

a. about the Glasshouse 300BSE series amplifier

The Glasshouse 300BSE series kit amplifier, features the classic 300B valve in single ended configuration. It is available in two versions, the 300BSEi integrated (with 6 line-level sources and one tape out) and the power amplifier version, 300BSEp (driven by a pre-amplifier, passive or active) The output power is 12 watts into a 6ohm load, so speakers of 89dB and above are required.

The main HT rail is valve rectified using the 5U4 valve, smoothed by a 10H choke and a combination of 4 reservoir capacitors in a Pi network. This powers the 300B and the EF86 input valves. The driver valve, the 5687 has its own dual supply +195Vdc and -195Vdc, formed by a solid state supply. All valve heater supplies are regulated DC. The amplifier is feedbackless and hardwired, with huge 120 lam 2.5 inch stack output transformers, sitting at the rear, astride the mains transformer. She is housed in a beautifully designed 2.5mm aluminium chassis, crowned with a copper plate, with a black transformer cover and valve cover (optional).

b. specifications

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| power output | 12 watts into an 8 ohm load |
| input sensitivity | 370mV |
| hum/noise | 1.2mV |
| bandwidth +/- 1db | 16Hz - 20kHz |
| input impedance | 100Kohm |
| AC mains voltage input | 110V/120V/220V/230V +/-10% |
| power consumption | 220W |
| dimensions | 440mm(w) x 230mm(h) x 440mm(d) |
| weight | 25kg |
| connectors | IEC lead, RCAs x 7pairs(BSEi) or x 1pair(BSEp), 4mm spk post x 2pair |
| valve sockets | 4 x 9BA, 1 x octal, 2 x UX4 |
| valve compliment | 2 x EF86, 2 x 5687, 1 x 5U4, 1 x 300B |

c. requirements of constructor

1. The kit builder needs to be able to solder to a good standard, the majority of problems that occur with kits are down to poor soldering.
2. Be able to read and understand these instructions completely.
3. To have some knowledge of valve circuitry, general electronics and be able to read a circuit diagram.
4. To have a multimeter that can read up to 1000V dc and be able to use the meter properly.
5. Have access to a dummy load, or a spare pair of speakers and be able to connect them to the amplifier during testing.
6. Be aware of the precautions necessary to avoid electric shocks from the mains and amplifier power lines.
7. Have patience, if you rush, you will make mistakes.

d. warantee

Part built kits cannot be returned for a full refund. Defective parts will be replaced, provided they are returned within 60 days of purchase and are confirmed to be defective and not misused. Please note that Hi-fi Collective Ltd will assist in anyway to get your kit up and running. To help you with your inquires, our phones are manned Monday - Friday, 9.00am - 5.00pm, we try to answer e-mails within an hour of them being read. We offer a repair service and will even finish off a part built amplifier for you. Also, we have a "Turn-on" service, where we will check your work, switch her on, test her and play her for 20hrs+. We charge £18.00 an hour for labour.

e. disclaimer

WARNING: The high voltages present in this kit can KILL and the high operating voltages can BURN. Observe all precautions and never connect the kit to an electrical supply until it has been fully assembled, checked and checked again and ready for testing. You should comply to the requirements of the constructor as listed in c. above. In the action of purchasing this kit you assume total responsibility and liability for the use and operation of this kit both for yourself and people around you.

f. company details

address: Hi-fi Collective Ltd, 21 Lakes Lane, Newport Pagnell, Bucks, MK16 8HS
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 e-mail: info@hificollective.co.uk website: www.hificollective.co.uk

CHAPTER 2 - UNPACKING and PARTS LIST

a. taking delivery

Your Glasshouse 300BSE series amplifier will arrive with you via United Parcel Service couriers (UPS), they can deliver any time of the day, so it is a good idea to have somebody around to receive collection, contact Hi-fi Collective Ltd for the delivery day. If they attempt to deliver and you are not in, then they will leave a contact card with a number for you to call, to arrange a suitable day. When delivered you will have to sign for it. Have a quick look at the box exterior for any sign of damaged, in the unlikely event of this happening get the driver to write a note describing the damage and get him to sign it. Contact Hi-fi Collective with the details.

The kit will arrive to you in two boxes. Box No. 1, will contain the mains transformer and 2 off output transformers (box dimensions 400mm x 250mm x 200mm, weight 17kg). Box No. 2, will contains the chassis parts, valves (if ordered), choke, hardware and components (box dimensions 550mm x 600mm x 350mm(h) weight 12kg).

b. unpacking

Carefully open the boxes and remove the items. You will see your receipt for the kit in the large box, make sure the items listed are correct. Also, enclosed are the parts list booklet, instructions booklet and kit pictures booklet. Remove all packing carefully and lay items out ready for cross checking.

With the parts list in front of you tick off the non bagged items. Then all the bagged items, 9 bags in total. To help you identify the numerous parts we have included a parts identifier page at the back of the parts list. On each bag you will see a label, describing its contents.

Any shortfall please contact Hi-fi Collective once a complete count is done.

CHAPTER 3 - PREPARATION

a. work place

Whether in a dedicated workshop, the garage or on the dining room table, an organised work place will save you time and prevent mistakes.

Have your tools close to you & in one place and when you have finished using them put them back. Keep your instructions to hand and try not to rip pages out. It is a good idea to protect you table, an offcut of carpet will work well. You need to have easy access to your soldering iron and solder, always turn it off when not using it especially those of you who have young children. Your work space needs to be well lit with good ventilation to move solder fumes away from you. Above all keep it clean, you don't want to scratch your chassis on a forgotten nut.

b. soldering iron and solder

Your solder and iron are the most important tools in an electronic constructors tool box, but some people get the combination wrong. A good solder joint is one that is shiny, with an even amount of solder on the joint & without brown flux residue. To get it right, first you must have an iron that gets hot enough to melt your solder properly. Most hobbist soldering irons have a tip temperature of around 370 degree C, for example the 25W Antex iron goes to around 390 degree C. Such irons will work well with solder that change from solid to liquid at around 200 degree C. A higher iron temperature will give good flow to higher temperature solders, these change at 300 degree C. Working with these types with your normal 25W Antex will cause dry joints. See section e of the chapter to see which solder and iron to buy.

c. soldering technique

Before soldering, make sure the wire and/or component lead is bent around the tag or valve pin that you are planning to solder. Place the tip of the soldering iron onto the surface of all parts, hold for 1.5 seconds. Apply the solder to the junction, do not flood the join with solder. The whole process should take about 3 seconds.

d. preparing the wire

The wire provided to assemble the 300BSE series has to be prepared before soldering, you need to expose 10mm of wire as a rule. Wire 1/0.6 is PTFE sleeved, silver plated copper wire. When preparing an end, use your snipe nose pliers and lightly squeeze the end. The PTFE sleeving will split and you can peel it like a banana to expose the wire. Cut off the excess sleeving and you are ready to solder.

The remaining wires provided can be stripped using your wire strippers. With multistrand wire it is a good idea to twist the ends & tin with solder before working them, this also applies to all the transformer wires.

d. tool list

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| Multimeter (318) | TOOL01 - £26.43 |
| Economy tool kit (side cutters, snipe nose pliers, wire strippers, flat blade & phillips screwdriver, tool case) | TOOL02 - £11.29 |
| Allen key set (PSEi only) | TOOL03 - £2.29 |
| 8mm spanner | TOOL04 - £1.79 |
| 10mm spanner | TOOL05 - £2.00 |
| 12mm spanner | TOOL06 - £2.36 |
| electrical tape (black) | TOOL07 - £0.79 |
| 16 piece 1/4 inch socket set | TOOL08 - £35.00 |
| 2 x 6R dummy load | TOOL09 - £4.32 -2 x (6 x 1R 5watt resistor to be wired in series per load) |
| Antex 25 W soldering iron | TOOL10 - £15.65 |
| Solder 2% silver | TOOL11 - £33.36 (250g reel, plenty to make several amps) |
| Audio Note silver solder | AN.SOLDER - £9.00 (30g 3 off required to make amp) |
| Electrical safety gloves | TOOL12 - £20.00 (1000Vdc working) |
| M3 nut drivers | TOOL13 - £3.90 |
| M4 nut drivers | TOOL14 - £4.50 |

All items listed above constitute a list of tools required to construct one of our 300BSE kits. They are available from www.hificollective.co.uk prices shown exclude vat. You can order on-line or by fax / telephone to 01908 217202.

CHAPTER 4 - FITTING OF HARDWARE (refer to hardware identifier list)

a. fitting of speaker posts

Follow the pictures on page 2 of the picture booklet for the fitting of each speaker post, start with post No. 1 first. Tighten the post in position by hand. Unscrew the speaker head to access the side hole of the speaker post's body, insert a screw driver through this hole. Tighten the head screw onto the screw driver by hand.

The aim is to achieve a 45 degree angle of entry into the side hole. When using the 10mm spanner, you will see that you have limited movement of the spanner, inside the amp. By using a combination of rotating the screw driver and adjustment of the position of both the screw driver and the spanner you will be able to tightening the post in place. Follow the same procedure to fit post No. 2, then No. 3 and finally No. 4.

 **pick list**
Speaker posts x 4



page 2, picture booklet

 **tools**
1. Phillips screw driver
2. 10mm spanner

b. fitting of phono sockets

Fit a red RCA (phono) sockets as shown on page 3 of the picture booklet, into the "R" right channel "record" location. Tighten by hand, align the solder tag so it is pointing up to the chassis lip (base). Use a 12mm socket set internally to hold the phono in place and tighten with the 12mm spanner externally, this way the solder tag will stay in place. To ease tightening of the RCAs, place the chassis rear slightly over the table edge. Now, fit "input 6", then "input 5"... Once the line is completed, fit the "L" channel RCA black sockets, again start with the "record" location.

If you are building the 300BSEp you need only fit one pair, fit these at the "input 1" position. Fit the "R" channel RCA first then the "L" left. Blank off the remaining RCA socket holes with the RCA insulation hole plugs provided. These snap into place easily.













 **pick list**
300BPSE:
Red RCA sockets x 7
Black RCA sockets x 7












300BSEp:
Red RCA sockets x 1
Black RCA sockets x 1
RCA insulation hole plugs x 12






page 3, picture booklet





 **tools**
1. 12mm socket set with extension
2. 12mm spanner









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| c. fitting of earth post | |
| <p>The earth post is located at the rear panel marked "earthpost". Fit as shown on page 4 of the picture booklet. Make sure you scratch off the paint with a small flat head screw driver where the serated washer contacts with the chassis internally, this ensures a good chassis earth connection for safety purposes. Splay out the solder tags so they are not lying on top of each other as you will need to solder wires to these later. Tighten by hand, then use a 8mm socket set or nut driver, internally to hold in place and tighten with an 8mm spanner externally. You will need to unscrew the earth post's head to fit.</p> |  pick list earth post x 1 M4 solder tags x 2 |
|  page 4, picture booklet |  tools 1. 8mm socket set with extension or 8mm nut driver 2. 8mm spanner 3. small flat head screw driver |
| d. fitting of IEC socket with fuse holder | |
| <p>Position the IEC socket & fuse holder the correct way round onto the chassis, see page 4 of the picture booklet, and fit in place with the screws and nuts provided. Remove the fuse tray, this can be levered out by careful use of a flat head screw driver. Snap in the fuse onto the tray into the correct compartment and re-insert into the socket. For 220V/230V operation you need a 1A anti-surge fuse, for 100V/110V/120V operation you need a 2A anti-surge fuse. Always use the correct fuse.</p> |  pick list IEC socket with fuse holder x 1 fuse x 1 M3 x 16 silver pozi-drive screws x 2 M3 nut x 2 |
|  page 4, picture booklet |  tools 1. Phillips screw driver 2. M3 nut driver 3. small flat head screw driver |
| e. fitting of the silver anodised front panel | |
| <p>Fit the front panel the correct way round. It is held in place by 4 screws that pass through holes in the main chassis front panel and screw into threaded inserts on the silver anodised front panel. To assist you can hold the screw in place on top of your phillips screw driver with a wrap of electrical tape.</p> |  pick list silver anodised front panel x 1 M4 x 6 black pozi-drive screws x 4 |
|  page 6, picture booklet |  tools 1. Phillips screw driver 2. Electrical tape |
| f. fitting of valve base, V7 | |
| <p>See page 8 of the picture booklet for orientation of the valve base, note the position of the locator key in the centre of the valve base. The ring slips onto the valve base, pushing the base onto the inside of the top of the chassis. Use the countersunk screws and fit the nuts, tighten by hand. For the final tightening, use the pliers to hold the nut and do the work with the screw driver. It is well worth tightening one screw a little then working on the other, then back to the first. This ensures that the valve base lies flat.</p> |  pick list octal valve base x 1 valve base fixing ring x 1 M3 x 10 silver pozi-drive countersunk screws x 2 M3 nut x 2 |
|  page 8, picture booklet |  tools 1. Phillips screw driver 2. snipe nose pliers |












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| g. fitting of copper plate | |
| <p>You will see that one side of the copper plate has a horizontal grain, this is the top, visible side. Place on top of the main chassis, you will see that it is slightly smaller than the chassis, but the holes will line up. Once aligned you can start fitting the top surface hardware. Pls note that copper is a soft metal and will distort slightly, so do not over tighten any of the screws. Also, even though the lacquer is baked on, it will scratch easily.</p> |  pick list copper plate x 1 |
|  page 6, picture booklet | |
| h. fitting of standoffs, valve bases and grommets | |
| <p>Follow closely the pictures on page 6 & 8, for the correct location of the different sized standoffs and correct orientation of the valve bases.</p> <p>For the STANDOFFS, use the phillips screw driver to hold the screw and tighten with the M3 nut runner holding the standoff. You will find 8 locations to the rear of the chassis where the hole cutout of the copper plate is larger than that of the main chassis. Here, you must use the M3 x 10 silver countersunk screws with the M3 x 20mm standoffs. (NB only 4 required for 300BSEp). For all the remaining standoff locations use the M3 x 12 black screws.</p> <p>For the valve bases V1/V2/V3/V4 use the M3 x 12 black screw with the M3 nuts, follow the same procedure as described in (f) for correct fitting.</p> <p>V5/V6 fit directly onto the M3 x 15mm standoffs, using M3 x 12 black screws. Note the orientation of the valve bases, 2 pin holes are larger than the other 2, refer to the pictures. The 6 grommets are fitted to the rear of the top surface to protect wires going into the main chassis. They fit snugly into position.</p> |  pick list B9A valve base x 4 B9A base fixing ring x 4 UX4 valve base x 2 M3 x 20mm standoffs x 14 (10 for 300BSEp) M3 x 25mm standoffs x 2 M3 x 15mm standoffs x 4 M3 x 10 silver countersunk screws x 8 (only 4 required for 300BSEp) M3 x 12 black pozi-drive screws x 40 large PVC grommets x 4 small PVC grommets x 2 |
|  page 6 & 8, picture booklet |  tools 1. Phillips screw driver 2. M3 nut driver 3. snipe nose pliers |
| i. fitting of LM323K 5V voltage regulators | |
| <p>These devices are used to provide a regulated dc supply for the heaters of V1-V6. 4 are used, one providing the heater supply for V1/V3, one for V2/V4 (incorporating diodes in the circuit to achieve 6.3Vdc), one for V5 and the last for V6. They are bolted onto the chassis which acts as a heatsink. The body of the device is the common connection, so they are isolated from the chassis by using mounting kits.</p> <p>Refer to page 5 of the picture booklet. Make sure the solder tags point to the front of the amp, ready for soldering later.</p> |  pick list LM323K x 4 M3 x 16 silver pozi-drive screws x 8 M3 nut x 8 M3 solder tag x 4 mounting kit x 4 (insulation washers x 2, rubber pad x 1, per device) |
|  page 5, picture booklet |  tools 1. Phillips screw driver 2. M3 nut driver |
| j. fitting of choke, capacitor clip and capacitor C5 | |
| <p>Align the choke over its 4 fitting holes, with the solder pins facing V7. Fit in place using the M4 x 10 black screws and M4 nuts provided. For the final fixing use pliers to hold the nut in place and tighten with the phillips screw driver.</p> <p>Fit the capacitor clip, using a M4 x 10 black screw and a M4 nut. Tighten using the M4 nut driver with the phillips screw driver holding the screw in place. Using 1 off M3 x 12 black screw and a M3 nut, join the 2 arms of the clip together. Only turn the nut a couple of times, now you can slide in capacitor C5. One in place tighten the arms together with the pliers holding the nut and tightening with the phillips screw driver. Orientation of the capacitor is vital.</p> |  pick list choke x 1 capacitor clip x 1 capacitor C5 x 1(bag 2) M4 x 10 black pozi-drive screw x 5 M4 nut x 5 M3 x 12 black pozidrive screw x 1 M3 nut x 1 |
|  page 1, picture booklet |  tools 1. Phillips screw driver 2. pliers 3. M4 nut driver |







| k. fitting of mains and output transformers | |
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| <p>Before starting, I must state that this stage involves HEAVY lifting. Each transformer weighs in at 5kg, the combined weight of the chassis and transformers is 23kg. You must ask for help, this is a 2 man lifting exercise.</p> <p>Fit in this sequence - output (either position), mains(middle), output. Note the orientation of the transformers, looking at the position and colour of the leadouts will help. This is vital for low hum operation. The pictures will detail which wires are to go through which holes.</p> <p>Align the first transformer over its fixing holes, insert its 4 x M4 x 10 black screws. Angle that corner on the amp over the table lip, with your "extra pair of hands", keep the amp stable, you can gain access underneath to hand fit the M4 nuts. Final fit with a M4 nut driver tightening, while the phillips holds the screw steady. Insert the wires of this transformer through the correct grommeted hole. Fit the remaining transformers following the same method.</p> <p>Make sure you do not sandwich any of the leads between the chassis and the transformer, this is very DANGEROUS .</p> <p>Push the transformer leadouts through the correct grommet as suggested.</p> | <p> pick list</p> <p>mains transformer x 1 output transformer x 2 M4 x 10 screw x 12 M4 nut x 12</p> |
| <p> page 7, picture booklet</p> | <p> tools</p> <ol style="list-style-type: none"> 1. Extra pair of hands 2. Phillips screw driver 3. M4 nut driver |

CHAPTER 5 - WIRING THE AMPLIFIER

| a. fitting of flying leads to U1/U2/U3/U4 | |
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| <p>Cut 8 lengths of 15cm 24/0.2 red wire and 8 lengths of 2cm heat shrink. Look closely at page 5 of the picture booklet, you will see that you must solder wires onto the pin outs of the LM323Ks and cover the join with heat shrink. It is best to use a hair dryer on "hot" setting to shrink the heat shrink.</p> <p>Once done, label the ends of each of the wires so that you can identify the U number and whether it is Vout or Vin once the wires are passed through the small grommet. These are wired in later. Writing on masking tape works well as a label</p> | <p> pick list</p> <p>24/0.2 red x 1.2m heat shrink x 16cm masking tape for identifying leads</p> |
| <p> page 5, picture booklet</p> | |
| b. fitting of tag boards & selector PCB (300BSEp only) | |
| <p>Pay close attention to page 15 & 16 of the picture booklet to see which holes in the centre part of the tag boards are used for fixing and which way round the selector PCB goes.</p> <p>When fitting boards PSU3 & PSU4, make sure the red flying leads are coming out between U1/U2 & U3/U4, respectively, for easy access later.</p> | <p> pick list</p> <p>tag boards x 6 M3 x 12 Black pozi-drive screws x 12</p> |
| <p> p1 & 15 & 16, pic booklet</p> | |

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| c. fitting of components to tag boards | |
| <p>Each tag board has 36 tags these are labelled and referenced throughout the wiring phase. Bags 1 - 6 of the kit contain the components, each is labelled, identifying the contents clearly. Some components need to be correctly orientated, see page 9, this is very important as they can blow up. Some components are positioned on the underside of the tag boards. Keep to the specified layout it has been proven to give minimal hum and in certain case it is the only way some components will physically fit.</p> <p>The higher wattage resistors 1W and above need to be spaced 10mm off the tag board as they do get hot and in time can tarnish the tag board. Otherwise keep lead lengths to a minimum.</p> <p>Make absolutely sure no leads are touching the chassis, tag board fixing screws or underlying standoffs.</p> <p>Once they are soldered in place, cut off excess.</p> <p>Components D9-D24 & U1-U4 are static sensitive so use pliers when handling and touch them only when you have too.</p> <p>All that should remain is R17-R20, R31-R34, R1, R39-R42, R6, R7 & R45, this are fitted in the next section. VR1 is fitted later (300BSEi only)</p> | <p> pick list</p> <p>bags 1 - 6</p> |
| <p> page 1, 9, 10, 11, 12, 13, 15 & 16, pic booklet</p> | |
| d. fitting of R45, valve base & C5 components | |
| <p>Follow page 1, 8, 15 & 16 for the fitting of all valve base located components, try and keep lead lengths to a minimum.</p> <p>For the fitting of R45 see page 4.</p> <p>R1 is connected between V7, pin 8 and pin 1 of the choke. This resistor sees a very high voltage so ensure there is no contact with the chassis, valve base ring or body of the choke. See page 1 & 8.</p> <p>For R6 & R7 fitting see page 1.</p> | <p> pick list</p> <p>R17-20 R31-34 R1 R39-R42 R6 R7 R45</p> |
| <p> page 1,4, 8, 15 & 16, picture booklet</p> | |
| e. wiring of PSU4 tag board | |
| <p>This board provides the heater voltage to V1/V3 - 6.3Vdc and V5 - 5Vdc. Follow page 8 & page 13.</p> <p>You will see that all the wiring information is provided in these pictures, which wire to use and where the wires are connected to.</p> <p>Twist together the 2 green wires from the mains transformer and follow the same practice for the yellow wires from the mains transformer.</p> <p>When wiring the "common" connection of U3 & U4 you are connecting to the solder tag on the body of the LM323K.</p> <p>Wire runs to the heaters are twisted together slightly to keep them close together.</p> <p>Try to avoid any physical contact of wires to the body of any of the LM323Ks as they do run warm.</p> | <p> pick list</p> <p>orange 1/0.6 red 24/0.2 green/yellow 24/0.2</p> |
| <p> page 8 & 13, picture booklet</p> | |
| f. wiring of PSU3 tag board | |
| <p>This board provides the heater voltage to V2/V4 - 6.3Vdc and V6 - 5Vdc. Follow page 8 & page 12.</p> <p>You will see that all the wiring information is provided in these pictures, which wire to use and where the wires are connected to.</p> <p>Twist together the 2 pink wires from the mains transformer and follow the same practice for the orange wires from the mains transformer.</p> <p>When wiring the "common" connection of U1 & U2 you are connecting to the solder tag on the body of the LM323K.</p> <p>Wire runs to the heaters are twisted together slightly to keep them close together.</p> <p>Try to avoid any physical contact of wires to the body of any of the LM323Ks as they do run warm.</p> | <p> pick list</p> <p>orange 1/0.6 red 24/0.2 green/yellow 24/0.2</p> |
| <p> page 8 & 12, picture booklet</p> | |

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| g. wiring of PSU2 tag board | | |
| <p>This board provides the HT voltage to feed V3 & V4, supply under load voltages of +195V, -195V and -35V. Follow page 8 & 11.</p> <p>You will see that all the wiring information is provided in these pictures, which wire to use and where the wires are connect to.</p> <p>Twist together the 2 grey and single red wires from the mains transformer.</p> <p>If you are constructing the 300BSEi, note that there is an extension rod that runs from the selector to the front panel, this travels over and near tag 13 to tag 24. Although this rod will be isolated with electrical tape prior to fitting later it is a good idea to lie all components flat.</p> |  pick list orange 1/0.6 red 24/0.2 green/yellow 24/0.2 | |
|  page 8 & 11, picture booklet | | |
| h. wiring of PSU1 tag board | | |
| <p>This board provides the valve rectified HT voltage to feed V1, V2, V5 & V6, providing 460V & 400V. A portion of the board acts as the star earth, where most earth returns meet prior to connection to R45. Follow page 1 & 11.</p> <p>You will see that all the wiring information is provided in these pictures, which wire to use and where the wires are connected to.</p> |  pick list orange 1/0.6 red 24/0.2 green/yellow 24/0.2 | |
|  page 1 & 11, picture booklet | | |
| i. wiring of C5 | | |
| <p>Follow closely page of the picture booklet and wire up as shown. The negative terminal of C5 is used as a connection point of the white wire of the mains transformer. this wire needs to be platted along with the mains transformer's 2 x black wires to assist in hum reduction. The black wires follow a similar course as they are connected to V7 later.</p> <p>Note that R6 floats at one end make sure it is not touching anything.</p> |  pick list | |
|  page 1, picture booklet | | |
| j. wiring of valve base, V7 | | |
| <p>follow the pictures on page 8. Twist together the 2 purple wires from the mains transformer and connect as shown.</p> | | |
|  page 8, picture booklet | | |
| k. wiring of the selector PCB (300BSEi only) or inputs (300BSEp only) | | |
| <p>For the 300BSEi you need to wire up the selector PCB as shown on page 14. Do not wire up the screened wire yet as VR1 needs to be fitted first. Try and keep all the signal wires together and follow the shortest route.</p> <p>For the 300BSEp, follow the picture on page 3 and wire up the screened wires accordingly. Keep the 2 signal wires and follow the route passed U4, between the choke and PSU2, keep to the right side of V7 and when the wires are 5cm under V1/V2, separate them and wire as shown on page 8.</p> |  pick list orange 1/0.6 screened wire | |
|  page 1, 3, 8 & 14, picture booklet | | |
| l. wiring and fitting of VR1 (300BSEi only) | | |
| <p>Follow page 14 of the picture booklet. Cut 2 lengths of 30cm screened wire and 2 lengths of 55cm screened wire. Wire as shown. You will need to label the free end of these wires. The shorter - "V1, right channel" and "V2, left channel" and the longer, "right channel, selector" and "left channel, selector".</p> <p>Prior to fitting you need to scratch the paint away internally around the VR1 hole on the front panel, so the body of the volume potentiometer is earthed.</p> <p>Now you can wire up the other identified ends -see page 1, 8 & 14</p> |  pick list VR1 screened wire masking tape | |
|  page 1, 8 & 14, picture booklet | | |

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| m. wiring of remaining valve bases | |
| Though completion of the previous sections most of the valve base wiring will be done. So go through each base carefully and complete the wiring. |  pick list 1/0.6 orange |
|  page 8, picture booklet | |
| n. speaker posts | |
| When soldering to the speaker posts remove the head screws to assist in quicker heat transfer. With a 25 watt you need to hold the iron onto the tip of the post for a least 6 seconds before the solder will take properly. Strip a length of red wire, solder one end to the black, right channel speaker post and the other to the black, left channel post. Wire the rest as shown on page 2. |  pick list green/yellow 24/0.2 red 1/1.2 |
|  page 2, picture booklet | |
| o. wiring of IEC/fuse socket, mains switch & earth post | |
| Follow page 4 closely. Solder appropriate lengths of the brown, blue and green/yellow wires to the correct solder tags of the IEC /fuse socket. Position the isolation boot so it fit snugly over socket. Wire the brown and blue wires (twisted along path) from the socket to the switch. It is easier to solder up the switch with the wires passing through the fixing hole with the switch hanging out. For 220/230V operation, solder together and isolate with electrical tape the red and orange wires from the mains transformer. Twist these up with the blue and brown wires of the mains transformer and wire the brown and blue wires to the switch. Insert the switch. Complete the wiring of the earth post. |  pick list green/yellow 24/0.2 brown 24/0.2 blue 24/0.2 |
|  page 4, picture booklet | |

CHAPTER 6 - TESTING YOUR WORK

| a. using your multimeter | | | | | |
|--|--------------------|-------------|-------------|-------|---------------|
| For all test procedures you will need to use your multimeter. I trust you are familiar with using one. Most tests are done with your meter on the dc voltage settings, measuring the voltage between 2 points. You will see from the following tables that you will be told the conditions of the test. Where to place your common probe (black), your voltage/ohm probe (red), the required setting of your meter and the expected result. Pls allow 10% variations in the results due to variations in the mains voltages and valve characteristics. | | | | | |
| b. no load, no valve tests | | | | | |
| the following tests require no valves to be fitted, no signal input and no speakers/dummy load to be attached. You will be measuring the heater voltages and the dual voltage supply that feeds the 5687s, all dc volts. Test points 5-7 will measure higher than on the circuit as the valve is not connected. This is not the case for test points 1-4 as they are created from voltage regulators whose job it to maintain a constant voltage whether under load or not. | | | | | |
| No. | multimeter setting | black probe | red probe | volts | circuit place |
| 1 | dc voltage, 20V | earth post | PSU4 tag8 | 6.3V | V1/V3 heaters |
| 2 | dc voltage, 20V | earth post | PSU3, tag29 | 6.3V | V2/V4 heaters |
| 3 | dc voltage, 20V | PSU4, tag16 | PSU4, tag17 | 5V | V5 heater |
| 4 | dc voltage, 20V | PSU3, tag21 | PSU3, tag20 | 5V | V6 heater |
| 5 | dc voltage, 1000V | earth post | PSU2, tag10 | 220V | point C |
| 6 | dc voltage, 200V | earth post | PSU2, tag20 | -39V | point D |
| 7 | dc voltage, 1000V | earth post | PSU2, tag16 | -220V | Point E |

d. with load and valves inserted test

the following tests require the valves to be fitted, speakers/dummy loads to be attached and no signal input. You will be measuring all under load test points. All test points as a rule will, at first, measure higher than the stated voltages, but as the valve heaters warm up and the valve begins to conduct, the voltage will fall. The exception being denoted by **, where the voltage will rise from 0Vs to the intended voltage.

| No. | multimeter setting | black probe | red probe | volts | circuit place |
|-----|--------------------|-------------|-------------------------|-------|---------------|
| 8 | dc voltage, 1000V | earth post | choke, pin 1 | 495V | choke, pin 1 |
| 9 | dc voltage, 1000V | earth post | choke, pin 2 | 460V | point A |
| 10 | dc voltage, 1000V | earth post | positive terminal of C5 | 400V | point B |
| 11 | dc voltage, 1000V | earth post | PSU2, tag10 | 195V | point C |
| 12 | dc voltage, 200V | earth post | PSU2, tag20 | -35V | point D |
| 13 | dc voltage, 1000V | earth post | PSU2, tag16 | -195V | Point E |

right channel

| | | | | | |
|----|-------------------|------------|---------------------------|------|---------------|
| 14 | dc voltage, 200V | earth post | V1, pin 6 | 175V | V1, anode |
| 15 | dc voltage, 200V | earth post | V1, pin 1 | 125V | V1, g2 |
| 16 | dc voltage, 20V | earth post | V1, pin 3 & 8 | 2.7V | V1,cath. & g3 |
| 17 | dc voltage, 200V | earth post | V3, pin 2 & 7 | -32V | V3, grids |
| 18 | dc voltage, 1000V | earth post | V3, pin 1 & 9 | 195V | V3, anodes |
| 19 | dc voltage, 1000V | earth post | V3, pin 3 & 6 | -23V | V3, cathodes |
| 20 | dc voltage, 1000V | earth post | V5, pin 1 | 450V | V5, anode |
| 21 | dc voltage, 200V | earth post | V5, junction of R39 & R41 | 57V | V5, cathode |
| 22 | dc voltage, 200V | earth post | V5, pin 2 | -23V | V5, grid |

left channel

| | | | | | |
|----|-------------------|------------|---------------------------|------|---------------|
| 23 | dc voltage, 200V | earth post | V2, pin 6 | 175V | V2, anode |
| 24 | dc voltage, 200V | earth post | V2, pin 1 | 125V | V2, g2 |
| 25 | dc voltage, 20V | earth post | V2, pin 3 & 8 | 2.7V | V2,cath. & g3 |
| 26 | dc voltage, 200V | earth post | V4, pin 2 & 7 | -32V | V4, grids |
| 27 | dc voltage, 1000V | earth post | V4, pin 1 & 9 | 195V | V4, anodes |
| 28 | dc voltage, 1000V | earth post | V4, pin 3 & 6 | -23V | V4, cathodes |
| 29 | dc voltage, 1000V | earth post | V6, pin 1 | 450V | V6, anode |
| 30 | dc voltage, 200V | earth post | V6, junction of R39 & R41 | 57V | V6, cathode |
| 31 | dc voltage, 200V | earth post | V6, pin 2 | -23V | V6, grid |

fitting of selector extension rod (300BSEi only)

with all testing done you can now fit the extension rod into the selector. Due to the close proximity of the rod to PSU3, measure 3cm up from one end of the rod. Starting here wrap at least 3 layers of electrical tape going up 6cm. Fit the coupler onto the shaft of the selector and with a flat head screw driver fix the coupler to the selector shaft. Fit the rod through the hole in the front panel and fix to the other half of the coupler.

**pick list**

electrical tape
flat head screw driver



page 15 & 16, picture booklet

play a tune

If all measurements are correct you have a successfully built amplifier and you are ready to play some music. Well done and enjoy your Glasshouse amp. If you have experienced any problems please contact Hi-Fi Collective, we are here to help you.