

# Miata Headrest Speaker Specifications and Installation Tips, Millennium-5



Check out our on-line installation guide with over 20 pictures and Miata wiring diagrams! [www.3rdstrategy.com/miata.htm](http://www.3rdstrategy.com/miata.htm)

## Installation tips

Don't hesitate to just screw these into your existing Miata headrest boxes and go for a drive! However, if you are interested, we do have a few tips to help maximize performance:

- We recommend that the Miata stock headrest boxes be lightly filled with fiberglass or acoustic dampening material. We do not recommend using the Millennium-5 speakers without the oem or equivalent headrest boxes.
- If the wiring hole in the speaker box is significantly larger than the wire, apply a dab of silicone caulk to the opening to seal it. Allow to dry overnight before using speakers or moving wiring. Having the box completely sealed is best.
- If the speakers seem to slide around a bit in the boxes, you can apply a very fine bead of silicone caulk to the rim of the box where the speaker will lie. Let it dry completely before installing the speaker and then screw in the speaker normally. This essentially forms a gasket to better acoustically seal the speaker into the box.
- A capacitor can help block potentially damaging low frequency audio from reaching the speakers. We recommend that you install a 150 uF *non-polarized* capacitor in series with the plus lead of each speaker or channel. A value of 25 volts or higher is generally OK unless you have a really high powered amp – but we don't suggest using such an amp for headrest speakers! This creates what is called a 6dB per octave high pass filter. It essentially blocks the extreme low frequency signals from reaching the speaker. 150uf will start to gently roll the frequency off at around 100 Hz. This capacitor can be installed anywhere in the speaker line that is convenient. We have these capacitors available for purchase on our website at [www.3rdstrategy.com](http://www.3rdstrategy.com). If you do not install capacitors to help protect the speakers, be careful not to drive the speakers to distortion! Note that damage to the speakers caused by overdriving with excessive power or low-frequency energy is not a defect and is not covered by the limited warranty.
- If after installing the speakers they sound weak or thin, the polarity of the wiring may be mixed up causing the speakers to be out of phase. Many Miata's came from the factory with incorrectly wired harnesses for the headrest. This is easy to correct. Simply open up the headrest in question and remove only one of the speakers. Reverse the wiring and reinstall. The sound should be noticeably improved when the phase is correct.
- Also, some users have reported finding existing capacitors in their headrest wiring that are noticeably different in value from the 150uf recommended above. If you find such a capacitor and the sound still seems thin or weak to you even after checking phase, remove the capacitor entirely and re-test. Many capacitors are incorrectly sized allowing only the highest frequencies through to the speakers. If you keep the volume levels moderate and don't drive the speakers into distortion, a capacitor isn't essential.
- Finally, if you have an older (pre-96) Miata factory radio still in your car, we should point out that some of these radios came configured with blocking capacitors for the headrests outputs intended for tweeters. Obviously you don't have tweeters in your headrests but midrange speakers. While it's possible to remove your radio and have the components that limit the lower frequencies from reaching the headrest speakers removed, we suggest you seriously consider replacing the head unit. Even though the factory radios (Panasonic) were of good quality, some of these factory radios are as much as 16 years old and we don't suggest putting money into maintaining such an old radio.

## Usage tips

- We recommend adjusting your stereo balance as follows: while safely driving at a normal speed, turn your stereo's balance control fully forward so that all sound is coming out of your door speakers. Adjust your left/right balance until you get a good stereo coverage. Then slowly adjust your fader to start bringing sound to the headrest speakers. Continue fading to the headrest speakers until you are hearing more content from the headrests than the doors. Stop and fade back slightly to the door speakers so that they are now louder. This is the optimal point for creating a 3D stereo field and also compensating for wind noise.

## Specifications

The Millennium-5 is a high fidelity, compact mid-range speaker specifically designed for the 90-97 Miata. The oem headrest enclosures in the 90-97 Miata are appropriately sized for good response and damping.

Speaker rated impedance	8 ohms	Sensitivity	85db ± 2dB average measured at 0.5 / 0.6 / 0.8 / 1.0KHz, 5.4v osc. input
Cone type	Polymer impregnated paper	Speaker impedance at resonance	12.41 ohms
Surround	Butyl rubber	Vas	.13 liters
Basket	Stamped steel	Magnet weight	1.7 ounces
Speaker DC resistance	10.9 ohms	Rated Power	5 watts continuous white noise 8 hours, 10 watts 10 minutes
Free air resonance	145 Hz	Frequency Response	100 – 14KHz -3dB

