

Picture 2 Synthesizer and Microprozessor Board Layout

Another topic is C389 itself. Such capacitors have a leakage current, which has to be considered. I've measured a leakage current of 0,05µA to 0,1µA (original C389, desoldered); this value may get worse with the years by aging.

Alternatively I've taken a new 10µF/25V electrolytic cap; it had app. 0,015µA.

But the best results had a tantalum cap (0,47µF/25V) with <<0,001µA(!); that was the limit of my Ammeter.

Therefore, i decided to replace the original C389 (1000µF) by a tantalum-cap (0,47µF/25V). I had no problems with ripple, peaks or other noise on the supply after the modification.

!! VERY IMPORTANT !!

When soldering at the connection point C389, there is a danger to destroy the IC U108. It's necessary to use a grounded soldering tool, which is connected to R8's ground (chassis). But before starting soldering, C389 has to be discharged!

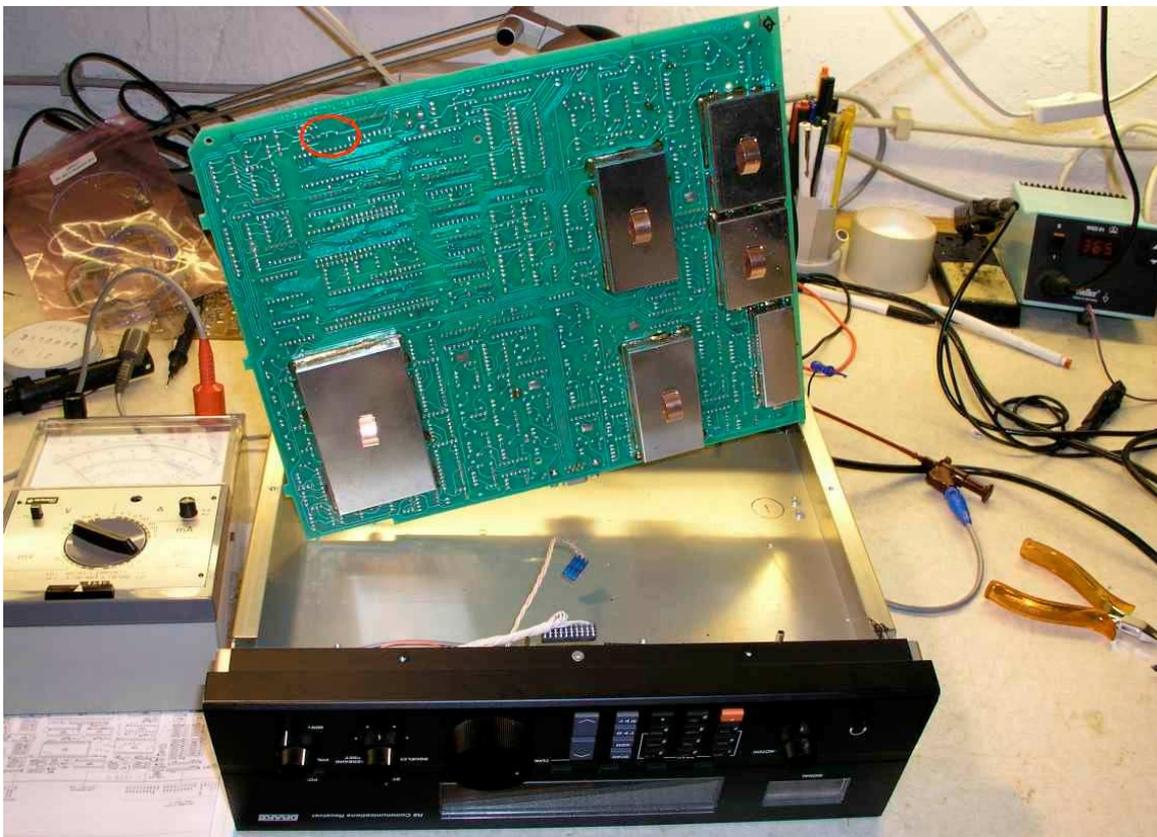
- Remove R8 from mains and external DC-supply
- Place R8 with bottom up and remove bottom cover (picture 3)
- Connect chassis of R8 to ground
- Remove Synthesizer/Microprocessorboard, unplug some connectors (picture 3)
- Connect ground of the soldering tool with the chassis of the R8 (both must have the same ground-potential!)
- Discharge C389 with a resistor of some 100 Ohms for some seconds

- Check voltage across C389. If there are still more than 100mV, discharge C389 and check voltage again
- Desolder C389
- Replace C389 by a tantalum-cap (0,47 μ F/25V) Observe polarity!! (picture 4)
- Solder diode's cathode to C389 (picture 5)
- Isolate plus- and minus-wires with heat shrink tubes (picture 6)
- Solder battery onto a small experimental board strip, look for good isolation to ground.
- Use the hole for the (hopefully not existing) VHF-converter to install the battery with a screw (picture 7)
- Fix the other end of the board with some glue
- FIRST Solder BATTERIE's PLUS to the diode's anode *) red wire
- THEN Solder BATTERIE's MINUS to ground *) black wire
- Remove ground/s; replace Synthesizer/Microprocessorboard, plug in all connectors
- Ready !

*) If not using this sequence you will shorten the battery via the grounded soldering tool when touching the plus pole.

Result:

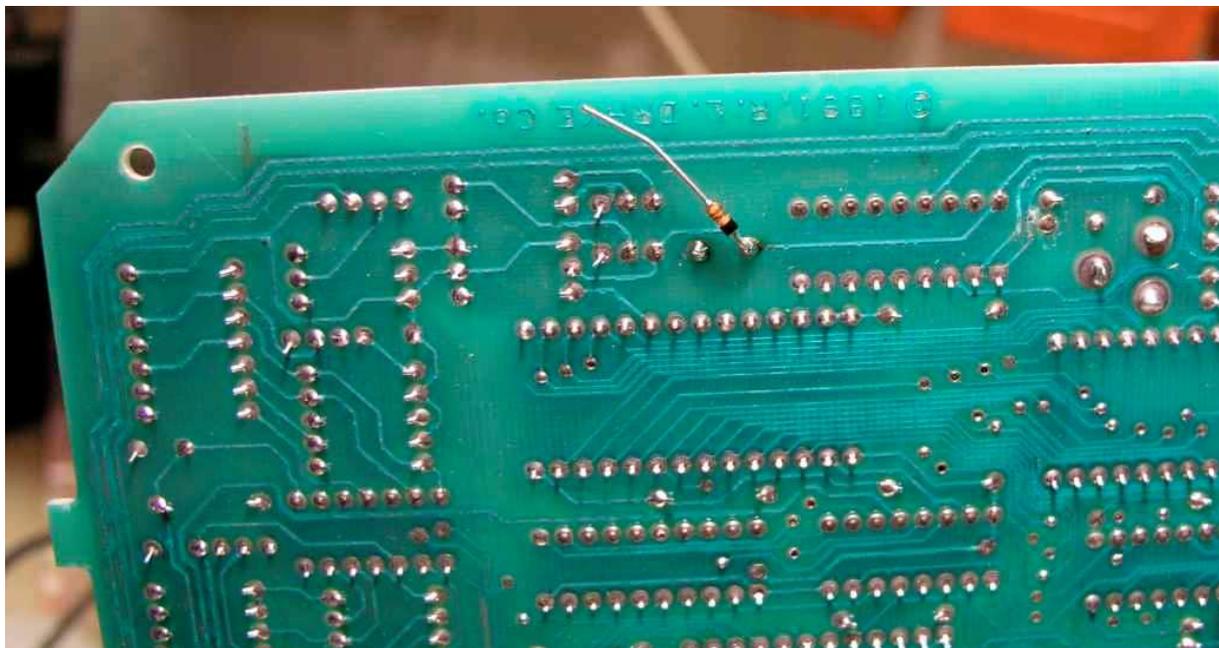
The measured backup current, supplied by the backup-battery is 2,4 μ A



Picture 3 Location of C389



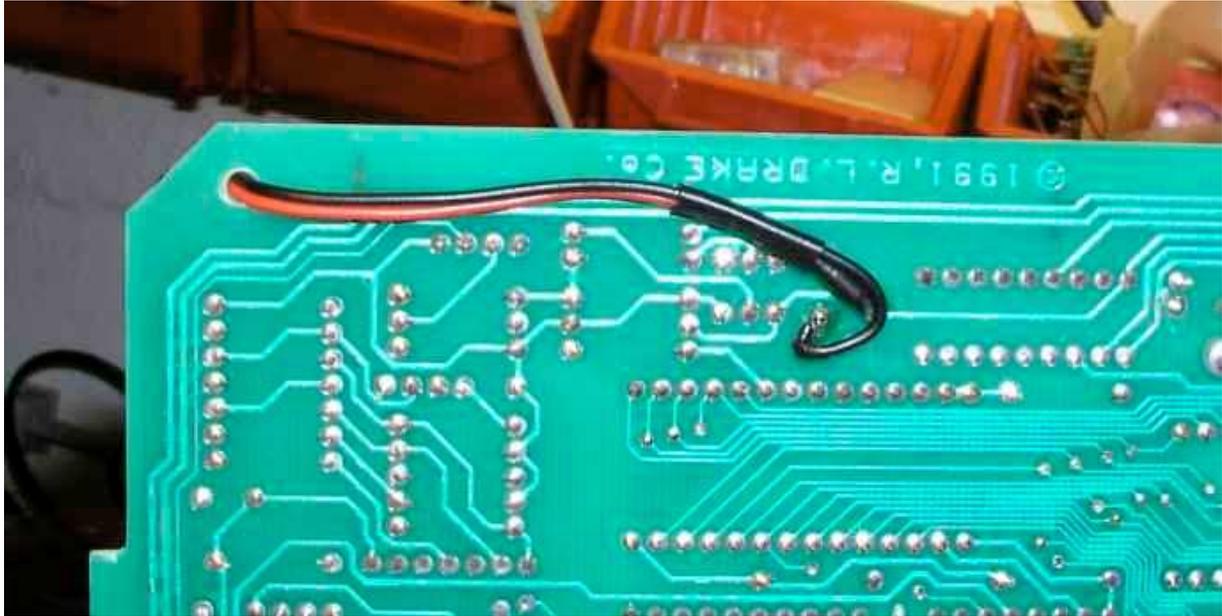
Picture 4 C389 (after all work is done)



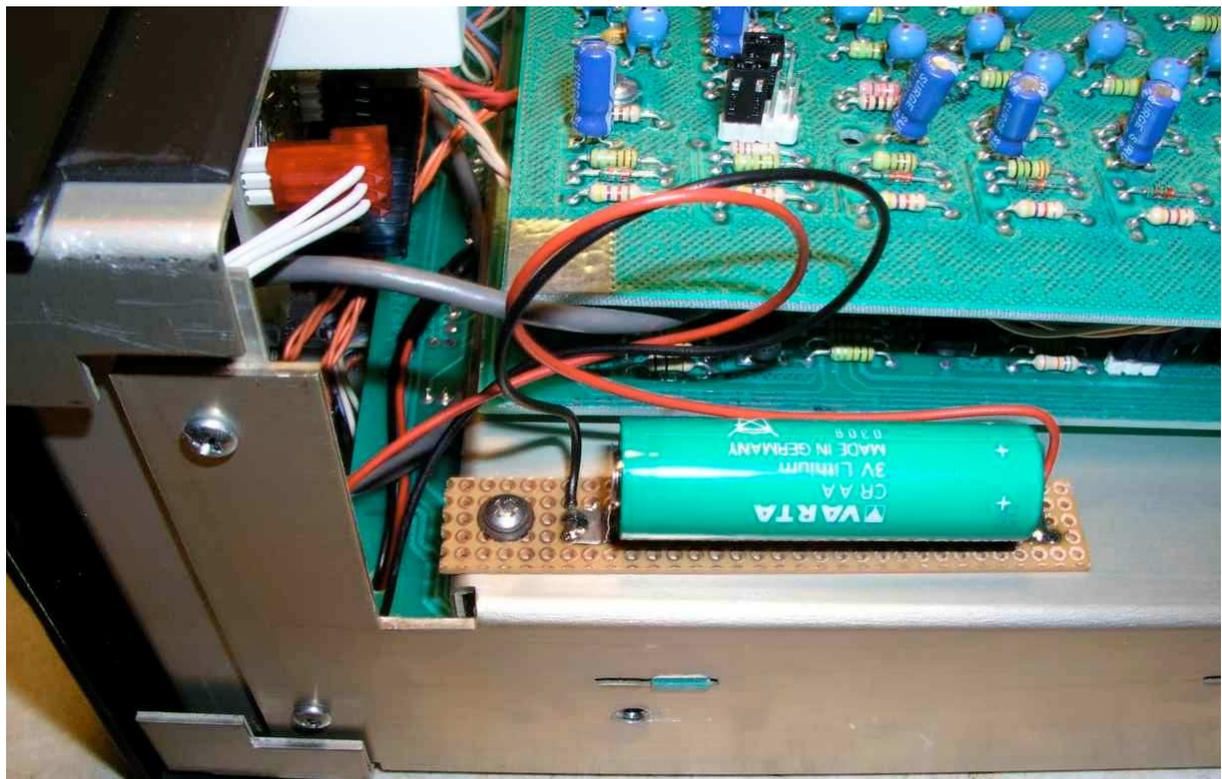
Picture 5 Soldered Diode

Note for alignment of the clock:

The alignment /3/ of the clock (C 402) should be done in the backup-mode, because the oscillators frequency depends a little bit upon the supply-voltage /2/.



Picture 6 Wires and heat shrink tubes



Picture 7 Backup-battery (at the spare place for the VHF-converter)

Additional power switch

With this modification, the R8 may be disconnected from AC- and/or DC-supply. The display gets dark of course, but the clock is still operating.

Note:

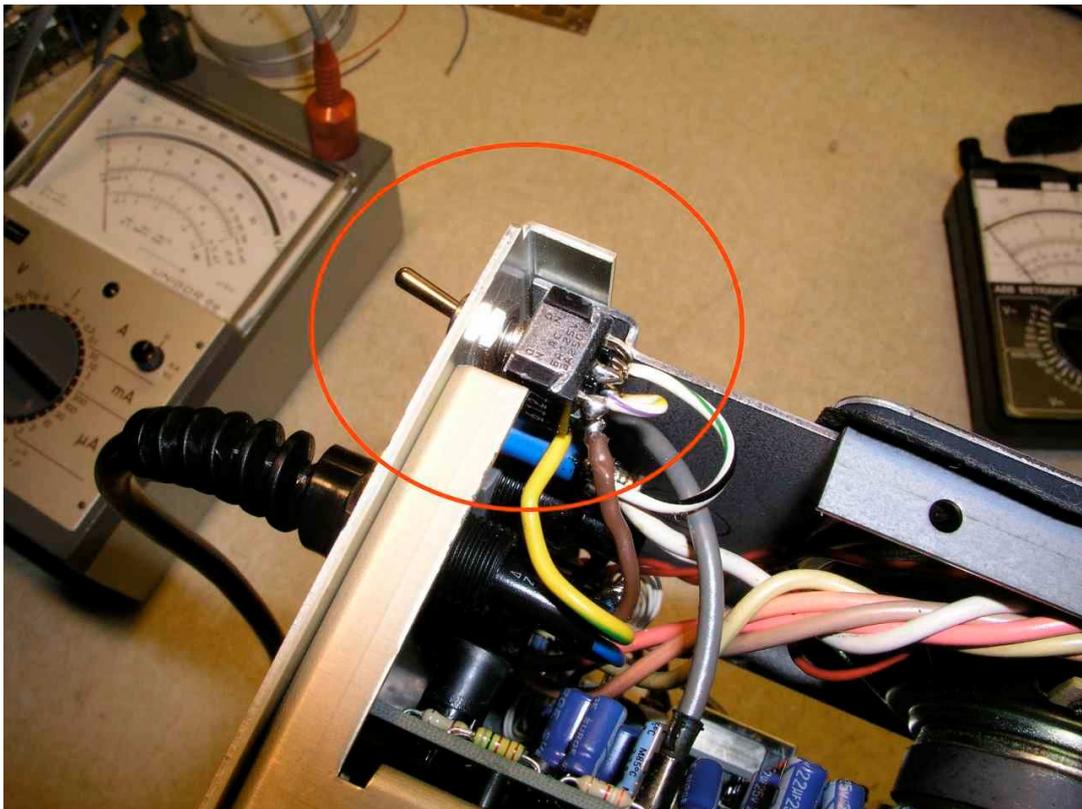
When disconnected from mains and/or external DC-supply, the timer-function won't operate – even with this new Backup-battery.

Disconnecting from mains (AC) can be done by unplugging; alternatively an external power switch can be installed in the power cord.

Both solutions are not good for me, because i hate to crawl under my station desk.

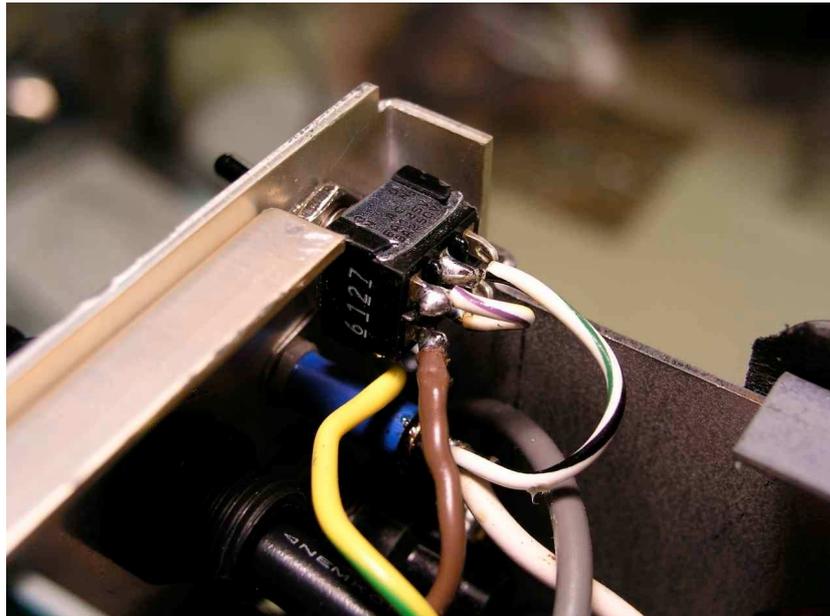
So i decided to install a power switch into the R8 at the rear side nearby the power cord (pictures 8, 9 and 10), which can be actuated from the front – as long as no further equipment is on top of the R8.

Due to the rating of the small switch, two switched contacts are in series to improve the voltage isolating level. My mains is (measured) 235VAC, one contact is rated up to 230VAC.

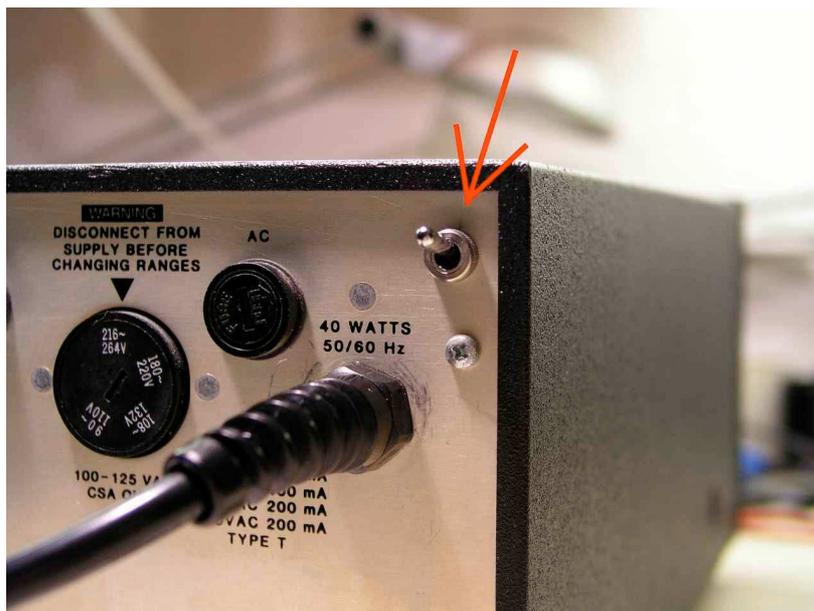


Picture 8 Installation of new AC-Power switch

If you use a DC-supply (car batterie, solar cells, etc...), the best is to unplug the R8. A DC-switch would need a rating of 13VDC at 2A.



Picture 9 New AC-Power switch: two switched contacts in series



Picture 10 View from rear side

- /1/ Owners manual Drake R8
- /2/ Datasheet TC8521AP, Toshiba (look for tc8521ap in the internet)
- /3/ Servicemanual Drake R8

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