

Command Technologies HF2500 Amplifier – Issue with Festoon Bulbs

Hardy Command Tech owners will testify to the problem of replacing the small bulbs used to light the two front panel meters on the original range of amplifiers. The HF1250/2500 and 2500E range use 4 small 'Festoon' type bulbs which are located on a small board called the 'Switch Board' positioned towards the front of the unit.

In theory replacing small bulbs such as these should be fairly easy, but although the Command Tech range proved a reliable and solid workhorse, it had some minor but annoying misgivings.

In order to replace these bulbs both top and bottom covers of the unit required removal. The reason the bottom cover needed removing was that the Switch Board was located directly behind the main transformer and was in a really awkward position. Coupled with this, the amps were all 'Hardwired' with very few plugs on leads. This made disassembly quite tedious and time consuming, even to fix minor problems.

To gain access to the Switch Board, remove both top and bottom covers and then remove the 4 stainless screws and bolts that hold the transformer. Unclip the transformer Molex connector and remove the transformer unit. Take care as towards the front of the transformer there is a small disc capacitor connected on the chassis which could easily be crushed by the heavy transformer. Now you can work without hindrance.

Take the knob off the IP/VP switch – it's held in with 2 small grub screws. Unscrew the fine nut which holds the switch in place, and slide the switch out. The switch is hardwired to the board, so the switch and whole board will now come out as a single unit.

You'll notice 4 small 'Festoon' type bulbs. They look like fuses but are not and work differently. All 4 of mine had blown but the PDF info from Command Tech gave no values. Checking the feed read 12v. I searched online here in the UK and found nothing, even at places like RS and Farnell.

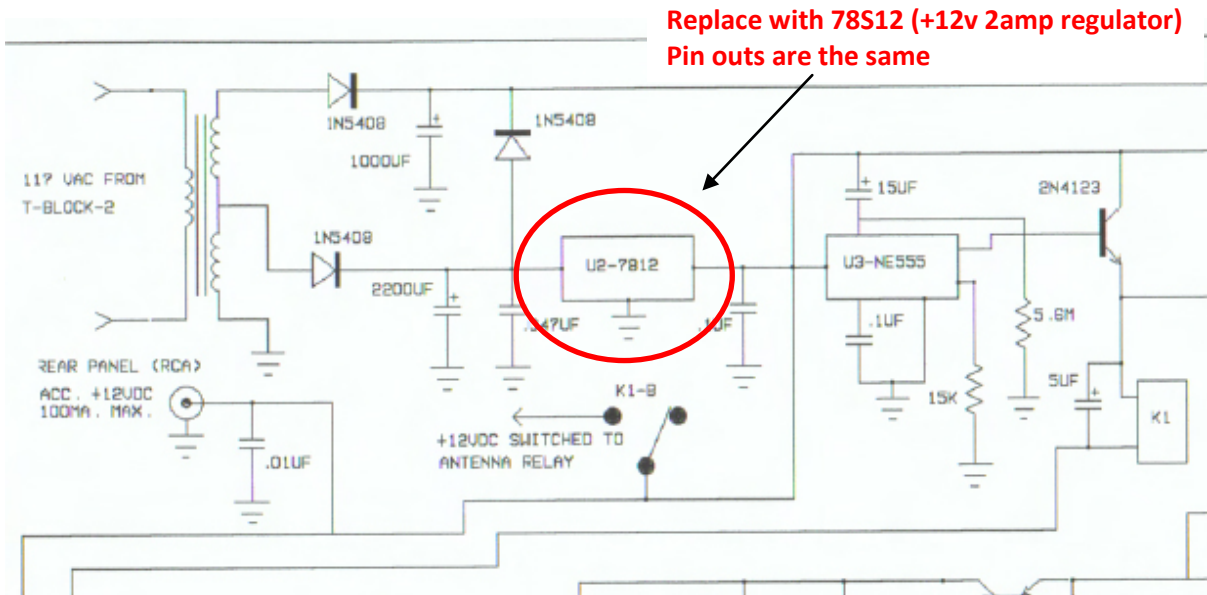
Eventually I found a 3w version here at Conrad, but it had to come from Germany – so I ordered ten. <http://www.conrad-uk.com/ce/en/product/725815/Barthelme-12VV-3WW-Festoon-Bulb-S55-Clear-00311203/0234057&ref=list>

On the face of it, it looked fairly easy so I popped in 4 new bulbs and re-assembled the amp. Switched on and four nice bright new bulbs lit the panel meters, more so than before.

I decided to check everything out and this is where the problems started. First time key up there was a definite problem, amp keyed but the internal relay failed to throw. Grid current went high with little or no output. Something is wrong, so I checked out all the leads and connections, I even checked the tubes and mountings. Could not find any problems. Tried again – same problem. Ok time to reverse engineer what I'd done, so took amp apart removed bulbs and re-assembled. Amp key'd fine and the relays worked so the bulbs are causing a problem. Time to check the schematic.

On reading the schematic, the 12v line seems to be fed from a normal **7812 12volt positive voltage regulator** mounted to a heat sink on the control board. Normal 7812 devices are rated at 1amp but you can allow a little extra if a heat sink is used. In theory this will allow just over 1amp current before the internal current limiting in the device cuts in.

If you then work out that the new 3w bulbs will pull an amp, there seems little in reserve to fire the relay. Also bear in mind the same 12v 1 amp line also supplies the 12v RCA socket on the rear of the amp. This is for supplying 12v DC to accessories. I had this coupled to an ATU which powered the panel lights on the tuner, so add another 100-200 milliamps.



At that point I decided that the problem was the regulator was not sufficient to drive the four new bulbs. No info existed on the old original bulbs so I presume they were fairly low wattage, maybe even 1 or 1.5w. I then took out the control board. This is also not easy as all connections are hard wired. I had to un-solder some connections from the main board to allow for full removal.

At this point I removed the 7812 regulator to find that **no conductive heat sink compound** had been used on the regulator and heat sink. This would further diminish the device output capacity as it would get hot quite quickly. I replaced it with a **78S12** 2 amp regulator mounted to the heat-sink **WITH** plenty of compound. On paper this should allow about 2.5 amps of current on the line.

Cutting a long story short, the amp now keys the relays with all four new 3w bulbs fitted. Following the failure of one bulb 6 months later, I then removed one bulb on each meter as 6w per meter was rather bright. I could have put a resistor inline, but I now run one bulb of 3w on each meter and the display is still really bright as shown below.



I do know of LED conversions which some owners may find easier but this mod worked for me.

73 – Steve G0UIH

Vortex Antenna Systems

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Command Technologies HF2500 Amplifier – Issue with Festoon Bulbs An Update – March 2013 – Enter the ‘Lady in Red’

Well if I thought my problems were now over with the HF2500 it was not to be. I was pretty pleased after doing the regulator mod and this seemed to have cured the problem of the ‘Cut-out’ on the 12v DC line on the control board.

However after a few days operating it soon became apparent that all was still not well. If I had fairly quick or brief QSO’s the amp worked fine. But in ‘*Ragchew*’ mode the amp would cut out after a few minutes of yammer yammer, fail to put any power out and the grid current would jump to around 80ma. Not good news. The only thing to seem to have changed (even before I did the regulator mod) was I had put new bulbs in it. Before then it work flawlessly. It seems really odd that just putting new bulbs in could cause these issues.

Everything originally seem to point to the 12v DX rail not being able to handle the current which was now only about 0.5amp using the 2 x 3 watt Festoon Bulbs. Saying that, I now have a 2 amp regulator in place so what’s going on. I have a small panel meter bulb connected to my tuner light via the 12v RAC jack at the rear of the amp. The specs say 100ma max on this output. I had one small 12v ‘*Grain of Wheat*’ bulb on the feed and that was only 50ma.

So - I removed ALL the Festoon bulbs and disconnected the panel meter RCA connection.

I then installed my own ‘*LED MOD*’ using 6 x 1.85v Super-bright Red LED’s with all 6 connected in series through a 47 ohm ¼ watt resistor on the anode (use 3 on each meter). I took the feed from the bulb holder points on the switch board. The LED’s are now mounted on top of the panel meters on a homebrew mount. There’s just enough room. I now only have 30ma of current draw on the 12v line.

Over 2 weeks it has not cut out once, it’s back to how it was. For some reason the 12v internal circuit which of course also powers other internal components seems unable to do the job when even low wattage (0.5amp current) bulbs are included in the circuit. The LED’s in total draw only 30 milliamps.

I can’t figure out what the issue is, but my thoughts are that the control relays (either one or all) are not working when other components are in the circuit. When the amp cut-out I re-key’d the TX and ‘No Relay’ clunk was heard, so the issue is certainly with the 12v rail. In the meantime, here’s my red LED conversion and touch wood the HF2500 is now happy again 😊.



If there are any guru’s out there that may be able to throw some light (xcuse the pun!) on what the problem may be, then I’ll put the info on here for others to share. Email me steve@vortexantennas.co.uk