NEWS

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546
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FOR RELEASE: FRIDAY, A.M.
August 6, 1971

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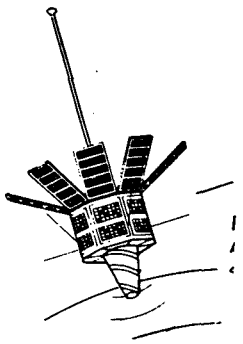
PRESS KIT



PROJECT: EOLE

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NEWS

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FRENCH WEATHER SATELLITE LAUNCH AUGUST 16

A French meteorological satellite -- Eole, the French name for the God of Winds in mythology is being prepared for launch from Wallops Station, Va., no earlier than August 16. The 186-pound (84-kilogram) satellite was developed by the French space agency -- Centre Nationale D'Etudes Spatiales (CNES) -- a cooperative project with the U.S. National Aeronautics and Space Administration which will launch the spacecraft.

The mission of Eole is to collect information on winds, temperatures and pressures from instrumented balloons flying at an altitude of about 39,000 feet (11,850 meters) in the Southern Hemisphere. A second objective is to demonstrate satellite and balloon technology for performing range and range-rate measurements for determining balloon positions.

- more -

Eole will be launched on the 73-foot Scout rocket which is made up of four solid propellant stages. This 75th NASA launch of Scout will be the first in which the rocket has carried an applications payload into orbit.

Eole is to be placed into a circular orbit of 560 miles (900 kilometers) inclined 50 degrees to the equator. The orbit will have a 103-minute period.

From this orbital vantage point, the satellite will collect wind speed and direction, and air temperature and pressure data from as many as 500 balloons floating freely in the Southern Hemisphere. The balloons will be launched by CNES and Argentine personnel from three sites in Argentina. Balloons which stray out of the experiment area will be destroyed by command from the satellite. This will reduce the amount of data collected by the satellite which is not required by the scientific investigators.

The balloons can be interrogated by Eole both day and night individually, in sequence, or in a programmed group (up to 64 at a time).

Meteorological data gathered by the mission will help develop accurate mathematical models required by the World Weather Program -- a global effort, to increase our knowledge of the atmosphere, to develop better measurement techniques, and to improve the accuracy and duration of weather prediction for the benefit of mankind.

The three specific meteorological objectives of Eole are:

- to reveal more about the circulation of the atmosphere from the tracks of the balloons,

- to provide a basis for a standard reference system of pressure and temperature to be used in the World Weather Program,

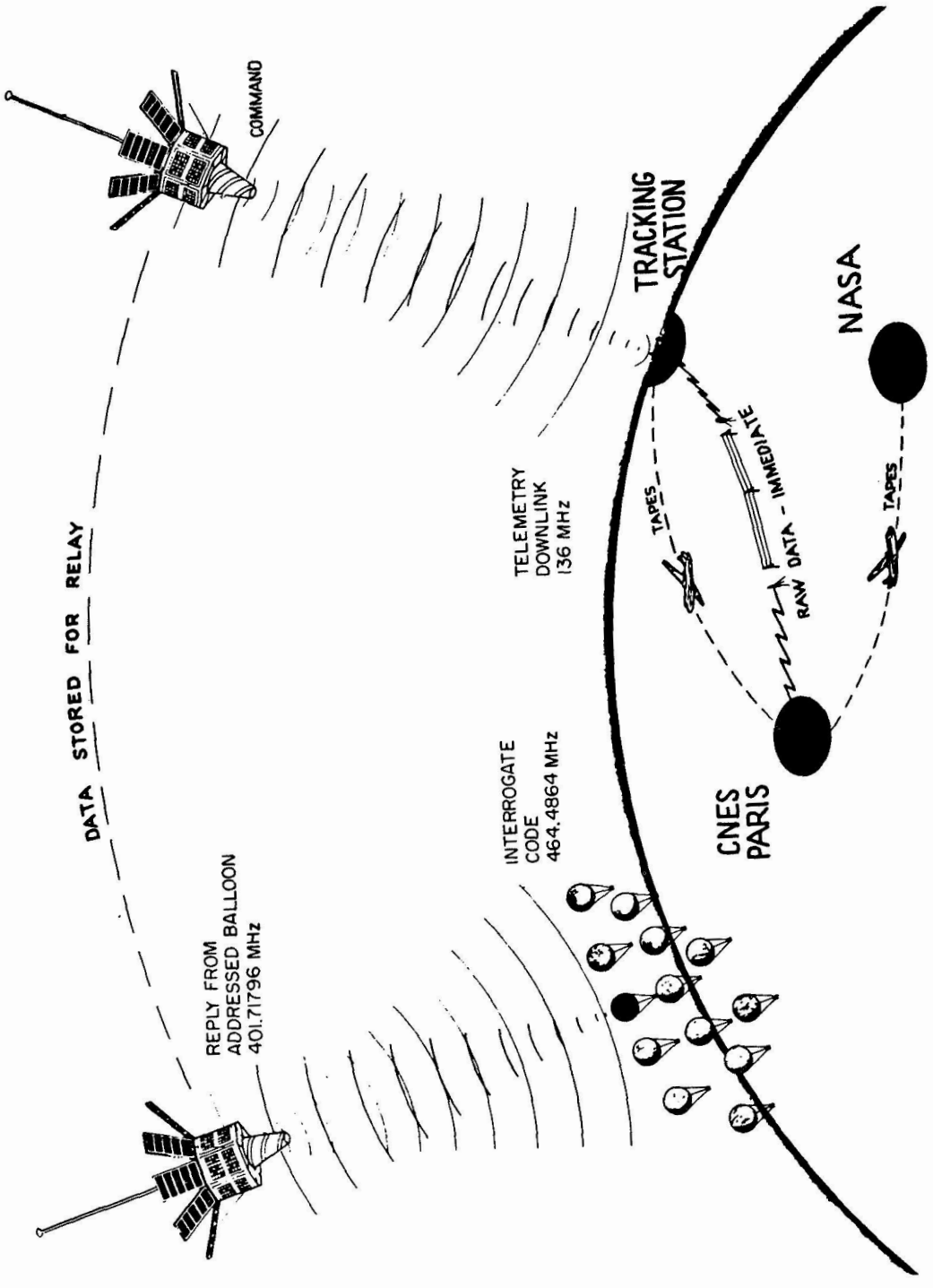
- and to learn more about local winds.

The secondary objective of the mission is to prove the feasibility of a modified Doppler system plus range measurements to determine accurately the location of each balloon. The satellite can locate the horizontal position of a balloon with an accuracy of about 1.9 miles (three kilometers).

In addition to the data interrogation and location techniques, the Eole project will prove out super-pressure balloon design and light-weight, frangible balloon-borne electronics. CNES has been experimenting with balloon technology for some years and has developed the balloons especially for the Eole project.

The agreement establishing the joint project provides that there shall be no exchange of funds between CNES and NASA.

CNES designed, built and tested the Eole spacecraft and balloons and will manage balloon launchings, spacecraft tracking, data acquisition and processing.


COMMAND
DATA STORED FOR RELAY
REPLY FROM
ADDRESSED BALLOON
401.71796 MHz
INTERROGATE
CODE
464.4864 MHz
TELEMETRY
DOWNLINK
136 MHz
TRACKING
STATION
TAPES
RAW DATA - IMMEDIATE
TAPES
NASA
CNES
PARIS

NASA is cooperating in the Eole mission under the Cooperative Applications Satellite (CAS) program of its Office of Space Science and Applications. NASA's Langley Research Center will provide the Scout launch vehicle. Wallops Station is responsible for prelaunch support as well as launch operations and initial tracking and data acquisition. NASA's Goddard Space Flight Center is project manager and will assist in first orbit computation operations with its Satellite Tracking and Data Acquisition Network (STADAN).

Data obtained from the mission will be simultaneously analyzed by the French and by a U. S. group called the Eole Data Interpretation Group. It is comprised of representatives of NASA, CNES, the National Science Foundation's Center for Atmospheric Research, National Oceanic and Atmospheric Administration and the University of California at Los Angeles.

The Eole data will be processed for preliminary analysis within six hours after its arrival in France for limited forecast applications and operational planning purposes. Eole 1 will be the 17th foreign spacecraft mission launched by NASA. Should Eole 1 fail, a back-up satellite and launch vehicle are available at Wallops Station.

(END OF GENERAL RELEASE; BACKGROUND INFORMATION FOLLOWS)

BACKGROUND - WORLD WEATHER PROGRAM

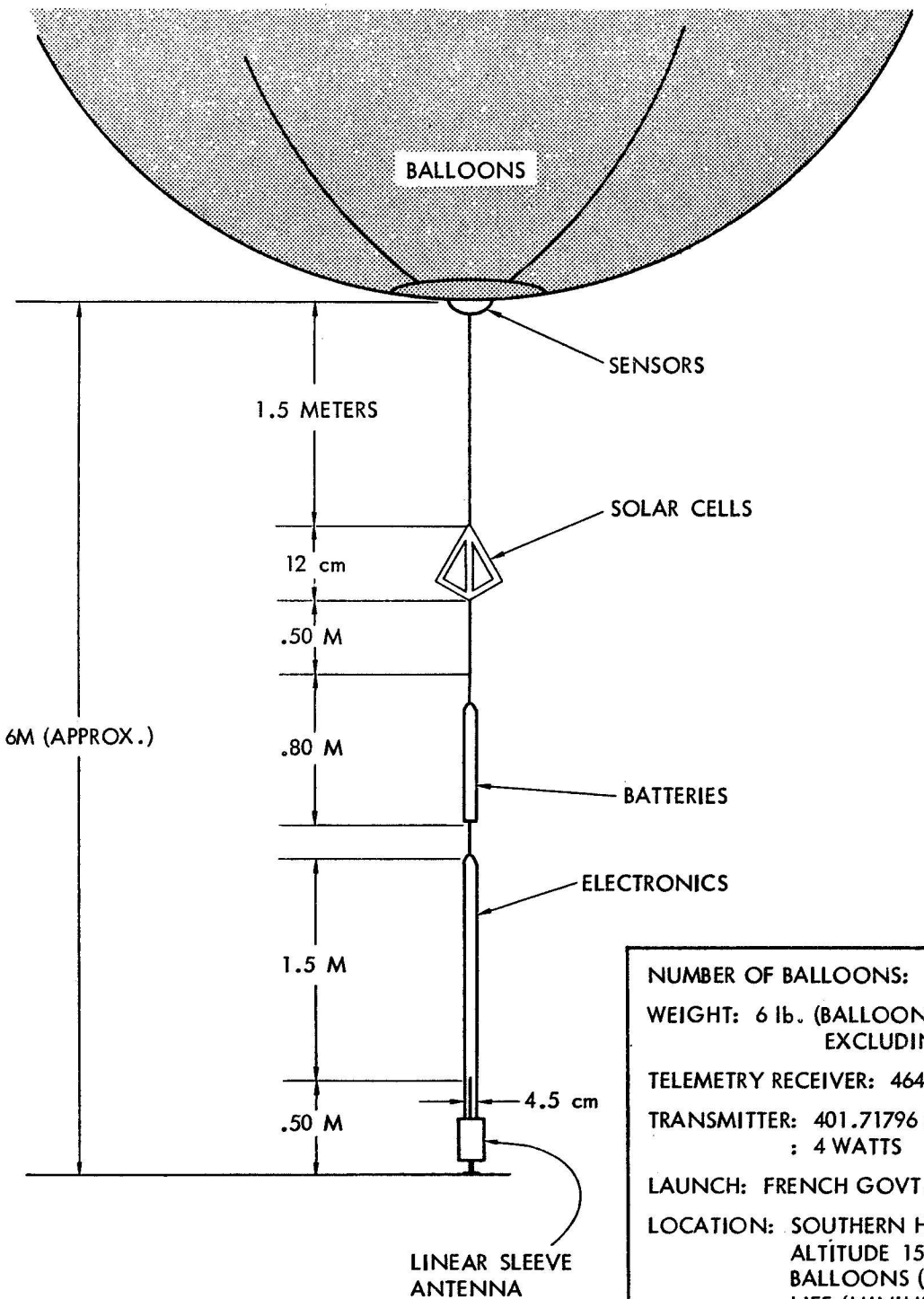
The World Weather Program represents a scientific/technological endeavor of truly international proportions. It involves improved weather service operations, basic research on the Earth's atmospheric environment and new technology usage. These three areas, the World Weather Watch, the Global Atmospheric Research Program (GARP) and the Systems Design and Technological Development Program--constitute the World Weather Program.

A major goal of the GARP is the comprehensive observation of the atmosphere for one year. These measurements, if sufficiently accurate, would establish the long-sought mathematical and physical basis for methods of long-range weather prediction. Conventional means of air sampling provide data for only some 10 to 20 per cent of the total atmosphere. Satellites, with related systems, are an ideal way to obtain the additional data since they provide global coverage.

For several years instrumental balloons have been tracked in constant level free flight by U.S. and French scientists using non-satellite methods. It is generally agreed that the wind velocity results obtained by these methods are too gross to be of value for weather prediction purposes. The position location accuracy is poor and the number of balloon readings are quite small since data can be obtained only when the balloon passes over a land-based station.

Experience indicates that balloons operating at or above 39,000-mile (11,850-kilometer) altitudes have a lifetime of a month to several hundred days, thus providing sufficient scientific data to use for experiment or prediction purposes.

A number of satellite location and data collection systems are under development and test by NASA. One, the Interrogation, Recording and Location System (IRLS), has been tested extensively on NASA's Nimbus 3 and 4. This has successfully tracked balloons, aircraft and other instrumented platforms from a wide variety of locations. Another is the Omega Position Location Equipment (OPLE) that has operated with geostationary satellites, such as ATS-1 and 3, and has successfully tracked and obtained instrument data from balloons and buoys.



NUMBER OF BALLOONS: 750 (APPROXIMATELY)

WEIGHT: 6 lb. (BALLOON PACKAGE EXCLUDING BALLOON)

TELEMETRY RECEIVER: 464.4864 MHz

TRANSMITTER: 401.71796 MHz
: 4 WATTS

LAUNCH: FRENCH GOVT.

LOCATION: SOUTHERN HEMISPHERE
ALTITUDE 150-200mb
BALLOONS (HELIUM FILLED)
LIFE (MINIMUM 30 DAYS)
DATE: 4TH QUARTER 1970

The French EOLE system is an advancement beyond the IRLS and OPLE systems. The IRLS locates by measuring the distance that a pulse travels from the satellite to the balloon and back. The EOLE system is similar to the IRLS in that it also uses a ranging system but it combines it with angular information which is derived from return signal Doppler shift. EOLE also operates with over 500 balloons; while IRLS has a smaller capacity.

The EOLE 1 experiment is important, therefore, in that it will contribute significantly to final development of a simple inexpensive instrumented platform location system using Earth orbiting satellites.

SCOUT LAUNCH VEHICLE

This will be the 75th Launch by NASA of the Scout which is NASA's only solid propellant launch vehicle with orbital capacity. The first development Scout was launched in July 1960. Since the Scout was recertified in 1963, it has attained a 94 per cent success record.

Scout B is a four-stage solid propellant rocket system. Scout No. S-180 will lift-off on an initial launch azimuth of 126.4 degrees to obtain a near-circular 560-mile (900-Kilometer) orbit with an inclination of 50 degrees and taking 103 minutes to complete one revolution.

The four Scout motors -- Algol II, Castor II, Antares II, and Altair III -- are interlocked with transition sections that contain guidance, control, ignition, and instrumentation systems, separation systems and the spin motors needed to stabilize the fourth stage. Control is achieved by aerodynamic surfaces, jet vanes and hydrogen peroxide jets.

The launch vehicle is approximately 73 feet (22.25 meters) long and weighs about 40,000 pounds (17,144 Kilograms) at liftoff.

Scout S-180 is the first of its class to use S-band telemetry. The Scout program is managed by NASA's Langley Research Center, Hampton, VA. The launch vehicle is built by LTV Aerospace Corp., Dallas.

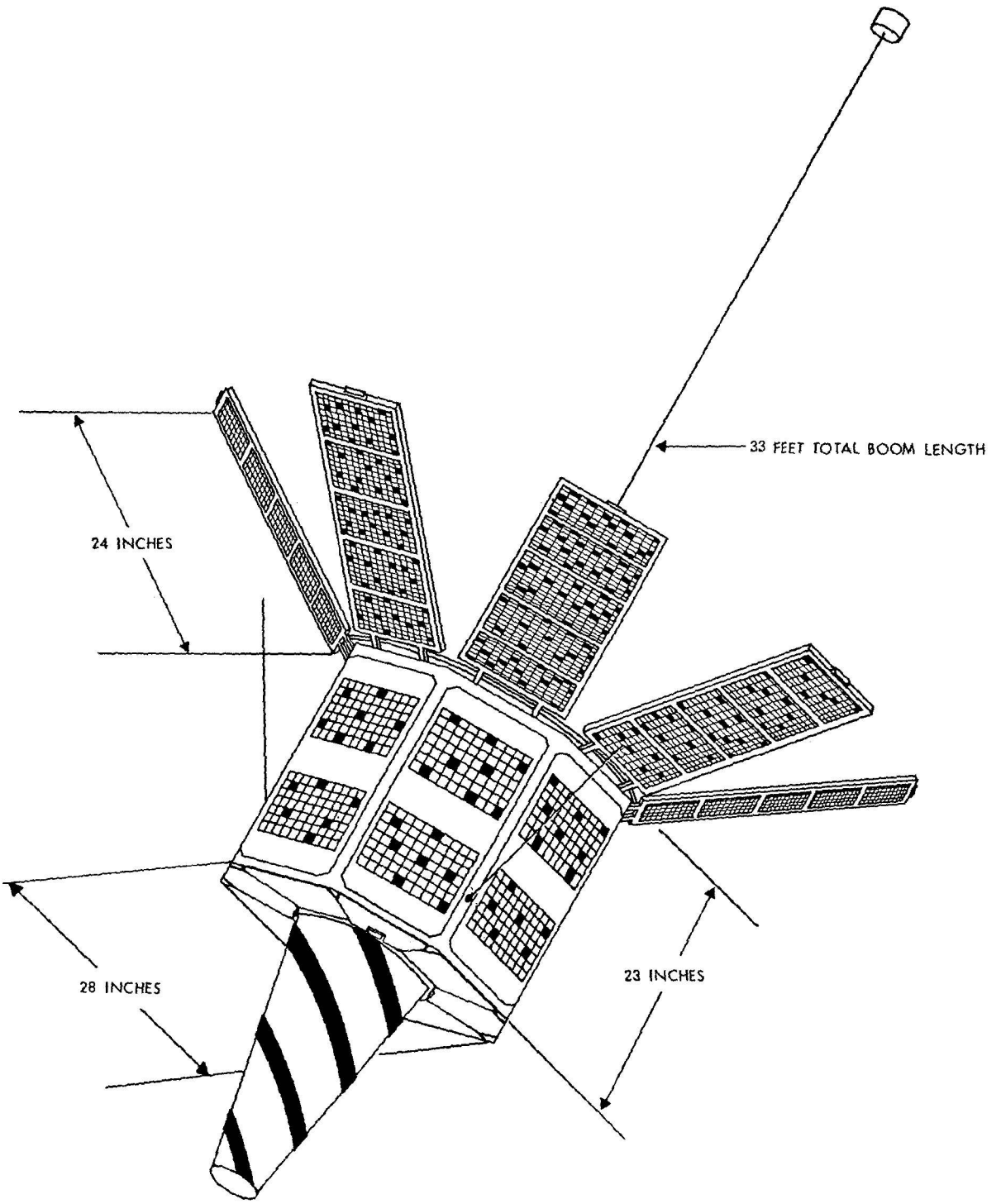
LAUNCH AND ORBIT SEQUENCE OF EVENTS

The sequence of events from liftoff until the spacecraft separation is as follows:

Liftoff	0.00 seconds
First stage burnout	77.5
Second stage ignition	77.7
Second stage burnout	120.0
Heat shield separation	126.2
Third stage ignition	127.9
Third stage burnout	164.6
Spin-up	668.8
Fourth stage ignition	675.2
Fourth stage burnout	711.1
Despin	1010.3
Solar panel deployment	1020.3
Payload separation	1030.3

EOLE 1 SPACECRAFT FACT SHEET

Weight:	206 pounds (including 20-pound vehicle separation system - E section)
Structure:	Octagonal-shaped cylinder (28-inch diameter) with a conical antenna appended to one end
	Overall length - 23 inches (exclusive of antenna and gravity gradient boom)
	Appendage - gravity gradient boom extending approximately 33 feet
	Antennas - four arm conical spiral experiment antenna (400-465 MHz)
	- canted turnstile telemetry and command antenna (136-148 MHz) pointing Earthward
Power System:	Solar cells plus a rechargeable silver-cadmium battery pack
	Mean power -- 20 watts
Communications and Data-Handling System:	Two transmitters with PCM/PM emission will be used. Transmitter 1 will operate at 464.4864 MHz with a power of four watts for balloon interrogation. Transmitter 2 will operate in the 136-138 MHz range, with a power of 250 mw, to transmit telemetry to ground stations
Tracking:	Transmitter 2 will be used for tracking initially by the STADAN system to establish orbit parameters, subsequently by CNES
Command:	The Command receiver operates at 148.25 MHz, using standard GSFC tone digital command system (PDM/AM/AM). Two address codes will be used, one for the standard spacecraft commands and both for teleprogramming balloon operations


33 FEET TOTAL BOOM LENGTH
24 INCHES
28 INCHES
23 INCHES

Expected lifetime:	180 days minimum
Stabilization System:	Gravity Gradient

Balloon

Numbers:	500 available for project
Instrumentation:	Includes temperature and pressure sensors, antenna solar cells, batteries, telemetry receiver (464.4864 MHz) and transmitter (401.71796 MHz) 4 watts
Length:	Instrumentation suspension line is 32 feet (approximately). Balloon proper is 12 feet (approximately)
Launch Sequence:	Three per day from each of three Argentina stations: Mendoza - 33 degrees S Neuquen - 39 degrees S Lago Fagnano - 55 degrees S Or 125 every two weeks
Lifetime:	Approximately five months
Position:	Almost all balloons expected to remain South of 30 degrees S latitude. Approximately 70 per cent will be between 30 degrees S and 60 degrees S.

EOLE PROJECT TEAM

Centre National d'Etudes Spatiales (CNES), France

Project Manager	J. Muller
Scientific Director	Prof. P. Morel, University of Paris

National Aeronautics and Space Administration (NASA)

Program Manager	Eugene Ehrlich
Program Scientist	William C. Spreen

Goddard Space Flight Center

Project Manager	Samuel R. Stevens
Project Scientist	William R. Bandeen
Tracking/Data Systems Manager	Thomas Z. Ziegler

Langley Research Center

Head, Scout Project Office	R. D. English
Payload Coordinator	Joseph B. Talbot

Wallops Station

Project Engineer	Joseph R. Duke

U.S. EOLE DATA INTERPRETATION GROUP

Chairman	William R. Bandeen, GSFC
Participant	Dr. A. Kasahara, National Center for Atmospheric Research, National Science Foundation
Participant	Dr. J. Angell, National Oceanic and Atmospheric Administration, Department of Commerce
Participant	Prof. Y. Mintz, University of California at Los Angeles
Participant	Dr. Robert Jastrow, Goddard Institute for Space Studies.

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