks for the suggestions. I did a realignment/retuning of the three oscillators. I now have output of around 90 watts on 80 and 40. 20 meters is "squirrelly", when I key it up it goes into oscillation, no drive needed. If I get the right setting of input tuning and output tuning on 20, it'll take off when I key it. Now I've got try and find what is causing the oscillations.***
You were correct regarding your evaluation of this unit I have. It came from an estate as I probably told you, it's had a lot of work done to it. I really aim to solve the self-oscillation problem. It's really a nice little rig. It'd be a good second rig for working local nets on 80 and 40 of which we have a few in the area. I'll just keep pluggin' away and see if I can find the problem is.

BE AWARE: The 80-meter coils L5 and L8 are in the circuit on all bands and do interact with 40- and 20-meter operation. If you have an oscillation on 40 or 20 meters you will want to minimize the effect of the 80-meter coils. To accomplish this, you will need to adjust the slug of L5 and L8 to the center of their coils. Once this is accomplished one of the two answers below should correct your problem. Once you have proper operation of the transmitter on the 20- and 40-meter bands return to 80 meters and realign L5 and L8 and check for oscillations on 40 and 20.

ANSWER #1: There are infinite possibilities for resonance in the tank circuits of the transmitter mixer and driver (L5, 6, 7, 8, 9, 10 and C8C and C8B). If they are incorrectly adjusted the mixer/driver circuits will fly.

To find the proper resonance try this:
Preset the DRIVER TUNE (C8C and C8B) control to the 12 o'clock position and do not move it for this entire procedure. Set it and forget it.

Use a meter plugged into the test jacks on the power supply to monitor the plate current of the finals. Always adjust the FINAL TUNE control for the plate current dip. If you do not get a dip or if the plate current dip and the power out peak do not coincide then the finals need to be neutralized or replaced. The replacement of the finals and re-neutralization MUST be accomplished before proceeding. The following adjustments will set the center of each band in the center of the DRIVER TUNE range. These frequencies were chosen for the center of the general class band.

On 80 meters set the VFO for 3.900 MHz. Adjust L5 and L8 for max power out.

On 40 meters set the VFO to 7.237 MHz. Adjust L6 and L9 for max power out.

On 20 meters set the VFO for 14.287 MHz. Adjust L7 and L10 for max power out.

You will need to readjust L1, 2, and 3 to get the receiver to track with the transmitter. When you do, first adjust the DRIVER TUNE in transmit mode. Once it is adjusted in transmit do not retune it in receive mode. The receiver must made to track with the transmitter.

ANSWER # 2: If the slugs in the plate coils of V13, the TX mixer are turned in too far into the coils (L5, L6 or L7) a self-resonate condition can occur and the mixer will become an oscillator. If you have max power out in the CW/TUNE operation with the CARRIER control set to minimum the mixer is oscillating.

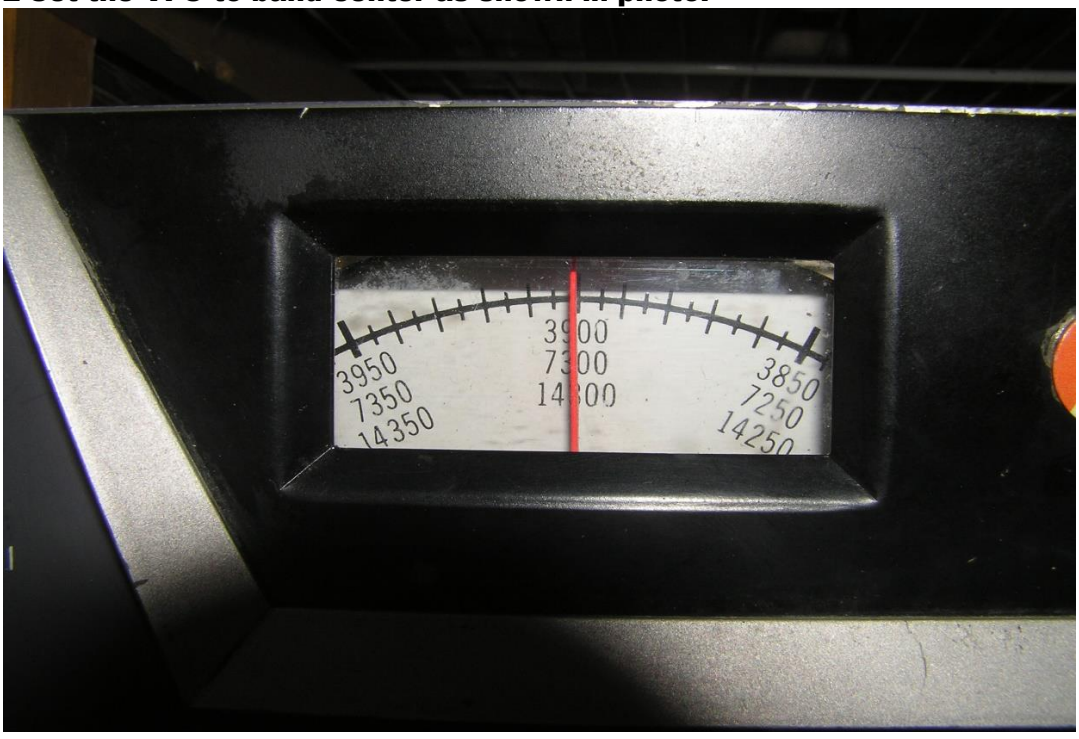
Simple test: Pull V3 or V17, if you continue to have power out the mixer V13 is oscillating.

The 20-meter band is the most sensitive. A visual inspection will verify this fault. The top of the tuning slug should be no more than 3/16" below the top of the coil form.

FIX:

1 Set the band switch to the offending band.

2 Set the VFO to band center as shown in photo.



3 Set DRIVER TUNE to the 12 o'clock position.
4 Set the FINAL TUNE control to the center of the band segment you are working on.
5 Adjust the offending coil (L5, L6 or L7) so top of slug is approx. 1/8" from the top of the coil form.
6 Connect voltmeter to test jacks in rear of the power supple (2 to 5vdv range)
7 Turn the OPERATION switch to RX and allow 5 minutes of warm up.

> **NOTE: Start the process with the CARRIER control at the 3 o'clock position. As you proceed back off on the carrier drive to keep the plate current below 100 to 150 mills.**

8 Observing the plate current indication on the voltmeter alternately adjust the FINAL TUNE and the offending coil (L5, L6 or L7) searching for an increase in plate current.
9 When you start to get moderate plate current adjust the FINAL TUNE for a dip in plate current.
10 As you adjust the offending coil occasionally reduce the CARRIER to zero to ensure that it is not oscillating.

SUMMATION: If neither of these fixes works to eliminate the oscillation then the problem is not of alignment or adjustments origin. Only once in 50 years have I seen an oscillation that was not caused by miss-adjustment, and in that case C88 on the screen of V13 was open.