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SPACE

a foreword to...

SPACE

HEADQUARTERS
AIR FORCE BALLISTIC MISSILE DIVISION (ARDC)
UNITED STATES AIR FORCE
Air Force Unit Post Office
Los Angeles 45, California

WDLPM-4

31 July 1960

FOREWORD

Activities summarized in the report include the major space systems, support programs, defense programs and studies for which the Air Force Ballistic Missile Division is wholly or partially responsible. Each space system and program is introduced by a concise history of the administration, concept and objectives, making possible a more meaningful evaluation of the monthly progress information. The program description information is revised monthly as necessary to reflect major technical and administrative changes. These programs must be sufficiently flexible to permit continuous and effective integration of rapidly occuring advances in the state-of-the-art.

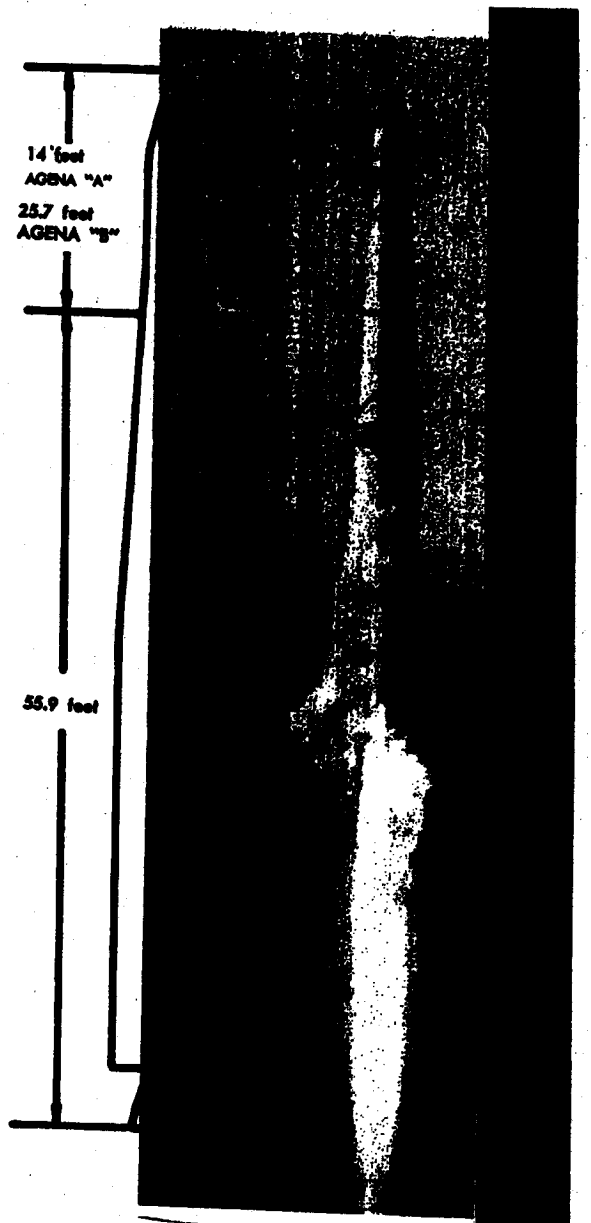
for O. J. KITLAND
Major General, USAF
Commander

SATELLITE
systems

DISCOVERER
SAMOS
MIDAS
COMMUNICATIONS SATELLITE

Discoverer

The DISCOVERER Program consists of the design, development and flight testing of 35 two-stage vehicles, using the THOR IRBM as the first stage booster and the AGENA as the second stage, satellite vehicle. The program was established early in 1958 under direction of the Advanced Research Project's Agency, with technical management assigned to AFBMD. On 14 November 1959, program responsibility was transferred from ARPA to the Air Force by the Secretary of Defense. Prime contractor for the program is Lockheed Missile and Space Division. The DISCOVERER Program will perform space research in support of the advanced military reconnaissance satellite programs.



PROGRAM OBJECTIVES

(a) Flight test of the satellite vehicle airframe, propulsion, guidance and control systems, auxiliary power supply, and telemetry, tracking and command equipment.

(b) Attaining satellite stabilization in orbit.

(c) Obtaining satellite internal thermal environment data.

(d) Testing of techniques for recovery of a capsule ejected from the orbiting satellite.

(e) Testing of ground support equipment and development of personnel proficiency.

(f) Conducting bio-medical experiments with mice and small primates, including injection into orbit, re-entry and recovery.

PROGRAM SUMMARY

Early launches confirmed vehicle flight and satellite orbit capabilities, developed system reliability, and established ground support, tracking and data acquisition requirements. Later in the program, biomedical and advanced engineering payloads will be flight tested to obtain support data for more advanced space systems programs. DISCOVERER vehicles are launched from Vandenberg Air Force Base, with overall operational control exercised by the Satellite Test Center, Palo Alto, California.

Tracking and command functions are performed by the stations listed in the Table on page A-4. A history of DISCOVERER flight to date is given on page A-5.

SECOND STAGE	AGENA "A"	AGENA "B"	
Weight—			
Inert	1,262	1,328	1,346
Payload equipment	497	887	915
Orbital	1,759	2,215	2,216
Impulse propellants	6,525	12,950	12,950
Other	378	511	511
TOTAL WEIGHT	8,662	15,676	15,722
Engine Model	YLR81-Ba-5	XLR81-Ba-7	XLR81-Ba-9
Thrust-lbs., vac.	15,600	15,600	16,000
Spec. Imp.-sec., vac.	277	277	290
Burn time-sec.	120	240	240
THOR BOOSTER		DM-18	DM-21
Weight—Dry		6,950	6,900
Fuel		33,700	33,700
Oxidizer (LOX)		68,200	68,200
GROSS WEIGHT (lbs.)		108,850	108,400
Engine		MB-3 Block 1	MB-3 Block 2
Thrust, lbs. (S.L.)		152,000	167,000
Spec. Imp., sec. (S.L.)		247.8	248.3
Burn Time, sec.		163	148

Telemetry ships are positioned as required by the specific mission of each flight. Figures 2 and 3 show a typical launch trajectory from Vandenberg Air Force Base, and figure 3 shows schematically a typical orbit. An additional objective of this program is the development of a controlled re-entry and recovery capability for the payload capsule (Figure 4). An impact area has been established near the Hawaiian Islands, and a recovery force activated. Techniques have been developed for aerial recovery by C-119 aircraft and for sea recovery by Navy surface vessels. The recovery phase of the program has provided advances in re-entry vehicle technology. This information will be used in support of more advanced projects, including the return of a manned satellite from orbit.

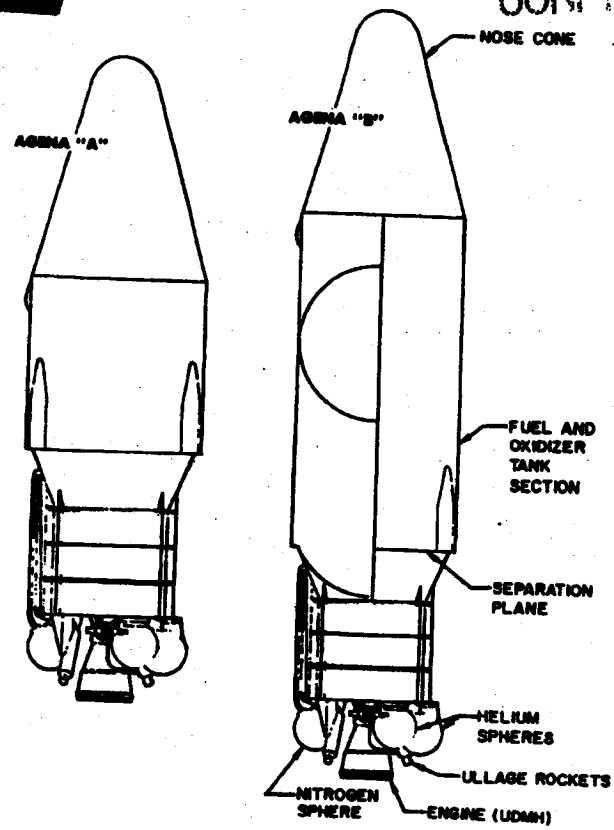
FLIGHT VEHICLE

The three versions of flight test vehicles used in the DISCOVERER Program are defined in the launch schedule shown on page A-5. Specifications for the two THOR configurations and three AGENA configurations used are given on page A-1.

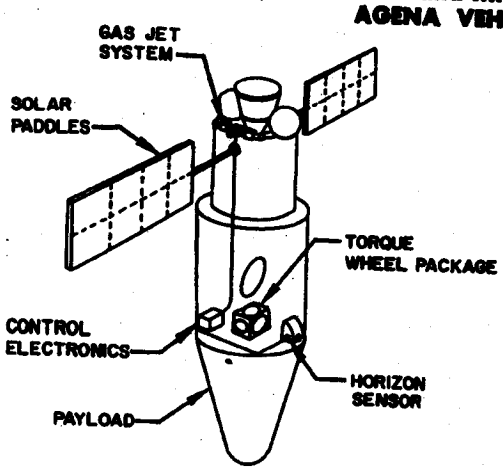
AGENA VEHICLE DEVELOPMENT

The AGENA vehicle was originally designed by the Air Force as the basic satellite vehicle for Advanced Military Reconnaissance Satellite Systems Programs. Basic design was based on use of the ATLAS ICBM as the first stage. ATLAS trajectory characteristics and the stringent eccentricity requirements of the advanced programs led to the selection of a guidance system suited to achieving orbital injection in a horizontal attitude. As a result, an optical inertial system was developed for vehicle guidance and a gas jet system for orbital attitude control. An urgent need for attaining higher altitude orbits resulted in development of the AGENA "B" versions. The YLR81 Ba-5 version of the LR81-Ba-3 engine (Bell Hustler engine developed for B-58 aircraft) is used on AGENA "A" vehicles. The YLR81-Ba-5 version of this engine was developed to provide increased performance through the use of unsymmetrical di-methyl hydrazine (UDMH) fuel instead of JP-4.

Early AGENA "B" vehicles will use the YLR81-Ba-7 version of this engine. The majority of AGENA "B" vehicles will use the XLR81-Ba-9 engine incorporating a nozzle expansion ratio of 45:1, and providing a further increase in performance capability including engine restart and extended burn capability.



SAMOS and MIDAS AGENA VEHICLE

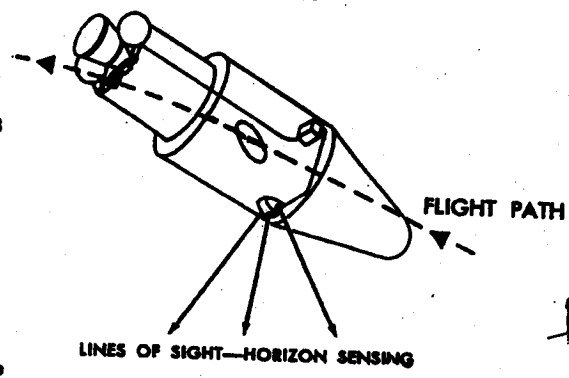


DISCOVERER/AGENA

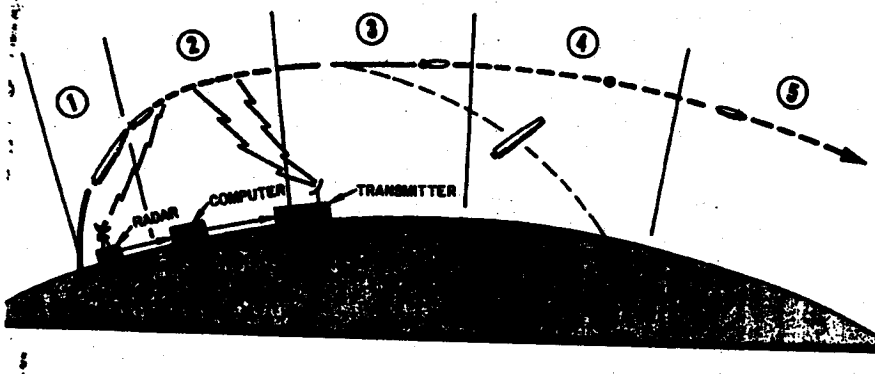
PERFORMANCE CAPABILITIES

ALTITUDE
200–20,000 MILES

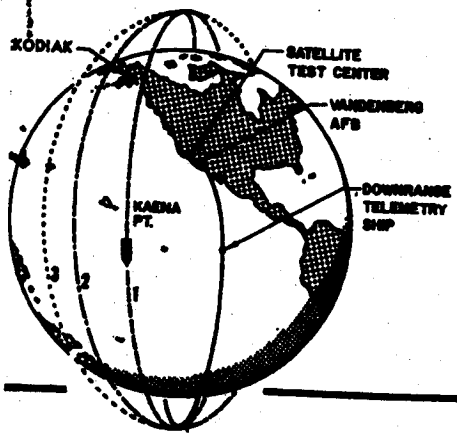
ATTITUDE
ROLL – 0.1 DEGREE
PITCH – 0.1 DEGREE
YAW – 1 DEGREE



Powered Flight Trajectory



1. First Stage Powered Flight—2.5 minutes duration, 78 n.m. downrange, guided by programmed auto pilot.
2. Coast Period—2.4 minutes duration, to 380 n.m. downrange; altitude controlled by inertial reference package, horizon scanner, gas reaction jets. Receives AGENA time to fire and velocity to be gained commands.
3. Second Stage Powered Flight—2 minutes duration, to 770 n.m. downrange. Guided and controlled by inertial reference package, horizon scanner, gas reaction jets (roll) gimballing engine, yaw and pitch accelerometer—integrated.
4. Vehicle Reorients to Nose Aft—2 minutes duration, to 2,000 n.m. downrange. Guided and attitude controlled by inertial reference package, horizon scanner and gas reaction jets.
5. In-Orbit—Controlled (same as 4).

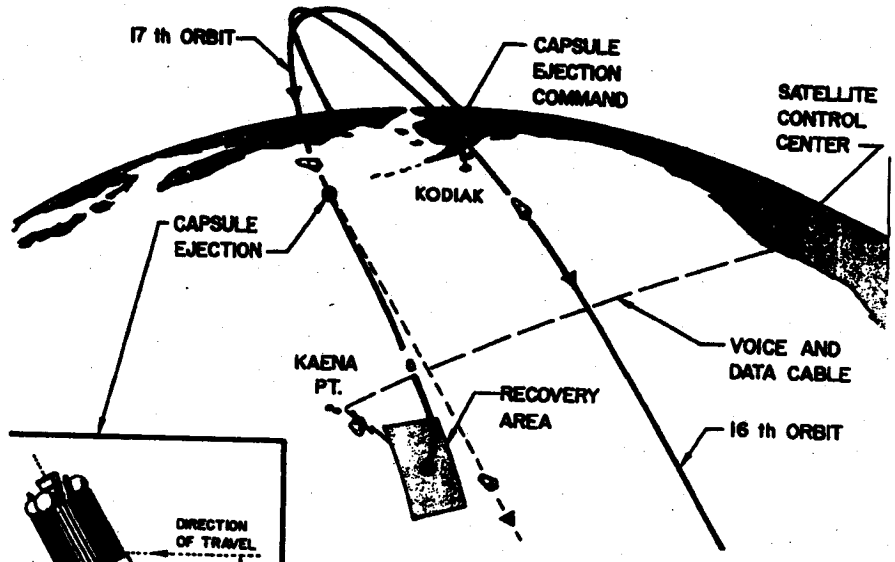


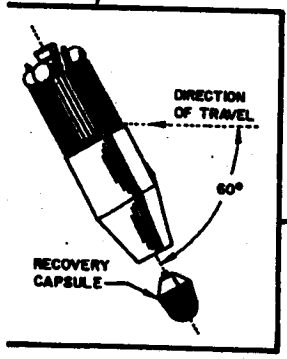
Orbital Trajectory

Schematic presentation of orbital trajectory following launch from Vandenberg Air Force Base. Functions performed by each station and a listing of equipment used by each station, is given on page A-4.

RECOVERY CAPABILITY

This objective was added to the program after the first launch achieved vehicle flight and orbit objectives successfully. It includes the orientation of the satellite vehicle to permit a recoverable capsule to be ejected from the nose section of the AGENA vehicle. Ejection is programmed to occur on command on the 17th orbit, for capsule impact within the predetermined recovery area south of Hawaii. Aircraft and surface vessels are deployed within the area as a recovery force.





CAPSULE RECOVERY SEQUENCE

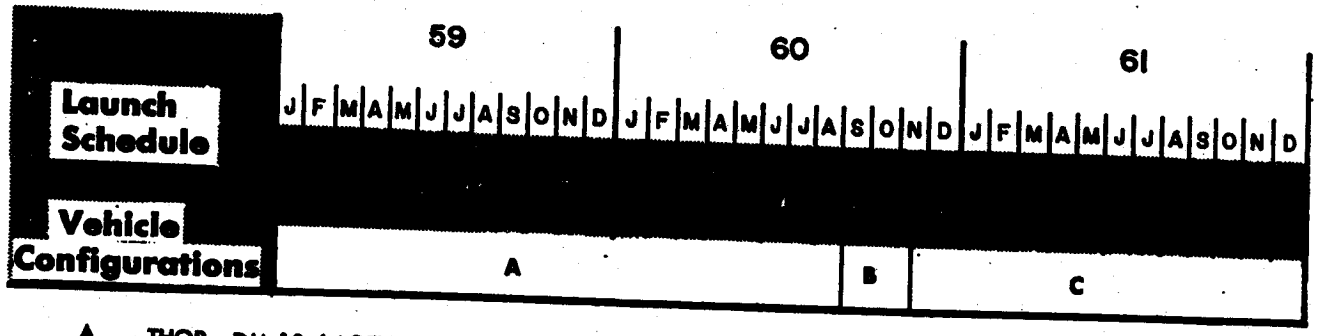
Capsule ejection command is sent to the satellite by the Kodiak, Alaska station on the 16th orbit. The vehicle reorients its position (see inset) to permit ejection to occur on a re-entry trajectory on the 17th orbit. The recovery capsule parachute is activated at about 50,000 feet, and the capsule beacon transmits a radio signal for tracking purposes. The recovery force is deployed in the recovery (impact) area.

Facility	Equipment*	Flight Function
Satellite Test Center	A	Over-all control, convert tracking stations data to obtain a predicted orbit and generate subsequent ephemerides issue acquisition data to tracking stations for subsequent passes, predict recovery area.
Vandenberg AFB	BCDEFGHIJK	Launch, ascent and orbital tracking, telemetry reception, trajectory measurements including time to ignite second stage.
Point Mugu	BCDEFGHIJKL	Ascent tracking and telemetry data reception, transmits command to ignite and shut down AGENA (via guidance computer).
Telemetry Ship (Pvt. Joe E. Mann)	DF	Final stage ascent tracking and telemetry data reception.
Kodiak, Alaska (tracking station)	BDEFGHIJK	Orbital tracking and telemetry data reception, including first pass acquisition, recovery capsule ejection and impact prediction.
Kaena Point, Oahu, Hawaii (tracking station)	BCDEFGHIJK	Orbital tracking and telemetry data reception.
Hickam AFB Oahu, Hawaii		Over-all direction of capsule recovery operations.

*Equipment

A. 2 UNIVAC 1103-A digital computers
B. VERLORT (Modified Mod II) radar
C. TLM-18 self-tracking telemetering antenna
D. Tri-helix antenna
E. Doppler range detection equipment
F. Telemetry tape recording equipment
G. Telemetry decommutators for real time data presentation
H. Plot boards for radar and TLM-18 tracking data
I. Conversion equipment for teletype transmission of radar, TLM-18 and doppler tracking data in binary format
J. Acquisition programmer for pre-acquisition direction of antennas
K. Ground command to satellite transmission equipment
L. Guidance computer

GROUND SUPPORT FACILITIES



A. THOR—DM-18 / AGENA "A"

B. THOR—DM-21 / AGENA "B"
MB-3 Block 1 / XLR81-Ba-7

C. THOR—DM-21 / AGENA "B"
MB-3 Block 2 / XLR81-Ba-9

0 Attained orbit successfully.

0 Failed to attain orbit.

Flight History

DISCOVERER No.	AGENA No.	THOR No.	Flight Date	Remarks
0	1019	160	21 January	*AGENA destroyed by malfunction on pad. THOR refurbished for use on flight XII.*
I	1022	163	28 Feb 1959	*Attained orbit successfully. Telemetry received for 514 seconds after lift-off.*
II	1018	170	13 April	*Attained orbit successfully. Recovery capsule ejected on 17th orbit was not recovered. All objectives except recovery successfully achieved.*
III	1020	174	3 June	*Launch, ascent, separation, coast and orbital boost successful. Failed to achieve orbit because of low performance of satellite engine.*
IV	1023	179	25 June	*Same as DISCOVERER III.*
V	1029	192	13 August	*All objectives successfully achieved except capsule recovery after ejection on 17th orbit.*
VI	1028	200	19 August	*Same as DISCOVERER V.*
VII	1051	206	7 November	*Attained orbit successfully. Lack of 400-cycle power prevented stabilization on orbit and recovery.*
VIII	1050	212	20 November	*Attained orbit successfully. Malfunction prevented AGENA engine shutdown at desired orbital velocity. Recovery capsule ejected but not recovered.*
IX	1052	218	4 February	*THOR shut down prematurely. Umbilical cord mast did not retract. Quick disconnect failed, causing loss of helium pressure.*
X	1054	223	19 February	*THOR destroyed at T plus 56 sec. by Range Safety Officer.*
XI	1055	234	15 April	*Attained orbit successfully. Recovery capsule ejected on 17th orbit was not recovered. All objectives except recovery successfully achieved.*
XII	1053	160	29 June	*Launch, ascent, separation, coast and orbital stage ignition were successful. Failed to achieve orbit because of AGENA attitude during orbital stage boost.*

Monthly Progress—DISCOVERER Program

Flight Test Progress

- The launch of DISCOVERER XIII is scheduled for 10 August. DISCOVERER XIV is scheduled for 18 August.

- DISCOVERER XIII will carry a diagnostic payload in addition to the normal recovery equipment. This payload contains instrumentation to determine capsule environment and the functioning of separation and recovery sequence events. A five-channel telemetry system is installed to transmit this data. To assure receipt of all data, a tape recorder is provided to record the real time events and capsule performance during the telemetry "blackout" period which occurs when the capsule re-enters the atmosphere. After a two-minute time delay, this stored data will be transmitted. The high speed of re-entry induces ionization over the skin of the capsule which effectively blocks telemetry transmission. An S-band transponder is also provided to aid in tracking the capsule from ejection through recovery.

Technical Progress

Second Stage Vehicles

- Three AGENA "B" vehicles (XLR-81-Ba-7 engines) are now in storage following Air Force acceptance.

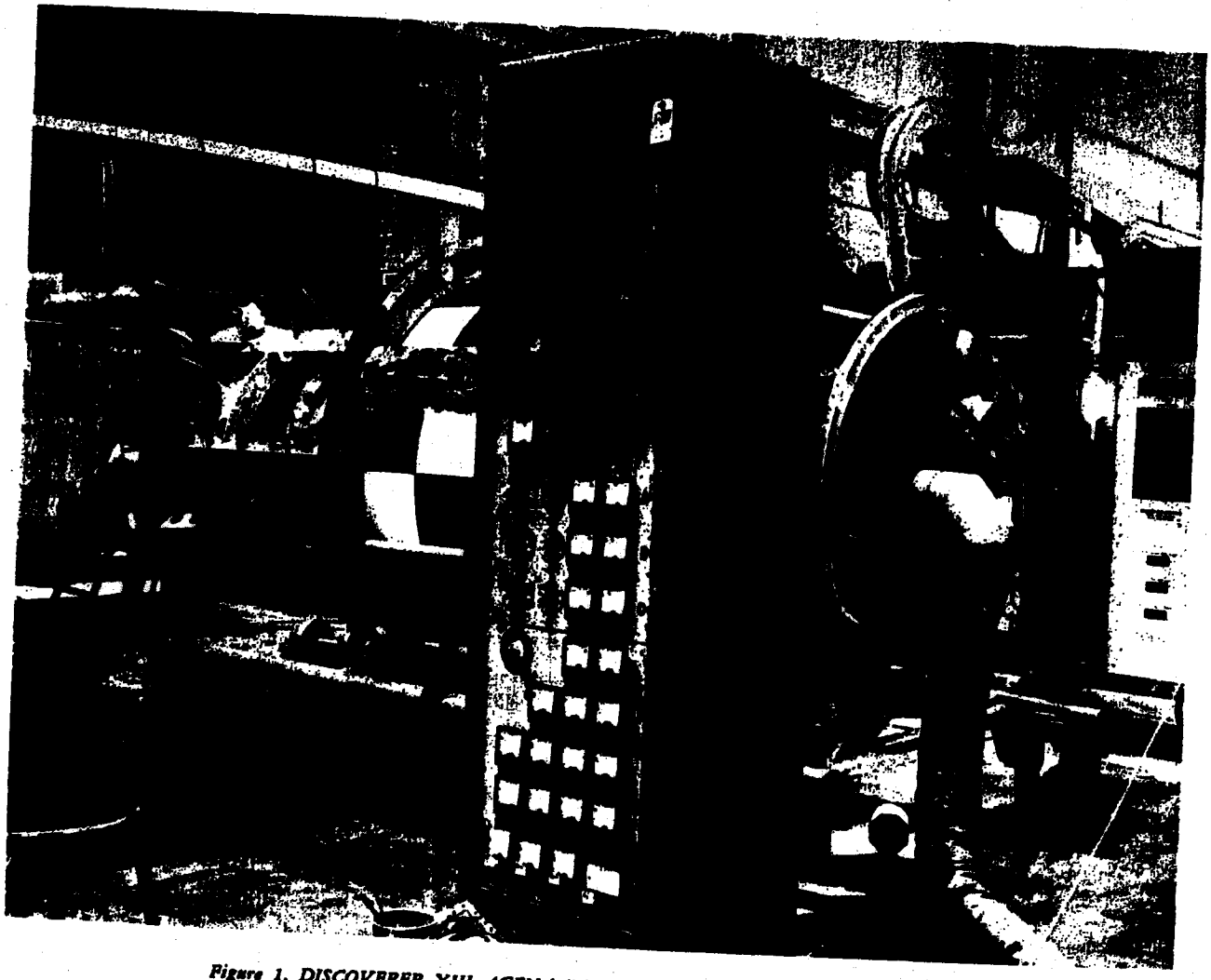


Figure 1. DISCOVERER XIII AGENA "A" vehicle (No. 1059) undergoing systems tests in the missile assembly building at Vandenberg Air Force Base. Following these checks the fairings will be installed and the vehicle will be transported to the launch pad for installation on the THOR booster. DISCOVERER XIII is scheduled for launch on 10 August.

These vehicles will be moved to the Vandenberg Air Force Base missile assembly building as required for launch. The first two AGENA "B" vehicles using the XLR-81Ba-9 engine are undergoing hot firing acceptance tests at Santa Cruz Test Base.

RF Interference Test Program

- The cause of improper horizon scanner operation during the DISCOVERER XII flight was determined to be RF interference from the satellite telemetry transmitter. A modification has been incorporated to correct this condition. Subsequent testing has revealed on RF interference with the scanner at any frequency or transmitter power level.

Recovery System Component Test Program

- The third and fourth successful balloon drops of the recovery system series were made at Holloman Air Force Base on 23 and 27 July. The retro rocket and spin/de-spin systems functioned satisfactorily. These were the second and third successful dynamic tests of the "cold gas" spin system. In both test chaff was dispensed from the pilot chute deployment bag and did not contact the main chute, indicating that the prior interference problem has been solved.

SAMOS

BOOSTER—ATLAS ICBM	
Weight—Wet	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

SECOND STAGE	AGENA "A"	AGENA "B"
Weight—		
Inert	1,508	1,695
Payload equipment	2,605	3,058
Orbital	4,113	4,753
Impulse Propellants	6,492	12,950
Fuel (UDMH)		
Oxidizer (IRFNA)		
Other	606	718
GROSS WEIGHT (lbs.)	11,211	18,421
Engine	YLR81-Ba-5	XLR81-Ba-9
Thrust, lbs. (vac.)	15,600	16,000
Spec. Imp., sec. (vac.)	277	290
Burn Time, sec.	120	240

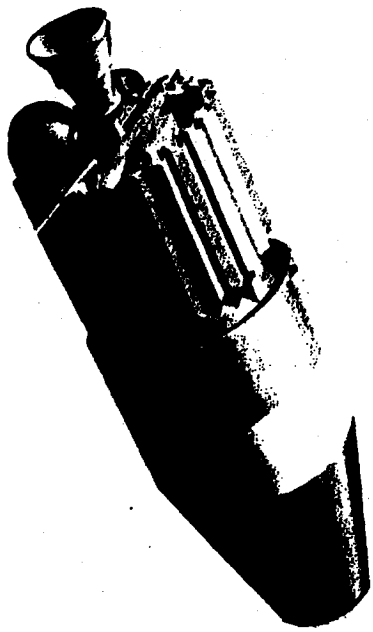
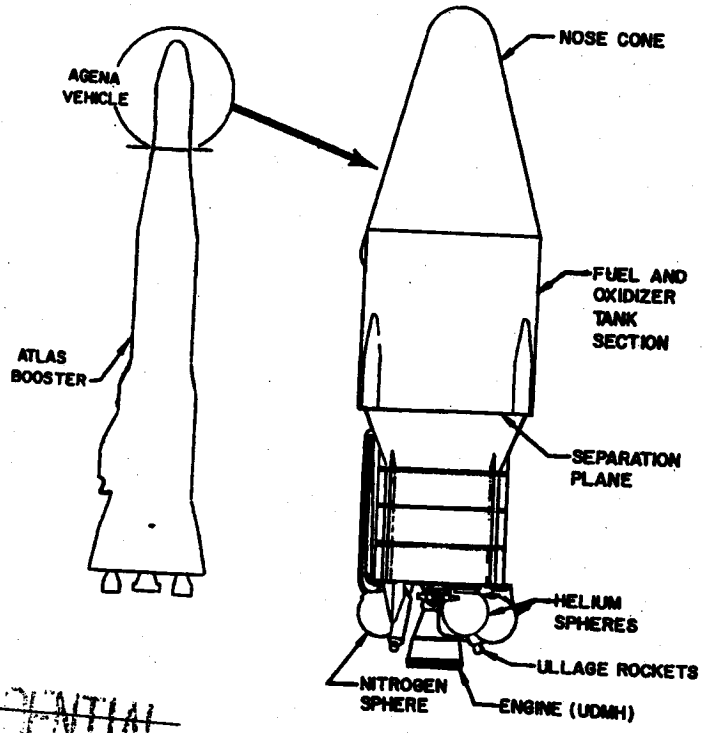


Figure 1.

Artists' concept of SAMOS satellite. Line drawing of complete flight vehicle (right) and detailed view of basic AGENA upper stage (left).



PROGRAM HISTORY

The SAMOS Program was included in Weapon System 117L when WS 117L was transferred to the Advanced Research Projects Agency early in 1958. ARPA separated WS 117L into the DISCOVERER, SAMOS and MIDAS programs with the SAMOS objectives based on a visual and ferret reconnaissance system. On 17 November 1959 responsibility for this program was transferred from ARPA to the Air Force by the Secretary of Defense.

PROGRAM MISSION

The primary mission of the SAMOS advanced reconnaissance system is to provide visual and electronic coverage of the USSR and its allied nations. Efforts include development of hardware to permit:

a. Determination of characteristics of enemy electronic emissions.
b. Verification of known targets, detection of unknown targets.
c. Location and evaluation of defenses.
d. Evaluation of military and industrial strength.
e. Assessment of high-yield weapons damage.
f. Reconnoitering of troop movements.
g. Location of naval forces throughout the world.

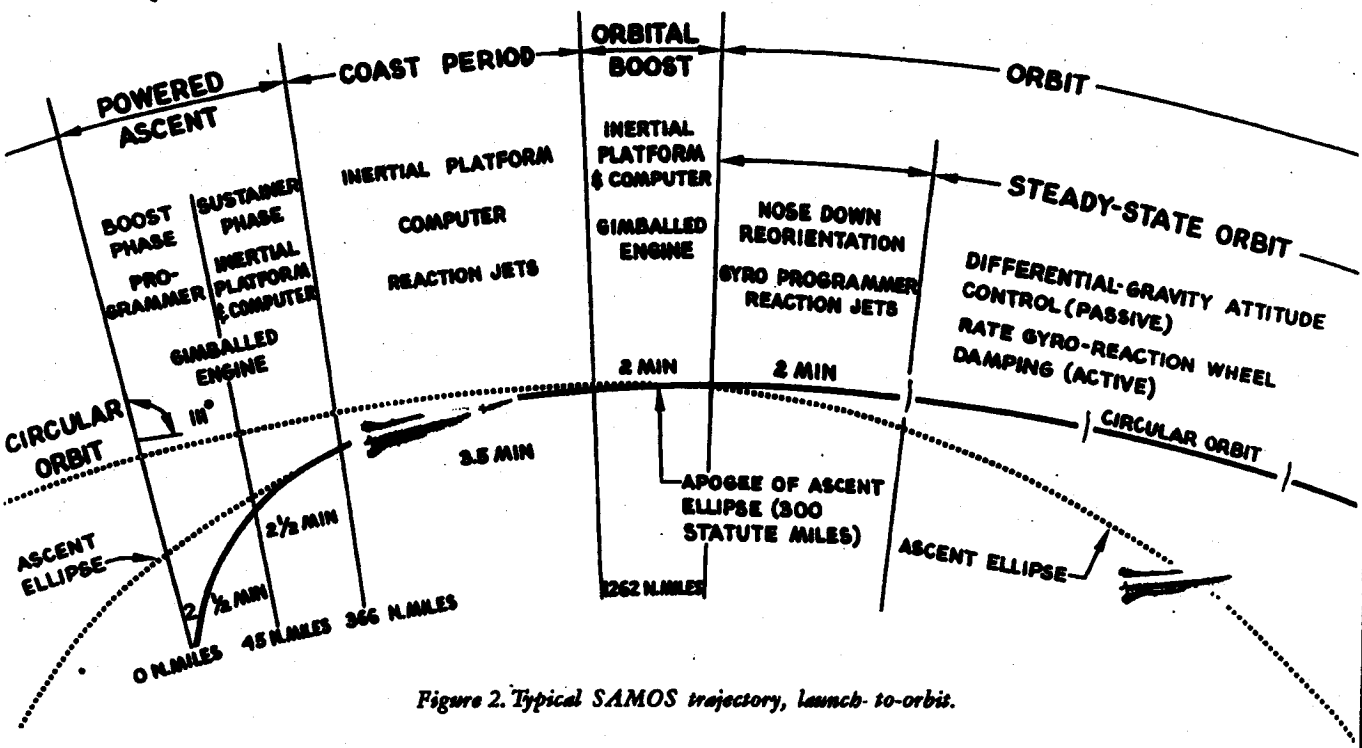


Figure 2. Typical SAMOS trajectory, launch-to-orbit.

Ferret Reconnaissance...

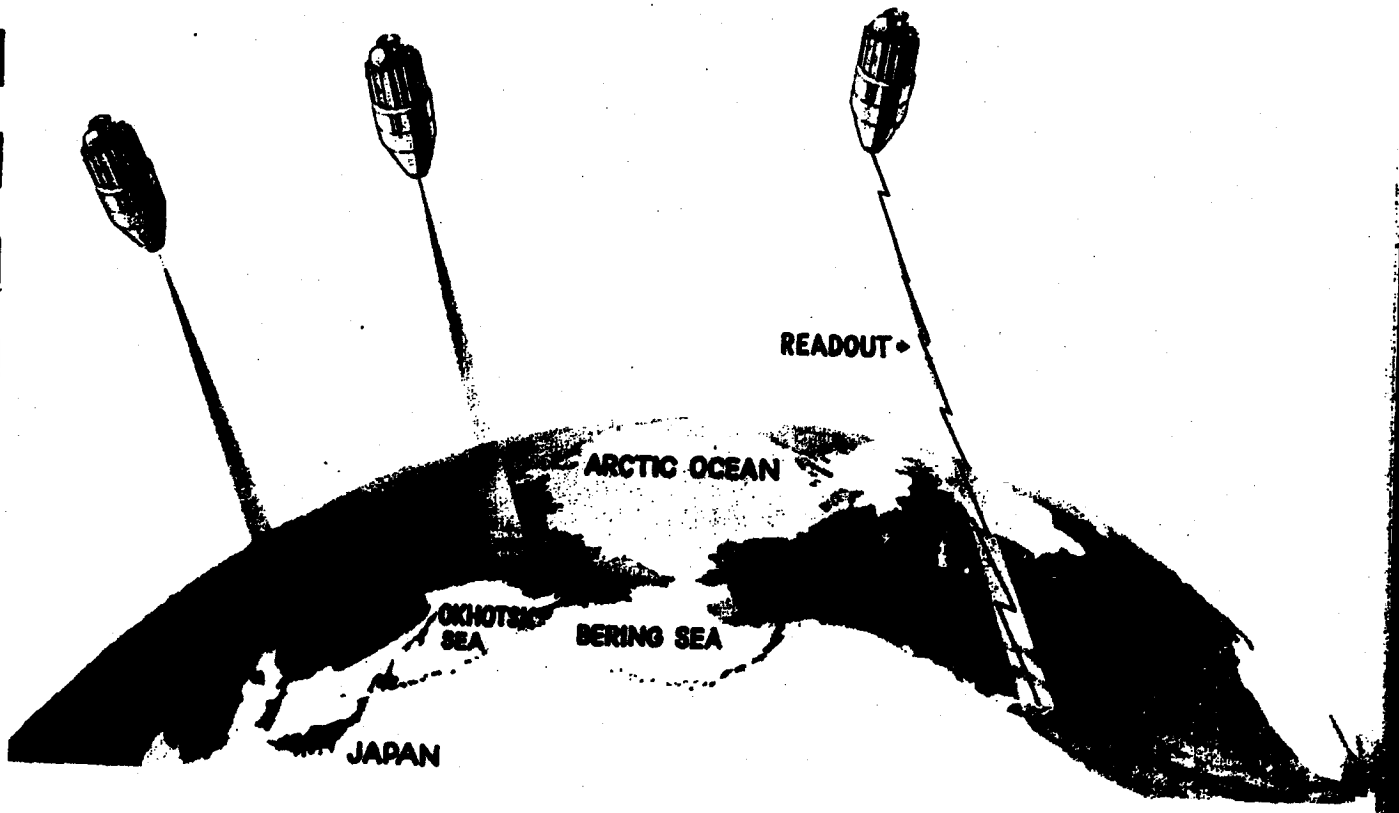


Figure 4. The Ferret reconnaissance system will gather data from electronic emissions over areas of interest.

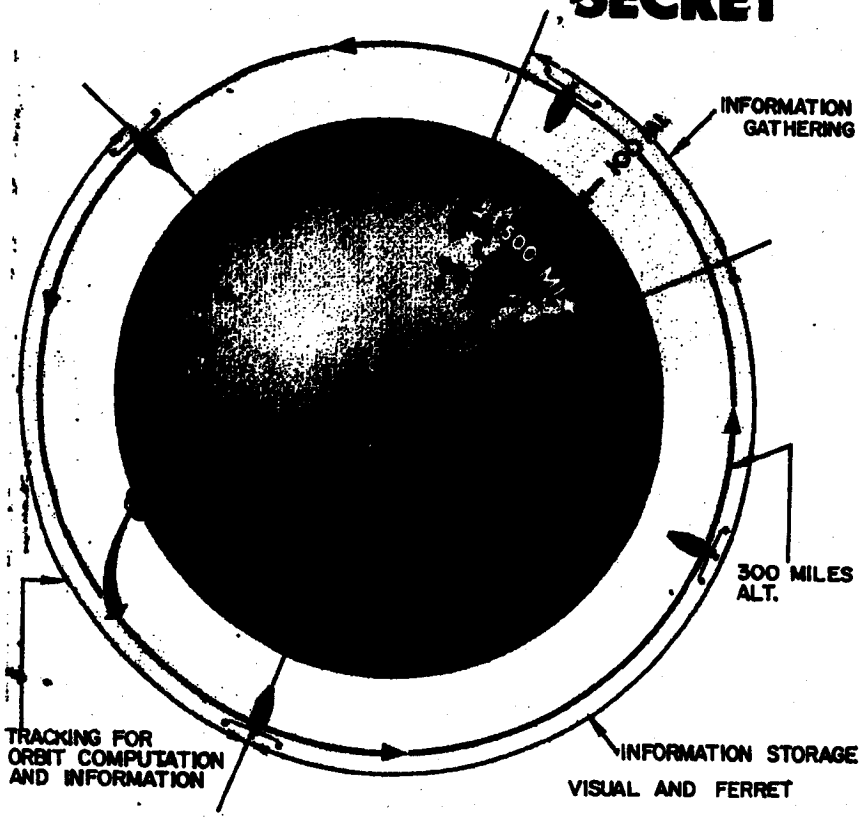


Figure 3.
Schematic of SAMOS system in operational orbit. When the satellite is over the area of interest the sensing equipment is turned on (Information gathering). When it leaves the area of interest the sensing equipment is turned off and the sensing data is processed (Information storage). When the vehicle comes within range of a ground receiving station, the data will be read-out upon command for processing and transmitted to using agencies. This process is continuously repeated during the useful lifetime of the vehicle.

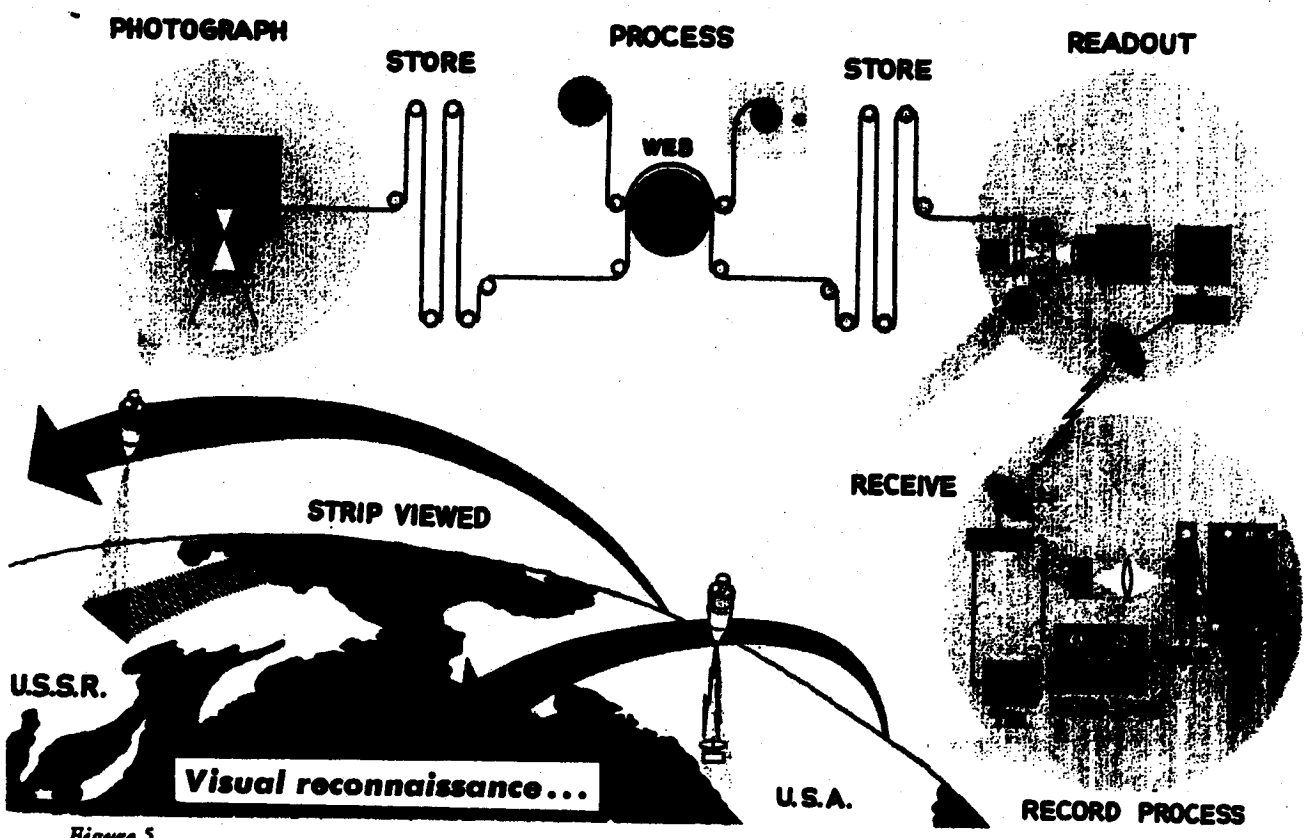


Figure 5.
The initial visual reconnaissance program will use conventional photo techniques with automatic film processing and TV-type electronic image readout to ground stations thru a data link. Ground electronics will reconvert the signal into photo image form, with a capability of resolving objects 20 feet in length.

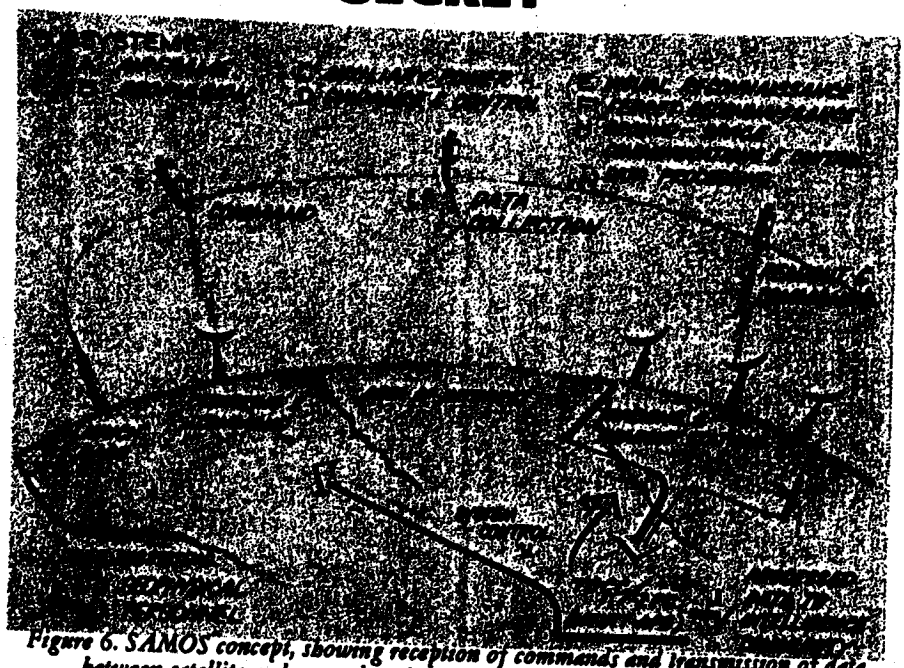


Figure 6. SAMOS concept, showing reception of commands and transmission of data between satellite and ground station; and subsystem functions (schematic).

For economical testing of components and subsystems, a dual-capability visual and ferret payload will be used during the early development phase. On later flights only a visual or ferret system payload will be carried. These payloads will be housed in the AGENA vehicle (Figure 1).

Data collected by the visual payloads will be electronically transmitted in the readout system and retrieved in the recovery system. Ferret data will be transmitted electronically. These systems are composed of the AGENA vehicle, ATLAS booster, launch facilities, tracking facilities, and a communications and data processing network. The recovery system will also include a re-entry capsule and a recovery force.

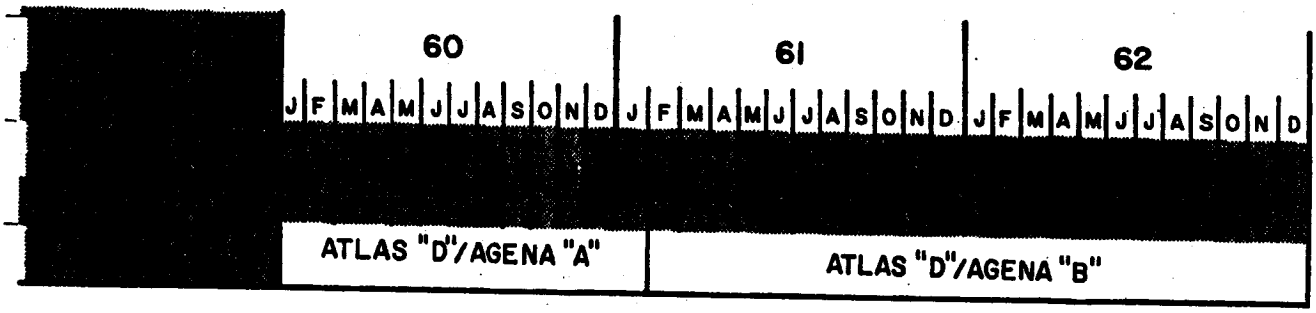
CONCEPT

ATLAS Series D missiles launched from VAFB will boost the AGENA vehicle into polar orbits. Injection into near-circular orbits (Figure 2) will be accomplished by the AGENA vehicle rocket engine. A self-contained guidance system using a horizon reference scanner will provide altitude stabilization. As the satellite travels in an orbit essentially fixed in space the earth rotates inside the orbit (Figure 3). Each successive orbit is displaced laterally approximately 23 ½ degrees at the equator, permitting one vehicle to observe the entire earth in a time period dependent upon the width of the area under surveillance. Early versions will have a useful life of approximately [illegible] days. These systems will have a useful life of four months with a design objective in certain configurations of one year; recovery systems will have a useful life of fifteen to thirty days.

TECHNICAL DESCRIPTION

Visual Program—Three versions (E-1, E-2, and E-5) of visual payloads are being developed. The E-1 payload is a photo component test payload which is combined with the F-1 ferret payload. The E-2 photographic payload, under development by Eastman Kodak Company, includes a camera, film processor, and electronic readout equipment. The E-5 recoverable system designed by Lockheed will retain the exposed film and the 66-inch focal length camera developed by Itek Corporation.

Ferret Program—Ferret payloads are being developed on a progressively more advanced basis from R&D (F-1) to advanced systems (F-4). The F-2 all-digital, general coverage payload will use superheterodyne scanning receivers in conjunction with directional antennas, an analog to digital converter and tape recorders (for storage). A programmer will be used to control read-in over areas of interest and readout over tracking stations. The F-3 payload will use similar receivers with stop-scan capability and controllable antennas added. Recording of the actual signal intercepted (rather than the digital representation) will be possible with a bandwidth up to 6mc. A complex programmer will permit satellite search of a given area or frequency range.



SAMOS Launch Schedule

Monthly Progress—SAMOS Program

Technical Progress

Second Stage Vehicles

- The AGENA vehicle for the first SAMOS flight was delivered to Vandenberg Air Force Base following successful captive hot firing tests and completion of dynamic systems testing at Santa Cruz Test Base. The vehicle is proceeding on schedule through modification and subsystem bench testing in the missile assembly building. Although impeded by parts shortages and the recent strike, schedules are being maintained to assure transfer of the vehicle to the launch pad by 19 August.

- The AGENA vehicles for the second and third flights are currently in the modification and subsystem test phases at the systems test area. Both vehicles are behind schedule because of the recent one-month strike and parts shortages. Efforts to recover current schedules are dependent upon continued availability of airborne communications equipment. The second flight vehicle is short the UHF narrow-band and wide-band data link transmitters. A firm delivery date is not available from the narrow-band transmitter contractor; however, a backup flight unit was received on 25 July. Delivery of a wide-band transmitter to replace the one used in the first flight vehicle has been made. The third flight vehicle has eight major airborne communications equipment shortages. Since delivery of these units is not expected before mid-August, it is doubtful that the schedule can be recovered.

- The first AGENA "B" vehicle is in the major subassembly phase of manufacture. Assembly was delayed by the recent strike, but every effort is being made to regain the schedule.

Visual Reconnaissance Systems

Visual Reconnaissance Systems payloads are being developed in a minimum number of configurations to attain readout and recovery mission objectives. The design and purpose of each configuration is as follows:

Readout:

E-1—Component Test Payloads

E-2—Steerable Reconnaissance Payload (with 20-foot ground resolution)

Recovery:

E-5—High Resolution, Steerable, Recoverable Payload (with 5-foot ground resolution)

E-6—General Area Coverage, Recoverable Payload (with at least 20-foot ground resolution)

Payloads

E-1 Payloads—Checkout and testing of the E-1 payload are progressing satisfactorily at Vandenberg Air Force Base.

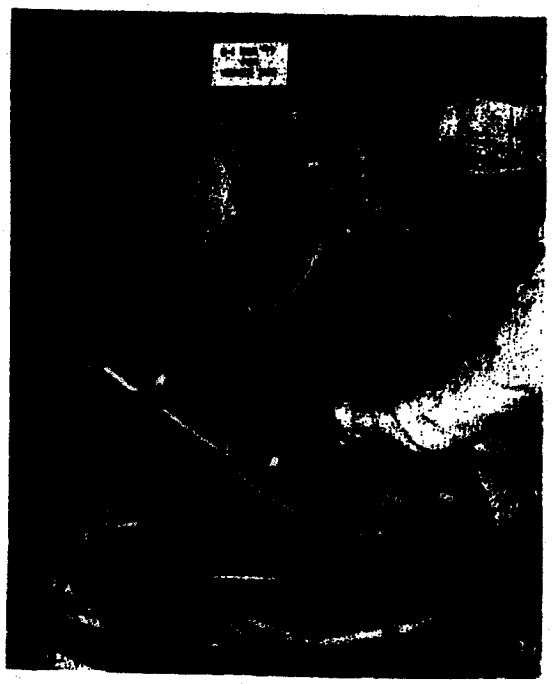


Figure 7. E-1 payload for first SAMOS flight showing technician installing pre-exposed, predeveloped film prior to testing the payload readout phase of operation.

E-2 Payloads—Initial E-2 payload component testing and assembly is progressing satisfactorily at Eastman Kodak. All components for the first flight payload (to be carried on the fourth SAMOS flight) are assembled and component qualification tests are underway prior to final payload assembly. Environmental tests of the thermal mock-up in the high altitude temperature simulator indicate that successful environmental control of critical components can be achieved under both hot and cold orbital conditions.

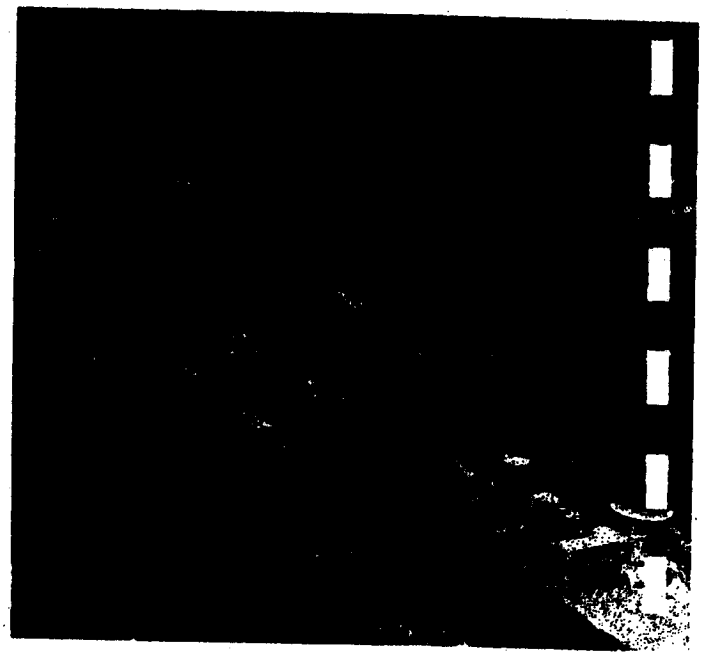
E-5 Payload—Development of the E-5 recovery payload continues on schedule. Design releases for the full-scale test models are nearing completion and fabrication of the initial test capsules is in progress. Wind tunnel tests of the aerodynamic configuration have been completed, except for the shock tunnel tests now being conducted at Cornell Aeronautical Laboratories. Aerodynamic/thermodynamic tests of the ablative heat shield are scheduled to begin at the Avco Corporation test facility in early August. A series of drop tests were initiated on 11 July at El Centro, California to evaluate the merits of a single large parachute and a cluster of three smaller parachutes to determine the most suitable configuration for capsule final descent. Tests to determine capsule drag and oscillation characteristics during retrieval into a recovery aircraft have started at Edwards Air Force Base.

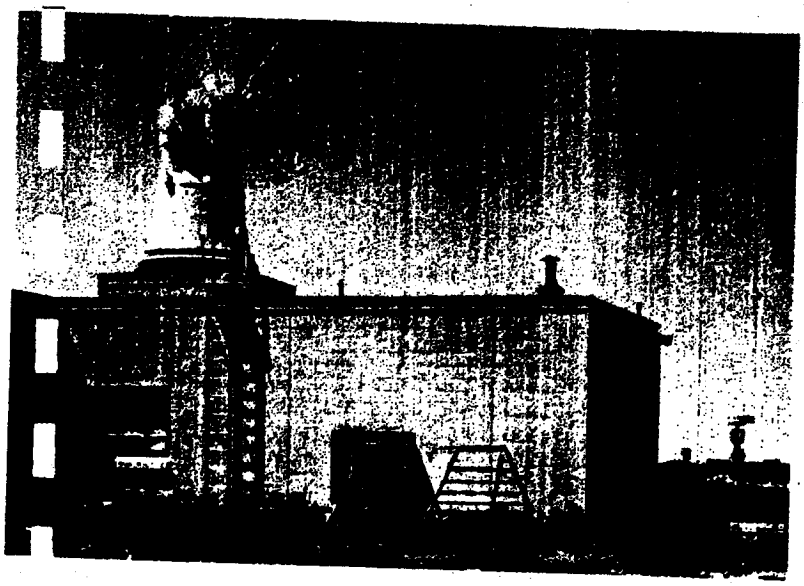
Ground Support Equipment

- Delivery of major items of ground equipment to Vandenberg Air Force Base in support of the initial SAMOS flights is now complete. The electronics package for the visual reconnaissance payload vacuum test chamber was shipped to the missile assembly building on 20 July.

- Installation of the E-1 operating console, the second set of E-1/E-2 visual reconnaissance ground reconstruction electronics equipment, and two primary record cameras in the Vandenberg Air Force Base data acquisition and processing building were completed during the report period. Installation of the UHF equipment required for initial SAMOS operations at the Vandenberg Air Force Base tracking and acquisition station is complete, and the equipment is undergoing systems integration. Also completed was the installation of the Model 1604 computer.

- Assembly and checkout of the Programmable Integrated Control Equipment (PICE), to be available for the third and subsequent SAMOS flights, are





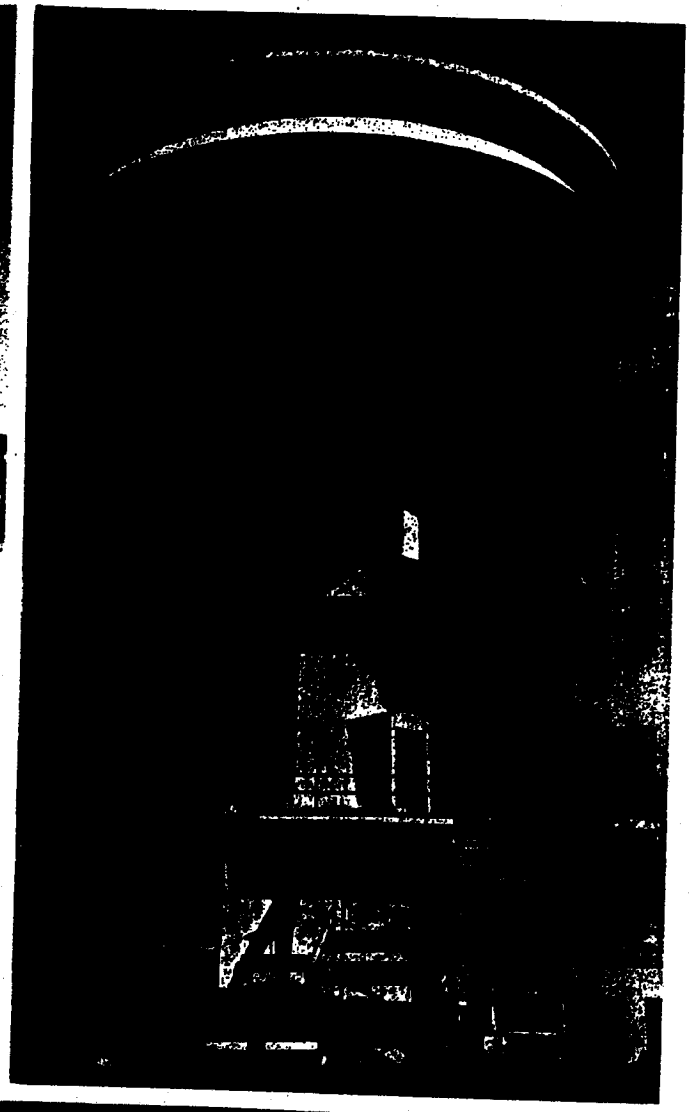
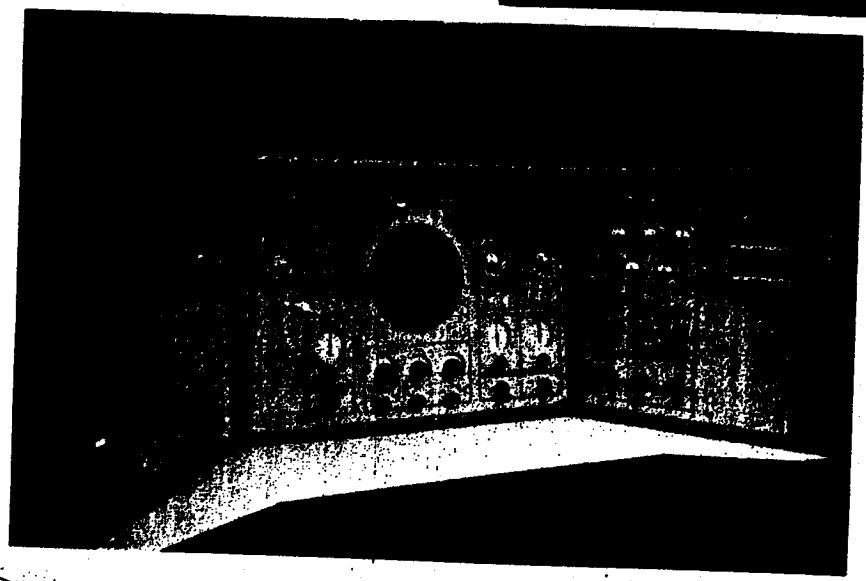


Figure 8. Aerial view (opposite page, lower) of the Vandenberg Air Force Base tracking and data acquisition station. The TLM-18 VHF antenna is in the upper left of the picture and the 60-foot telemetry and data antenna is in the lower right. UHF angle tracking antenna and control building (above) at Vandenberg Air Force Base. Sixty-foot antenna is in the background. Closeup (right) of the 60-foot UHF tracking and data antenna. Angle tracker console (below) with equipment racks in the background. This equipment is undergoing systems integration tests.



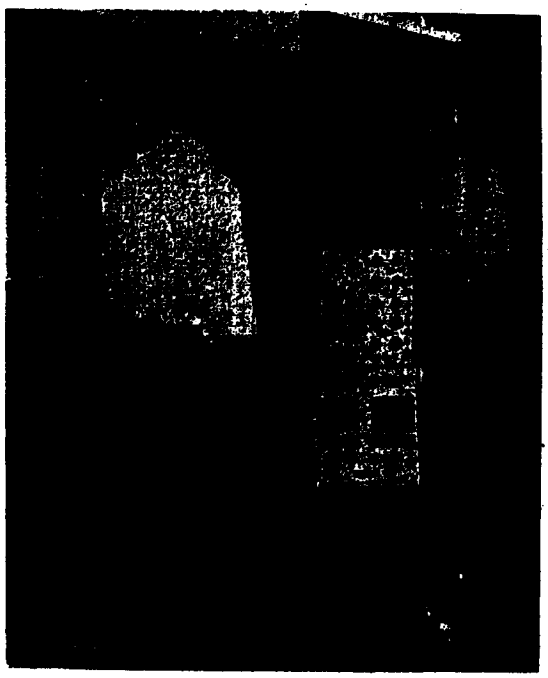


Figure 9. Checking Programmable Integrated Control Equipment (PICE) control cabinet operation. The first set is scheduled for installation at Vandenberg Air Force Base in September.

progressing on schedule at the contractors facility. Functional checkout and compatibility tests of set No. 1 are now in progress. Delivery to the Vandenberg Air Force Base tracking and acquisition station is scheduled for September. Set No. 2, scheduled for delivery to the Satellite Test Center 60 days after completion of Set No. 1, is in final assembly.

Ferret Reconnaissance System

- Ferret Reconnaissance System payloads are being developed in a minimum number of configurations. The designation and purpose of each configuration is as follows:

  F-1—Component Test Payloads

  F-2—Digital General Coverage Payloads

  F-3—Specific Mission Payloads—Analog Presentation

Figure 10. Adjusting the checkout console signal generator during functional testing of the F-1 payload. These tests consist of checking payload readout against calibrated inputs. The telemetry monitoring equipment is in the left-hand section of the console.

Payloads

F-1 Payloads—The F-1 payload, previously deleted from the first SAMOS flight, was reinstated on 26 July. Checkout and testing of the payload has been accelerated at Vandenberg Air Force Base.

Ground Support Equipment

- The F-1 operating console has been delivered to the data acquisition and processing building at Vandenberg Air Force Base.

Facilities

- Construction of all facilities required for the first SAMOS flight is complete, and installation and checkout of equipment are progressing at a rate compatible with the scheduled launch date. Systems testing of the Pad 1 complex at Point Arguello was completed late in July.

- Bid opening for the Point Arguello diesel generator building was held on 26 July. A total of twelve bids ranging from $184,000 to $249,000 were received.

- The SAMOS laboratory building at Vandenberg Air Force Base was completed and accepted on 18 July, with minor deficiencies remaining to be corrected. Design of the Vandenberg Air Force Base helium unloading and storage facility has been initiated with design completion scheduled in early October.