

Kenwood TK-690H Modifications for 6 Meter Operation

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- ➔ Obtain a piece of 1/16" brass rod and either Electronic grade or non-corrosive RTV or the equivalent Hot Glue if it can stand the heat of a hot car trunk.
- ➔ Test the radio on the original frequency and verify it meets specifications.
- ➔ Save and archive the original programming using KPG44D V2.01. (Windows)
- ➔ Turn radio upside down, remove bottom screws and cover. (TK690_1)
- ➔ Measure the voltage at test point "CV" (near center of board next to VCO cover); it should vary from 1.5 vdc at 50 MHz to about 7-8 vdc at 40.0 MHz in receive and transmit modes (use test frequencies). (TK690_2)
- ➔ Adjust the RX VCO trimmer[A] for maximum voltage at test point "CV".
- ➔ Adjust the TX VCO trimmer[C] for maximum voltage at test point "CV".
- ➔ The code plug 6bmmddy.dat is for a front mount radio with the basic head. It contains the full 6 meter band plan with both 1 MHz and 0.5 MHz pairs.
- ➔ Write this 6 meter code plug into the radio.
- ➔ The radio should lose lock as evidenced by beeping when you get above 51.5 MHz; you can change channels or use the added test frequencies in test channels 7(52.5 MHz), 8(53.99 MHz), and 9(51.0 MHz).
- ➔ Prepare two brass slugs, each slightly less than 1/4" long, from the 1/16" brass rod.
- ➔ Remove power from the radio, remove the VCO cover, and re-apply power
- ➔ Temporarily insert the brass slug into the RX VCO coil. (TK690_3)
- ➔ Measure the voltage at point "CV" it should be greater than 1.5vdc at 53.99 MHz
- ➔ Remove the slug, put RTV or Hot Glue in the center of the coil, insert the slug making sure it is well coated as the brass slug will be upside down and must not be microphonic. (TK690_4)

- ➔ Temporarily insert the second brass slug in the TX VCO coil. (TK690_3)
- ➔ Measure the voltage at point “CV” in transmit it should be greater than 1.5vdc at 53.99 MHz.
- ➔ Remove the slug, put RTV or Hot Glue in the center of the coil, insert the slug making sure it is well coated as the brass slug will be upside down and must not be microphonic. (TK690_4)
- ➔ Remove power from the radio, re-install the VCO cover, and re-apply power but DO NOT turn the radio over and do not put the bottom cover back on. The RTV needs about 12 hours to cure.
- ➔ Check the VCO alignment with the radio still upside down. The voltage at point “CV” should vary from a minimum of 1.5vdc at 54 MHz to maximum of 8.0vdc or less in both RX and TX modes at the lowest frequency which will now most likely be above 40 MHz but should be OK at 45 MHz or lower.
- ➔ Verify that the radio is on frequency and adjust if necessary. (see Radio Adjustments)
- ➔ For amateur service decreasing the TX output to reduce excess heat from the increased duty cycle makes good sense. 75% to 80% or 80 watts is a good choice.
- ➔ For amateur service increasing the maximum deviation from 4.0 KHz with tone to about 4.8 KHz with tone will give the audio more punch. The tone deviation should remain at about 700-750 Hz.
- ➔ The open squelch value may be too tight for some and you should adjust accordingly.

Radio Adjustments

Many of the radio adjustments are softpots and can be adjusted from the front panel. Hold down the PF1 key (1st button to the right of the knobs) and turn power on. This will put the radio in Panel Test Mode. Use the PF1 and PF2 keys to select the test channel (7, 8, and 9 are the added 6 meter test channels). Press the “^” key to enter Panel Tune Mode. In this mode PF1 and PF2 select the item, PF3 and PF4 select the value, and PF5 saves the value. Cycle the power to go back to User Mode.

FREQ_XXX – adjust the frequency(master oscillator warp)
 POW_XXX – adjust the transmitter power
 MAX_DEV – adjust the maximum deviation for voice plus tone
 SQ_O_XXX – adjust the squelch open point

Programming Software

You can use the DOS based software or the Windows based software but do not go back and forth with the same code plug. The windows software is recommended. KPG-44D V2.01 is what you will need along with a KPG-43 Programming Cable. You will also need a Hex editor such as the free HEXIT utility to change frequencies above 50.0 MHz.

The KPG-44D software will not allow you to enter a frequency greater than 50.0 MHz. The solution is to create the code plug with values 10 MHz lower, i.e. 42.525 MHz instead of 52.525 MHz. After a code plug has been created or modified, exit the KPG-44D software and use a hex editor to change any 4x.xxx frequencies to 5x.xxx frequencies. The frequencies will appear correct when the code plug is loaded into the KPG-44D software. Remember, everything can be changed with the KPG-44D software except the frequency entries above 50 MHz.

The HEXIT utility is a very simple Hex editor that runs in DOS or Command Mode. If you are using Windows, open a Command Prompt. CD to the directory where you have stored the code plug. Start Hexit with the codeplug filename as the argument. At about 1840 you should start seeing the channel programming data, one channel per line. For 53.01 MHz which you programmed at 43.01 you will see a line like this:

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XX ...00 10 30 04...00 10 20 04...
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This translates to 43.01 RX and 42.01 TX. To change it to 53.01 RX and 52.01 TX change the 4's to 5's so it looks like this:

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XX...00 10 30 05...00 10 20 05
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You should be able to go right down the two columns, transmit and receive, and change all the 4's to 5's in a matter of seconds.

After you exit HEXIT, run the KPG-44D software and check that you have made the changes correctly. You can now load the code plug into the radio.

Using a Motorola PAC-RT with the TK-690H

A Motorola PAC-RT can be used with the TK-690H. It is connected via the DB25 connector.

Details to follow soon.