

# 12V to 120V Inverter

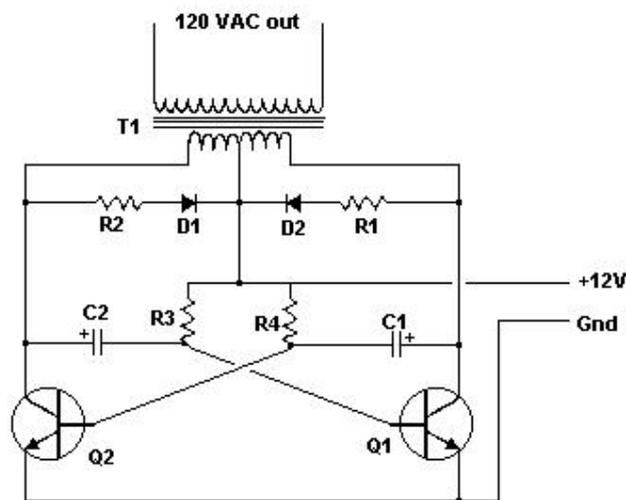
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Have you ever wanted to run a TV, stereo or other appliance while on the road or camping? Well, this inverter should solve that problem. It takes 12 VDC and steps it up to 120 VAC. The wattage depends on which transistors you use for Q1 and Q2, as well as how "big" a transformer you use for T1. The inverter can be constructed to supply anywhere from 1 to 1000 (1 KW) watts.

**Important:** If you have any questions or problems with the circuit, see the forum topic linked to in the Notes section. It will answer all your questions and provide links to many other (and better) inverter circuits.

## Schematic



## Parts

| Part      | Total Qty. | Description                         | Substitutions |
|-----------|------------|-------------------------------------|---------------|
| C1,<br>C2 | 2          | 68 uf, 25 V Tantalum Capacitor      |               |
| R1,<br>R2 | 2          | 10 Ohm, 5 Watt Resistor             |               |
| R3,<br>R4 | 2          | 180 Ohm, 1 Watt Resistor            |               |
| D1,<br>D2 | 2          | HEP 154 Silicon Diode               |               |
| Q1,<br>Q2 | 2          | 2N3055 NPN Transistor (see "Notes") |               |

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|      |   |  |
|------|---|--|
| T1   | 1 | 24V, Center Tapped Transformer (see "Notes") |
| MISC | 1 | Wire, Case, Receptical (For Output)          |

## Notes

1. Q1 and Q2, as well as T1, determine how much wattage the inverter can supply. With Q1,Q2=2N3055 and T1= 15 A, the inverter can supply about 300 watts. Larger transformers and more powerful transistors can be substituted for T1, Q1 and Q2 for more power.
2. The easiest and least expensive way to get a large T1 is to re-wind an old microwave transformer. These transformers are rated at about 1KW and are perfect. Go to a local TV repair shop and dig through the dumpster until you get the largest microwave you can find. The bigger the microwave the bigger transformer. Remove the transformer, being careful not to touch the large high voltage capacitor that might still be charged. If you want, you can test the transformer, but they are usually still good. Now, remove the old 2000 V secondary, being careful not to damage the primary. Leave the primary in tact. Now, wind on 12 turns of wire, twist a loop (center tap), and wind on 12 more turns. The guage of the wire will depend on how much current you plan to have the transformer supply. Enamel covered magnet wire works great for this. Now secure the windings with tape. Thats all there is to it. Remember to use high current transistors for Q1 and Q2. The 2N3055's in the parts list can only handle 15 amps each.
3. Remember, when operating at high wattages, this circuit draws huge amounts of current. Don't let your battery go dead :-).
4. Since this project produces 120 VAC, you must include a fuse and build the project in a case.
5. You **must** use tantalum capacitors for C1 and C2. Regular electrolytics will overheat and explode. And yes, 68uF is the correct value. There are no substitutions.
6. This circuit can be tricky to get going. Differences in transformers, transistors, parts substitutions or anything else not on this page may cause it to not function.
7. If you want to make 220/240 VAC instead of 120 VAC, you need a transformer with a 220/240 primary (used as the secondary in this circuit as the transformer is backwards) instead of the 120V unit specified here. The rest of the circuit stays the same. But it takes twice the current at 12V to produce 240V as it does 120V.
8. Check out this forum topic to answer many of the most commonly asked questions about this circuit: [12 - 120V Inverter Again](#). It covers the most common problems encountered and has some helpful suggestions.

## Related Circuits

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**jabeeru** 12VDC To 120VAC Inverter Saturday, February 18, 2012 2:38:17 PM

i made this connection. but it didnt working,because in my area i didnt get a tantalum capacitor, that is why, i used aluminium elecrolytic capacitor 100uf instead of 68uf tantalum capacitor

**Ammu** 24VDC To 120 / 240VAC Inverter Saturday, February 18, 2012 10:57:32 AM

I have step down transformer 240 vac to 24 vdc in an system and i want to use the same as reverse as most of the time i don't get 240 vac current. i want to use it for charging my laptop

**gene** 12VDC To 120VAC Inverter Tuesday, February 07, 2012 5:30:33 PM

A 6 volt battery has 1,350 watt hours. When fed into an inverter does it still have 1,350 watt hours of 120 V AC? Thanks PS How will I know if a responce to my question happens

**mayengo** 12VDC To 120VAC Inverter Tuesday, January 24, 2012 4:56:39 AM

thanks alot for the post. is there a way i can connect a relay switch to help automate my inverter? how is the connection? can i charge my dc battry using the output from this very inverter? how do i do it aswell?

**ben** 12VDC To 120VAC Inverter Saturday, January 14, 2012 11:49:15 PM

woul it be posibile to invert the 12 VDC transformer? and plug it back to the 220AC out? for the perpose of floerecent bulb lighting.? because the problem in our place is no electricity.

**Jack Wilkins** 12VDC To 120VAC Inverter Monday, January 09, 2012 11:57:47 AM

It seems to me that a transformer from a large battery charger would be better.

**joe** 12VDC To 120VAC Inverter Saturday, January 07, 2012 9:32:35 AM

in our place did see 68 uF tantalum capacitor only 0.68uf...can you tell me what is the substitute for these capacitor and also the the HEP 154...can you tell what is the other substitute for these..pleaseeee..if you want help!

**Kultus** 12VDC To 120VAC Inverter Saturday, November 05, 2011 12:49:26 AM

Hi all I Have a working inverter from this exact design it works well for 110-130vac, I used a MOT and rewound it as described with a centre tap. What I would like to know now is how can I increase the output voltage, I live in Australia and we have 240vac mains... I have tried everything I can think of I have wound up and down the number of turns on my MOT with only a very slight variance in voltage, I have tried to change the resistor values and that has changed nothing ... If any one has any Idea's what I should be doing could you please throw me a comment. Thanks for a great head start either way with this circuit.

**bosco** 12VDC To 120VAC Inverter Monday, May 02, 2011 6:39:33 AM

iam a student of Busitema University, Uganda making a 12vdc to 120vac inverter but i have failed to get the centre tapped transformer and the tantulum capacitor. can some one help me if there are alternatives for these equipments. thanks

**lars** 12VDC To 120VAC Inverter PLEASE HELP Tuesday, March 29, 2011 9:34:46 AM

i have build this scheme but it doesn't work.i have tried to reverse c1 and c2 but it will make no difference. when input is 12vdc, i wil measure on both collectorsides -12 vdc. i have connected a transformer, q1 and q2 will heating up (cables also) but there is no voltage on the secondaire side

of the transformer. please help me and tell me wat i'm doing wrong.

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