CHAOTIC PENDULUM
by Ned Kahn

MAINTENANCE INSTRUCTIONS

GENERAL INFORMATION:

Chaotic Pendulum contains a deceptively simple set of pendulums in a steel and Plexiglass case. A central, T-shaped bar supports three bearing-mounted bars from its ends. The "T" is itself bearing mounted at the intersection of the upright and the cross arm. The visitor gives an initial twist to the pendulums with a protruding knob. One's intuition says that the resulting motion of this system should be, if not simple, at least predictable. Intuition doesn't work with this device since its motion is chaotic and extremely complicated. Chaotic change occurs whenever a small difference in initial conditions produces a large difference in the outcome; such systems are characterized by having many branch points in their processes. Originally, this device was conceived of as a model of turbulence in fluids.

General Cleaning:

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

Servicing the Pendulum Mechanism:

First remove the screws holding the rear acrylic cover panel in place. Next remove the circlip at the rear of the shaft. The cover panel will now slide out. (Suction grips for handling glass will facilitate removal.) The pendulum clamps to the shaft with a split collar. Loosening the two screws in the collar will allow the pendulum assembly to slide off the shaft. Reassembly is the reverse of this procedure.

Inspect all of the bearings at this point for smooth motion. Use care when removing and replacing bearings. Keep track of the washer and spacer when disassembling the arms. When reassembling, the bearings must be pressed straight into their bores. If a bearing becomes miss-aligned while pressing it in, the aluminum may score. Be sure the spacer is in place before installing the second bearing. The arms are bolted to the inner races with a washer to space it away from the 'T' section. Tighten the nut lightly at first and check that the arm rotates freely without any noticeable drag. Then cinch up on the bolt. (5 to 7 lb-ft) Check that the arm still rotates freely, and cannot hit the 'T' section,