

Kenwood TH-F6A deviation adjustment

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PROBLEM: My only concern with this otherwise excellent and versatile radio has been low deviation, even when using a speaker mic. My friends who know my voice all commented on how weak the audio was and that I "didn't sound like my usual self", when using my other Kenwood radios which make 4 to 4.5 KHz FM deviation. I usually close-talk my mics and HT's, speaking in a quiet voice directly across, but not into, the mic hole, at a distance of about -?? to 1". This typically delivers excellent audio without much breath noise, but not on this rig.

Discussions with Kenwood's service staff offered no help. I guess they consider the adjustment beyond the abilities of most consumer hams. It is somewhat delicate, but requires no special tools. Nonetheless, I do not recommend it unless you are experienced with handling small tools and comfortable with taking your radio apart.

There also appears to be a mechanical problem: excess glue blocking the audio channel between the speaker and mic element housings. My F-6 also had this problem, and although fixing that did not significantly raise the deviation, I think it did improve the high frequency response. It's tempting to drill a hole into the case in front of the mic element, but doing so would ruin the water resistance of the case. I don't recommend doing this.

Prior to modification, my 2m deviation was only about 3 KHz, or maybe 3.25 if I talked really loud, which I dislike. We are allowed 5 KHz, and 3 may seem like it's pretty good, but there is a significant boost in volume and signal-to-noise ratio when you get the deviation up to 4.25-4.5 KHz!

CREDITS: My procedure is a refinement based on a procedure for Kenwood's TH-F6/F7 that I found at <http://www.ham.dmz.ro/>, posted anonymously. I especially want to thank Martin Storli, LA8OKA, for posting the service menu access procedure on Mods.dk, without which no adjustments can be made! Otherwise I would have forever lamented the poor audio.

For my F-6, this original deviation adjustment procedure produced only a temporary change that was lost when I exited the service menu. This may possibly be because the original author has an F7, or non-USA version of this HT. After some trial and error, I found a procedure that is permanent. The photos in the original article are excellent, so I will not recreate them.

I used an MFJ-224 FM Signalyzer to measure the 2m deviation. For the other bands, I used audio checks from trusted friends to compare the strength of the audio from the F-6 to other rigs of established good audio quality.

Now, on with the job!

STEP ONE: OPEN THE CASE.

1. Remove the antenna and battery.
2. Remove the tuning and volume knobs by gently pulling them straight up off of their shafts.
3. Unscrew and remove the threaded retaining rings from the antenna connector and encoder shaft. I accomplished this by using a jeweler's flat-blade screwdriver to push on one of the two slots in the top surface of the ring to make it unscrew. Take care that you don't slip and scratch your radio.
4. Remove the two Phillips-head screws from the back of the case, near the bottom corners.
5. Gently lift up on the bottom of the chassis, separating it from the plastic case, just enough to allow you to then pull the chassis down. Once the antenna connector and encoder shaft clear their holes, you can turn the chassis over to expose the keypad contacts.
6. Take care not to break the tiny speaker wires. Although you can perform the procedure without disconnecting the speaker, it will be a little easier if you pull the connector off of the chassis board to

allow the front of the radio to completely separate.

STEP TWO: CLEAN OUT THE MIC AUDIO CHANNEL.

1. Remove the rubber keypad assembly from the front of the case and examine the molded cavity for the mic element. You will need a jeweler's loupe or some other magnifier to see this well. There is a tiny rectangular molded channel that connects the mic element chamber to the one for the speaker. You will notice some white rubber cement all around the edges of the speaker. Use a needle to probe the bottom of the mic cavity to find the channel. Pick away any excess glue with the needle and some tweezers.

STEP THREE: ADJUST THE DEVIATION IN THE SERVICE MENU.

1. Set the chassis face-up and reinstall the tuning/encoder knob. Plug in your charger or other source of 12VDC to the external DC jack.
2. Using a set of metal tweezers (or a short length of wire bent into a 'U' shape), briefly touch the fingers on either side of the power switch contact pad with the tweezers' tips to turn the radio on. You can also place the power button of the rubber keypad over the pad and press it to turn on the radio.
3. Next, locate the two circular, gold-colored contact pads just to the left and between the #1 and #4 contact pads. These are easy to distinguish from the regular pads: they are plain, round dot contacts, with no fingers.
4. Without touching any other part of the chassis, momentarily short the two pads together with your tweezers to turn on the service menu. When you have done it correctly, the bottom line of the display will change, showing a parameter name and values. If you brace your hand by grabbing the chassis with your fingers, you will make contact with another circuit which will prevent the service menu from coming on. When I did it this way, the A-Band 'BUSY' (green LED) would light up, and the service menu would not come up until I tried it without touching anything else on the radio. It took me a while to figure this out!!
5. CAUTION: the service menu starts with an adjustment of the empty battery voltage trip level. DO NOT PRESS THE SCROLL BUTTON DOWN or even left-right until you copy down the factory stored value on the right-hand side. In all the service menus, the left-hand value is the new value that will be stored if you press OK on the scroll button. If you accidentally press OK here, you will be setting the charger's voltage as the dead battery voltage. To recover, connect a variable power supply to the power jack, and adjust it until the value on the left is the same as the factory value. My factory value was 45.
6. Carefully press right on the scroll knob repeatedly (about 28 times) until you see three lines, one after the other, that read: "MAX:XX f1:XX", followed by, "MAX:XX f2:XX", followed by "MAX:XX f3:XX". NOTE: You will need to change all three values, f1, f2 and f3 for each band (2m, 220, and 440). The XX's on the right are the stored values, and the XX's on the left are the new values that you can adjust with the encoder knob and then store by pressing OK with the scroll knob. These are hexadecimal numbers, and each digit ranges from 0-9, then A-F.
7. Place the rubber keypad over the circuit board and use it to select VFO mode. Use the BAND switch to rotate through the three transmitting bands. Notice that the values of f1:, f2:, and f3: change for each band. COPY DOWN THE FACTORY SETTINGS for all three transmitting bands. You should have nine numbers written down for safety, in case you want to return to the factory settings.
8. Set the band to 2 meters and the service menu to "MAX:XX f1:XX". Rotate the encoder clockwise to raise the MAX: XX value on the left, then press OK on the scroll button to write it into the f1:XX position. Keep raising the value until the deviation reaches the desired level. Then set this same value for the f2:XX and f3:XX lines in the service menu. Then repeat for the 220 and 440 bands. On my F-6, here are the factory values I found and the new values I set (FACTORY VALUE/NEW VALUE):
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 - a. 2m band : f1:90/C3; f2:8E/C3; f3:88/C3
 - b. 220 band : f1:42/82; f2:42/82; f3:42/82
 - c. 440 band : f1:90/C3; f2:8E/C3; f3:88/C3
9. You can key the radio and make test transmissions to test the audio with friends before exiting the service menu. Note that a speaker mic will produce more slightly more deviation than the internal mic. I would set the max deviation to no more than 4.5 KHz using the speaker mic.
10. Once you have finished with the adjustments, turn the radio off and reassemble it. Don't forget to plug the speaker cable back in if you disconnected it!

Regards,

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