Well Tempered Versalex

It's probably safe to assume that Bill Firebaugh is a Bach fan. It was 1985 when he designed his first turntable and named it for one of Johann Sebastian's most famous keyboard pieces. His company never did climb into the exalted heights occupied by the best-known turntable makers, but he has endured...which is more than can be said of some once famous companies we all know.

The Versalex model name has a less obvious origin, though anyone with some notion of Latin will recall that "lex" means "law," and is therefore likely to conclude that the name means "against the law." That seems fitting because, throughout his career, Firebaugh has maintained that "the law" (i.e. what is considered obvious by his competitors, and thus mandatory) is wrong.

Let us then examine the problem of a turntable platter's bearing. We've known since the 1970's that the major source of noise and vibration in a turntable is likely to be not the motor, as was once assumed, but the bearing. Most turntable designers, therefore, concentrate on establishing a friction-free contact between the platter spindle and the shaft, with as little play as possible. The ways of doing this are well established. Typically, that means tapering the shaft of the platter that rests against a ball bearing at the bottom of the well, soaked in light oil. Tapering the shaft means its rotating surface is small, and one can expect minimal noise if the machining is of good quality. However, Firebaugh long ago pointed to a problem with such bearings. The belt from the motor to the platter pulls the platter *laterally*, and therefore the shaft will rub against the side of the well. Problem!

To make matters worse, the tight tolerances leave little room for even light oil to find its way between spindle and well.

Others have noticed the same problems. On some turntables the belt goes from the motor to the sides of the platter, then on to a second pulley on the other side. That eliminates the side thrust, but the second pulley adds a new source of vibration, thus swapping one problem for another. Tiny holes may be drilled into the spindle to let oil circulate, but Bill Firebaugh found that measure unsatisfactory.

Firebaugh's solution is to use the side of the well as the bearing, reducing noise and vibration as much as possible, but there's more to it than that. His spindle is much smaller than the well in which it spins, leaving room for lubricant, and it is supported at five points: from underneath, and at each of four lateral points. The supports are nitrite rubber, the material used for engine piston seals. The lubricant is not oil but silicone, which also provides damping of vibrations.

The Versalex comes with Firebaugh's own LTD arm, and that's not of conventional design either. Like a turntable, a tone arm must be made according to requirements that conflict. Make the bearings too tight and you have excessive friction. Make them too loose and they will "chatter," adding spurious vibrations to the *desired* vibrations you need to recover from the record groove. What's more, excessive play will hamper the arm and cartridge's ability to recover subtle information from the groove. His solution was to suspend the centre of the arm (actually a black golf ball) from an overhead support with a twisted monofilament thread. The ball bathes