



[Home](#) [Proline](#) [A/V](#) [Events](#) [Products](#) [Photos](#) [Misc](#) [About](#)

DSP Audio Settings for Heil Microphones

OTHER HELPFUL LINKS ON THIS PAGE:

**Removing RFI
From Audio Inputs**

**Decoupling d.c.
from ICOM inputs**

**Adjusting Your Transmitter
when using HEIL Microphones**

DSP SETTINGS FOR HEIL MICROPHONES

To achieve maximum audio quality, it is important to adjust the DSP settings of your transmitter when using Heil microphones. We present a few starting points for a few of the most popular transceivers. These are merely starting points. You should fine tune these settings based on your voice, acoustics and set up.

The *only* way to truly know how you sound to the outside world is to transmit into a dummy load and listen in a nearby receiver with quality headphones, such as the Heil ProSet. Listen in the same bandwidth you are transmitting in and then you will be able to fine tune your initial settings.

Yaesu 1000 MP

Menu #4-4 (TREDSP)	3
Menu #5-9 (TFIL)	6.0
Menu #7-7 (SSBT)	100-3100
Menu #8-9 (TLSB)	-200
(PROCLSB)	.08 + .06
(TUSB)	-200
(PROCUSB)	.08 - .06
4 dB processing	

Yaesu FT 100

Menu #25 Mic Gain	85
Menu #16 Mic EQ	3
Menu #64 XMT Carrier shift	-.05 to +.05
Menu #65 SMT Carrier shift	+.05 to -.05
Menu #27 Compressor level	80
<i>64 and 65 carrier point is very important</i>	

Yaesu FT-920

Menu U-51 (Mic-EQ)	3
Menu U-59 (TLSBCAR) lowest setting	-300
Menu U-60 (PROCLSB) LSB w/processing	-200
Menu U-62 (TUSBCAR) USB setting	-300
Menu U-63 (PROCUSB) USB w/processing	-200

Yaesu FTX 9000

Menu 69	select Front or Rear microphone input
#1 Parametric Freq.	100 Hz
Bandwidth	2
Level	-10 dB
#2 Parametric Freq.	1500 Hz
Bandwidth	4
Level	+7 dB
#3 Parametric Freq.	3000 Hz
Bandwidth	3
Level	+5 dB

Kenwood 950 SDX

Menu #20 (DSP 1 HPF)	-100
Menu #21 (DSP 1 LPF)	-3100

Kenwood 570

Menu #13 Bandwidth	2.4 kHz
Menu #14 TX EQ High Boost	H
Microphone Gain (default level)	50

Kenwood 870

Menu #29 Bandwidth	3000 Hz
Menu #30 Bandshift	0 or 100
Menu #31 TX EQ	H or C
Menu #22 Mic AGC	start @ 1 (try 0 or 2)

Kenwood 2000

Menu #22 Bandwidth	3000 Hz
Menu #21 TX EQ	H or C
Menu #20 RCV EQ	C or OFF
Microphone gain default level	50

ICOM 746 PRO, 756 PRO, iC 7800

Mic Gain	¾ open
Bass	-2 dB
Treble	+5 dB
Wide Compression	on 10 o'clock
Vox	65%
Anti-Vox	10%
Delay	8%

It is very important to monitor your signal in another receiver. This rig has incredible parameters that can change the sound of the microphone or the key elements.

ICOM 746 (not PRO)

Menu M1 and F4: TCN	+10 dB
Mic Gain	¾ open
Compression always	on 10 o'clock

ICOM 706

Proc. On	-10 dB
Mic Gain	9
Menu Q4 or Q6	-200 to +200
<i>Offset is very important for transmitted audio tone.</i>	

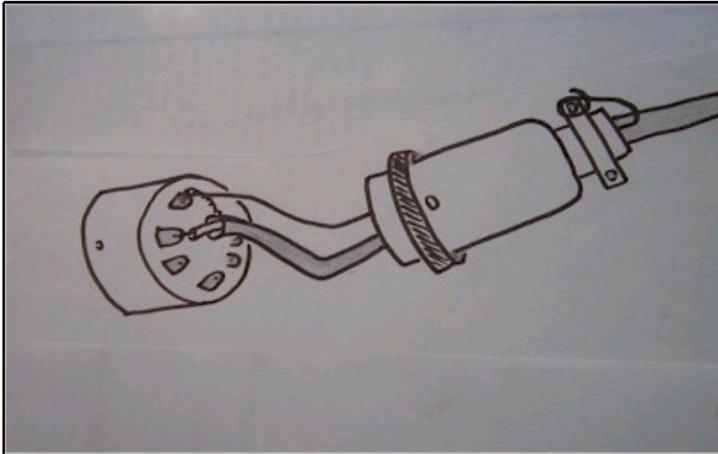
REMOVING RFI FROM AUDIO INPUTS

Many amateur radio stations today are experiencing terrific RFI (radio Frequency Interference) that is impeding their audio signals and causing very garbled and distorted audio. Careful listening of MANY SSB signals on the air today exhibit RFI - not sometimes enough for their receiving stations to notice as they listen to a 3" speaker of a transceiver but careful listening in a wideband receiver with VERY high quality receiving equalizers and studio monitor speakers allow

this slight interference to become VERY annoying. But then there are the signals that have terrific problems with RF getting into their audio lines and cause all sorts of problems.

We, here in the Heil Sound lab have discovered a very interesting fact. Most of the major transceivers today do NOT ground their microphone shields! That's correct - the mic shields FLOAT! Now wasn't this one of the FIRST things we learned about building RF transmitters with speech audio sections? GROUND those shields!! So, we came up with a very simple fix that just about anyone can make to their rig...don't have to get inside...don't void any warranties...simple....effective.

This applies to the 4 and 8 pin Foster (that's the Japanese company that builds those dang little mic connectors!!) microphone connectors so common on today's rigs. Plug your Heil (what - you don't have one yet!) microphone cable into the front panel of the transceiver.



Remove the two small #4 Phillips head screws and the cable clamp they hold. Then remove the tiny Phillips head screw that holds the rest of the metal sleeve. Slide that back onto the mic cable. Now...cut off the end of a resistor or get a #20 solid tinned wire about 3" long. Locate the mic pin that has the shield of the mic cable soldered to it. With a small iron, carefully solder this solid wire to that shield and pin. Bring the sleeve back up the cable and attach to the connector with the small screw. This leaves the solid wire coming out the back of the connector. Replace the cable clamp and as you do that, tightly wrap that solid wire around one of the #4 Phillips head screws and tighten the clamp assembly very well.

What you have accomplished is grounded the shield to the transceivers chassis ground through the ring on the mic connector. (Make sure that ring is tight). This has been a big help to many stations with RFI problems and should help you clean up your signal.

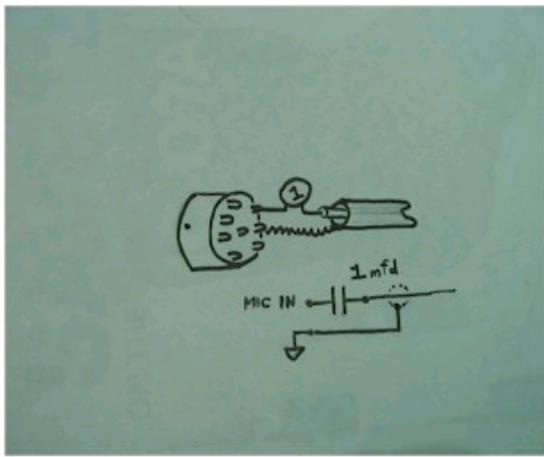
D.C. DE-COUPLING ON ICOM RIGS

All ICOM transceivers 'phantom power' their microphone inputs. Borrowed technology from the recording studios, d.c. power to power the f.e.t. element is fed down the mic line. At the same time d.c. flows DOWN the mic cable the mic audio is fed UP the same wire. Of course this signal is a.c. D.C. flows one direction while A.C. flows the other direction - all on the same cable. Pretty cool huh?.....until you start having all kinds of RFI but we'll cover that in another addition of 'Harmonics'.

The BIG problem with this is when you try using a REAL microphone ...the good old copper wound, magnetic bobbin, dynamic. Connecting a dynamic into your mic input will provide a nice short of the +8 v.d.c, power straight to ground. SMOKE CITY!!!

To use any dynamic element on these phantom powered inputs (which should NEVER be applied to a mic input of a radio transmitter !!!) the input must be de-coupled so the mic audio a.c. signal can pass through to the mic preamp and yet, block the d.c. voltage from that mic element. Simply install a 1 mFd. non-polar tantalum capacitor in series with mic lead. You may get by with a .68 or a .47 mFd but anything less (.01, .005 etc) will not pass any speech audio worth listening to). The cap MUST be a non-polar. This will keep the D.C. from getting across the dynamic element while passing the speech audio through the cap into the mic preamp circuitry.

All Heil microphones have a 1 mFd. capacitor inside. All AD-1 boomset adapters have the decoupling cap installed the 8 pin Foster connector. The coupling cap is NOT installed in our new high impedance GM 'VINTAGE' microphone as they will never be used with ICOM low impedance inputs.

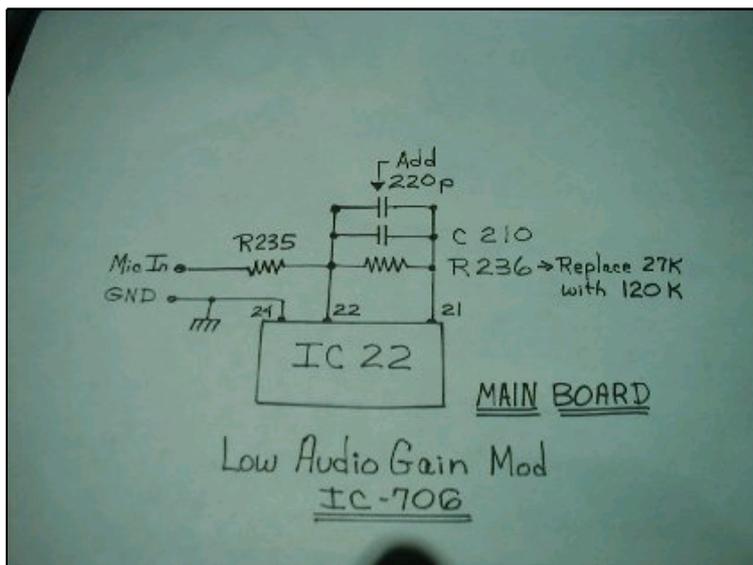


ICOM decouple

INCREASED MIC GAIN FOR ICOM 706

A recent modification was passed along to us for increasing the microphone gain of the popular ICOM 706 transceiver. This modification is not a simple thing to do but it DOES take care of the low audio problem and bring the 706 up to speed with most all other inputs.

IC 22 is the microphone preamp chip. The feedback resistor is 27K from the factory . Remove that and replace with a 120K ohm resistor. Add a 220 pf by-pass capacitor and your are ready to go!



Be sure and check this page at least once a month as I will begin sharing items of interest from our own labs as well as Heil Sound users, world wide.

ADJUSTING YOUR TRANSMITTER WHEN USING HEIL MICROPHONES

The Heil 'Key Element' HC-4 'DX Dream Machine' and HC-5 Full Range microphone elements are purposely designed to be down in gain by -10 dB over the 'stock' microphones. We do this to reduce the pick up of unwanted background noise (amplifier blowers, TV sets, cars outside). Every one of the 'matching' stock microphones (that only means they are painted the same color as the transmitter !) have W -A -Y too much gain. They are O.E.M. mics with elements designed for paging or public address systems....NEVER SSB communications. The specialized HEIL microphones must be close talked (1 - 2 ") and you must adjust your microphone gain at least +10 dB higher in gain. When adjusted and used in this correct fashion, your will have a much easier to understand signal with terrific dynamic range.

When using your HEIL microphone with ICOM transceivers, you will have to make another few adjustments. ICOM has traditionally had a very low level mic preamp. Starting with their 701, 720, 730 and 740 - they didn't even HAVE a mic preamp. It was built inside their FET microphone case. As the market began demanding to use other DYNAMIC microphones ICOM began increasing the gain of their mic preamps - model by model. The 736,745,751,761 and others still were -10 to -15 dB LOW in gain. The HEIL HMP in-line preamp will - in some cases - bring back the gain needed on these models. Finally the 746,706,756 and the remarkable 756 PRO does NOT - does NOT need the HMP preamplifier.

You DO, however have to adjust your ICOM transmitter properly. You will use compression ALWAYS. Adjust to about 8 to 10 dB (1 o'clock). At this level the ICOM compressor acts simply as a preamplifier. The microphone gain will adjust to about 1/2 to 3/4 open and then adjust the internal transmit equalization of the DSP for the tonal quality you want to transmit. You do this adjustment by actually listening to yourself in another nearby receiver with a good pair of headphones to reduce feedback. Monitor circuits are NOT the way to do this... they do not reflect the affect that the receiver filters have on your signal. Only this way will you know EXACTLY how you sound to the outside world.

Because of component tolerances, different production runs, etc. there are some cases where the late model WILL need extra mic preamplification so it is heavily recommended to try the above settings with your ICOM radio, first.

USING THE GM STUDIO MICROPHONE

The GM studio microphone reproduces a wide frequency range. Studio microphones are best worked about 2 - 3" from your mouth. As with all wide frequency range elements, the best sound is achieved when equalized using either the built in DSP equalizer built into most rigs today or with an outboard EQ system such as the original HEIL EQ 300 or the newer technology used in the W2IHY EQ system. For the more in depth studio operation, you will want to use a small studio mixing console with three band EQ such as a Berhinger 602 or Symetrix 528 pre/amp processor. You will want to increase the mid range and adjust some high frequency response while reducing low end response by -4 to 6 dB. Again, listen to yourself in another receiver. You will be able to hear the importance of those changes.

Always remember that it is best to call us at 618-257-3000 Monday through Friday 10 - 4 CST. This is the BEST way to communicate technical conversations and questions. E-Mail is not a place to have in depth TECHNICAL discussions.

**Best Regards,
BOB HEIL, K9EID**

Defining the standards for Amateur Radio Audio ! - Copyright © 2001-2006 Heil Sound Ltd. All rights reserved

[Home](#) | [Broadcast and Live Sound](#) | [Custom Home Entertainment](#)
[About us](#) | [Ads](#) | [Appearances](#) | [Audio Welcome](#) | [Bal-Unbal](#) | [Bob's Page](#) | [Catalog](#) | [Dealer List](#) | [Decoupling Icom DC Input](#)
[DSP Audio Settings](#) | [DxPedition Sponsorship](#) | [Feedback & Review Articles](#) | [Low-Gain Icom Mic Inputs](#) | [Electret Condenser Connections](#)
[E-mail](#) | [Heil Hospital](#) | [New Announcements](#) | [New Products](#) | [Parts](#) | [Photos](#) | [Products](#) | [Radio Connections & Mic Retrofit](#)
[R.F.I. Removal](#) | [Repair Dept](#) | [Reviews](#) | [Sound Comparisons](#)