The Blue Guitar

Pro Maniac mod

for BF/SF Reverb amps

OVERVIEW

A few years ago I had put a Torres Super Texan mod kit into my butchered-up '65 Pro, which I thought sounded pretty good until I did some mods to my Peavy Classic 30; I eventually picked up a Pignose G40V which made them both sound very limited. The Super Texan OD channel was basically a one-trick pony as the sound could not be cleaned up by backing off the volume or gain. I liked the way the Pignose could get both clean and overdriven sounds from a single channel so I had this great idea: why not rebuild the Normal channel and output section to Super Reverb AB763 specs and transplant the G40V preamp into the OD channel?

There were a few obstacles to this goal. For starters, the B+ voltages for the preamp tubes were way off; even with the Super Texan mod they were about 100 volts too high. So I added 2 additional stages to the BF Pro power supply, using a 33k/2w resistor followed by a 10k/2w resistor (each stage filtered with a 22uF/500v cap). This brought the voltages down to the values I measured on the G40V so I was ready to wire it up. When I first fired it up I noticed that the OD channel was much brighter than the Pignose, which I attributed to the differences in the driver/PI voltages. So I made a few mods to the G40V preamp so that it would work better with the BF driver (like the 470k/560pF contour network between V2B and V3A).

I had originally installed the Torres Dual Stage Master volume (a 500k dual-ganged pot installed between the driver and output tubes), but all of the pots I tried made a loud "thump" when turned up to 9. So I put in a single-ganged 1MA pot before the driver, with a 100k resistor on the wiper to smooth out the response. (This project amp has pentode/triode and fixed bias/cathode switches left over from it's SuperTexan days which are not indicated on the schematic; these switches and the associated wiring may be the cause of the problems mentioned with the post PI mv.)

I was almost there, but still had room for one more pot on the front panel (which had previously been for the Torres optional "presence" control with the dual stage mv). So I decided to rebuild the driver/PI to brownface specs (Super 6G4-A), which includes a real presence control. Although that alters the stock blackface sound I originally wanted to get from the Normal channel, I prefer the sounds with the brownface driver and presence control.

The last major change was a "Tweed/High Gain" mode switch added to the OD channel to bypass the added gain stage to more faithfully recreate the preamp circuit of the 5F6A tweed bassman. I had to redesign the OD channel preamp a bit to produce

decent tones in both modes but the results were worth the effort. When I was done the OD channel preamp resembled the MVP.GIF schematic over at AMPAGE as much as it did the Pignose G40V. In adding the "Tweed/High Gain" mode switch, some switching noises could not be eliminated (especially at the higher settings of the master volume control) and the added cabling and switches may have added some other noises so I'd consider the "Tweed/High Gain" switch to still be in the experimental stages and "not ready for prime time". I may go back and redesign the switch to eliminate the post volume control altogether for the "tweed" mode; this may reduce some of the noises mentioned above. My suggestion is that you try out the "basic design" first, and that only the more adventurous out there try the "advanced design"; you can still get a fairly authentic 5F6A tweed bassman sound with lower settings of the OD channel pre-gain control.

Before I move on to the details of the design I would like to mention the preamp tubes I ended up using. For the Normal channel preamp tube V1 I got the best clean sounds from a GE JAN 5751 tube (although the Yugo EI 12AX7 works well, too.). For the initial preamp tube of the OD channel V2 you can get a really nice and sweet blues tone using the Yugo EI 12AX7 tube, but for high gain distortion sounds the Sovtek 12AX7WXT+ works great. For the direct-coupled cathode follower in the OD channel I prefer the lower gain of the Sovtek 12AX7WB. The reverb driver tube V4 is a GT 12AT7 because that is what I happened have on hand. I had overlooked the importance of V5, which is the reverb recovery stage as well as the final preamp stage before the driver/PI. I had stuck a cheap chinese 12AX7 in there and finally figured out that it was causing a lot of hum and other noise so I borrowed a NOS GE 12AX7WA driver tube from my Peavy Classic 30 and noticed quite an improvement in tone. For the driver/PI tube I've been using a Golden Dragon 12AT7 which is a very high quality tube even if it was made in China.

The Details

Let us now trace our way through the circuit and I will point out the various sources for this design. Starting with the Normal channel, it was basically rebuilt to Super Reverb AB763 specs for the Vibrato channel. I did add a switch to toggle the 22uF Ck capacitor at the cathode of V1A (using a 100k resistor on the switching contacts to eliminate the "pop" sound). With Ck switched off, you get a cleaner sound with more headroom (but at the expense of 6dB less gain). Other changes from the original specs include the 82k slope resistor (instead of 100k) and the 68k bright cap (instead of 120pF). I added a 10M resistor between the contacts on the bright switch to eliminate the annoying pop when sliding the switch on. The single input jack which serves both channels has the 1M grid load resistor soldered to the jack and a shielded cable terminated by the 33k series resistor is run to pin #2 of V1. A separate shielded cable connects V2 pin #2 to V1 pin #2.

The added shielded cable at the wiper of the Normal Volume control goes to the mute contacts of the channel switching relay K1 (leftover from the Super Texan mod). The relay K1 is shown with the Normal channel selected. The .022uF coupling cap used is from the SR AB763 Vibrato channel. The 1M resistor to ground after the coupling cap is used to bleed off any voltages when the OD channel is selected.

Moving on to the OD channel, the cathode circuit of V2A is a combination of G40V and Marshall values. The 2k7 Rk resistor is common to both designs and I've included a center-off DPDT mini-toggle switch to chose between a 22uF cap ("Full" like a Fender), a 0.68uF cap ("Warm" like many Marshalls) and no cap at all in the center position ("Clean") for less gain but more clean headroom. The plate resistor is 100k and the coupling cap is .022uF, which are fairly standard for this design. The OD Gain pot circuit is straight out of the G40V circuit, with a non-standard 500kA pot used with the cw terminal of the pot connected to a 510k series resistor.

My guess here is that Dennis Kager used the pot and resistor here to simulate the effect of a 1M pot on the circuit, while limiting the gain to what is effectively a setting of 8 (out of 10). The Pignose design is very "hot" (with very few pF caps on the plates and grids) and setting a 1M pot here to 10 could cause oscillations. At least that is my theory behind his design here. (You could alternately replace both the 510k resistor and 500kA pot with a 1mA pot.) The 47pF bright cap on the OD Gain pot is lower than the 5F6A and Marshall values of 100pF and .001uF, but this circuit has plenty of brightness anyway and the 47pF value adds some definition at the lower gain settings.

The cathode circuit of V2B has been the subject of many discussions. This stage is added to the basic 5F6A/Marshall 1959 design on both the Pignose G40V preamp and the MVP.GIF schematic available at AMPAGE. Both the G40V and MVP.GIF designs use a cathode resistor (Rk) of 10k, rather than the more typical values between 820 and 2k7. The G40V adds a rather unorthodox 0.047uF cathode resistor bypass cap, which acts like a bright switch on steroids, and is largely responsible for its "in your face" sound. I originally wired up a Ck switch to toggle between the stock Pignose 0.047uf and a 1.0uF cap mellowed out with a 3k3 resistor in series to ground. (Without the 3k3 resistor, the gain with the 1.0uF cap was too intense. I tried 2k2 and 2k7, but settled on 3k3 as having the most useful sounds at various gain settings.) I experimented with different values for Rk here, and noticed that the lower values (1k5 to 2k7) caused the notes to be cut off abruptly when the 0.047uF cap was selected. So I ended up sticking with the stock Pignose value of 10k. After adding in the "Tweed/High Gain" mode switch, I found myself using the 1.0uF cap almost exclusively so I eventually removed the Ck switch for V2B and hardwired the cap and resistor to the board, and replaced Rk with 1k5.

The OD preamp was running fairly hot so I decided to cut the gain a bit by inserting a 470k/560pF RC contour network after the .022uF coupling cap from V2B and before the 470k grid load resistor for V3A. I later added a center-off DPDT "Contour"

switch to select between the 560pF cap, a 390pF cap and no cap at all for 3 different tonalities.

In adding the "Tweed/High Gain" mode switch, there was initially quite a difference between the signal levels of the two modes so I first replaced the 470k resistor with 150k to reduce the voltage in the High Gain mode by 75%. This did limit the maximum gain and distortion so I later added in a High Gain boost switch (S5) which added a 220k resistor in parallel to the resistor on the board (which was restored to the 470k value). If you do the math you'll find that a 220k and a 470k resistor in parallel add up to approximately 150k. The Tweed mode was still a bit softer than the High Gain mode so I ended up using a switch section to insert a 510k resistor between the ccw terminal of the OD Volume pot and ground.

The direct coupled pair, V3A and V3B, are wired up as in the 5F6A and Marshall circuits, but I did add in a 0.1uF/630v cap between the cathode and the tone stack to smooth out the response a bit. Although not noted on the schematic, I did put in an on-on-on DPDT mini-toggle switch to select between a .022uF cap, the 0.1uF cap and no cap at all. The differences between the 3 settings is fairly subtle, but the 0.022uF cap allows for cleaner low gain sounds.

The tone stack uses a few non-standard values, with a push-pull switch (S7) on the 500k OD Volume pot to choose between the G40V values and more traditional values for the treble cap and the slope resistor. The Pignose uses a treble cap of .001uF and a slope resistor of 33k, which really boosts the midrange and bass (probably compensating for all of the high frequencies boosted by the 0.047uF Ck cap on V2B). So for more traditional sounds, I mounted a 330pF treble cap and a 56k slope resistor on the eyelet board. The push-pull pot parallels the 330pF mica cap with a 680pF mica cap, which add up to 1010pF. It also parallels the 56k slope resistor with an 82k resistor which add up to approximately 33k. (Normally a mid-boost switch just adds in a cap parallel to the treble cap, but I used the second set of contacts to change the slope resistor as well for a more effective simulation of two distinct tone stacks.)

The mid pot for the tone stack is a 50k linear pot paralleled with a 51k resistor. I just did the math on this tweak from Dennis Kager this morning and by combining the two parts we get a 25k pot with a non-linear curve, which has a hump over the straight-line curve of a linear pot. (An audio taper pot has a hump under the straight-line curve.) The result is not a reverse audio taper, but it does resemble that taper a bit.

The OD Volume control is like the OD Gain control, with a 510k resistor in series with the 500kA pot. There is a 500pF cap to ground right after the treble control wiper to bleed some of the high frequencies to ground. As noted above, the Tweed/High Gain mode switch adds in a 510k resistor between the ccw terminal of the OD Volume pot and ground to increase the volume with the Tweed mode. This wiring arrangement allows you to balance the level of the two modes if desired (or even set the Tweed mode louder). With the added 510k resistor, you cannot turn off the volume of the OD channel in the

Tweed mode with the OD Volume control, but can just adjust between what would be 7 and 10 on a typical pot. Mesa uses a similiar approach on their older Boogie amps, but they just cut the ground connection at the volume pot altogether rather than inserting a resistor. The OD channel signal then goes to the channel switching relay.

There is a 1M resistor to ground at the common "hot" relay terminal which then goes to the standard 3M3/10pF reverb splitter. The resistor is left over from the Super Texan channel switching circuit, evidently to reduce any "pops" or maybe to ensure that there is a grid load if the reverb circuit is not used.

The reverb mixer stage V5A is basically to SR AB763 specs. The SR AB763 schematic has a nominal 50k load to ground right after the 0.1uF cap through the Vibrato circuit, so I put in a 100k resistor to ground to load the signal down a bit before going to the 100k series resistor that leads to the 1 meg Master Volume pot, which has a 100k resistor on the wiper to smooth out the response a bit. Not indicated on the schematic is an unbuffered passive fx loop which is inserted into the circuit right after the 100k series resistor.

As mentioned earlier, the driver/PI circuit started out as a slightly modified SR AB763 design (using a 4k7 FB resistor instead of the stock value of 820 ohms). I wanted to add a real tweed-bassman style presence control so I decided to rebuild the driver/PI to the specs of a Super 6G4A, which uses a 56k FB resistor, along with other parts noted on the schematics with asterisks. All of these changes are noted in a text box, indicating which parts to replace if you want to build the driver/PI to SR AB763 specs. I personally think that the presence control adds some nice sounds to the traditional blackface design, and is great for fine-tuning the OD sounds.

Final Notes:

My original idea was to combine the best of two worlds: an AB763 Blackface Super Reverb with a hot-rodded 5F6A Tweed Bassman, all in the same combo amp. Well, due to differences in B+ voltages and in the driver/PI design that magic combination of two "Holy Grail" amps really didn't work out as planned. However, the amp is a lot of fun to play and a lot more usable than it was with the Torres Super Texan mod. Until I added the presence control, the Normal channel was about as Blackface as you could get, duplicating the Vibrato channel preamp of the AB763 Super Reverb. (Although not specifically mentioned before, the amp does not have vibrato, with the vibrato tube socket being used for additional gain stages on the OD channel.)

The OD channel is fairly versatile as it can get a lot of tones from clean to very distorted. For the cleanest sounds, you can use the Tweed mode which eliminates the added gain stage (with the tone stack switch set to 330pF treble and 56k slope). When cranked the Tweed mode produces a nice crunchy sound. The High Gain mode has several options, like the Contour switch (S4) and the High Gain Boost switch (S5) for a

variety of different usable tones. With the OD Gain control set low, you can also get some nice clean tones from the High Gain mode as well.

As always I welcome any suggestions or comments sent to my e-mail address listed below.

Good luck!

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Important Note:

Before starting on this project be sure to read the article listed below ("Pro Maniac Revisited") for all of the latest revisions and additions.

Pro Maniac and related files:

Pro Maniac Revisited (late Summer 1999):

http://www.techaccessinc.com/blueguitar/pro_man2.pdf

Basic design (early Summer 1998):

http://www.techaccessinc.com/blueguitar/pro_man1.pdf

Advanced design (late Summer 1998):

http://www.techaccessinc.com/blueguitar/pro_man2.pdf

Revised design (late Summer 1999):

http://www.techaccessinc.com/blueguitar/pro_man9.pdf

Pignose G40V schematic:

http://www.techaccessinc.com/blueguitar/g40_full.gif

Hot Rod Tweed schematic

http://www.techaccessinc.com/blueguitar/hrt_bm_s.pdf