

The Icom IC-706 Mk.II. How to stop shouting and stay happy! (Also applies to IC-706 Mk.I.)

By John Everingham, G4TRN

I have recently become the proud, but not entirely happy owner of Icom's tiny brainchild the IC-706 Mk.II. A good deal had been struck, and a boot load of nice but large gear was traded for the Icom . A case of "Honey, I've shrunk the shack".

Gradually I got used to the wide open space on the shelf and the multiplicity of beeps from the rig. These new rigs have minds of their own, and not entirely logical ones at that. But one thing stood out, the difficulty of getting, then holding, the full power output. I even had to rebuild my trusty homebrew microphone. Soon I became aware that this was a general problem, and a large number of 706 owners were seeking a solution. Having found it, I have been persuaded to pass my findings on, so here they are. This information is not on Internet.

When first used, the rig seems to be very deficient in the microphone gain department on SSB. Using the settings recommended in the instruction book makes it necessary to shout to achieve full SSB output. Historically, ICOM rigs have favoured the unusual but technically sound approach of putting an amplifier in the hand microphone. This is not the case with the 706 Mk.II but the rig does give the impression that it needs one. The following notes and procedures apply specifically to SSB, which must show as such, or as "USB" or LSB" on the screen whenever adjustments are made. (FM and AM are separate and no trouble.)

(The following notes apply to the 706 Mk.1 and Mk.II only. The Mk.IIG has a changed value resistor in the mic amp circuitry. A message has got through. You can go this way if you wish, the circuits are almost identical. The resistor between pins 21 and 22 of IC22, uPC5023-077, ("R 236" in the IC.706 Mk.II) is 27k. In the IIG it is much higher, I believe 82K.)

I worked through the service manual to find answers to the problem. All non-limiting audio functions are specified for 10mV at 1.5kHz at the mic socket, and

the Q2 menu setting of 5 for mic gain. This knowledge is the starting point for setting up the audio more effectively, 10mV is an unrealistically high voltage to expect from any ordinary microphone.

The first step is to set the Q2 mic gain to 10. This will help a lot (never mind that the book says 5!). The next step is to engage the compressor, and set up the external pot to keep the ALC in the acceptable range. For good results the ALC must be "on scale".

The compressor does not do much in the way of speech processing, it is more of an audio AGC system. The effect is as though the Q2 mic gain is turned up to 50. The downside is a high degree of bass cut so that the signal sounds harder, one learns to recognise 706s by this. (Bass cut is fine for real mobile operation.)

It is frustrating that the compressor can not be accessed in FM mode. This is of no real importance though as it is not functional on FM. One might have expected the "COM" flag to vanish on FM, but one can't have everything. Note that Q2 mic gain is set independently for each phone mode. Remember too that for duplex (i.e. 'SPLIT'), the wide or narrow option is individually assigned to each VFO, so that you do not automatically send with the setting one has selected for receive (the same goes for CTCSS/tone burst).

All the above applies to SSB operation at the Q2 power setting "h". As the output power is reduced, so the need for mic gain diminishes. The power setting is an ALC threshold setting and the lower the power is set the easier it is to achieve the threshold value. The manual does not say it, and the rig does not do it, but for tidy results the mic gain should be set to the value appropriate to the power setting. It is very helpful that the ALC scale comes on automatically when setting the Q2 microphone gain.

If you are not into tweaking the engineering parameters of a rig, this is as far as you will want to go. A "power mic" or high gain desk mic (the only approach suggested by Icom UK) is your next step. For the rest, read on.

The quick menu Q4 enables the carrier frequency to be altered (only on SSB transmit). Because all functions are controlled by the rig's micros, and unlike older rigs, this does not change the output frequency. It is like moving the shift control, but on transmit. You will probably find that your audio gets better, i.e. "more natural" reports if the carrier is set on the negative side of the default. This is probably something to do with the difference between Japanese and European speech. I have set my rig to "-50". (This setting has no effect on the receive function, a pity, it does on my TS 50, which now transmits the way I prefer to receive. I am a great believer in reciprocity).

The final trick to get more RF out is to turn up the “SSB” mic gain. There isn’t one! However, there is “Transmit Gain”. It works like RF gain on a receiver, but on the through RF transmit signal. Too little and the output varies with the speech in an unstable way, and the signal lacks “punch”, too much and you get overload and distortion. When it is right everything is clean and firm. Think of the ALC scale as being the transmit equivalent of an S-meter with delayed AGC. If you can’t get enough through amplification microphone to antenna, with the Q2 setting, which is the audio frequency control, then turn up the “Transmit Gain” and do the job at radio frequency.

There is a variable resistor provided. The service manual says set it for 50W out at you’ve guessed it, 10mV 1.5khz, Q2 setting 5! No wonder we’ve all been shouting our heads off!

I suggest that you set it for a decent ALC reading at Q1 power setting “h”, Q2 mic gain “6”, compression off and a spoken “FORE” into the hand mic held the way you prefer, but fairly close. Afterwards, fine tune the Q2 value and the compression level.

If you are happy with the above reasoning you can do the adjustment in a few minutes.

The "Transmit Total Gain" potentiometer is on the main board, (the one under the top cover), marked R511. It is at the front edge of the board, hidden by the printed ribbon lead, about a third of the way along from the left as you look at the front of the rig. You will need a small cross screwdriver, a magnifying glass, and a very small straight screwdriver. Connect your dummy load if you are going to monitor progress. Turn R511 about 20 degrees, clockwise.

(Note! For those of you who are inclined to "tune for maximum smoke" there can be a nasty surprise. These sub-miniature pots have no end stops. They can be turned through 360°. The output will go up and up until all of a sudden it drops to zero. Very disconcerting if you are not prepared. You can turn on through the "dead zone" and then smoothly up from zero, or go back the way you came. No damage will have been done. But the pot is very small and I do not advise you to play with it. Set it and leave it before you break it.)

Success! At last other stations are commenting, "nice audio" and "sounds like you". My PEP meter stays at 100W. I only need to use the compressor now when the going gets hard.

What a relief!

John Everingham, G4TRN

Please note that W&S PLC do not endorse any modifications to rigs, as it may be possible that opening up equipment may invalidate the warranty. Any modifications are purely done at owner's risk and W&S PLC will not enter into any communication regarding modifications unless approved by the manufacturer and conducted by duly accredited service engineers.

I found this while clearing out old data. My IC706II is still going strong, along with many others, and I thought it could be useful info for anyone who picked one up at a rally.

I sent it (on a floppy disc!) to the RSGB thinking that it could be an article or reader's letter but they gave it to Pat Hawker to incorporate in his column. It also found its way to W & S (original typos and all!) who printed it in their catalogue (with an incorrect call sign). I was somewhat miffed that neither organisation contacted me in any way.

September 2018