

# Sangean WR-2 AM/FM Receiver

By Bob Grove W8JHD

**N**ewly released from Sangean is a handsome, fine-performing, AM/FM tabletop radio with RDS (Radio Data System). For the uninitiated, RDS has been widely adopted by FM broadcasters as a means of delivering to suitably-equipped receivers (typically automotive) displayed messages like programming format, 12 or 24 hour time, title and artist of current song, road and traffic information, advertisers' phone numbers, station identification, and even station tuning information.

The WR-2 also has EON (Enhanced Other Networks), a gradually-emerging technology which allows a local broadcaster to break in on a network transmission if drivers need to be alerted to emergency road or traffic information. This new technology can even feed retuning-command information so that such a broadcast can switch an EON-equipped radio from one channel to another on which the message is being transmitted.

Following in the footsteps of its successful predecessor, the WR-1, the up-scaled WR-2 offers improvements requested by consumers of the first model. All primary functions may be operated manually or by a thin-style remote control (provided).

Weighing 5-3/4 pounds and measuring 9-1/2"W x 4-1/2"H x 7-1/4"D, the WR-2 offers a respectable 7 watts of monaural audio (10% THD) through its internal speaker. The wood housing helps keep ringing down which is often prevalent in metal-enclosed speaker systems.

For the utility of using the high-quality amplifier system with external audio sources, an auxiliary 3.5 mm mini-jack is provided on the rear panel; it accepts external, high-impedance audio inputs (47k ohms nominal) with a rated 160 mV sensitivity. Another 3.5 mm jack on the rear panel can be used with stereo headphone for private monitoring; the output is limited to 5 mW per left or right channel to avoid blasting. Yet another rear-panel jack offers an output of low-level (2.2 k ohm) monaural audio for external distribution or recording.

Encased in an all-wood cabinet and available in three different color schemes (walnut, black, or white) to match the owner's decor, the WR-2 features a large LCD display with brightness control and front-panel tuning. An additional rotary control may be alternately selected as a volume control or separately-tapered bass and treble control.

A tuned-port speaker enclosure assists bass reproduction. The PLL tuning reports its frequency to the digital display, and ten memory channels are assigned as five each



to the listener's choice of AM and FM stations. A clock/alarm can be selected as radio or buzzer.

External antenna jacks are provided for AM (screw terminals) and FM (F connector). A scan button searches through the currently-selected band (AM or FM) looking for active channels.

The radio can be powered directly from the AC line, or alternatively from a source of 12 VDC for automotive/boat/emergency use.

## ❖ Our Test

The handsome styling definitely lends appeal to this radio; it has a serious look to it as well as being nicely designed. Much of the operation will be intuitive, while a quick glance at the manual should familiarize the user with some of the more esoteric functions.

Audio reproduction is, of course, monaural. Sound quality is very good from the internal, tuned-port speaker. The bass/treble control allows a considerable range for custom adjustment. The double array of pushbuttons are well marked as to function, and tactile to confirm the presses.

The main tuning dial is somewhat cumbersome to use. It is too shallow to grasp, and its ring of raised spots aren't really adequate to prevent the finger from slipping as it turns the knob. Placing the hand on the top of the cabinet and pressing the thumb against the face of the knob was more effective, but the inclusion of a dimpled finger indent would have been better for slewing through the spectrum.

It is tempting to compare this radio with the well-established GE Superadio, but that

would be hard to do. The low-cost GE product is a large portable, and although it does have narrow/wide selectivity selection which the WR-2 does not, the Sangean, at more than twice the price, has digital readout and a number of other features that the GE does not.

So can the WR-2 be compared instead to the widely-promoted Bose radio? No again; the Bose costs several hundred dollars, and its concentration is on the satisfying production of FM stereo sound, in which it excels.

For those of us with a few decades of listening experience, the new WR-2 could be favorably compared to the old KLH bookshelf receivers; fond memories should flood back as we reflect on the soft bass and silky highs that emanated from those wood-enclosed receivers.

But for present-day listeners, we should consider the approximately \$150 Sangean WR-2 as filling a pricing-point niche between the modest-cost, AM/FM, monaural portables and the high-cost, stereo, bookshelf receivers. In that perspective we found the new Sangean WR-2 to be a very satisfactory and attractive performer at a reasonable pricing point in the consumer radio market.

# FRS or MURS? Hype or Hot Performance?

By Bob Grove W8JHD

**W**ith the wide selection of FRS (Family Radio Service) walkie-talkies available from virtually every electronics shop, mass merchandiser, and Internet electronics site, there's no question that these little radios have captured the imagination of our technical generation. It's reassuring to be able to keep in touch while caravanning, hiking in the woods, hamfesting, and other temporary separations. How does the casual consumer decide among the bewildering array?

And what about MURS (Multi-Use Radio Service)? Is there really a difference between it and FRS from a performance standpoint? After all, the advertising rates the radios by talking distance, ranging typically from two to eight or more miles.

## ❖ Created Almost Equal

Is it possible that a \$19.95 pair used under the same conditions as a \$79.95 pair can achieve the same results? Since all FRS radios are limited by law to no more than 1/2 watt of output power and they all have at least 14 UHF channels (462/467MHz band), there must be some subtle differences that let one model beat another.

For starters, some have longer antennas (FRS antennas are permanent; you can't substitute a longer antenna!), and the most expensive of them (those with the greatest distance claims) include eight additional channels for the FCC-license-required GMRS (General Mobile Radio Service), thus offering higher power (2 watts). Many FRS/GMRS radios also have features like drop-in chargers, voice activation (VOX), calling tones, and sub-audible tone squelch to reduce co-channel interference.

But what about that other, no-license-required, service? MURS allows higher power (2 watts) on five preset VHF (150 MHz range) channels. Base/mobile and hand-held transceivers are available at very reasonable cost from communications equipment suppliers. Unlike FRS, antennas are interchangeable, permitting the connection of mobile and rooftop or tower tower-mounted base antennas for extended range.

But back to the basics: Is there an inherent advantage in us-

ing one FRS hand-held radio over another? How does FRS compare with MURS under the same conditions?

## ❖ Our Units

Our choices for the test included a pair of Cherokee FR-465 FRS radios (discontinued), operating at 0.5 watts and with removable whips (disallowed by the FCC, but allowing antenna swapping); a pair of Midland G-225 FRS (claiming a 7 mile maximum range by switching from 0.5 watts FRS to 2 watts with GMRS channels); and a pair of Alinco DJ-196 2 meter held-helds at 0.8 or 4 watts with removable antennas. We used the Alincos on 148 MHz, close enough to 151.820 MURS channel 1 for a valid simulation.

As readily seen in the accompanying photo, the UHF Midland units have a short stub antenna, the UHF Cherokees have much longer antennas, and the VHF Alincos carry the longest of all. With all other factors being equal, the longer antenna means greater aperture (signal capture area). Will that make a difference?



## ❖ Our Field Test

To compare the relative performances of the three radios, one was operated from inside a house while the other unit was carried through the woods in mountainous terrain. This would allow three basic parameters to be tested: operation from inside a building, attenuation from foliage, and blocking by terrain. Additionally, it was a foggy day, slightly worsening line-of-sight attenuation.

At a distance of about 1/4 mile into the woods, the Midland was solid copy, but accompanied by background hiss; the Cherokee and Alinco were noticeably stronger.

At 1/2 mile, with more intervening hills and trees, the differences were more pronounced: The Midland was erratic in performance, while the Cherokee and Alinco remained stronger and consistent. But at a mile, with even more rolling terrain, both the Midland and Cherokee were unreadable. The Midland became readable when switched to high power (2 watts), while the Alinco remained loud and clear on low power (0.8 watts).

At 1 mile away, with considerable intervening terrain and woods, only the Alinco was readable by switching to high power (4 watts). Changing antennas seemed to make very little difference in communicability between the UHF or VHF radios. It would be expected, however, that under difficult fringe-reception conditions, a longer, gain-type antenna should make a difference.

## ❖ The Bottom Line

The tests seem to confirm theory – and probably many readers' suspicions: The higher the frequency, the worse the attenuation by foliage and intervening terrain; and while stub antennas may work for short distances, they degrade badly on the long haul.

If price is a necessary consideration when you're buying hand-held transceivers, select a pair of FRS transceivers with the longest antennas; next, consider the ability to switch to higher power (which requires the easily-obtainable GMRS license). If price isn't a limiting factor, buy MURS units for considerably better performance.