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science news

Largest Objects in the Universe

Conversation Pieces

Technically intriguing items from TRW, guaranteed to add luster to your conversation and amaze your friends.

Oh Say Can You See Discussions about whether or not we should continue to "go into space" often overlook a fundamental point—namely, that we are in space already. Each of us is an astronaut on a spacecraft called earth traveling around the sun at 67,000 miles per hour. The biological community that lives on the spacecraft has a fragile life support system—the thin film of soil, air and water in which we dwell. During the past century, the number of passengers aboard the spacecraft has increased tremendously; so also has their ability to consume its finite supplies. We see some of the results in the pollution of our environment and the decay of our resources.

As astronauts we need to monitor our spacecraft to see that we are not doing irreparable damage to its life support system. NASA has undertaken several programs which involve the development of advanced sensors. From a satellite or aircraft, these sensors can monitor air quality, determine the condition of crops, or help locate mineral resources. Currently, TRW is developing such a sensor for NASA. It is called MOCS, an acronym for Multichannel Ocean Color Sensor.

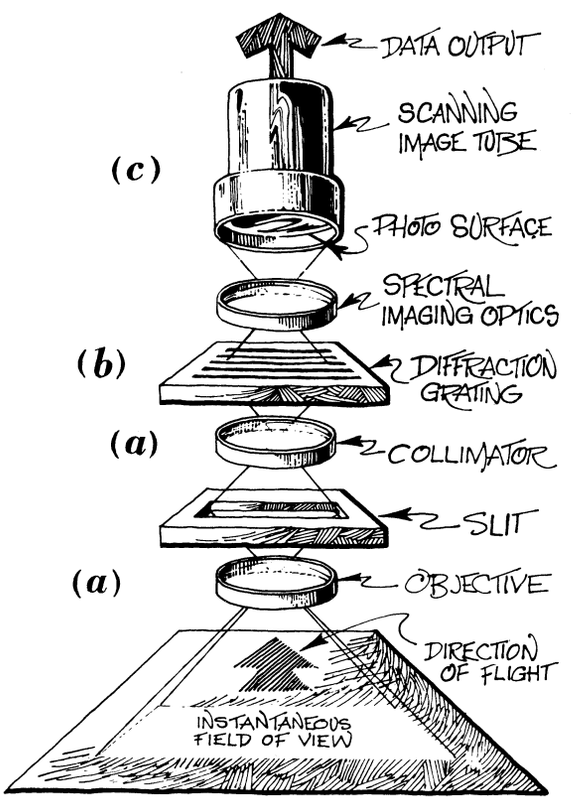
MOCS is based on the principle that sea water, plankton, and such pollutants as oil spills, sewage, and river sediments, all reflect light at different wavelengths and in varying proportions. MOCS measures these subtle differences with great sensitivity and better spectral resolution than any other available scanner. Its value lies in its ability to map the spread of pollutants as well as their effect on the chlorophyll content and other signs of health or sickness in the world's plankton beds. Only with a historical record based on hard facts, can all the arguments be settled as to whether ocean pollution has reached dangerous levels or not.

MOCS weighs less than 20 lbs., has no moving parts, and uses only 7½ watts of power. Yet it has produced some fascinating information about the spacecraft on which we live. Recently, for example, we tested MOCS by flying it in an aircraft at 37,000 feet over Clear Lake in California. MOCS showed that the lake teemed with sediments, algae growth, and foreign matter. In fact, the only thing clear about the lake was its ironic name.

We're happy to be associated with the excellent work NASA is doing in remote sensing. We hope that MOCS and other NASA sensors will help make spacecraft earth a habitable home for us all.

The Multichannel Ocean Color Sensor

Lenses (a) focus light through a slit onto a diffraction grating (b) which separates the light into its spectral components. These are focused on a dissector tube (c) which shows spatial variations of light across the field of view in one direction and spectral variations in the other. The raster scan then gives an electronic signal proportional to the spectral radiance of each spectral band in each element across the field of view.



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