BIC Turntable models 980/981/1000 - Motor Board Adjustments

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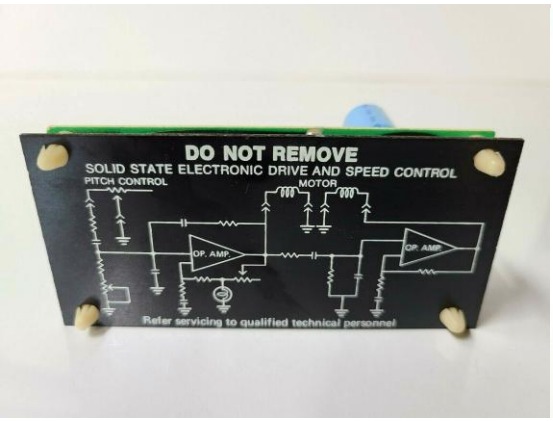
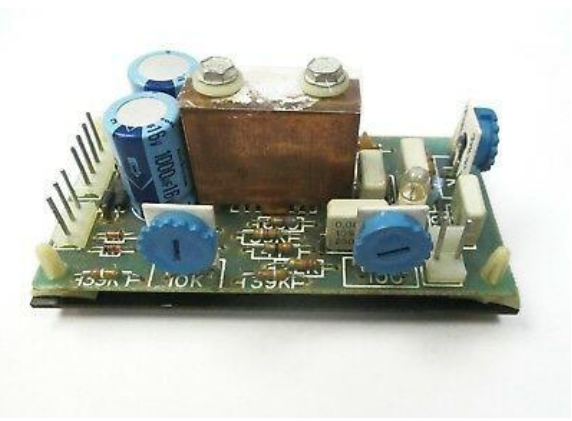
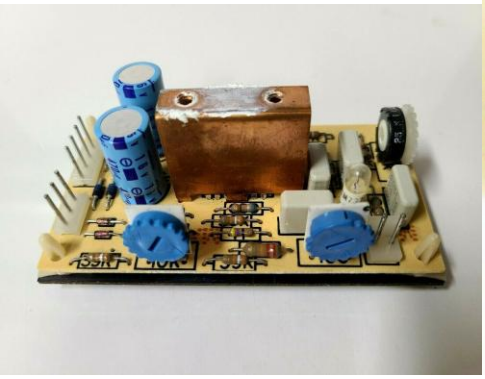
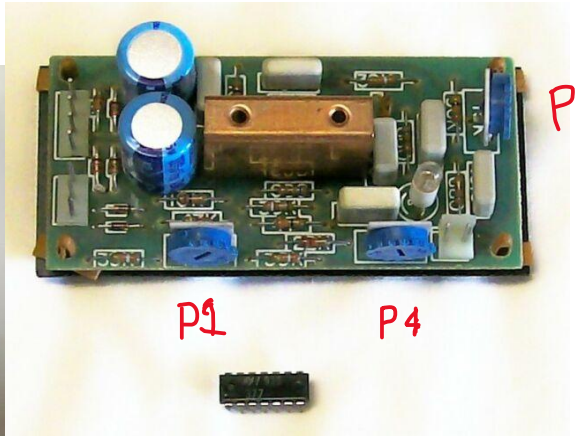
Revised slightly 2022.07 for clarity.

"BIC Motor drive PC Board assy. 12-046-01"
It came in a few different mask colors. AFAIK, the electronics are all the same.









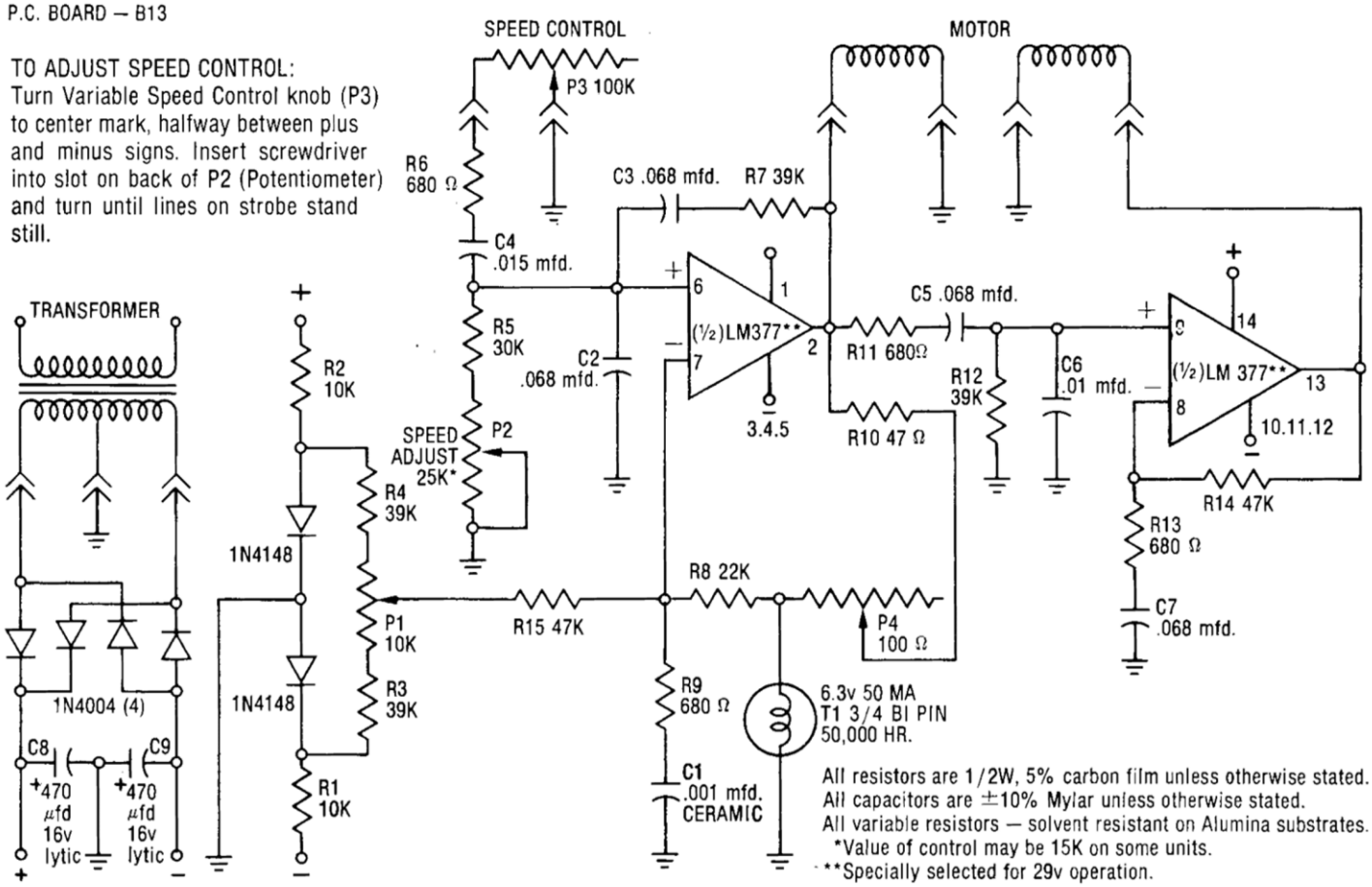
First, identify the adjustment pots.
The labeling is inconsistent, so I've called out their schematic designation, value, function, and location for clarity here.

P4, 100 ohm -> Motor voltage, right pot on long side, near light bulb
P1, 10K ohm -> Oscillator DC null, left pot, closest to ac power and motor connections.
P2, 25K ohm -> Speed center trim (frequency trim) , right short side pot
P3, 100K ohm -> User Pitch/Speed adjust, illuminated topside control

Schematic — Model 980 Motor Supply

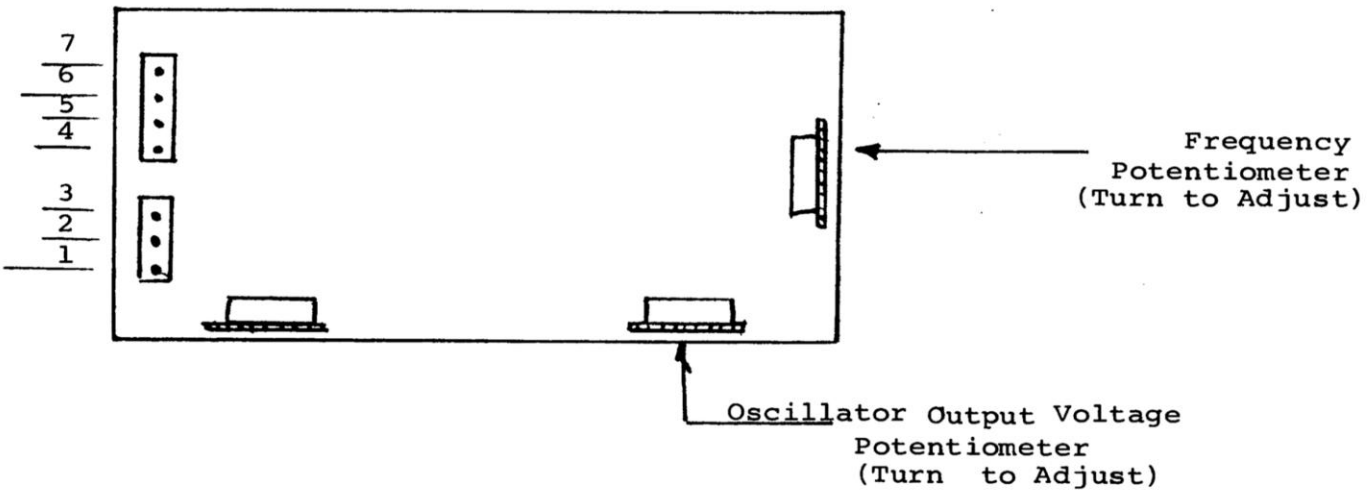
P.C. BOARD — B13

TO ADJUST SPEED CONTROL:
Turn Variable Speed Control knob (P3) to center mark, halfway between plus and minus signs. Insert screwdriver into slot on back of P2 (Potentiometer) and turn until lines on strobe stand still.



All resistors are 1/2W, 5% carbon film unless otherwise stated.
All capacitors are ±10% Mylar unless otherwise stated.
All variable resistors — solvent resistant on Alumina substrates.
*Value of control may be 15K on some units.
**Specially selected for 29v operation.

MOTOR CONTROL BOARD MODEL 980/1000



About the design:

-The power transformer's secondary is 20 VAC, center tapped, and it feeds the full wave bridge and filters on the PCB.
-The motor control board is the same on all three models, it's a 60 Hz Wien bridge design. Once trimmed, this design is pretty stable.
-The 1000 has an additional PCB, but it's for the cue controls.
-The motor does not change speed for 33 1/3 vs 45 RPM, the change is made strictly by the belt being moved on the pulley.

It is my understanding that the 980 was the first released of these three units. When it proved successful, they designed the slightly more upscale 1000. Later, they "refreshed" the 980 into the 981, probably a manufacturing efficiency change as the 981 uses some 1000 parts. In any case, the motor speed PBC was unchanged.

BIC Parts list,http://turntableexperts.com/html/bic.html

BIC Turntable Information: Vinyl Engine -
https://www.vinylengine.com/library/bic/980.shtml

The official BIC service bulletin is under "Miscellaneous/Service Information, bulletin number 8.
But it doesn't cover all 3 adjustments. Meh!

PCB adjustment procedures

First, let the unit warm up for 10 minutes or so to let the electronics stabilize. Then select one of the following adjustment procedures, depending on your available equipment.

Instrument adjustment version: (only needs an accurate DMM)

1) Motor voltage adjustment, P4, 100 ohms “Oscillator output voltage”, right pot

The right pot P4 on the board front is for adjusting the AC voltage to the two motor coils and is covered in service bulletin #8 at VE. White/black lead motors are 5 volts and red/black lead motors are 4 volts, motors usually have the voltage stamped as well.
Measure the motor voltage at pins 4/6 and 5/7 – set to 4.0 VAC for red/black motor leads, 5.0 VAC for white/black. Also look for balanced voltages, within 0.3 VAC. Greater than 0.3V difference means a problem with PCB, or sometimes the motor.

2) DC NULL adjustment, P1, 10K, “Oscillator DC balance”, left pot

Now, flip your meter to DC and a sensitive range like 100 mV or so. Adjust for 0.00 volts DC across motor coils.

At this point the bulb should be steadily dimly lit. If it is bright, pulsing, or flickering, the two previous adjustments are incorrect, or the board has other issues.

3) Center the user speed control:
User speed control -> P3, 100K, on top plate – set to center
“Oscillator frequency” trim -> P2, 25K, right edge pot
Finally, the pot on the right edge of the board (P2) is adjusted so the strobe marks are still with the top speed/pitch control (P3) at its center.

Non instrument version: Based on info from "Doug G" on vinyl engine

(First, let the unit warm up for 10 minutes or so to let the electronics stabilize.)

Steve is correct about the right pot in that it adjusts the amplitude of the oscillator but also the phase. Adjust it so the little bulb burns absolutely steadily and at the dim brightness, not bright.

The other front pot sets the oscillator DC voltage to zero and some claim you need an oscilloscope to adjust this but all you need to do is set it so the little bulb on the board doesn't pulse at all and is as dim as possible. Watch it for a while after it appears to be burning steadily to make sure its not pulsing really slowly.

And again, the three pots on the motor control board are as follows: The one on the long side closest to the bulb - to adjust the voltage to the motor coils. The other one on the long side - to adjust the bulb so it is dim and NOT pulsing. The one on the end - adjusting so the strobe stands still with the top control at its center of rotation.