Icom 765 Sidetone Tracking Modification Revisited

By Michael Mraz, N6MZ

Introduction by Floyd Sense, K8AC:

After acquiring a very nice Icom IC-765 at Dayton this year, I set out to find any modifications for the transceiver. One of the most useful I came across was a design by Michael Mraz, N6MZ, in the May 1993 QST article entitled "Add Tracking Sidetone to Your ICOM IC-765 Transceiver".

After a couple of days searching for a source for the PC boards mentioned in the article, I contacted N6MZ to see if perhaps he had a layout for the board. Mike responded immediately, and suggested another way to accomplish this modification, eliminating the need for the circuit board and circuitry described in his article.

I installed the new mod and find that it works just as Mike describes. The variation in volume of the sidetone with the setting of the power control is of no consequence, since the sidetone volume is controlled by the monitor gain control (you must have the monitor ON to hear the sidetone). While I haven't taken the time to measure the sidetone frequency against the received signal pitch, my ear says it's the same or extremely close.

If you don't already have a copy of the IC-765 service manual, you can get one from Icom. But - the manual they are currently selling is NOT a multicolor original, but a black and white copy. However, it's a very good copy, right down to the large fold out pages, and perfectly readable. Finding Q16 and R77 is certainly easier with the manual. If you plan to give this a try without the manual, you can find the two components just behind the shielded BFO enclosure on the main board. The BFO alignment information is found in the IC-765 instruction manual on page 47, and in the IC-765 service manual on Page 6-4.

Here's Mike's description of the newer modification:

I'd recommend doing the tracking sidetone another way. This mod is MUCH simpler and actually uses the 765's monitor mixer to beat the TX carrier oscillator against the RX BFO. The downsides are that the sidetone volume will vary a little, in proportion to the output power setting, and that you won't hear the sidetone when you aren't transmitting (i.e. you can't do CW practice with the "VOX" button off).

This is what I did:

1. Remove Q16 on the Main board. This transistor cuts off the BFO during CW transmit.
2. Remove R77 on the Main board. This resistor couples the CW sidetone oscillator to the audio T/R switching circuit.

Now when you transmit, you should hear the actual tone resulting from the receive BFO beating with the transmit carrier oscillator. The volume of the audio sidetone will vary with the setting of the RF PWR control (more power = louder sidetone). If (*and it's a BIG if*) all the mixer oscillators are aligned perfectly, when you tune the radio to match the sidetone frequency to the frequency of the received signal, you will be exactly zero-beat. My rig is accurate to within 10 Hz or so.

If you plan to work on the 765, you really should buy a copy of the service manual; it has all the two-color drawings that show the component locations on the boards. It also has the calibration procedure and theory of operation.