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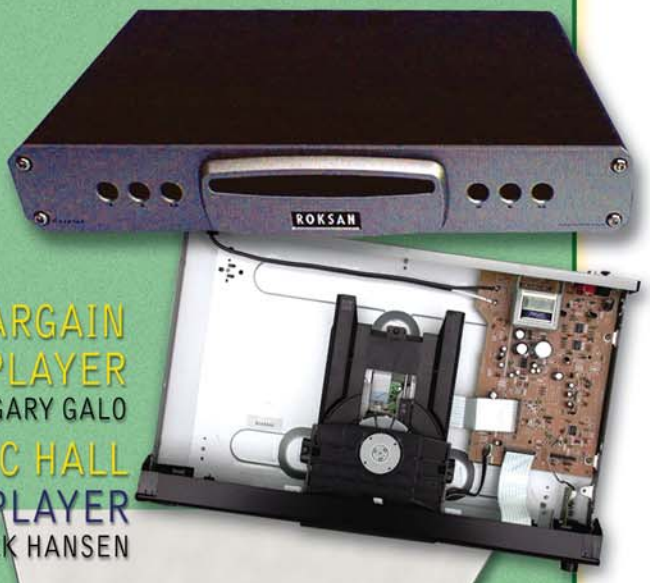

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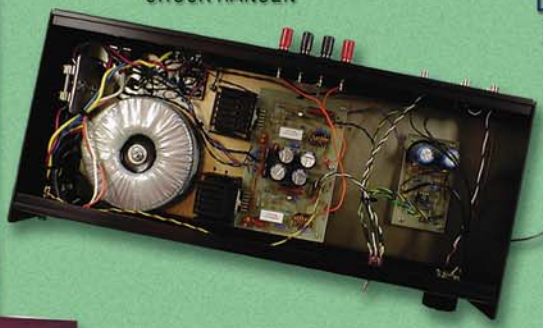

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A Start-Up Delay for Vintage Amplifiers

This circuit offers a different solution to delay the start-up of classic amps. **By Alexander Rubli Kaiser**

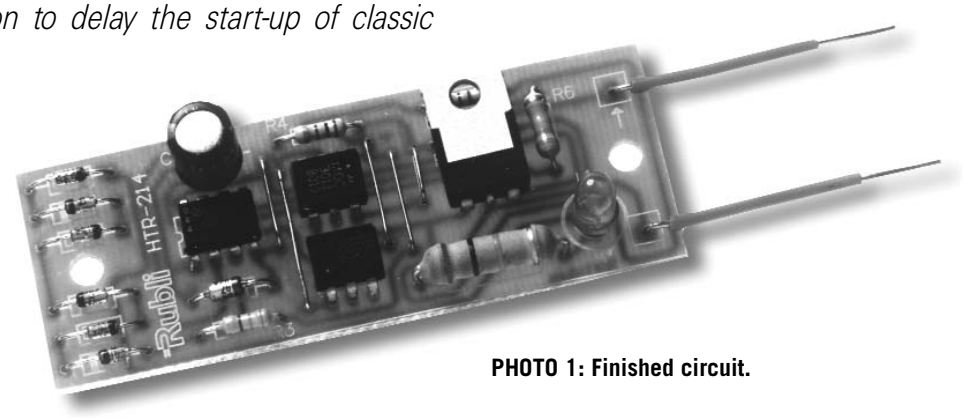
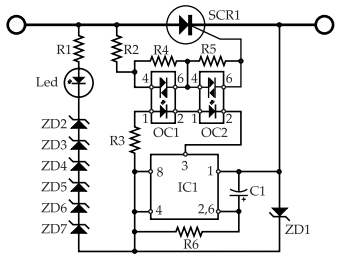


PHOTO 1: Finished circuit.

I have read dozens of articles and reviewed many recommendations about adding a retard circuit via a relay-controlled timer, a rectifier tube, or even a "standby" switch to avoid voltage jolts to cold components. All these solutions can work. But what if you own a vintage amp? There simply is no space to add a transformer, a tube socket, or relay. Drilling a hole into the chassis so as to add a standby switch is not an option. Most collectors would not purchase an original amplifier if major modifications had taken place.

My proposed circuit (*Fig. 1*) is a small PCB with only two terminals that go in series to the HV. Attaching the PCB to the amplifier can return it to its original state by reconnecting the cable you unsoldered. There are no connections to ground, no relay, no switch, and no cable runs (*Photo 1*).

The circuit contains an SCR that acts as the switch, a 555 IC timer, and other associated components. Once the SCR switches on, all components on the circuit vanish from the electrical path. The drop voltage of the SCR is less than 1V. The voltage of the associated components is taken from a shunting cascade of zener diodes.



Components List:

R1	10KΩ 1 W
R2,3	330Ω 1/2W
R4,5	1M Ω 1/4W
R6	330K Ω 1/4W
C1	47uF 16 V
OC1,2	MOC3011
IC1	NE555
SCR1	600V 8 amp SCR S6008L
ZD1	Zener Diode 12V 1/2W 1N5242
ZD2	Zener Diode 17V 1/2W 1N5247
ZD3-7	Zener Diode 56V 1/2W 1N5263
Led	Gen Purpose LED

FIGURE 1: Circuit schematic. G-1731-1

INSTALLATION

Be careful, for this project involves high voltage; electric shock can be fatal. Before installing, always unplug the unit from the AC socket and fully discharge the electrolytic capacitors with a 10kΩ resistor to the ground. Then wait a few seconds before trying to handle the amplifier. Always check the voltage before soldering or unsoldering any cable.

Locate the positive lead of the main rectifier and the first electrolytic capacitor. You will notice several other connections that lead to the amp: one goes to each OPT, and a resistor goes to the next HV stage. The connections to the PCB go from one side to the junction of the positive side of the rectifier and the first electrolytic capacitor; the other connection goes from the remaining cables that were connected to that point.

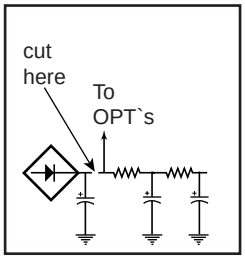


FIGURE 2: Connecting the PCB. G-1731-2

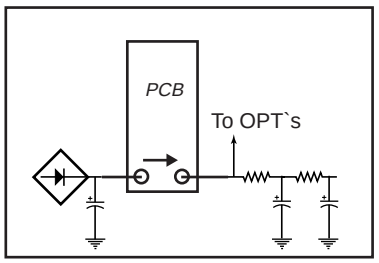


FIGURE 3: PCB placement. G-1731-3

ABOUT THE AUTHOR

Alex Rubli is a Macintosh computer consultant based in Cholula, Mexico. He worked as chief engineer/designer at Pierdant Electronica, the German DUAL audio company representative in Mexico back in the '80s, when some of his designs, such as turntables, solid state amplifiers, and speakers, hit the Mexican market. For personal reasons, he moved out of this business and went into computing science. His interest in tube audio re-emerged some years ago. In his laboratory, it is usual to see high-end Macintosh computers testing laboratory cards and software, next to a pair of vacuum tube amplifiers waiting to be restored.

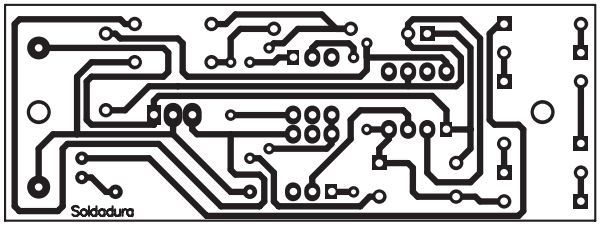


FIGURE 4A: Copper side. (100%) G-1731-4A

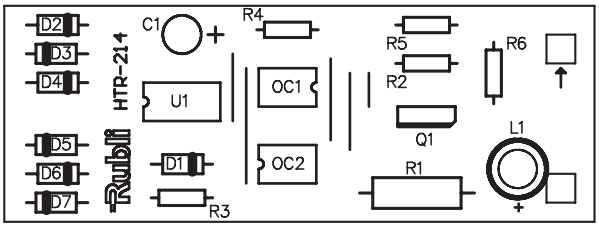


FIGURE 4B: Component side. (100%) G-1731-4B

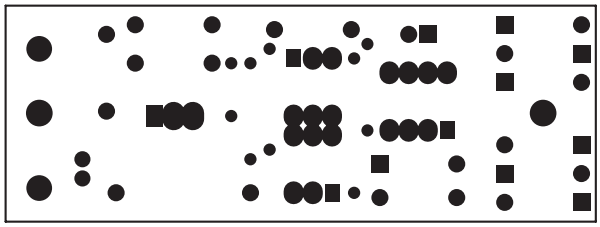


FIGURE 4C: Soldering mask. (100%) G-1731-4C

See *Fig. 2*; notice the direction of the arrow on the PCB.

The circuit is intended for use with an HV of 350-550V. If you have an amplifier with a lower HV, try bypassing ZD2. The voltage across R1 should be 45V or more.

THE LED

When the amplifier is powered on, the LED will turn on until the timer fires up and takes the SCR to the "on" state. After this occurs, the LED will turn off.

The timing circuit will fire up the SCR in about 45 seconds if the tubes are cold. If the tubes are hot, the time is reduced about ten seconds. The necessary current for this circuit originates primarily from the idle current in the output tubes. If you are troubleshooting the amp and remove the tubes, the SCR will not activate, and you need to bypass the circuit.

The PCB (*Fig. 3*) measures 3″ × 1⅛″. The completely assembled PCB is available from the author at rubli@pobox.com. You can find further information at http://www.pobox.com/~rubli. ❖