

## **MkIII Replacement X-Overs for Tannoy HPD315A Loudspeakers (Cheviots)**

Although meant for my HPD315A, the design of all the Tannoy HPD and Monitor Gold x-overs, is very similar. It would be easy to tweak the layout to suit all variants, just substituting the correct values.

My goal, is to take the already good Tannoy design and refresh tired and ageing parts. I have limited funds, so in all aspects I will be looking for a good price/performance ratio. I will be using values recommended by Hans Hilberink on the Tannoy user group, to achieve a midrange more like the Monitor Golds.

### **My choice of parts:**

All resistors will be the popular and good sounding Mills MRA-12 1% range. There are arguably better sounding parts out there, but for considerably more cash.

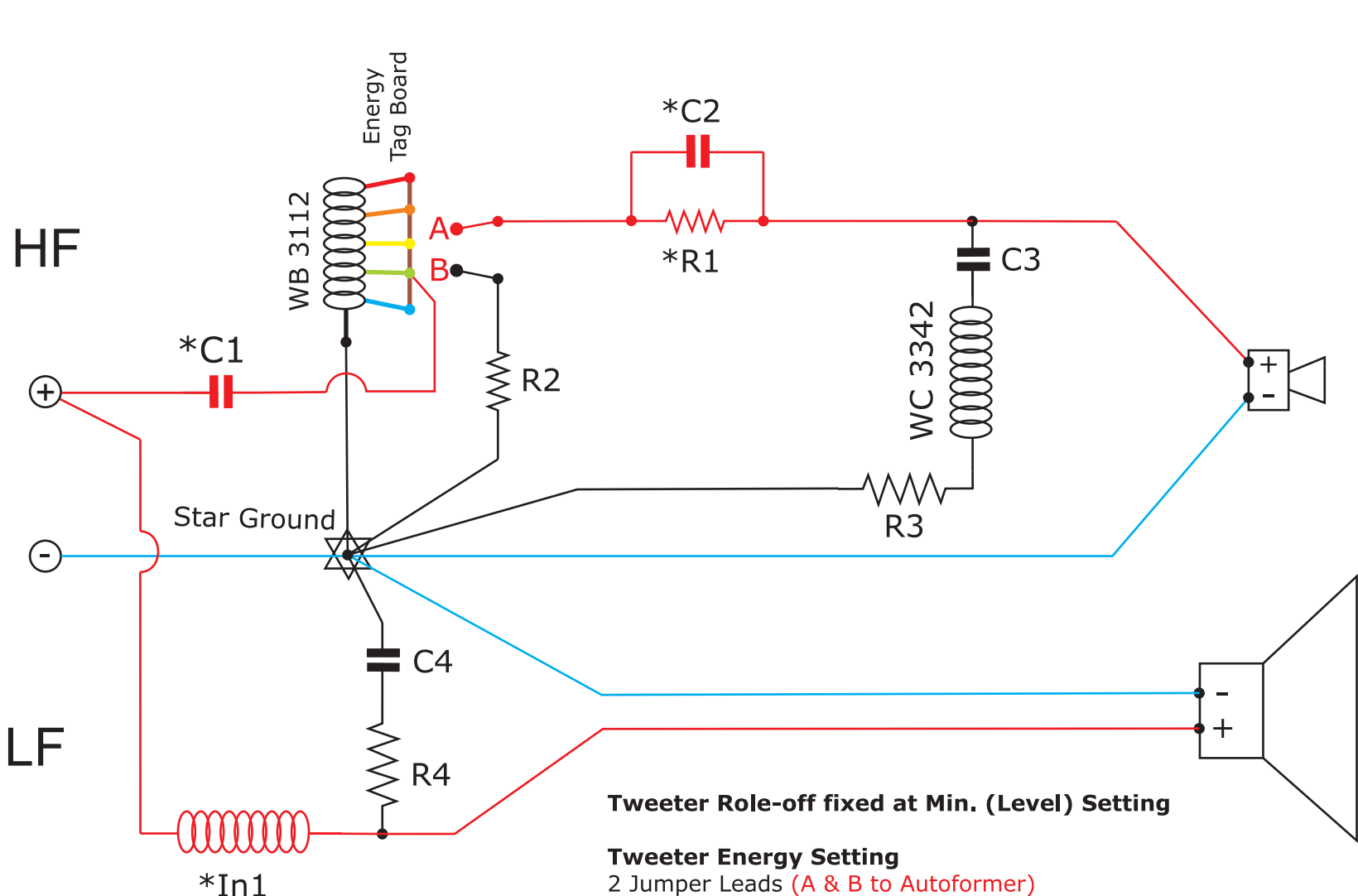
The capacitors, Sonicap Gen I. These get some great reviews and comments like ""I can advise them if you are looking for a "high-end" cap but are on a "tight" budget"" from Tony Gee's humblehomemadehifi.com. In his capacitor tests he also recommends the Vishay1837 capacitor paired up as bypass cap for the Sonicap. On the Vishay caps the verdict was: "Can't live without them!" Tony commented that the Sonicaps work best when used throughout as they don't always mix well with other makes. I take this advice and will be using them exclusively.

The use of bypass caps is, I know, contentious. I took the stance that for £10 all in, it will be worth including them. If they improve the sound, even slightly, then it's a bonus. As I am not aware of any downside to putting them in, the worst case is that I have wasted a tenner.

I am keeping the original small value inductor in the HF correction circuit. Also the much talked about Autotransformer. The stock low pass coil (2.1mH) will be replaced with a Jantzen-1844 Air Coil. I will place the chunky Jantzen as far away from the Autoformer as possible within my layout.

I notice that many DIY x-overs look very crude in their construction and layout. I know it's the sound that counts but a bit of care surely! Typically \$1,000 worth of parts thrown in a box, with crude blobs of solder and no thought about cable paths, or the need to swap out parts easily, if the first choice is wrong. One of my pet hates is cable ties, they look awful, a Mundorf Silver in Oil held by a single cable tie, that hasn't even been turned so the clasp is on the underside, pretty it ain't! But that's just me, if I'm going to spend time and cash, on my hobby, I want it to look as good as the manufacturers, if not better. Half the fun is in trying to achieve this. Rant over - I am going to use a 2.5mm thick Tufnol sheet as my board (Synthetic Resin Bonded Fabric). Much more substantial than your typical glass fibre PCB. The components will be held in place with hot melt glue, this serves two purposes. First it helps avoid unwanted vibrations, second the chunky parts become part of the structure and help make the whole thing more rigid. The wiring will be point to point, 16 AWG, single strand tinned copper. Most connections will be on the underside, leaving the top deck tidy. I will be adopting star grounding, Tannoy (and others) concluded there were benefits.

Well that's my intended approach, we'll see if I manage to deliver on this project. For progress/more pictures see [www.jkwynn.co.uk](http://www.jkwynn.co.uk)



C1 = 6.8 mfd  
 C2 = 1.5 mfd  
 C3 = 3.3 mfd  
 C4 = 15.0 mfd

In1 = 2.1 mH

R1 = 30 ohm  
 R2 = 50 ohm  
 R3 = 10 ohm  
 R4 = 2 ohm

**Tweeter Role-off fixed at Min. (Level) Setting**

**Tweeter Energy Setting**  
 2 Jumper Leads (A & B to Autoformer)

Connect A to:		Connect B to:	
+	Red	None	
Level	Orange	Green	
	Yellow	Yellow	
	Green	Orange	
-	Blue	Red	

Use A to Green and B to Orange for monitor gold type sound.

Note: \* These parts are in series, use the best parts you can afford. Each Capacitor has a 0.01uf Vishay MKP 1837 bypass cap fitted but not shown. See component layout.

This set up has been tweaked as Hans Hilberink suggested to give a mid range more like the Monitor Golds. The values of C1 and R4 have been altered from standard and as suggested the treble energy level reduced by one notch.

## X-Over Components Used - Pricing is just a guide

					<u>QTY</u>
C1 = 6.8 mfd	Sonicap Gen I	Dia23x46		\$16.34+P&P	2
C2 = 1.5 mfd	Sonicap Gen I	Dia17x25		\$7.92+P&P	2
C3 = 3.3 mfd	Sonicap Gen I	Dia20x32		\$10.78+P&P	2
C4 = 15.0 mfd	Sonicap Gen I	Dia33x44		\$25.64+P&P	2
In1 = 2.1 mH	Jantzen-1844 Air Coil (0.60 ohm) Dia54x30			£9.56+vat/P&P	2
R1 = 30 ohm	Mills MRA12	10w 1%	Dia8x30	\$4.15+P&P	4
R2 = 20 ohm		Ditto		\$4.15+P&P	2
R3 = 10 ohm		Ditto		\$4.15+P&P	2
R4 = 2 ohm		Ditto		\$4.15+P&P	2

Vishay MKP 1837 0.01uf Bypass Caps 7.5 x 5.5 x 7 Tall £10.50 per 10

\$162.86 +P&P

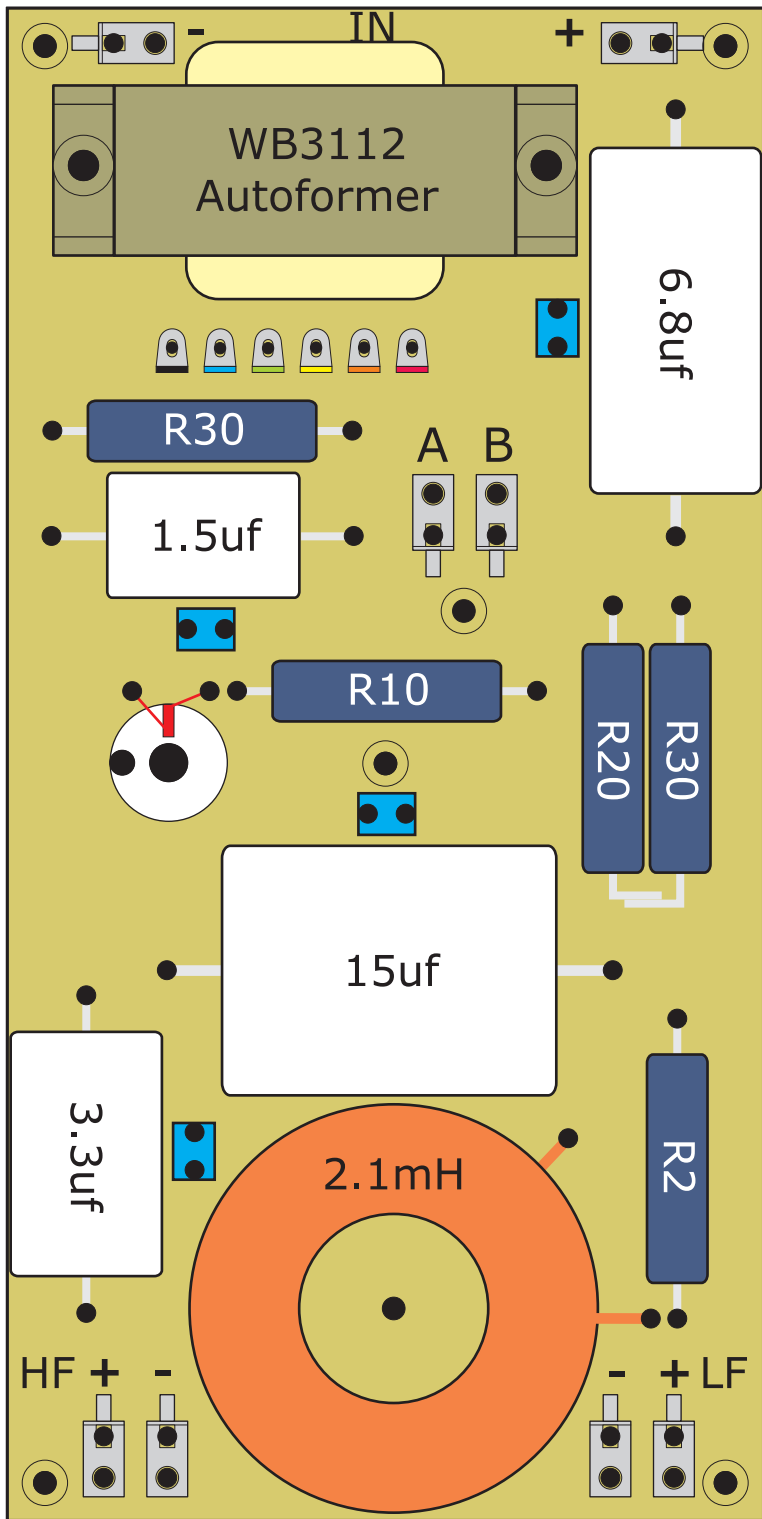
£33.45 +P&P

Cost at current exchange rate approx (Feb 2012) £137.00 +P&P

I spent about £30 on other parts like the tufnol boards, brass nuts & bolts, heat shrink etc.  
Importing the Caps and Resistors cost £30 in Tax.

**Total to produce the two x-overs was about £210.**

Note: R2 (50 ohm) made up of 20 + 30 ohm - All Dimensions in MM



## Component Layout

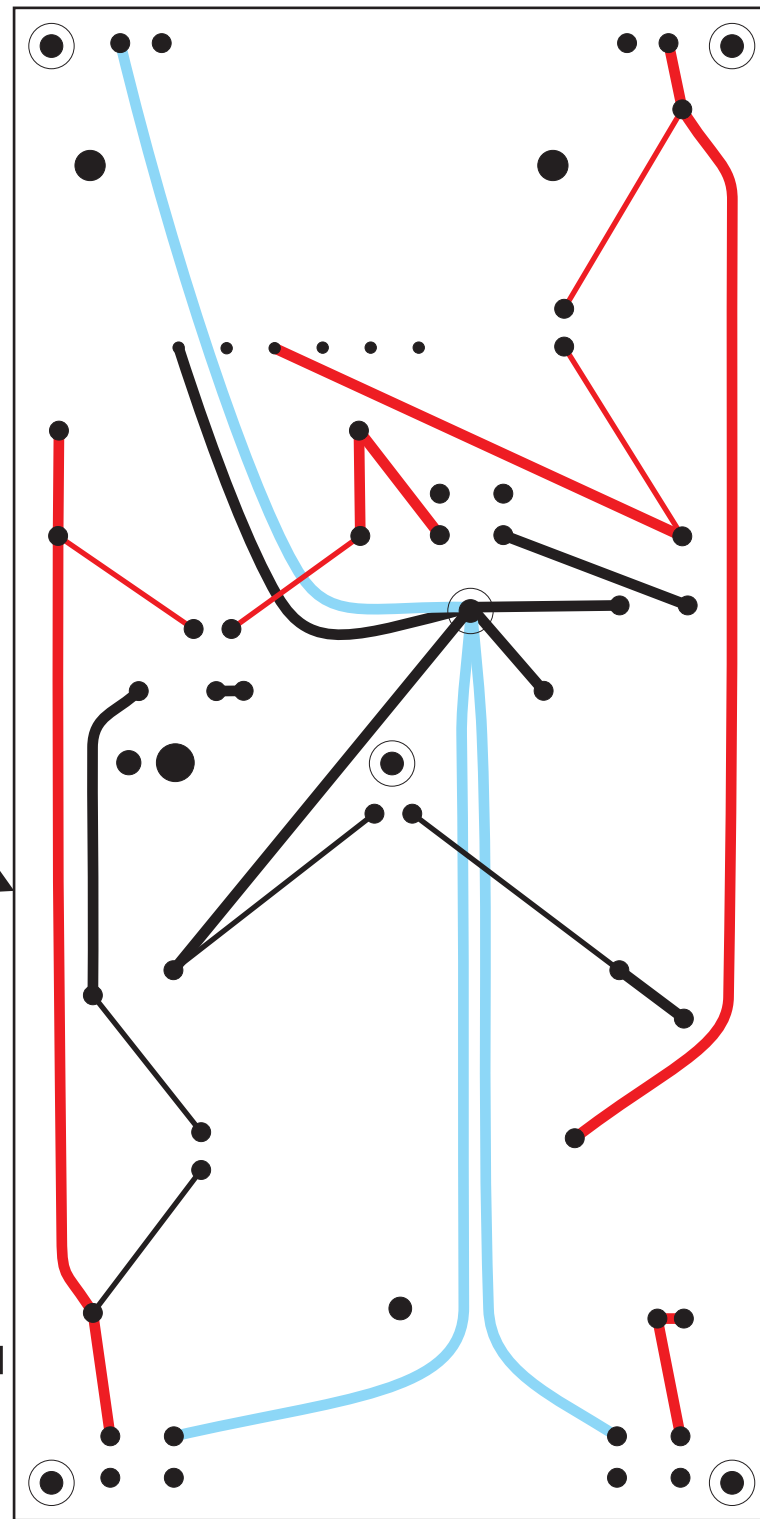
Drawn at full size.  
The board measures  
100 x 200mm.

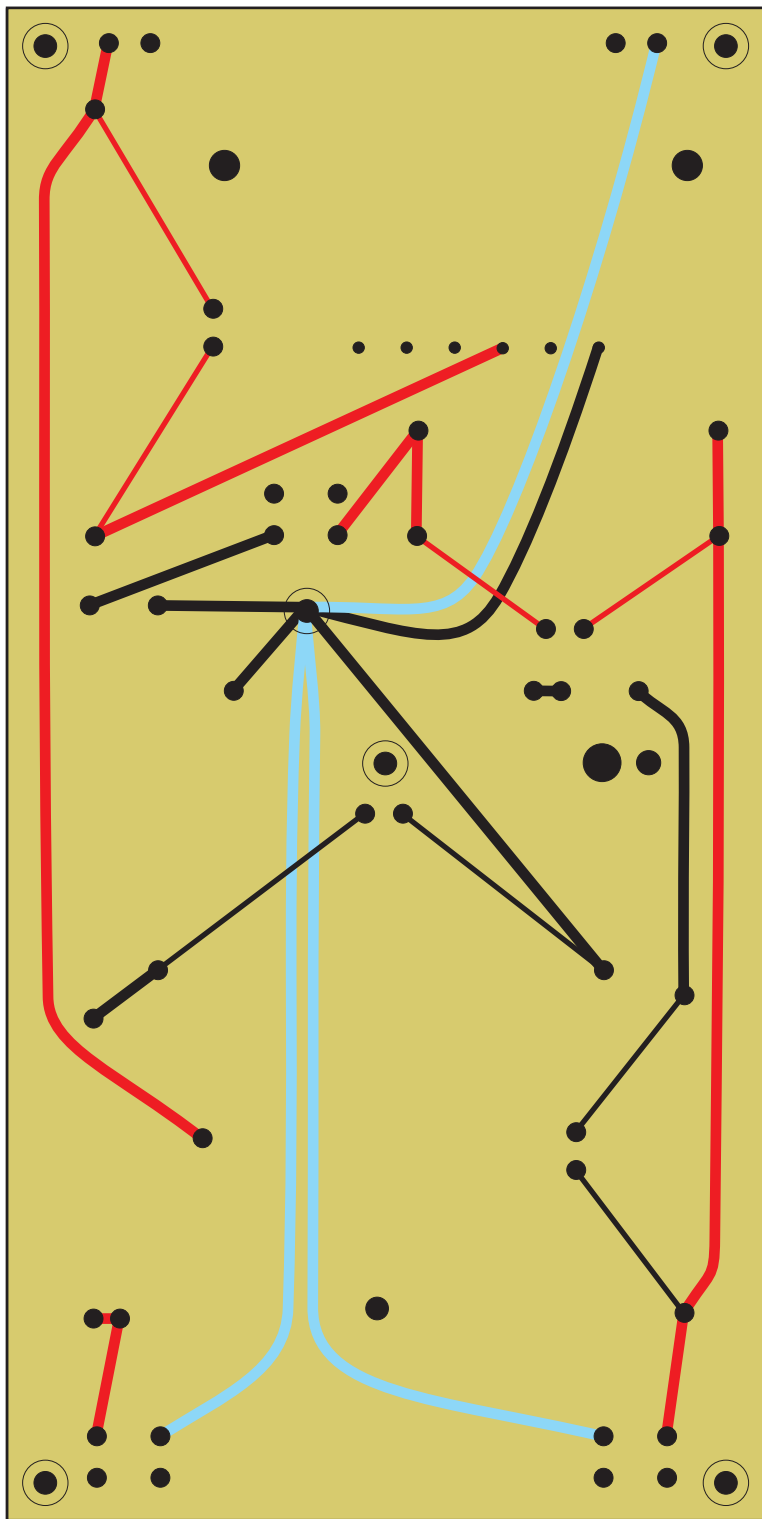
Board is 2.5mm Tufnol

The parts (As described  
on page 3), are  
dimensionally accurate  
at this size. If you use  
alternatives, make sure  
you have room for them.

Looking through a  
Transparent Board  
and seeing the  
connecting wires  
beneath.

Note: Plastic mounting  
for WC3112 has had  
the fixing lugs trimmed  
back to leave 8mm of  
land, just enough for an  
M4 machine screw head  
to fit. Terminal strip in  
front of Autoformer is  
made from 16 AWG tinned  
copper wire with 1/4"  
centres between contacts.





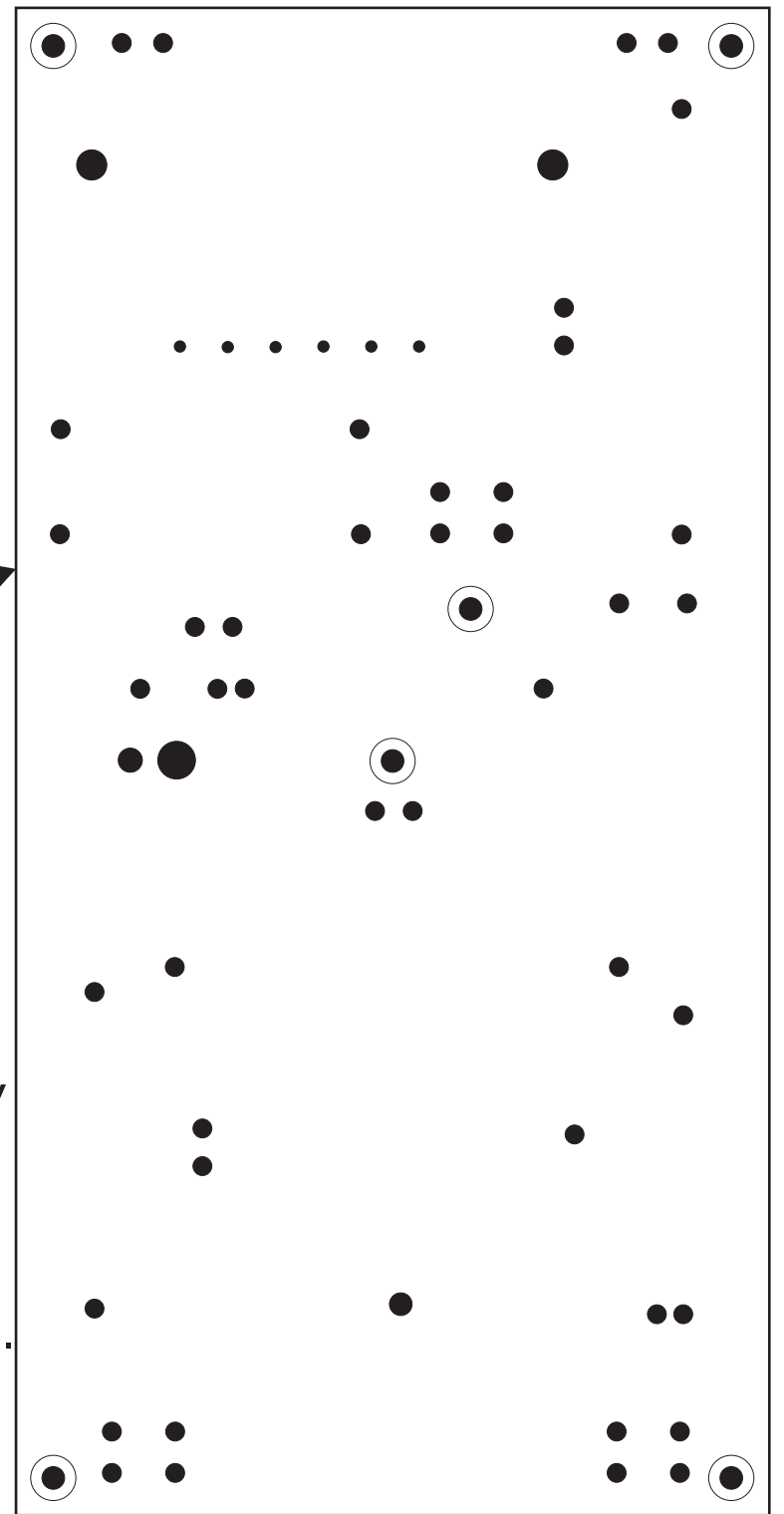
True view of rear showing wire routing



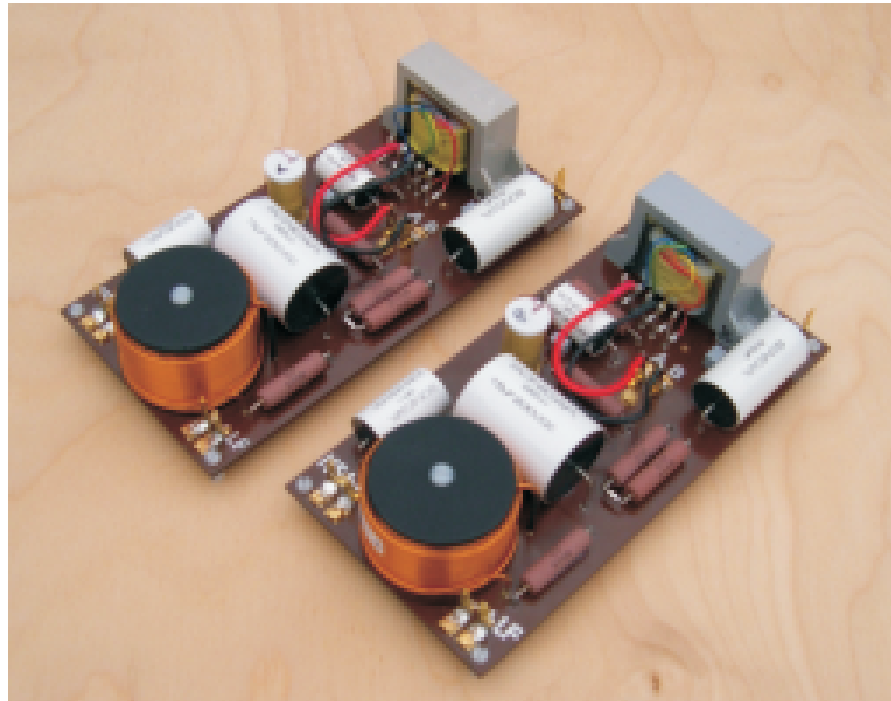
Drilling Template  
(Top Face)



When Printing, check it prints 100 x 200mm. Stick the template to board with spray glue. Run a 1.8mm size drill, required to take the brass eyelets, through all the centres, then remove template with white spirt. Enlarge holes as required to take other parts and fixing screws.



## Completed MkIII X-Overs



For more pictures see [www.jkwynn.co.uk](http://www.jkwynn.co.uk)