# Peavy Classic 30 Mods

## Overview

Many of us have bought the Peavy Classic 30 because it is a nice-sounding, small-sized, vintage-looking yet economical tube amp with a good voice for guitar leads (or miked harmonica). After playing it for awhile, its limitations become obvious: as tubed from the factory, the sound can be overly harsh, the bass response is very thin, and the boost switch radically alters the tone as well as the gain so it is unusable for many guitarists looking for vintage sounds. After a few months, I put it in the back of my closet, deciding that it was more of a "toy" amp than a ***real*** amp. Many amp techs have mentioned that customers would bring in Classic 30's to see if anything could be done to improve the tone; however with the small transformers and printed circuit board design they were reluctant to promise any improvements that would justify the costs involved. As a hobbyist with a Classic 30 sitting around just gathering dust I figured I might as well try out some different mods to see if I could get some better tones out of the amp. After doing the mods outlined in this article, the amp captures the sounds I've been looking for. You may want to try changing some of the values I recommend to capture the sound ***you*** are looking for.

## Retubing

*Check out my Righteous Tubes! page for the details on the latest preamp tube combinations which seem to work best for me (as I find better combinations, I will revise that page).*

The Classic 30 uses 3 12AX7 preamp tubes, labelled V1, V2 and V3 from right to left as viewed from the rear of the amp. The C30 isn't a true 2 channel amp; the channel select switch adds in the 2 additional gain stages of V2, ***between*** the initial and final preamp stages of V1. V3 uses both stages for the driver circuit before the 4 EL84 output tubes.

As for which brands and styles of 12AX7 tubes that work best in the Classic 30, let us address the V3 driver tube first. If you are looking for clean guitar tones from the Normal channel, you will want to use a driver tube that is fairly transparent. I have found that the stock Chinese tubes that ship with the amp work well as driver tubes; for an even better sound, check out a Golden Dragon 12AX7 or Ruby Tubes 7025STR: they are very clean and transparent tubes with a little more gain than the stock tubes.

The guitar signal goes directly to the first stage of V1 in all modes so its selection is very critical to the sound you are looking for. If you use the Normal channel a lot, you should choose a tube which sounds well in this mode. For crystal clarity (at the expense of lower gain), you can use a 5751 tube. I personally prefer the Sovtek 12AX7WBT+ because it produces a warmer tone, very similar to a vintage Telefunken. For V2 (the 2 gain stages added in overdrive mode), I prefer the Sovtek 12AX7WB, which has lower gain than the WBT+. This tube is bypassed in the normal mode, so you can try out different tubes here to decide what works best for you in the overdrive mode.

If you use the Classic 30 strictly in overdrive mode, you can try out higher gain tubes in all 3 positions, with one suggestion here. I always thought of changing preamp tubes as being like changing spark plugs in your car: decide which brand and style works best for you and replace them all with the same type. In trying out different tubes, what I found is that if all tubes are the same, it exaggerates the tonal characteristics of that particular tube. Perhaps that is exactly what you are looking for, but you can generally get a fuller sound if you mix and match different tubes. You may want to bring your amp down to your local music store and see if they will let you try out different combinations of preamp tubes.

## General Information on mods for Classic 30

*Warning! Tube amps have high voltages inside of them, even when the amp is unplugged! The large power supply filter capacitors can be safely discharged using a well insulated test probe connected to the chassis ground through a 10K resistor. With the chassis removed from the cabinet and the FX jacks to your left you will notice several large 5 and 1 watt resistors mounted on stand-offs away from the board. Directly above from the Bass control is R58; with the insulated 10k resistor/probe short first the left lead and then the right lead. Directly above from the Pre gain pot is R59 mounted horizontally and R60 mounted vertically. With your special resistor probe, short first the left and then the right leads of R59, and then fisrt the back and the front leads of R60. Generally any charge will be drained through the OT (output transformer) after a minute or two, but its best not to take any chances.*

To remove the Classic 30 from the cabinet to work on it, first unscrew the reverb spring bag and cable straps, unplug the speaker and reverb leads, and then remove the 8 shoulder screws on the top and sides of the cabinet holding the chassis. I generally label tubes with their socket numbers using a Sharpie marker before I pull them out so I know where to put them back; this also helps in lining them up properly so you don't bend the pins. In putting the tubes back into the Classic 30, the gap between pins 9 and 1 for the preamp tubes faces the front of the amp, and the gap for the output tubes faces the rear of the amp.

To remove the 3-sided circuit board from the chassis, remove the chicken head knobs and unscrew the 11/32" nuts holding down the 7 pots and 1/2" nuts securing the 5 jacks. Pull out the small jack board. Unplug the yellow and red wire harness from the power transformer as well as the yellow and blue speaker plug, two OT plugs (the lower OT plug is Blue-Red-Brown) and the reverb cable connector. Remove the 8 black screws holding in the circuit board with the tube sockets and then gently push in first the tube sockets and then the pots to remove the 3-sided circuit board from the chassis (it should be free to come out completely). As I remove different components from the board, I tape them to the inside of the chassis and label them with the reference numbers and value in the event I want to reinstall them later.

After taking the amp apart about a dozen times in developing these mods, I noticed that some of the pot bushings would not tighten down properly and that some of the chicken-head knobs were loose enough to rattle or slip. I found that teflon tape (for plumbing) works great for both of these problems; for the pot bushings wind a few wraps of the teflon tape clockwise around the bushing. For the loose knobs, fold over the tape so that it is about 4 layers thick and place it on the shaft before pushing the knob back on. If I am just making a quick test of a mod, I'll only replace maybe 3 of the pot nuts, and only tighten them down loosely. But be sure to tighten down the input and extension speaker jacks as these establish the grounds for the circuit board and power tubes.

A few other tips: label the bottom of the knobs with a Sharpie permanent marker when you first take them off. Although they are all supposed to be identical, they will slip on some pots but not others. After having one of the grounds break on a reverb tank plug, I put heat shrink tubing on both of the plugs to help protect the solder connections. After unfolding the circuit board a dozen times, I found the hinged jumper wires starting to break; be careful when you unfold them and if you notice any copper showing through that means the wire is ready to break- either replace it with 22 ga bus wire or you can try reinforcing it with a short length of 24 ga bus wire.

As for replacing components on a printed circuit board there are a few tricks I learned. Desoldering braid works better for small solder connections than a desoldering tool. Although you can get it at Radio Shack (#64-2090B), the Chem-Wik line carried at electronics parts houses uses a finer braid that is less abrasive to the board. Be sure to check all of the sections of the board you work on for solder bridges (which are short circuits between two traces). In the event that a solder trace breaks off when you are reworking the board you can reestablish the connection by bending the component lead over to where the trace had gone originally (check the layout drawing from Peavy). The bottom of the circuit board is covered with a protective coating; I'll polish a trace with the desolder braid and a dab of solder until the solder adheres to

the trace where I intend to run the lead. One last note on soldering: be sure to use a damp sponge to keep the tip clean.

## Tone Cap Mods for the Classic 30

*Modify the tonal response of this amp by replacing the tone and boost circuit caps!*

By changing the values and style of capacitors used in the tone and boost circuitry of the Classic 30, the tonal response can be changed dramatically. Most amp builders and connoisseurs prefer Sprague-style Orange Drop caps for the midrange and bass caps; many of them likewise prefer silver mica caps for the treble caps.

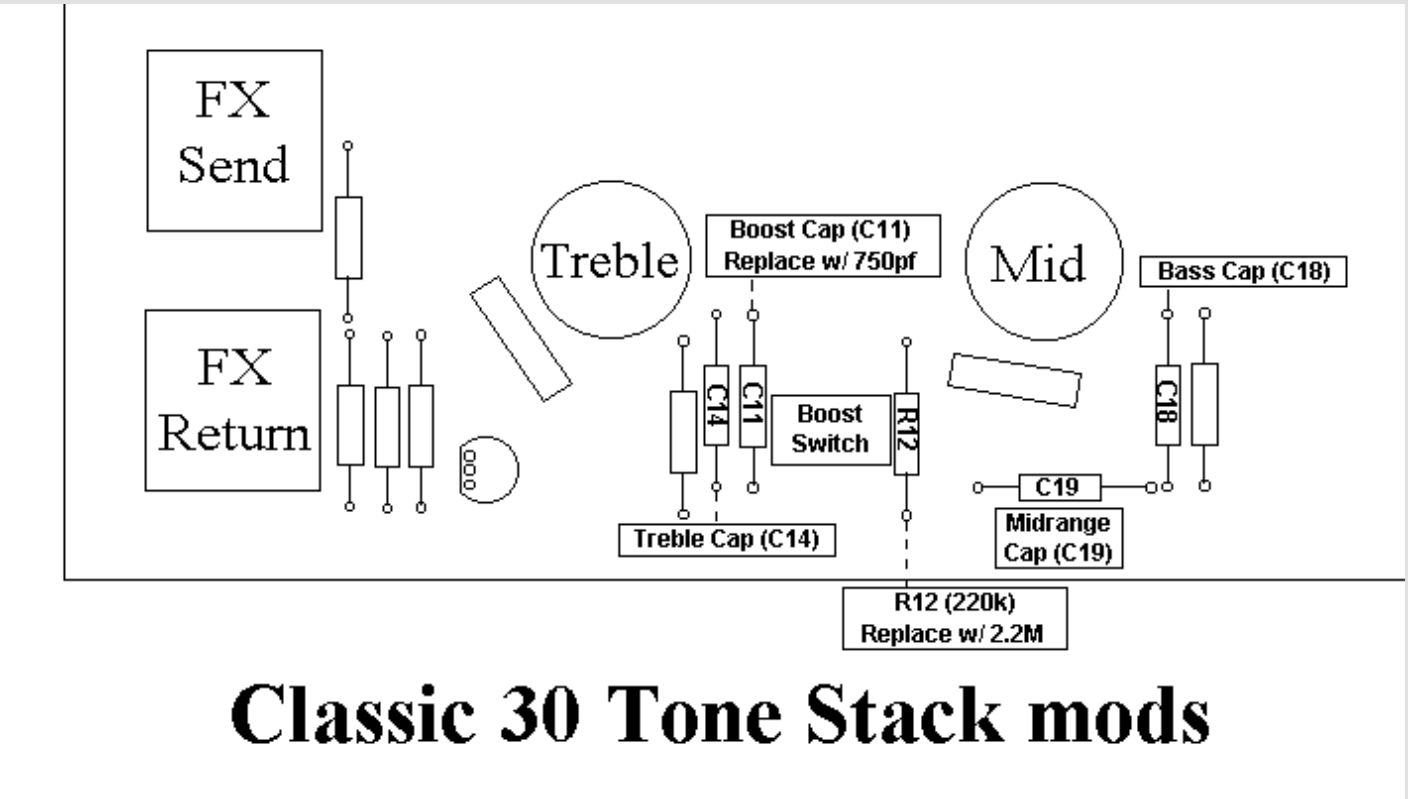
As for the values of the tone caps, Peavy uses a 270pf cap for treble and a pair of .022uf caps for midrange and bass. They also use a .047uf cap in the boost circuit, which drastically increases the gain and midrange response of the preamp. The boost cap bypasses the treble cap, in effect raising the value of the treble cap to the sum of the two values. Because of the very high value used (most boost circuits use a 750pf to .0015 cap) a 220k resistor to ground is used to reducing popping when the boost circuit is switched in or out.

For this mod, I recommend replacing the .022uf bass cap (C18) with a .047uf Orange Drop-style cap for improved bass response. (If you prefer a higher-gain overdrive tone, you may prefer to use a .022uf Orange Drop cap instead for a more midrangy sound). The .022uf midrange cap (C19) should be replaced with a .022uf Orange Drop. I put in a 270pf silver mica cap in place of the 270pf tubular ceramic treble cap (C14- it looks like a resistor but with a green body instead of a tan). However, the stock treble cap can be used if you can't find a silver mica cap.

For the boost cap (C11), I recommend using a 750pf cap. With this value, the boost switch works similar to a Shift switch on an older Mesa Boogie amp: it kicks the volume up a notch and boosts the midrange response. For more boost and tonal shift, you can use a .001uf or .0015uf cap instead. Using smaller values such as these, the 220k resistor (R12) to ground could be eliminated or replaced with a very high value (I used a 2.2M resistor). With the stock boost cap, I found the gain boost and tonal shift to be too drastic to be usable for vintage blues tones. With the values I recommend, the boost switch offers an alternative voicing which retains much of the tone and character of the unboosted mode.

If you choose to replace the boost cap with a lower value as recommended here, you will sacrifice much of the gain of the stock boost circuit. To recapture some of the gain lost I suggest that you replace the 100K plate load resistor for V3A with a 120K or 150K resistor as outlined later in this article. Click Here!

The following drawing illustrates the location of the components in the tone and boost circuits:



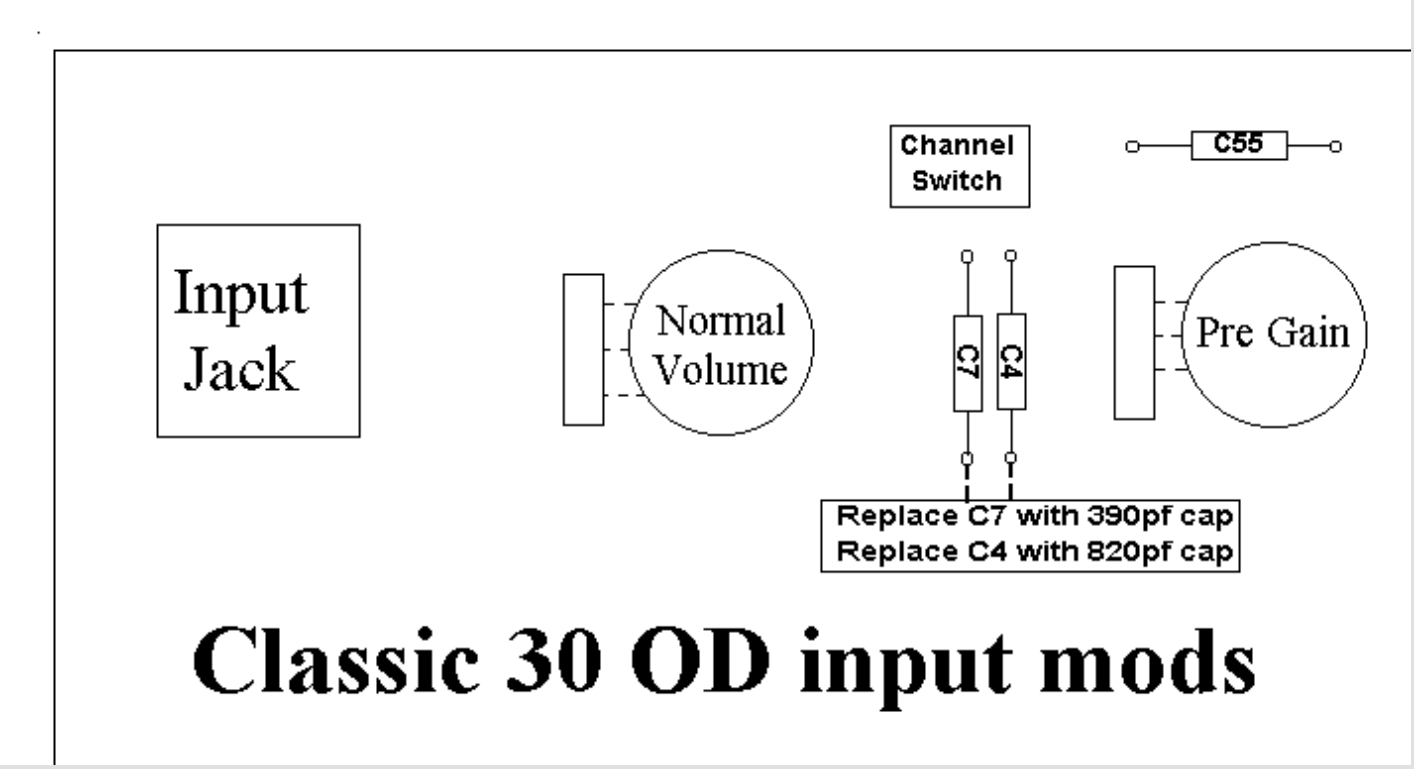

**Overdrive Channel input mod for the Classic 30**

*Replace C4 cap to tone down the harshness of the OD Channel.*

Another common complaint concerning the Classic 30 is that the Overdrive Channel is too harsh-sounding. After replacing the tone and boost caps as outlined above, I wasn't able to get a really nice sound from the OD channel unless I kicked in the Boost switch. In re-examining the schematic, I noticed that the signal from V1A is routed first through a .047uf coupling cap and then sent to both the Normal and OD channels. The Normal channel gets its signal from a .001uf cap paralleled with a 680k resistor, while the entire signal going to the OD channel is routed through a 470pf cap (C4)! A cap of that value will allow mainly treble and midrange frequencies through, and effectively blocks most of the low frequencies from V1A.

To reduce the harshness of the OD channel, I recommend replacing C4 with a 820pf mica cap and C7 with a 390pf mica cap. To locate C4, look for the 2 tubular caps (they look like resistors but with a green body) between the Normal volume pot and the Pre volume pot for OD channel; C4 is the tubular cap closer to the Pre volume pot and C7 is closer to the Normal volume pot. For a heavier distortion sound you can replace C4 with a 1000pf mica cap and optionally add a resistor (1 meg) in parallel with the cap; solder the resistor between the 2 cap leads on the top of the board and then insert the cap leads through the holes in the circuit board. (After trying the 1 meg resistor with a 1000pf cap, I switched back to a 820pf cap which gets a better tone for blues.) Replacing the 470pf stock value of C7 with a 390pf mica cap adds back a touch of brightness to the OD signal.

Here is the diagram for OD channel input mod:




**Mods to the Tube board**

*Replace C1 cap and R5resistor to tone down the harshness of the OD Channel. Replace R41 cap to increase gain of driver stages (only if you converted boost switch to shift switch as described above).*

Further down the OD channel circuit, the .001uf coupling cap (C2) between V2A and V2B is followed by a 470k resistor (R5) paralleled with a 470pf cap (C1), which make up an RC network. I recommend replacing C1 with a 390pf silver mica cap and R5 with a 390k resistor. With the other mods outlined here, those values give a tone which is bright enough for blues, yet has a stronger bottom end; the bass and treble controls work well to fine-tune your sound with these values.

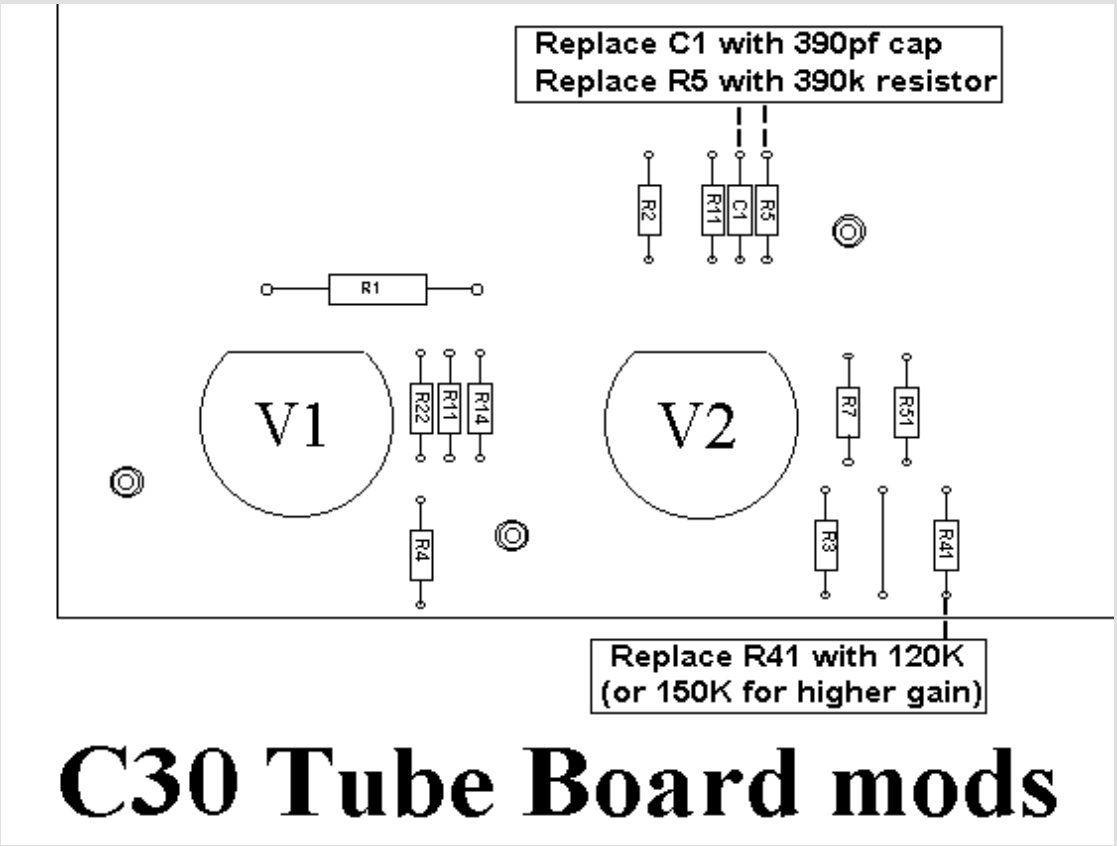
For a stronger and fuller OD sound, you can also replace the .001uf coupling cap (C2) with a .01uf / 600v Orange Drop cap. C2 is located on the middle circuit board right next to the blue channel switching relay: it is the white "rectangular box" cap. (In the Advanced Mods article, I explain how to hook up a toggle switch to select between the two values for C2: .001uf for a brighter blues tone and .01 uf for a fuller OD tone.)

C1 is the tubular cap between the V2 tube socket and the middle circuit board; there is a group of 2 resistors and 1 tubular cap next to the threaded post. R5 is the resistor between C1 and the threaded post. To desolder them you will need to remove the 3 black phillips machine screws that hold the circuit board to the angle bracket. There is very little clearance for a mica cap here so you will need to bend it over the resistor R5. Although I replaced C1 with a 390pf one for a tone bright enough for blues, you may want to experiment with different values here. A 560pf cap with 470k resistor was mentioned in one post as having an almost magical effect in guitar amps, but I didn't think it worked that well in the Classic 30. For a thicker tone for rock, you can drop C1 to 100-250pf, or increase it to 680-820pf for a different effect; a lower value for R5 will also produce a louder, thicker sound. In my experiments I replaced these two parts so many times that the copper traces on the circuit board wore out (I used 24 ga bus wire to make the connections).

There is one other mod I recommend if you chose to replace the .047uf boost cap with a 750pf shift cap

(thus eliminating the very strong gain boost of that switch). You can make up for the gain lost in that mod by replacing the 100K plate resistor (R41) for V3A with a higher value (120K to 150K). I put in the 150K resistor for the maximum increase in gain, but you need to use some discretion here: if you plug your guitar into a stomp box that adds plenty of gain to the signal, you may blow out one of the internal fuses if you crank the volumes up to 12. If you have little control over the guitarists using the amp, you may want to put in a 120K resistor which increases the gain of the driver circuit less than the 150K resistor. There is a tradeoff involved here: although the gain of the stage is increased, its headroom is decreased so if you are looking for a strong, clean Normal tone you may want to skip this mod.

Here is the diagram for the 3 mods on the Tube Board:




## Final notes on these mods

*Tips to reduce buzzing and rattles with increased low frequency response.*

After replacing the tone caps as outlined above, I found my amp cabinet and chassis buzzing a lot because it simply wasn't designed for the fuller bass response. The chromed chassis is a lot lighter than those used in the older Fender amps so to reduce its buzzing, I glued weather-stripping along each of the sides that was secured to the cabinet. I used an open cell weatherstripping (1/2" wide by 7/16" thick) so that it could be compressed enough so that the 8 shoulder screws would still line up. For the top with the controls I cut the weatherstripping down so that its width and thickness was 1/4". Self-stick weatherstripping tends to peel off shiny metal very easily so I ran small beads of crazy glue on the chassis. I also noticed the pilot light buzzing so I put a bead of silicon around the light housing underneath the panel.

To further reduce any chassis buzzing or rattles, you could also try gluing small o-rings to the 8 threaded posts which secure the circuit board with the tube sockets. I used 5-minute Epoxy in the "hypo" tube along to glue the Perfect Match #14504P o-rings (9/32"x5/32"x1/16"). These o-rings tend to fall off when you take

the amp apart so I wouldn't recommend adding them until you are completely satisfied with the amp mods. [If you try adding these o-rings, wait overnight for the glue dry. I didn't and one of the screws broke off inside which was a real hassle to fix. After that when the o-rings fell off I just left them off, although I may add them all back someday.] There is a tendency for the chassis bottom to vibrate at high volume levels; I may glue a piece of reinforced neoprene parallel to the tube sockets to reduce these vibrations. [In the Advanced Mods, I added pots and switches behind the tubes so you may want to skip this suggestion as well.]

Another solution might be to add a jack for the built-in speaker so that you could unplug it and use an external speaker when you need to crank the amp up loud. I drilled a hole below the power switch and indicator light for a speaker jack (connect the yellow wire to the hot terminal and the blue wire to the ground terminal). The added jack is connected to the 16 ohm tap, the existing jack is connected to the 8 ohm tap, and if you plug into both jacks, they are connected in parallel to the 8 ohm tap. This last mods makes the amp much more versatile.

I strongly recommend that you replace the stock 12" 16 ohm speaker. (I put in an 8 ohm Celestion V12-60 "Silver Series" for about $60 and was fairly pleased with the performance.) What I did notice when I put the stock speaker back in, the amp sounds much more alive if I plug it into the existing "Extension Speaker" jack (which uses the 8 ohm tap). I also noticed a similar response when testing the amp with the 16 ohm load of my Classic 50-410 speakers. I suspect that putting the speaker load on the 8 ohm tap has an effect on the feedback loop; in any event, for a nice blues lead guitar tone use the 8 ohm jack whenever feasible.

There is a simple trick to switch the built-in speaker from the 16 ohm tap to the 8 ohm tap: plug a bare 1/4" plug into the Extension Speaker jack. The internal switching contacts of the jack will connect the built-in speaker in parallel to the 8 ohm tap when anything is plugged into the Extension Speaker jack. If you can't afford to replace the stock speaker at this time, be sure to switch it over to the 8 ohm tap.

## In Conclusion

*Legal disclaimers, suggestions and parting comments.*

In conclusion I thought I better issue any appropriate disclaimers. These mods are not endorsed by Peavy and will obviously void any warranty on your Peavy Classic 30. The values of caps and resistors I recommend reflect my own tastes, but you are welcome to try other values. For the boost/shift cap, I like 750pf because it does not drastically change the tone; a higher value such as 1000-1500pf alters the tone more, but may be more appropriate for highly distorted sounds. For the tone caps, you may want to stick with the original values (.022uf for bass and midrange), but I'd definitely recommend putting in a higher quality cap than the tan globs that Peavy uses. Many people consider the Sprague-style Orange Drop caps to be the best, although other metallized polypropylene caps work well, too.

For the OD channel input mod, you may want to try a cap larger than the 680pf to 820pf cap I recommend, and you may want to try paralleling it with a 1.0M+ resistor to increase the low frequencies. As for the mods to the tube board, you can replace the 390pf silver mica cap I recommend with a 100-250pf or 680-820pf for a more "midrangy" sound perhaps more suitable for modern rock. As for replacing the V3A plate load resistor R41 (100k) with a 120k or 150k resistor to increase the gain of the driver stages, this is ***only*** to compensate for the loss in gain when converting the boost switch to a shift switch; if you choose to use the 150k resistor, use discretion when turning up the volume pots.

The Classic 30 isn't the easiest amp to work on with its printed circuit board design, but with these mods as a starting point you may be able to fine-tune your amp to get the sounds you are looking for. Good luck.

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## Parts List:

| Ref # | Stock Value | Modified Value (Substitute) | Source / Number |
|---|---|---|---|
| C4 | 470pf /50v tubular cer cap | 680pf / 500v mica cap | AES # C-SM680<br>ME # 5982-19-500V680 |
| C7 | 470pf /50v tubular cer cap | 390pf / 500v mica cap | AES # C-SM390<br>ME # 5982-15-500V390 |
| C2 | .001uf / 630 v | .01uf / 600v Orange Drop | TE / ME # 75-715P600V0.01<br>AES # C-UD01-630 [NOT O.D.] |
| C1 | 470pf /50v tubular cer cap | 390pf / 500v mica cap | AES # C-SM390<br>ME # 5982-15-500V390 |
| R5 | 470k 1/4 watt resistor | 390k 1/4 watt resistor | Radio Shack, local parts house |
| C11 (Boost) | .047uf / 50v cap | 750pf (820pf) / 500v mica cap | AES # C-SM820<br>ME # 5982-19-500V820 |
| R12 | 220k 1/4 watt resistor | 1.5M to 2.2M 1/4 watt resistor | Radio Shack, local parts house |
| C14 (Treble) | 270pf /50v tubular cer cap | 270pf (250pf) / 500v mica cap | AES # C-SM250<br>ME # 5982-15-500V270 |
| C18 (Bass) | .022uf / 50v mon cap | .047uf * (.022uf)/600v Orange Drop | TE / ME# 75-715P600V0.047<br>AES # C-UD047-630 [NOT OD] |
| C19 (Mid) | .022uf / 50v mon cap | .022uf / 600v Orange Drop | TE / ME# 75-715P600V0.022<br>AES # C-UD022-630 [NOT OD] |
| R41 | 100k 1/4 watt resistor | 120k - 150k 1/4 watt res. | Radio Shack, local parts house |
| | | * use .047uf for more bass | |

## Parts Suppliers:

| Name | Phone | Fax | URL http:// |
|---|---|---|---|
| ME: Mouser Electronics | 1-800-346-6873 | Call toll-free # | www.mouser.com |
| TE: Torres Engineering | 1-650-571-6887 | 1-650-571-0849 | www.wwsites.com/ca/torres007 |
| AES: Antique Electronic Supply | 1-602-820-5411 | | www.tubesandmore.com |
| Peavy Electronics | 1-601-483-5365 | 1-601-486-1361 | www.peavey.com |

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## Other Classic 30 files:

- **Adobe Acrobat PDF file:**
  - **All Seven Classic 30 Articles (PDF): c30_mods.pdf (804K)**
- **Resources:**
  - **Classic 30 Schematic: c30schem.gif (116K)**
  - **Classic 30 Schematic (w/ Mods): c30scmod.gif (144K)**
  - **Classic 30 Layout (hi-res): c30layg1.jpg (708K)**

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