Tangency Template Instructions

To Prepare Tangency Template

Press the tip of a pin into the white center of each of the small black circles (A and B).

Adjusting Tangency

Correct cartridge tangency ensures that stylus motions always occur in the same directions as the groove modulations. Incorrect tangency causes distortion of the signal.

The matter of tangency adjustment is at best a compromise. Ideally, the cartridge's cantilever would be tangent to the record groove at all times, but this is possible only with linear tracking arms. With pivoted arms, the cantilever will be perfectly tangent to the record groove in only two places as it swings across the record. It has been calculated that the best such tangency points for minimal distortion are points A and B on the template. Making the cantilever tangent can be carried out in two ways: the more straightforward method is described on this side of the sheet; if it doesn't work, or doesn't suit you, use the method described on the flip side of this sheet. The two methods have the same result, but arrive at it using different means.

Method A

Tangency is adjusted by varying the relationship between the tonearm base, the spindle, and the stylus tip. The means of adjustment will vary from arm to arm; follow the manufacturer's instructions for tonearm mounting before attempting final tangency adjustment.

Mount the cartridge and align it with the sides of the headshell. If tangency is adjusted via elongated cartridge-mounting holes, leave the cartridge screws just loose enough to allow the cartridge to be moved back and forth. Otherwise, tighten these screws enough to immobilize the cartridge.

Put a disc on the turntable. Fit the large hole of the template over the turntable spindle. Place the stylus in the pinhole at A. With some cartridges the side of the cartridge is obviously parallel to the cantilever; with others the front of the cartridge is obviously perpendicular to it. With the stylus tip at pinhole A, either the side or the front of the cartridge should be parallel to the appropriate lines on the template. If this is not the case, move the cartridge slightly away from or towards the tonearm base in order to achieve tangency.

Place the stylus in pinhole B and repeat the above procedure. Tangency is correct when the cartridge is parallel to the lines at both A and B. If alignment at both A and B is impossible to achieve in this manner, it may be necessary to rotate the cartridge slightly so that it is no longer parallel to the sides of the headshell. This indicates that the tonearm base is not mounted the correct distance from the turntable spindle, or that the offset angle of the tonearm is incorrect. In either case, you will have achieved correct tangency if alignment at A and B is achieved.

Finally, tighten the cartridge screws enough to immobilize the cartridge.

Method B

With Method B, overhang is adjusted first, according to the chart below. Overhang is the distance from the center of the turntable spindle to the stylus tip when the cartridge is swung out over the turntable spindle, and the correct overhang varies for different effective tonearm lengths (the effective tonearm length is the distance from the center of the tonearm pivot to the stylus tip). In order to adjust overhang it is convenient to have a rule graduated in hundredths of an inch, or at least 64ths. First, mount the cartridge snugly, but capable of movement, in the headshell. Measure the distance from the stylus tip to the pivoting center of the tonearm (this will probably involve some estimating). Consult the table below to find the correct overhang for that length. Then measure your actual overhang by pivoting the tonearm so that the cartridge is directly over the spindle — again a little estimating will be necessary. Some adjustment will probably be required to get the correct overhang, either by moving the cartridge within its headshell or by moving the tonearm pivot point closer to or farther away from the spindle. These changes slightly change the effective length of the tonearm and therefore the optimal overhang; remember that the effective tonearm length is the distance from the center of the pivot to the *stylus point*, not to the turntable spindle.

Once correct overhang is set, your cantilever will be tangent to the groove in points A and B on the template already, but only if the offset angle of your tonearm is exactly correct.

Put a disc on the turntable. Fit the large hole of the template over the turntable spindle. Place the stylus in the pinhole at A. With some cartridges the side of the cartridge is obviously parallel to the cantilever; with others the front of the cartridge is obviously perpendicular to it — either will do. Either the side or the front of the cartridge should be parallel to the appropriate lines on the template with the stylus tip at pinhole A. Since this is rarely the case, it may be necessary to twist the cartridge within the headshell in order to achieve tangency at point A. With alignment correct there, move the stylus tip to point B. Some little adjustment may be called for, and then rechecking at point A. If you really can't get it right at both points, begin again with the procedure for overhang adjustment.

When in doubt, remember that this entire procedure is a compromise and that perfect tangency will be achieved at only two points on the record. And don't forget to tighten the cartridge as securely as possible to the tonearm when finished, without stripping the screws or deforming the cartridge body. Happy listening.