All Things iCOM

Microphone Basics

Icom HF rigs fall into two distinct categories, as far as microphone interfacing is concerned: these are the "low-gain" models (earlier designs like the IC-735/745/751/761/765/781, non-Pro 746/756, and early IC-706), and the "modern" designs (which include the 746Pro, 756Pro series, IC-7700/7800, IC-7000, and the IC-706MkIIG).

To accommodate the low-gain Icom designs, Heil Sound developed a high-quality condenser element, called the "IC" 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 Quiet Phones IC, Pro Set Plus IC, BM-10 IC, the Traveler series, and the Classic IC.

Owners of "modern" Icom rigs wishing to utilize the specialized characteristics of Heil Sound dynamic elements (like the 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, 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.

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 (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/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. 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

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

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!

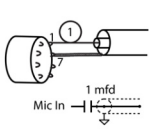
Heil Sound Traveler on the IC-7000, IC-706, and other Icom Rigs

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-18 adapter cable. For Icom mobile rigs, use the HSTA-706, and for Icom HTs use the HSTA-IHT.

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.

For best results please consult your manual.