Extra

Use This procedure for all 170, 170A, 180, 180A

SERVICE AND ALIGNMENT PROCEDURE

NOTE

Before servicing this receiver, disconnect from the power source and remove all lead wires attached to terminal connections located at the rear of the chassis apron. Carefully turn the receiver onto its front panel face on a smooth clean surface (preferably a soft cloth). Remove the three No. 10 hex head machine screws which fasten the chassis to the cabinet. Remove the knob from the clock adjustment shaft if the receiver is so equipped. Lift the cabinet straight up and off the chassis. To re-assemble, reverse this procedure.

IF ALIGNMENT.

NOTE

Two non-metallic alignment tools are required for complete alignment:
General Cement Co. No. 5097, or equal.
General Cement Co. No. 8282, or equal.
Unless otherwise specified, all front panel controls shall be positioned as follows for the complete alignment of the receiver:

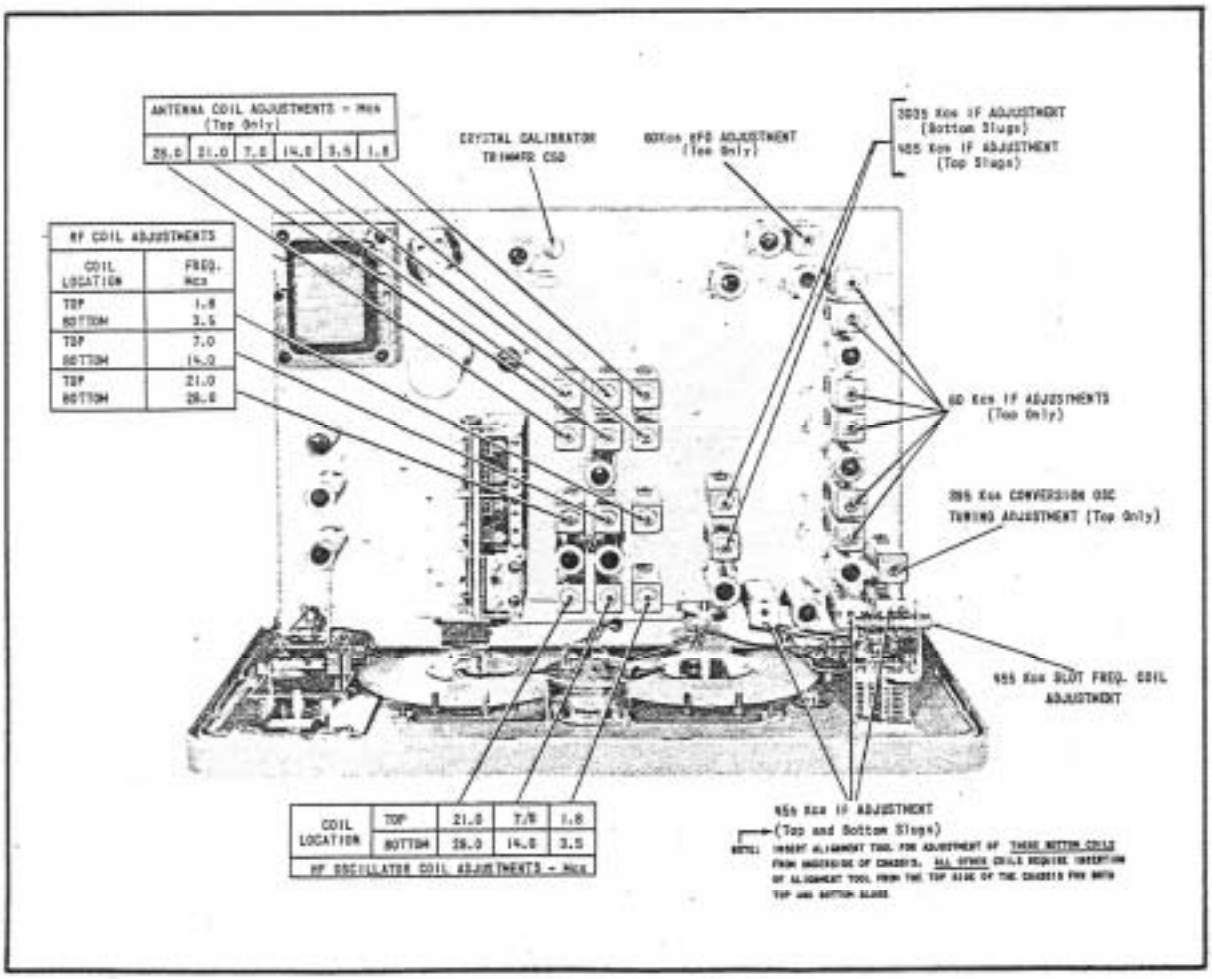


Figure 9. Top View of Chassis

Turn the Function Switch to SSB/CW and with the "BFO KCS" control set at zero, adjust the BFO Transformer T28 for zero beat heard in the loudspeaker, then return switch to AM.

Reduce Signal Generator output to zero and adjust the "S" meter zero position by means of the screw-driver slotted control R20 which is located on the rear apron of the chassis. Remove the generator lead.

Connect the output cable of an accurately known 455 Kcs unmodulated signal generator to the grid (pin 7) of the first mixer V2 (6BE6) and the chassis. Turn the Band Selector to 3.5-4.0 Mcs band. Peak the passband tuning transformer L4 for maximum output (topside adjustment most convenient). Then, peak the top and bottom cores of IF transformers T3, T4 and T5 and the top cores of IF transformers T1 and T2.

Turn Slot Frequency control to "O" and Slot Depth control to mid-position and adjust slot filter coil L2, located directly behind slot frequency control, for minimum meter reading. Raise the input signal to obtain sufficient meter deflection. Return these controls to nominal positions.

Turn the band selector to the 14.0-14.4 Mcs band and feed in a 3035Kcs unmodulated signal. Adjust the generator frequency for maximum output, then peak the bottom cores of Transformers T1 and T2 for maximum output.

Turn Selectivity switch to 3 Kcs position and sideband selector to the "BOTH" sideband position.

RF ALIGNMENT.

NOTE

Alignment tool such as General Cement Co. 8282 or equal is required.

a. The cores and trimmers have been factory adjusted, and should require only a minimum amount of readjustment for any realignment.

b. All RF and oscillator core adjustments are made from the top of the shield cans with exception of the 50-54 Mcs coils. The 50-54 Mcs RF coil is adjusted from the underside of the chassis by varying the turn spacing. A slight spreading of the turns decreases the inductance and, conversely, pushing the turns slightly closer together increases the inductance. The 50-54 Mcs Antenna coil, as a rule, will not require readjustments because of the large range of adjustment of the antenna trimmer capacitor. Before proceeding with the actual alignment, check cord drive and knob orientation of the antenna tuning drive system. The antenna capacitor should be half open when the Knob marking is vertical (see Figure 12).

c. Connect the unmodulated, signal generator output cable to the antenna and ground terminals of the receiver, with both links on the antenna terminal strip closed.

d. Set the controls the same as for IF alignment. Connect a d-c vacuum tube voltmeter between the grid (pin 7) of meter amplifier V13 and the chassis. Always keep output volts in the vicinity of -5 volts D.C. Adjust the sensitivity control as required to obtain a sufficient voltmeter reading and to prevent overloading. Adjust Calibration Reset Knob for alignment between window and escutcheon markings.

e. The oscillator adjustments are performed first. The RF is adjusted next to obtain maximum amplitude. The antenna cores are adjusted last. A certain amount of inter-action will occur between the oscillator and RF adjustments, particularly on the higher frequency bands. Final adjustment should be accomplished by combined or alternate adjustment of the oscillator and RF for maximum amplitude.

NOTE

The trimmer adjustments, if required, should be final adjustments for each band.

f. Note that the oscillator frequency of the HQ-170 is on the high side of the signal frequency, except on the 50-54 Mcs band where it is on the low side. Therefore, it is necessary to make sure that the oscillator frequency is not adjusted below the signal frequency which would be an image response of the signal on all bands, except 50-54 Mcs where the reverse is true.

g. On the 50-54 Mcs band, a shift in oscillator frequency occurs upon replacing the receiver in the cabinet, with the result that the dial calibration reads approximately 50 Kcs, or one division low. This condition may be remedied as follows:

(1) After alignment in the usual manner with the receiver out of the cabinet, adjust the 50-54 Mcs oscillator coil T26 until a 50.00 Mcs signal is received at approximately 50.05 Mcs on the dial.

(2) Place the chassis in the cabinet or place a metal plate (such as a cookie sheet) over the bottom of the chassis. The dial reading should be

approximately correct. If it is not, another re-adjustment of the oscillator coil T26 is required.

CALIBRATOR ALIGNMENT:

The crystal calibrator is factory adjusted to zero beat with the National Bureau of Standards Radio Signal emanating from WWV. If minor adjustment is determined to be necessary to re-zero the calibrator, an external receiver capable of receiving signals from Radio Station WWV on any one of its operating frequencies is necessary since the tuning bands of the HQ-170 receiver do not include any of these frequencies.

To re-zero the calibrator, loop one or two turns of insulated wire around the envelope of V11 (6BZ6—Crystal Calibrator) and connect the wire to the antenna terminal of the receiver used for heterodyning. Tune in a strong signal on any one of the WWV frequencies and zero-beat the calibrating oscillator with WWV by slowly rotating the ceramic trimmer C50 at the top rear of the chassis.

For a quick check of the 100 Kcs calibrator setting without having to remove the cabinet from the HQ-170, connect the antenna terminal of the receiver being tuned to WWV, to the antenna terminal of the HQ-170 that is farthest away from the ground terminal.

Dial Cable Assembly

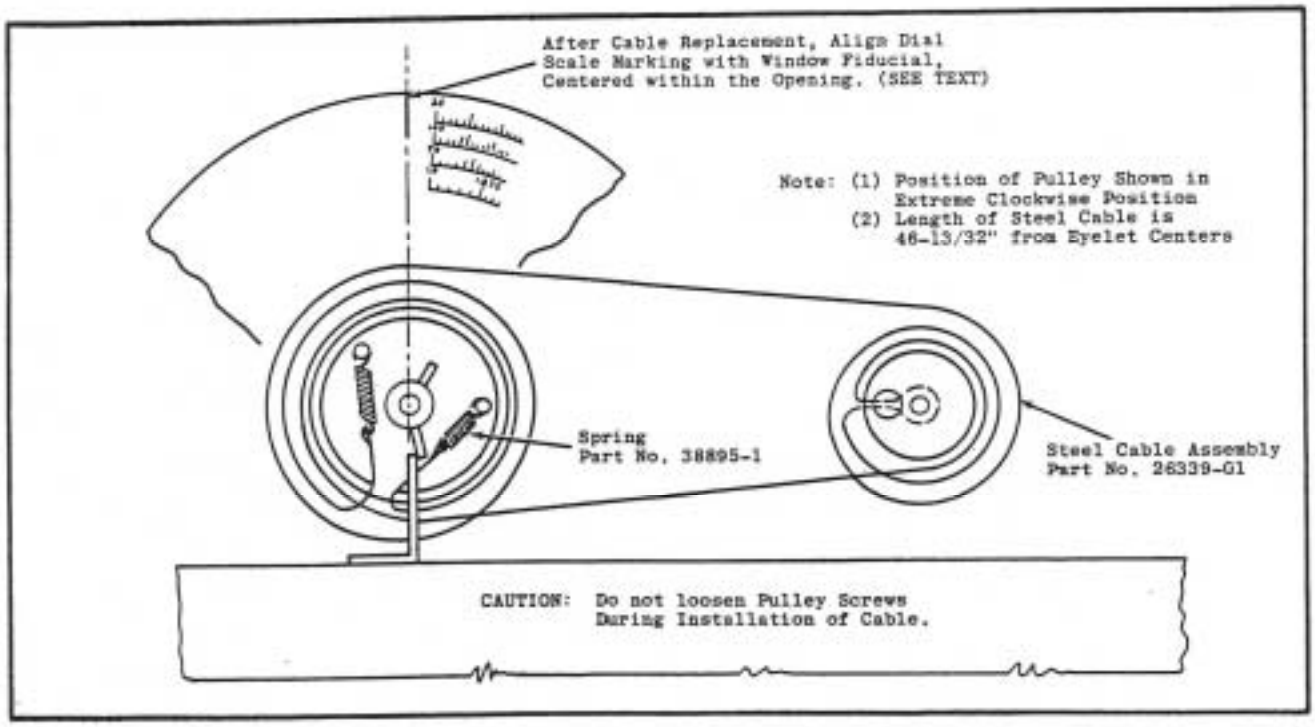
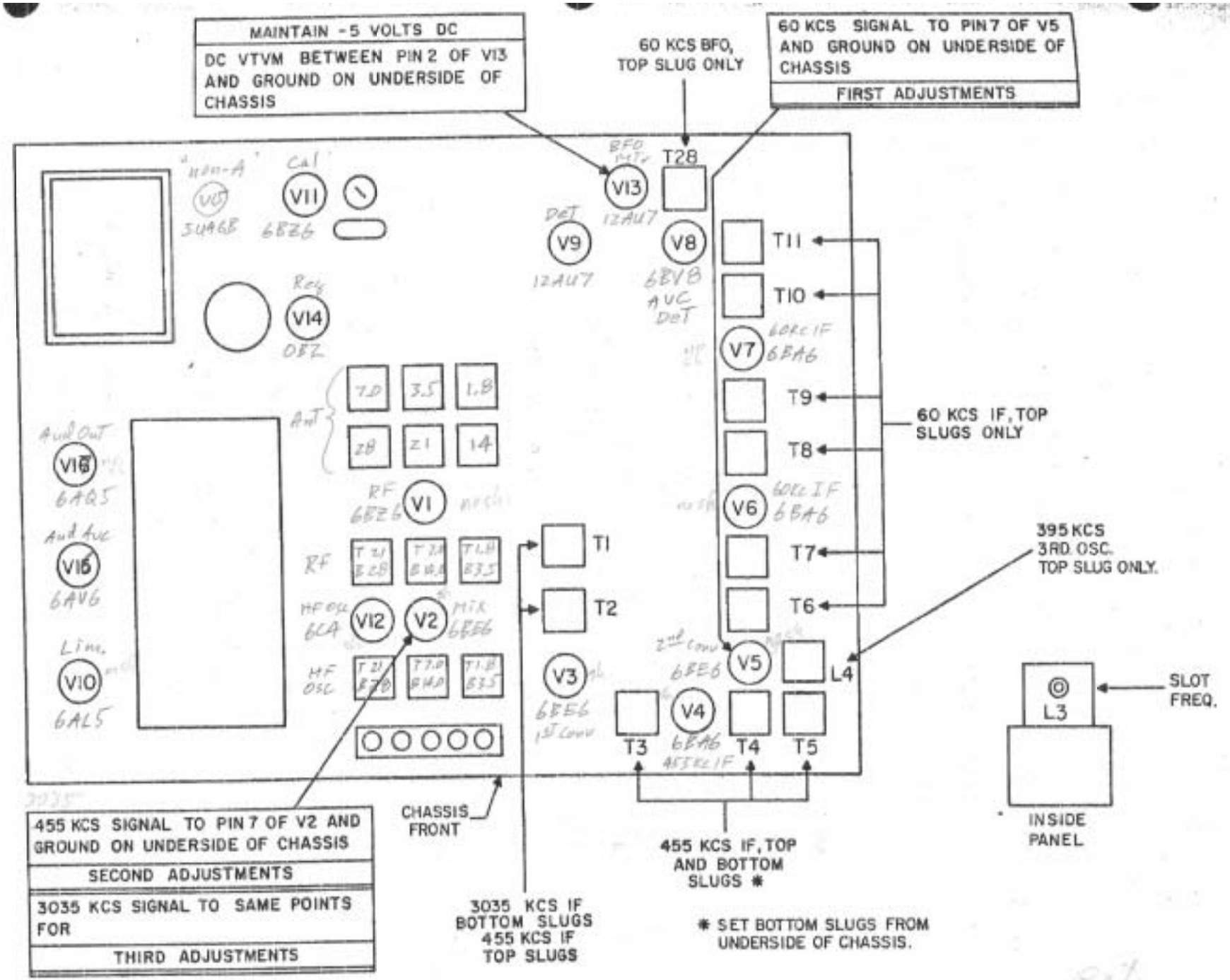


Figure 11. Installation of Dial Cable Assembly



FIRST, SECOND & THIRD IF ADJUSTMENTS

STEPS 1 TO 9

Al Parker

From: "Al Parker" <anchor@ec.rr.com>
Sent: Thursday, October 19, 2006 3:44 PM
Subject: HQ-180/170(A) manual error

Paul.Katz@bakerbotts.com
Wednesday, October 18, 2006 11:16 AM

There is an error in the Hammarlund HQ-180(A) service manual about alignment of the 60 kc IF. The sideband switch should be in the first (1) position "L" lower sideband (see small note on schematic) not "U" upper sideband as specified in the service manual alignment instructions. This is also true for the HQ-170(A). The HC-10 has the sidebands reversed, i.e., position 1 is USB on the sideband switch. See also Electric Radio #149, p. 15.

---

from the "archives" tnx Cecil

"Craig Roberts" <crgrbrts@verizon.net>
December 10&11, 2004
As you guessed, the manual's wrong.
The correct connection point for a VTVM in aligning
the HQ-170 is of C44 and L10-- it's
at the connection between a coil and cap in the upper right hand corner of the set it it's sitting vertically with the front panel on the left).
December 11, 2004
The note on the schematic in my manual copy says:
"IF aligned at 60 kHz with S5 in .5 KC and S6 in Pos.1" S5 is the selectivity switch, and S6 position 1 is LSB.
The alignment text says, "Turn the selectivity switch to 0.5 kHz and the side band switch to "L".

Also - the text says, "Connect the output cable of a 60 Kcs unmodulated signal generator . . . to the grid (pin 7) of third mixer V5 and the chassis.

From: thompson@mindspring.com
To: Old Tube Radios <boatanchors@theporch.com>
Subject: More on the HQ170 and 170A
Date: Sat, 25 Sep 1999 15:04:47 -0400
X-MSMail-Priority: Normal
X-Mailer: Microsoft Outlook Express 5.00.2314.1300
X-MimeOLE: Produced By Microsoft MimeOLE V5.00.2314.1300
Reply-To: thompson@mindspring.com
Sender: owner-boatanchors@theporch.com

The differences between the HQ170 and 170A were pointed out recently
1. solid state PS and 2. heaters always on.

The 170A was hotter on 6 meters and this was extended to the 170A-VHF with a 2 meter converter built in. I had the chance to compare the HQ170A-VHF to the Clegg Interceptor in 1964 and the Clegg was the better performer on 6 meters by a nose and the Clegg was much better on 2 meters. Not to say that the 170A was not a good performer but the Interceptor was just better. The HQ170A-VHF did yeoman duty on the HF bands matched with the HX-50 TX and HXL-1 amp. The Interceptor was paired with a Clegg Zeus and into a 6 el Hygain beam worked from W1 to KP4 to W5 from the Mountains of North Carolina.

I have now aligned three HQ170A's (2 were A-VHF models). The first, Jon K1VVC and I found could not be properly aligned until we followed the instructions in the HQ170 (not A) manual. This was the same with 2 other A's I aligned (I used the same sig generator with all three). Greg KX4R found the same thing in the HQ170A I sold him.
The 60Kcs IF alignment is very critical and must be done to properly receive LSB/USB and CW and set the IF selectivity especially below 3 kcs. I find that the A model still is unstable for 30 minutes or so after turn on (at least turning on the rest of the circuits) and the alignment changes after several months. I suspect the tubes and components change values that cause this difference. On my models its not the same bands but different in all cases. I set them with the sig generator at the top and bottom of the bands and they get off as much as 10 or 15 kcs just by sitting. I even tried keeping one 170A plugged in and the alignment changed.

I do find that there were at least 5 models of the HQ170 and 4 models (or versions) of the HQ170A. Frank Silvester W4AMJ was not sure of the differences and the Hammarlund Historian is currently unreachable so if anyone knows exactly was the different versions mean please let me know. Frank did say that the alignment should not change due to the versions and his explanation about the alignment problems I and others found he attributed to the technical writers of the manuals. He did say that a final sweep generator test might be useful.

73 Dave K4JRB

X-Sender: kherron@pop.voyager.net
X-Mailer: QUALCOMM Windows Eudora Light Version 3.0.6 (32)
Date: Sat, 25 Sep 1999 20:53:28 -0500
To: Old Tube Radios <boatanchors@theporch.com>
From: Kim Herron <kherron@voyager.net>
Subject: Re: More on the HQ170 and 170A (long)
Reply-To: kherron@voyager.net
Sender: owner-boatanchors@theporch.com

Hi Gang,

Let's see if I can help here.
>I do find that there were at least 5 models of the HQ170 and 4 models (or
>versions) of the HQ170A. Frank Silvester W4AMJ was not sure of the
>differences and the Hammarlund Historian is currently unreachable so if
>anyone knows exactly was the different versions mean please let me know.

The official version that Hammarlund put out was that there was (and I've concluded, is)only two actual versions of the 170 and 3 180's. This includes the a versions. If you choose to include the options that Hammarlund made available, then that number grows significantly. Probably on the order of a dozen or more, between mechanical and electrical variations. However Hammarlund's own documentation shows only two versions. They have already been discussed, so I won't bore you with those details again. These variations included export models verses domestic, the A version 6 meter amp and 2 meter converter (worked so-so), the clocks, the crystal control box that went in the clock hole in the front panel, etc. Those items weren't considered different models. They all carried the same basic Model number and any stock 170 could be converted to, or upgraded to any option you chose, after purchase. The basic radio and circuit design stayed the same.

>Frank did say that the alignment should not change due to the versions and
>his explanation about the alignment problems I and others found he
>attributed to the technical writers of the manuals. He did say that a final
>sweep generator test might be useful.

What Frank discovered, and Hammarlund never bothered to tell anyone, is that the later 170A and 180A alignment procedures are WRONG!! If you try to align a radio with the newer procedures, you ain't gonna like what you git! The control settings are not correct and in some of the photo's that Hammarlund used, the controls were reversed from what they should be. If you want a radio to work correctly, use the original 170 alignment procedure, even on a 180. The only place that you can get into trouble using it, is on the 1ST IF OSC coil on a 180/A. It's a different coil, than a 170 and the circuits are different too! Use the 180 procedure on that stage only. Many fellows find that after alignment, that their bandpass response is screwed up. Part of it's alignment (see above), the other is that some of the circuit component values have changed, changing the IF bandpass curve when changing the setting on the bandwidth control. You have two choices here (You make the choice). You can align the IF for broader bandwidth, or change a bunch of components out to repair the offending stage (sometimes more than one). Sweep alignment definitely helps here because you can see the offending stage's shape and compentsate for what you want. Be aware too, that it's possible that the trimmer capacitors may be causing a problem if you're having trouble keeping the dial tracking (it'll change when you operate the bandswitch). I've seen the brass bands on the trimmers come loose and move back and forth as the bandswitch is moved. Either glue the band in place or change that piston trimmer. I've done both.
As far as drift is concerned be aware too that Hammarlunds coils LOVE moisture!!! If your radio sits where it's damp, or very humid, you will

have problems you're not going to do much about. The coil forms in these things have gotten old, the sealing material has died and they absorb LOTS of water. I've had several receivers that I've had to leave on for more than a MONTH to drive all the moisture out. I live where it's humid, and the only thing I finally found that cured the problem was CENTRAL AIR CONDIIONING, thank you very little! So be aware that some or all of these things could be plaguing you in your endeavor to stabilize your180. This is assuming that you have good quality oscillator and mixer tubes installed. If yourattempting to get your170/180 to work using off brand tubes (Lindal, International Servicemaster, Hitachi, et al), you might want to consider a better quality tube. I've found that they do not preform with stability and predictability, in these radios. The can be more of a headache than you may at first realize. More late as I thing about some of this. Thanks for your patience!!

73 Kim W8ZV

KNOB FUNCTION	NOMINAL POSITION
Band Selector	14–14.4 mcs band
Pass Band Tuning Dial	0
AM-SSB/CW Selector	AM
Side Band Selector	Both
Selectivity Selector	3 Kcs
Slot Frequency	Counter-clockwise
Slot depth	Counter-clockwise
Beat Frequency Oscillator	0
Noise Limiter	Off
AVC	Off
Antenna	Center
Calibration Reset	Center
Send-Receive Switch	Receive
Audio & RF Gain	Adjust to Test Requirements

NOTE

The receiver should be warmed up for a period of at least 1/2 hour before proceeding with the complete alignment.

Connect the output cable of a 60 Kcs unmodulated signal generator known to be accurate, to the grid (pin 7) of third mixer V5 and the chassis. Connect a dc vacuum tube voltmeter between the grid (pin 2) of V13 (meter amplifier) and the chassis. Turn the selectivity switch to 0.5 Kc and the sideband switch to "L". Peak transformers T6, T7, T8, T9, T10 and T11 for maximum negative D-C volts. Always keep output volts in the vicinity of -5 volts D.C.

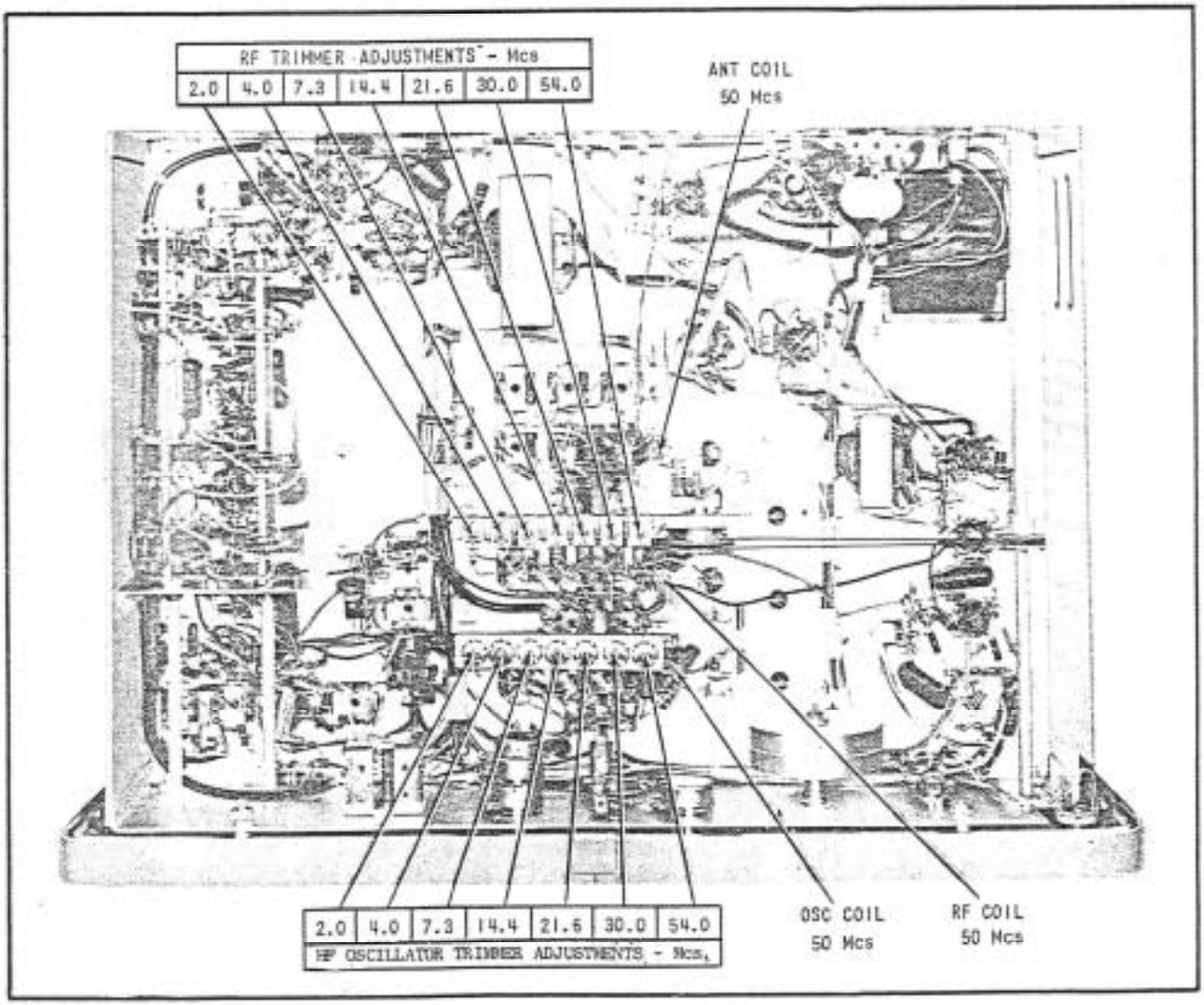


Figure 10. Bottom View of Chassis