

Flight of the Skyrider, 2010

by

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It was 1933, the year Hitler came to power, that the first Hallicrafters Skyrider came to market, and 1946, a year after the demise of the Third Reich, that the last of the Super Skyrider series, the SX-28A, was built. Although Hallicrafters said that over 50,000 SX-28's were manufactured (including both the original SX-28 and the slightly modified SX-28A), serial numbers suggest that actual production may have been half that. Whatever the correct number, the SX-28 was the top of the Hallicrafters line in its day, and it would be on any list of classic shortwave receivers. It saw extensive military use during World War II.

The SX-28 looked like a shortwave receiver. The main tuning and bandspread knobs



were more like steering wheels that would be at home on a submarine. There was a clutch on the main tuning knob to lock it in place, and a large S-meter. The other knobs—RF gain, AF gain, antenna trimmer, noise limiter, etc.—all sported numbers on their metal skirts. There were six bandwidths, three in the IF circuit, three crystal controlled. The cabinet was an art deco design of heavy metal, with a top hatch. The receiver had 15 tubes, all but three of them metal, and the receiver weighed 75 lbs., plus another 18 lbs. for the speaker.

It may have been the early photo of Arne Skoog, DX editor of Radio Sweden, at the dials of an SX-28 (above), that made me want to someday own one. The weight of the radio put me off, however, for shipping a 75 pound, half century-old radio was looking for trouble. But I kept an eye out, and one day I spotted an eBay ad for a decent-looking SX-28A that lived just half an hour away. I was the successful bidder.

When I went to pick it up it was about as advertised—not a show piece, but not abused either, and pretty good cosmetically for a receiver built in 1944 (the year after I was born). The cabinet showed its age, but there were no dents and the bright metal trim along the sides was in good shape. The front panel was a little dirty but unmarred; the bandswitch knob was a mongrel; the skirts of the other knobs were worn; and the main tuning and bandspread dial faces had faded over time, a common problem with the SX-28. Electrically it was good. The stations were where they were supposed to be on the dial, and the audio was wonderful, something I would not

fully appreciate until later.

The seller was a ham and a restorer of old radios. He specialized in old broadcast sets, and from his handiwork I could tell that he was a craftsman. Although he was not restoring the SX-28A, he agreed that, for an additional charge, he would refinish the cabinet, add a 3-prong plug and do some other minor electrical work, and lubricate all the controls and moving parts. When I returned two weeks later, the cabinet looked like it had just come off the assembly line.

Cleaning it up

When I got home and got the receiver into my radio room (with the help of a wheelbarrow), I decided to clean it up cosmetically as much as I could without turning it into a major project. I removed all the knobs and cleaned the front panel with Lestoil. The panel is constructed of 1/8" steel and has a leather-like, charcoal-color finish that seems indestructible, so heavy rubbing was not a problem. I next decided to replace all the knobs except the main



tuning and bandspread knobs, which were in good shape. I was lucky to find a parts dealer in Maryland with a complete set of original SX-28 knobs in nearly new condition for a price that was reasonable (by restoration standards).

While I was awaiting arrival of the knobs I replaced the screws and finish washers on the front panel and relettered all the front panel markings. This was relatively easy because the markings are not painted on but engraved into the panel; relettering involved filling in the engravings. I used white correction film made for use with typewriters; you put the film over the

engraving, trace the letters, wipe away the excess and you have a neat “repainting” that adheres very well. (Purists no doubt will remind me that the original paint on the SX-28 was silvery white, but plain old white was good enough for me.) For the red “Super Skyrider” lettering, I followed the same technique using a red paint pen.

While some of the front panels of later SX-28A’s were marked “SX-28A,” most of the SX-28A receivers, this one included, were marked “SX-28.” They are identifiable as “A’s” by several design features and not by an “SX-28A” on the front panel. The SX-28A has different front-end coils than the SX-28 (the main reason the “A” model was introduced), a different cover style for the RF section, no stand-by socket on the rear apron, and slightly different main tuning and bandspread knobs.

When I replaced the knobs and burnished up the bright metal parts on the front panel (AVC knob and main tuning clutch), the set was looking pretty good and I was feeling adventuresome. So I decided to take one more step and replace the main tuning, bandspread and S-meter dial faces. The SX-28 dial faces are amber-colored, and they usually darkened over the years, often quite badly. On mine, the red ham band markings had disappeared without a trace (making me wonder if some of the dials were produced without these markings). Fortunately, there is a chap in Florida who restores SX-28's and who sells reproduction dial faces. I bought a set.



Installing them, while not particularly difficult in theory, did increase my heart rate a bit because it required things that definitely would, as they say today, “void your warranty,” and, if you were unlucky, leave you with a very big headache.

I pulled the chassis, and then, in order to replace the S-meter dial face, I removed the meter from its mountings, opened the meter (which, of course, had been closed for over a half-century), unscrewed the old dial face and screwed on the new one, being careful not to disturb the meter’s innards. Then I cleaned the old meter window and reassembled and remounted the meter. I also had to drill two holes in the new dial face because the existing holes lined up with some SX-28 meter mounting screws but not others, mine being in the latter category. Although opening the meter required more coaxing than expected, it all went well.

As for the main tuning and bandspread dial assemblies, each consisted of a brass bushing with setscrew, attached to which were a large metal washer, the dial face, and a second large

washer, all held to the bushing by a metal flange. Removing the old assemblies involved loosening some of the controls attached to the front panel, removing the screws holding the panel in place, and moving the top of the panel forward enough to slide the dial assemblies off their shafts. I had to remove the flanges by grinding them off with a Dremel tool. I SuperGlued the pieces back together, slid them on the shafts, making sure the setscrews were properly aligned, and put the panel back. This all went well, if more slowly than anticipated. With the dial faces off I was also able to clean the inside of the dial windows, which had looked pretty clean to me but proved otherwise once the Windex was applied. The SX-28 being a product of the pre-plastic era, the dial windows were glass and thus regained their clarity with no problem.

Before closing things up I did a little dusting and cleaning of the chassis with a small brush. More is needed in that department. The components and wiring that are under the chassis still look like new. The main tuning and bandspread capacitors are inside the RF section atop the chassis, which is covered by a removable metal top, and are still in good condition. The top side of the chassis, and everything connected to it, needs a good cleaning, but I'm leaving that for later, mindful of the guy who cleaned his car engine after many years only to discover that it was the dirt that was holding it together.

Before I bought the receiver I sought the counsel of a fellow member of the Boston Area DXers who was a boat anchor expert. What luck to discover that in the collection of his late



father, who was a ham, was a Hallicrafters PM-23 speaker which my friend was willing to part with. This was the "matching speaker" that was sold with the SX-28. It is large, and maybe the ugliest speaker ever designed, but I could not resist adding this icing to the cake, especially when I learned that it boasted the sought-after chrome "h" on the grill (real chrome no less). The 5K:4 audio transformer inside the enclosure had been cannibalized and needed replacement. The speaker enclosure was in good shape. The paint job appeared original, and the unit responded well to another Lestoiling. The grill cloth was good, but the two heavy metal grill pieces

needed some work. I removed them and worked them over with every cleaning liquid I could find, then Dremeled them with a small wire brush and steel wooled them with fine steel wool. After a lot of effort, bright metal was at last my reward.

This completed the receiver's face lift.

Operation

There is an enchantment to using this receiver that is hard to describe. The hearty click of the on-off control, the sturdy feel of the old fashioned knobs and toggle switches, the glow of the

dial lights, the booming audio (more on that below), the sheer mass of the experience—it brings you back to another era.

Sensitivity and selectivity

When using the SX-28 several things become immediately apparent. I don't know how the specs compare, but to the ear the receiver's sensitivity is easily the equal of the modern receivers that I am using right now, the Drake R8 and the Eton E1-XM. Any weak signal on one of them—at least any that was not in a pileup—was also detectable on the SX-28. Performance is improved even more with the addition of a preselector, whose use I understand was common among SX-28 owners. I hooked up an old Gilfer A-20 (a vintage unit itself, hailing from the early 1970s) and its impact, especially on the higher bands, was dramatic, if seldom really necessary.

The second thing about the SX-28 is that, in terms of signal handling, you are riding bareback. Missing are all the modern controls we are used to—upper and lower sideband, tuning to multiple decimal places, PBT, notch filter, synchro, even the peak and null controls of a good old Q-multiplier. All those things came later. The receiver does have six bandwidths, which are wide by today's standards. The three wider ones are IF connected. The specifications state that the widest of these IF bandwidths is 12 kHz. and the narrowest 4.1 kHz. (which is the selectivity position I generally use on my other receivers). In the SX-28 described in the Kleronomos article (see below), the author measured them at 14 and 5 kHz. respectively. The three bandwidths that are narrower than 4.1 are crystal controlled and also activate a crystal phasing control (for which I have yet to find any practical use in SWBC listening). Skirts seem about average.

In practice, selectivity is fully adequate in most situations. I was surprised that in his *Proceedings* review of the SX-28, John Bryant found the receiver annoying for program listening in crowded bands because of a more or less constant background “whine” caused by IF skirts too broad to eliminate even a moderate-level signal 5 kHz. away from a strong signal. All I can say is that I have not experienced this. I found selectivity surprisingly good.

Operating the SX-28 is pretty simple by today's standards. You dial your frequency, select your bandwidth, adjust the antenna trimmer and the tone control (see below), and that's pretty much it. If you want to be able to ferret out and manipulate some weak signal that is buried in a pile of QRM, the SX-28 is definitely not for you.

Audio

Where the SX-28 compensates, however, is in the audio department. I have always been a “speaker” DXer. My R8 and my E1 are each connected to dedicated Hammarlund S-200 speakers, which are 7" ovals in foot-square enclosures. The R8 and E1 produce good audio, but they are no match for what comes out of the Hallicrafters speaker (which is a 10" Jensen round). Audiophiles often extol the superiority of tubes over solid state circuitry, and no doubt that is part

of the reason for the SX-28's excellent audio. But the Hammarlund HQ-180A was my main receiver for many years, and I was a regular user of a Collins R390A, both tube receivers, and neither produced audio like the SX-28. This must be what the audio on the big "hi-fi" shortwave sets of the 1930's, like the Scotts, was like.

Of course, a 12 kHz. bandwidth is always going to yield hi-fi audio of sorts. However, the better audio of the SX-28 persists even in the other bandwidths. Two controls affect this. One is the "Bass-On/Off" switch, which, when turned on—which is recommended by Hallicrafters for all general listening—is supposed to create "normal audio fidelity." In fact the effect is roughly that of a "loudness" control on a stereo set—a fuller, warmer, more listenable sound. In the "Off" position an audio filter is switched in. In practice, on SWBC signals you always leave the Bass control on.

The other important audio control is the Tone control (ganged with the on-off switch). As with all tone controls, you generally move toward bass to enhance music, treble to enhance voice. This tone control has an extremely wide range and a much more dramatic impact than any I have ever encountered on an audio device. It has the capability of making even the muddiest audio intelligible. It is particularly impressive at narrower bandwidths where voice clarity deteriorates. As a result, you can use the narrower bandwidths on the SX-28A without huge sacrifice of audio. Tone controls seldom get much attention from DXers, but this one is a major feature of this receiver.

I have always felt that the E1 produces more listenable audio than the R8. The SX-28A is better than both of them. Background noise is less, resulting in a quieter signal and a more pleasant listening experience.

Like the tone control, the AF gain control has a very broad range. It is usually operated in a minimal position, 1 or 2 on the 9-point scale. The main reason to increase it is to enhance gain when using a narrow bandwidth. Also, when tuning from one place to another on the main tuning dial I often reduce the AF gain to zero.

Tuning

The SX-28 hails from a time when such now-commonplace tuning aids as digital frequency display to decimal levels and push-button frequency input could not even be imagined. In the 1940s, knowing your frequency was as much art as science. However, the SX-28 is designed so that you can determine your frequency with considerable accuracy, at least on the SWBC bands, if you are willing to do a little homework first.

The main tuning dial and the bandsread dial are typical of the time. Main tuning displays six bands in concentric circles. The bandsread dial is calibrated for the 80, 40, 20 and 10 meter ham bands, also shown in concentric circles, with a 0-100 scale on the outer perimeter.

If you have used a hollow state receiver you know that determining your “exact” frequency typically involves setting the main tuning dial at a known reference point, creating calibration charts reflecting where on the 0-100 bandspread scale particular stations or frequencies fall, and interpolating as necessary.



This is basically the way the SX-28 works, except that Hallicrafters has provided a second 0-100 scale to help you out, this one on the main tuning dial knob skirt. This means that you can always return to a known reference point on the main tuning dial if you have made note of its 0-100 number. You simply return to the general frequency area and then dial to the desired 0-100 number. The other, and somewhat more accurate, alternative is to set the main tuning dial at a known 100 kHz. reference point and tune to your station using the bandspread dial and the calibration charts you have made. It is cumbersome by today’s standards, but it works.

Of course, all of these steps can be eliminated simply by paralleling your frequency on a receiver with direct readout, or—horrors!—connecting a digital display to the SX-28. If those strategies offend your sense of authenticity, a 100 kHz. crystal calibrator will identify all the main tuning dial reference points you need. I added a Heathkit HD-20 battery-operated crystal calibrator (from the early 1960's) to my setup and it solved the problem.

On the main tuning and bandspread dials, the numbers appear below the corresponding circular scales. However, because there is a tendency to associate the numbers with the scale below them rather than the one above, you have to pay attention when reading the dial. Mechanical pointers on both dials, visible when the dials are illuminated, point to the scales the receiver is set to, and this is somewhat of a help. Turning the main tuning knob to the left increases frequency, while turning the bandspread knob to the left decreases frequency. This takes a little getting used to.

There is virtually no backlash on either the main tuning or the bandspread dials. And these controls must be the reason the phrase “dial spinning” was invented. The weighted flywheels produce smooth, fluid dialing, and you can move around the bands quickly. Three determined spins will take you from one end of the main tuning dial to the other; the bandspread

dial requires only one.

Some miscellaneous things

I am surprised at the absence of spurious signals and at the receiver's low drift operation. There is some small drift at the outset, but because you are in AM mode all the time it is virtually unnoticeable.

The AVC produces a very stable, listenable signal. However, unlike more modern receivers, there is just one level of AVC. When quickly tuning away from a very strong signal there is sometimes a couple of seconds delay before the audio recovers. From what I have read this is a standard characteristic of the SX-28.

The receiver's Lamb noise limiter gets high marks in the literature, but seemed to me to be, like noise limiters generally, of limited practical use, especially in the kind of noise environment we face today.

In 1951, over a decade after the birth of the SX-28 (1940), Hallicrafters issued a Service Bulletin describing circuit conversions that could improve the noise blanker and enable connection of a panoramic unit or oscilloscope, and also permit the addition of a built-in crystal calibrator. Although this involved changes well beyond just rewiring, users were not discouraged from doing it themselves. If that was not feasible, Hallicrafters service centers would do it "at moderate cost." In 1959, *CQ* magazine published some further suggestions for the improvement of the sensitivity, selectivity and AVC of the SX-28; and part of an article, source unknown, containing some other modifications are pasted into the back of the manual that accompanied my receiver. I have not checked to see if any of these mods were actually made.

Planning to re-tube the receiver, I purchased a set of American-made "new old stock" tubes. However, having used the receiver for a while, I don't think there is much to be gained from new tubes, so I am just holding on to them for insurance.

I have to decide whether to get the receiver realigned and recapped. Alignment might yield improved performance, and there are a few errant oscillations that could probably be gotten rid of while the receiver was being worked on. Overall, however, there don't seem to be any operational deficiencies that scream out for an alignment. Recapping will be difficult, since the receiver's wiring and parts placement is very dense, and, in places, deep. Although the capacitors appear to be in good shape, you can't really tell much from a visual inspection. For the long term the receiver should be recapped. On the other hand, there is something to be said for "if it ain't broke don't fix it." We'll see.

The SX-28 is clearly not up to today's technical standards. With a modern receiver you can manipulate a signal in many ways that you cannot with the SX-28. However, for old fashioned dialing around, for program listening, and for sheer fun, the SX-28 has become my

receiver of choice. It goes to prove that, even after 50+ years at the dials, there are still interesting new shortwave experiences to be had.

If you want to read more about the SX-28, check these references:

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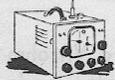
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