

Automobile Radio Backup Power by Ivan Baggett – Updated 05/10/2004

If you hate it when your VCR blinks “12:00” from a power outage, I bet you also hate it when your car has been serviced and the radio has lost all of its station presets and the time. I finally got tired of this and decided to do something about it for my two cars and my girlfriend’s car. The circuit shown below will maintain the radio presets and clock while the car battery is disconnected for servicing. The backup power is supplied by a rectangular 9V-style nickel-cadmium (NiCd) battery which is commonly available from Radio Shack. As long as the car battery is supplying power, the diodes ensure that the radio is powered from the car battery while the NiCd is trickle-charged. When the car battery is disconnected, the diodes route the power from the NiCd battery to the radio while preventing the power from back-feeding into the car electrical system. Note that even though the NiCd battery looks like a typical 9V battery, it actually only supplies 7.2V. This will not affect its ability to function in this circuit. Do not leave out the 2.2K resistor - it is essential to limit the NiCd charging current. The circuit ground (GND) must be connected to the same ground as the radio, which is usually at a metal surface inside the dashboard. The wire colors shown may not be the same on your vehicle. NiCd batteries are shipped in a discharged state and must be charged before using. It will take 3 days to charge the NiCd due to the low charging current in this circuit, therefore you may want to charge the NiCd battery before installing it in this circuit. Once it is fully charged, it should maintain the radio for 12 to 24 hours. Be sure to insulate all parts of the circuit from the auto chassis to avoid short circuits.

I have used this circuit for over two years and it works well.

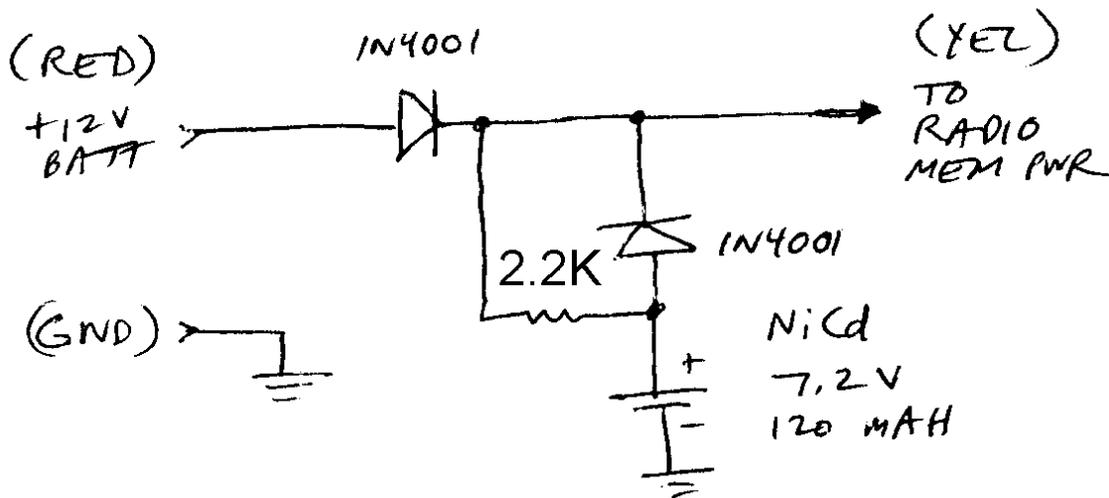


Figure 1: Radio Memory Backup

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Unlike older head units that use the battery only for memory backup, many new head units also operate their internal amplifier sections from the battery. This requires a high power battery backup circuit. In Figure 2, a relay is added to the basic power backup circuit of Figure 1. The relay contacts close when the ACC car circuit is on, bypassing the diode and supplying power directly to the head unit. When the ACC is turned off, the relay contacts open, allowing the much lesser memory backup current to flow through the diode. Use a relay with a 12VDC coil and contacts rated for at least the fuse rating of the head unit.

Some 9V NiCd batteries are actually 7.2V, and others are 8.4V. Use a 2.2K resistor for the 7.2V type, and a 1K resistor for the 8.4V type. Do not use a NiMH battery, since they are not designed to tolerate a continuous trickle charge.

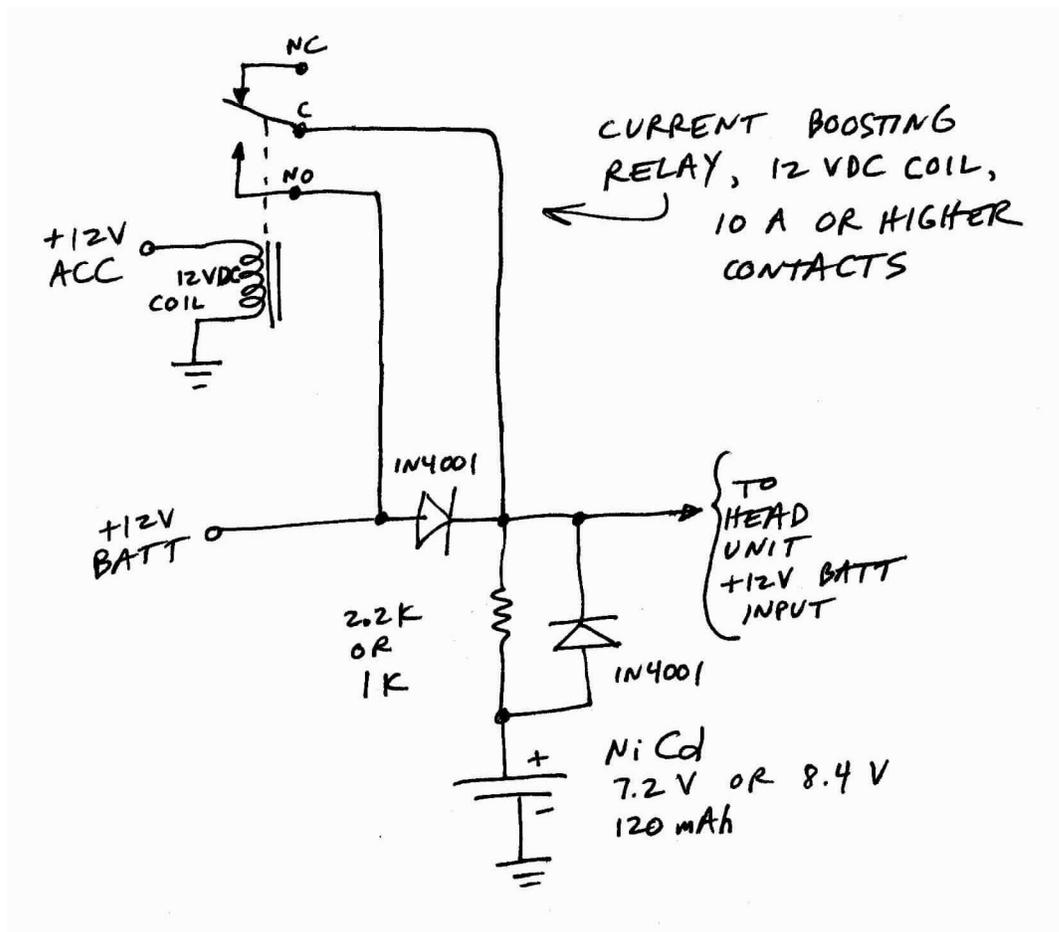


Figure 2: Radio Memory Backup with Current Boost Relay