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MONTHLY SUMMARY OF

SPACE

Systems Divi

ACTIVITIES

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SSLPR-79

a foreword to...

SPACE

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SPACE SYSTEMS DIVISION
AIR FORCE SYSTEMS COMMAND
United States Air Force
Air Force Unit Post Office, Los Angeles 45, California

SSLPR

27 November 1961

Monthly Summary of SPACE SYSTEMS DIVISION ACTIVITIES OCTOBER 1961

FOREWORD

This month's report includes information about the successful aerial recovery of the DISCOVERER XXXII capsule. MIDAS IV was launched on 21 October and successfully placed into a near circular 2000 nautical mile orbit. Valuable payload data was received. The first launch in VELA HOTEL has been delayed one month because of the delay in selecting the Spacecraft contractor. BLUE SCOUT D-8 was launched on 1 November but failed to attain orbit. Preparations are being made for the launch of the MERCURY MA-5 capsule in late November. RANGER II is currently scheduled for launch during the 18 through 26 November period. This will be the second of two Lunar Test Missions. The TRANSIT 4B launch is scheduled for 15 November.

for O. J. RITLAND
Major General, USAF
Commander

SATELLITE
SYSTEMS

DISCOVERER
MIDAS
BIOASTRONAUTICS
SATELLITE INSPECTOR
SNAPSHOT
VELA HOTEL

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Flight History

DISCOVERER No.	DM-21 No.	AGENA No.	Flight Date	Remarks
DISCOVERER FLIGHTS 0 THRU XX ARE ON PAGE A-6				
XXI	261	1102	18 February	*Attained orbit successfully. Non-recoverable, radiometric data gathering MIDAS support flight.*
XXII	300	1105	30 March	*Launch, ascent, separation, coast and orbital stage ignition normal. Orbital velocity was not attained because of an AGENA hydraulic malfunction.*
XXIII	307	1106	8 April	*Attained orbit successfully. Loss of control gas prevented proper positioning of the satellite for capsule re-entry. Capsule was ejected into new orbit on re-entry pass.*
XXIV	302	1108	8 June	*Failed to attain orbit because of a second stage malfunction.*
XXV	303	1107	16 June	*Attained orbit successfully. Capsule recovered from the ocean after two days on orbit. All objectives achieved.*
XXVI	308	1109	7 July	*Attained orbit successfully. Capsule was ejected on the 32nd orbit and aerial recovery was accomplished. All objectives achieved.*
XXVII	322	1110	21 July	*Failed to attain orbit because of severe booster pitch oscillation.*
XXVIII	309	1111	3 August	*Failed to attain orbit because of a hydraulic failure in the satellite engine control system.*
XXIX	323	1112	30 August	*Attained orbit successfully. Capsule recovered from the ocean after two days on orbit. All objectives achieved.*
XXX	310	1113	12 September	*Attained orbit successfully. Capsule was ejected on the 33rd orbit and aerial recovery was accomplished by a C-130. This was the first C-130 air retrieval. All objectives achieved.*
XXXI	324	1114	17 September	*Attained orbit successfully. Recovery was not achieved because of an on orbit AGENA electrical power malfunction.*
XXXII	328	1115	13 October	*Attained orbit successfully. Aerial recovery was accomplished after the 18th orbit by a C-130 aircraft.*
XXXIII	329	1116	23 October	*Failed to attain orbit because of an AGENA malfunction.*

Flight History (continued)

DISCOVERER No.	DM-21 No.	AGENA No.	Flight Date	Remarks
0	160	1019	21 January 1959	*AGENA destroyed by malfunction on pad. THOR refurbished for use on flight XII.*
I	163	1022	28 February	*Attained orbit successfully. Telemetry received for 514 seconds after lift-off.*
II	170	1018	13 April	*Attained orbit successfully. Recovery capsule ejected on 17th orbit was not recovered. All objectives except recovery successfully achieved.*
III	174	1020	3 June	*Launch, ascent, separation, coast and orbital boost successful. Failed to achieve orbit because of low performance of satellite engine.*
IV	179	1023	25 June	*Same as DISCOVERER III.*
V	192	1029	13 August	*All objectives successfully achieved except capsule recovery after ejection on 17th orbit.*
VI	200	1028	19 August	*Same as DISCOVERER V.*
VII	206	1051	7 November	*Attained orbit successfully. Lack of 400-cycle power prevented stabilization on orbit and recovery.*
VIII	212	1050	20 November	*Attained orbit successfully. Malfunction prevented AGENA engine shutdown at desired orbital velocity. Recovery capsule ejected but not recovered.*
IX	218	1052	4 February 1960	*THOR shut down prematurely. Umbilical cord mast did not retract. Quick disconnect failed, causing loss of helium pressure.*
X	223	1054	19 February	*THOR destroyed at T plus 56 sec. by Range Safety Officer. Severe pitch oscillations caused by booster autopilot malfunction.*
XI	234	1055	15 April	*Attained orbit successfully. Recovery capsule ejected on 17th orbit was not recovered. All objectives except recovery successfully achieved.*
XII	160	1053	29 June	*Launch, ascent, separation, coast and orbital stage ignition were successful. Failed to achieve orbit because of AGENA attitude during orbital stage boost.*
XIII	231	1057	10 August	*Attained orbit successfully. Recovery capsule ejected on 17th orbit. Capsule was recovered after a water impact with negligible damage. All objectives except the airborne recovery were successfully achieved.*
XIV	237	1056	18 August	*Attained orbit successfully. Recovery capsule ejected on 17th orbit and was successfully recovered by the airborne force. All objectives successfully achieved.*
XV	246	1058	13 September	*Attained orbit successfully. Ejection and recovery sequence completed. Capsule impact occurred south of the recovery forces; located but lost prior to being retrieved.*
XVI	253	1061	26 October	*Launch and ascent normal. AGENA failed to separate from booster and failed to attain orbit.*
XVII	297	1062	12 November	*Attained orbit successfully. Recovery capsule ejected on 31st orbit and aerial recovery was accomplished. All objectives were successfully achieved.*
XVIII	296	1103	7 December	*Attained orbit successfully. Recovery capsule ejected on 48th orbit and aerial recovery was accomplished. All objectives were successfully achieved.*
XIX	258	1101	20 December	*Attained orbit successfully. Non-recoverable, radiometric data gathering MIDAS support flight.*
XX	298	1104	17 February	*Attained orbit successfully. Capsule did not re-enter due to on-orbit malfunction.*

MONTHLY PROGRESS — DISCOVERER

Flight Test Progress

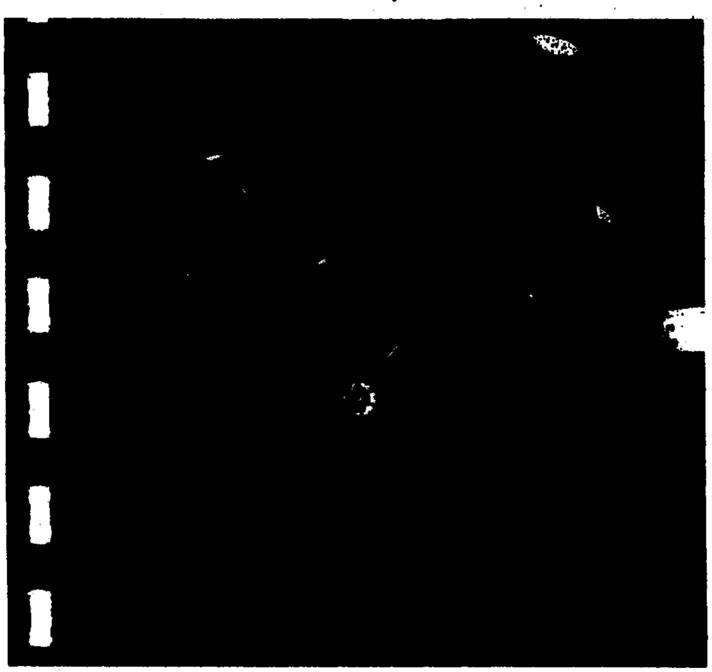
DISCOVERER XXXII Flight

● DISCOVERER XXXII was launched from Complex 75-3, Pad 4, at Vandenberg Air Force Base at 1053 PST on 13 October. All events during launch, boost, separation, coast, AGENA burn, and orbital injection occurred as planned. The orbit attained was almost exactly as programmed as shown in Table I. (U)

Event	*Programmed*	*Actual*
Apogee, statute miles	259.02	251.15
Perigee, statute miles	146.20	144.01
Period, minutes	91.0	90.85
Eccentricity	0.0135	0.0128

Table I. PROGRAMMED AND ACTUAL ORBITAL PARAMETERS FOR DISCOVERER XXXII.

● Based on satellite operation, the decision was made to recover the capsule on the 18th pass. Capsule separation occurred at 1437 PST on 14 October over Alaska and re-entry occurred over the impact area near Hawaii. The descending capsule



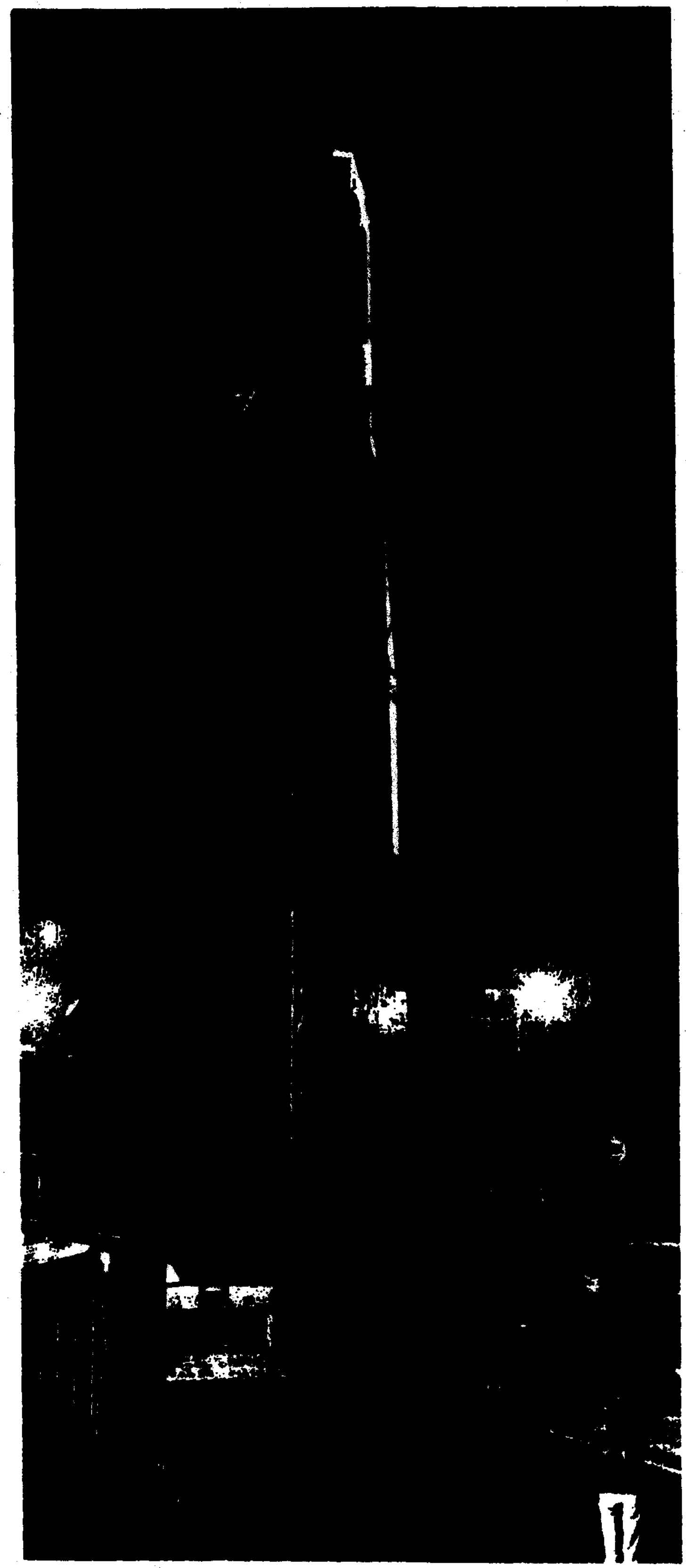
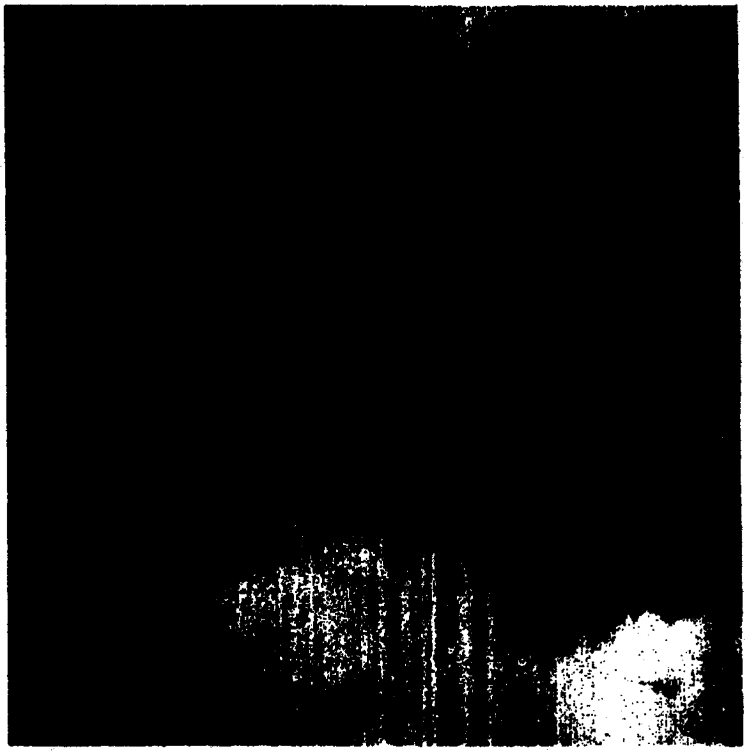
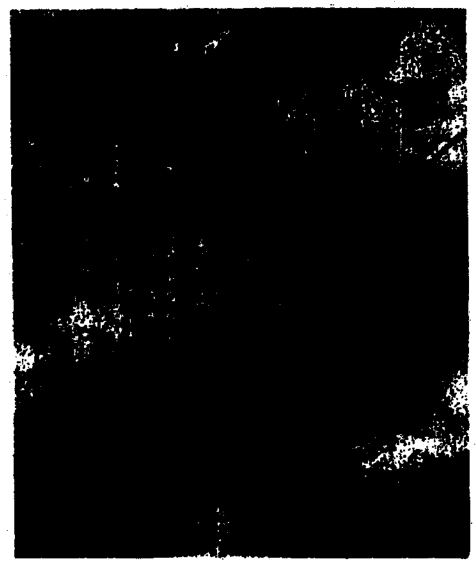


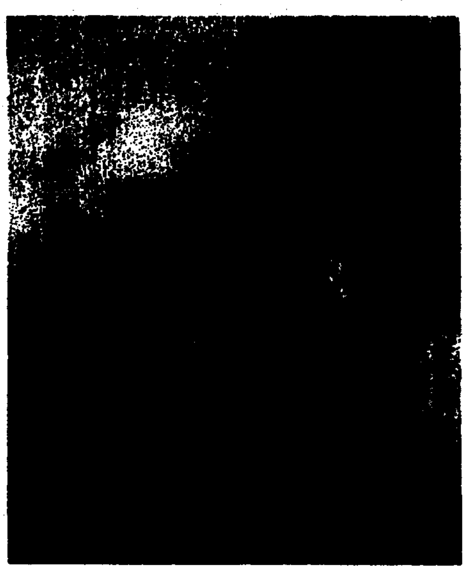
Figure 1. View inside the missile shelter (below) looking into the DM-21 interstage structure. The flight controller and inertial reference package (BTL guidance system components) are visible in the upper right. DISCOVERER XXXII erected on Complex 75-3, Pad 4. This vehicle was successfully launched on 13 October.

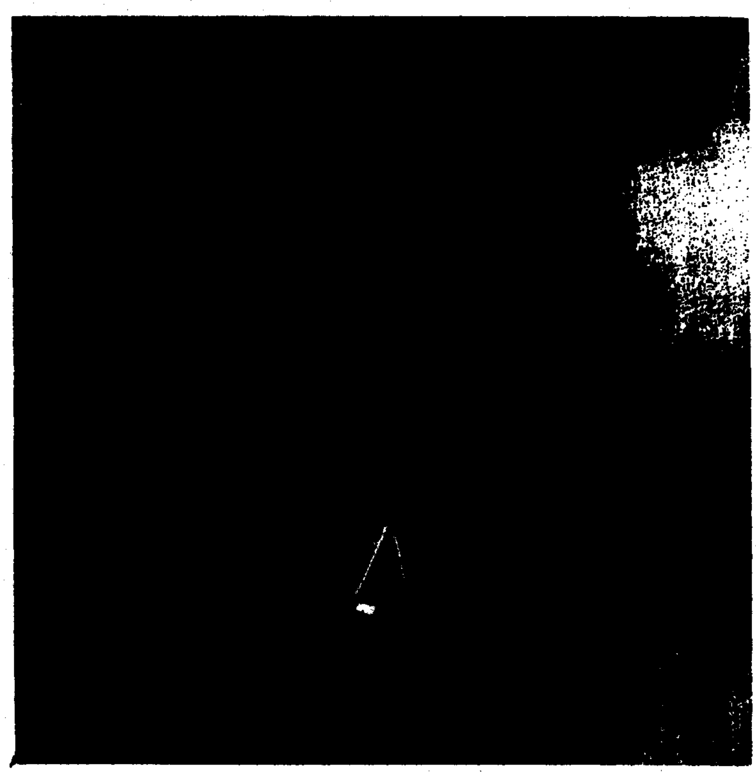




FIRST PASS...Parachute (left) is missed by the hooks trailing from the C-130 recovery aircraft and continues its descent.

SECOND PASS...Hooks snare parachute canopy and the DISCOVERER XXXII capsule is reeled in. This is the second recovery by a C-130 aircraft.





was located by radar and DISCOVERER direction finder equipment on board the aircraft and ships in the recovery force. The capsule was first sighted at 28,000 feet by the crew of one of the C-130 recovery aircraft. This aircraft snagged the parachute canopy on its second pass and reeled the capsule aboard. This was the second successive aerial recovery by a C-130 aircraft. Five of these planes have recently been assigned to the recovery force to replace the C-119's previously used. The C-130's are faster, have longer range, and can be used to recover the heavier capsules under development in other programs. (U)

DISCOVERER XXXII Experiments

● Samples of various materials were carried in and recovered with the DISCOVERER XXXII recovery capsule. These included solar cells, dosimetry packs, and a pack containing shielding material, nuclear blocks and metallic discs. These were returned to various Air Force organizations for analysis of space radiation effects. A cannister containing approximately 500 kernels of corn was also in the capsule and was returned to the Air Force. This corn will be planted to determine the mutations resulting from exposure to space radiation. (U)

● A University of Illinois experiment was conducted in an attempt to determine the southern boundary of an ionospheric disturbance which causes attenuation of RF signals from satellites in the northern hemisphere. A small 20 megacycle transmitter was mounted on DISCOVERER XXXII and it transmitted a continuous, unmodulated signal. Stations located throughout the world recorded the signal and the results are currently being analyzed. (U)

● In cooperation with the Army Signal Corps, a Sequential Collation of Range (SECOR) experiment package was carried aboard DISCOVERER XXXII. The package contains a transponder which can be interrogated from ground stations and is used as a means of determining the precise distances between the various stations. The SECOR Program will permit precision mapping of the world. (U)

● DISCOVERER XXXII also carried Air Force Geophysical Research Directorate equipment consisting of an erosion detector, an electron density gauge, and a charged particle energy analyzer. Data from these instruments were transmitted to ground stations by the DISCOVERER telemetry system and sent to the Geophysical Research Directorate for analysis. (U)

DISCOVERER XXXIII Flight

● DISCOVERER XXXIII was launched from Complex 75-3, Pad 5, at Vandenberg Air Force Base on 23 October. DM-21 boost, separation, coast, and

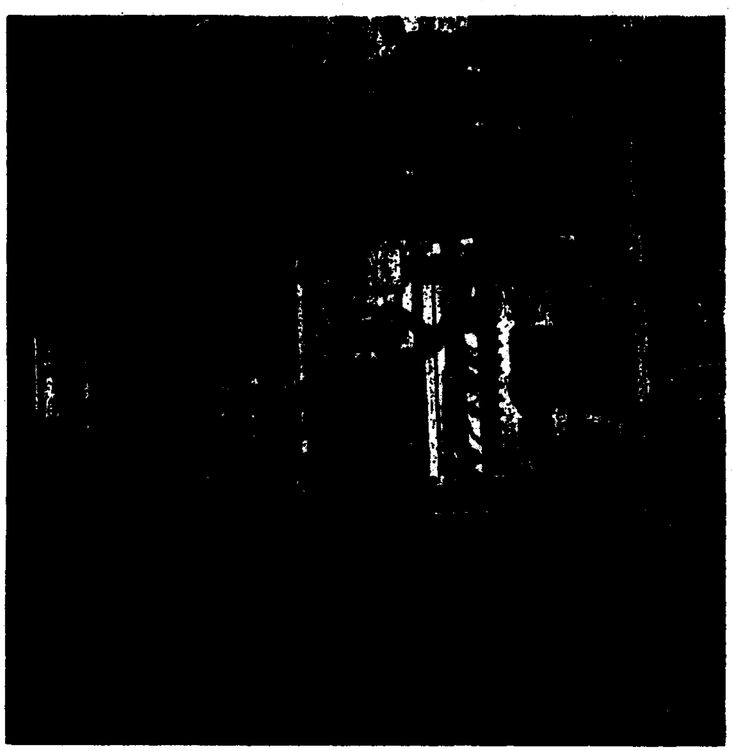


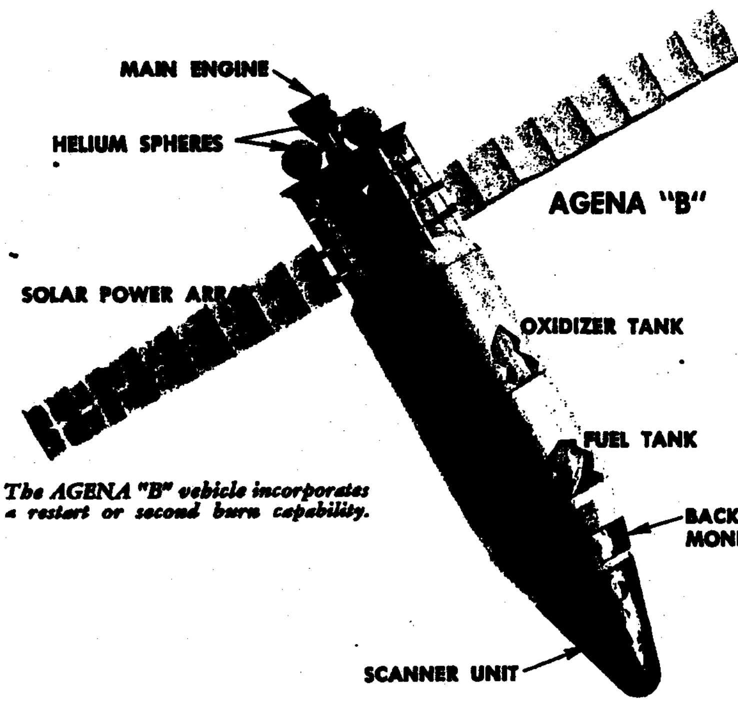
Figure 2. Air Force Geophysical Research Directorate instruments mounted on the DISCOVERER XXXII AGENA vehicle. These space environment experiments are a portion of those carried to utilize the increased AGENA weight carrying capability. A University of Illinois experiment and an Army Signal Corps SECOR package were also carried on this flight.

AGENA ignition occurred as planned. However, operation of the hydraulic system which provides the motive power for engine gimbaling was erratic. The violent maneuvers of the satellite during this period resulted in disturbance of the gyro references and the satellite started on an extremely high trajectory. About 162 seconds after AGENA ignition, the hydraulic pressure dropped abruptly to zero and control of engine position was lost. Approximately ten seconds later, the XLR-81Ba-9 engine shut down. It is assumed that this premature cutoff resulted from the high acceleration forces imposed on the uncontrolled vehicle. The AGENA impacted in the south Pacific. (C)

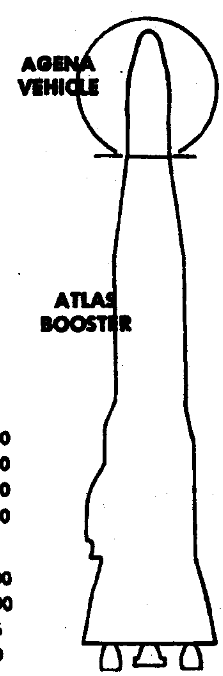
- Because of the hydraulic system difficulties on this and two previous flights (DISCOVERER XXVIII on 3 August and DISCOVERER XXII on 30 March), an extensive analysis and test program was started immediately. Hot firing tests at the Santa Cruz Test Base have been conducted and laboratory tests at both the Lockheed and Bell facilities were initiated. Areas of investigation include mechanical weakness, contamination in the hydraulic system, and contamination resulting from UDMH chemical action or foreign material in the UDMH. (UDMH contamination could affect the hydraulic control system because the hydraulic pressure pump is driven by a hydraulic motor which gets its power from UDMH pressure and flow). Each system must be thoroughly rechecked before launch to be certain there is no contamination. No rescheduling will be necessary. (C)

SECOND STAGE	AGENA "B"
Weight—	
Inert	1,763
Payload equipment	1,641
Orbital	3,404
Impulse Propellants	12,950
Fuel (UDMH)	
Oxidizer (IRFNA)	
Other	758
GROSS WEIGHT (lbs.)	17,112
Engine	XLR81-Ba-9
Thrust, lbs. (vac.)	16,000
Spec. Imp., sec. (vac.)	290
Burn Time, sec.	240
Restart Provisions	Yes

MIDAS



The AGENA "B" vehicle incorporates a restart or second burn capability.



BOOSTER—ATLAS ICBM		
Weight—Dry		15,100
Fuel, RP-1		74,900
Oxidizer (LOX)		172,300
GROSS WEIGHT (lbs.)		262,300
Engine—MA-2		
Thrust (lbs. vac.)	Boost	356,000
	Sustainer	82,100
Spec. Imp. (sec. vac.)	Boost	286
	Sustainer	310

[redacted]

PROGRAM HISTORY

The MIDAS Program was included in Weapon System 117L when WS 117L was transferred to the Advanced Research Projects Agency. ARPA subsequently separated WS 117L into the DISCOVERER, SAMOS and MIDAS Programs, with the MIDAS objectives based on an infrared early warning system. The MIDAS (Missile Defense Alarm System) Program was directed by ARPA Order No. 38, dated 5 November 1958 until transferred to the Air Force on 17 November 1959. The Air Force directed that the program be continued under the technical guidance of the ARPA Order and approved the MIDAS R&D Development plan dated 15 January 1960. This plan was a "minimum essential" program directed toward the satellite vehicle and proof of the feasibility of infrared detection capabilities. It provided for ten test launches, two from the Atlantic Missile Range and eight from the Pacific Missile Range. Subsequent authorization was obtained to utilize two DISCOVERER flights (designated RM-1 and RM-2) to carry background radiometers in support of MIDAS.

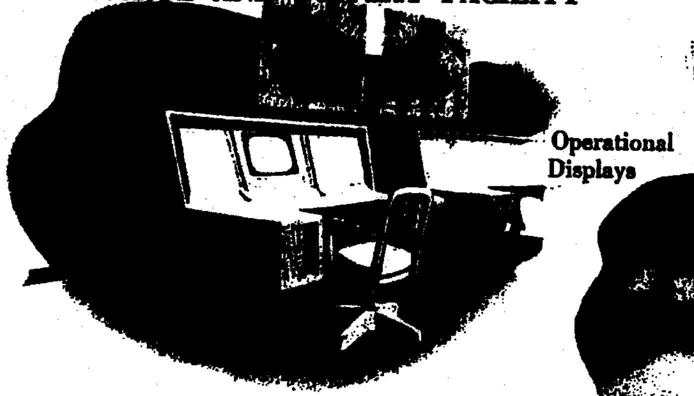
A program of complete system development, including the ground environment of MIDAS, has been submitted to the Department of the Air Force and has been approved in principle and objective. Authorization has been received to initiate action implementing the plan with reconsideration for approval to be accomplished subsequent to a successful test launch in 1961.

TECHNICAL HISTORY

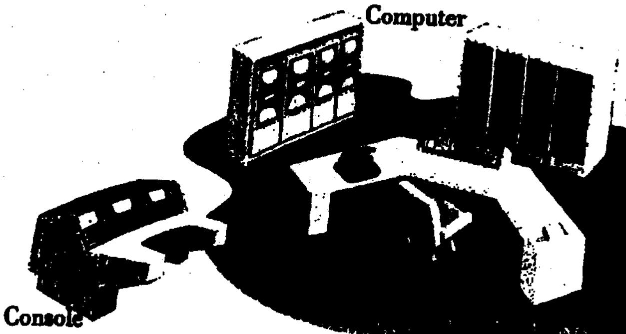
The MIDAS infrared early warning payload is engineered to use a standard launch vehicle configuration. This consists of an ATLAS missile as the first stage and the AGENA vehicle, powered by a Bell Aircraft rocket engine as the second, orbiting stage. The final configuration payload weight will be approximately 1,000 pounds.

The first two R&D flights used the AGENA "A" and ATLAS "D" vehicle programmed to place the payload in a circular 261 nautical mile orbit. Subsequent R&D flights utilize the ATLAS "D"/AGENA "B" configuration programmed to place the payload in a circular 2,000 nautical mile polar orbit.

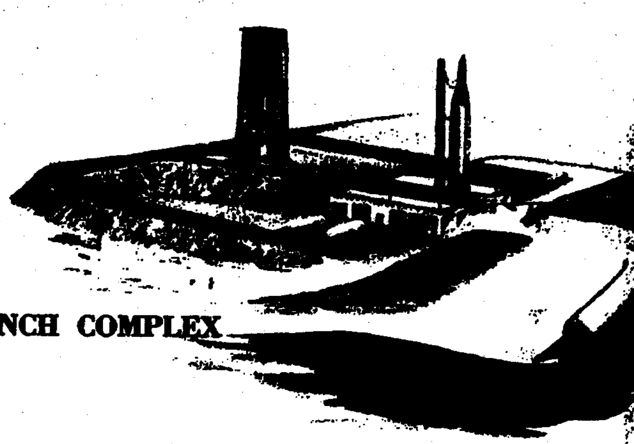
CONTROL AND DISPLAY FACILITY



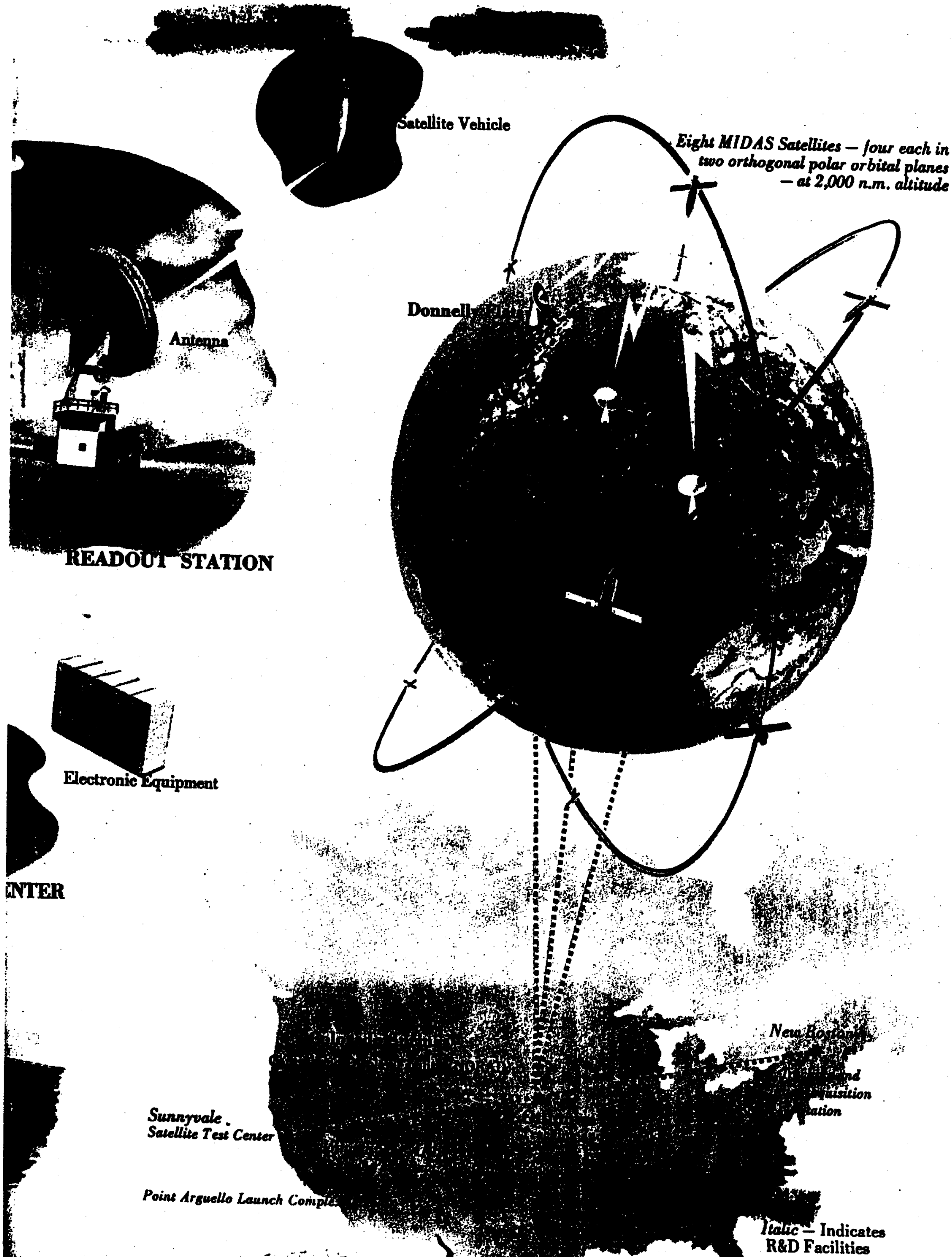
Orbiting satellites detect infrared radiation emitted by ICBM's in powered flight. Data is telemetered instantaneously to Midas Tracking and Control Center via far north Readout Stations. Decoded data reveal approximately the number of missiles launched and launch location, direction of travel and burning characteristics. This data is displayed in near real time on the control consoles and operational displays at the Control and Display Facility. The Tracking and Control Center monitors and controls the status of the orbital network and the ground environment. The Point Arguello Stands are used to launch the MIDAS R&D satellites into polar orbits.



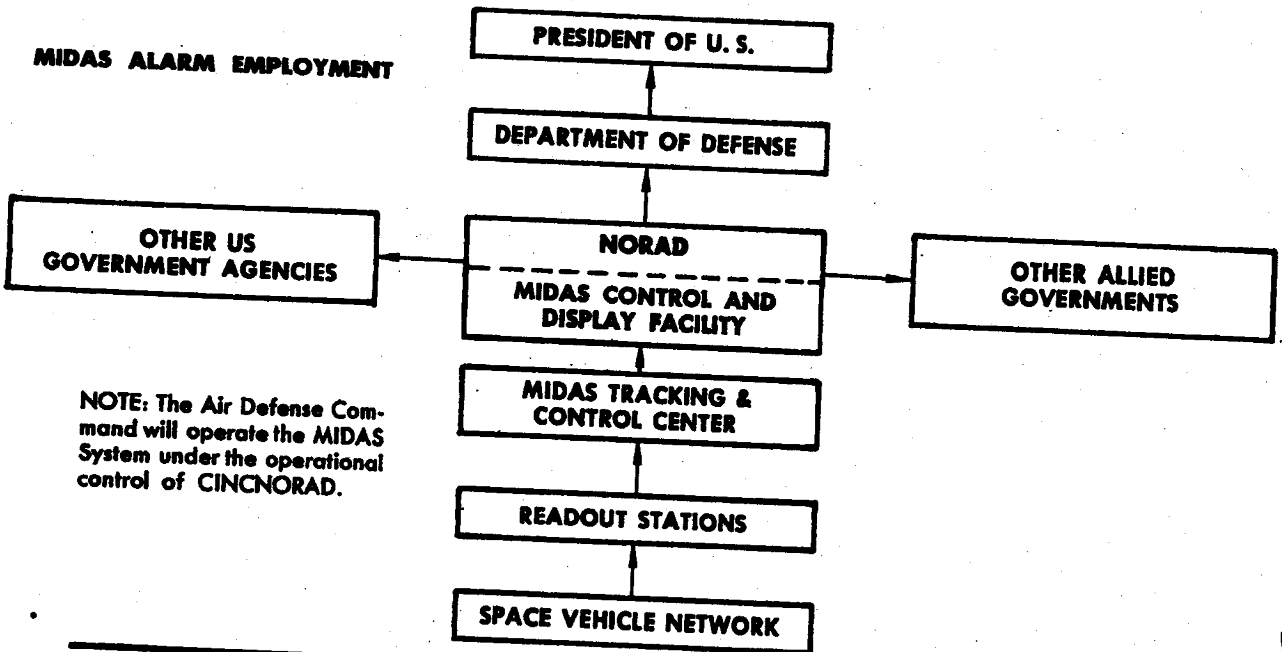
TRACKING AND CONTROL C



LAUNCH COMPLEX


Satellite Vehicle
Eight MIDAS Satellites — four each in two orthogonal polar orbital planes — at 2,000 n.m. altitude
Antenna
READOUT STATION
Electronic Equipment
Sunnyvale
Satellite Test Center
Italic — Indicates R&D Facilities Only

MIDAS ALARM EMPLOYMENT



NOTE: The Air Defense Command will operate the MIDAS System under the operational control of CINCNORAD.

CONCEPT

The MIDAS system is designed to provide continuous infrared coverage of the Soviet Union. Surveillance will be conducted by eight satellite vehicles in accurately positioned orbits. The area under surveillance must be in line-of-sight view of the scanning satellite. The system is designed to accomplish instantaneous readout of acquired data by at least one of three strategically located readout stations. The readout stations transmit the data directly to the MIDAS Tracking and Control Center where it is processed. It is then displayed and evaluated in the MIDAS Control and Display Facility. If an attack is determined to be underway, the intelligence is communicated to a central Department of Defense Command Post for relay to the President and national retaliatory and defense agencies.

Flight History

MIDAS No.	Launch Date	ATLAS No.	AGENA No.	Remarks
I	26 February	29D	1008	*Did not attain orbit because of a failure during ATLAS/AGENA separation.*
II	24 May	45D	1007	*Highly successful. Performance with respect to programmed orbital parameters was outstanding. Useful infrared data were observed and recorded.*
RM-1	20 December	DISCOVERER Vehicle		*Despite satellite oscillations, sufficient data were obtained for evaluation of payload operation. Information obtained in the 2.7- micron region agrees with data obtained from balloon-borne radiometric equipment. Intensities in the 4.3- micron region were somewhat higher than had been anticipated from theoretical studies.*
RM-2	18 February	DISCOVERER Vehicle		*All channels functioned properly and valid data were obtained on six stable orbits. Data confirmed previous radiometric measurements.*
III	12 July	97D	1201	*Extremely successful. Second firing of the second stage occurred as programmed. AGENA B vehicle was stabilized in an 1850 nautical mile circular orbit with an eccentricity of 0.0039. Operation of the payload and data link was excellent. Because of an electrical power loss, apparently caused by the failure of one solar array panel to extend, data acquired subsequent to pass five was limited to Van Allen belt radiation information. Inability to properly control power consumption by appropriate and timely vehicle command programming resulted in nearly complete power deterioration within the succeeding several orbits. Van Allen radiation measurements will be obtained during the anticipated 60-90 day battery life of the High Energy Proton Damage Experiment (HEPDEX) package.*
IV	21 October	105D	1202	*Despite a loss of roll control during the ATLAS boost phase, the satellite vehicle was successfully placed into a near circular 2,000 nautical mile orbit with 0.0125 eccentricity. Several complete revolutions and a significant spin (roll) velocity component was imposed on the AGENA B prior to separation. By expending a greater amount of control gas than normal, the AGENA vehicle was able to control the ATLAS generated disturbance. Telemetry reported accomplishment of all programmed events including expulsion of the West Ford package after second burn. All vehicle functions, with the possible exception of "on orbit" attitude control, occurred as planned. Electrical power output from the solar array exceeded expectations. All telemetry channels (e.g., status and performance of vehicle and payload, SAPUT, HEPDEX) provided good data. A cyclic variation in telemetry signal strength indicated a probable vehicle, on orbit, stability/attitude discrepancy. Subsequent data reduction verified the vehicle instability. Telemetry also indicated a vehicle electrical power degradation commencing about pass 31. On pass 63, seven days after launch, telemetry contact, with the exception of HEPDEX, was no longer enabled. The HEPDEX is expected to transmit data for the 50 to 60 day nominal life of its separate battery power supply. The acquisition of extensive data, on all telemetry channels, over an extended time period in a 2000 nautical mile orbit, made this an exceptionally successful R&D test.*

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MIDAS GROUND SUPPORT FACILITIES

Facility	*Equipment**	*Flight Function*
Satellite Test Center	ABCDEP	Operations control, orbit computations and predictions, initiation of commands to satellite (via tracking stations), process payload data.
Vandenberg AFB Tracking Station	ABCEFGHIJKLMP	Ascent and orbital tracking; telemetry reception; trajectory computations; command transmission; reception recording and processing of payload data.
Downrange Telemetry Ships	GHIJNO	Tracking and data reception during ascent. (Three ships are available for this function. Equipment is typical.)
Hawaiian Tracking Station	BEFGHJ	Orbital tracking, telemetry reception, payload data reception.
AMR	HJ	Orbital data reception.
New Hampshire Station	ABCEFGHIJKLM	Orbital tracking; telemetry reception; command transmission; reception, recording and transmission of payload data.
African Tracking Station	BEGJ	Telemetry reception and recording during second burn.
North Pacific Station	BCEHKP	Satellite and payload data reception.
Kodiak Tracking Station	FJ	Orbital tracking.
Mugu Tracking Station	BEFGJ	Tracking and telemetry reception.

NOTES: (1) In addition to equipment listed, all stations have inter- and intra-station communications equipment and checkout equipment.

(2) Equipment listed is either presently available or planned and approved for procurement.

**Equipment*

A. General Purpose Computer(s) and Support Equipment
B. Data Conversion Equipment
C. PICE
D. Master Timing Equipment
E. Control and Display Equipment
F. VERLORT
G. VHF FM/FM Telemetry Station
H. PAM FM Ground Station
I. Doppler Equipment
J. VHF Telemetry Antenna
K. UHF Tracking and Data Acquisition Equipment (60 foot F&D Antenna)
L. UHF Angle Tracker
M. UHF Command Transmitter
N. APL Doppler Equipment
O. SPQ-2 Radar
P. Midas Payload Evaluation and Command Equipment

MONTHLY PROGRESS—MIDAS

Program Administration

● The DDR&E special task group, established to evaluate MIDAS feasibility and capability, convened at Stanford Research Institute (SRI), Palo Alto, California on 25-28 October. Findings of the subcommittees, established during the initial session in late September, were reported and discussed preparatory to reporting the Task Group findings. (C)

● Representatives from Space Systems Division (AFSSD) and Lockheed Missiles and Space Company (LMSC) met on 3 October to review overall plans and costs. The failure to make schedules, the slippages and associated increased costs make it impossible to meet all Fiscal Year 1962 program objectives. This necessitates an adjustment of phasing and scope of the MIDAS Program including a reduction in the effort to develop a nitrogen textroxide (N_2O_4) engine and secondary propulsion system (orbit adjust) for the AGENA satellite vehicle. Redirection of Aerojet-General and Baird-Atomic MIDAS Series III and IV payload development effort was accomplished during September to keep within budget allocations. (S)

● The MIDAS III Payload Data Analysis and Evaluation Report was distributed on 15 October. This report describes the major payload elements used on the mission and their function. It also discusses the methods used in gathering and processing the read-out data. An analysis and evaluation of payload performance and the data processed is presented. Included in the report are analyses of the payload thermal design and weather conditions while the satellite was on orbit. (U)

Flight Test Progress

● MIDAS III HEPDEX data have been reduced and a report issued on the proton flux levels experienced at the MIDAS orbital altitude. At 180 MEV the proton flux density is about equal to that predicted from other experimental data. However, at 60 MEV the proton flux density was one to two orders of magnitude above the predicted level. (U)

● Due to the erratic motion of the vehicle (MIDAS III) the solar panel data, although reduced, showed time varying discrepancies and therefore is not conclusive. (C)

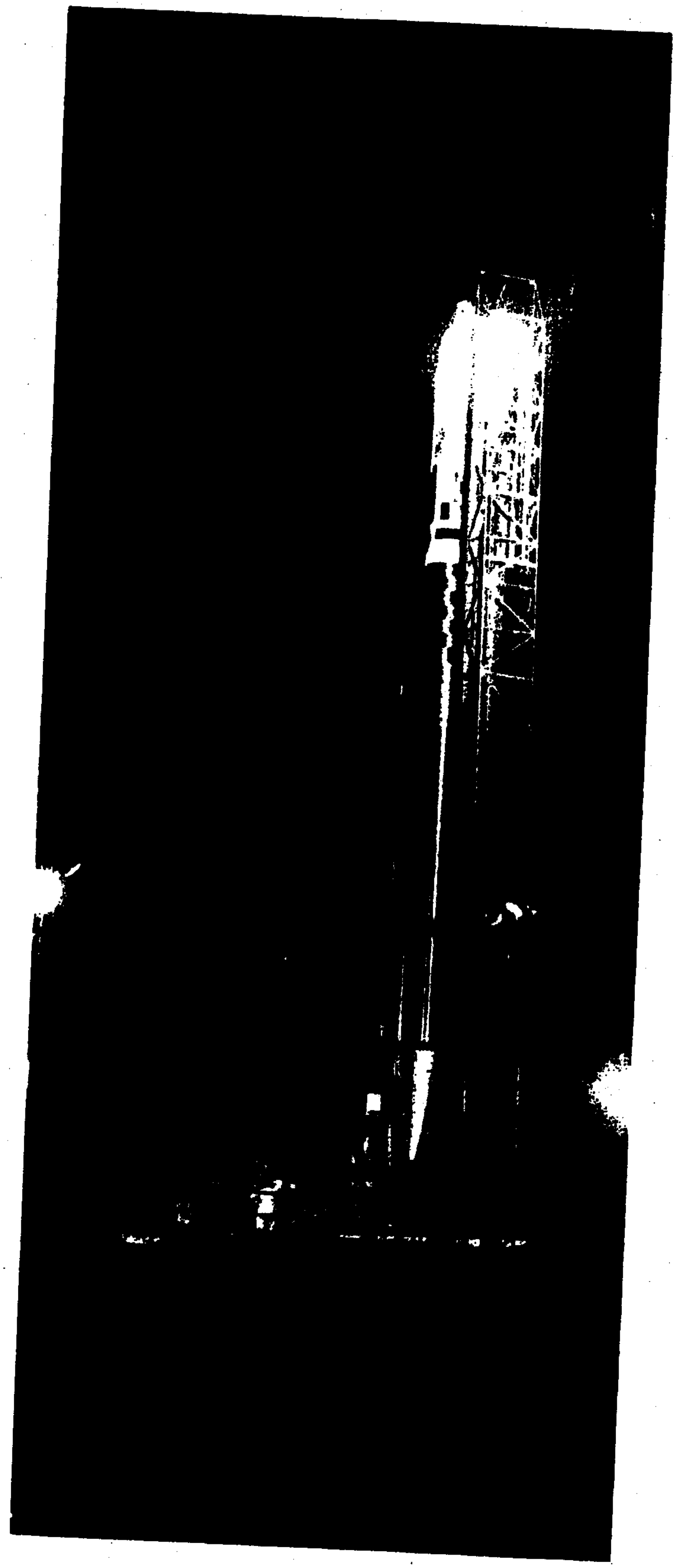
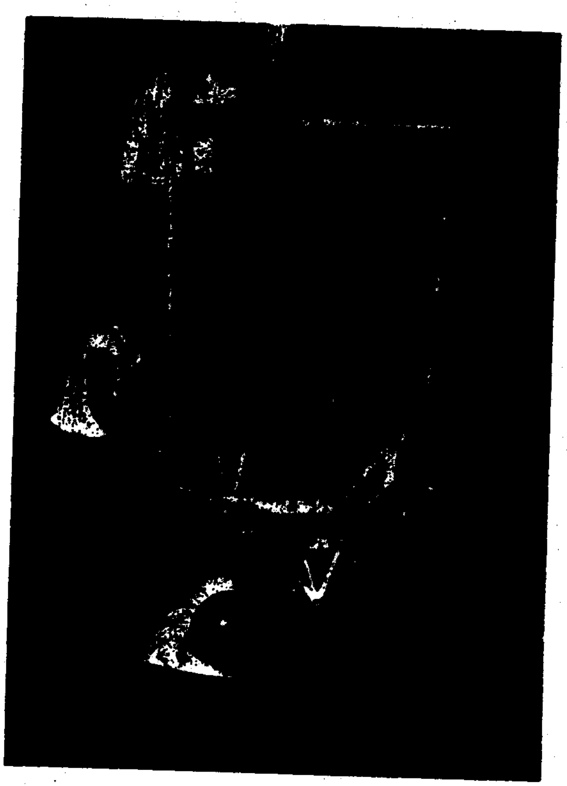


Figure 1. MIDAS IV before launch on the morning of 21 October from Point Arguello Launch Stand No. 2.



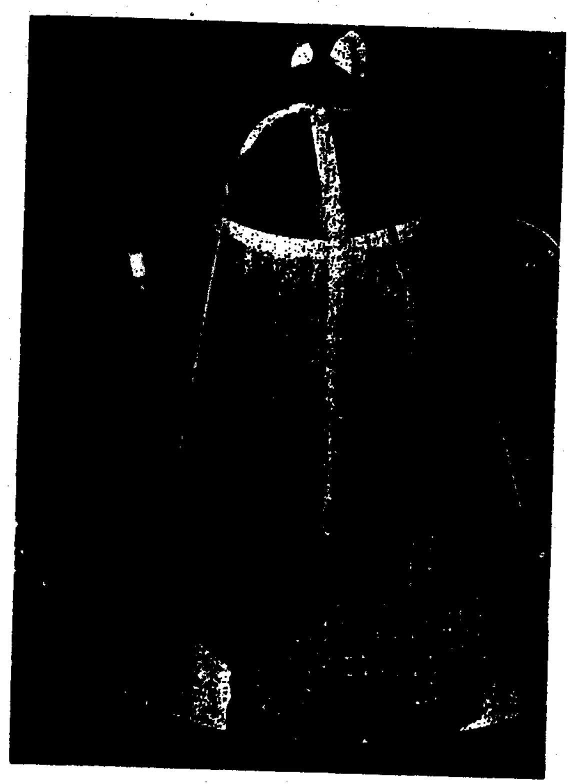


Figure 2. Preparing to raise AGENA 1202 (left) for mating with ATLAS 105D...Installing the Baird-Atomic infrared detection payload...Positioning the protective shroud over the payload...LIFTOFF.

● MIDAS IV, delayed because of an AGENA engine fuel pump seal drain line problem, was successfully launched from Point Arguello at 0553 PST on 21 October. Despite a loss of roll control during the ATLAS boost phase, the satellite vehicle was placed into a near circular 2000 nautical mile orbit. Table I shows the predicted and attained orbital parameters. (C)

Event	*Programmed*	*Actual*
Apogee, nautical miles	2100	2025
Perigee, nautical miles	2100	1898
Period, minutes	172.6	166
Eccentricity	0.00046	0.0125
Inclination, degrees	90.02	95.87

Table I. **COMPARISON OF PROGRAMMED AND ACTUAL ORBITAL PARAMETERS FOR MIDAS IV**

● Telemetry channels (e.g., status and performance of vehicle and payload, SAPUT, HEPDEX) provided considerable high quality data. Pertinent items that have been extracted from the data are as follows:

1. Acquisition, tracking, and response to commands from the ground were near perfect. (U)

2. During sustainer operation, the ATLAS booster rolled several times at a rate which reached a minimum of 72°/sec and was 44°/sec at AGENA separation. The total ATLAS/AGENA roll was 8.7 revolutions. The AGENA reduced the roll rate to zero after approximately one additional revolution. To accomplish this, twenty percent of the attitude control gas was expended. (C)

3. Successful ejection of the West Ford package following AGENA second burn and continued operation of the High Energy Proton Density Experiment (HEPDEX) equipment has been confirmed by telemetry data. (U)

4. All operating subsystems, including the solar power arrays and payload, functioned satisfactorily except that the control gasses were depleted on pass 1. On pass 34, one solar array turned away from the sun with the result that insufficient power was generated to maintain system operations beyond pass 54. (C)

5. Analysis of the telemetry data shows:

a. The vehicle is rotating about the pitch axis in a direction opposite to the direction of vehicle travel at a rate of approximately one revolution per 92 sec. (C)

b. The vehicle is stable about its yaw axis within five degrees. (C)

c. The vehicle roll axis is displaced twelve degrees from vertical in a direction away from the sun. (C)

Technical Progress

● MIDAS V completed systems tests early in October and was placed in bonded storage pending insertion into the launch schedule. Prior to commencing the final systems test, the Space Systems Division decided to install a new Baird-Atomic, Inc. payload. The new payload is much more sensitive than the one originally installed in the satellite. This payload has the improved optical system that was initially flown in MIDAS IV and is expected to provide more precise infrared radiation data. Because of launch stand availability problems, the MIDAS V booster vehicle has been removed from the stand and is being held for launch in the near future. The completion of Point Arguello Launch Complex No. 2 construction will alleviate the present stand loading problem. (S)

● MIDAS VI commenced guidance and control and communications compatibility tests on 24 October. The integrated systems test of this vehicle is scheduled to begin on 10 December. (C)

Facilities

● Lockheed representatives have briefed Space Systems Division personnel on an operational concept for a MIDAS Tracking and Control Center. A configuration description report of this facility will be published in December 1961. (U)

● A review of final plans and specifications for the first increment of the support facilities at the Ottumwa, Iowa, Tracking and Control Center was held on 31 October. Advertising for construction contract award for the technical facilities and support facilities at this station is delayed pending release of funds. (U)

● All construction at Point Arguello Launch Complex No. 2 is progressing satisfactorily. Construction completion is estimated at 9%. Walls and foundations of Launch Stand No. 3 and the foundations for the Technical Support and Launch Operations Buildings have been completed. The cable vault and footings for Launch Stand No. 4 have been poured. The Technical Support Building is being erected and utilities are being installed. (U)

● Modification of Building 6007, one of the Vandenberg Air Force Base technical support buildings, has been completed. Modification work on 18 of the 20 buildings in the second increment of this package is approximately 40% complete, with completion scheduled for January 1962. The remaining portion of the second increment package will be awarded if FY-62 Military Construction Program funds are released. (U)

● Bid documents for the addition and modifications to the Data Acquisition and Processing Building at the Vandenberg Tracking and Telemetry Station were revised to reduce the scope of the project within available funding. The Corps of Engineers has been requested to advertise this project for bids on a 150-day construction schedule to allow beneficial occupancy by 15 March 1962. Except for minor deficiencies, construction of the auxiliary power system at this station has been completed. (U)

● Design concepts for the administrative addition to the Satellite Test Annex, Sunnyvale, California, were approved on 11 October and design has been initiated. The preliminary design review is scheduled for 17 November. (U)

Figure 3. Herd of American buffalo (Bison) shows little concern for the MIDAS radome as they graze near the Donnelly Flats, Alaska, tracking station. View, right, inside the radome shows the UHF tracking antenna.