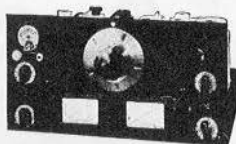


The COMMUNICATION RECEIVER

Editor: Bill Fizette, K3ZJW

R.D. 1, Box 55, Henryville, Pennsylvania 18332

All correspondence requires SASE for reply



RESTORING THE NATIONAL COMPANY SLIDING-COIL RECEIVERS

INTRODUCTION

There were literally thousands of the National Company sliding-coil receivers manufactured over an approximate 20-year span, with the largest production during the WW II years for the armed forces where they were widely used as workhorse receivers, especially by the U.S. Navy. Sooner or later the collector of communications receivers will acquire one of these units, and invariably there is a urge to *"plug it in and turn it on"*.

Before taking this drastic step, however, the collector is well advised to observe the usual precautions about applying power to a radio that may be 50 or more years old. There have been numerous columns on this subject in the various antique radio publications, and they are mandatory reading for a restorer. The sliding-coil receivers, in addition, are characterized by the massive catacomb which occupies the entire sub-chassis space. This makes the restoration task somewhat unique and difficult unless a specialized approach is employed. The following comments will apply to virtually all of these receivers.

A National NC-101XX was acquired in the flea market at the 1985 AWA Conference, and while appearing to be in reasonable shape, turned out to be badly in need of attention. Some work had been done on it, but fortunately most of the original components were still in place. However, the power resistors were fried, the chassis was covered with rust and accumulated dirt, and the 160-meter coils and the matching speaker unit were missing.

PLEASE NOTE: Before tearing into one of these receivers, it would be a good idea to know what you have. The original NC-100 with the BC and short-wave bands, and characterized by the



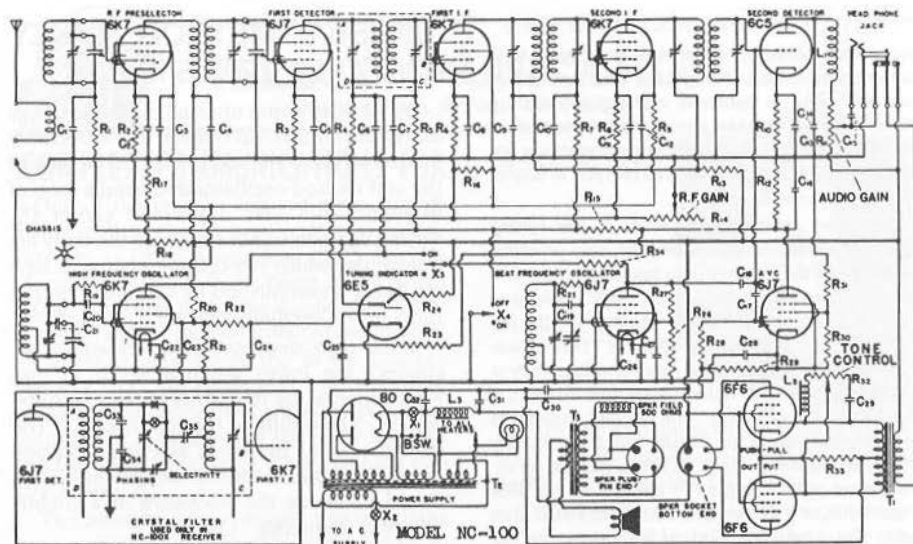
NC-100A NC-100XA

distinctive colored front panel, is probably the rarest of the group, and if you have one in "good" or better condition it is recommended that it be cleaned and put on display. The NC-101X and the direct-reading dial variants, however, make excellent candidates for restoration.

These sets are often found without the distinctive original National power transformers, a result of overloading the supply by leaky electrolytics or by-pass capacitors. Unfortunately the spacing of the mounting holes appears to be non-standard, and replacing the transformer often leads to surgery on the chassis. If you have to do this, be sure to allow for the high filament current required. A small TV transformer will work well if the B+ voltage can be adjusted to about 250 volts.

In my case, I disassembled the set by removing the PW dial, the knobs, and the cabinet. A close inspection revealed that the chassis was too rusted to *"patch and spot"*, so it was decided to totally strip the chassis, repaint with a gray approximating the original, and reassemble.

Removing the catacomb and the tuning capacitors are the major tasks in this part of the work, since the weight of the sliding box can cause problems. The best procedure is to remove the front



pinion drive, lift the front of the box away from the chassis after positioning it between coil contacts at one end of the run, and prop it on a folded towel to cushion the brass fingers. Then the steel rod can be sprung loose by knocking it clear (hammer and wood block approach) after taking out the end screws, and the assembly lifted clear of the chassis. The box has fiber inserts to cushion and insulate it from the rod, and often they are loose or out of the holes. It may be necessary to cement these back in place to keep them there.

If you are working on one of the "A" receivers with the direct-reading dial, the removal is complicated by the elaborate dial cord configuration which operates the sliding band-change pointer. Observe closely and make copious sketches so you will be able to reassemble the unit when the time comes. The tuning capacitor is a special case, and the writer recommends the following specific procedure to remove it. Along the sides of the steel channel upon which the coil terminal blocks are mounted are six access holes for wiring. Carefully remove (clip close or unsolder) the leads where they tie into the circuit, noting that one by-pass capacitor lead goes directly to one of the terminals. Pay very close attention to the wire which goes from the junction of the large resistors R17 and R18 into the front access port; it goes to the first contact on the oscillator block at the very front of the receiver.

A careful inspection of this spring contact will reveal a piece of insulating material between the two leaves... it is actually a switch which is closed by the action of the coil pin going between the two pieces. The lead from the other leaf of this switch goes out the opposite port to the RF and IF screen circuits, in effect cutting the circuit off between

bands when the tray is moved. After all leads (including the A and G wires) are disconnected, the six screws holding the coil blocks are removed, followed by those holding the gearbox and the capacitor to the chassis, and the assembly lifted off.

How far you go is dictated by the condition of the chassis and the end result desired. It is relatively easy to unsolder and remove the IFs and BFO can, crystal filter, the audio choke and the power components. The chassis can then be cleaned with hot detergent, rinsed and dried. If there are only a few rusted spots, patch and spot with matching paint and reassemble. However, if the rusting is extensive, as it was in my case, it is necessary to drill out the rivets and remove all the components; the entire sub-chassis wiring harness will fall out. The chassis can then be sand-blasted and repainted.

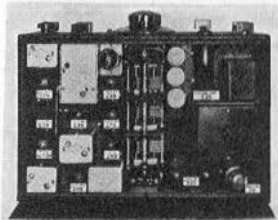
The balance of restoration follows procedures previously detailed for the HRO. Check all capacitors and resistors, leaving the original can electrolytics in place for appearance, but removing them from the circuit, replacing them with small 10 to 20 mfd tubulars. By now you have noted that the old rubber silk-covered wiring is very fragile and often falls apart. It must be replaced, or damaged spots may be covered with clear spaghetti. The multiple toggle switches should be checked carefully, as they often do not work. I have found that WD-40 will usually free them up, but Nick, W3DSE, who has worked with these receivers, totally disassembles each switch for cleaning and lubrication.

He also advises paying very close attention to the Litz wire in the IF cans to make sure that all

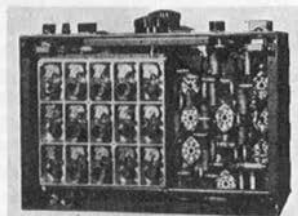
(Continued on next page.)

strands are soldered; otherwise, the circuit Q is badly compromised. You get the idea; use all due care and exercise patience, and you will end up with a good job. And be sure you have the correct circuit diagram for the model you are working on. The original NC-100 and the NC-101X are in *Rider's*, Volume 8.

The heavy steel spacing studs in the tuning capacitor are often rusted, and the only practical way to clean these parts is to take the entire unit apart, chuck them in a drill press, and use files and steel wool. A good coating of wax to finish the job will help keep them clean. (NOTE: This procedure has been written up in more detail; a copy is available for a SASE. If there is enough interest, it may be published later.) The original speaker is an important part of the circuit, but unfortunately it is often missing. Paul, W3VVS, makes up replacement units using a PM speaker with a 500 ohm choke, or a dynamic speaker with a 500 ohm field. The output transformer is mounted on the speaker and should match P-P 6F6's.



Top
view



Bottom
view

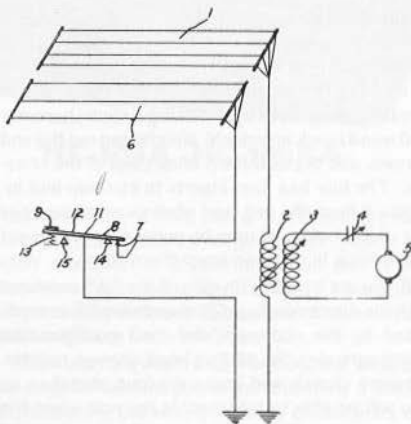
Reassembly and alignment follow a mixture of common sense and standard procedure, aided by a manual or a copy of the *Rider's* reference. I have found that the engraving on the front panel is a particular problem if you have to repaint the cabinet... it is difficult to clean the paint out and make it look good. If anyone has a procedure, I would appreciate hearing about it. And if anyone knows where to get hookup wire that resembles the original National Company black wire used in these 1930's receivers, please let me know the details.

My set has been reassembled and awaits only the installation of the original eye tube, replacing an S-meter which was added, and the 160-meter coils, which I hope to locate in due course. Good luck, and remember that a properly functioning NC-101X is an excellent CW receiver for the OT contest.

UNUSUAL METHOD TO KEY EARLY TRANSMITTER

We've seen some unusual methods to key early transmitters but believe this is decidedly unique. It was patented in 1921 in the days of the self-excited oscillator and used a form of frequency-shift and depressed carrier (?). Keying was somewhat similar to the early arc transmitter which ran continuously with keying being accomplished by shorting a couple turns in the oscillatory circuit.

In this case, depressing the key would disconnect the lower antenna which in turn would change the frequency to the one to be copied. The oscillator ran continuously. The inventor claims the lower antenna absorbed much of the power when it was grounded and would minimize the backwave at a slightly different frequency. I wonder.



NUMBER 1,506,736—Signaling System

CLAIMED SCORES FOR 1988 QSO PARTY (Over 1000 pts.)

1. W1YG	2364	9. W8BFD	1053
2. W2VDI	1430	10. W2AN	1044
3. W2ER	1404	W8AU	1044
4. K4TS	1386	11. WB4OUF	1029
5. N4FS	1310	12. W4NM	1026
6. K2OA	1205	13. W4COC	1024
7. N3AYU	1204	14. W8VSK	1022
8. J37XC	1136		

Note: Several of the top scores are subject to change after final score sheets are verified. Logs are requested from: K2MP, W2ZUX, AB4EL, NA4G, N5JBB, J37AE, VE3AUI, VE4ZK. Send to Ken Gardner, W2BGN, 42 Oakdale Avenue, New Hartford, NY 13413.