

INTRODUCING THE EMDRC TALKING FM MONITOR

A new 2 metre on-air information service is now under test by the EMDRC and available for radio amateurs living near Burwood to try out.

Introducing Australia's first on-air real time **FM Modulation Monitor** that determines the peak audio deviation for any narrow band FM signal that it receives and reports the result to you immediately using spoken word. Please note that the service is experimental, and members may find that it is unavailable at times when the equipment is being updated.

TELL ME HOW TO USE IT

1. THE SYSTEM'S RECEIVER MUST "HEAR" YOU 100% FULLY QUIETING IN ORDER TO DELIVER AN ACCURATE RESULT. This is important. Even the slightest noise on your signal will make the result inaccurate. Don't bother whilst you are mobile.
2. Turn off any CTCSS tone
3. Key up your transmitter and talk in a normal voice for 5 seconds, then release your PTT. The FM Monitor responds with a report of your peak deviation, which ideally should be close to, but not exceeding the ideal value of 5 KHz. Around 4-5KHz is fine.
4. If you don't speak for long enough, the system will respond with a "Try again" message. You must speak for 5 seconds to allow the system sufficient time to properly assess your FM deviation level.
5. If you get an unusually high result – greater than 5.8KHz, you probably have noise on your signal and the result will probably be incorrect.
6. If you are not sure if you are fully quieting into the device, transmit 5 seconds of absolute silence (without CTCSS of course). The monitor will respond with a result of 0.0KHz deviation if you are noise free. If you get any other value, you are not fully quieting, and your result will not be correct.

TELL ME WHERE TO GO

You will find the service running now on **145.250MHz**, which is the recommend frequency for "FM Simplex Information Beacon" services in the March 2020 band plan. The callsign this is running under is VK3LL, however this will change. The system is operating from the EMDRC club rooms in Burwood.

TELL ME HOW IT WORKS

The incoming resolved audio is sampled at over 32,000 times each second and the peak minima and maxima for both positive going and negative going parts of the demodulated audio waveform are sampled through an A to D Converter (ADC) and evaluated within a microcontroller. These ADC values are compared with predetermined samples from an accurate Agilent test instrument using an algorithm that determines the peak deviation within an accuracy of +/-2% across the 300-3000Hz audio spectrum. The result is then spoken back to the user using audio samples stored on flash memory and reconstructed via a simple Digital to Analog Converter (DAC). The CW ident is generated using PWM and a sine lookup table to create a low THD sine wave at 1KHz. The unit can also record and play back audio samples, however this has not been enabled for this project.

The system has almost perfectly flat audio response – from 300 to 3KHz within 0.5dB – beyond which audio rolls off. Any white noise or hiss present on the signal will also be included in the result, hence the reason to be noise free and fully quieting to get an accurate result. Since the audio response below 300Hz is intentionally attenuated, it is currently not possible to accurately measure the deviation of just CTCSS audio.

FAQ

Q. How much TX power is it running?

A. The transmitter currently runs 25 Watts and may be increased later to 50.

Q. What is the effective range?

A. From its current location (the club rooms), the range is a few kilometres in all directions. Later the committee may decide to relocate it somewhere else for extended coverage.

Q. Can I use it to check my DTMF deviation?

A. Yes.

Q. What is considered the "correct" FM deviation?

A. The amateur service in Australia has mostly standardised on 5KHz deviation. 5KHz deviation is thus considered optimum.

Q. Will it help me to know how close I should hold my microphone?

A. Yes. That was the one of the principal reasons for this project.

Q. Can I use it on HF/CW/SSB/Fusion/DStar etc etc?

A. Sorry, no. It only works on narrow band 2m FM signals.

Cheers,

Ralph VK3LL