

Table 2: Specifications

Guaranteed frequency range: 150kHz to 240MHz and 420MHz to 1.9GHz
Typical frequency coverage: 150kHz to 260MHz and 410MHz to 2.05GHz
Maximum span: 192 kHz, real time
Modes: AM, NFM, WFM, USB, LSB, DSB, CW-L, CW-U
TCXO specified at 0.5ppm (in practice about 1.5 ppm)
Standard SMA female antenna port
USB male connection
Eleven discrete hardware front end filters including:
6MHz 3dB bandwidth (10MHz at -40dB) SAW filter for the 2m band.
20MHz 3dB bandwidth (42MHz at -40dB) SAW filter for the 70cm band
Third- and fifth-order LC bandpass filters for other bands
Front end LNA IP3 30dB
Typical noise figures:
50MHz 2.5dB
145MHz 3.5dB
435MHz 3.5dB
1296MHz 5.5dB
Typical NFM 12dB SINAD sensitivity measurements:
145MHz 0.15uV
435MHz 0.15uV
No additional drivers required for Linux, OSX or Windows
Integrated 5V bias T switchable from software
USB power required: 5 VDC @ 160 mA

be pressed. Next, a box of SDR receiver models is consulted to select the FunCube Dongle PRO+.

In order for the Dongle to work right off the bat, we have included a recommended list of settings (Table 1). Using those settings, we found the FunCube Dongle Pro+ to be a delight to use, with excellent reception throughout its tuning range.

Filter bandwidths can be custom adjusted to suit the requirements of the operator. Frequency entry is done by the user's computer keypad. The current frequency is cleared by right clicking the left-most box, then typing in the numerals in their respective boxes. The cursor can be slewed back and forth, selecting and fine-tuning the frequency. Alternatively, the cursor can be placed on any digit in the frequency display and toggled up and down in those units.

Tuning steps for slewing the cursor may be selected from among 27 step sizes ranging for 1 Hz to 500 kHz. They cleverly include all current standard channelization spacings, such as 6.25 and 12.5 kHz for NFM, 8.33 kHz for European VHF aero, and 9 kHz for European MW AM.

Since there are no instructions for the third-party driver, we have included startup settings that worked well during our review.

We found audio recovery, sensitivity, and signal stability in all modes including SSB to be outstanding. It is our understating that third party efforts are developing scanner software. We hope additional efforts will provide wider spans for the spectrum display.

At this writing, Howard Long is waiting for FCC approval. Until then, it is unlawful for the Dongle to be merchandised in the U.S. Grove Enterprises is awaiting notification for distribution. In the meantime, however, they cannot provide price or delivery information, although their European distribution seems to be in the \$200 range plus shipping.

Interested experimenters are encouraged to keep up with progress on this front by visiting Howard's website: www.funcubedongle.com

Sangean WFR-28 Radio

By Larry Van Horn N5FPW

I am a big fan of Internet radio. So much so we have quite a few of them in our household. So any chance I get to review a new I-Radio is a lot of fun and something that I look forward to. Recently, I had the chance to review another new entry in this growing marketplace and can say that Sangean has another winner in their new radio the WFR-28 Radio.

❖ Features

The Sangean WFR-28 is a combination Internet radio and audio media streaming device that is fully portable. With it users can listen to over 13,000 radio stations from NPR, FOX news, CNN, BBC, CBS to KROQ, and over 35,000 podcasts as well as to your regular FM band (87.5 -108 MHz) with a RDS (Radio Data System).

WFR-28 features include Frontier Silicon's IR 2.2 network audio software that provides the most complete, versatile and easy-to-use software available for the next generation Internet-connected audio systems. The WFR-28 delivers some real nice sound well beyond its size, and bass and treble controls let you further adjust that sound to your liking. The built-in clock with dual alarms can wake you to FM radio, Internet radio or buzzer. This platform can serve as a network music player so it can play music stored on your computer.

DLNA, UPnP and Windows 7 Certification is supported to enhance music sharing and playing. The WFR-28 even supports remote control by iPhone and iPod touch thanks to the iSangean App.

This radio does require a broadband wireless Internet connection for all media play functions except for FM band reception and auxiliary/USB inputs. Consequently, you can listen directly from your wireless router with no PC or Mac required. Jacks include: DC in, Aux-in, Line-out, Headphones and USB Port. This unit may be operated by the supplied AC adapter or four D cells (not supplied).

❖ iSangean App Available

iSangean is the remote control app for Sangean Internet radios and media streamers for your iPhone or iPod touch. The app allows selection of Internet radio stations, selection and control of media for UPnP/DLNA music streaming from a local computer, server or NAS device, as well as control of FM radio and other functions (where these functions are present on the radio). The Now Playing screen provides radio station or media information with direct control of the radio volume. iSangean is available for download in the iTunes App Store.

❖ Bottom Line

You are going to get big sound in a small package. The WFR-28 delivers sound well beyond its size. The built-in digital EQ audio controls let you further adjust the sound.

The WFR-28 delivers a solid radio listening experience, complete with a built-in external telescopic antenna for clear FM reception. Add to that the ability to listen to over 13,000 Internet stations worldwide and you can save your favorite Internet stations as well as your FM stations on your presets.

The only down side to this unit is no remote control. But if you have an iPhone/iTouch the iSangean more than fills that role.

Overall, if you are looking for a good entry level Internet portable receiver with FM band receive capability, at a reasonable price; take a good look at the WFR-28.

This unit sells for \$150 and is available from Grove Enterprises.

Technical Specifications

- Product Description - WFR-28 WiFi Internet / FM-RDS / Network Player / USB Portable Radio
- Tuner - Internet radio, FM-RDS waveband
- Station Presets - 10 (Five FM, Five Internet)
- Internet Radio - Over 13,000 stations worldwide, search by country, genre and my favorite radios
- Display - 1.3-inch LCD display with adjustable backlight
- Alarms - Dual alarm timer with HWS (Humane Wake System) buzzer and radio, Sleep timer and snooze functions
- Speaker - Single full range speaker, RMS output power 1.2 Watts
- Audio EQ - Normal / Flat / Jazz / Rock / Movie / Classic / Pop / News / Custom sound effects and bass/treble control
- Input/Output Jacks - FM wire external antenna, aux-in, USB, and headphone
- USB - MP3 playback, MP3 and WMA compatible, plug and play, UPnP / DMR music streaming (DLNA 1.5 compliant)
- Ethernet Technology - Ethernet
- Wi-Fi Standard - IEEE 802.11b/g
- Power Source Type - Plays on rechargeable and dry-cell batteries, built-in rapid battery charger, AC Adapter 7.5V/1.6A
- Size - 5.83-inches/148mm (H) by 2.44-inches/62mm (L) by 9.3-inches/273 mm (W)
- Weight - 1 pound 14 ounces/851 grams
- Manufacturer Website Address: www.sangean.com
- List Price - \$150

