Set-up and assembly instructions: Scorpio 4

Section 1: Introduction:

Welcome to the Scorpio 4, we hope you gain much pleasure from the tonearm, and appreciate the efforts we have made to provide you with this exotic and bespoke product.

Before attempting to mount the arm, it might be sensible to take a few moments to familiarise yourself with it. This is undoubtedly going to save some time later.

The Scorpio is very simple to mount and align, the total time taken should not be more than 30 minutes, but this is dependant to a large extent on the turntable.

To start with, your box should contain the following;

1) The Scorpio pick-up arm.
2) One small bag of screws and hexagonal keys.
3) One set of instructions.
4) An alignment protractor
5) A template for cutting the turntable arm board.

Should any of these parts be missing, please consult your dealer or contact us directly.

The sequence of events to fit the arm is as follows.

1) Remove the base plate from the arm.
2) Fit the cartridge to the headshell and temporarily fit the counterweight.
3) Mount the Scorpio base plate onto the turntable arm board.
4) Fit the arm board/base plate back on the turntable.
5) Insert the arm/cartridge into the base plate and set the height.
6) Align the cartridge with the protractor.
7) Fit the counterweight to the arm and adjust the down-force.
8) Plug the arm into the amplifier.
9) Set the bias force.
10) Setting Cue height.
11) Play !

Each of these will now be considered in turn.

1) Firstly remove the arm from the box, compare it with Fig. 1 and identify the main features. The arm is supplied without the weight fitted as the extra stress incurred during transit may result in bearing damage.

   Remove the base plate by relaxing the M5 grub screw that locks the vertical height of the arm.

2) Starting with the Headshell, the cartridge must fit firmly against the main flat area. The bolts used to fix the two should only be finger tight at this stage.

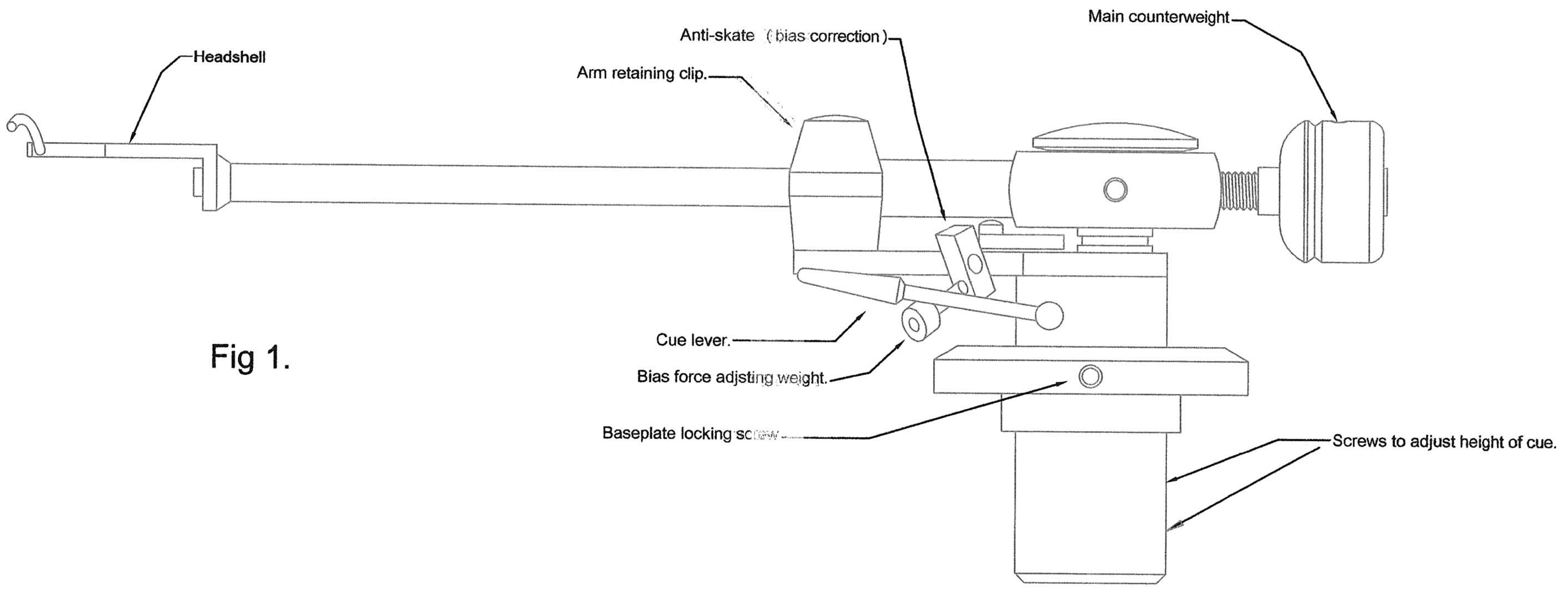


Fig 1.

3) Do not over-tighten them. Apart from the fact that you will damage the cosmetic finish, it will not improve the sound quality and may distort the body of the cartridge.

Connect the gold tags from the arm to the cartridge. These are usually colour coded, the convention being that

Red is Right +
Green is Right -
White is Left +
Black/Blue is Left -

Note the colours are correctly matched. Do not `pull-out' any more wire than you have available as you might inadvertently tighten the cables against the bearings resulting in the arm not traversing the record fully.

Finally, take the main counterweight and slide it onto the back of the arm, but before fitting it, please note the rear end of the arm where you will see a black sleeve. This rotates and will completely unscrew if needed, but it is damped with a layer of silicon grease so if you do remove it, you may need to wipe off any sticky silicon that transfers to your hands.

Please note that it is preferable if you do not remove the sleeve.

If you look, you will see the underlying threaded brass rod. About 8 mm of this should be visible. If it isn't, then unscrew the sleeve until about this amount is seen.

The purpose of this is to permit the counterweight to screw inwards and add positive downforce.

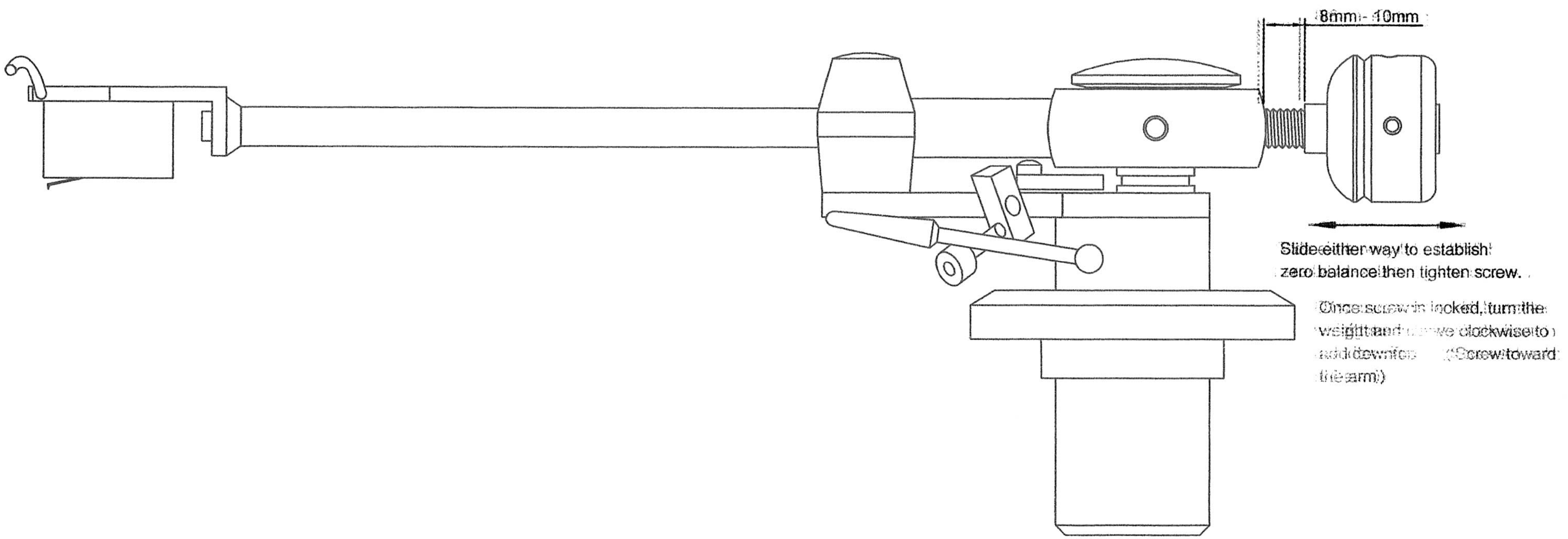
Take the main weight and slid it over the black sleeve. For now, lock it gently about half way along its length until the cartridge is fitted but do not overtighten it.

Moving the weight inwards towards the bearings increases the tracking down-force, and conversely, unscrewing it outwards decreases it.

The standard weight should be able to accommodate cartridges of 7g to 12g.

Heavier cartridges should be used in conjunction with a more massive counterweight, obtainable from Helius.

4) Putting the arm to one side for now. Fit the arm to the turntables arm mounting board. Templates are provided for this purpose, however, the turntable manufacturer may also supply a ready- made board.



For those doing the job yourself, please read Section 2 of these instructions and look carefully at Fig. 3

When bolting the arm down, ensure the clamping grub screw is visible on the right hand side (looking forwards)

5) Once the base plate is firmly fixed, return the assembly back to the turntable and fix it in place.

6) The arm/cartridge combination can now be fitted to the turntable. Insert the arm pillar through the base plate, taking care to feed the wires in first and that you have the Allen key ready to pinch the grub screw in the base plate.

Place a record on the turntable. Before resting the stylus onto the record surface, gauge the downforce. You need a modest positive pressure to ensure the stylus stays on the record and does not float away. Slacken the grub screw in the weight and adjust its position along the black sleeve to achieve this.

Looking from the side, note whether or not the arm tube is parallel to the record surface and adjust the height by sliding the arm up or down in the baseplate. When you are satisfied you have achieved this, tighten the grub screw and consider the vertical tracking angle set (VTA).

7) Once you are satisfied that height is correct, the cartridge must be properly aligned within the headshell. Identify the alignment protractor and place it over the turntable spindle. Place the stylus on each of the two points shown.

Twist the cartridge in the Headshell, and adjust its position in the slots, until the body of the cartridge remains parallel with the lines on the protractor, in both positions on the protractor.

Tighten the Headshell screws.

8) You must now return to the job of refining the tracking down-force.
At this stage, you should understand how slackening the screw in the counterweight and sliding it in either direction has allowed you to achieve a notional positive down-force. Check Fig 2 for a pictorial explanation. Assuming you are happy the stylus is resting on the record without floating away, tighten the grub screw in the weight sufficiently to allow the black sleeve to turn with the weight.

Using stylus scales to check the results, screw the whole counterweight inwards towards the bearings. This time the black sleeve should turn as well, providing some finesse to the adjustment.

Keep going until the correct reading is achieved. Once the correct force has been established, a tracking record can be used, if available, to verify the result. If such

a record is not available, then select a highly modulated record..... an orchestral crescendo for instance, and listen for any break up of the music.

If there is none, they leave the down-force as it is, otherwise, increase move the counterweight inwards slightly to increase the force.

9) Dress the cables in such a way they allow the turntable suspension to move freely, and plug into your amplifier.

10) The only job left is to set the bias or anti-skate force. This corrects the inward pull of the arm generated by the fact that the arm sweeps across the record in an arc, and that this arc is not perpendicular to a radius drawn form the centre of the turntable.

The amount of bias required unfortunately varies, there is no `ideal' setting. It not only changes according to the geometry of the turntable, but changes from the beginning to the end of a record (the radial velocity decreases towards the centre).

It is a force that is sensitive to the suspension settings of the turntable, if not exactly horizontal, the force will change. And to make things worse, it also varies according to the degree of modulation within the groove.

So the setting bias correction is always, at best, an approximation. Please note that it does not really adversely affect the sound quality that much. Ultimately, optimal setting only allows any particular musical performance to be tracked with a slightly lower downforce.

Be careful in trying to set tracking downforce too low, as you will be more likely to damage both the record and cartridge if it mistracks too often.

Please note that the turntable must be level otherwise the arm may be inclined to swing inwards or outwards of its own accord (under the influence of gravity alone) without bias correction being set.

On the Scorpio, a small weight is provided to compensate for bias. Adjustment is facilitated by screwing the weight in or out of the small block positioned on the side of the platform. (See fig 1)

For cartridges weighing between 6g and 10g, tracking at about 1.8g/2.2g of downforce, the best position for the bias weight is about 10mm out from the block into which it is screwed.

You are free to experiment with more or less bias force, but don't expect to hear huge differences. The effect is more `engineering' than `aural'.

11) There is one last task that needs addressing. Adjusting the height the arm lifts off the record when cued.

The extent to which the arms lifts is entirely subjective, some customers like the arm to `just' lift off the surface, others like the safety of a higher margin.

Adjusting the height is easy, but involves lifting the bearing structure from within the pillar.

If you refer to Fig. 1, it identifies the location of the 2 grub screws that permit this adjustment.

If you do wish to change the height, you will have to do so with the arm off the turntable. Using the Allen key provided, slacken the 2 grub screws with the arm still in its clip.

From the underside of the arm, you will see the stainless steel shaft (9mm in diameter.) Pushing this up slightly will reduce the height the arm lifts off the record surface, and pushing the arm deeper into the pillar will increase the cuing height.

Note that you only need to move the shaft a single millimetre in either direction to achieve a change of about 4mm in lift-height.

Congratulations. The arm is now setup and can be played.

Section 2: Baseplate Mounting Instructions:

This section is for people who are attempting to cut out their own turntable arm boards.

Several aids are supplied to ensure accuracy. The first one being the Template supplied. However, additional dimensional information is provided in the form of printouts so a rule and protractor will suffice or provide the extra level of confidence needed.

The objective is to cut a large central hole into which the Scorpio base plate will fit, followed by 3 smaller holes for the screws that will bolt the arm's base plate and the turntables arm board together. Fig 4 provides basic dimensional information to enable you cut the base plate hole.

a) Use a small pin to pierce the small dark green circle labelled 'Bearing centre'.
b) Place the 6mm hole in the template over the turntable spindle, then use a pencil inserted into the pin hole you've just made, to scribe an arc on the arm board.
c) The Scorpio may be mounted at any point along this arc, but obviously needs to be positioned centrally within the arm board. Due attention also needs to be given to the orientation on the arm with respect to the turntable, visually, the arm should be parallel with the side of the turntable.
d) Use a pin to fix the template to the arm board, then remove the other end of the template from the spindle. It should now be free to rotate about the pin. Ensure the image of the Scorpio is oriented parallel to the side of the turntable.

Use another pin to piece the other 3 small red holes that identify the M4 screw locations, and more importantly, the hole identified as the `Base Plate centre'. Note that the arc you just marked is not the centre of the base plate, but the centre of the arm bearings, and the centre of the base plate lies 4.8 mm ***in fr nt of*** the bearing centre. It is this second point that is to be drilled for the ba e plate, ***not*** the bearing centre point.

e) Remove the template from the turntable / arm board. At this point you should have 4 points marked on the arm board.
f) Cut the large central hole between 38mm and 40mm in diameter.
g) Drill the 3 screw holes 5mm in diameter.
h) Insert the base plate into the cut-out, and bolt it into place using the three M4 screws found in the plastic bag. Depending on the thickness of the arm board, (the materials will vary from wood to metal to plastic.) select the corresponding 4mm diameter screw length from the bag of screws provided. Two lengths are provided with the arm.

Before cutting the holes, it might be helpful to use a pair of compasses to draw a circle 54mm in diameter from the `Base Plate centre' point, to identify the circle on which the M4 screws will be drilled, and secondly, a circle 38mm in diameter to mark the main base plate hole. Note that the 54mm diameter circle should superimpose the 3 base plate screw holes. See fig 2.

It would help also if you further scribed a line from the same `Base Plate centre' directly down (towards the front of the turntable) so it intersects with the 54mm diameter hole. This establishes the exact position of the first hole. Likewise, scribe two other parallel lines nearly 23.5 mm immediately to the left and right.

Before cutting the holes, first note the location of the 4mm grub screw that locks the height of the arm. Although the rotational position of the base plate is not critical, it remains convenient that this screw is accessible from the right hand side of the arm. In much the same position it was when you separated the arm from the base plate.

The combined base plate / arm board should now be fitted to the turntable.