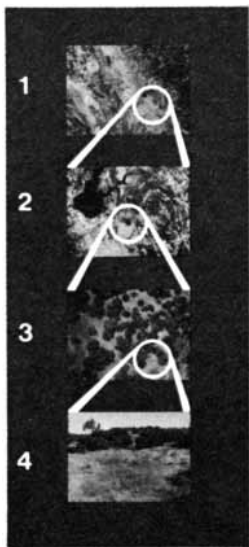


Broad-coverage, small-scale data from satellites (1) are evaluated to select more limited areas for the acquisition of more costly (per acre), larger-scale imagery data (2, 3) from high-, then low-flying aircraft. These data, in turn, are used to select specific ground plots (4) for on-site measurement of individual plants and detailed assessment of species mix, size, age, and condition.



## New information gathering and processing techniques hold high hope for improved management of our renewable resources.

Every nine days, two satellites circle the earth, recording all surface data between 82° N to 82° S latitudes. Handling and interpreting these massive amounts of data are two of the keys to improved resource management. ESL Incorporated, using an HP 3000CX computer-based system, is helping to handle the data and process it quickly and economically into multilevel, cross-comparative forms.

The effective management of renewable natural resources over any but small areas depends directly on frequent, accurate, large-scale inventories, and the ability to compare them. Heretofore, adequate data were difficult, sometimes impossible, to acquire on a timely basis. And where such acquisition was possible, the sheer volume of data needed was costly and discouraged adequate interpretation—let alone comparison over time.

Now, with multispectral scanner data of almost any locale available from NASA's LANDSAT satellites, complemented by optimal analysis of small- and large-scale photography from high- and low-flying aircraft, and relevant ground data such as tree size and condition, a cost-effective alternative to existing information gathering and analysis procedures is possible.

To exploit this volume of data from complementary sources, ESL Incorporated of Sunnyvale, California, has developed a complete systems approach, the hub of which is an interactive digital image processing system (IDIMS), utilizing an HP 3000CX as the host computer for several data-

handling and processing subsystems.

By applying techniques facilitated by the ESL system, thematic maps, inventory statistics, assessments, and predictions can be made and updated to meet a variety of objectives: timber volume estimates, wild land studies, censuses of people and animals, coastal zone management, and range and forest inventory, to name a few.

The advantages of the system are impressive. Spatial and spectral resolution characteristics of the digital data appear to be near optimum for computer mapping of surface vegetation. Geometric fidelity, spatial resolution, and computer compatibility of sampling and analysis combine to simplify the generation of map overlays demarcating various boundaries—of administrative, management, ownership, and political areas—to meet diverse informational needs. Satellite coverage is both systematic and periodic, providing a broad, uniform data base and the opportunity for frequent updating of the resource information base through identification and mapping of surface changes.

The ESL system is used by NASA at the Ames Research Center and the Johnson Space Flight Center, and by the EROS Data Center maintained by the U.S. Department of the Interior in Sioux Falls, South Dakota. ESL maintains a service bureau in Sunnyvale, California, and another is planned for the Washington, D.C. area. For more information, write or call ESL Incorporated.

For more information on the versatile HP 3000CX, talk to us. Hewlett-Packard, 1504 Page Mill Road, Palo Alto, California 94304.

System prices for the HP 3000CX start at \$99,500\*.

## This fetal monitor frees the obstetrical team to care for mother and unborn child.

Obstetricians have been relying on cardiocograms, especially during difficult deliveries, for more than a decade of fetal monitoring. By continuously measuring fetal heart rate and maternal labor contractions, the fetal monitor (cardiotocograph) gives the obstetrical team valuable information about the stress of birth on the fetus, from which they can better manage labor and deliver healthier babies.

Virtually automatic in its operation, the new HP 8030A Cardiotocograph frees the delivery team from the task of managing the instrument for the much more important one of caring for the mother and unborn child. Specifically, the instrument can measure fetal heart rate by any of four methods (direct or abdominal ECG, ultrasound, or heart sound) and labor activity by internal or external methods. The nurse or physician need only plug the desired transducer into the appropriate connector—and the instrument automatically switches to the correct mode, calibrates the input signal, adjusts its sensitivity and makes the measurement accurately.

A built-in scope continuously shows the fetal input waveform and thus helps the obstetrical team to place the transducer for the best signal. The trace itself does not fade and its intensity adjusts automatically to changes in room light; it can also be “frozen” for inspection by pressing the STOP button.

The computed beat-to-beat heart rate and maternal uterine pressure are displayed simultaneously on large, clear digital readouts while status lamps



clearly identify the type of measurement method in use. An acceptance lamp lights with every valid heart rate measurement, and an INOP indicator immediately signals if there is any problem in the ECG electrode or transducer.

The instrument checks its own operation and circuits at the touch of a button; its built-in silent recorder prepares a permanent cardiocogram on smudgeless thermal paper; and it is easily configured to various monitoring modes simply by plugging printed circuit boards into the instrument chassis.

From any point of view, the 8030A meets the needs and preferences of the obstetrical team. Prices start at \$6,250\*.

For more information on these products, write to us, Hewlett-Packard, 1504 Page Mill Road, Palo Alto, California 94304.

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\*Domestic USA prices only.

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