SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

SPACE

Timers Quiet Satellites

➤ VANGUARD 1, the fourth man-made object put into orbit (March 17, 1958), is still transmitting data after more than seven years, whenever it is in sunlight. Scientists would like to put a stop to this.

Since 1960, automatic cut-off timers have been built into most U.S. satellites so that they will not tie up more than their share of time on the limited number of radio frequencies available for telemetry.

Pegasus, for example, an accordion-pleated micrometeoroid-detection probe with a 96-foot "wing"-span, was launched last Feb. 16, and began sending back streams of data. On Feb. 16, 1966, a tiny electronic device, powered by its own battery independently of the satellite power supply, will shut off the current to the transmitters, leaving Pegasus to orbit in silence.

The timers, including a second one for a backup, aboard Pegasus, as well as those of Telstars I and II, are built around tiny tuning forks, whose unvarying vibrations provide an accurate base for time measurement. They were developed by Bulova Watch Company, Inc., and are called Accutrons.

As more and more data-collecting satellites are launched into space, the restrictions on their transmissions will have to be increased. One approach may be to expand the number of usable radio frequencies into areas now vacant.

Another idea being considered by space scientists is one that has already been used on a limited scale: instead of sending continuous streams of data down to earth, satellites would tape record their own information over an extended period of time, then send it at ultra-high speed upon a signal from earth. This technique has been used on the Orbiting Solar Observatories (OSOs), but not because of crowded frequency bands. During the larger part of the OSOs' orbits, they were out of radio range from earth. Therefore, they saved up their data until they were relatively nearby, and then sent it all at once.

The Mars-bound Mariner spacecraft, which will take 22 or 23 pictures of Mars in mid-July, will use a tape delay system for still a different reason. The television camera making the pictures will be feeding in a signal at 10,700 bits per second, while the telemetry playback rate at that great distance is limited to 8.33 bits per second, a ratio of 1285 to 1.

In order to slow down the signal before it is transmitted to earth, all the pictures will be recorded at once, and then the whole series will be "played back."

• Science News Letter, 87:262 April 24, 1965

Tornado
Page 263

A SCIENCE SERVICE PUBLICATION