All Things iCOM

Microphone Basics

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http://www.heilsound.com/amateur/support/dsp-settings/all-things-icom

Important! The iCOM 7300 has been updated to work with all Heil Sound iCM and dynamic microphones. For more on the iCOM 7300 settings, see below.

Icom HF rigs fall into three distinct categories, as far as microphone interfacing is concerned.
First, are the original "zero" models: 701, 720, 730, and 740. These had no microphone preamplifier, it was build into the microphone. Without the original microphone you will have to use an outboard preamp such as a W2IHY or a small mixer/preamp.

Second, are the "low-gain" models (earlier designs like the IC-735/745/751/761/765/781, non-Pro 746/756, all 706 models, and the 7000, 7100, and 7200.

Third, are the "modern" designs: 746Pro, 756Pro series, iC-7600, 7700, and 7800.

To accommodate the low-gain Icom designs, Heil Sound developed a high-quality condenser element, called the "iC" (for iCOM) in our products designations, that provides the optimum frequency response, impedance, and (most importantly) sufficient gain to drive these earlier rigs. The "iC" element also works tremendously well with the "modern" types of Icom rigs, making it an ideal all-around microphone. This element is found in products including the iCM base station microphone, the Handi Mic iC, the Pro Set iC, Pro Set Plus iC, BM-10 iC, and the Classic iC but the HEIL 'iC' electret will not work on Kenwood or Yaesu which require only our dynamic elements found in our microphones and headsets.

Owners of "modern" Icom rigs wishing to utilize the specialized characteristics of Heil Sound dynamic elements (like the current HC-6 and HC-7, and discontinued HC-4 and HC-5) need only obtain the proper adapter cable (AD-1-I, AD-1-IM, CC-1-I, CC-1-IM or CC-1-XLR-I) to ensure proper interfacing. The AD-1-I and AD-1-IM include blocking capacitors that prevent the phantom power supplied by the radio from affecting performance of the dynamic elements. If you try to use the AD-1-iC or AD-1-iCM adapter cable on an dynamic-element microphone, the lack of a blocking capacitor will cause the element to seize up, and no output will be heard. Microphones like the GM series, Heritage, Classic 4/5 Handi Mic 4/5, and the HM-10 Dual sound great on modern Icom rigs.

Heil Sound recently introduced the model PR 781 dynamic microphone, which sounds simply wonderful on modern Icoms. It rolls off at about 150 Hz on the low side, and it has a few dB of boost at about 2100 Hz, but its response otherwise is very natural, and its large-diameter element provides sparkling highs and beautiful audio that responds very well to the audio adjustment capabilities of today's Icom transceivers.

Pin connections on Icom rigs are very straightforward, and are shown below.

Pin Connections

8-pin Round (IC-730/735/745/751/761/765/720/725/726/728/781/901/910/3200/7700/7800 etc.)
Pin 1: Microphone In*
Pin 5: PTT
Pin 6: PTT Ground
Pin 7: Microphone Ground
*Pin 1 also carries voltage for the electret elements used in Icom mics. This voltage must be blocked for use of Heil Sound dynamic elements.
8-pin Modular (IC-703/706/2000/7000)
Pin 4: PTT
Pin 5: Microphone Ground
Pin 6: Microphone In*
Pin 7: Ground
*Pin 6 also carries voltage for the electret elements used in Icom mics. This voltage must be blocked for use of Heil Sound dynamic elements.

Click here to view pin out information for hundreds of rigs, mics and connectors.

DSP and Mic Gain Settings

When using a dynamic element on rigs like Icoms, which were designed for electret microphone elements, one must not be afraid to do two things: (1) utilize the full range of Mic Gain available, and (2) turn on the Compression, using the Compression Level control as a secondary Mic Gain control if necessary.

It is impossible for us at Heil Sound to know what settings will sound "best" on your voice, in your station environment, with your microphone, for your interest (DX, Contest work, rag-chewing, or maximum fidelity) The recommendations below are just starting points; listen to yourself in a separate receiver through headphones to reduce speaker feedback (with its antenna disconnected) to determine what sounds best in your unique situation. Monitoring of your signal is particularly important when setting Menu item Q4, which has a huge effect on your transmitted tonal quality.

IC-746Pro/756Pro/7600/7700/7800

Mic Gain: About 2 o'clock to 3 o'clock for dynamic elements, 10 o'clock for higher output "iC" condenser elements. But forget actual numbers. Always adjust mic gain by watching the ALC meter. Never see that even close to 'the red'
Equalization: Normal 'rag chew' conversation Bass: -2dB Treble + 4dB
DX or pileup busting audio Bass - 5 dB Treble +5 dB
Compression: ON (if you desire) 10 o'clock - no more

TRANSMIT BANDWIDTH (TBW) This is confusing, but very important when trying to determine the type of transmit audio you desire. The same button turns the Compression On or Off also is used to adjust the Transmit Bandwidth Filter. Hold it for three seconds to change one. Quickly tap it for the other. WIDE TBW - Set to Wide for Fidelity, Mid for everyday operation, or NAR for very aggressive DX pile-up busting (significant roll- off of low frequencies will occur). Wide is 2.9 kHz. Mid is 2.4 kHz and Narrow is 2.1 kHz.
VOX Gain: About 65% or where needed
Anti-VOX: About 10% or where needed (keep in mind that the speaker level will affect this a lot)
VOX Delay: About 8%

IC-746 (non-Pro)
Menu Mi/F4 (TCN): 10 (Tone Control)
Mic Gain: About 3 o'clock
Compression: 10 o'clock

IC-718
The iCOM 718 is a terrific value. Great receiver, full coverage .3 to 30 mHz, works great on AM, the digital modes, a terrific CW transceiver, DSP, etc. HOWEVER, the Mic Pre Amp on the iC 718 has down in gain by -15 dB. It will NOT support dynamic microphones. The supplied hand microphone – as ALL hand mics, sounds hollow and mushy. Because of this low gain mic pre amp Our GM, Goldline, HC 4 or HC 5 elements will not work. They will be very low in gain. The answer to making the iC 718 come alive is our iCM, handi mic iC or one of the headsets using only our high output 'iC'. The iCM is the perfect match for the iC 718. Set the microphone gain to 70 and with the stock bandwidth of 2.4 kHz your SSB signal will be terrific.

IC-706
Compression: Adjust for ALC mid-scale on voice peaks.
Mic Gain: 9
Carrier Point (Q4): Try +100 for DX/Contest work, -100 for rag-chewing.

IC-7000
Compression: Set for 10 dB on voice peaks on COMP meter.
Transmit filter: Set to WIDE for fidelity, MID for everyday operation, and NAR for DX pile-up busting.
Mic Gain: Set to 50% for "iC" elements, 80% for dynamic elements.

Hi-Fi on the IC-7000, 7100 series, 7200

For really beautiful audio, using a studio microphone like the Heil Sound PR 40 or PR 781, connect the microphone via an outboard equalizer like one of the fine products from W2IHY, and then apply the output from the equalizer to pins 2 and 11 of the rear-panel "Accessory" jack. Set the Transmit Bandwidth to Wide (100-2900 Hz), and you will be the talk of the band!

Heil Sound Traveler on the IC-7000, IC-706, and other Icom Rigs

The popular "Traveler" boomset works exceptionally well with the IC-7000 and IC-706. Just contact your dealer to get the HSTA-706 Adapter Cable, and the Traveler should work perfectly using the factory default settings on the rig.
For use on earlier Icom 8-pin (round) equipped rigs, use the HSTA-I8 adapter cable. For Icom mobile rigs, use the HSTA-706, and for Icom HTs use the HSTA-iHT.

The ICOM 7300

Enter the new ICOM 7300 hybrid SDR. Truly a game changer in the amateur radio transceiver market. The 7300 is a terrific value. Great receiver, full coverage 160 through 6 meters. Excellent on SSB, works great on AM and FM and covers the digital modes.

All of our Heil microphones work well on the iC 7300.

The PR 781, PR 40, PR 30, Pr 20, PR 10 all connect with the CC 1 XLR -i.
The Gold Elite, HM 12connect with the CC-1 i.

For stunning hand mic performance the HMM with the AD-1 i.

The PRO 7 with the HC 7 or the HC 74 mic elements and all other Heil headsets with our dynamic elements connect with the Ad-1 i.

The headsets using our iC elements will use the Ad-1 iC adapter.

Adjust the mic gain by watching the ALC meter. Never want to see over 50 or 60%.
Usual mic gain will be set between 65 to 80. Pay attention to the ALC.
Compression On at , 1 or 2. Never any more.

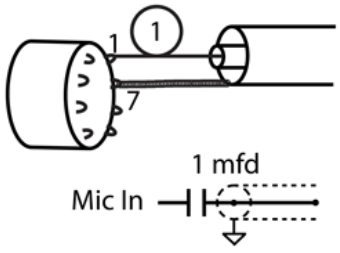
Equalization settings:
Normal conversation Bass -1 to +1 Treble +3
DX and contest use Bass -3 Treble +4

These are merely beginning settings. You will want to listen to your signal in a second receiver and make small minor adjustments to tailor the audio you desire.

The receiver also has a great equalization circuit so adjust the treble and bass to your listening preference.

DC De-coupling on Icom Rigs

All ICOM transceivers utilize "phantom power" on their microphone inputs. Borrowing technology from the recording studios, DC power is



applied via the mic line to energize the electret elements used in stock Icom microphones. At the same time, DC flows DOWN the mic cable while the mic audio is fed UP the same wire. Of course, the voice signal is AC, so DC flows one direction while AC flows the other direction - all on the same cable. This is pretty cool until you start having RFI problems, but we shall ignore that possibility for now.

The BIG problem with this is when you try using a REAL (dynamic) microphone. Connecting a dynamic into your mic input will provide a nice short of the +8V DC 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, IMHO), the input must be de-coupled so the mic audio AC signal can pass through to the mic preamp, while simultaneously blocking the DC voltage from reaching that mic element. Simply install a 1 µF non-polarized tantalum capacitor in series with mic lead. You may get by with a .68 F or a .47 F, but anything less (.01 µF, .005 µF, etc.) will not pass any speech audio worth listening to). The cap MUST be a non-polarized type. This will keep the DC factor into the mic preamp circuitry.

All Heil microphones have a 1 µF capacitor inside. All AD-1 boomset adapters have the decoupling capacitor installed in the 8 pin Foster connector. The coupling capacitor is NOT installed in our new high-impedance GM "VINTAGE" microphone, as this model should never be used with ICOM low impedance inputs.