

Measuring AVR Voltage Output

This exercise will determine the usable voltage from the front left, right, center, or subwoofer outputs of an AVR, using a DVD player and a test disc with 0dBFS reference signals. Use either an analog L/R connection between the DVD player and the AVR, or a digital connection; the latter is preferable.

The required tools and recommended supplies include:

- * Digital multimeter.
- * Test disc with reference signals.
- * A long RCA cable ~6 ft. or so.
- * RCA coupler.
- * A female-to-female "turnaround" XLR adapter (for balanced outputs).

Part 1: Determining Maximum Voltage

1. Unplug all speakers from the AVR.
2. If needed, connect the RCA cable to the AVR output to be measured - left/right, center channel or subwoofer - and route it outside the equipment rack to a convenient location. Plug the RCA coupler into the other end of the cable. For balanced outputs, use the mic cable with the turnaround adapter.
3. Set the receiver to Bypass or Stereo mode.
4. Change the speaker size setting in the AVR's menu to Large. For the subwoofer channel, set the crossover for the highest frequency.
5. In the AVR's menu, adjust the levels for the channels to be measured to their maximum setting.
6. Also on the AVR's menu, make sure any auto-EQ functions are disabled and/or tone controls are adjusted to flat (0 dB gain).
7. Set the volt meter for low-range AC voltage.
8. Play the **60 Hz, 0 dBFS** reference track from the test disc.
9. Turn the AVR's volume control all the way up.
10. Measure and record for future reference the voltage measurement from the RCA jack, or pins #2 and #3 from the XLR connector.
11. Repeat steps #8 - #10 for each channel to be measured. To measure the center channel, change the AVR to Dolby Pro Logic mode.

Part 2: Determining Maximum Clean Voltage, Using a Pro Audio Amplifier

1. If no pro audio amplifier is available for this test, skip to #16.
2. Connect a pro audio amplifier that has input gain controls to the AVR.
3. Connect a speaker (not subwoofer) to one channel of the amplifier.
4. Turn the amplifier gain control all the way down.
5. Adjust the AVR's volume control for a setting below the half-way point.

6. Play the **1 kHz, 0 dBFS** reference signal from the test disc.
7. Adjust the amplifier's gain to the lowest setting that will get an audible signal from the connected speaker.
8. Slowly increase the AVR's volume control.
9. At some point a strange and audible "overtone" will be added to the 1 kHz signal from the speaker. This is the point where the AVR's pre amp begins to clip.
10. Decrease the AVR's volume setting to slightly below the point where the "overtone" is no longer audible.
11. Stop the test signal and turn off the AVR and amplifier. Disconnect the amplifier from the AVR.
12. Turn the **AVR** on again and re-start the test disc, this time playing the **60 Hz, 0 dBFS** signal.
13. Measure and record for future reference the voltage measurement from the RCA jack, or pins #2 and #3 from the XLR connector. This is the usable (i.e. clean) voltage output from the AVR. This figure will be lower than what was previously measured/recorded.
14. Calculate the percentage of voltage reduction between the maximum and usable voltage readings. For instance, if the maximum voltage was 6.5 VAC and the clean voltage was 5.5 VAC, that's a 19% difference.
15. To determine the usable center channel or subwoofer voltage, no additional test is needed. Just subtract the above percentage figure from the maximum voltage figure previously measured.
16. If no professional amplifier is available, subtracting 30% from the maximum voltage figures is a safe determination of an AVR's clean output.