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Redco UFO Tech Aid 0011

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REDCO TECH-AID

INTENDED TO AID TECHNICIANS WITH INSTALLATIONS OF REDCO PRODUCTS

SUBJECT: 8719 & 8734 SYNTHESIZERS

TYPICAL PROBLEMS ENCOUNTERED

1. DOWN MIXER OUTPUT SIGNAL (TP-10)

The Uniden 8719 & 8734 chassis have been found to have a relatively large difference in the amplitude of the down mixer signal available on TP-10. The UFO picks up this signal on Coax #1, amplifies the signal and compares it with an internal reference. Problems are encountered when the UFO does not get enough drive from the radio. This can cause an "out of lock" condition, and in this state the radio would be on some random frequency dependent only upon the VCO adustment and not the UFO. To determine if an "out of lock" condition is caused by lack of drive, follow the procedure outlined on TA-002. A minimum of 3v peak to peak signal is required on Pin 2 for proper UFO operation. If the "out of lock" condition is caused by low drive, it can be cured by one of the following methods:

RADIO MODIFICATION

a. Install a resistor from the base of TR-20 or Pin 10 of VCO chip to ground. This will improve the radio's gain by approx. 30%.

UFO MODIFICATION

*b. Short the capacitor (.01uf) connecting the amplifier to Pin 2 of the PLL chip. Remove the 4.7k resistor to the right of the .01uf cap previously mentioned and replace with a 68k resistor.

*Modification b. has been put into production of all new UFO's being manufactured as of 5-5-79.

2. VCO ADJUSTMENT

For maximum range and a clean sounding radio it is highly recommended the VCO be aligned in the following manner: (NOTE: Use a non-metallic alignment tool)

a. Set UFO to 28.000 MHz.

b. Turn the VCO adjustment to a point where the radio is near 27.950.

c. Align the VCO slug very slowly until the VCO just locks at 28.000 and do not turn the VCO past this point.

Other alignment prodecures may cause loop filtering adjustments to be very critical and the radio may not be clean over a wide range of frequencies.

REVISIONS		
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1		NC-JC
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REDCO UFO

APPLICATIONS

DRAWN BY JC	SCALE	MATERIAL
CHK'D	DATE 6-7-79	DRAWING NO. TA# 0011
TRACED	APP'D	

DEFINITION OF SYMPTOMS

OUT OF LOCK: In an "out of lock" condition varying the UFO frequency setting will not change the radio frequency. A voltage measurement on the TP-2 will quickly determine a locked or unlocked condition, 0v for locked, 5v for unlocked.

LIMITED RANGE: An "out of lock" condition at the top or bottom end of the band.

WARBLE: A warble is detected on SSB This can cause SSB communications to be distorted or difficult to clarify.

RADIO OFF FREQUENCY BY A MULTIPLE OF 5KHz: Radio in lock but the operating frequency is constantly off by some multiple of 5KHz.

RECEIVES 2 OR MORE CHANNELS AT ONCE: When receiving,the same incoming signal can be heard on several frequencies.

WILL NOT LOCK WHEN POWER IS RESET: A radio may function normally after re-alignment, but, when the power is turned off and then turned on again, it may not relock. The reason this condition can exist is as follows: Power is first applied and the UFO circuitry has no input on Coax 1 because the VCO has not begun to oscillate. The UFO senses the lack of input and puts out a high (5v) state on Coax #2. The VCO then oscillates at its maximum frequency,and because of inherent design its amplitude decreases at higher frequencies; therefore, the down mixer output is low and the UFO cannot get enough drive from the radio on Coax #1. The PLL chip does not get enough drive and the loop is unable to recover. The problem is solved by increasing the gain of the down mixer or input amplifier or re-adjusting the VCO coil to a point where the VCO will not run as high in frequency. Use the VCO alignment suggested later in this text.

LOOP FILTERING

The addition of a variable loop filter on radios is occasionally a necessity. A variable loop filter allows the technician to vary the loop filtering and make up for variables present in synthesizer circuits of radios.

Symptoms of the loop filtering being incorrect may be: distorted SSB, warble on SSB, difficult to clarify SSB, or, in extreme cases, squeal on AM and bleedover may be present. In most cases the problems described above are most easily cured by the addition of a variable loop filter consisting of a variable resistor (usually a trimpot) in series with an electrolytic capacitor. Values of 10uf and 10k have been used here at the factory quite successfully. This loop filter is added between the center of Coax #2 and ground.

Better results can be achieved by removing the capacitors inside the UFO which normally compose the loop filter. These capacitors are identified in the programming section of the instruction manual as they are removed for 858 installations.

The loop filter is aligned for best SSB clarity. If the resistance of the trimpot is too low, the radio will warble on higher frequencies; and, if the resistance is too high, bleedover may be experienced on lower frequencies.

GROUND CONNECTIONS: For proper operation the UFO must have a good ground loop to the radio. Best results are achieved by connecting the shields near the VCO and connecting the black wire to a ground near the voltage regulator.

BROKEN PC PADS: The pads under the PLL chip are sometimes damaged during chip removal. The 8v source is connected through one of the pads and the circuit must be complete through the pad to attain a locked condition on 8719 installations.

TROUBLESHOOTING UFO INSTALLATIONS