

# Active Seismic

**NSSDCA ID:** 1971-008C-05

**Mission Name:** Apollo 14 Lunar Module /ALSEP

**Principal Investigator:**Dr. Robert L. Kovach

## Description

The purpose of the active seismic experiment was to generate and monitor seismic waves in the Moon near the surface in order to study the internal structure to a depth of 460 m. The seismic energy source used was the 'thumper' device, which contained 21 small explosive charges. The mortar package containing four high-explosive grenades was planted 91 m from the LM, but its deployment from Earth was postponed and eventually cancelled when it was decided that the back blast from firing the grenades could damage the central station and other experiments. The thumper equipment consisted of a staff held and triggered by an astronaut with the charge initiators mounted on the lower end of its base, a cable connecting the staff (thumper) to the central station, geophones (miniature seismometers) for recording the waves, and a three-channel amplifier with log compressor for telemetering to the earth.

The thumper shots were fired over the period from 18:10:38 to 18:37:07 UT on 5 February 1971. Eight of the 21 shot attempts (shots 5, 6, 8, 9, 10, 14, 15, and 16) were misfires. The thumper device provided data that indicated that two P-wave velocities were measured at the Fra Mauro site. The near surface has a seismic wave velocity of 104 m/s, and a sublayer starting at a depth of 8.5 m has a velocity of 299 m/s. Estimates of the thickness of this substratum range from 38 to 76 m, which is probably indicative of the depth of the Fra Mauro formation.

## Alternate Names

- Apollo14ALSEP/ActiveSeismic
- S033

## Facts in Brief

**Mass:** 11.2 kg

## Funding Agency

- NASA-Office of Space Science United States

## Discipline

- Planetary Science: Geology and Geophysics

## Additional Information

- Apollo 14 Lunar Module /ALSEP
- Data collections from this experiment

Questions and comments about this experiment can be directed to: Dr. David R. Williams

## Personnel

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