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tested

The New WiNRADiO G303

The future's just arrived with the WiNRADiO G303, a PC-based HF receiver.

No I'm not joking! As far as short wave radio goes the hot new WiNRADiO G303 marks a significant step forward. Successfully combining the power of the desktop computer with a state of the art radio receiver has been the holy grail of developers over recent years - it looks as though the G303 is first past the post.

As short wave radios go, the G303 has a huge range of features as well as tremendous flexibility for future development. Our sister publication, *Short Wave Magazine* has recently completed a full technical review - it did extremely well and puts many traditional receivers to shame! I shall not attempt to duplicate John Wilson's excellent work here, but instead concentrate on the receiver's usability, software and future potential.

full-featured short wave
receiver. 9kHz-30MHz in 1Hz
steps - all mode!

What's so special?

There are two main points that make the G303 worthy of special note a) it lives inside a PC and b) the final intermediate frequency and demodulators are defined in software. Putting a receiver inside a PC is a formidable challenge. Well, it's not so much putting it inside, as making it usable! If you've ever tried to operate a radio in close proximity to a modern PC you will understand the huge amount of RF noise that can be generated. International emission legislation has helped improve the situation over the last few years, but computers remain inherently radio unfriendly devices.

The engineer's at WiNRADiO have achieved a minor miracle in screening technologies to produce a top flight receiver with virtually no spurious pick-up from the computer. Of course, you have to take care and make sure you use good quality connectors, feeder and antenna, but WiNRADiO have done the hard bit and tamed noise pick-up within the PC. This is a remarkable achievement and a major factor in making the G303 the success it will inevitably be.

Just to add to the fun, the G303 uses your computer's soundcard to handle the final IF stage. This may initially sound a bit odd, but it adds tremendous flexibility and opens up a whole new world for programmers to transform the application and performance of the receiver through the use of software add-ins. This is a huge step forward and makes the G303 one of the most versatile systems around. Having successfully located a receiver inside a PC WiNRADiO have created a very powerful receiving system with huge potential to develop the concept to produce an almost limitless range of receive systems. That's what is so special!

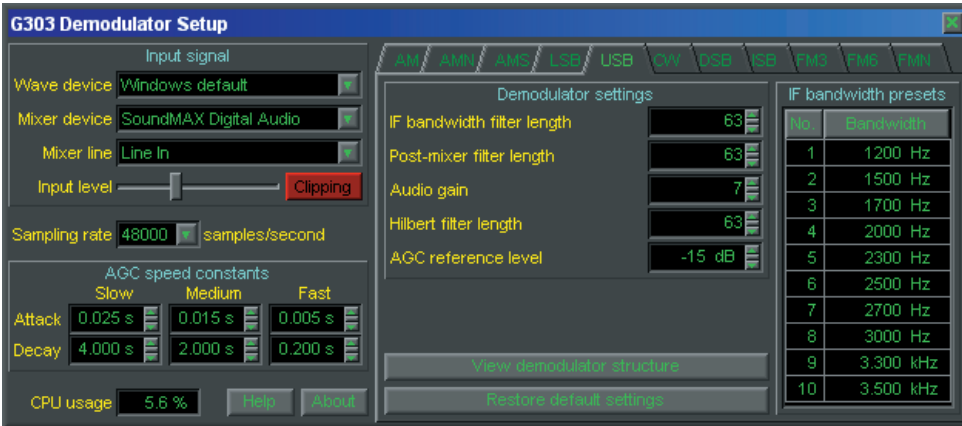
What Does it Do?

Whilst most of WiNRADiO's receivers are wide-band models covering the entire HF, VHF and UHF bands, the G303 is a dedicated HF receiver with continuous coverage from 9kHz through to 30MHz. One of the benefits of reducing the frequency coverage is that it frees the designers from the inevitable compromises that have to be made to create a wide-band design. If you take time out to read John Wilson's review you will see that WiNRADiO have really



WiNRADiO PCI card.

The units are available from Falcon Equipment & Systems. Tel: 01684 295807, priced £399.



Professional demodulator configuration.

WINRADIO in full flight.

taken the design of this receiver very seriously and are challenging the market leaders with a mix of solid technical performance and innovative software based features - more on that later.

As well as the comprehensive LF through to HF coverage, the G303 has tuning steps adjustable from 1Hz plus a full range of AM, FM, SSB and CW demodulation systems - all the basics for a top flight receive system.

Getting Going

Whilst the review model was supplied preloaded on an IBM PC, installation is very simple. Being based around a PCI card you do need to delve inside your computer and you will need a spare PCI slot available. With the card installed you just need to load the software from disk. It's also worth checking the WinRADIO website as the latest version is posted there for download. The file is only around 1.4Mb so download shouldn't present a problem even if you're on a basic dial-up connection. If you want to try the software to see the interface for yourself, you can download and install the package and it will run in demo mode - great idea WinRADIO. If you'd like to try a copy just go to the WinRADIO website, choose Downloads and follow the instructions to download the file for your operating system.

With the card installed and software loaded you just need to connect the output of the WinRADIO to your soundcard input using the supplied patch lead. The very final link is to connect the antenna to the SMA socket. Please don't skimp on the antenna - this is a great receiver and justifies a descent antenna! Like many listeners my first choice is a Wellbrook Loop.

Tune-Up!

One of the challenges facing designers of software products is how to manage the interface between the computer and the operator. Receivers are no exception to this problem, as the ubiquitous tuning knob has become something of an art form in the better quality receivers. Many of the classic receivers of the past have had really great tuning knobs with a finely crafted balance between spin-ability and precision. However, the software receiver designer just has the conventional keyboard and mouse available.

This is quite a task and WinRADIO have tackled this by providing a huge range of tuning options, presumably in the hope that there will be something for everyone. If that's the case, then I think they've succeeded! If you know the frequency you want, you just type it in - they've made this very simple as you don't need to select the display first or carry-out any preliminary set-up, just type the number and it goes straight to the display. If you want to enter MHz or kHz just type an M or K after the number - you see it's really simple.

Moving on to the mouse reveals another well thought through



system. When you move the mouse cursor over the tuning knob the cursor changes to an arrow - in this state the left and right mouse buttons can be used to tune up or down in 500Hz steps. These tuning steps can be increased to 5kHz by pressing the **Shift** key or reduced to 50Hz by pressing the **Alt** key. If you have a wheel mouse you will find that turning that changes the frequency in 10Hz steps for really fine tuning. A truly amazing range of tuning options available from your humble mouse!

Next tuning option is the use the **Up/Down** buttons located under each digit of the display this provides precise and rapid setting to 1Hz accuracy. Another neat and unique alternative was the Tuning Pad. I've not seen this implemented anywhere else, but it was a really interesting way to tune a receiver. There were two parts to the tuning pad - the narrow window and the yellow pads. When you place the mouse cursor in the window you can move the mouse to the left or right to choose progressively larger increasing or decreasing tuning steps. Clicking the left mouse button starts the receiver tuning with the selected steps. If you want to speed the tuning you just slide the mouse further to the left/right and to reverse direction switch from the left to the right mouse button. The range of tuning steps available with this system 1Hz through to 1MHz!

It takes bit of getting used to but, once mastered, it's a really powerful way to move around. If you don't want to go the whole hog,

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the yellow buttons just below the window provide a simpler alternative. These provide fixed step changes from 1Hz to 10kHz that can be reversed by swapping between the left and right mouse buttons.

Elephantine Memory!

One of the many benefits of integrating the receiver and PC is the ease with which sophisticated memory and scanning systems can be implemented. WiNRADiO have really capitalised on this and provided a huge armoury. The memory files can hold up to 1000 frequencies each with full details of the demodulator settings, squelch level and call sign/notes. The number of memories you can have is simply limited by the size of your hard-disk!

To compliment the huge memory capacity is a full range of scanning and searching options to make hunting-down active frequencies a real breeze. The searching was particularly good with opportunities to create any number of search ranges each of which can be set with an auto-store option to capture the active frequencies. If you're into Microsoft Excel and fancy some simple programming WiNRADiO have provided full details of the memory file format used in the G303 so you could relatively easily convert your existing frequency lists into a format that can be used directly by the G303.

Spectrum Tuning

One of my real favourite systems was the spectrum display. This was a fully customisable spectrum display that could be set to analyse any range of frequencies you want with frequency steps from 100Hz through to 1MHz. The display could either be set to run a single sweep of the required band or a continuous sweep and display. Once the sweep has completed you can use the mouse to click on any apparent signals and the receiver immediately tunes to that frequency. To make this easy, the cursor automatically snaps to the nearest peak, so you're always assured spot-on tuning.

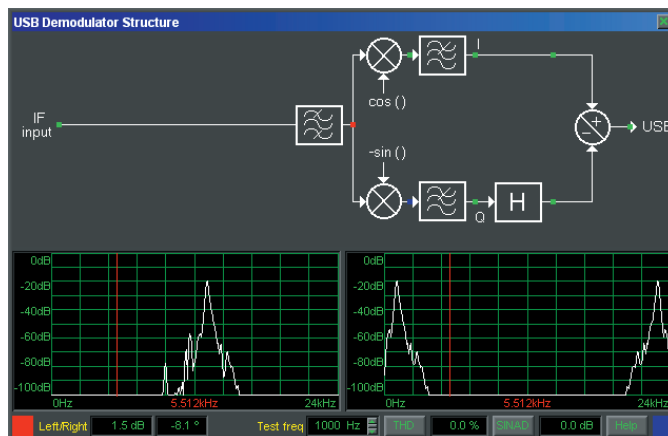
This was a really good system for trawling a relatively narrow band for active frequencies. As an added bonus, the spectrum display provided a detailed frequency and signal level readout at the cursor position. The continuous sweep with min and max recording was really good for spotting activity in an otherwise very quiet band segment.

Demodulator Flexibility

At the time of writing there were two demodulator systems available for the G303. The standard demodulator provides a better than average range of modes with AM, FM (3kHz, 6kHz and 12kHz b/w) plus SSB, CW and synchronus AM. The review model was supplied with the Professional demodulator and this adds ISB and DSB modes but, more importantly, a continuously variable IF bandwidth covering from 1kHz through to 15kHz. This demodulator also adds many customisable settings for the filters and automatic gain control systems.

Extendibility

As you can see from the features I've already covered, the combination of receiver and PC makes for a very powerful listening tool. But we've



really only just scratched the surface as the folks at WiNRADiO have done their best to open-up the G303s features for 3rd party developers. In simple terms this means that it's relatively easy for anyone with programming skills to produce customised enhancements to the receiver. The key to this flexibility is WiNRADiO's Extensible Radio Specification - known as XRS. This specification provides a well documented standard for communicating with XRS compatible receivers thus making customisation relatively easy.

In the case of the G303 the full Application Program Interface (API) is freely available for download as is a comprehensive Software Development Kit (SDK). These two items prove all the information necessary to support complex program development for the G303. I have to say it's really refreshing to see a manufacturer taking such an open approach to their software and positively encouraging others to use their skills to enhance the system.

This openness has already led to the development of many bolt-on extras - at the time of the review there were 33 XRS plug-ins available for download from the WiNRADiO site. What's remarkable is that most of them are free!

If you're not really into serious programming, but would still like to add features, WiNRADiO's Rbasic could be the answer. Rbasic is a simple to use Basic programming language specially designed to align with the XRS specification. The language uses very simple statements so even quite complex tasks can be completed with relatively little coding. Just to illustrate the point the following simple code produces a spectrum analyser for the VHF broadcast band!

```
startfreq=88: endfreq=108 : step=0.1
count=(endfreq-startfreq)/step+1
graph$="Spectrum scope"
OPENGRAPH(graph$,count,120)
RMODE$="FMW"
FOR i=0 TO count
  rfr=startfreq
  CLEARV(graph$,i)
  signal=rss
  SETCOLOR(graph$,signal*2+15,signal*2+15,0)
  LINE(graph$,i,signal,i,0)
  startfreq=startfreq+step
  DELAY(100)
NEXT i
```

As well as being a relatively simple to use programming language, Rbasic has the advantage of being a completely free download from the WiNRADiO!

Summary

I'm sure you've already gathered that I really liked the G303 receiver! WiNRADiO have produced an undoubted winner here with the unique combination of a top flight receiver with the power and flexibility of the modern home PC. By providing full access to the programming environment along with free development software they have also opened-up a huge potential for future development. I'm sure we will very soon see a host of new radio based applications that take full advantage of this powerful receiver. The G303 is available from **Falcon Equipment and Systems**. Tel: 01684 295807, e-mail: winradio@sda-falcon.co.uk at the remarkably low price of £399 without the additional professional demodulator. The unit is available either direct from Falcon Equipment and Systems or from Waters & Stanton or ML&S. ■