

## 2003 996 Carrera 2 - In-dash HU & Amplifier: Misc Application Notes

Original: CDR-23 w/BOSE (MOST)

I wanted to replace the factory CDR-23 with an aftermarket unit primarily because: (1) it didn't really sound that good, esp. for a premium setup; (2) there was no simple way to add an AUX input; and (3) (eventually) I wanted to get a double-DIN, in-dash Navigation/Bluetooth/CD unit. I had a Nakamichi CD400 1-DIN HU leftover from a previous life, so I figured I'd look into what it would take to replace the factory CDR23 with an aftermarket stereo, using the CD400 as a test unit.

One important consideration (for resale value), however, was to retain the option of returning the car to stock (original) form, which meant NO cutting into the factory configuration (wiring, sheetmetal, etc.). Also, I didn't want to lose any trunk space, so that ruled out most of the fancy ICE installs that add amp(s) in that location.

After doing some research on the CDR23/BOSE/MOST setup, it looked pretty involved - basically the HU + BOSE amp need to be replaced together (b/c of the fiber-optics link) at a minimum; and potentially speakers as well (b/c of impedance). I searched around and found a 2-ohm stable, 4-channel amp small enough to fit where the BOSE amp sits - ARC Audio Mini 4. I also found a matching harness adapter - Autoleads PC2-95-4 - that plugs into the factory loom in place of the BOSE amp, giving access to the speaker wiring.

Here's the result - I'll note some of the particulars together with pictures next.



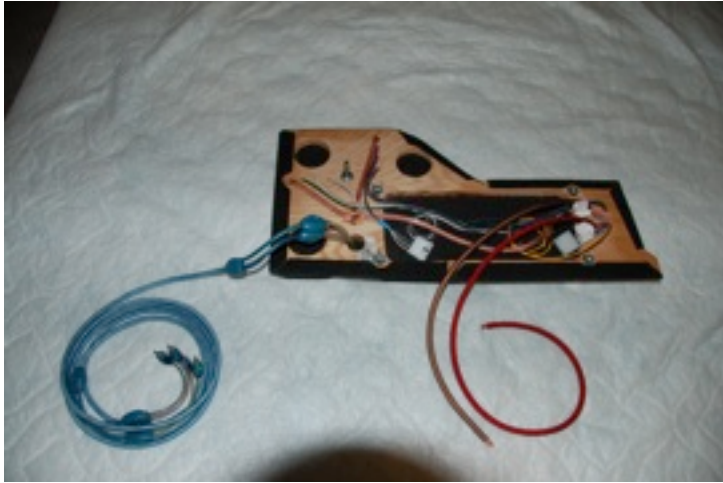
To mount the amp & a pair of 3-way x-overs (CDT Audio EX-30), I cut an amp-board (felt-covered 1/2" plywood) that sits neatly against the rear trunk wall, using only factory mounting holes to secure it - a 2" fastener (A) together with the two factory amp-frame M6 bolts (B,C) seem to do the job fine.



The x-overs are needed to split the Mini4 Front L+R ch into door spkr low-pass and dash mid/tweets. I used the Mini4 Rear L+R ch in Bridged Mode to power the factory sub, while the CD400 HU supplies rear spkr L+R signal (low-level fill). The Autoleads connector was the key to this layout - it sits where the BOSE amp would be, so allows this amp-board to "plug-in" w/o needing to splice into any factory loom.



Messy wiring was run as inconspicuously as possible behind the amp-board, with “pigtailed” and Molex connectors for ease of installation/removal into the car. 8-ga amp wiring and a 60A fuse are easily located (the battery is close by).



There is a generously-sized rubber grommet thru which the RCA+signal+power wiring enters the trunk. Also, a grommet just behind the battery-left-side to enter the cabin (firewall pass-thru). I used a JL-Audio 10-ft 4-ch RCA set (blue) between amp and HU, which was quite long enough with an extra ft or so at each end.



The second wire loom (white/braided shield) contains the rear-spkr and remote-turn-on signal wires to complete the HU connection to the amplifier and factory speaker connector. Wiring was routed around the battery w/stick-on cable ties.

Once inside the cabin, RCA+signal wiring is routed behind the center-dash area to the HU, starting from the under-dash area just above the accelerator pedal. You may need to pull back some felt insulation to expose the grommet (already inscribed on my car).





IMPORTANT - I found it immensely easier to slide the HU in with the Climate Control unit removed (see photo). This gives you (ample) room and access to arrange and guide the (bulky) wiring bundle at the rear of an aftermarket unit as the HU slides in. It tends to get hung up easily on the various metal frame protrusions, if not done this way. The CC unit is held in by 2 screws, access by removing the trim surround first - it pulls off straight outwards.

If you want to preserve the factory wiring, BE CAREFUL with the MOST optical fiber (2x orange lines) - it CANNOT be bent too sharply, and is protected (see photo) by a plastic wire loom to prevent this. I chose to secure this out of the way first, to avoid interference with the wire bundle or HU sliding in.

\*Wiring NOTE - You will need to access 12V Battery and ANTENNA-Enable from the factory CDR23 plug connector. I also used the GROUND from this plug, and have experienced no noise issues (alternator whine) as a result of an improper ground. (Installers generally recommend wiring the HU ground directly to the chassis - certainly a better idea!) There is no 12V ACC at this plug. I ran a wire to an unused slot on the fuse box. There may be other nearby solutions (eg. unused telephone prep connector).

\*I used the CDR23 wiring diagram posted by Loren and others on this site - it shows the 3 connector pins referred to above.

SPEAKERS - There is a lot of speculation on this. The factory BOSE speakers appear to be decent quality, and are probably equalized within the BOSE amp to get the

desired SQ and in-car freq response. Having now fed them with a clean (flat) source signal, I note the following:

- the CDR23/BOSE amplifier system is OK; the CD400/ARC-Audio is noticeably better in terms of sound transparency - inner detail, voicing, imaging, etc. - and that's running thru the factory speakers. However, some tone control tweaking (a little "smile" EQ) was required to bring out the bass and high freqs to avoid sounding weak in these ranges.
- the factory midrange speakers suffer from some critical mid-freq harshness (1k~1.5k cone breakup?), which can be heard significantly on female vocals, some mid-guitar tones, and (for me, at least) become practically unlistenable on solo piano. Intimate recordings of acoustic performances suffer the greatest. Changing out the source and amp does nothing but uncover this even more. The factory midrange spkrs are not bandpassed, relying on its own acoustic rolloff. I suspect this is not really optimal for this driver.
- I haven't seen any impedance/amp-shut-down issues yet, at least with moderate listening levels. I measured the factory speakers' DC resistance as:
  - FR dash mid/tweeter units ~2 ohm
  - FR door mid-bass units ~2 ohm
  - Rear seat mid/tweeter units ~4 ohm
  - SUBwoofer unit ~1 ohm

I wouldn't push the SUB level with this setup! since the amp is not rated to 1 ohm. It should handle everything else, though. However, I suspect I will be looking into a good 3-way set - Focal, Morel, Dynaudio or the like, before long :) Some drop-in replacement driver for the SUB enclosure will also be needed for me to truly realize its potential.