

Battle of the “Super” Radios

(A Comparison of the GE Superadios I, II, III and the RS Optimus 12-603)
by Gerry Thomas

Like many MW DXers, I have been staring at the picture of the Optimus 12-603 (\$59.99) in the 1997 Radio Shack catalog and have been wondering if just maybe, Radio Shack got it right this time. After all, they did come out with the fantastic (for the price) “TRF 12-655” back in the 1970s but, on the other hand, fell flat with their “UltraRadio” clone of GE’s successful original Superadio in the late ‘80s. A cause for concern on my part was the Optimus’ striking resemblance to the Superadio III, the latest offering from GE (and one of which I don’t think too highly). But maybe this time Radio Shack didn’t just jump on the bandwagon (while at the same time cutting performance corners to increase profit margin); maybe this time they abandoned the “me-too” approach and actually tried to improve on a design and beat the competition on performance (yeah, I know, I know, I’m rapidly approaching the outskirts of LA-LA land here). At any rate, after some awfully heavy hints to my wife, I found the new Optimus under the Christmas tree...

Before beginning the actual comparisons, I’d like to take a few minutes to make some comments regarding GE and Radio Shack. General Electric has traditionally put out some really fine performing (from a MW DXer’s standpoint) portable radios. I still have a shirt-pocket, 8-transistor AM radio that I purchased new in 1962 (for \$6.95, I believe) that has emblazoned on its dial, “Long Distance”, and it performs incredibly well for night-time DX. Similarly, in the ‘60s and ‘70s, GE produced its “Long Range TRF” models that are still being used by DXers today. (I was fortunate enough to find one at a flea market a few months back and it too performs very well.) So, with that pedigree, it was not too surprising that when GE introduced its original Superadio it represented a further advancement (if I can call it that) in the art. Here was a radio that not only pulled in the DX, it also offered excellent fidelity and incredibly long battery life. Unfortunately, in my humble opinion, GE’s tradition of excellence in this area dropped a few notches with its Superadio III.

Radio Shack, on the other hand, has not had a particularly stellar reputation in offering DX machines. Other than the DX-160 and SX-190 (which didn’t even cover MW), some scanners, and, more recently, the DX-440 (aka Sangean 803A), Radio Shack radios have generally left much to be desired. One very notable exception was the “TRF-12-655”. This was a \$29.95 AM-only portable with a tuned RF stage and a double stage of IF tuning. The secret to its prowess, however, was the utilization of a 455 kHz ceramic filter between the two IF stages (all housed in the same “can” and, by the way, still available to

manufacturers though I don't know any who use them). Moreover, the TRF's use of discrete transistors (instead of ICs) allowed easier "hot rodding" with emitter by-pass filtration and discrete IF filters. All in all, this Radio Shack offering has attained legendary status and accounts of DX caught with this inexpensive rig still cause jaws to drop (how about Paraguay from the Mississippi Gulf coast at sunset skip?). So, having experienced the TRF, I continue to hold out hope that Radio Shack will one day place a premium on performance and offer a worthy successor to the old 12-655. The "UltraRadio" definitely wasn't the long-awaited successor, maybe the Optimus???

(Please don't get the wrong impression from the preceding. There are several radios available today that equal these earlier radios in performance (e.g., Sony's ICF-2010, ICF-7600G, the Sangean 803A/DX-440, etc.). These earlier radios were noteworthy because of their performance for the price; for under \$50 you could nab some great DX!)

To make this comparison a little more interesting, I decided to perform some side-by-side tests with the original Superadio, the Superadio II, the Superadio III, and the new Optimus 12-603. But first, some comments about each...

The Original GE Superadio Charlie Barfield and I, back in the mid-'80s, were lucky enough to make contact with the local GE field representative and get an early production sample of the "soon to be released" GE Superadio. This was the Model 7-2880 and was being touted in the sales kits as a sophisticated long-range AM and FM portable. As the club newsletter we wrote at the time indicated, we were impressed! (Incidentally, copies of our article in DX News and DX Monitor were reprinted in General Electric's in-house newsletter.) These Superadios were definitely in a class by themselves: four stages of IF, a tuned front-end, a 7-7/8" ferrite rod antenna, a beautiful, metal six-gang variable capacitor, two separate circuit boards, one for RF and one for IF and AF (audio frequency), with over 400 hours of battery life, excellent FM, great fidelity, and at a price of around \$50 (readily available at discount stores for under \$35). We did, however, have two major wishes for the original Superadio: a provision for an external antenna and a wide-narrow selectivity option (the IF bandwidth of Superadios is ideal for domestic DX but too wide for serious foreign, split-frequency DX). Soon thereafter, GE came out with its Model 7-2880B, essentially the same as the "A" model but with external antenna terminals. Today, these early Superadios are known as the Superadio "I" or simply, "Superadio." Most, if not all, of the original Superadios were made in Hong Kong.

The Superadio II Several years after the introduction of the original Superadio, GE came out with the Superadio II Model 7-2885. I can detect no major circuit changes from the original, but GE did add a separate 1-1/2" tweeter (the tweeter in the Superadio I was coaxial with the main speaker) to help with the highs on FM, a jack for earphone use, and made a few minor cosmetic changes as well. Performance, however, was indistinguishable from

the Superadio 1. All in all, GE made a few nice improvements to make a good thing even a little bit better. Still, there was no wide/narrow selectivity option, the only thing keeping the Superadio from having great split frequency DX abilities in addition to its already excellent domestic capabilities. All of the SR1s that I've seen were manufactured in Malaysia.

The Superadio III Early news of the forthcoming Superadio III caused quite a stir in my heart. Headlined among its features was dual selectivity! Now we would finally have the perfect, low-cost portable, I thought, but why would they call this dual selectivity feature, "AM Accent", I wondered? Finally locating one of the earliest SR1s in Tucson, AZ, I immediately tore it open and was astonished to find...no resemblance to the SR1 and SR2. This was a complete reworking of the circuitry! Gone were the two separate circuit boards and variable capacitor of the earlier Superadios; instead I saw a single, crowded, large board and varactor tuning diodes! Still there were the four IF stages, the tuned RF stage, the large ferrite rod...maybe things would be okay after all. Not so. Besides having the power switch wired backwards (On was Off, and Off was On), birdies were present across the dial, one station appeared at five different places, and the dual selectivity switch turned out to be "Wide" and "Wider" (this was the "AM Accent" that was supposed to make AM stations sound better...Dumb and Dumber). No, there was no IF filter to narrow the passband, instead there appeared to be a Q-spoiling resistor that could be switched in to make the passband even wider...not exactly what I had hoped for. Performance was, not too surprisingly, disappointing. But this was just one sample, maybe I just got a lemon. So I tried another, with the same results. Since then, I've tried two other SR1s with similar outcomes. Still, DXers whose opinions I respect claim that the SR1 is just as good as the SR1 or SR2. Maybe so, I just have never been lucky enough to own one. This series of Superadios is being manufactured in China.

The Radio Shack Optimus 12-603 Given its physical resemblance to the SR1, and Radio Shack's past history with its UltraRadio, I was somewhat apprehensive about this guy but I asked for one anyway...I should have saved my breath. It turns out that the Optimus is, in some respects, even worse than the SR1s I've tried.

After giving the dials a quick spin (and noting the Optimus' seemingly mediocre sensitivity), I opened up the back and was greeted by a single, crowded, large circuit board with the word, "Superadio" printed on it! Could it be that GE and Radio Shack used the same Far East shop to make the circuit? Or was this Radio Shack's working title for its obviously imitative Optimus? I went back and opened up the SR1 and it turns out that, while the two circuit boards share some similarities, there are major differences. Principal among the differences is the fact that the SR1 uses four stages of tuned IF on AM, whereas the Optimus uses only two. In theory, this should give the SR1 better deep skirt selectivity. Secondly, parts layouts are very different with the SR1 enjoying a

more intelligent design (though far from optimal) and better shielding. Thirdly, whereas the Superadio family uses a 7-7/8" ferrite rod, the Optimus uses a smaller 5-1/2" model. I could not tell from looking at the top of the Optimus's circuit board whether the "Wide" selectivity option was achieved through the use of a Q-spoiling resistor or a lower Q transformer. Like the SRIII, the Optimus uses varactor diodes instead of a variable capacitor and is being manufactured in China.

One of the things that I noticed was that it seemed as though there were very few turns of wire on the ferrite rods in the SRIII and Optimus. The SRIII had about 38 turns covering about a quarter of the rod whereas the Optimus had even fewer covering about an eighth of the rod. I seemed to remember that the SRI and II had many more turns and, after checking, found that there are about 90 turns on the early Superadios that covered about two-thirds of the rod. Apparently the varactor diodes had a higher capacitance than the variable capacitor and therefore required fewer turns to resonate. This could have two possible results: (1) Fewer turns could result in a higher Q (or tuning sharpness) if the coil wasn't loaded down by front-end circuitry and, because overall gain is a product of Q times amplifier gain, a really sharp, hot front-end could result; or (2) the fewer turns would pick up less RF that the rod had gathered and if the Q of the coil was spoiled by the front-end load, lower sensitivity and selectivity would result. From the performance test results that follow, it appears that the second alternative prevailed.

Performance Tests Almost any radio will give the impression of being a DX hawk when it's used at night. Stations from all over the East Coast boom in on my wife's \$20 Panasonic clock radio, a radio that has trouble picking up locals during the daytime. Therefore, these performance tests were conducted for two hours on either side of noon on a clear, atmospherically quiet, winter's day. All of the radios were equipped with fresh alkaline batteries (that's a total of 24 D-cells, ouch!) and I even took the time to re-align the RF and IF stages of the SRIII and add some additional shielding to the circuit board to make sure that it was performing to its potential. The Superadio I was one that I have had for years and the Superadio II and Optimus were fresh out of their boxes.

Low-end sensitivity The target station here was WOOF-560 in Dothan, AL, a 5 kW'er about 100 miles to the northeast of Pensacola; it is not bothered by any local interference. Both the SRI and SRII brought in WOOF at armchair level; the SRIII provided a signal at a FAIR level; and the Optimus signal could only be termed POOR (readability took effort) even with the volume control at full blast (something that was necessary on just about every non-local station throughout the band; locals were at ear-splitting levels though, so the AF amp was working).

Mid-band sensitivity WACV-1170 is located in Montgomery, AL, also about 100 miles north of Pensacola; no local stations bother its

reception. Despite its 10 kW output, it generally puts a fairly weak signal into Pensacola. The SRI and SRII pulled in WACV at a FAIR level but some effort was required to follow the gist of the transmission. The SRIII's signal was rated as POOR with intelligibility possible only with concentrated effort. The Optimus's signal varied from POOR to NIL even with the volume control wide open.

High-end sensitivity Usually high-end sensitivity is not a problem with portable radios but the performance of the Optimus was an exception. KLEB-1600 is a low-powered Cajun station in Louisiana that routinely puts an armchair copy signal into Pensacola. The SRI and SRII gave VERY GOOD signals from KLEB; the SRIII's signal was judged to be a notch down at GOOD; while the Optimus provided no sign of KLEB; that is, NIL! In fact, from about 1490 kHz to the top of the band the Optimus was virtually dead; only two faint signals on 1550 and 1590 were discernable (and these two stations were LOUD on the SRI and SRII, FAIR to GOOD on the SRIII).

Low-end selectivity WVOG-600 kHz next to local slopper WVTJ-610 remains my test of low-end selectivity. WVOG is a 1 kW'er located in New Orleans and is almost always bothered by my local. It takes a decent radio to give even a hint of the presence of WVOG. The SRI and SRII provided a POOR signal from WVOG; it being bothered by slop from both WVTI and WGNE-590 in Panama City, FL. The SRIII provided no trace of WVOG (just interference from the locals) while the Optimus gave an intermittent signal that ranged from NIL to VERY POOR in a background of sometimes intelligible splatter.

High-end selectivity Because one of the radios (the Optimus) had, for all practical purposes, no high-end, I tuned to WRBQ-1380 next to local WCOA-1370 (a clean, tight signal) to test for selectivity in this frequency range. The SRI and SRII provided a VERY GOOD signal from WRBQ, a 5 kW'er down in Tampa, with virtually no trace of WCOA. Similarly, and somewhat surprisingly, the Optimus also provided a VERY GOOD signal from the downstate station with just a bit of splatter from 1370. The SRIII happens to be bothered by "birdies" in this frequency range. Harmonics from the 455 kHz IF appear prominently on the SRIII at 910 kHz (2 X IF) and at 1365 kHz (3 X IF). The 1365 kHz birdie heterodynes 1370 kHz wreaking havoc in the area. Therefore, I could only rate the SRIII as a GOOD with het and minor local station interference.

Conclusions After conducting the preceding performance tests, I, quite frankly, lost interest in evaluating the remaining characteristics of the Optimus. Things like audio quality, dial read-out resolution and accuracy, etc. really didn't seem that important since I wouldn't consider recommending the radio for anything other than local station listening. I should say again, however, that at night, when signal levels are high, the Optimus gives the impression of being a satisfactory DX radio.

The main conclusion I've come to is that Radio Shack missed again. The Optimus 12-603 for all its potential falls short of its principal competition, the GE Superadio III. Of course, in my limited experience, the SRIII falls well short of its forerunners, the SRI and SRII. The biggest drawback these days of the SR I and SRII is that they are very difficult to find (most DXers aren't willing to part with theirs). Another drawback is that they only tune to 1600 kHz but this is fairly easily remedied by twiddling with the oscillator and front-end coils to extend coverage to 1700 kHz. So, unless you can find a SRI or SRII, the search must continue for a top-notch, low-priced MW DX portable.