

## CCRadio: Best AM DX Portable?

by Gerry Thomas

A couple of years ago I had heard that Bob Crane of the C Crane Co. was working on a new portable radio and that among the design criteria was a requirement for a DXable AM



**Figure Error! No text of specified style in document.-1 -- the CCRadio**

section. I had even spoken to Mr. Crane during the early design stages of the radio about, among other things, aspects of the CCRadio and came away thinking that he really wanted to do this project right. I was guardedly optimistic that he would pull it off. Still, between the drawing board and the store shelf a lot could go wrong, including the possible cost-cutting compromises that seem to inevitably accompany bringing a product to market. Nonetheless, Mr. Crane seemed adamant enough about the required performance of the radio that I had high hopes for the CCRadio. Well, I finally got my hands on one (courtesy of Roger Giannini) and have had the opportunity to check out this Sangean-made portable so I thought I'd share my impressions and the results of some side-by-side tests with known and reputed DX hounds.

**General Features** The CCRadio is a medium-sized (11"W x 6.5"H x 4"D) multi-band portable made by Sangean and finished in the requisite gray color and weighing in at 3.8 lbs. (without batteries). Besides the four D-cells required for DC operation, the CCRadio also can be powered by the built-in AC transformer (cord supplied). The radio covers four bands: the standard AM (it tunes 520-1710 kHz) and FM bands, the channels 2-13 TV band (audio only, of course), and seven NOAA weather channels (a weather alert feature is included). (These are the four bands I monitor when a hurricane hits Pensacola so I consider the CCRadio to be an ideal emergency/survivalist radio... add a scanner and you've got it all.)

The radio is PLL frequency synthesized and is digitally tuned by slewing buttons (10 kHz on AM) or a rotary knob (1 kHz tuning and read-out on AM) and has large (9/16") LCD dial frequency numerals. Tuning can also be accomplished by up/down scanning as well as by the five memory buttons located atop the cabinet. A digital clock replaces the dial frequency when the radio is off and adds alarm and snooze functions if desired. The cool green display light is push-button controlled when operating on batteries and is on continuously when using AC. A lock button on the side can prevent a channel change while listening or an inadvertent power-on condition during transport. Rounding out the features are a headphone jack, battery status indicator, and screw-type external antenna terminals. There is no carrying handle as such but rather a large indentation in the top rear of the

cabinet to facilitate carrying. The operating manual is brief but clearly written and even has a small section on AM DXing with mention of the National Radio Club. The CCRadio costs \$159.95.

**Operating impressions** Operating the CCRadio is really pretty straightforward. The rotary tuning knob has 1 kHz detents and is comfortably located, the various buttons are sufficiently large and have a positive feel, and the digital display can be viewed from wide angles. There is a tuning indicator of sorts in that a boxed "TUN" appears on the display face if a station is sufficiently strong (I would have preferred a finer resolution signal strength indicator but, oh well). About the only thing I would add for desktop DX sessions would be a Tupperware turntable for easy nulling/peaking and a block of wood or such to tilt the radio back a bit.

All in all, from an operating standpoint, the CCRadio seems to be well thought-out with no operating quirks.

**Looking Inside** An affliction I've had my whole life is an irrepressible need to open ("tear-up," my wife would say) any new electrical/electronic devices that find their way into the house. So it was that within 15 minutes of receiving the CCRadio, the back was off and I was examining its innards... and I was impressed. This obviously is a carefully designed and well-made radio. Two large circuit boards comprise the layout with the RF, IF, and AF sections on one large board and the logic/clock/display functions on the other. Functional sections are well separated on the boards and very extensive shielding is employed throughout. Whereas the Superadio series employs multiple (four) stages of IF tuning to provide selectivity, the CCRadio uses ceramic filtration. I counted seven ceramic filters being used on the various bands with at least one being used on AM. The circuitry is a mix of integrated circuits, and standard and surface-mount components (all 1% precision, from what I could tell). Not having a schematic and being reluctant to remove all of the shielding to follow the circuit traces, my circuit analysis pretty much ended at this point. The ferrite rod, however, is worth mentioning. It's a 7-7/8" x 7/16" rod that is really a beauty (I'd like to get my hands on a pile of these, hi). It's the same length as the rods used in the Superadios but its girth is 1/16" thicker. The windings are of Litz wire and a two-turn pick-up winding provides for external antenna coupling. Notably, the ferrite rod is located as far as possible from the AC transformer (which can suck RF from the rod, a common design flaw in Radio Shack portables).

I guess the bottom line of this visual inspection is that the CCRadio is a well-designed and very well built portable, but the absolutely ultimate question is, "How well does it perform?"

**Performance Tests** To test and compare the performance of the CCRadio, I lined it up against the only other viable, currently available radio that touts itself as a "long distance AM reception" device... the General Electric Superadio III (SRIII). I considered including the Radio Shack Optimus superadio clone (#12-603), but it had fared miserably in earlier comparisons. Still, on the off-hand chance that Radio Shack had made some recent design changes, I got one from a local store and tested it briefly to verify that it was as awful as before...it was, so it was not included in the testing. Although long discontinued, I also included in the testing my personal, under-\$100, favorite for portable domestic AM DX---a fresh-out-of-the-box Superadio II (SRII). Regarding the SRIII, I used two different samples in the tests. I knew that my personal SRIII was not very good so I borrowed Charlie Barfield's SRIII, a radio that Charlie has spent an untold number of hours tuning up for optimal performance (no circuit changes were made to either SRIII, just tweaking of transformers and trimmer capacitors).

All of the testing was conducted between local noon and 2:00 p.m. on a mid-November, atmospherically quiet day in Pensacola, FL. All radios were AC powered and were rotated and tuned for optimal reception of the target stations. Note that all of the target stations that I chose for this test are, for the most part, moderately to very difficult daytime catches. Just about any radio can pull in AM DX at night but if a radio shines during the day, you know it will do well at night. The stations reported here are representative of the several tested in each of the low-, mid- and high-band portions of the AM band to test the two principal performance measures that were of interest: sensitivity and selectivity.

**Sensitivity Tests** The target stations used were R. Vision Christiana, Turks & Caicos Islands on 530 kHz, 1200 miles away, R.Reloj-570 1000 miles away, WYLD-940 180 miles away in New Orleans, but directional away from here, and WTIR-1680, 350 miles away in Winter Park, FL.

The CCRadio and the discontinued SR11 performed on the same level but the nod has to go to the CCRadio with its stronger low- and mid-band performance. This was somewhat startling considering that I felt that the SR11 was one of the two best under-\$100 portables ever made (the other was the Realistic "TRF" (#12-655)). Of course, the SR11 only nominally tunes to 1600 kHz but I was able to compare the CCRadio and SR11 on WPHG-1620 and both provided equal signals rated at 4.5. Neither of the two SR11s was in the same class as the CCRadio and SR11, and both exhibited the usual birdies and images.

**Selectivity Tests** From a DXer's standpoint, selectivity is just as important as sensitivity in hearing weak stations in the crowded AM band. For this test, I selected as targets three distant stations located on frequencies near strong locals; these were tough catches that require good selectivity in a radio. They were WVOG-600, New Orleans, a low-powered station next to my local evangelical slopper, WVTJ-610; WQYK-1010 Tampa slopped badly by WRNE-980, and WZEP-1460 slopped by local WBSR-1450.

With all three targets, the CCRadio and SR11 were virtual equals. The SR11s really couldn't compete except for Charlie's on the low end. No specs are provided in the documentation for the CCRadio, but the IF filtration acts and sounds like it's about 5 kHz @ -6dB and 9-10 kHz @ -60 dB (great for domestic DX; serious split DX needs a narrower filter); ultimate selectivity is very good.

**Audio quality** The SR11 and SR111 are clearly superior to the CCRadio on this variable. Their 6-1/2" woofers and 2" tweeters clearly sound better on loud and clear stations than the CCRadio with its 4" speaker. The CCRadio certainly sounds good on both AM and FM but can't match the full, wide-frequency sound of the SR series, especially when they are in their "AM Accent" mode.

**Battery life** This one really floored me when I read in the CCRadio's manual that it draws 450 mA of current! That's about as much as a small portable TV! I couldn't believe it so I measured its current drain myself. At normal listening levels, the CCRadio draws 40-50 mA, not 450 mA. Apparently, the proofreader of the manual missed the typo. By comparison, the SR series draws about 20 mA. Since both radios use D-cells, the CCRadio should run about half as long the SR11 and 111 (which, according to the SR literature, is 460 hours on a set of batteries).

**FM, TV, and WX band performance** I didn't really check/compare these bands. I did note that all of the local and semi-local FM stations came in fine on the CCRadio and that I was able to pick up not only my local NOAA station but also the one in Jackson, MS.

**Further tests** After finishing the preceding tests, I couldn't help but wonder how the CCRadio would do against radios in a higher price class. So I decided to repeat the tests using some of my favorite AM DX portables, regardless of price. The challengers included:

- *Sony ICF-2010* --- This is my personal radio with selectivity mods (the original narrow filter is in the "Wide" position and a very narrow (2.1 kHz) filter fills the "Narrow" position). Sensitivity is unmodified.
- *Sony ICF-7600G* --- This little radio does a good job for a little tag-along, pocket-book size portable.
- *Panasonic RF-2200* --- This long discontinued analog portable remains a marvel of engineering and one of the all-time best MW DX portables (but only covers 530 kHz-1600 kHz).

The only change from the first series of tests was that all of these radios were tested using

batteries instead of AC. The tests were conducted on a different day but during the same time frame (i.e., noon to 2:00 p.m.).

Given its performance compared to the SR11 in the early tests, I wasn't too surprised that the CCRadio belongs in this elite class of AM DX portables. On average, it was just as sensitive as the 2010 and RF-2200 and consistently more sensitive than the 7600G. On the selectivity measure, it out-classed the 7600G and was essentially the same as the RF-2200 in its narrow mode. It even matched the 2010 when the Sony was in its "wide" mode (really the stock narrow mode in this modified 2010) unless the target signal was strong enough to lock the synchronous AM detection circuitry in which case the 2010 gave better readability. In fact, with all three competitors, invoking the synchro AM or using ECSS (via the BFO) resulted in improved readability in some situations.

**Conclusions** The owner's manual of the CCRadio states, "The CCRadio incorporates the highest quality parts and superior engineering to produce the most sensitive AM receiver available." On the whole, I'd have to agree (but I'd qualify it by adding "portable" AM receiver "under \$350"). Unless you pay \$200 more for a 2010 and the signal you are seeking is strong enough to activate the synchronous AM detection circuitry and you install very narrow IF filters, you won't do better than the CCRadio for AM DX.

Congrats to Bob Crane and Sangean for a very worthwhile DX machine.

Note: Sample-to-sample variation could alter tests of individual radios. For example, some DXers have SR11s that are reportedly excellent performers. It's just that of the eight SR11s that I've auditioned over the years, none has been excellent and the two SR11s tested here are representative of those I've experienced. Under less challenging conditions, there may be little or no noticeable differences between any of the radios tested but under tough signal conditions, I would be very surprised if any SR11 equalled, much less exceeded, the performance of the CCRadio.

There is now a more recent version of this radio, the CCRadio *plus* and the company web site (<http://www.ccrane.com/ccradio.asp>) tells us that some improvements have been made to audio quality, a signal strength meter has been added, as have audio in/out jacks, etc.

The CCRadio, a Review  
By Steve Hawkins

And now from the Secret Mountain Laboratory, high atop the Secret Mountain, "The CCRadio vs everything else". Following my theory that you can't have too many radios, my lovely wife purchased a CCRadio for me as a surprise last February. I already had a GE SR11. At home most of my AM BCB Dxing is done with my Ham radio, a Kenwood TS950. It is the best radio I have ever used to DX.

The CCRadio is a little shorter than the SR11 but very close to the same size and weight. It has 4 "Bands". The standard AM BCB, the standard FM BCB, TV audio channels 2-13, And NOAA Weather radio. It runs on "D" cells or wall socket AC. The AC cord is not attached to the radio and stored in a little compartment like the SR11. It just plugs into a socket in the back and must be kept someplace else when not in use. When you lay your hand on the top of the radio and fold your fingers down the back there is a large hole for your fingers to go into for carrying the radio around. I have heard a few folks complain about the "handle". Their complaint was that it felt insecure. I have not had a problem carrying the radio this way. Except occasionally when trying to get the back door to the lab open to watch the Gray Line Pass over, when I have the radio in one hand and one of my malted Barley experiments in the other.

The display is a liquid crystal that lights up bright green when the

radio is plugged into the wall socket. While operating the radio on batteries the display can be turned on and off by pushing a button on the front of the radio. There is a clock built into the radio that uses the display thus the radio can be used as a clock radio, alarm included. When using the radio to do AM BCB DXing the first thing I noticed was that when tuning rapidly across the band with the tuning knob, every time you pass any audio you hear a kind of chirp as the PLL steps across it.. I hear zero chirp on my Kenwood. This however was just about my only complaint. Some years ago I stopped being a hardware nerd and became a computer nerd, thus I no longer have tons of test equipment at home or work to use to compare the radios. My ear tells me that on AM the sensitivity is about the same or better as the SR11. Selectivity is a little tougher to measure accurately by ear. They are probably close, but to me the SR11 sounds crisper on AM. Having an accurate digital read out on the CCRadio is a big plus, especially when compared to the famous dial accuracy of my SR11. On FM I got a surprise. On Fathers day the NPR station in Nevada City Ca. Broadcasts a Blue Grass concert live for a couple of days. I could hear it quite well on the CCRadio with its short whip. I could only hear it on the SR11 if I moved around the Laboratory to just the right spot and then not well.

To sum things up it is a pretty good radio, probably the equal of my SR11, just a little different and with more features. I am glad my wife bought it for me. I use it a lot. I have been listening to KXOL on it (LOUD as a local) since I got home at 1500 PST. This weekend I will try to find out how early I can hear them. If anyone has questions I have not answered, or wants more information please feel free to mail me at: [hawk@vornet.com](mailto:hawk@vornet.com) Stephen Hawkins WV6U

The CCRadio: The Radio That Wasn't  
By Kevin Redding

We all have heard the hype on the Art Bell show "Coast to Coast" and the Rush Limbaugh program about the "Best AM radio ever", the CCRadio. If you go to [www.ccrane.com](http://www.ccrane.com), heres what they say. "Never before has a radio been specifically designed for talk radio, news, sports and weather. Twenty years of dreaming, planning and engineering went into the development of this radio. Audio has been specifically tailored for the human voice." The claims of "The Most Powerful AM / FM Radio Ever Made" and "Hear Radio How It Was Meant To Be" are now gone from the site where they were once prominently shown.

This is a very good radio for a casual listener and not a serious DXer. Anyone who expects otherwise is going to be sadly mistaken. I would classify this radio as one that is a fair to good radio that can do some nice domestic DXing. If you purchase it with that in mind, then you will not be disappointed.

Let me describe the radio to you. The CCRadio is smaller than the GE Superadio III. It is 11"W x 6.5"H x 4"D. There is a very large LCD display with large numerics shown on the screen. It is even easy for my 45 year old eyes to make out with bifocals. The radio weighs about 4 lbs. without batteries.

There are treble and bass controls, an up or down tuning button which moves the frequency 10 kHz on AM, light switch, band selector, clock / frequency display and a sleep timer button on the front. On the side there is a very large dial which tunes in 1 kHz steps, a lock switch, volume pot and jack that will accomodate stereo headphones although there is no AM, FM or TV stereo on this unit. On the top of the set there is an alarm button and a button that sets the weather alert for when the alert tone is set by the NWS in

case of an emergency. Across the set are five large round buttons marked one through five. Each band has 5 memory settings. On the end of the top above the LCD there is the power switch. And near the alarm button there is the FM / TV / WX telescoping antenna which seems to be rather short at about 20 inches.

The radio is carried by a handgrab recess in the back and this is rather unfortunate. This radio desperately needed to have a handle. When you pick the radio up via the hand access your thumb or heel of your hand rests on the control buttons on the top and changes frequencies, sets alarms, turns off the radio or turns off the weather emergency alert.

The CCRadio I purchased was the model with the DC charging circuit and the LED light. These jacks are found on the back along with external AM antenna connections. The AM antenna connections are virtually useless and I would not attempt to attach any antenna to it as there is very little to be gained by doing this as the ferrite antenna in the unit can not be disabled.

The LED light which is an option, is very bright and the light exceptionally white. The light has no consideration for turning it on and off while connected to the radio. Either the light is plugged in and running or unplugged and off. I find that for a light that is \$39, this is a extremely glaring omission.

The DC charging circuit which also is optional, can either be used with a 6v wall wart or a solar panel. I do not have the solar panel but it is said to be able to charge the four optional NiCd batteries in 67 hours using the solar panel. The optional 6v wall wart will charge the NiCds in 27 hours. The expected run time on the NiCds is 48 hours. The radio seems to like batteries a great deal.

This radio tries very hard to be a lot of things to a lot of people. The frequency coverage is from 520 - 1710 on AM, 87.5 - 108.0 on FM, TV channel 2 -13 and all seven channels on the weather band. The set has an alarm, a sleep timer and a snooze feature.

When it comes to AM reception, if you live in the city and are surrounded with many signals, this may not be the radio for you. I have observed that this radio is very sensitive but not very highly selective. I live approximately 3 miles from KMIK 1580's antenna. On my Radio Shack DX-398 [ Sangean 909 ] I have KMIK and its splash from 1570 to 1590. On the CCRadio KMIK kills the band from 1540 to 1620 and also has its images popping up in places on the X-band during the day. I have a similar problem with KXAM 1310 also about 3 miles away running 5 kW where the spread is larger on the CCRadio than the DX-398.

However if you are not in proximity of a local 50 kW or 5 kW station, the radio is fine and is not prone to overloading as it is nearer to an antenna. I would say that this is the major problem with the CCRadio. The sensitivity is ever so slightly better than the GE Superadio III and selectivity less on the upper end of the band than the GE model.

This radio will perform very well though if not in the vicinity of any strong RF signals and if you are in an area where you don't have to deal with this it is a solid radio.

There is an issue with the memory display on the LCD that C. Crane and Sangean needs to address and is common on all three CCRadios I have used. Once the 5 memories on the bands are set, and only on AM, if you press the memory buttons the selection comes right up and the memory number on the LCD is fine. However, for example if memory button 4 is set for 1450 kHz and you tune with the DIAL, at 768 kHz the M-4 shows although this is not where the setting is. It has no bearing on the operation of the radio, it just is there. There are several places where memory numbers show up at odd places. Not good

programming nor quality control to have this issue show up in a 160 dollar radio.

The reception on the weather band is adequate and nothing exceptional. On most radios that have the weather band, I get five different stations but generally I only get three on the CCRadio and sometimes four with a lot of antenna twisting.

I have found the TV section to be poor at best. For example, I have a channel 4 in Tucson that is easily receivable on the Optimus 12-604a which is NOT known to be a DX monster. The CCRadio has an image of KDKB 93.3 FM right on top of KVOA 4 Tucson's signal rendering it unreceivable. Channel 7 from Prescott is doable with other radios but there is an image of KNIX 102.5 squarely atop its signal.

On FM I have found that this is your typical lackluster Sangean built FM section that is not only weak and lifeless but full of images. I have only seen one Sangean radio on FM that was not full of images and that is the DX-398 with RDS but even that is fairly dead and impervious to most DX.

I have two stations I use as a standard for FM reception. One is KAHM 102.1 in Prescott [100 driving miles] as I am on the edge of its receivability and the other is harder to hear on a portable in Mesa, Arizona, KMGN 93.9 from Flagstaff [180 driving miles]. Both of these stations are fairly doable on a GE Superadio and for the CCRadio costing 3 times as much as a GE Superadio, well I believe the reception should be able to be duplicated if not superior. Guess what? It isn't. KAHM is receivable although weakly and KMGN, forget it.

My take on the CCRadio. This is a good radio on AM reception for those who are not in close vicinity of an AM transmitter and tower.

The radio when it is not there is not overloaded and quite selective. It will pull in DX and do a fair job and somewhat better than a GE Superadio under those conditions.

The TV / FM / and WX bands are usable in a local sense and do a good enough job in that role. This radio was not sold as a top of the line powerhouse in these areas and they are good enough to get the job done.

I believe that this radio is priced way too high for what you get and would be better if it were priced at nearer to \$100 than \$160.

The radio has an advantage over the GE Superadios in that it has a digital readout and a clock plus the GE does not have WX or TV. However for the price, I believe that the GE offering is hard to beat at \$50.

This CCRadio would be highly recommended if the new price was \$120 or less but it is not the best AM radio ever made. It is a very good to fine set for someone who is a domestic DXer and is well made but it doesn't live up to the hype it has received. Its definitely a little better than the GE Superadio III but certainly not as good as a Sony 2010 with its ability to lock on to a signal.

I would not say that its a no buy, but will say that you should consider whether or not you can deal with a radio that overloads near strong RF more than other radios, and how much you want the TV, FM and WX reception before buying. At \$160 you might want to consider waiting for a sale on the DX-398 at \$30 more and get SW, continuous coverage from 153 kHz to 30 MHz and FM with RDS which is a very nice feature.

Its like everyone always says, there is no such thing as a perfect radio. If you are considering one, this may work for you and do a fine job under the right conditions since this is still a good, but not great, receiver.

