

11 METER CONVERSION FOR FT-901

1 Order three crystals from your favorite parts place.

FREQUENCY #1 40.⁴87500 MHZ (for 26.000 to 26.500 MHZ)
#2 40.987500 MHZ (for 26.500 to 27.000 MHZ)
#3 41.487500 MHZ (for 27.000 to 27.500 MHZ)
#4 41.987500 MHZ (for 27.500 to 28.000 MHZ)

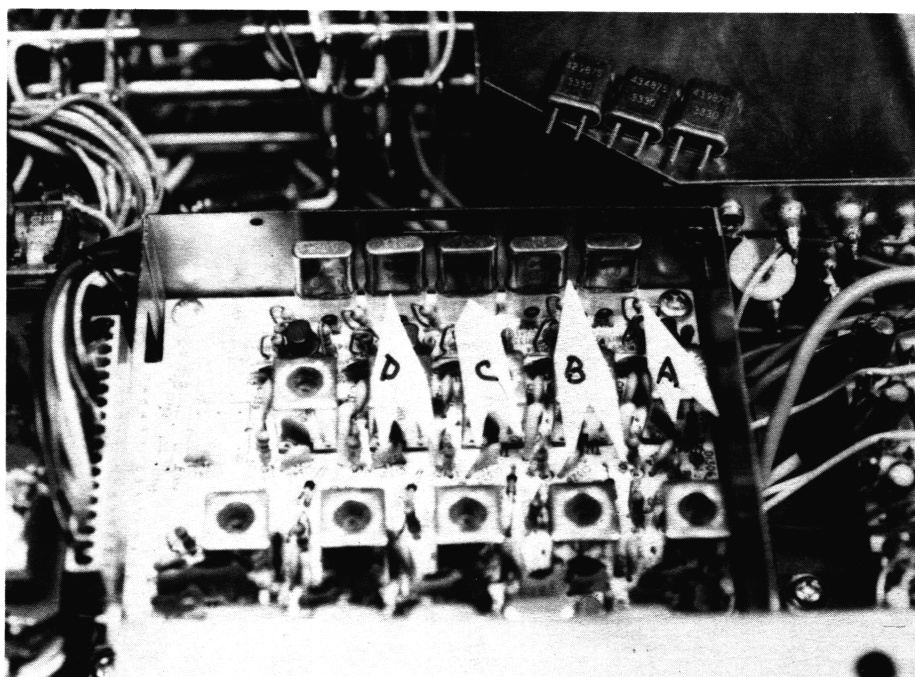
Type HC-25/u

1-LOAD CAPACITANCE	30pf
2-SERIES RESISTANCE	25 ohm or less
3-STATIC CAPACITANCE	7pf or less
4-CALIBRATION TOLERANCE	.001
5-TEMPERATURE TOLERANCE	.003 from -30°C to +60°C
6-AT CUT	

NOTE: These factors are identical to the YAESU FT 101B crystals except for frequency.

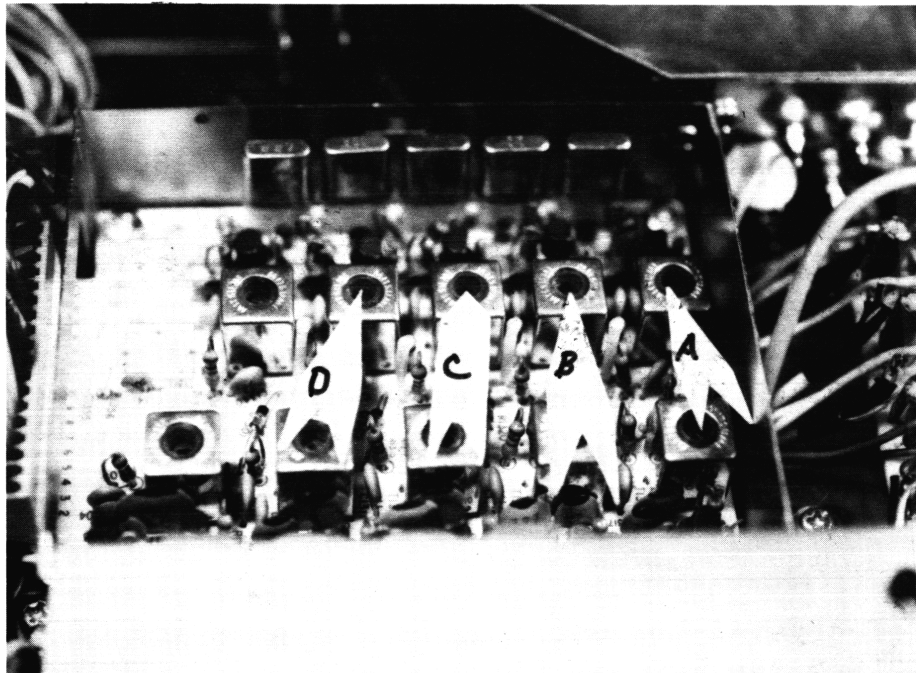
2-Remove the top and bottom shell of unit. Install 40.4875 crystal where 10A crystal is, install 40.9875 where 10B is, install 41.4875 crystal where 10C is and install 41.9875 where 10D is.

Inside view of crystal box showing the installation of the new 11 meter crystals and the old crystals that were removed.

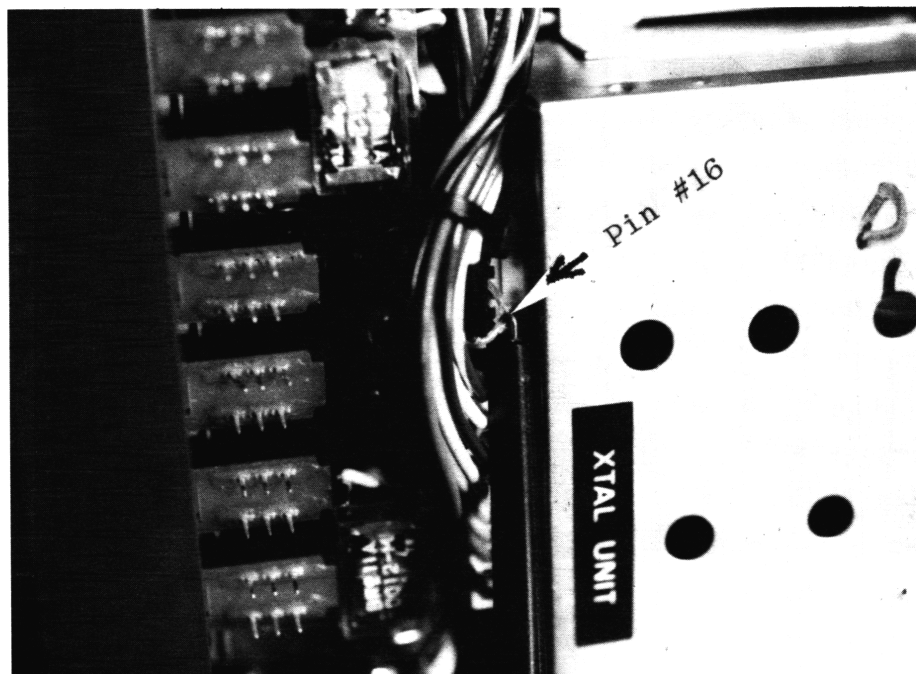


3-Connect a sensitive RF voltmeter or scope to pin #16 on the connector block in front of crystal box and put band switch to 10A and adjust the coil next to the 40.4875 crystal to maximum output on the voltmeter. Install cover to adjacent coils, then bare wire from pin #16 to connect probe.

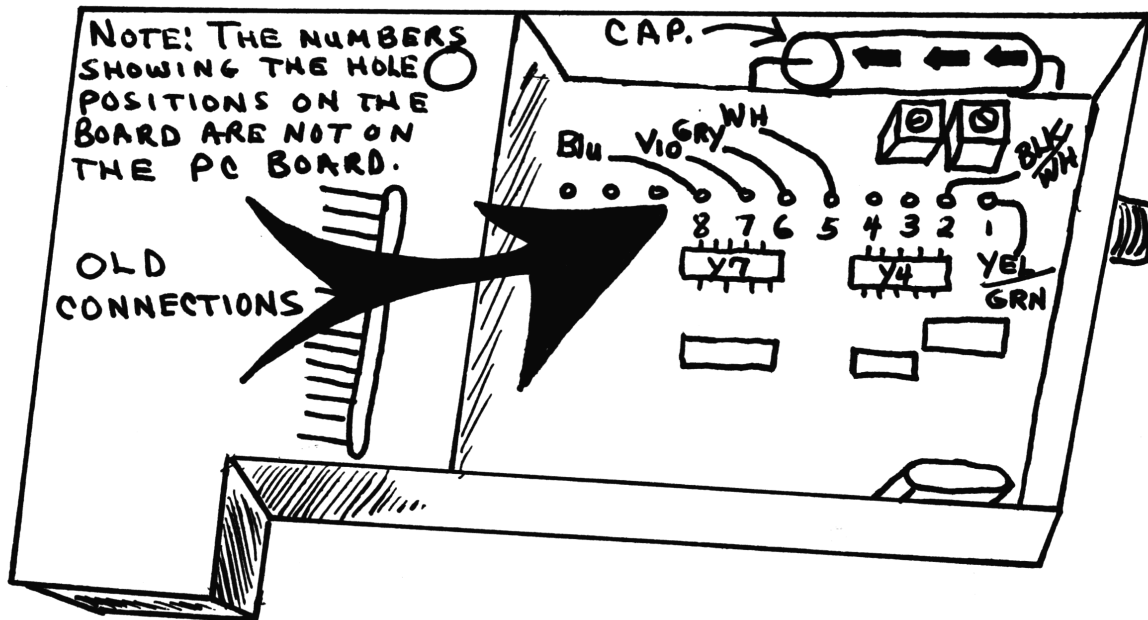
This photo shows the coils that are to be adjusted and their placement.



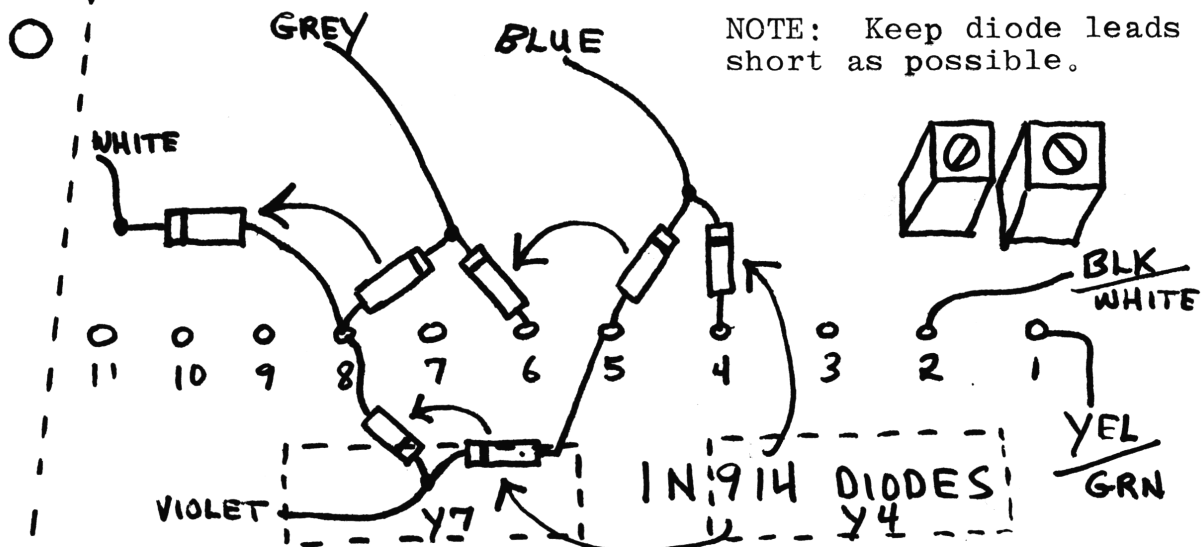
This photo shows the close-up view of pin #16 and the connection of the scope probe for the alignment of the coils.



4-Remove counter box in back of display unit. The PLL unit must be removed first to allow the counter unit to be removed. Notice the colored wires soldered in the circuit board next to the two integrated circuits Y7 and Y4. Remove the blue, violet, grey, and white wires from the circuit board and re-connect them as shown, using silicon diodes in series.



TOP VIEW INSIDE OF COUNTER BOX



EXPLODED VIEW
NEW CONNECTIONS

As a note of interest these wires are switched to ground by the channel selector switch to change the left most three digits on the display. Only one wire is used for each position.

10A is the BLUE wire, 10B is VIOLET, 10C is GREY, and 10D is WHITE. Normally 10A is $28.0 + \text{VFO}$. 10B is $28.5 + \text{VFO}$, 10C is $29.0 + \text{VFO}$, and 10D is $29.5 + \text{VFO}$.

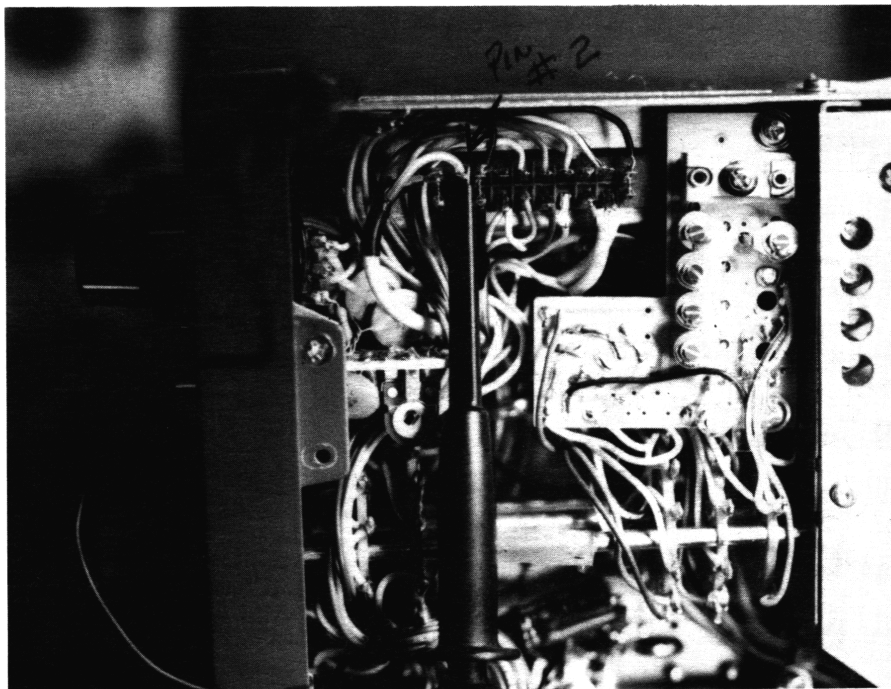
After rewiring and adding diodes, the new ranges are:

10A = $26.0 + \text{VFO}$ (BLUE)
10B = $26.5 + \text{VFO}$ (VIOLET)
10C = $27.0 + \text{VFO}$ (GREY)
10D = $27.5 + \text{VFO}$ (WHITE)

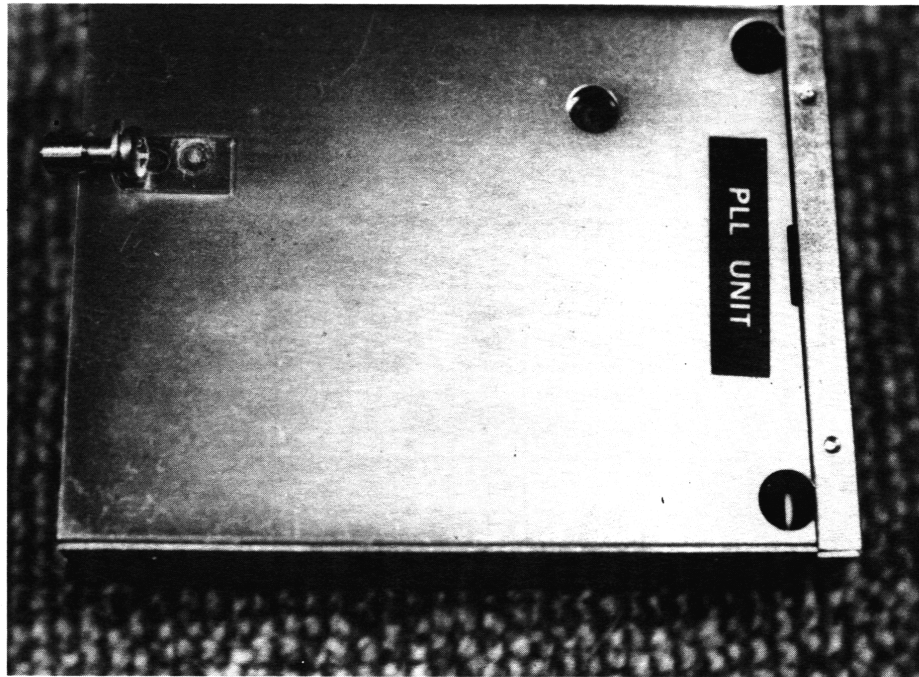
The wiring changes only effect the display and not the frequency. The display only measures the VFO frequency, adds three digits to this count to show the band.

5-In changing VCO frequency, the crystal frequency is mixed with the VFO frequency and is used to control the VCO frequency. A single VCO range is controlled by two consecutive bands. In other words, band 10A and 10B controls a VCO range of 1 MHZ, 10C and 10D controls another range of 1 MHZ. The VCO adjustment is very critical as lock frequency is approached. Once the lock is attained, an adjustment of only 1/10 of a turn may make the VCO fall out of adjustment, so proceed slowly. Connect a frequency counter of pin #2 on the plug under the chassis, directly under the VCO unit. (Do not remove cover of VCO). Place band switch to 10A and VFO dial to 000.

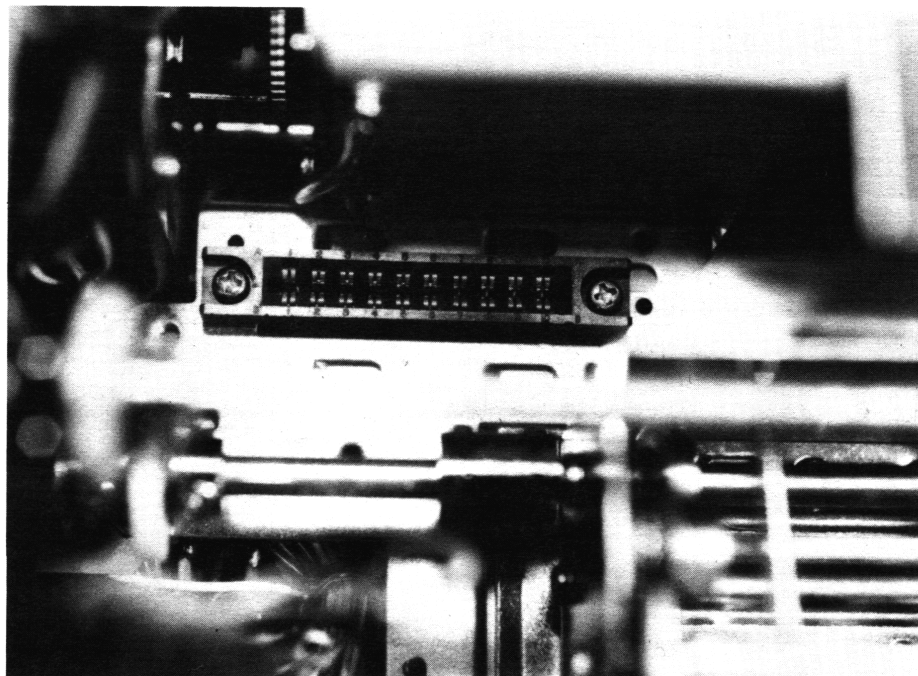
This is the view of bottom chassis under the VCO unit. Connect probe to pin #2 of terminal block to adjust AB and CD of VCO.



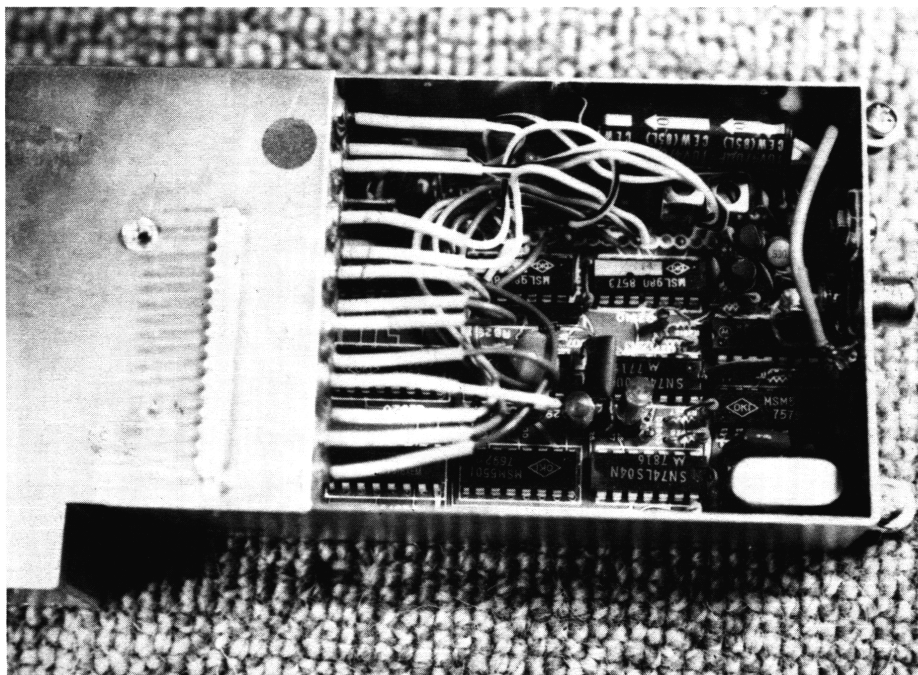
This photo shows the PLL Box that must be removed before the counter box may be removed.



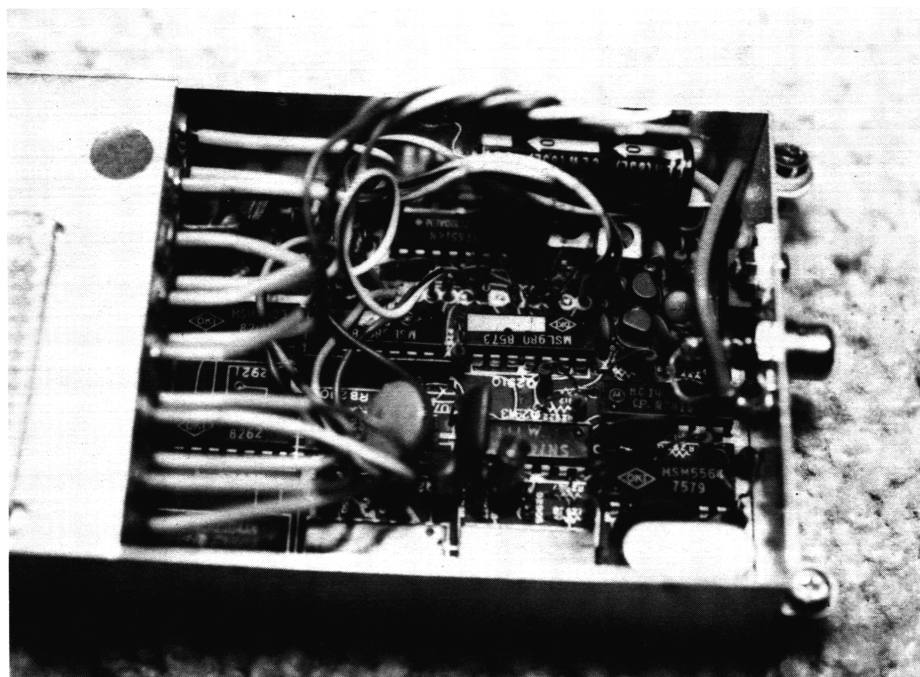
This photo shows the view of chassis where the PLL Unit and the counter unit were removed.



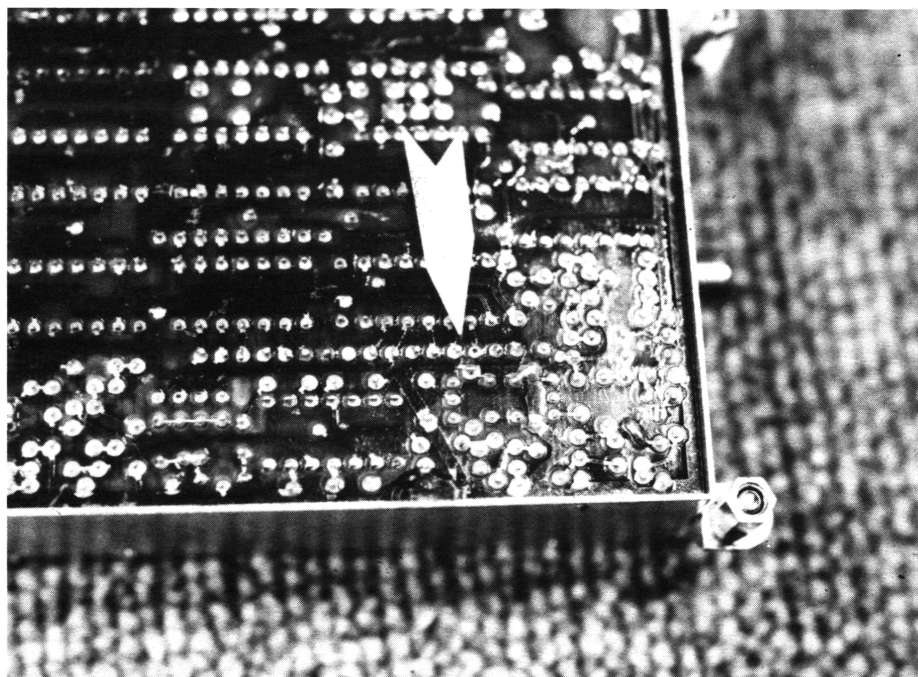
his photo shows the inside view of the frequency counter unit before modification.



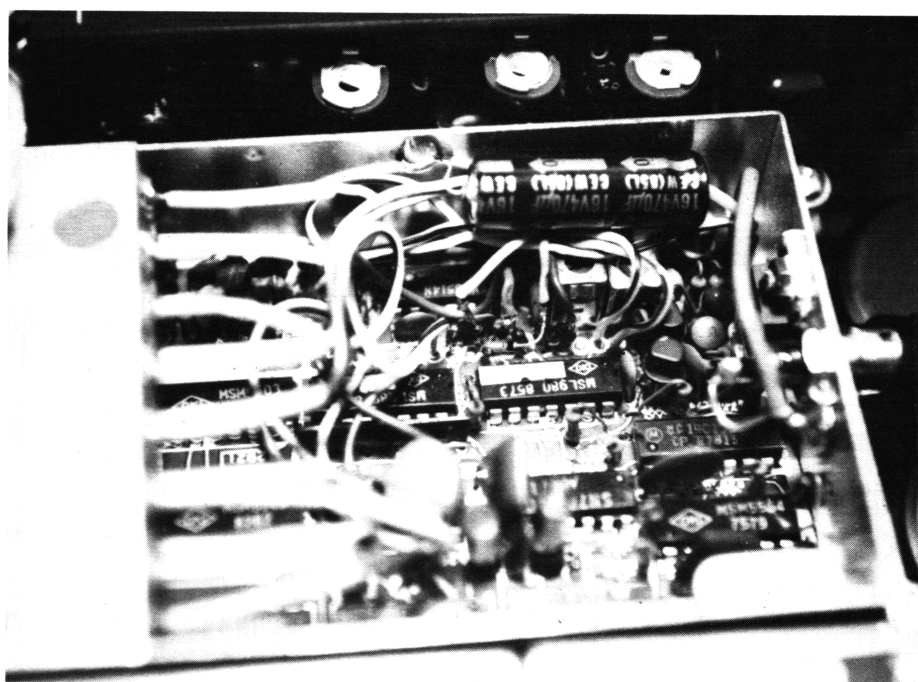
inside view of counter unit with the diodes installed.



View of bottom of counter p/c board after modification. Diode wires must be trimmed close.

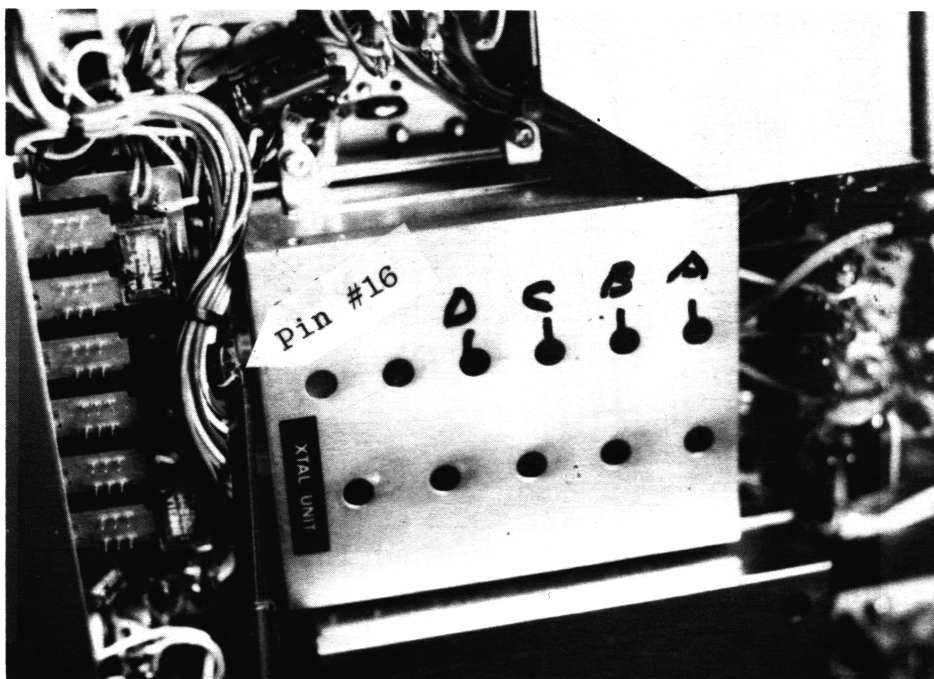


View of frequency counter board installed in radio. Modification completed, note short leads on diodes.



- (a) Put band switch to 10B and tune coil next to 40.9875 crystal to maximum.
- (b) Put band switch to 10C and tune coil next to 41.4875 crystal to maximum.
- (c) Switch to 100 and peak coil next to 41.9875 crystal to maximum.
- (d) At least .3 volts RMS should be noticed on pin 16 on all four bands.
- (e) Flip channel selector from 10A thru 10D and make sure all crystals are still oscillating.

This photo shows the crystal box and the position of the coils to be tuned.



Do not remove cover of VCO unit to adjust. Make the adjustments with a small non-metallic tool.



With an insulated tool, adjust 10A and 10B to read 34.9875 MHZ on counter, switch to 100 and if counter does not display 35.4875, slightly readjust 10A and 10B. When switch is rotated from 10A to 10B, an instant lock on 10A of 34.9875 and on 10B of 35.4875 should be measured on the counter.

If VFO is not exactly on 000, the counter will show a little high or a little low. This is not important, but the basic lock up at 35.4 and 35.9 is.

Next, switch to 10C and adjust 10C and 10D to 35.9875. Then switch to 10D and slightly touch up for 36.4875. Switch back and forth between 10C and 10D and watch counter for lock up.

SUMMARY

BAND	CRYSTAL USED	COLOR OF DISPLAY CONTROL WIRE	FREQ. RANGE
10A	40.9875 40.4875	BLUE	26.000 to 26.500
10B	41.4875 40.9875	VIOLET	26.500 to 27.000
10C	41.9875 41.4875	GREY	27.000 to 27.500
10D	41.9875 41.9875	WHITE	27.500 to 28.000

BAND	VFO DIAL at 000 VCO FREQ. (pin 2)	DISPLAY	VFO DIAL at 500 VCO FREQ. (pin 2)	DISPLAY
10A	34.9875	26.000	35.4875	26.500
10B	35.4875	26.500	35.9875	27.000
10C	35.9875	27.000	36.4875	27.500
10D	36.4875	27.500	36.9875	28.000

Note: While tuning VCO adjustments, the display will remain the same since it measures the VFO instead of the VCO. The VCO must be in lock or, the display will be in error.

View of unit after modification completed. Note counter display of 26.500 MHZ.



Reinstall all covers the Modification is now complete.

OOPS, WE GOOFED!

- VOL. 4, PAGE 39** : Add a step marked 17A to read as follows:
Locate C308 - it is a 4.7uf/450V capacitor on TB3 from connection 4 to 7 (ground).
Replace it with a 4.7uf/600V or you could have a problem. If you have already done this mod. we suggest you go back and change out this capacitor, if possible.
- VOL. 6, PAGE 3** : On Crystal frequency for #1, should read 40.487500 instead of 40.587500.
- Vol. 6, PAGE 12** : In first table, under Crystal Used, should read:
- | | |
|-----|---------|
| 10A | 40.4875 |
| 10B | 40.9875 |
| 10C | 41.4875 |
| 10D | 41.9875 |
- VOL. 7, PAGE 54** : In step 9, do not cut D405 for max. modulation. Instead, obtain a 1N914 diode and connect the Anode to the base of Q405 and the cathode to ground.
- VOL. 10, PAGE 25** : Add: Cut trace at Pin 14 and solder a 4700 ohm Resistor across cut.

