

## PENDULUM / RELATIVE MOTION

### MAINTENANCE INSTRUCTIONS

#### GENERAL INFORMATION:

This exhibit consists of table and pendulum mounted on pivots at right angles to each other. The pendulum has a pointer while the table has a polar grid of lines and circles etched into it. There are several patterns that the pendulum can follow when it and the table are set into motion. The pendulum and table can be made to inscribe a line or circle by adjusting their relative phase and amplitudes appropriately. The pendulum weight may be raised to shorten its period, thus demonstrate the procession of the relative motion.

The pivots for the pendulum and table are "knife-edge" type consisting of beveled steel plates with each beveled edge riding in a pair of co-linear (aligned) notches in the frame. These pivots should provide many years of service since there is really no failure mode.

#### General Cleaning:

The finished or painted surfaces of the exhibit may be cleaned with a mild soap solution or general purpose cleaner. The Plexiglas graphic panels should be cleaned with a plexi cleaner and a soft wipe that will not leave scratches, (we suggest Wype-All™).

#### Initial Set-up:

The exhibit is shipped in parts that are essentially bolted together as shown in the assembly sketch. The pendulum is held down into its pivot notches with large "cot" springs to prevent it from being lifted out by the visitor. Delrin retainers keep the pendulum and table from sliding sideways in their pivots. Check that the table pivot bevels rest along the full length of the notches and not just on one point. (The notched bars can be rotated by loosening their retaining bolts.)

It is important that the exhibit be leveled so the pendulum points towards the center of the pattern when at rest. The pendulum and table pivots have a small amount of axial play to fine tune the rest position. The cot spring retainers may need to be adjusted along the spreaders to retain the pendulum's position in the direction of the pivot axis.

The pendulum weight is adjusted so the periods of the pendulum and table are matched as close as possible to demonstrate the most interesting relative motion patterns. Changing the period is best done by a teacher or staff member for supervised demonstrations. This requires loosening the split shaft collars, sliding the weight up to shorten the pendulum's period, and re-tightening the shaft collars. The pendulum's relative motion will then process from linear to circular and back again. The weight should be returned to normal matched-period position for the general public's use. Keep the upper shaft collar tightened just over the weight so the weight cannot be lifted and dropped.