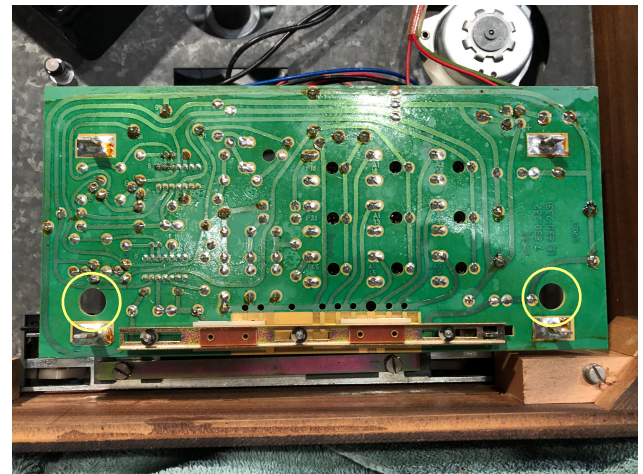


Thorens TD-125 MkII Turntable Controller Board Rebuild by Mark Handley November, 2021

I am the original owner of a Thorens TD-125 MkII turntable with a Shure SME 3009 arm purchased 50 years ago. This turntable has played LPs for many years until recently when the 33 rpm speed decided to go wonky.

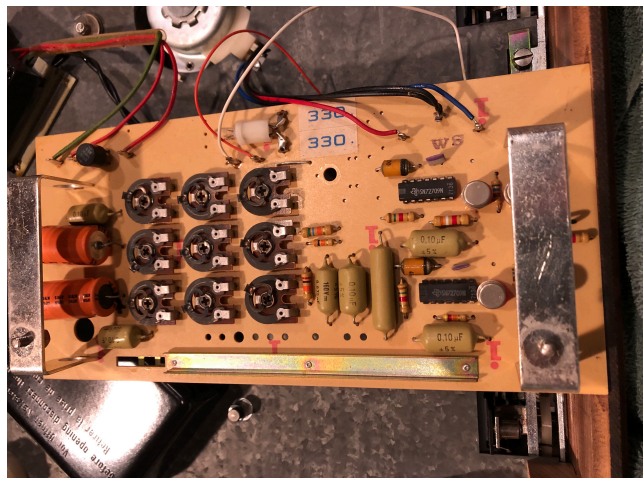


I decided to replace the passive components on the motor controller board. Components age and this was a good opportunity to do an overhaul so the Thorens would last another half century for my son to use.



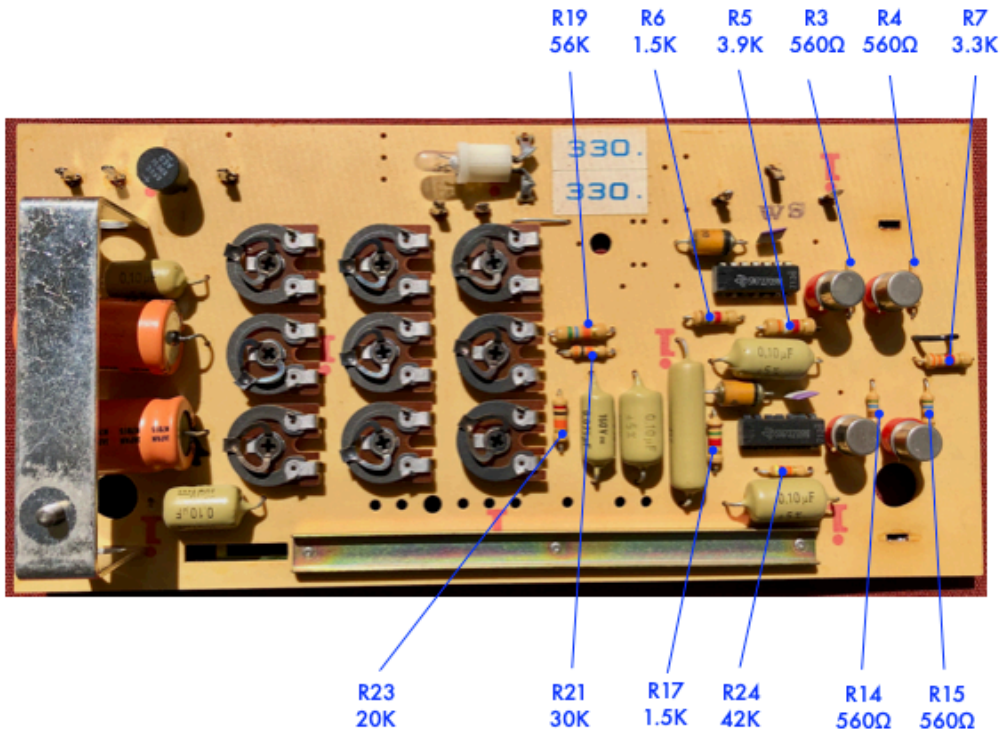
I removed the dust cover, arm, platter and base cover and removed the motor controller board. The large holes lead to slotted capture screws to remove the board.

Once the board is free, a soldering gun or pencil can be used to remove the wires to the transformer, speed trim control and motor – I made a wiring diagram first. I also unsoldered the bracket on the right side to access the transistors and resistors underneath. De-soldering braid was used for this step.

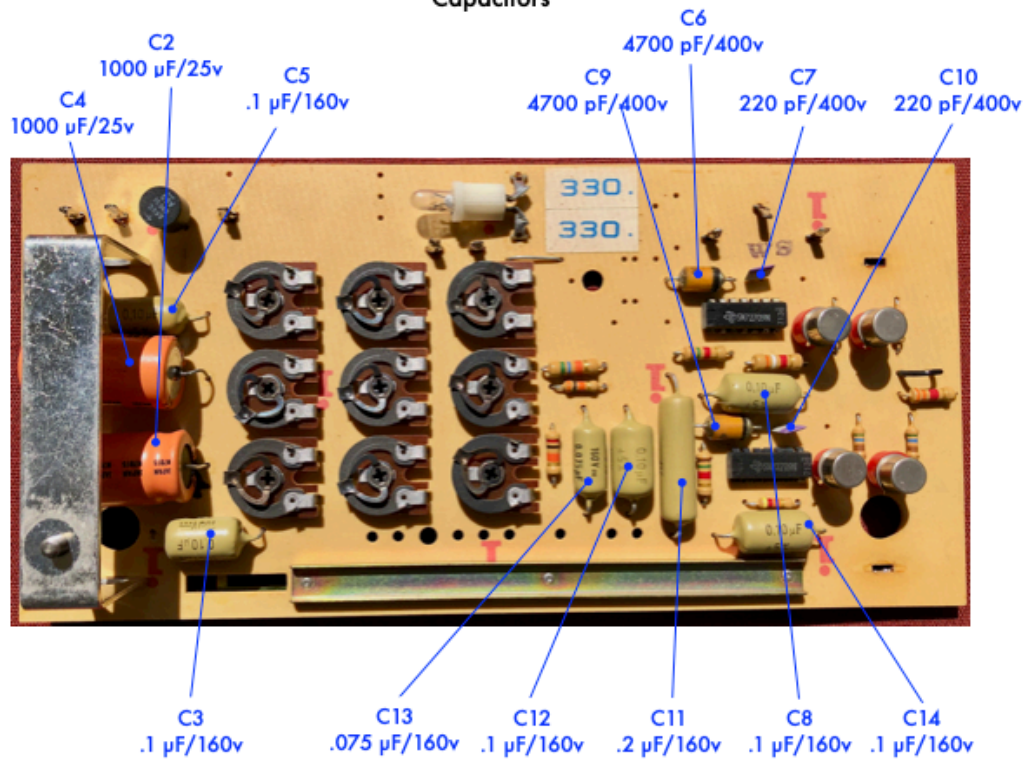


I created a diagram of where the resistors and capacitors are located.

Resistors



Capacitors



The most difficult part of the rebuild is to locate the parts in the quantities needed. I was able to find everything except the 42 kOhm resistor (available from wholesalers but in quantities of 1000) for which I substituted a 43K. I was able to find better components but order requirements – either a dollar amount or minimum quantities – are usually required.

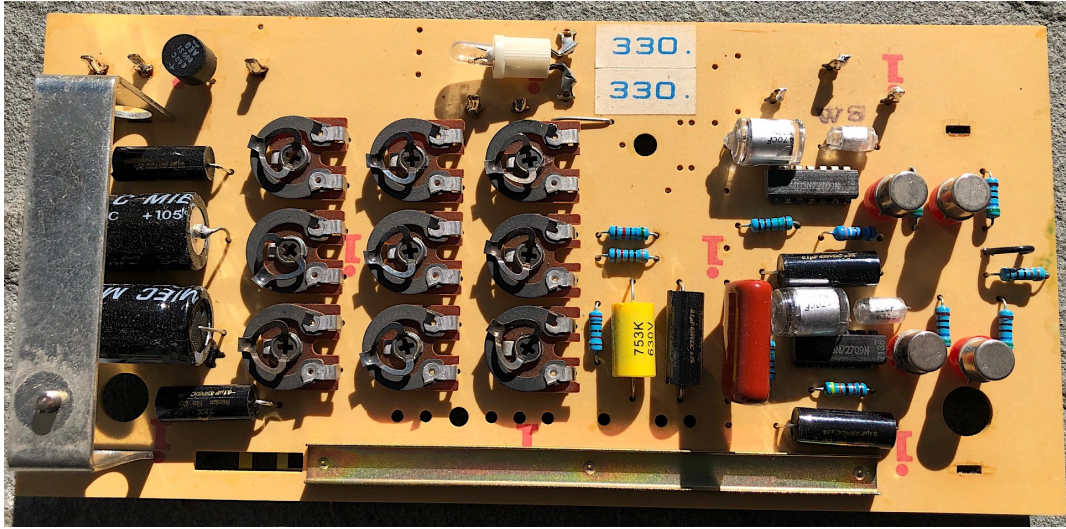
Thorens TD 125 Mark2 Parts Complement

Callout	Item	Quantity	Substitute	Source
C3, C5, C8, C12, C14	0.1 μ F \pm 5%, 160 VDC	5	0.1 μ F \pm 1%, 630 VDC, metalized poly film	Just Radios
C2, C4	1000 μ F, 25V	2	1000 μ F, 50V	Just Radios
C6, C9	4700 pF \pm 10%, 400 VDC	2	4700 pF \pm 1%, 630 VDC, polystyrene	Just Radios
C7, C10	220 pF \pm 10%, 400 VDC	2	220 pF \pm 1%, 630 VDC, polystyrene	Just Radios
C11	0.2 μ F \pm 5%, 160 VDC	1	0.2 μ F \pm 5%, 400 VDC, metalized poly film	Electrics Lee via eBay
C13	0.075 μ F \pm 5%, 160 VDC	1	0.075 μ F \pm 5%, 630 VDC, metalized poly film	Just Radios
R1	100 Ohm \pm 5%, 0.3 watt	1	100 Ohm \pm 1%, 0.5 watt metal film	Crystal Electronics via eBay
R2	47k Ohm \pm 5%, 0.3 watt	1	47K Ohm \pm 1%, 0.5 watt metal film	Crystal Electronics via eBay
R3, R4, R14, R15	560 Ohm \pm 5%, 0.3 watt	4	560 Ohm \pm 1%, 0.5 watt metal film	Crystal Electronics via eBay
R5	3.9 kOhm \pm 5%, 0.3 watt	1	3.9K Ohm \pm 1%, 0.5 watt metal film	Crystal Electronics via eBay
R6, R17	1.5 kOhm \pm 5%, 0.3 watt	2	1.5 Ohm \pm 1%, 0.5 watt metal film	Crystal Electronics via eBay
R7	3.3 kOhm \pm 5%, 0.3 watt	1	3.3K Ohm \pm 1%, 0.5 watt metal film	Crystal Electronics via eBay
R19	56 kOhm \pm 5%, 0.3 watt	1	56K Ohm \pm 1%, 0.5 watt metal film	Crystal Electronics via eBay
R21	30 kOhm \pm 5%, 0.3 watt	1	30K Ohm \pm 1%, 0.5 watt metal film	Crystal Electronics via eBay
R23	20 kOhm \pm 5%, 0.3 watt	1	20K Ohm \pm 1%, 0.5 watt metal film	Crystal Electronics via eBay
R24	42 kOhm \pm 5%, 0.3 watt	1	43K Ohm \pm 1%, 0.5 watt metal film	Crystal Electronics via eBay
T1, T3	2N2218A	2	None	Boca Semiconductor via eBay
T2, T4	2N2904	2	2N2904A	Boca Semiconductor via eBay

I used either a Weller pencil-style soldering iron or Weller dual-heat soldering gun on low heat and desoldering braid to remove old components cleanly. After each passive component was removed, I tested it on a Proster LCR meter to see if components had drifted off spec. Interestingly, there was little change in component values. This shows the quality of the original components used.

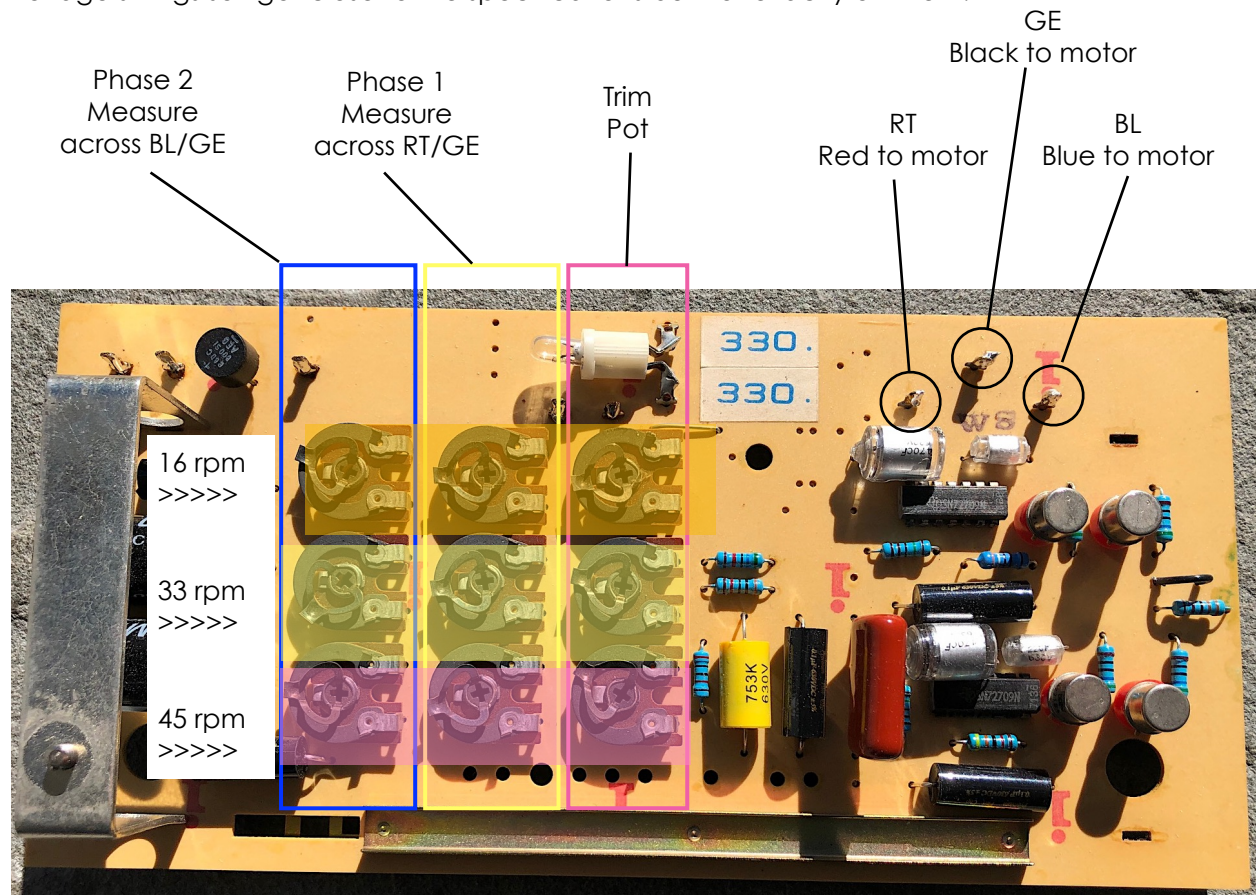
Thorens TD 125 Mark2 Parts Complement						
Callout	Original Part	Measured Value	Callout	Original Part	Measured Value	
C2	1000 μ F, 25V	Did not test	R3	560 Ohm \pm 5%, 0.3 w	562 Ohm	
C3	0.1 μ F \pm 5%, 160 VDC	0.107 μ F	R4	560 Ohm \pm 5%, 0.3 w	559 Ohm	
C4	1000 μ F, 25V	Did not test	R5	3.9 kOhm \pm 5%, 0.3 w	3.9 kOhm	
C5	0.1 μ F \pm 5%, 160 VDC	0.105 μ F	R6	1.5 kOhm \pm 5%, 0.3 w	1.5 kOhm	
C6	4700 pF \pm 10%, 400 VDC	5100 pF	R7	3.3 kOhm \pm 5%, 0.3 w	3.3 kOhm	
C7	220 pF \pm 10%, 400 VDC	231 pF	R14	560 Ohm \pm 5%, 0.3 w	563 Ohm	
C8	0.1 μ F \pm 5%, 160 VDC	0.102 μ F	R15	560 Ohm \pm 5%, 0.3 w	553 Ohm	
C9	4700 pF \pm 10%, 400 VDC	5500 pF	R17	1.5 kOhm \pm 5%, 0.3 w	1.5 kOhm	
C10	220 pF \pm 10%, 400 VDC	220 pF	R19	56 kOhm \pm 5%, 0.3 w	55.6 kOhm	
C11	0.2 μ F \pm 5%, 160 VDC	0.208 μ F	R21	30 kOhm \pm 5%, 0.3 w	30 kOhm	
C12	0.1 μ F \pm 5%, 160 VDC	0.104 μ F	R23	20 kOhm \pm 5%, 0.3 w	20.1 kOhm	
C13	0.075 μ F \pm 5%, 160 VDC	0.079 μ F	R24	42 kOhm \pm 5%, 0.3 w	41.9 kOhm	
C14	0.1 μ F \pm 5%, 160 VDC	0.106 μ F				

Board with new passive components installed



Calibration

To finish up, I wanted to check the output voltage to the motor. It's difficult to make adjustments when the board is mounted in the turntable base and, since I had the board out anyway, I extended the wiring to the transformer, motor and strobe to the bench then made the adjustments there. I found that moving the potentiometers a fraction of a degree resulted in wild voltage swings so I got close to the specifications but not exactly on them.



Cost of rebuild

For the cost of rebuild I included full shipping of the items and the proportional share of the cost of the components themselves. If I had to buy ten resistors for \$10.00 and used one resistor, I'd make the cost \$1.00. The total costs of the passive components replaced was:

Component	# replaced	Total component costs	Shipping	Cost with shipping
Resistors	12	\$2.80	Free	\$2.80
Capacitors	11	\$34.07	\$7.90	\$41.97
Grand Total	23	\$36.87	\$7.90	\$44.77

Transistors

I also purchased new transistors for replacement use but opted not to install them at this time. The total cost of those devices with shipping was \$19.26 for three of each type (two are needed per board).

What I learned

The Thorens turntable is solidly built. Over time there is some component drift but not much attesting to the quality of the components originally installed. Removing and replacing passive components is not difficult but finding the exact replacement items while avoiding dollar or quantity minimums is challenging.

I now have a Thorens TD 125 MKII which runs great and has the potential to last many more years.