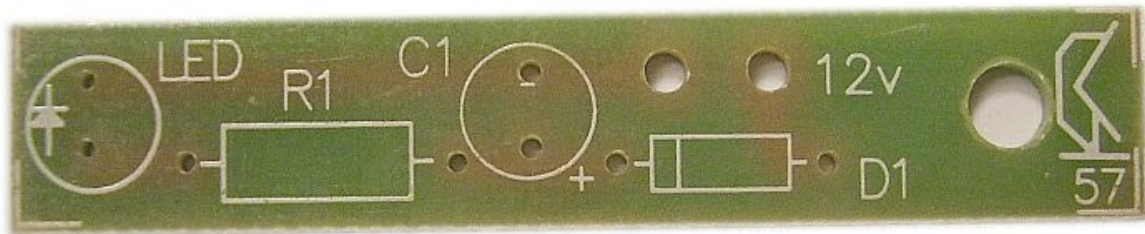


**LED Lamp Replacement PCB**  
for the  
**Dynaco® PAS Series Preamps**  
and  
**SCA-35 Integrated Power Amplifier**

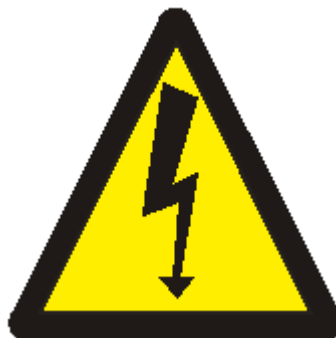


*Classic Valve Design*



Classic Valve Design assumes no responsibility for circuit or user damage from the use or misuse of these boards or any other product. We simply provide these on an AS-IS basis with workmanship quality as the only thing guaranteed at this time.

This product is designed for and use around **LETHAL VOLTAGES**. We assume the user has a reasonably competent grasp of line operated electronics at the time of sale.

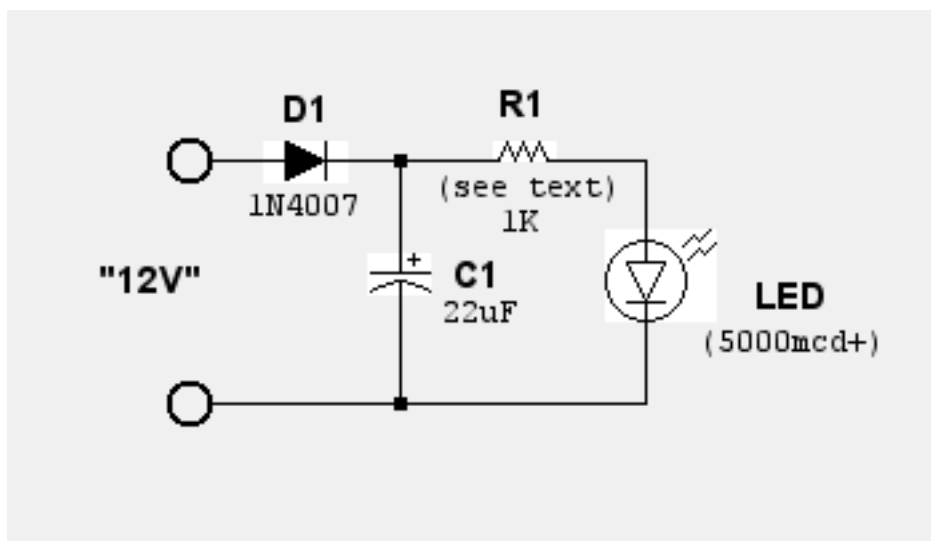


It has been the custom of DIY'ers, and professionals to use LED's as power indicators for their designs for a very long time. With the super and ultra bright Light Emitting Diodes coming down to reasonable prices as technology advances, they are also the choice in upgrading those old incandescent pilot lamps in vintage equipment as well. They use far less current, don't get anywhere near as warm as their glowing filament counterparts and last for the life of the equipment and then some.

Another advantage to the LED indicator is current savings. The LED will draw 20mA or less compared to 120mA for the #53 and 150mA for the #47 bulb. The result is less strain on your power transformer (usually underrated with Dynaco) and cooler running!

Some replacements are easy, others are not. This PCB will assist those that use Dynaco gear to upgrade their old #47 (6.3V) or #53 (14V) pilot lights to something more reliable.

### Schematic



Nothing could be simpler, right? The unit is made to operate of the AC heater voltage given by the power transformer. For the PAS series pre amplifiers, this is 12.6V. For the SCA-35, it's 6.3V. All that's required to change from 12 to 6V is the value of R1.

D1 rectifies this voltage to save the LED from reverse breakdown and premature failure. Unlike other LED boards, we include a filter capacitor for two reasons: 1) To avoid perceptible flicker and 2) some LED's (like some blue ones we have tried in our R&D) are prone to early failure with pulsed DC.

D1 can be any of the 1N400x series. 1N4007's are just found more frequently in a hobbyists supply tray.

R1 is typically 1K @ ½W for a 12V PAS heater supply. This will give between 10-12mA for a shorter-wavelength red super bright LED and light the jewel to roughly the same intensity as the #53 bulb.

The LED is a T1-¾ case (5mm) type with no standoff on the leads. This case is chosen to have the correct physical height above the jewel rear (about 1/16 to 1/8 inch). Clear lens types with narrow beamwidth work best.

For other LED's, you can calculate the resistor thus:

$$R_{\text{ohms}} = (14.4 - V_{\text{fwd LED}}) / 0.012$$

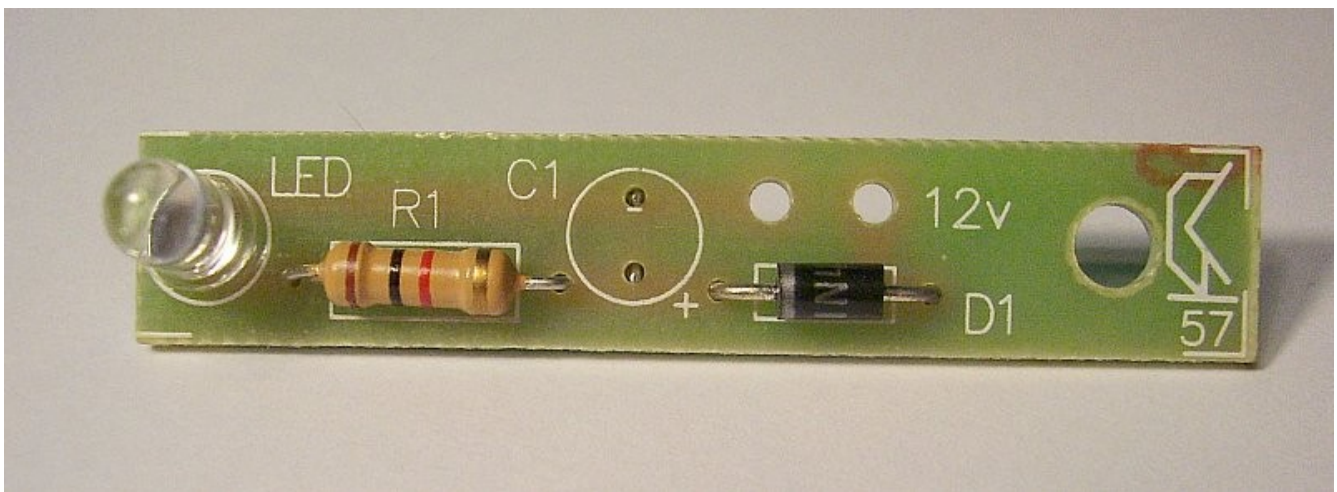
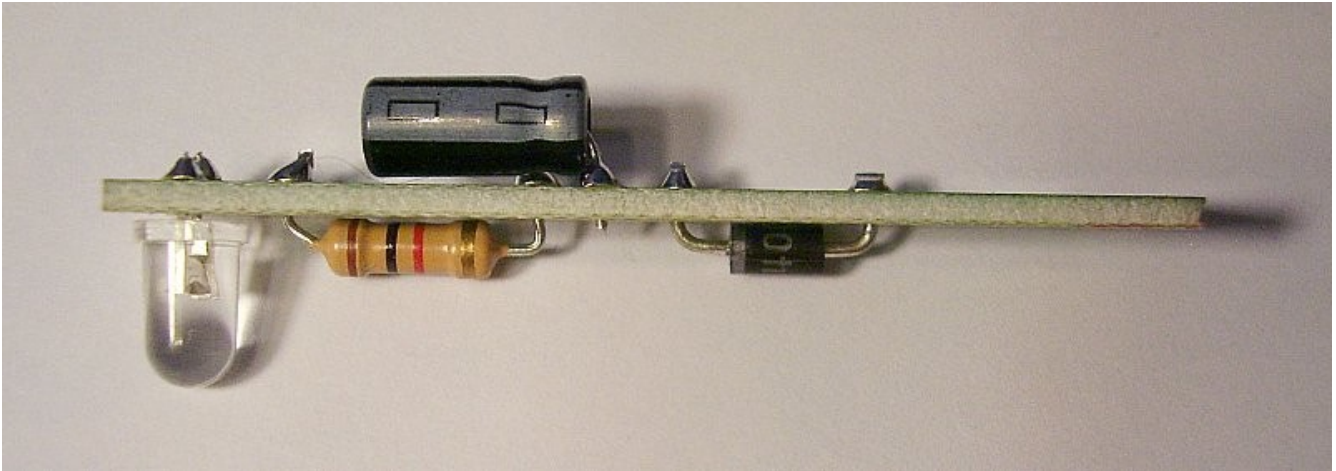
The  $V_{\text{fwd LED}}$  will be specified by the manufacturer and can be anywhere from 1.85 for a typical super bright red to 3.5V for a super bright white and as high as 5V for a silicon carbide blue.

For using this PCB with a 6.3V heater supply, just divide the result above by 2. So the 1K example can become 470 ohms.

The typical Dynaco jewel colour is reddish orange. So any red, orange, yellow or white LED with enough millicandela (mcd) rating can be used. Personally, I buy the brightest T1-¾ cased LED I'm willing to pay for.

## Assembly

Assembly is pretty straight forward, except that C1 has to be mounted on the rear of the board as the following pictures show (otherwise it will not fit when you install it).



Capacitor polarity is important (they can go off like firecrackers if you get them backwards).

## Installation

This is the tricky part, as it requires removal of the knobs and faceplate to do. The good part is it can be done with regular hand tools commonly found on a DIY'ers bench.

### **For the PAS series:**

- Unscrew and remove the knobs for the line selector and volume control.
- Pull to remove the other knobs.
- With pliers, carefully remove the nots on all the bushings and remove the faceplate.
- This will now expose the mounting screw for the lamp holder on the left side near the power switch. If you find a rivet, then you have a factory assembled unit and it will need drilling out with a 5/32" drill bit to clear the #6 screw. The rivet will be steel, not aluminium. Extra care will be needed.
- Once the bulb holder is removed, clip the leads at the holder and strip and tin about 5/32" of wire.

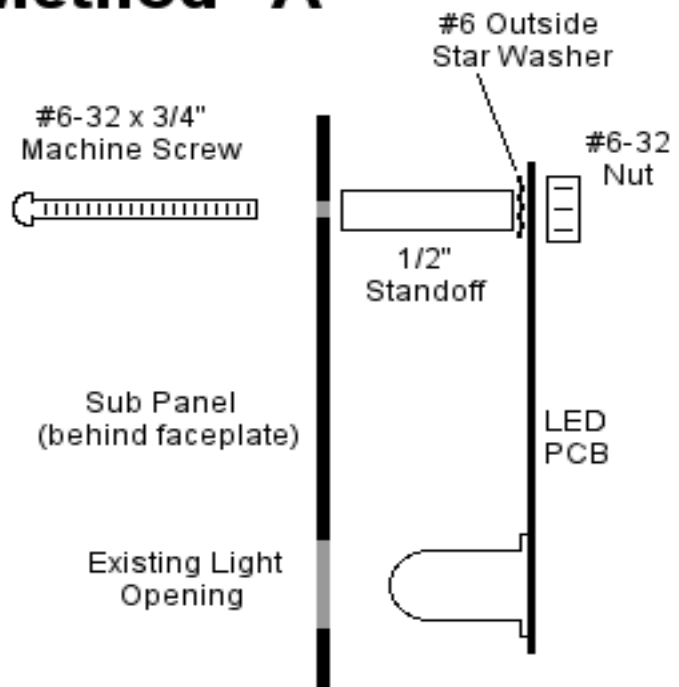
### **For the SCA-35:**

- Same as the PAS, except all knobs are held on with screws.

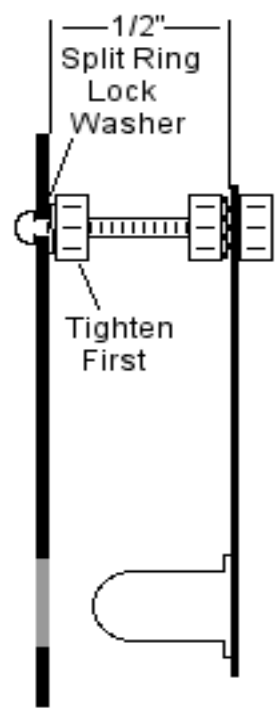
Solder the newly stripped wires into the "12V" holes and you're ready to install.

There are two methods you can use to install. Method "A" uses a 1/2" standoff. If you do not have one, you can use method "B" and a couple of extra nuts as shown on the following page.

# Method "A"



# OR



# Method "B"

Use of the outside star washer is recommended for keeping the PCB from shifting once mounted as they grip nice and aren't near as thick as the split-ring lock washers. If you don't have one, don't worry too much, though they are easy to scavenge .

Reassemble the faceplate, taking care to align it so the slide switches don't jam, replace the knobs and enjoy!