

A WORLD WAR II RELIC REVISITED - NATIONAL'S NC-200

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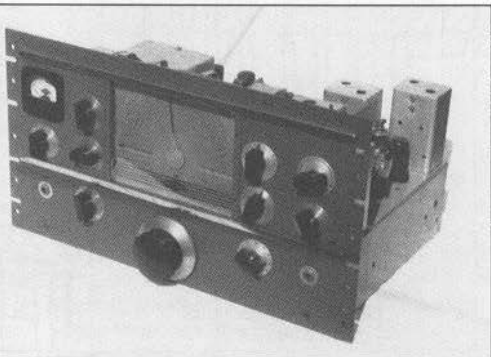
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Many will remember how the U. S. government, at the outbreak of WW II, scrambled to purchase commercially manufactured radio gear from any and all sources. It was not unusual for them to buy a complete prewar amateur station, sending trucks and men to pick up receivers, transmitters and a multiplicity of other gear. To complement these purchases, the government procuring agencies turned their attention to equipment that was currently in production by such well known makers as Hallicrafters, National and Hammarlund.

At the time, the National Company had a series of fine all-band receivers, a "natural" for these procurements. Such receivers as the NC-100, the NC-200, and the venerable HRO series were ready to assist the war effort.

The NC-200 had gone into production in late 1940, with good acceptance by the amateur community. One reason for this popularity was the feature of full 180° bandspread on the main tuning dial for the 80-, 40-, 20-, and 10-meter bands. The 160-m band was direct dial-calibrated. Other features included a crystal filter, noise limiter and calibrated S-meter. The receiver was offered as the NC-200 TG (table model in two-tone gray wrinkle enamel), with optional matching NC-2 TS 10" speaker; the NC-200 TGM (a -TG without amateur bandspread); and the NC-200 RG rack-mounted model in plain gray wrinkle, with NC-2 RS 10" speaker.

At the outbreak of the war, of course, to expedite delivery of equipment to the military, few changes were incorporated into these purchases. Thus receivers bought in 1942 (and probably into early 1943) had most of the amateur niceties incorporated. Later, as equipments were designed or modified specifically for military use, such things as hermetically sealed capacitors and mois-

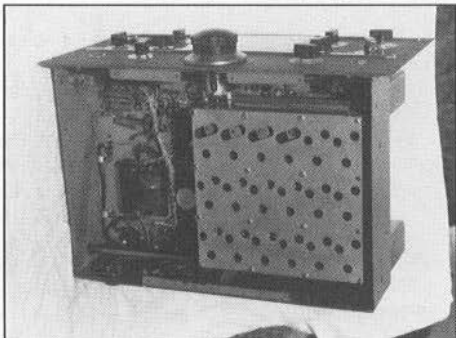
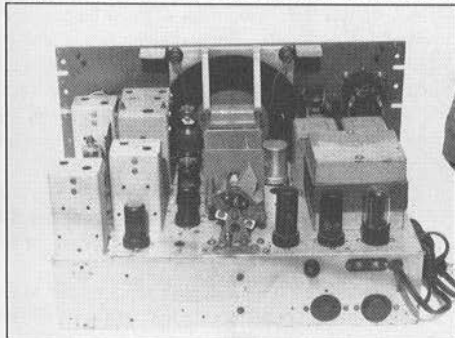


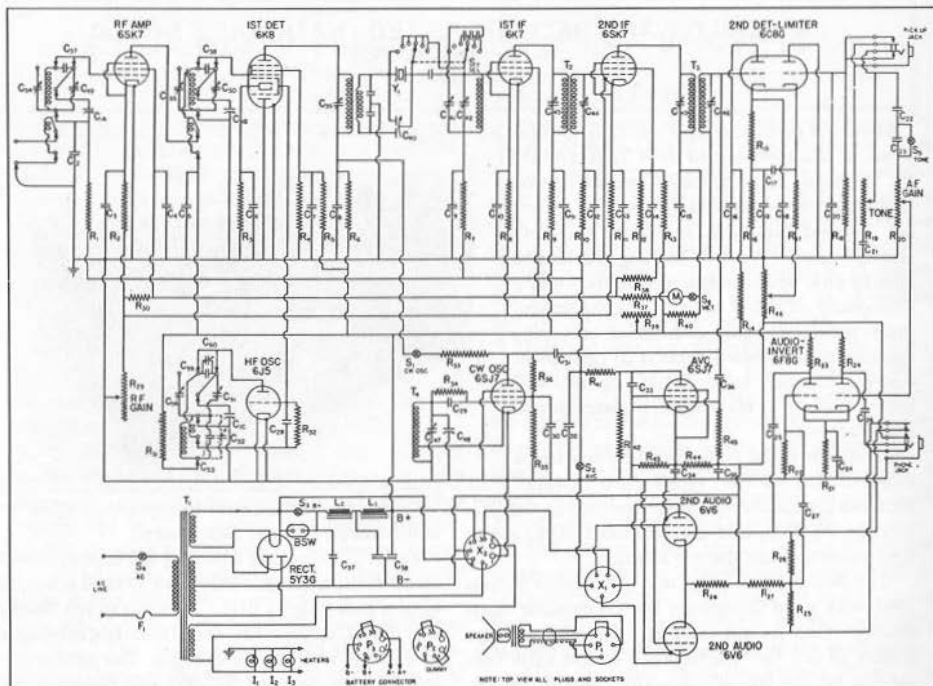
ture-fungus proofing were incorporated, while amateur-related features disappeared.

The NC-200 is truly a relic of the days of WW II, since its life cycle was only from 1940 to a last catalog appearance in 1945. An echo of the NC-200 was the NC-2-40C, -CS, and -D models, catalogued in 1946-48, with modest changes. The photos show the author's restored NC-200 RG (minus a rack cabinet, which I'm still pursuing).

The clean "National" lines and layout are evident. This receiver, basically an update of the NC-100/101 family, uses a single-conversion design (455 kHz) and includes such features as an RF stage, a mixer with separate oscillator, two IF stages, and the usual detector/noise limiter. There is a separate amplifier for the automatic volume control, with a claimed ability to hold the audio output constant within 2 dB despite changes of input signal as wide as 80 dB (from 10 to 100,000 μ V). Since the emphasis in the '37-'41 time period was on providing a "high" audio output, the unit includes a phono input and uses push-pull 6V6s to provide eight watts of audio (if the operator's ears could stand that level).

The IF section incorporates a five-position crys-





tal filter, while a heavy-duty power supply with two-choke filtering was included on the chassis.

Perhaps the most unique feature of the NC-200 is the flywheel-tuning and band-changing system. This system, a legacy of that electromechanical design genius James Millen and his team, combined band-changing, selection of the bandspread function, and general-coverage tuning - all with one knob. According to a National ad in *QST* (Sept. 1940), other designers were Jack Ivers, WIHSV, and Dana Bacon, WIBZR (electrical); and Bill Larkin (mechanical).

When the main tuning knob is pulled outward approximately $\frac{1}{4}$ ", the knob is disengaged from the general tuning position and may be rotated to provide band changing and bandspread. A rotation of approximately one turn brings in the next band (an indication of the band selected appears on the dial), while an additional $\frac{1}{2}$ turn of the knob provides the bandspread function for the selected amateur band. Push the knob back in and normal tuning of the newly selected band is obtained.

This complex, and convenient, single-knob control was achieved using a gearing system and catacomb arrangement. The sliding-coil catacomb, like that of the NC-100, is a study in excellent RF design. It is constructed of an aluminum casting that resembles a honeycomb, except that the cells are rectangular. Each cell contains a subassembly of the coils, air trimmers and padder condensers required for the RF, mixer and oscillator circuits.

Each cell provides shielding on all four sides of the tuning elements. When the bottom cover is in place, each is completely shielded.

The bottom-view photo shows the catacomb with the cover in place, with the access holes for alignment. The catacomb is supported and moved laterally under the chassis on a large ($\approx \frac{1}{2}$ ") support rod that runs the width of the radio. All electrical components are located close to the chassis, permitting the catacomb free access of the chassis width as it moves from side to side on the rack-and-pinion driver.

This arrangement and the fact that each tuned-circuit network is mounted on a phenolic molding that contains protruding dagger pins provides a wiping-type direct connection to the main tuning capacitor that is mounted rigidly on the chassis. Thus, an absolute minimum of lead length is involved for all bands. James Millen was a true genius of RF design. The system provides ten bands to cover the frequency range of 490 kHz to 30 MHz. In addition to the six standard medium and short wave bands, the four bands of amateur bands spread mentioned earlier are provided.

How does this restored radio function? In true National Company style, on-the-air tests reveal it is and has certainly provided many hours of listening enjoyment.

I often wonder if we will ever see a return to the solid design and construction that was embodied in these receivers of yesteryear.