C-Hamm for most Hammarlund radios.

- Works for Models :
  - HQ-100 IF=455KHz
    - for HQ-105 use HQ-100
  - HQ-110* IF=455KHz/3.045MHz
  - HQ-120 IF=455KHz
  - HQ-129 IF=455KHz
  - HQ-140 IF=455KHz
  - HQ-145 IF=455KHz/3.035MHz
  - HQ-150 IF=455KHz
  - HQ-160 IF=455KHz/3.035MHz
  - HQ-170* IF=455KHz/3.035MHz
  - HQ-180 IF=455KHz/3.035MHz
  - HQ-200 IF=455KHz
  - SP-110 IF=465KHz
  - SP-200 IF=465KHz
  - SP-210 IF=465KHz
  - SP-400 IF=455KHz
  - SP-600* IF=455KHz/3.955MHz

***Does not work on 6 Meter band**

One model displays "FREQ" and can be Used with any radio having a 455KHz IF.

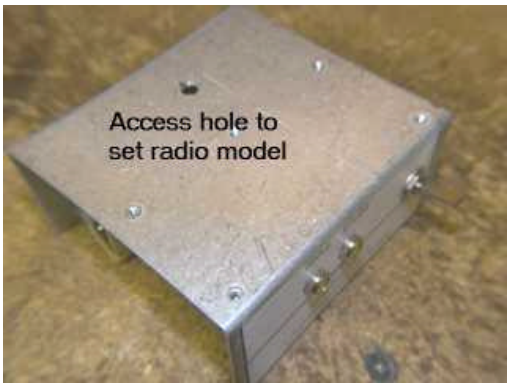
You simply adjust a 15 turn trimpot until the model of your radio is displayed ie: HQ-129X .
This trimpot is accessible through A hole in the bottom of the chassis.
For those models that are dual conversion on some bands DFD1-Hammarlund automatically detects the band and changes the IF offset. It has no controls.
DFD1-Hammarlund uses a 20 MHz TCXO reference so it can be easily calibrated by zero beating its oscillator against 20 MHz WWV's carrier.
Jumper selectable 100Hz/1000Hz resolution.
Digital filtering to eliminate flicker due to round off uncertainty.

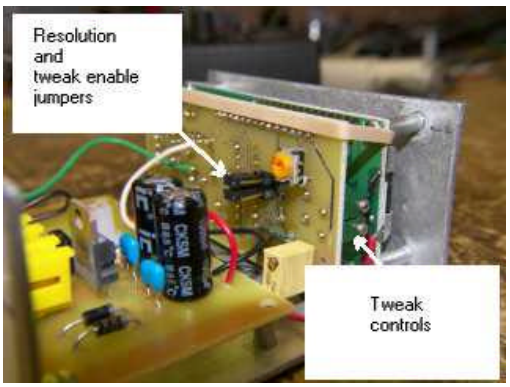
TWEAK MODE provides optional accurate calibration capability.
The frequency to which the radio is tuned is computed as F = Local Oscillator freq +/- IF freq offset.
C-Hamm assumes the IF frequencies shown in the chart above are the actual IF frequencies of your radio.
However, 455KHz Ifs can be aligned to some other nearby frequency and some types use a crystal filter or crystal controlled second conversion which make the actual IF frequency a function of the frequency of those crystals which can vary a few hundred Hz from radio to radio.
There are two jumpers on the back of the counter PCB.
Top jumper decides 100Hz (off) / 1000Hz (on) resolution of the displayed frequency.
Bottom jumper decides TWEAK mode (enabled) / (disabled)
In TWEAK mode there are 15 turn trimpot on the edge of the counter PCB, which allows adjustment of the IF offset.
For dual conversion radios there is a separate TWEAK control for each IF frequency.
Top green trimpot TWEAKs the lower, 455/465KHz IF offset
Bottom green trimpot TWEAKs the high IF offset, for those models using dual conversion on the high bands.
TWEAK range is +/- 12.8KHz in 100 Hz steps
To adjust TWEAK mode, tune a known frequency (crystal calibrator etc.) for maximum signal and adjust TWEAK control to cause correct frequency to be displayed on DFD.

C-Hamm assumes that the LO frequency is always greater than the received frequency so it subtracts the IF frequency.
This is not always true so a switch is provided on the rear panel that causes it to add the IF frequency.

If the displayed frequency appears to be off by twice the IF frequency (ie: 910KHz for a 455KHz IF) then the switch is in the wrong position.

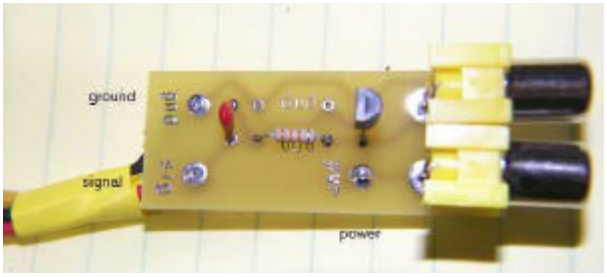
IMPORTANT: POWER SOURCE SHOULD BE OFF BEFORE CONNECTING TO DIGITAL DISPLAY OR IT COULD BE SHORTED



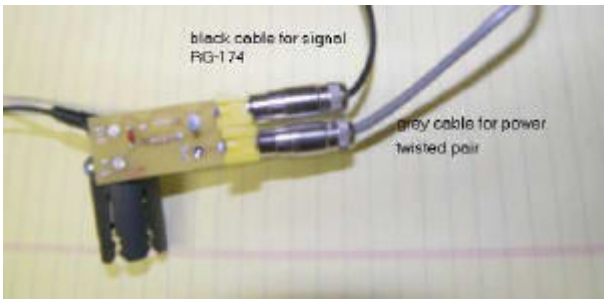


A Universal probe interface.
Makes almost any installation plug-n-play

The probe has three connections, power, ground and signal



It has two RCA jacks that interface to the DFD or digital dial, Power and Signal.

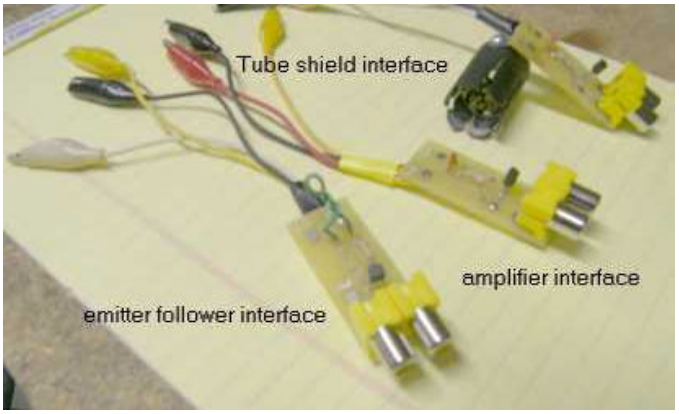


Power (use grey cable supplied with digital dials) is 9 to 18 VDC for a DFD or 9 to 18 VDC or 6.3 to 12.6 VAC for a digital dial.

Signal (use black cable supplied with digital dials) is the oscillator signal to DFD or digital dial.

Use of the power connection is optional. It does not power the probe.
It is intended to tap power from the radio for the DFD or digital dial.
Typically from the hot side of the pilot light for a digital dial.

It can be built in one of three versions

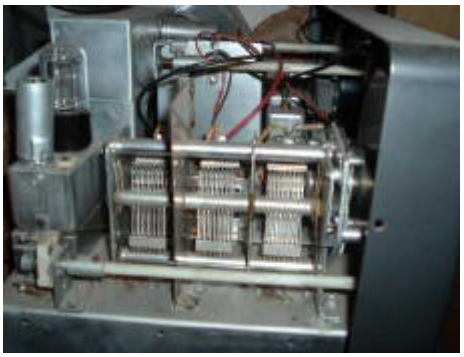


The emitter follower interface

has no gain but a high input impedance and low input capacitance.
It is used to connect to the tuning gang of any radio, as shown below.

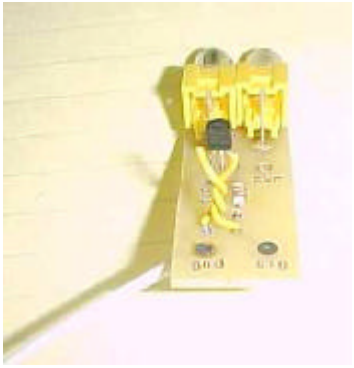
The intent of this interface is minimum loading on the radio and isolation of the coax cable leading to the digital dial.

The tuning gang interface works with most older vacuum tube radios.
The tuning gang is the large air variable capacitors used for bandset and/or bandspread tuning.
The connection is made to the section of the tuning gang that controls the local oscillator.



This is the tuning gang of my SX-100
The tuning gang fixed plates (stator) is usually the signal and the moving plates (rotor) is ground.
It takes about 15V p-p to use this interface up to 32MHz, fairly easy for a vacuum tube radio.

A gimmick provides a very small coupling capacitor to minimize loading of the local oscillator tank circuit. A slight shift in the tuning can be compensated for by adjusting the trimmer capacitor on the side of the tuning gang.



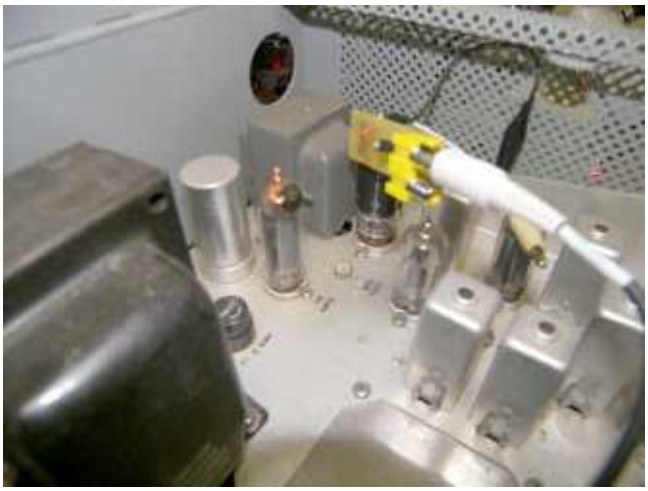
A gimmick is a pair of wires twisted together to form a small capacitor (less than 2pf)

The emitter follower version can be used to make direct connection to solid state radios.
Replace the gimmick with a small capacitor for increased sensitivity.

capacitor	signal@32MHz	capacitor	signal@32MHz
2.2pF	15 Vp-p	15pF	2 Vp-p
4.7pF	7 Vp-p	20pF	1.8 Vp-p
10pF	3.5 Vp-p	24pF	1.5 Vp-p

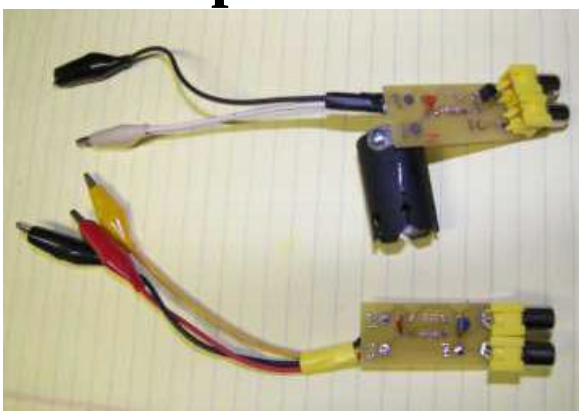
The tube shield interface

works with most vacuum tube radios having 7 or 9 pin miniature tubes.
The signal connection is a tube shield which you simply slide over the oscillator tube.
The tube shield should not touch metal, only the glass of the tube.



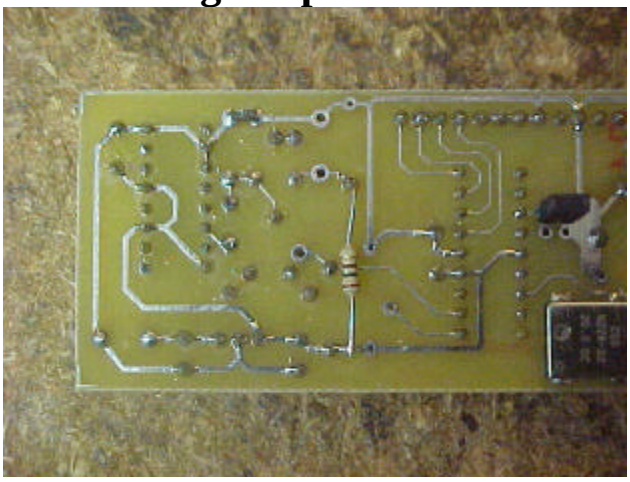
The tube shield attaches to the signal point on the probe. It has a ground connection lead.
Simply slide the tube shield over the oscillator tube and connect the ground to a nearby chassis ground.

The amplifier interface



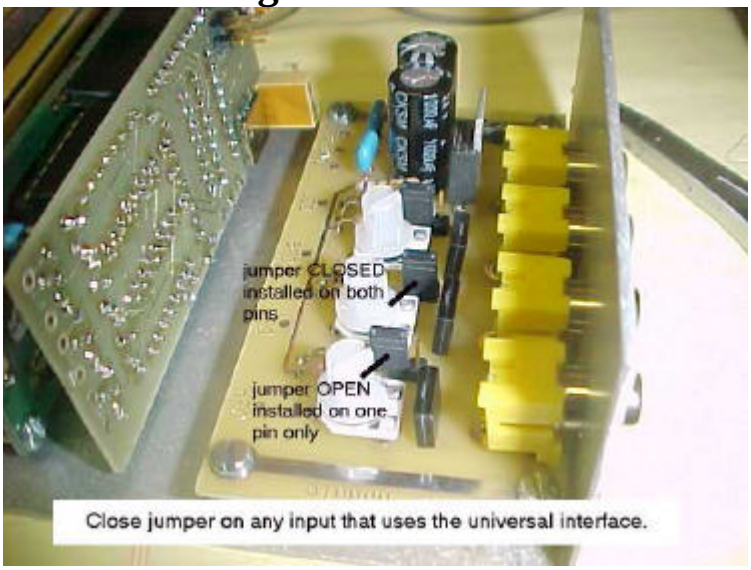
has a gain of 4 but has a lower input impedance.
It is used for the tube shield interface and for direct connection to solid state oscillators or the cathode of vacuum tube oscillators
It is not available without the power connection but you don't have to use it.

When using the probe with a DFD



With a DFD, Solder a 100 ohm ¼ W resistor from the input to +5V as shown above

or with a digital dial



With a digital dial, install the jumper on the power module board. (there are one to three jumpers, one for each input).

Additional applications may be found at:
www.aade.com/applications2/app2.html