NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION
Washington, D. C. 20546
202-755-8370

FOR RELEASE:

Thursday, May 30, 1974

PROJECT: HAWKEYE

RELEASE NO: 74-138K

PRESS KIT

contents

GENERAL RELEASE ---------- 1-5
HAWKEYE MISSION IN BRIEF ---------- 6
FLIGHT SEQUENCE ---------- 7
SPACECRAFT DESCRIPTION ---------- 8
LAUNCH VEHICLE ---------- 9
HAWKEYE PROGRAM MANAGEMENT ---------- 10-11

NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION
Washington, D. C. 20546

FOR RELEASE:

Nicholas Panagakos
Headquarters, Washington, D.C.
(Phone: 202/755-3680)

Maurice Parker
Langley Research Center, Hampton, Va.
(Phone: 804/827-3966)

Thursday, May 30, 1974

RELEASE NO: 74-138

NASA TO LAUNCH HAWKEYE SATELLITE

A Hawkeye scientific satellite will be launched by NASA into polar orbit from the Western Test Range near Lompoc, Calif., about June 3.

The spacecraft will be launched aboard the first five-stage version of a Scout rocket.

- more -

May 22, 1974

Hawkeye's primary objective is to investigate the interaction of the solar wind with the Earth's magnetic field, with emphasis on the North polar cap.

Secondary objectives include locating magnetic neutral points or lines during both quiet and disturbed solar wind conditions, and studying the magnetic field topology at large radial distances over the Earth's polar caps.

The newly configured Scout-E incorporates a BE-3A solid rocket motor into the fifth stage, and is equipped with an attitude correction system (ACS) required to orient the fourth and fifth stages in the proper pitch plane before fifth-stage ignition.

Hawkeye will operate in a highly eccentric orbit with a perigee of only 500 kilometers (270 nautical miles) and an apogee of 101,746 kilometers (54,909 nautical miles). Its inclination to the equator will be 90 degrees. The orbital period will be approximately 38 hours.

Hawkeye's three major scientific instruments, all provided by the University of Iowa under contract to NASA's Langley Research Center, are a flux gate magnetometer, a low energy proton-electron differential energy analyzer (LEPEDEA), and a very low frequency-extremely low frequency (VLF-ELF) electric and magnetic field receiver.

NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION
Washington, D. C. 20546

FOR RELEASE:

Nicholas Panagakos
Headquarters, Washington, D.C.
(Phone: 202/755-3680)

Maurice Parker
Langley Research Center, Hampton, Va.
(Phone: 804/827-3966)

Thursday, May 30, 1974

RELEASE NO: 74-138

NASA TO LAUNCH HAWKEYE SATELLITE

A Hawkeye scientific satellite will be launched by NASA into polar orbit from the Western Test Range near Lompoc, Calif., about June 3.

The spacecraft will be launched aboard the first five-stage version of a Scout rocket.

- more -

May 22, 1974

Hawkeye's primary objective is to investigate the interaction of the solar wind with the Earth's magnetic field, with emphasis on the North polar cap.

Secondary objectives include locating magnetic neutral points or lines during both quiet and disturbed solar wind conditions, and studying the magnetic field topology at large radial distances over the Earth's polar caps.

The newly configured Scout-E incorporates a BE-3A solid rocket motor into the fifth stage, and is equipped with an attitude correction system (ACS) required to orient the fourth and fifth stages in the proper pitch plane before fifth-stage ignition.

Hawkeye will operate in a highly eccentric orbit with a perigee of only 500 kilometers (270 nautical miles) and an apogee of 101,746 kilometers (54,909 nautical miles). Its inclination to the equator will be 90 degrees. The orbital period will be approximately 38 hours.

Hawkeye's three major scientific instruments, all provided by the University of Iowa under contract to NASA's Langley Research Center, are a flux gate magnetometer, a low energy proton-electron differential energy analyzer (LEPEDEA), and a very low frequency-extremely low frequency (VLF-ELF) electric and magnetic field receiver.

The magnetometer, mounted on an extendable boom approximately 1.6 meters (5 feet) from the spacecraft's centerline, will measure magnetic topology and its temporal variations in four sensitivity ranges. The principal investigator for this experiment is Dr. James A. Van Allen of the University of Iowa.

The LEPEDEA will measure the energy spectrum and angular distribution of electron and proton intensities within a wide energy range. Dr. L.A. Frank, University of Iowa, is principal investigator.

The VLF-ELF receivers will measure frequencies through two electric field antenna booms, each extendable to about 23 meters (75 feet), and a search coil, mounted on a boom extendable about 1.6 meters (5 feet) from the spacecraft centerline. Dr. Donald A. Gurnett, University of Iowa, is principal investigator.

The nominal mission lifetime is one year. At the end of the year's operation, the spacecraft and data quantity will be examined to determine whether extended operations would increase scientific yield.

The new Scout attitude correction system (ACS) will establish a pitch reference point for the launch vehicle before ignition of the Scout's fourth stage. After insertion into parking orbit, the ACS will reorient the fourth and fifth stages into the proper attitude for fifth stage ignition.

Fifth stage burn will be in the vicinity of the South Pole and will insert the spacecraft into its highly eccentric operational orbit.

Hawkeye continues the University of Iowa's Injun series, which has provided a comprehensive study of charged particles trapped in the Earth's magnetosphere. The first spacecraft launch was in June 1961.

The Hawkeye spacecraft will be controlled during operations by the University of Iowa's North Liberty Radio Observatory (NLRO) and its Spacecraft Operations Control Center.

NASA's Goddard Space Flight Center will support the mission through the Spaceflight Tracking and Data Network (STDN), and the National Science Foundation South Pole Station will support the launch phase by monitoring and recording performance of the Scout's fifth stage burn.

During the scientific life of Hawkeye, NLRO will receive, record and transmit realtime data to the University of Iowa's Physics Department Computer Center. Data recorded at selected STDN stations will be mailed to the University.

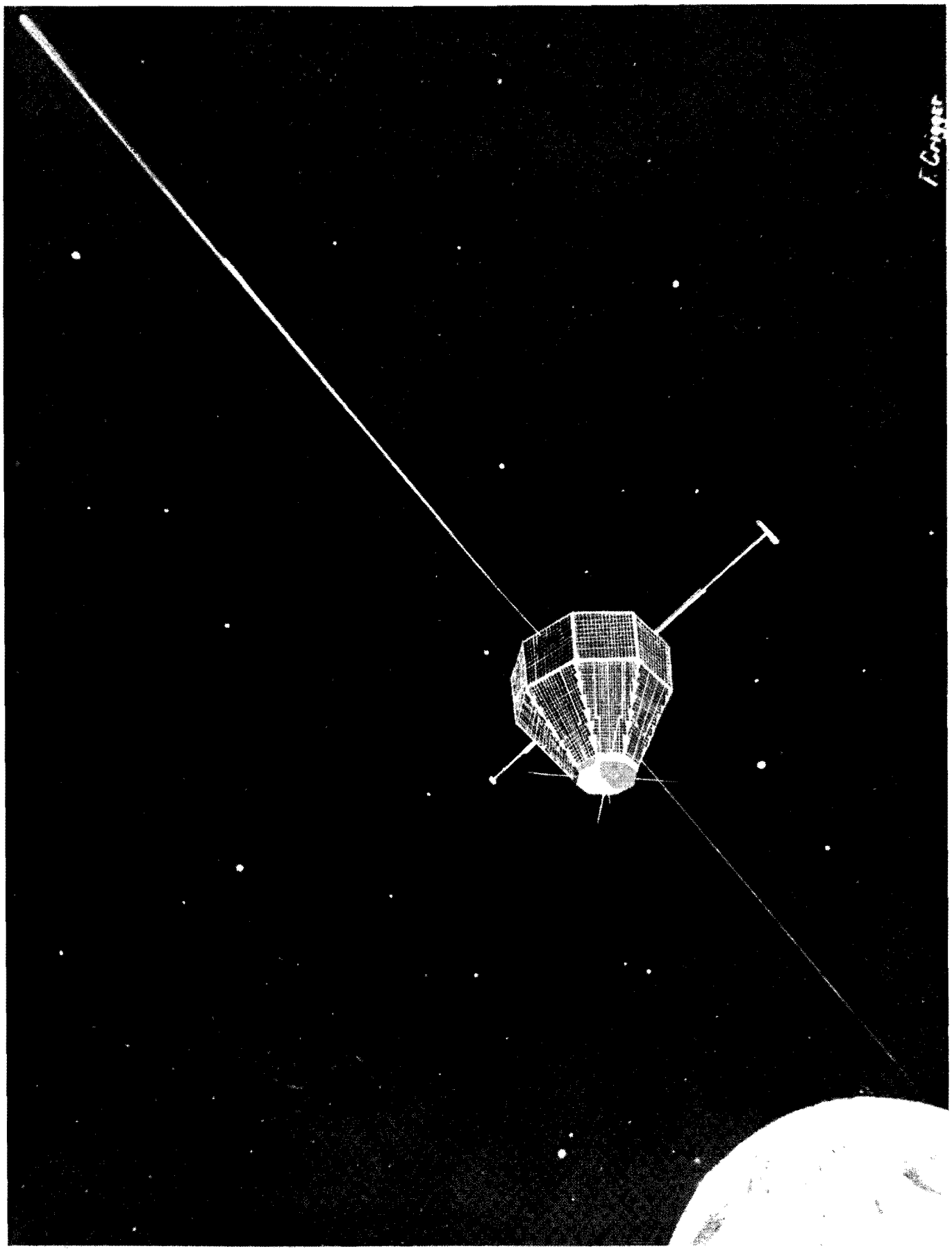
NASA direction for the project is through the Office of Space Science, NASA Headquarters, Washington, D.C. NASA's Langley Research Center, Hampton, Va., has management responsibility for the complete project, including the Scout launch vehicle.

Hawkeye was designed and built at the University of Iowa, and the Scout-E vehicle was built by Vought Systems Div., LTV Aerospace Corp., of Dallas, Texas.

Launch services will be provided by LTV's Vought Division, under technical direction of the Air Force 6595th STG at the Western Test Range, and supported by NASA's Kennedy Space Center Unmanned Launch Operations Division, Lompoc, Calif., in cooperation with Langley's Scout Project Office.

After the satellite has achieved a successful orbit, it will be designated Hawkeye-1 (One) and assigned an Explorer number.

(END OF GENERAL RELEASE; BACKGROUND INFORMATION FOLLOWS.)


F. Cripper

HAWKEYE MISSION IN BRIEF

Launch Window:	6:30 p.m. to 7:30 p.m. EDT, June 3, 1974
Launch Site:	Air Force Western Test Range, NASA Space Launch Complex (SLC) 5, Vandenberg Air Force Base, Lompoc, California.
Launch Vehicle:	Five-stage, solid-fuel, Scout-E, number S-191.
Orbit:	500 kilometer (270 nautical mile) perigee and 101,746 kilometer (54,909 nautical mile) apogee.
Spacecraft:	Weight: 26.6 kilograms (58.7 pounds).
	Structure: Eight-sided, truncated cone with a 0.75 meter (30 inch) diameter base, 0.25 meter (10 inch) diameter top, and a 0.75 meter (30 inch) height.
	Appendages: two electric field antenna booms, each extendable to approximately 23 meters (75 feet; a flux gate magnetometer boom and a search coil magnetic antenna, each extendable to about 1.6 meters (5 feet).
Power:	Solar cells are mounted on all sides and bottom of the outer shell, providing power for the spacecraft subsystem and experiments.
Spacecraft Control:	Operations after attainment of orbit will be controlled by the University of Iowa's Spacecraft Operations Control Center.
Tracking:	NASA's world wide Spaceflight Tracking and Data Network (STDN) at the Goddard Space Flight Center will provide tracking and data acquisition support.

FLIGHT SEQUENCE

EVENT	TIME (Min-Sec)
Liftoff	00:00
First Stage Burnout	01:20
Second Stage Ignition	01:23
Second Stage Burnout	02:01
Payload Heat Shield Separation	02:24
Third Stage Ignition	02:26
Third Stage Burnout	02:55
Uncage Attitude Correction System (ACS)	08:19
Fourth/Fifth Stage Spin-Up	08:29
Third Stage Separation	08:30
Fourth Stage Ignition	08:35
Fourth Stage Burnout & Parking Orbital Insertion	09:06
Fourth/Fifth Stage Reorientation	10:34
Fourth Stage Separation	13:35
Fifth Stage Ignition	37:56
Fifth Stage Burnout & Orbital Insertion	38:05
Spacecraft Antenna Deployment	39:55
Payload Separation	40:05

SPACECRAFT DESCRIPTION

The Hawkeye spacecraft is essentially an eight-sided, truncated cone in shape. Its base diameter is 0.75 meters (30 inches) and its top diameter is 0.25 (10 inches). It is 0.75 meters (30 inches) in height and weighs 26.6 kilograms (58.7 pounds).

The spacecraft structure provides mounting surfaces to support the experiments' electronic and mechanical packages, panels for solar cells on the sides and bottom of the outer shell, and the launch vehicle adapter.

Several sensors and booms will project through the outer shell to collect experimental data, and telemetry antennas are mounted on the top shell.

All booms are retracted at launch and antennas are tied down. After fifth stage burnout, and before spacecraft separation, the antennas will be deployed.

After spacecraft separation, the telescopic booms will be deployed to reduce the spin rate from 172 revolutions per minute (rpm) to about 99 rpm. A damper must reduce deployment disturbances before the electric field antennas can be deployed. After deployment, the spacecraft spin rate will be between five and 10 rpm.

Total weight of the spacecraft includes all subsystems and the three instruments. The orbiting configuration will be about 46 meters (140 feet) tip-to-tip of the electric field antennas, and 3.2 meters (10 feet) tip-to-tip of the telescopic booms.

LAUNCH VEHICLE

The Scout-E launch vehicle is a five-stage, solid-propellant rocket system. Scout vehicle S-191 is the first five-stage version of this well tested launch vehicle.

The fifth stage of the Scout, called Alcyone 1A, will be added to the four previously used stages: Algol 3, Castor 2A, Antares 2B, and Altair 3. All stages are interlocked with transition sections that contain guidance, control, ignition, instrumentation system, separation mechanics, and the spin motors needed to stabilize the fourth and fifth stages.

A roll-stabilized attitude control system, consisting of a single nitrogen gas jet, will pitch the fourth and fifth stages through an angle of approximately 110 degrees to obtain proper orientation for fifth stage burn in the vicinity of the South Pole.

The five-stage Scout vehicle is 22.25 meters (73 feet) long and weighs about 21.61 kilograms (47,542 pounds) at liftoff.

HAWKEYE PROGRAM MANAGEMENT

NASA Headquarters

Dr. John E. Naugle	Deputy Associate Administrator/ Acting Associate Administrator for Space Science
Dr. Alois W. Schardt	Director, Physics & Astronomy Programs
Dr. E.R. Schmerling	Chief, Magnetospheric Physics
Joseph Mahon	Director, Launch Vehicles and Propulsion Systems
I.T. Gillam	Manager, Small Launch Vehicles and International Programs
Raymond Miller	Manager, Hawkeye Program
Paul E. Goozh	Manager, Scout Program
J.R. Holtz	Manager, Explorer and Sounding Rocket Programs

University of Iowa

John E. Rogers	Project Manager
Donald E. Enemark	Deputy Project Manager
Dr. James A. Van Allen	Project Scientist and Magnetometer Principal Investigator
Roger F. Randall	Integration and Operations Engineer
Dr. L.A. Frank	LEPEDEA Principal Investigator
Dr. Donald A. Gurnett	VLF-ELF Principal Investigator

Langley Research Center

Edgar M. Cortright	Director
Eugene S. Love	Director for Space
Donald D. Davis Jr.	Chief, Space Applications and Technology Division
Claude W. Coffee Jr.	Hawkeye Project Manager and Mission Director

Charles V. Woerner	Hawkeye Assistant Project Manager and Operations Manager
Briscoe B. Brown Jr.	Hawkeye Technical Project Manager
Larry B. Hall	Hawkeye Instrument Project Manager
Nathan D. Watson	Hawkeye Dynamics Specialist
Roland D. English	Head, Scout Project Office
David E. Morris	Mission Integrator
Clyde W. Winters	Launch Operations Engineer
Franklin P. Keesee Jr.	Attitude Correction System Engineer
E. Eugene Hall	Mechanical Systems Engineer
Ralph P. Parks	Electrical and Electronics Systems Engineer
W. Lee Sullivan	Fluid Systems Engineer
Jon L. Van Cleave	Quality and Reliability Engineer

Western Test Range

Henry R. Van Goey	Manager, Kennedy Space Center Western Launch Operations Division
C.R. Fuentes	Hawkeye Coordinator, KSC Western Launch Operations Division

- end -