

Satellites: space-age window to see the world

In 1957 I remember sitting in Mrs. White's science class listening to her commentary on the Russians, Sputnik and the importance of science education.

Today, more than 20 years later, we are still debating U. S.-Soviet relations and the decline of science education. However, little is heard today about satellites. America's latest love affair in the space program is with the shuttle.

Satellites have become commonplace since dozens have been launched for a variety of purposes, beginning with Sputnik in 1957.

TIROS (Television Infrared Observation Satellite) is used for weather watching. It records temperature and maps weather development over the entire globe twice each day.

Closer to home, **SMS** (Synchronous Meteorological Satellites) monitors the weather in the United States every half-hour around the clock.

This system assists our local weather reporters in getting their forecasts.

Another, **GEOS** (Geodetic and Earth Observation Satellites), maps the Earth's surface.

LAGOS (Laser Reflecting Geodetic and Earth Observation Satellite) specifically watches over California's San Andreas Fault, monitoring movement in the Earth's crust over a period of years.

SEASAT keeps watch over storms, ice fields and ocean currents as an aid to ships.

LANDSAT, by far the most thrilling of all satellites, has opened up whole new fields of Earth studies.

LANDSAT can spot schools of fish in the

ocean, detect geological formations that indicate oil and mineral deposits, monitor air and water pollution, and even keep track of migrating animals.

Though not the first to launch a satellite, in 1972 the United States pioneered the technology which brought us the **LANDSAT** system. **LANDSAT** is a relatively simple satellite. About one ton in weight, it travels around the earth 870 miles above in a circular orbit every 103 minutes.

The satellite is sun-synchronous, so it sweeps across the earth at the same local time of day, about 9:30 a.m. The satellite passes around the world 14 times a day.

As the earth turns beneath the orbiting

space craft, the instruments on board take pictures of the successive swaths of ground directly below. Similar to adhesive tape being wound onto a ball, these swaths of coverage gradually envelop the earth with a full layer of tape being added to the ball every 18 days. Each strip is approximately 116 miles wide.

LANDSAT does not take photographs like a camera. The spacecraft uses an instrument called a **Multi-Spectral Scanner**. This instrument scans the area that lies directly below the spacecraft as it moves along in its orbit, sensing the brightness of sunlight reflected from the earth.

The scanner senses the reflected sunlight in

high tech
Ronald R. Watcke

four different colors, and separate images are converted to voltages and returned to earth as electronic pulses. This data, once received on earth, is corrected for distortion, processed, and stored on film, computer tape, or disks.

By monitoring the intensity of each color, the satellite can distinguish between water, land, concrete, and grass, or healthy and diseased vegetation.

LANDSAT can see the difference in ground cover between any two spots on earth as small as the size of a suburban house lot.

LANDSAT can detect in less than 13 seconds what would take an earth-bound traveler years to discover.

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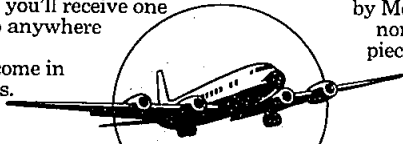
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