

Mesanovic CDM65

Active Monitors



Mesanovic's three-way speaker offers outstanding performance, wireless connectivity — and a cardioid bass response.

PHIL WARD

I reviewed boutique US microphone manufacturers Mesanovic's first foray into monitor manufacture, the RTM10, back in *SOS* July 2021. In the spotlight this month is the company's second monitoring product,

the CDM65. And, ignoring the fact that all moving-coil speakers are conceptually similar, the CDM65 and RTM10 are like chalk and cliché. I say this because whereas the RTM10 has just an analogue input, the CDM65 adds the WISA HT wireless audio protocol and all the streaming options that this technology makes possible. And where the RTM10 incorporates an in-house developed and manufactured ribbon tweeter, the CDM65 employs a considerably more conventional OEM device. There's more differentiation, too, because where the RTM10 is an entirely conventional two-way direct-radiating loudspeaker

with acoustic dispersion defined by its drivers and enclosure dimensions, the three-way CDM65 features Kii Three-style active cardioid radiation, enabled by its side-mounted drivers functioning as both low-frequency radiators and low-midrange dispersion modifiers. So, not only is the CDM65 not much like its Mesanovic sibling, it's a pretty unusual monitor full stop.

Sizing Up

On arrival, the CDM65 turned out to be more compact than I had anticipated. This is a good thing, and means not only that the CDM65 fits easily into a nearfield installation

(although bear in mind that side-firing drivers need a little space to breathe), but also that it's potentially suited to immersive multi-channel installations — tapped inserts on its back panel enable the attachment of VESA standard mounting brackets. Compact does not mean lightweight, though, and at 14.5kg, the CDM65 is still a significant lift on to the monitor shelf. The CDM65 cabinet itself is a slim, rounded-corner, wood-based design finished in a textured dark grey paint. It's the kind of utilitarian paint finish that is both relatively inexpensive to apply and good at hiding material flaws. But, given that the CDM65's wireless functionality seems intended to fit it for consumer as well as professional markets, I wonder if it looks classy enough. Time, and customers, I guess, will tell.

The CDM65's active electronics comprise Class-D amplification rated at 150 Watts each for the midrange driver and tweeter, and 300 Watts for the twin bass drivers. Being a wireless-capable monitor, the signal flow is digital throughout and capable of up to 96kHz/24-bit sampling rate and word length. Around the back is a configuration and connection panel that offers a power switch, a balanced XLR analogue input, a wireless pairing button, an input sensitivity switch (+6dB, 0dB, -6dB) and a USB socket for firmware updates. To switch the CDM65 between its default cardioid-bass mode and 'standard' mode, you need to load alternative firmware from a USB pen drive. A schematic shows a 7.1 speaker system with LED indication that's used to specify the role of the specific CDM65 in a wireless multi-channel system. I'll describe the WISA HT wireless and multi-channel capabilities more fully in the 'Without Wires' box.

Driving Force

In terms of its electro-acoustic architecture, the CDM65 is a three-way system with four drivers: a waveguide-loaded 25mm tweeter, a 130mm midrange driver and two 165mm side-mounted bass drivers. Rather than being built in-house at Mesanovic, as is the tweeter used in the RTM10, all of the CDM65 drivers are OEM devices, although the tweeter employs a Mesanovic-designed and manufactured waveguide. Said waveguide is CNC machined from solid aluminium and carries a high-quality anodised finish. The aluminium-diaphragm midrange driver appears to be the same as, or at least very closely related to, the one used in the RTM10. It incorporates specific features within its motor system

(the voice coil, magnet and associated metalwork) designed to counter some of the distortion-producing mechanisms inherent to moving-coil drivers, and over the decades I've come to realise just how significant these kinds of features are. This bodes well. More generally, the CDM65 midrange driver is one I already know to be of very high performance, both objectively and subjectively.

The side-mounted bass drivers are Kevlar-reinforced paper-diaphragm devices, engineered specifically for their low-frequency role, with four-layer voice-coil windings and relatively generous ($\pm 7\text{mm}$) maximum linear displacement capability. The drivers share a closed-box enclosure of around 14 litres internal volume. Bearing in mind the impressive low-frequency specifications of the CDM65 (-3dB at 36Hz combined) with a maximum of 103dB SPL at 1m, the diaphragm area of the two bass drivers is relatively modest so they will potentially find themselves working pretty hard.

Hot Fuzz

Now seems a good time to describe and explain how the drivers are employed to

Mesanovic CDM65

£5778

PROS

- Wide bandwidth.
- Active cardioid.
- Fabulous imaging and low coloration.
- Neutral tonal balance.
- Great bass.

CONS

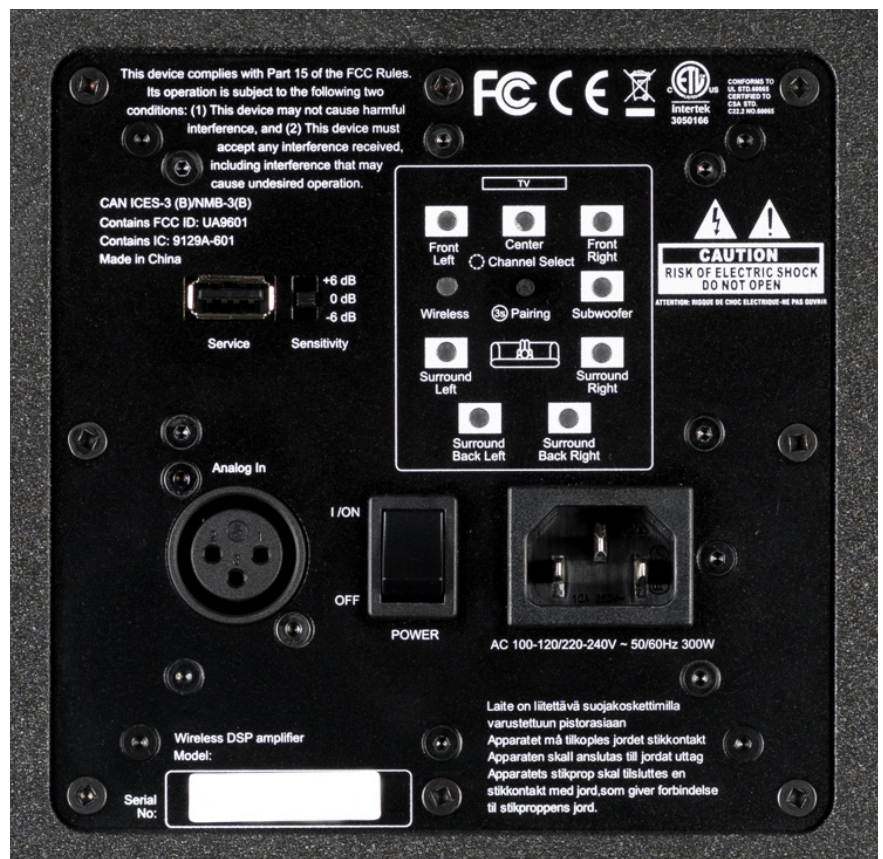
- None.

SUMMARY

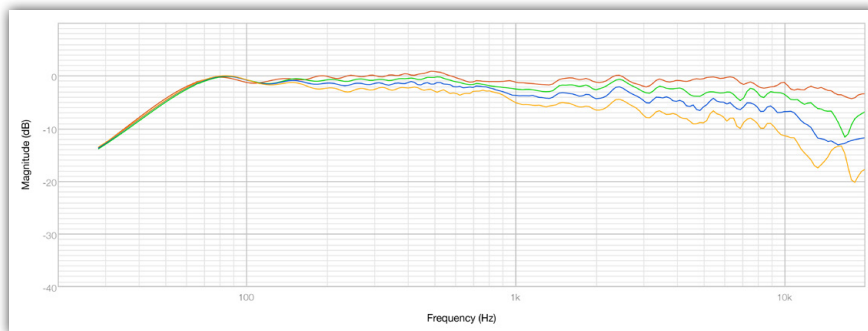
There's no difficult second album for Mesanovic. Their second monitor is a brilliant example of the electro-acoustic arts, with a neatly realised and effective cardioid trick for good measure.

create the CDM65's cardioid radiation, and as part of that, we'll look at some FuzzMeasure acoustic data. Being a three-way system, the CDM65 has two crossover frequencies, where complementary low-pass and high-pass filters are used to integrate the radiation of each driver. The low-frequency to mid-frequency crossover of the CDM65 is at 150Hz, and its mid-frequency to high-frequency crossover is at 2.3kHz.

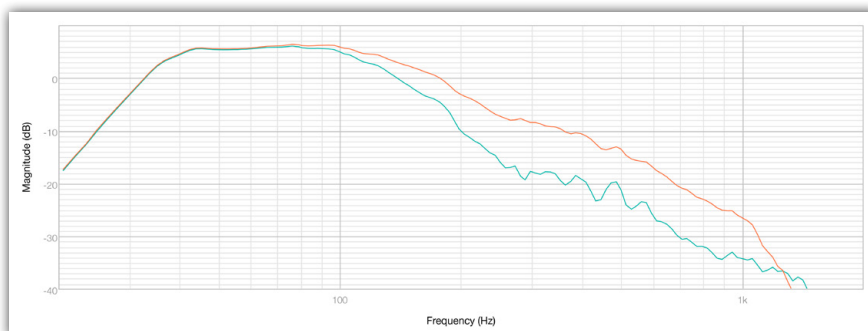
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As well as featuring an analogue XLR input, the CDM65 can be used wirelessly as part of a WISA network in configurations up to 7.1 surround.



■ Diagram 1: The CDM65's frequency response in cardioid mode, measured on axis (red trace), and 30, 45 and 60 degrees horizontally off axis (green, blue and orange, respectively).



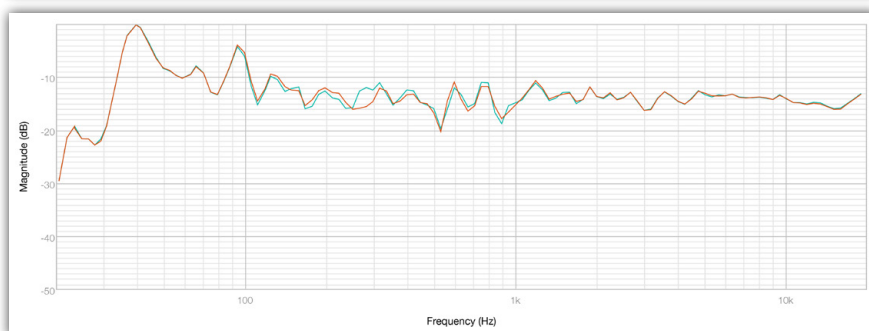
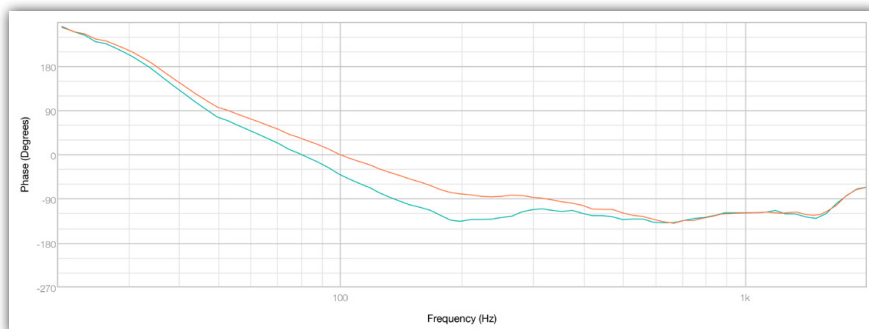
■ Diagram 2: The CDM65's bass driver output, measured at 0.5cm and in both standard and cardioid modes (green and red traces, respectively).

» Now, if the CDM65 were a conventional monitor with dispersion primarily defined by its physical dimensions, that dispersion would be substantially omnidirectional up to around 500Hz, where the wavelength begins to become comparable to the cabinet dimensions.

However... Diagram 1 illustrates the CDM65 cardioid mode dispersion through frequency response curves measured on axis and at 30, 45 and 60 degrees off axis horizontally, and the CDM65 clearly begins to become directional at the advertised 150Hz. That 150Hz also marks the bass-to-midrange crossover frequency is no coincidence because, in cardioid mode, rather than quickly being attenuated with a steep low-pass filter, the bass drivers

are rolled off slowly so that their output overlaps in the 150Hz-1kHz band with that of the midrange driver. The overlap results in interference between the bass and the midrange drivers, and the result of that,

■ Diagram 3: The bass driver's phase response, again in both standard and cardioid modes (green and red, respectively).



■ Diagram 4: The in-room response of the CDM65, in standard (green) and cardioid (red) modes.

modulated by a degree of time-domain massaging of the bass driver output above 150Hz, is the selective modification of the system's inherent directivity right down to the 150Hz point.

To illustrate this further, FuzzMeasure Diagram 2 shows the 20Hz-2kHz output of a CDM65 bass driver, captured by placing a measuring microphone around 0.5cm from the diaphragm, with the speaker in cardioid (red curve) and standard (green curve) modes. The difference in the bass driver roll-off is clearly apparent. Diagram 3 also records the close-mic bass driver output, but this time shows phase rather than amplitude response. Again, a difference is apparent between the cardioid and standard modes, and it is this modified phase relationship between the outputs of the midrange and bass drivers that results in a cardioid radiation.

I've included one more FuzzMeasure diagram to illustrate the two modes. Diagram 4 shows the in-room frequency response of one CDM65 at the listening position in my studio in both standard and cardioid modes. There's a measurable difference between the two modes, with the most subjectively significant divergence I think being that at around 300Hz.

The final FuzzMeasure curve I've included, Diagram 5, isn't particularly relevant to the CDM65's cardioid characteristics but simply records the monitor's axial frequency response linearity and harmonic distortion performance.

ALTERNATIVES

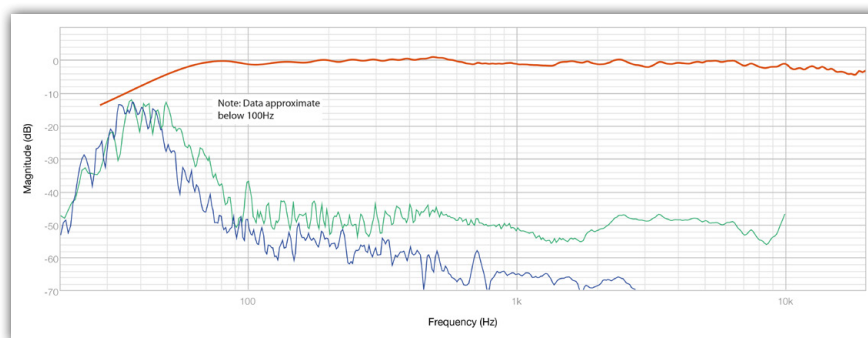
The CDM65 is one of those rare monitors for which there isn't much competition. The only other pro monitor that comes close in terms of offering active cardioid electro-acoustics and integration with audio streaming is the **Kii Three** when combined with the Kii Control, but that system costs very much more than the CDM65. A few conventional monitors at around the same price of the the CDM65 that would all be worth a listen are the **PSI A21M**, the **Genelec 8341A**, the **Barefoot Footprint 01** and the **Amphion Two15** with its matching **Amp700**.

Both are very impressive. The frequency response is predominantly flat within around $\pm 1\text{dB}$, and the distortion products, measured at 90dB output level at 1m are, below 100Hz, typically 50dB down (0.3%) in the case of the second harmonic and 60dB down (0.1%) in the case of third harmonic.

In Use

And so to listening. I set up the CDM65s on my monitor shelf in prime position, temporarily demoting my current Neumann KH150 reference and Dynaudio BM5 MkIII Atmos monitors to the floor. As usual, I played a bunch of familiar material, and very much enjoyed the experience, because the CDM65 is an extremely fine monitor — up there with the best I've heard in recent years. It's the kind of monitor that makes this review job so enjoyable (because when a monitor is this good, I quite quickly default to listening just for pleasure), but at the same time makes it somewhat difficult to know what to write because flaws, or even just quirks, are often the reviewer's raw material and the CDM65 is very short of either. I'm left trying to describe virtues, and that's more difficult to do without venturing into hi-fi review territory and turning the descriptive hyperbole up to 11. So I'm going to keep it relatively short.

Starting at the low end, I was particularly struck by how well the CDM65 reproduces



■ Diagram 5: The on-axis frequency response (red trace), overlaid with second- and third-harmonic distortion levels (green and blue, respectively).

pitch. Low-frequency pitch isn't easy for a speaker because the frequencies that represent different notes are relatively close together and, by the very nature of the electro-acoustics involved, adjacent to a major system resonance: that of the bass drivers in the enclosure (to which a reflex resonance might be added). But the CDM65 reproduces low-frequency pitch with a notable level of explicit accuracy. It makes for a really secure foundation for a piece of music. Low-frequency timing and dynamic accuracy is also very good, but these things do tend to go hand in hand with good pitch reproduction.

Moving up the audio band, the midrange driver is uncoloured and displays a natural, even-handed quality on vocals and acoustic instruments that suggests that

it'll be trustworthy in translation terms on everything else too. It also has a highly revealing nature that very effectively lays all the details bare. And finally, at high frequencies, the CDM65 tweeter is the epitome of clarity and detail without emphasis. But if there's anything that sums up just how good a monitor the CDM65 is, it's the way in which all the different elements are well integrated, yet get out of the listener's way to reveal exactly what's going on in the mix.

As far as the subjective difference between cardioid and standard mode is concerned, even though the relatively long delay involved in switching from one mode to the other makes it hard to A/B them directly, the contrast is marked. In tonal terms, standard mode sounds a little warmer in the voice band than cardioid mode, and in imaging terms, cardioid mode is noticeably more tightly focused, with a more explicit portrayal of stereo depth and perspective — to the point where the imaging is truly striking. Cardioid mode sounds generally more analytical and better suited to a mix role, and after a few mode swaps, became my preference. But even in standard mode, the CDM65 is still exceptional.

The CDM65 is a hugely capable monitor that offers very wide bandwidth, a revealing and uncoloured midrange, a high end that's detailed and delicate without drawing undue attention, and brilliant stereo imaging. It's a fine example of the speaker designer's art and it makes for supremely effective monitoring. And if it floats your boat, and suits the way you work, it can play the consumer audio multi-input, multi-channel wireless streaming role too. ■■■

Without Wires

The WiSA acronym stands for Wireless Speaker and Audio Association and, along with its conventional balanced analogue input, the CDM65 employs the WiSA protocol to enable wireless operation. The WiSA association is a group of large and primarily consumer-focused electronics brands and their technology is becoming increasingly visible in consumer multi-channel audio systems. Rather than employing a local WiFi network or Bluetooth to transmit and distribute audio to wireless playback devices, the WiSA HT hub hardware creates a separate dedicated wireless mesh network, and that confers the system with some notable advantages. Firstly, because WiSA HT doesn't rely on an existing WiFi network, it doesn't suffer from network congestion. Secondly, WiSA HT is able to handle sample rates and word lengths up to 24-bit/96kHz, and lastly, WiSA HT isn't limited to stereo; it can transmit audio to playback system formats up to 7.1. A 7.1-channel format unfortunately doesn't cover Dolby Atmos mix work, where the minimum speaker-based monitoring system is generally accepted to be 7.1.2 or 5.1.4. Of course, there's nothing to stop anybody building an Atmos monitoring system based on seven wirelessly connected CDM65s in, say, a 5.1.2 format, but it will be an outlier in terms of Atmos mixing. Having

said all that, I think it's probably the case that Mesanovic see the CDM65's wireless abilities as more relevant to consumer applications than professional monitoring. I don't imagine there'll be many mix engineers drawn to using CDM65s in a wireless multi-channel mix role.

Mesanovic offer a WiSA hub for the CDM65, based on a device manufactured by Platin Audio (www.platinaudio.us), which offers multiple analogue and digital audio inputs along with compatibility with Apple AirPlay, Spotify Connect and ChromeCast. I was able to try a Platin hub for the very last couple of days that I had the CDM65 review samples. Once I'd worked through the WiSA configuration and pairing process using the Mesanovic app, the hub worked flawlessly and I soon had both a turntable and Spotify from a phone happily playing through the CDM65s. It would also of course be feasible to send the output of a recording interface to the WiSA hub and use the CDM65s as wireless monitors. In that mode of use, the EQ and room optimisation functions (the latter based on smartphone mic data capture) that the Mesanovic app offers, but which aren't available on the CDM65 analogue inputs, might add an attractive further element of monitor configuration.

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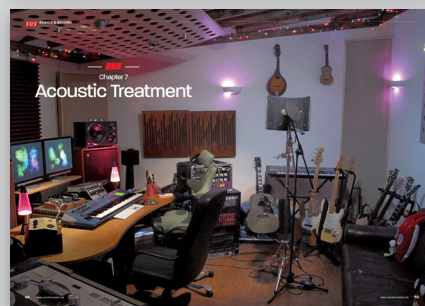
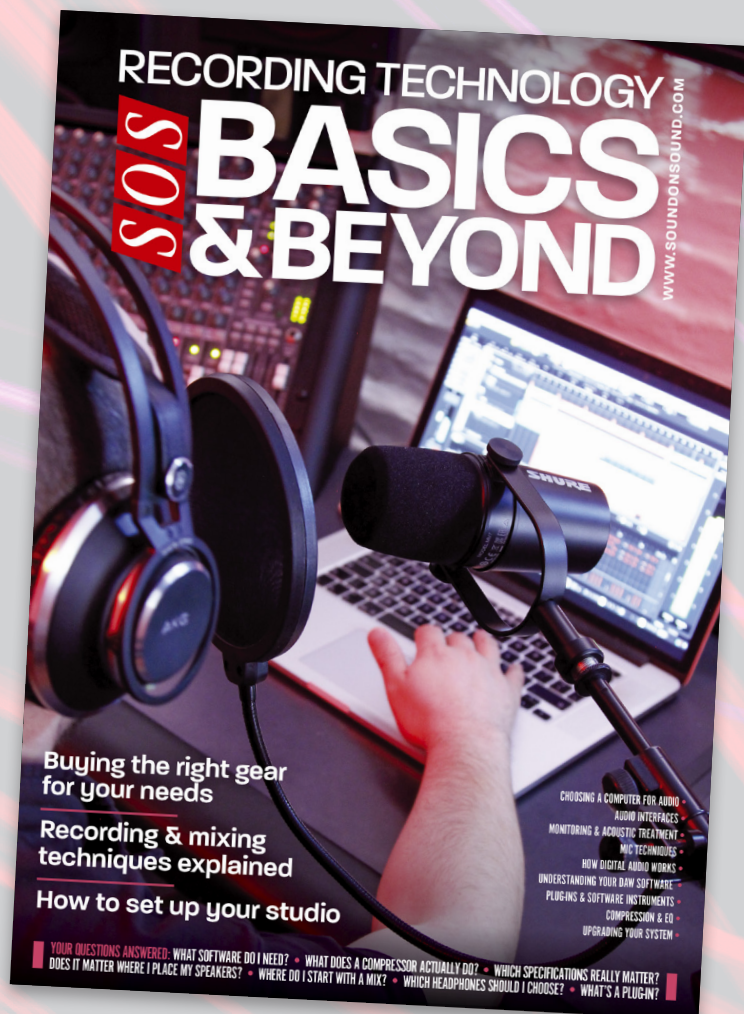
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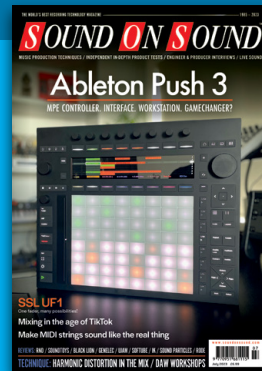
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