

THE COMMUNICATION RECEIVER



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All correspondence requires SASE for reply.

"NATIONAL NOTES"...A NEW FEATURE

INTRODUCTION

With this column we begin a continuing series of miscellaneous notes on random topics pertaining to the products of the National Company of Malden, Mass., which we hope will be informative and helpful to National collectors and restorers. With a very extensive product line, extending over several decades, it promises to be a subject almost without end, encompassing receivers, transmitters, components, and associated items. Many of the receiver topics will naturally pertain to the HRO and NC-100 series, since they were the sets manufactured the most, and are particular favorites of collectors. Most of the "notes" are taken from the restoration experiences and other research of the author, but will not be restricted to this source alone. Readers are invited to contribute, and all letters will be answered.

This particular column will concentrate on the HRO receiver, starting with a particularly vexing problem faced by many a restorer.

No 1. REMOVING A FROZEN PW TUNING DIAL.

The circular PW tuning dial used on many of the National receivers such as the HRO, the NC-100 series, and the 1-10, is a thing of beauty and a joy to use. However, it is often necessary to remove it to clean, lubricate, and adjust the dial settings. And before any physical restoration work on the receiver can be done the dial must be taken off, but more often than not, it just will not come off, no matter how much force is applied. The problem is caused by the hard set screw digging into the softer metal of the tuning shaft, and spreading the metal up into a ridge that effectively locks the dial on. Often this happened when the set was first assembled at the factory.

I have tried freezing the whole set (minus 25 F) to contract the metal parts, jamming the gears and twisting the dial off, and numerous other approaches, with little or no success. It is possible, of course, to cut the tuning knob off

but this is destructive and not recommended. After looking at a particular NC-100 for three years, I finally hit on the idea of removing the large tuning knob in the center of the dial assembly from the rear of the panel by unscrewing the three flat head screws that hold it on. With the dial set at 250, the three screws were visible from the rear and I was able to unscrew them with a slender screwdriver. With the tuning knob off, the end of the shaft was exposed and the problem was essentially solved.

After removing the set screw(s), a stack of pieces of cardboard about 3" x 6" was cut, and then jammed in between the dial and the front of the panel, forcing the dial forward until it was under even tension. I then gently tapped the end of the shaft using a light hammer and a piece of hardwood to avoid any more metal damage, and as the shaft retreated back into the dial, kept adding to the pieces of cardboard. Before long the dial was off and I was able to dress the shaft with a fine file. The dial was fitted back on the shaft after cleaning and lubricating.

A frozen HRO dial, on the other hand, was a bit more tricky, since the tuning capacitor effectively blocked access to the screws, and none of the screwdrivers I had would work. Finally, in desperation, I tried making a long flexible screwdriver out of a piece of steel coathanger wire. Using a small light to show me exactly where the screws were, I was able to thread the wire through the capacitor to the screw heads and break them loose. Then it turned out that the wire was too stiff (0.100") to turn around the curve, so I made another out of thinner, more flexible wire, 0.060". This did the trick, the screws came out, and the knob was off.

No. 2. SETTING THE PW DIAL CORRECTLY ON THE TUNING SHAFT

The PW dial must be mated correctly to the gear box shaft or the dial readings will not track with the calibration charts, and the numbers may not be centered in the top window. The procedure is relatively simple:

1. The dial is removed, cleaned and lubricated (I use Lubriplate, but other greases will work) and has been reassembled, ready to be reinstalled. The gear box has also been cleaned and re lubricated.
2. Jump the center dial plate with the numbers

along the gear track until the reading 250 is centered in one of the windows, the springs are vertical, and the three screws are visible through three access holes in the back of the assembly.

3. Set the tuning capacitor to approximately mid-range, slip the dial back on, and tighten the set screws. Run the dial to the end and check to see that the capacitor gangs are fully closed and symmetrical; that is, all the same. Make any necessary corrections by resetting the dial to 250, removing it, hand cranking the capacitor to compensate, and replacing the dial.

One precaution: Check to see that the dial rotates smoothly with no wobble and without scratching the panel. It seems that some of the dial castings are warped. If so, they must be replaced. I have also found one gear box with a slightly bent main worm-drive shaft.

No. 3. CLEANING THE PW DIAL GEAR BOX

The grease inside the gear box used to couple the PW dial to the tuning gang can be as much as 60 years old, hardened, serving no useful purpose, and causing dial drag. To service this, remove the top of the gear box and carefully dig out the accumulated hard grease with a probe. Then slightly spread the two halves of the split gear with a thin screwdriver and lubricate the inside faces with Lubriplate or thin oil. Use new grease on the gears. If you wish to do a complete job (recommended,) you can slide the main worm drive out, but be careful to not lose any small parts. When reassembling, be sure to put tension on the split gear halves; you can hold them in place with a nail through the alignment holes.

No. 4. BY-PASS CAPACITORS IN NATIONAL RECEIVERS

Old tubular by-pass capacitors, and some not so old, just will not work correctly, and if you have your eye on making a particular receiver work well it is necessary to replace each and every unit. Furthermore, you may run the risk of a burned-out power transformer. This is an especially prevalent problem with the NC-100 series of receivers with the heavy PP output stage, and I have seen a number of these sets with replacement or even missing transformers.

With National receivers this is usually not a major chore, since the wiring under the chassis is most often readily accessible. I use a simple Heath or Eico capacitor checker, rebuilt with good capacitors, to check mostly for breakdown under voltage. All replacements are also checked before installing, since even modern high-tech caps can be defective. Mylars and disk ceramics are the units of choice, and are usually good.

One trick, well known to the experienced restorer: When removing the old cap, leave leads in the set and solder the replacement to these leads. This eliminates the possibility of damage to the terminals. Just be sure to tin the old leads before installing the new capacitor.

No. 5. UNIQUE COMPONENTS

The radios of the 1930s used some unusual components, and National products were no exception. The FB7s and HROs among others had distinctive resistors with a white ceramic body and molded metal ends, with heavy end leads soldered into place with a technique that almost defied removal. All should be checked and if they are out of spec. on the high side it is a simple matter to bridge the bad original with a good modern resistor to bring it down to the correct value.

Another prominent item is the cathode electrolytic; there are two in each HRO, and they are in other receivers as well, riveted to the chassis. I wire a new modern unit to a small stand-off soldered to the original cap terminal, and leave the original in place physically, although disconnected from the circuit.

6. THAT OLD HOOK-UP WIRE

Surprisingly, it is not unusual to find early National receivers where the hook-up wire has corroded at the terminals it is soldered to, buried beneath the solder. This was probably due to the use of paste flux in the early days to facilitate the soldering process, and the only way to locate these spots is to examine each connection with a magnifier and a strong light, and by poking at the wiring with an insulated probe while the set is working.

It also helps to remove those blobs of excess solder. I usually do not attempt to resolder the original connection, which can be badly corroded, but cut the wire off and make a new joint, after first carefully tinning the wire. If the wire is too badly worn, you should replace it with a new piece of stranded.