

189882 526-48
N89-28144 1135.0067
9.8

OCEAN DATA ACQUISITION SYSTEM

by

B. Johnson, J. Cavanaugh, J. Smith (674), W. Esaias (671)

The Ocean Data Acquisition System (ODAS) is a low-cost instrument with potential commercial application. It is easily mounted on a small aircraft and flown over the coastal zone ocean to remotely measure sea surface temperature and three channels of ocean color information. From this data, chlorophyll levels can be derived for use by ocean scientists, fisheries, and environmental offices. Data can be transmitted to shipboard for real-time use with sea truth measurements, ocean productivity estimates and fishing fleet direction.

The aircraft portion of the system has two primary instruments: an IR radiometer to measure sea surface temperature and a three channel visible spectro-radiometer for 460, 490, and 520 nm wavelength measurements from which chlorophyll concentration can be derived. The outputs of both instruments is fed into a data system where they are digitized to 12-bit resolution, formatted, recorded on-board, and transmitted to a receiving (shipboard) system for processing. The aircraft package contains a LORAN-C unit for aircraft location information, clock, on-board data processor and formatter, digital data storage, packet radio terminal controller, and radio transceiver for data transmission to a ship. From the measurement altitude of 500 feet, the line of sight transmitter range to a ship is about 30 miles. The VHF transceiver can also be used for voice communication and

PRECEDING PAGE BLANK NOT FILMED

coordination between aircraft and ship.

The shipboard package contains a transceiver, packet terminal controller, data processing and storage capability, and printer. Both raw data and chlorophyll concentrations are available for real-time analysis.

To keep down the cost of reproducing the instrument system in the future, commercially available subsystem components are principally used. Good quality camera lenses for the optical systems, amateur radio packet controllers, and modified amateur transceivers (modified to FCC assigned ODAS frequencies) for the data transmission systems, and rack mountable personal computers for the data systems are examples.

FIELD MISSIONS:

ENGINEERING FLIGHTS AT WALLOPS FLIGHT FACILITY; MAY 13, 1987
1987 AIRBORNE SCIENCE EXPEDITION TO THE ARCTIC OCEAN NEAR
SPITSBERGEN; MAY 17 - MAY 30, 1987.
BIOWATT FALL EXPEDITION, NOVEMBER 1987
SEEP II (SHELF EDGE EXCHANGE PROGRAM); MARCH 1988.

1. MEASUREMENT TECHNIQUE: NARROW BAND INTERFERENCE FILTERS AND SILICON DETECTORS.
2. OBSERVATION WAVELENGTH(S): 460, 490, & 520 nm.
3. PARAMETER MEASURED: OCEAN COLOR TO DERIVE CHLOROPHYLL.
4. SENSOR HEAD SIZE: 12" DIAM. X 17" DEEP WEIGHT: 25 POUNDS (EST)
5. DATA SYSTEM: 19"W X 15"D X 9"H (AIRBORNE DATA SYSTEM IS A PERSONAL COMPUTER W/ PLUG-IN A/D CONVERTER & "HARD CARD".
SHIPBOARD DATA SYSTEM IS A PERSONAL COMPUTER WITH HARD DISC OR CARD. WEIGHT: 30 POUNDS (EST) DATA RATE (BPS): 1200
6. REMOTE SENSING AIRCRAFT USED: WFF P-3 DE HAVILLAND "BEAVER".