ERTS

EARTH RESOURCES TECHNOLOGY SATELLITE

"We are just beginning to comprehend the benefits that space technology can yield here on earth, and the potential is enormous."

President Richard M. Nixon

EARTH RESOURCES INVENTORY

Water, vegetation and soils all have unique signatures in the realm of multispectral light, and there is evidence they will reveal their identity from images produced through the technique of remote sensing. Results of earth surveys from high-altitude aircraft have already aided scientists and conservationists in charting the features of the earth. Synoptic images returned on a repetitive schedule from the vantage point of an earth-orbiting satellite hold even greater promise of charting the earth and its bounty.

NASA has included earth resources experiments on the testing agenda of several Gemini and Apollo manned spacecraft flights. Images were made of the earth both in the visible light range and in the unseen infrared and ultraviolet. Results were promising and indicated that such data properly interpreted may someday assist in increasing agricultural yield, chart the movement of sea life, monitor concentrations of air and water pollution, and furnish more knowledge of geography, cartography, and hydrology. A summary of a few experiments indicates the potential of earth surveys from satellites:

AGRICULTURE

- Wheat fields have been identified on images returned by Apollo 6.
- Infrared photos from high-altitude aircraft have shown difference between a healthy cotton crop compared with a unhealthy yield.

FORESTRY

- Extensive flood damage over 165 square miles along the Ouachitra River in Louisiana following a storm in January, 1969, was shown in Apollo 9 images.
- Infrared imagery from Apollo experiments have indicated potential in the detection of forest fires.

HYDROLOGY

- Gemini 4 provided pictures of water drainage patterns in Western Texas.
- Apollo 9 photos showed snow concentrations on an Arizona mountain range.

CARTOGRAPHY

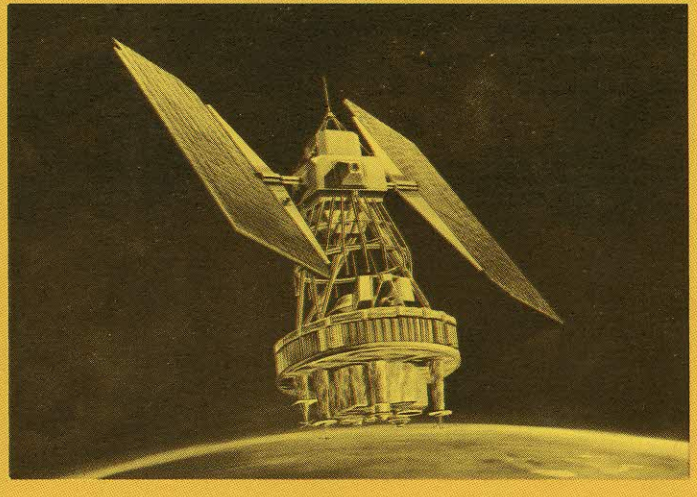
- Comparison photos taken of Cape Kennedy area by Gemini 6 and Gemini 7 revealed changes in urban structure and the addition of new roads in the intervening six months between flights.

EARTH RESOURCES SATELLITE SYSTEM

NASA is currently developing two experimental Earth Resources Technology Satellites (ERTS A/B); the first to be launched in 1972 and the second during the following year. The Earth Resources Technology Satellite program is a first step in the merger of space and remote sensing technologies into a system devoted to developing the ability for more efficient management of the earth's resources.

Design of the observatory is based on the highly successful Nimbus meteorological satellites which have regularly returned pictures of the earth's weather state since 1964. The ERTS observatory will operate in a polar orbit, 500 miles above the earth, and return images from two independently functioning multispectral sensors. A Data Collection System on board the observatory will gather environmental information from earth-based platforms and relay this data to the ground processing facility.

Operation of the observatory will be controlled by the Ground Data Handling System facility to be located at NASA/Goddard Space Flight Center. The GDHS will also process the wideband video data into both black and white, and color photo images tailored to the needs of the ERTS users.



ERTS CONTRACTOR TEAM

The General Electric Company Space Division is the prime contractor to NASA's Goddard Space Flight Center for the ERTS program. Bendix Corporation and Wolf Research and Development are major subcontractors for the data processing facility. Radiation Inc. will provide the Data Collection System.