EQ^{s} Tremor Table

User Guide

PITSCO EDUCATION

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Introduction

You now have the ideal tool for the equal testing of structures – the EQ^s Tremor Table. Like its predecessor, the Epicenter, the EQ^s can be operated manually. Or, record up to eight minutes of a shake sequence and play it as many times as needed. This feature makes the EQ^s ideal for repetitive testing and for structure-building contests because it eliminates all variables except for the structure being tested.

A control box with an LED display reports the cycles per second in a range similar to that of an earthquake's P-waves. The EQ^s can also be used for soil liquefaction experiments.

EQ^s Package Contents

The EQ^s Tremor Table package should include the components listed below. If anything is missing, call Pitsco Customer Service at 800-358-4983.

- EQ^s Tremor Table tester
- Control box
- 8 washers
- 8 block base anchors

Block Base and Foundation Block

Structures tested will need to be built on or attached to a foundation block, which will then be attached to the block base. These can be purchased from Pitsco, or you can make your own.

To make your own, use the following specifications:

Foundation Block – construct this from 3/4" wood such as pine, medium-density fiberboard (MDF), or plywood and according to the dimensions in Figure 1.

Tower Block Base – construct this from 3/8" plywood according to the dimensions in Figure 2. on the next page.

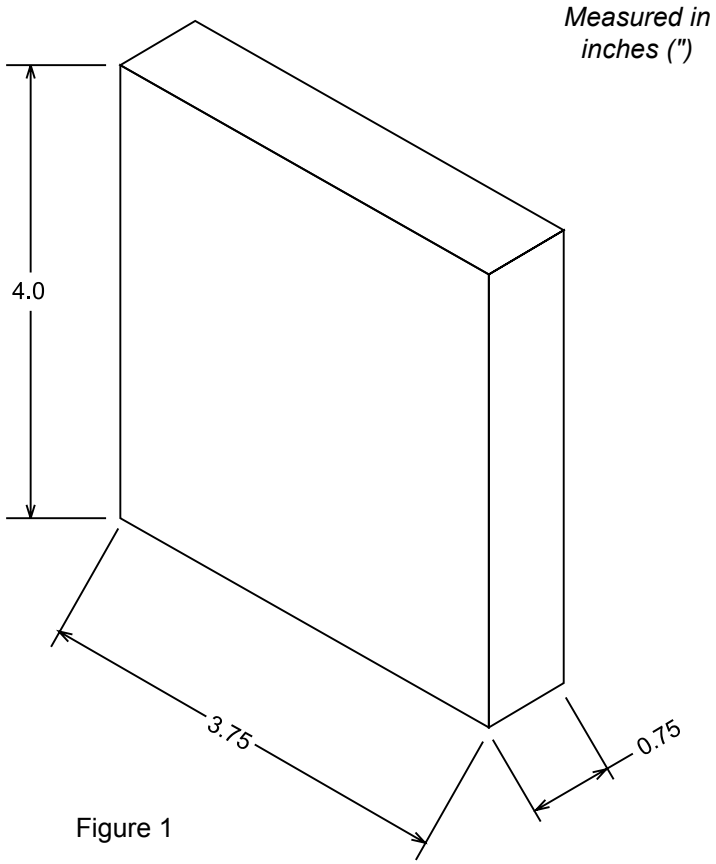


Figure 1

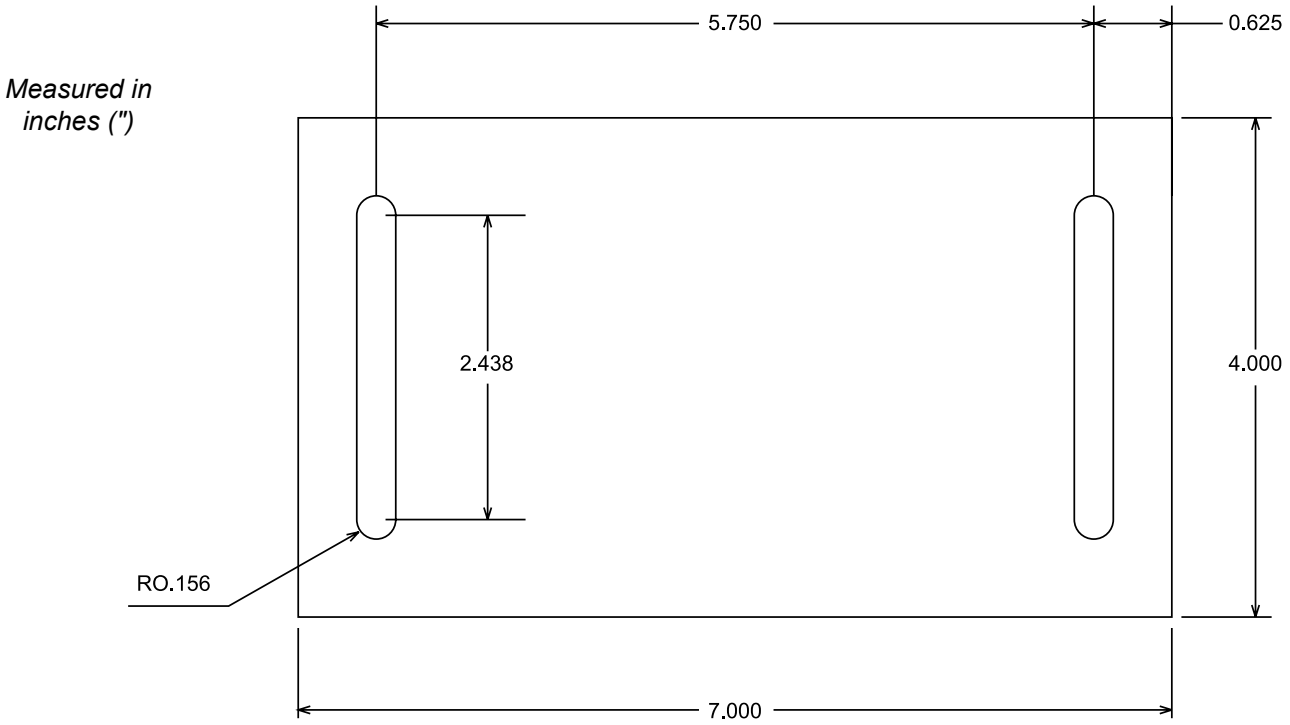


Figure 2

Setting Up the EQ^{s}

Note: Before setting up the EQ^{s}, be sure to select a solid surface free of debris. On some surfaces, the tester might move a bit. The ideal place for setup is on the floor. However, if using on a table or countertop, you can clamp it to the surface. Before doing that, remove the screwed-in rubber feet on the bottom of the EQ^{s}, so the unit lies flat on the surface.

1) To set up the EQ^{s}, first plug the control box cord into the six-pin jack on the side of the tester (Figure 3). Place the control box where the cord is not pulling against the jack and where the operator can easily reach and see it.

2) Plug the EQ^{s} power cord into a standard 120V outlet. The LED display on the control box should light.

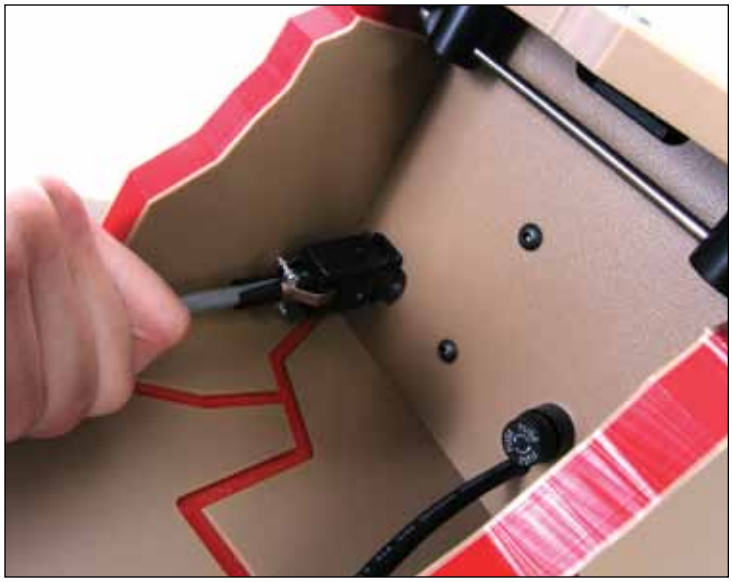


Figure 3

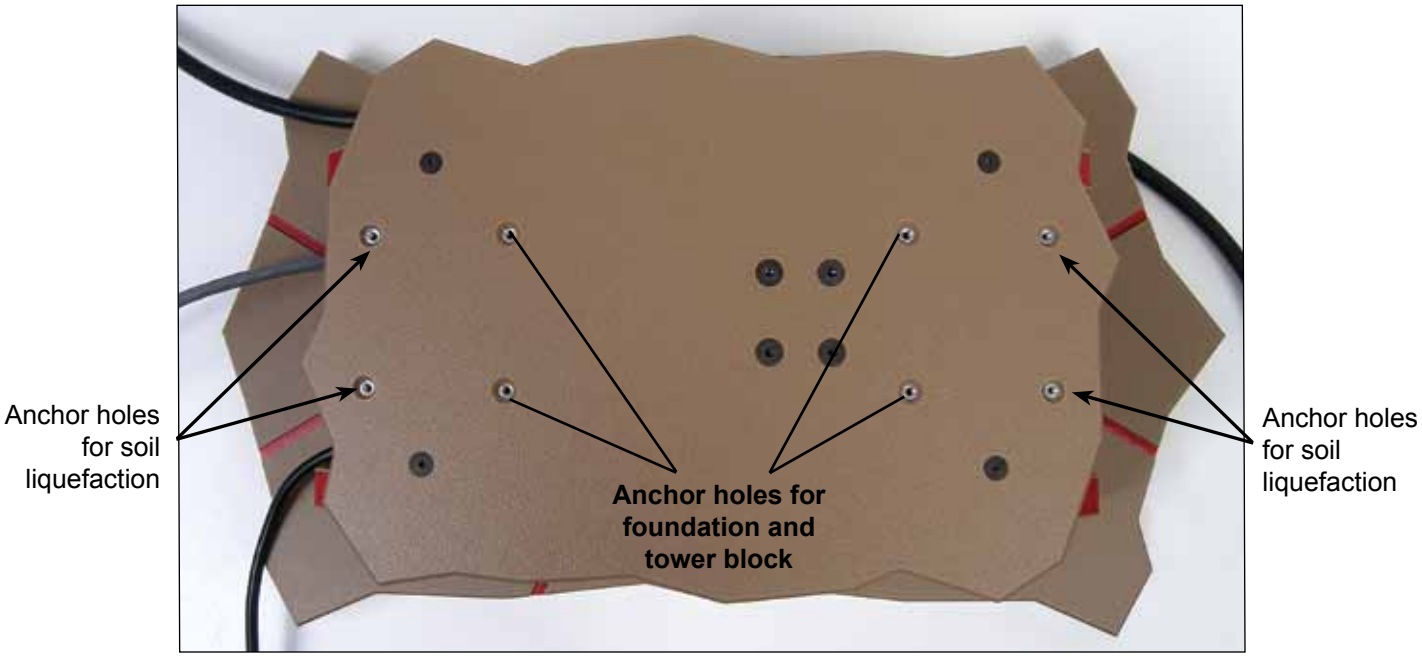


Figure 4

Placing the Structure on the EQs

Note: If you are conducting soil liquefaction experiments with a bigger platform, you will need to use the anchor holes that are closer to the sides of the EQ^{s} tabletop (Figure 4). For the 4" x 4" foundation block and tower block base, use the anchor holes toward the center of the EQ^{s} tabletop.

Caution: When conducting soil liquefaction experiments, make sure no water falls or splashes into the motor area of the EQ^{s}.

1) Place the structure attached to the foundation block and block base on top of the EQ^{s} tester. Line up the cutout slots in the base so you can see the anchor holes underneath the base.

2) Place a washer over each hole and thread the anchor through it and into the EQ^{s} tabletop (Figure 5). Screw the anchors into the anchor holes – but do not overtighten the anchors. Overtightening the anchors could strip the threads in the anchor holes.

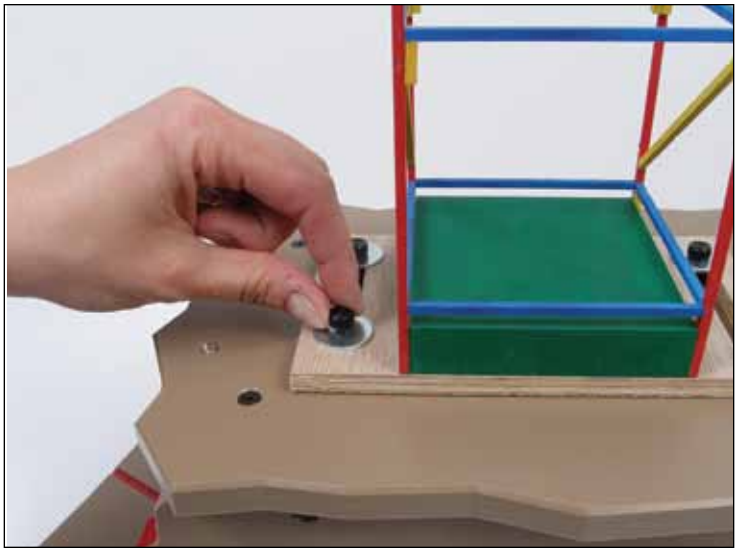


Figure 5

Operating the EQ^{s}

Caution: When testing a structure on the EQ^{s} Programmable Tremor Table, anyone near the tester should wear safety glasses.

There are three modes for the EQ^{s} Tremor Table: Manual, Record, and Play (Figure 6).

Manual Mode

1) Make sure the switch on the front side panel of the control box above the LED display is in the middle position. Move the Rate slide control to the bottom (or minimum) position.
   Note: The Rate slide control does not directly determine the LED reading – this is communicated from a sensor on the tremor table to the LED display.

2) Hold down the Start button on the control box. While doing this, move the Rate slide control up (toward the LED display) to increase the frequency of cycles per second or down to decrease the frequency.

3) To stop testing, release the Start button. The tester will stop and the frequency at the time the Start button was released will appear on the display. The frequency will remain on the display until the Start button is pressed again.

Figure 6

Record Mode

1) Move the switch on the side of the control box above the LED display to the left – this direction is also indicated on the control box where it says "Rec." The LED display will blink. Make sure the Rate slide control is in the minimum position.

2) Hold down the Start button on the control box – the EQ^{s} starts to record the shake sequence and the LED will stop blinking. As with the Manual mode, hold down the Start button while moving the Rate slide control up and down to the desired frequencies. The EQ^{s} will record a sequence up to eight minutes long.

3) To stop recording, release the Start button. The Record light will be blinking. To use this recorded sequence, follow the directions in the Play Mode section below.

Figure 7 – Moving the Rate control slide changes the frequency.

Play Mode

1) To use this mode, move the switch on the front side panel of the control box above the LED display to the right – this direction is also indicated on the control box where it says "Play." The Play light will blink.

2) Press down the Start button and the recorded sequence will play as you hold the Start button (the Rate slide control will not work in this mode). The LED display will stop blinking. Release the Start button when the building is destroyed. The LED display will show the frequency at which you released the Start button – the reading will remain until Start is pressed again.

3) Follow Steps 1 and 2 for all the tests you need to run at that sequence. The EQ^{s} will remember the sequence even if the tester is unplugged or switched back to Manual mode. Just plug it back in or switch it back to Play, and the tester will play the same sequence until you record a new sequence.

Storage

Make sure the EQ^{s} is not left in direct sunlight for long periods of time. Unplug the unit when it is not in use for long periods of time.

When storing the unit, make sure to store the unit in a clean, dry area. Do not store the EQ^{s} in extreme temperatures (such as below freezing).

Ideas for Structure Building & Testing Activities

1) Record a structure testing activity with a video camera and have the class evaluate the video to see if they can identify the weaknesses and strengths of the structures.

2) Record a shake sequence and play it for your students. Have students study engineering concepts and design a structure to withstand the recorded sequence. Test the structures they build.

Notes

EQS EARTHQUAKE TOWERS VIDEO

A Pitsco Exclusive

Get things shakin' with the new EQ^{s} Tremor Table – and this video will eliminate any tremors you have about it!

Learn how to build an earthquake-resistant tower with the new floor plate system, where the plate is built into the tower instead of placed into it. This new system widens the range of tower design possibilities – including taller towers!

Then, see how to test your tower to the point of destruction with the EQ^{s}, sold separately. Closed-captioned.

Level: Middle School-High School.

31678

EARTHQUAKE ENGINEERING: THE EQ^{s} PROJECT BOOK

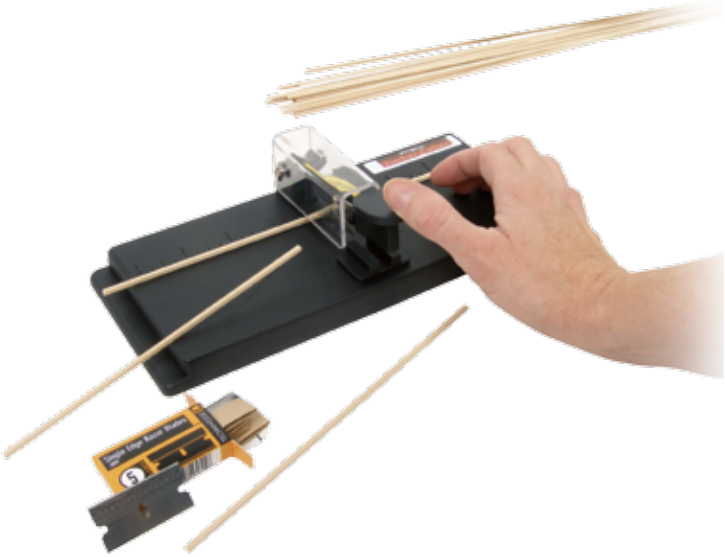
A Pitsco Exclusive

Earthquake Engineering EQ^{s} Project Book

This hands-on project book guides students through the earthquake structure-design activity. Includes fascinating information about earthquakes – what causes them, how they occur, and how they destroy human-made structures. Scientific details give students insight about how to engineer a quake-proof model building. Learning activities, design tips, and step-by-step building and testing instructions make this the perfect student handbook for the EQ^{s} project. Paperback, approximately 25 pages.

Level: Middle School-High School

31718



TIMBER CUTTER

A Pitsco Exclusive

The Timber Cutter is a helpful tool for cutting 1/8" wooden sticks. We recommend it for bridge and tower building as well as other model projects. The see-through safety guard limits finger access to the blade.

A single-edged razor blade provides a clean, accurate cut. Miter marks are molded into the base to use as a reference when making angle cuts. Five extra blades are included.

18818

TIMBER TESTER

A Pitsco Exclusive

By using the Timber Tester, you can determine the best timbers to use for the most critical members of the bridge or tower, as well as the optimum way to orient the timbers to provide the maximum amount of load-bearing capacity for any structure. The unit is durable with the main member of the unit constructed of rugged ABS plastic. The testing span is adjustable from 4 to 12 inches, and the scale provides readings from 0 to 7 units of load. We recommend one Timber Tester for every four to six "structural engineers."

18523

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