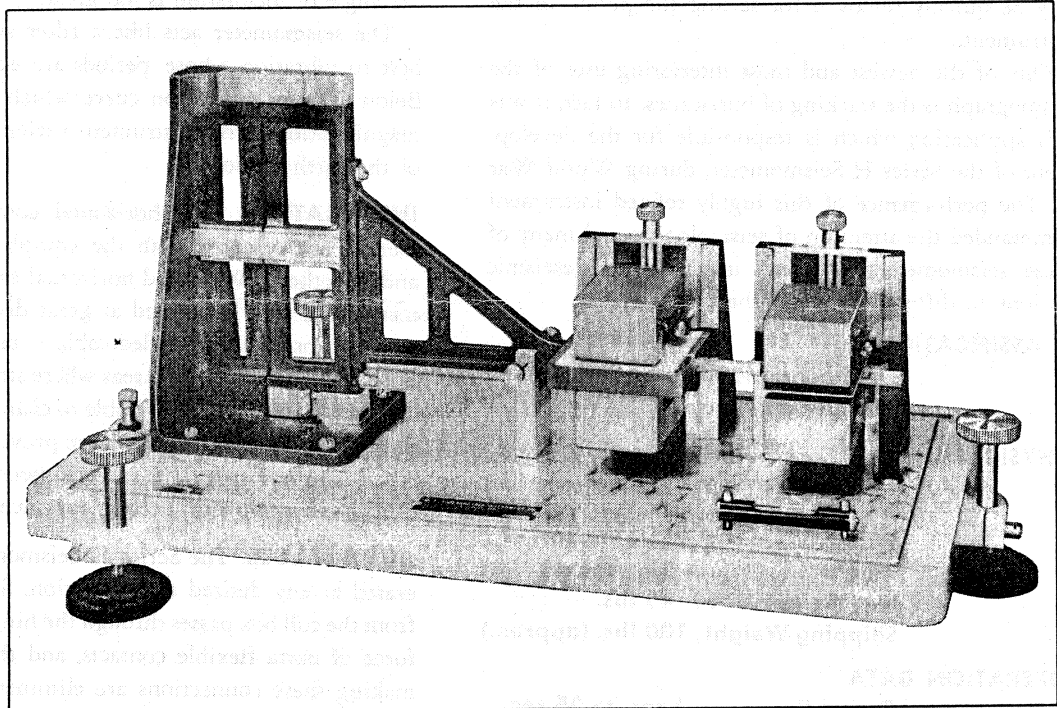
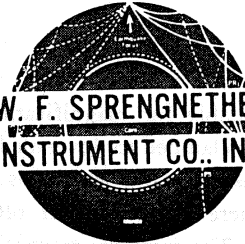


MANUFACTURERS OF

SEISMOLOGICAL · GEOPHYSICAL · AND · ENGINEERING · INSTRUMENTS · · · 4567 · SWAN · AVE ·

W. F. SPRENGNETHER
INSTRUMENT CO., INC.

SAINT LOUIS · 10 · MO · U · S · A ·



SPRENGNETHER

HORIZONTAL COMPONENT SEISMOMETER, SERIES H

THE SPRENGNETHER HORIZONTAL COMPONENT SEISMOMETER, Series H, consists of a horizontal pendulum with tension hinge supports, induction transducer, and electro-magnetic damping. The principal mass of the boom consists of a coil box which is supported in the strong magnetic field. A copper vane moving in a separate magnetic unit provides the damping.

The base plate consist of a brass casting with marginal groove for air tight transparent plastic cover box. There are three $\frac{1}{2}$ x 40 leveling screws. The side screws are for centering the boom. A transparent scale is provided to show when the boom is centered. The end leveling screw controls the period. The boom swings on crossed hinges at top and bottom. A clamp bar is provided for locking the boom, and also serves to hold it in the correct position for mounting the hinges, which are clamped in place. The retaining standard is designed so as to make all hinge clamps accessible. The current generated in the coil passes through the hinges, thereby eliminating outside connections between the stationary and moving parts. There are no visible wires. A calibration mirror is mounted at top of boom. The clamping yoke near the coil box is drilled for an air jet by means of which the boom may be given controlled impulses for calibration and adjustment. A level vial is mounted on the base for quick adjustment of the period.

The magnets are adjustable for magnification and damping. The magnets are clamped to dovetailed plates which are moved by means of a screw which has a right and left hand thread. There are millimeter reference scales on each magnet unit. The complete magnetic units may be quickly removed for setting the period of the instrument.

One of the newest and most interesting uses of the seismograph is the tracking of hurricanes. In fact, it was this application which is responsible for the development of the Series H Seismometer, during World War II. The performance of this highly refined instrument commanded the attention of seismologists and many of these seismometers are now installed in teleseismic stations in different parts of the world.

CLASSIFICATION

Electro-magnetic—Long Period, Horizontal Component.

PHYSICAL DATA

Dimensions

- Length 22½ inches
- Width 13½ inches
- Height 11 inches
- Net Weight 45 lbs.
- Shipping Weight . 100 lbs. (approx.)

OPERATION DATA

Period Range . . . 4 sec. to 25 sec.

MAGNIFICATION

Adjustable 2,000 to 10,000

APPLICATION DATA

- Seismological: Long distance earthquakes, periods 14-20 sec.*
- Meteorological: Microseism caused by storms over the sea. Periods 4 to 7 seconds.*

OPERATION: The Series H Seismometer is provided with adjustable magnification so that it can be made to operate in any location. The optimum magnification which can be used will depend upon the locality of the station. The period of the pendulum is determined by the angle at which the axis of rotation is inclined. Disregarding the restoring moment of the flat springs which are used for hinges, the fundamental undamped period of the pendulum is:

$$T = 2 \pi \sqrt{\frac{l}{g \sin i}}$$

where *i* is the angle of the inclined axis of the pendulum. For period near 20 seconds, this angle is very small. The

axis of rotation is fixed perpendicular to the base. By changing the angle of the base, the period may be adjusted to the required value. The sensitivity will vary with the period. High sensitivity may be obtained down to a period of four seconds. For periods less than this, the angle of inclination is too great.

The seismometer acts like a filter since it responds best to vibration whose periods are equal to its own. Below is a magnification curve which shows how the magnification of the instrument varies with the period of the earth motion.

INSTALLATION: Two horizontal component seismometers, one oriented with the equilibrium plane N-S and the other E-W, record horizontal earth motion. The instrument may be located at great distances from the recorder, providing shielded cable is used. When these instruments are set up in areas where strong earthquakes are likely to occur, it is advisable to clamp the instrument to the pier. Clamping fixtures are provided at low, extra cost. Complete operating and maintenance instructions in English or Spanish accompany each unit.

ADVANTAGES: The Series H Seismometer can be operated at any desired magnification. Since the current from the coil box passes through the hinges, the restoring force of extra flexible contacts, and the difficulties of making these connections are eliminated. The seismometer will compensate for tilt. It is possible to determine the constants for the study of true ground motions. It is easy to assemble. The simple boom clamping arrangement as well as the relative light weight, place it in the class with portable equipment.

