9VAC power solution for C64
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1. Introduction
C64, DD1541 or similar, harddisk, CDROM etc. need power supply for proper working. DD1541, harddisk and CDROM need +5VDC and +12VDC power supply but C64 needs different power supply (+5VDC, 9VAC). This solution is intended to substitute all power supplies (DD1541, harddisk, CDROM, C64) with one PC power supply.

2. C64 power supply
As described above C64 needs two voltages for proper function, +5VDC and 9VAC. +5VDC is used for all logic. 9VAC is internally connected to USER PORT. C64 uses 9VAC internally different ways:
1) rectified to 9VDC (unregulated) for CASSETTE PORT
2) internally doubled, rectified and regulated to +12VDC for SID
3) in old version C64, 9VAC is rectified and regulated to second +5VDC

+5VDC and 9VAC voltages are each other electrically isolated. Therefore only two pole power switch is used for switching +5VDC and 9VAC power. One pole for +5VDC, second pole of power switch for 9VAC.

3. Solution
CDROM and harddisk can be supplied directly from PC power supply.
DD1541 can be supplied from PC power supply by simple reduction cable (DD1541 has DIN connector).
C64 +5VDC can be supplied directly from PC power supply. Only C64 9VAC needs special converter from +12VDC.

Converter is very simple. U2 555 timer, R1 and C1 makes 50Hz (60Hz) frequency (important for CIAs timer). Voltage polarity is alternated by full bride Q1 to Q4. U1, Q6, Q7 and resistors are used for driving transistors in bridge.

With this converter C64 power switch cannot be used! As described above: original C64 power supply has electrically isolated 5VDC and 9VAC and only 2pole power switch. In this converter both voltages have common ground. If you turn off C64 with original power switch only one wire from 9VAC is disconnected but common ground is still connected. Therefore one period from 50Hz still power your C64 what makes that half voltage on 9VAC is present. Half voltage on 9VAC without +5VDC can cause SID noise, VIC blinking etc.

You must use PC supply power switch to switch off your C64 correctly.

4. Conclusion
This solution is designed to simplify powering C64 and connected devices from standard PC power supply. Is recommended for people with good electrical knowledge and experience. Use it on own risk. Bad created converter or different internal wiring in your C64 can damage your C64.
Be careful with connecting other devices to USER PORT, which use 9VAC power supply. In this case check internal device powering.

If you have any doubt or question, please contact author.