Gph 136
Seismological Instrumentation

Experiment 2

THE TORSION SEISMOMETER

Purpose: To assemble, adjust, and calibrate a torsion seismometer.

Equipment: A Sprengnether Series AR torsion seismometer kit, with all accessories
Meter stick
Photographic paper to fit drum
Stop watch
Telescope and scale

Theory: The theory of the torsion seismometer and the tilt test for magnificatio has been covered in the lectures.

Procedure:

1. Assemble the seismometer in accordance with the manufacturer's instruction book. Measure pitch of rear screw and distance from rear to front screws before assembling.

   Set up the seismometer and recorder so that a sharp spot is focused on the recording surface.

2. Determine the range of natural periods obtainable with this system.

   Adjust for the longest stable period.

3. Set up the telescope and scale and determine the static magnification by the tilt test.

4. Adjust the damping magnet for maximum damping, and, placing a piece of photographic paper on the drum, record a sufficient number of trains of free vibrations to enable you to determine the amount of damping.

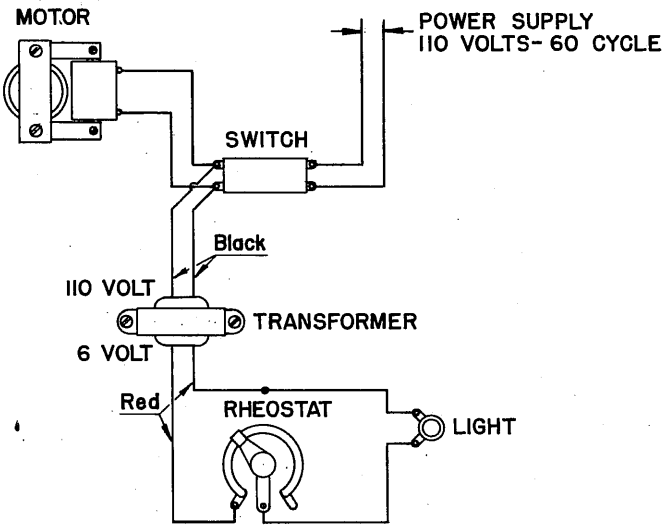
Report:

Derive sufficient theory to explain the procedure followed.
Report the values found for the range of periods, the period actually used, the degree of damping (both the damping rates and the damping factor) the static magnification, the equivalent pendulum length, the reduced pendulum length, and the angle of inclination of the axis of rotation.

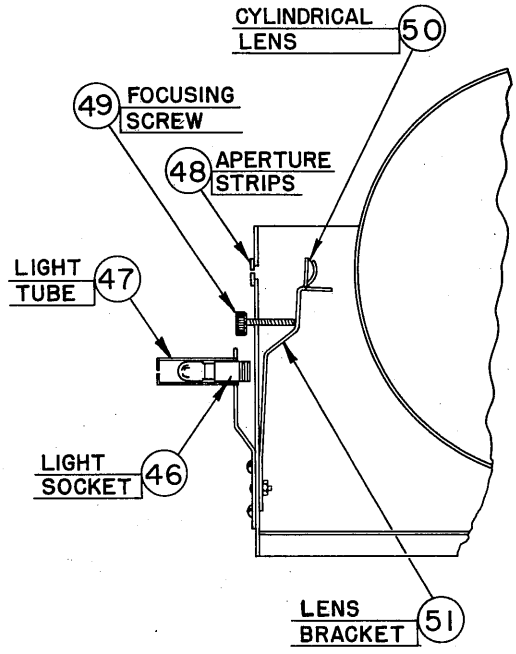
Questions:

What important element is missing from the system as used here that would prevent it from being a usuable seismograph?

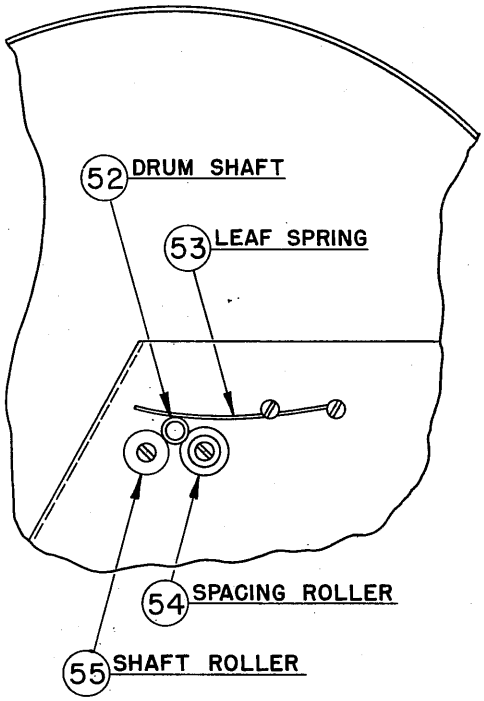
For what range of periods would this system be a satisfactory seismograph?



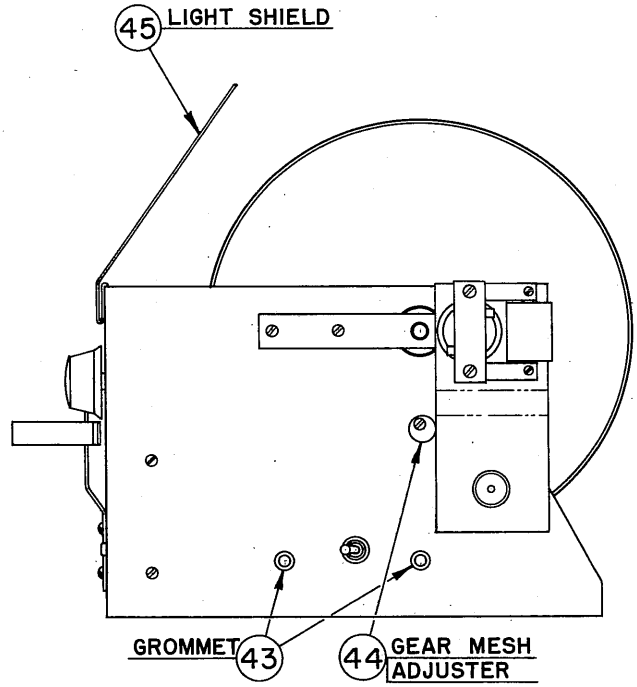
WIRING DIAGRAM



SECTION A-A

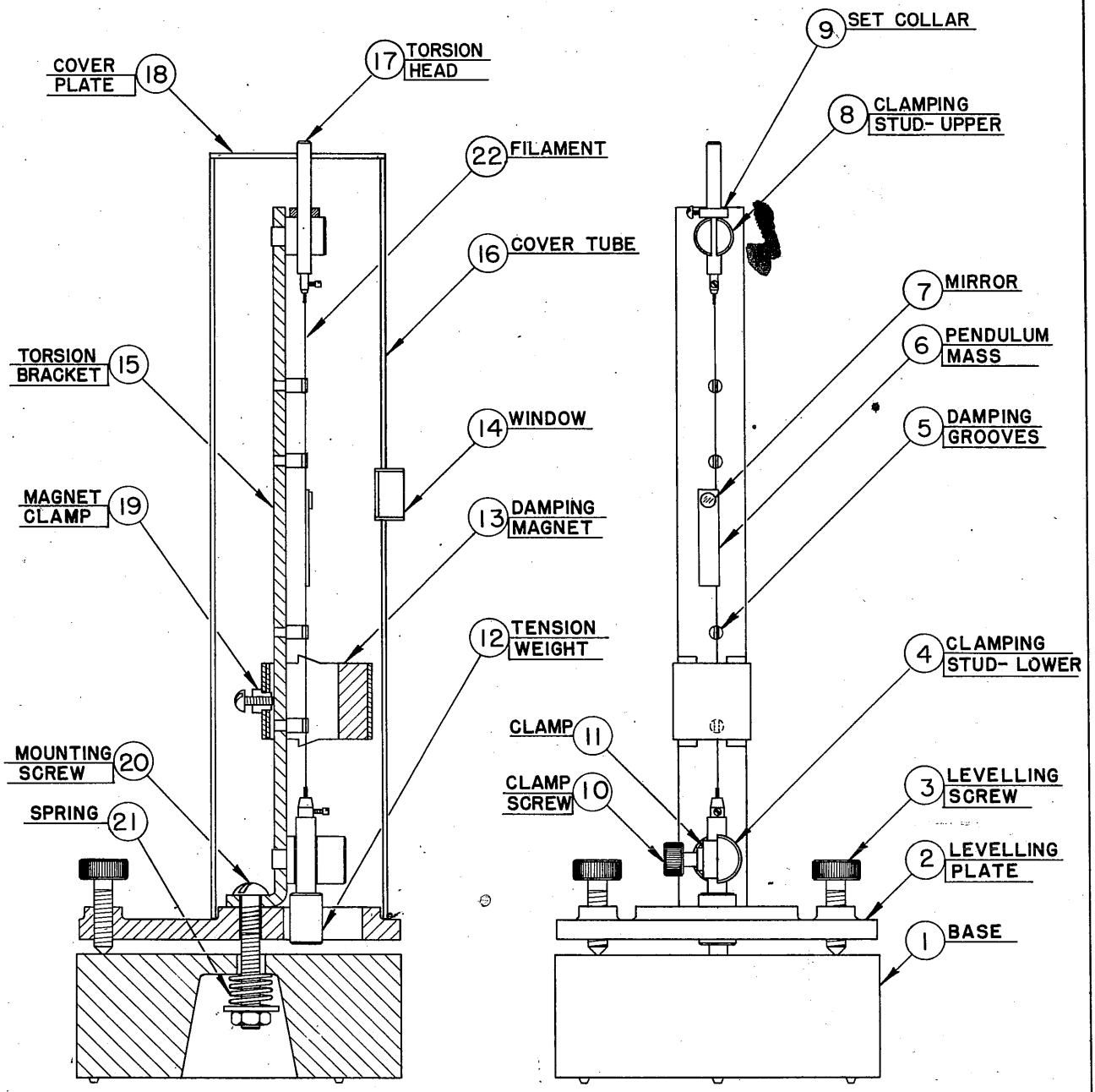


VIEW B-B



END VIEW

W. F. SPRENGNETHER INSTRUMENT CO. ST. LOUIS, MISSOURI, U. S. A.	
SEISMOGRAPH RECORDER – SERIES A-R, AUXILIARY VIEWS	
Drawn: 10/30-50	Approved: W.F.S.
103	



SIDE CUT-AWAY VIEW

FRONT VIEW WITH COVER REMOVED

W. F. SPRENGNETHER INSTRUMENT CO.
ST. LOUIS, MISSOURI, U.S.A.

SEISMOMETER – SERIES A-R
HORIZONTAL COMPONENT

Drawn: 10/30/50 | Approved: | 101

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Telescope and scale

Theory: The theory of the torsion seismometer and the tilt test for magnification has been covered in the lectures.

Procedure:

1. Assemble the seismometer in accordance with the manufacturer's instruction book. Measure pitch of rear screw and distance from rear to front screws before assembling.

   Set up the seismometer and recorder so that a sharp spot is focused on the recording surface.

2. Determine the range of natural periods obtainable with this system.

   Adjust for the longest stable period.

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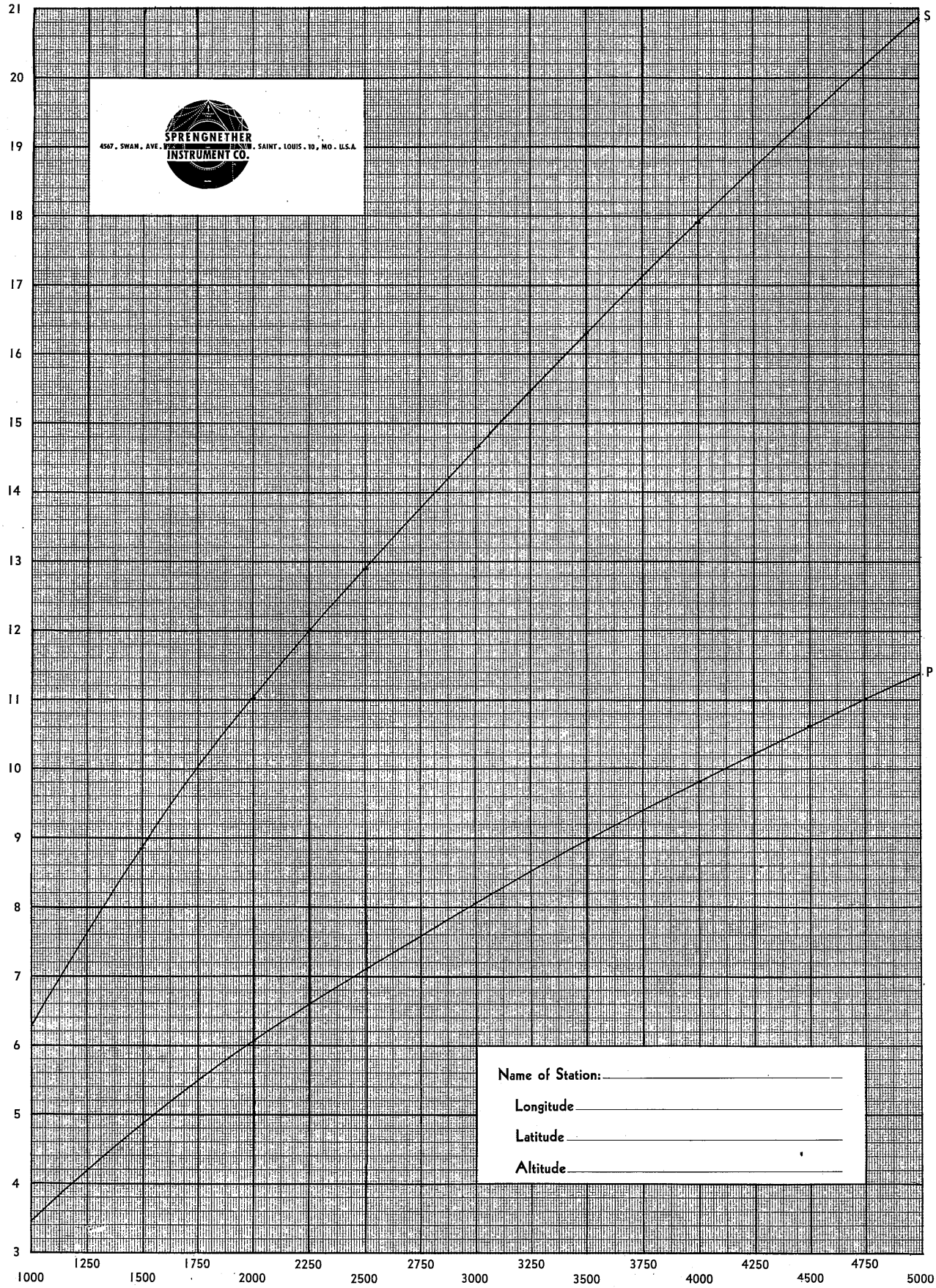

CHART 1. Travel times for normal P and S waves for epicentral distances between 1000 and 5000 Miles. Plotted for Sprengnether Series A-R Siemograph.