Project: Lunik I or Mechta (Dream)

Project Direction: U.S.S.R.

Launched: January 2, 1959

From: Northeast of Ural Lakes

Lifetime: (Indefinite)

Major Objectives Measure temperature and pressure inside vehicle; study gas components of interplanetary matter and corpuscular radiation of Sun; magnetic fields of Earth and Moon; meteoric particles; heavy nuclei in primary cosmic /radiation.

Major Results: Placed in orbit around the Sun.

Flight Program

Launch Vehicle: Believed to be a T-3. Stages: (1) Modified ICBM, Thrust 220 tons (liquid) + 80 tons (solid); (2) Modified IRBM; (3) Special.

Lift-Off Weight: Not Available

Dimensions: Believed to be 110 feet high.

Program: Place instrumented satellite in orbit around Sun.

Program Results: Orbit achieved.

Perigee (Miles): 91 million from Sun
Apogee (Miles): 120 million from Sun

Inclination: 1 degree to Ecliptic
Period: 443 days

Velocity: Average 63,100 mph with respect to Sun.

Payload And Instrumentation

Dimensions: Not Available

Payload Weights: Total weight in flight reported to be 3,245 pounds; Instrument capsule 800 pounds.

Payload Configuration: Hermetically sealed sphere of aluminum magnesium alloy.

Instrumentation: To measure temperature and pressure inside vehicle; study gas components of interplanetary matter and corpuscular radiation of sun; magnetic fields of Earth and Moon, meteoric particles; heavy nuclei in primary cosmic radiation, sodium cloud generator.

Transmitters: Three: 19.997 MC and 19.995 MC signals of 1.6 second duration; 19.993 MC and 183.6 MC.

Power Supply: Not Available.

Additional Data:

Sources: UNOFFICIAL from U.S. and Soviet Press and Radio.

Date: Prepared September, 1960

LUNIK I or MECHTA (U.S.S.R.)

Project: Vanguard II (1959 Alpha)

Project Direction: NASA

Launched: February 17, 1959

From: Atlantic Missile Range

Lifetime: 10 years or more

Major Objectives Place satellite in orbit for study of cloud cover.

Major Results: Satellite placed in orbit but satellite precession or wobble prevented interpretation of cloud cover data.

Flight Program

Launch Vehicle: Vanguard (Satellite Launching Vehicle 4). Stages: (1) Liquid. (2) Liquid. (3) Solid.

Lift-Off Weight: 22,600 lbs.

Dimensions: 72 ft. high, 45 in. diameter.

Program: Place satellite in Earth orbit

Program Results: Placed satellite in elliptical Earth orbit.

Perigee (Miles): 347 (Sept. 1960)
Apogee (Miles): 2,046 (Sept. 1960)

Inclination: 32.86 degrees to Equator
Period: 125.3 minutes

Velocity: 18,299 mph at perigee
13,109 mph at apogee

Payload And Instrumentation

Dimensions: 20 in. diameter

Payload Weights: 21.5 lbs.

Payload Configuration: Sphere with shell of highly polished silicon-monoxide-coated magnesium.

Instrumentation: Chiefly two infrared photocells and accessory equipment.

Transmitters: 108.00 MC at 10 mw (tracking) lasted 27 days. 108.03 MC at 1 watt triggered from ground lasted 18 days.

Power Supply: Mercury batteries.

Additional Data:

Sources: NASA

Date: Prepared September, 1960

VANGUARD II (1959 Alpha)

Project: Discoverer I (1959 Beta)

Project Direction: ARPA

Launched: Feb. 28, 1959, 1:49 PM (PST)

From: Vandenberg AFB, Calif.

Lifetime: 10 days (approx.)*

Major Objectives Demonstrate orbital capability of Discoverer-Thor combination and capability of its ground support equipment.

Major Results: Satellite placed in near-polar orbit. Difficulty in stabilization caused tumbling which hampered continuous tracking.

Flight Program

Launch Vehicle: Thor-Agena. Stages: (1) Modified Thor IRBM. (2) Agena.

Lift-Off Weight: Over 100,000 lbs.

Dimensions: 78.2 ft. high, 5 ft. base diameter

Program: Place satellite in near-polar orbit.

Program Results: Satellite placed in elliptical near-polar orbit. No recovery planned.

Perigee (Miles): 176
Apogee (Miles): 519

Inclination: .3 degrees off North-South axis.
Period: 95.57 minutes

Velocity:

Payload And Instrumentation

Dimensions: 18.8 ft. high, 5 ft. diameter

Payload Weights: 1,300 total lbs. including second stage casing & all components and 40 lbs. of instruments.

Payload Configuration: Cylindrical

Instrumentation: Guidance system including both a pneumatic, jet control system and a hydraulic control system; VHF low power beacon transmitter; radar beacon transmitter with transponder. No separate capsule.

Transmitters: Includes telemetry and tracking beacon as above.

Power Supply: Not available.

Additional Data: *Reentered atmosphere and decayed in early March 1959.

Sources: DOD

Date: Prepared September, 1960

Prepared by Office of Public Information, U.S. National Aeronautics and Space Administration, Washington 25, D.C.

DISCOVERER I (1959 Beta)

Project: Pioneer IV

Project Direction: NASA

Launched: March 3, 1959

From: Atlantic Missile Range

Lifetime: Eternal orbit around Sun.

Major Objectives: Place instrumented probe in an Earth-Moon trajectory; measure radiation in space; test photo-electric sensor in vicinity of Moon; sample Moon's radiation; test long-range tracking.

Major Results: Achieved Earth-Moon trajectory and yielded important radiation data in space. Injection below planned velocity prevented near-lunar experiments. In orbit around Sun.

Flight Program

Launch Vehicle: Juno II. Stages: (1) Modified Army Jupiter IRBM. (2) 11 scaled-down Sergeant rockets in cluster. (3) Three scaled-down Sergeants in cluster. (4) One scaled-down Sergeant.

Lift-Off Weight: 121,000 lbs. **Dimensions:** 76 ft. high; 8-3/4 ft. diameter

Program: Place instrumented vehicle in an Earth-Moon trajectory. If possible, pass within 20,000 miles of Moon to test photoelectric sensor.

Program Results: Placed in Earth-Moon trajectory and achieved orbit around Sun. Came within 37,300 miles of Moon at 5:24 p.m., EST. March 4, 1959.

Perigee (Miles): 91.7 million from Sun. **Inclination:** .127 degrees to Ecliptic

Apogee (Miles): 107.9million from Sun. **Period:** 406.9 days

Velocity: Injection velocity of 24,790 mph was 188 mph below planned velocity. Average speed in Sun orbit: 65,144 mph with respect to Sun.

Payload And Instrumentation

Dimensions: 20 in. long; 9 in. diameter **Payload Weights:** 13.40 lbs.

Payload Configuration: Conical with shell of gold-washed fiberglass which also serves as conductor and antenna.

Instrumentation: For measurement of radiation in space and photoelectric sensor (not used) for tests in vicinity of Moon.

Transmitters: 960.05 MC @180 mw with 3 subcarriers. Lifetime: 90 hours.

Power Supply: Mercury batteries.

Additional Data: Tracked for 82 hours to a distance of 407,000 miles.

Sources: NASA

Date: Prepared September, 1960

PIONEER IV

Project: Vanguard

Project Direction: NASA

Launched: April 13, 1959

From: Atlantic Missile Range

Lifetime: Not Applicable

Major Objectives : a) Place instrumented satellite in orbit to map Earth's magnetic field. b) Place inflatable sphere in orbit to measure density of extreme upper atmosphere.

Major Results: No orbit due to malfunction in second stage. Payload and second stage fell into Atlantic several hundred miles from launch point.

Flight Program

Launch Vehicle: Vanguard (Satellite Launching Vehicle 5) Stages: (1) Liquid. (2) Liquid. (3) Solid.

Lift-Off Weight: 22,600 lbs.

Dimensions: 72 ft. high, 45 in. diameter

Program: Place satellite and inflatable sphere in Earth orbit.

Program Results: No orbit due to malfunction in second stage.

Perigee (Miles): Not Applicable
Apogee (Miles): Not Applicable

Inclination: Not Applicable
Period: Not Applicable

Velocity: Not Applicable

Payload And Instrumentation

Dimensions: Satellite "A": 13 in. sphere topped by 17-1/2 x 2-1/2 in. cyl. "B": 30 in. inflatable sphere.

Payload Weights: 23.3 lbs. total.

Payload Configuration: As above. Satellite "A" of fiberglass and phenolic resins; "B" of laminated aluminum foil and plastic sheet.

Instrumentation: Satellite "A" contained precise magnetometer to measure earth's magnetic field. "B" contained no instrumentation; was to be tracked optically.

Transmitters: For "A", 108 MC at 10 mw for tracking and 108.03 MC at 80 mw for telemetry at ground command.

Power Supply: Silver zinc batteries.

Additional Data:

Sources: NASA

Date: Prepared September 1960

Prepared by Office of Public Information, U.S. National Aeronautics and Space Administration, Washington 25, D.C.

VANGUARD

Project: Discoverer II (1959 Gamma)

Project Direction: ARPA

Launched: April 13, 1959, 1:18 PM (PST)

From: Vandenberg AFB, Calif.

Lifetime: 13 days (Approx.)

Major Objectives: Satellite system to gather data on propulsion, communications, orbital performance, stabilization, recovery techniques, and measurement of cosmic radiation.

Major Results: Achieved near-circular polar orbit and controlled stabilization. Timer malfunction caused premature capsule ejection and prevented recovery attempt.*

Flight Program

Launch Vehicle: Thor-Agena. Stages: (1) Modified Thor IRBM. (2) Agena

Lift-Off Weight: 108,400 lbs. (Approx.)

Dimensions: 78.6 ft. high, 5 ft. base diameter

Program: Place satellite in near-polar orbit and recover capsule.

Program Results: Satellite placed in near-polar orbit. Timer malfunction prevented recovery.

Perigee (Miles): 156
Apogee (Miles): 225

Inclination: .2 degrees off North-South axis.
Period: 90.4 minutes

Velocity:

Payload And Instrumentation

Dimensions: 19.2 ft. high, 5 ft. diameter Recovery capsule 27 x 33 in.

Payload Configuration: Cylindrical

Payload Weights: Total in orbit 1600 lbs. including 245 lbs. of instrumentation for communications and performance; 195 lbs. data capsule; second stage casing.

Instrumentation: Includes data capsule to be ejected from satellite by timing device; small retro-rocket to aid re-entry. Various devices to aid in locating capsule. Capsule included emulsion packs to measure radiation, and environmental package equipped to measure and report on internal conditions for possible life-support.

Transmitters: Telemetry ran to April 14, 1959; tracking beacon to April 21,1959.

Power Supply: Not available

Additional Data: *All equipment worked as programmed but timer, which made capsule impact in vicinity of Spitsbergen Islands April 14 instead of Hawaii vicinity where it was to be recovered by airplane or ship. Whereabouts unknown. First satellite to carry recoverable instrument package.

Sources: DOD

Date: Prepared September, 1960

DISCOVERER II (1959 Gamma)

Project: Discoverer III

Project Direction: ARPA

Launched: June 3, 1959; 4:09 PM (EDT)

From: Vandenberg AFB, Calif.

Lifetime: Not Applicable

Major Objectives: Satellite system to gather data on propulsion, communications, orbital performance and stabilization, recovery techniques. Measurement of radiation. Biomedical enviromental research pack contained 4 black mice.

Major Results: No telemetry received. Injected downward instead of horizontally as programmed, thus effecting flight that would probably be terminated to the Antarctic regions.

Flight Program

Launch Vehicle: Thor-Agena. Stages: (1) Modified Thor IRBM. (2) Agena.

Lift-Off Weight: 108,400 lbs. (Approx.)

Dimensions: 78.6 ft. high, 5 ft. base diameter

Program: Place satellite in near-polar orbit and recover capsule.

Program Results: Preliminary telemetry indicated second stage fired but no signals from satellite received. Orbit believed doubtful.

Perigee (Miles): Not Applicable
Apogee (Miles): Not Applicable
Inclination: Not Applicable
Period: Not Applicable

Velocity: Not Applicable

Payload And Instrumentation

Dimensions: 19.2 ft. high, 5 ft. diameter. Recovery capsule 27 in. long, 33 in. diameter.

Payload Configuration: Cylindrical.

Payload Weights: 1600 total lbs. including second stage casing; 245 lbs. of instrumentation for communications and performance and 195 lb. data capsule.

Instrumentation: Includes data capsule to be ejected from satellite by timing devices; small retro-rocket to aid re-entry. Various devices to aid in locating capsule which contained four black mice, environmental research devices and radiation measurement equipment.

Transmitters: Not Available

Power Supply: Not Available

Additional Data:

Sources: DOD

Date: Prepared September, 1960

DISCOVERER III

Project: Vanguard

Project Direction: NASA

Launched: June 22, 1959

From: Atlantic Missile Range

Lifetime: Not Applicable

Major Objectives: Place satellite in orbit for measurement of solar-earth heating process which generates weather; test separation of payload and third stage on ground command.

Major Results: No orbit due to malfunction in second stage. Traveled 300 miles in a ballistic trajectory and landed in Atlantic Ocean.

Flight Program

Launch Vehicle: Vanguard (Satellite Launching Vehicle 6) Stages: (1) Liquid. (2) Liquid. (3) Solid.

Lift-Off Weight: 22,600 lbs.

Dimensions: 72 ft. high, 45 in. diameter

Program: Place satellite in Earth orbit.

Program Results: No orbit due to malfunction in second stage. *

Perigee (Miles): Not Applicable
Apogee (Miles): Not Applicable
Inclination: Not Applicable
Period: Not Applicable

Velocity: Not Applicable

Payload And Instrumentation

Dimensions: 20 in. diameter

Payload Weights: 22.5 lbs.

Payload Configuration: Sphere of magnesium alloy

Instrumentation: Four antenna-mounted thermistors for measurement of solar-earth heating process which generates weather.

Transmitters: 108 MC at 10 mw and 108.03 MC at 100 mw

Power Supply: Mercury batteries.

Additional Data: *Regulator designed to control helium flow for second stage did not respond to command. Pressure built up within helium reservoir which ruptured about 40 seconds after second stage ignition, and at 40-50 miles altitude. Rocket rolled over in ballistic trajectory at an altitude of about 90 miles. Third stage ignited before plunging into Atlantic some 300 miles northeast of launch site.

Sources: NASA

Date: Prepared September, 1960

VANGUARD

Project: Discoverer IV

Project Direction: ARPA

Launched: June 25, 1959, 3:09 PM (PDT)

From: Vandenberg AFB, Calif.

Lifetime: Not Applicable

Major Objectives Satellite system to gather data on propulsion, communications, orbital performance and stabilization, recovery techniques.

Major Results: Failed to achieve orbit due to insufficient velocity.

Flight Program

Launch Vehicle: Thor-Agena. Stages: (1) Modified Thor IRBM. (2) Agena.

Lift-Off Weight: 108,500 lbs. (Approx.)

Dimensions: 78.6 ft. high, 8 ft. base diameter.

Program: Place satellite in near-polar orbit and recover capsule.

Program Results: Failed to achieve orbit. Telemetry indicates second stage fired. Satellite was not acquired by tracking stations.

Perigee (Miles): Not Applicable

Apogee (Miles): Not Applicable

Inclination: Not Applicable

Period: Not Applicable

Velocity: Not Applicable

Payload And Instrumentation

Dimensions: 19.2 ft. high, 5 ft. diameter. Recovery capsule 27 in. long, 33 in. diameter

Payload Weights: 1700 lbs. total including second stage casing and 300 lb. data capsule.

Payload Configuration: Cylindrical

Instrumentation: Includes data capsule to be ejected from satellite by timing devices; small retro-rocket to aid re-entry. Various devices to aid in locating capsule.

Transmitters: Not Available

Power Supply: Not Available

Additional Data:

Sources: DOD

Date: Prepared September, 1960

DISCOVERER IV

Project: Explorer

Project Direction: NASA

Launched: July 16, 1959

From: Atlantic Missile Range

Lifetime: Not Applicable

Major Objectives : Place satellite in orbit to measure Earth's radiation balance; Lyman-Alpha X-Rays; heavy primary cosmic rays; micrometeorites; cosmic rays; satellite temperature; erosion of exposed solar cells.

Major Results: No orbit achieved. Vehicle destroyed by range safety officer after 5-1/2 seconds when it tilted sharply due to failure of power supply to guidance system.

Flight Program

Launch Vehicle: Juno II. Stages: (1) Modified Army Jupiter IRBM. (2) 11 scaled-down Sergeant rockets in cluster. (3) Three scaled-down Sergeants in cluster. (4) One scaled-down Sergeant.

Lift-Off Weight: 121,000 lbs.

Dimensions: 76 ft. high, 8-3/4 ft. diameter

Program: Place satellite in Earth orbit.

Program Results: Orbit not achieved. Vehicle destroyed by range safety officer.

Perigee (Miles): Not Applicable
Apogee (Miles): Not Applicable

Inclination: Not Applicable
Period: Not Applicable

Velocity: Not Applicable

Payload And Instrumentation

Dimensions: 30 in. high; 30 in. diameter

Payload Weights: 91.5 lbs.

Payload Configuration: Two truncated cones joined at bases.

Instrumentation: Instruments to measure Earth's radiation balance; Lyman-Alpha X-Rays; heavy primary cosmic rays; micrometeorites; cosmic rays; satellite temperature; erosion of exposed solar cells.

Transmitters: 20 MC at 600 mw on solar power designed for cutoff after one year; 108 MC at 15 mw designed to operate for two months.

Power Supply: Solar cells and chemical batteries.

Additional Data:

Sources: NASA

Date: Prepared September, 1960

Prepared by Office of Public Information, U.S. National Aeronautics and Space Administration, Washington 25, D.C.

Project: Explorer VI (1959 Delta)

Project Direction: NASA

Launched: August 7, 1959

From: Atlantic Missile Range

Lifetime: Estimated 2 years

Major Objectives Place satellite in orbit to measure three specific radiation levels of Earth Radiation Belts; test scanning device for Earth's cloud-cover; map Earth's magnetic field; measure micrometeorites; study behavior of radio waves.

Major Results: Orbit achieved. All experiments performed. First complete televised cloud-cover picture was obtained. Detected large ring of electrical current circling Earth; complete map of Van Allen radiation belt obtained.

Flight Program

Launch Vehicle: Thor-Able. Stages: (1)Modified Thor IRBM. (2) Liquid engine modified from Vanguard. (3) X 248 solid motor modified from Vanguard.

Lift-Off Weight: 105,100 lbs.

Dimensions: 90 ft. high, 8 ft. base diameter.

Program: Place satellite in highly elliptical Earth orbit.

Program Results: Satellite placed in desired orbit.

* **Perigee (Miles):** 156
Apogee (Miles): 26,357

Inclination: 46.9° to Equator
Period: 12-1/2 hours

Velocity: At perigee 23,031 mph. At apogee 3,126 mph.

Payload And Instrumentation

Dimensions: 26 in. diameter, 29 in. deep with four 18x18 in. solar vanes.

Payload Weights: 142 lb. total in orbit.

Payload Configuration: "Paddlewheel" -- spheroid shaped with flattened bottom plus four solar vanes or paddles, each carrying 2,000 solar cells.

Instrumentation: Equipment to measure radiation levels; tv-type scanner; micrometeorite detector; two types of magnetometer and devices for space communication experiments.

Transmitters: 108.06 MC at 500 mw; 108.09 MC at 500 mw; 378 MC ultra high frequency at 5 watts.

Power Supply: Nickel-cadmium batteries re-charged with solar cells. Transmitting lifetime of one month.

Additional Data: *Initial orbital elements. Current position uncertain.

One "paddle" failed to extend properly, cutting initial power supply.

Sources: NASA

Date: Prepared September, 1960

Prepared by Office of Public Information, U.S. National Aeronautics and Space Administration, Washington 25, D.C.

Project: Discoverer V (1959 Epsilon)

Project Direction: ARPA

Launched: August 13, 1959, 3:00 PM(EDT)

From: Vandenberg AFB, Calif.

Lifetime: Rocket Carrier down Sept. 28, 1960. Capsule still in orbit.

Major Objectives: Satellite system to gather data on propulsion, communications, orbital performance and stabilization and recovery techniques.

Major Results: Orbit achieved. Separation of recovery capsule occurred as planned, 5:42 PM (EDT), Aug. 14 over Pacific. No signals received from capsule and no recovery made.

Flight Program

Launch Vehicle: Thor-Agena. Stages: (1) Modified Thor IRBM. (2) Agena.

Lift-Off Weight: 108,500 lbs. (Approx.)

Dimensions: 78.6 ft. high, 8 ft. base diameter

Program: Place satellite in near-polar orbit and recover capsule.

Program Results: Satellite placed in near-polar orbit. No recovery made.*

Perigee (Miles): 120 (Approx.)
Apogee (Miles): 718 (Approx.)

Inclination: 78.9° to Equator
Period: 98.3 minutes

Velocity:

Payload And Instrumentation

Dimensions: 19.2 ft. high, 5 ft. diameter Recovery capsule 27 in. long, 33 in. diameter.

Payload Weights: 1700 total lbs. (Approx.) including second stage casing and 300 lb. data capsule.

Payload Configuration: Cylindrical

Instrumentation: Includes data capsule to be ejected from satellite by timing devices; small retro-rocket to aid re-entry. Various devices to aid in locating capsule.

Transmitters: Not Available

Power Supply: Not Available

Additional Data: *Rocket carrier re-entered atmosphere on Sept. 28, 1959. Defense Dept. announced in Feb., 1960 that capsule of Dis. V believed to be in polar orbit probably having been ejected while satellite was not in proper position for ejection toward Earth.

Sources: DOD

Date: Prepared September, 1960

Prepared by Office of Public Information, U.S. National Aeronautics and Space Administration, Washington 25, D.C.

Project: Beacon

Project Direction: NASA

Launched: August 14, 1959

From: Atlantic Missile Range

Lifetime: Not Applicable

Major Objectives Place 12-foot inflatable sphere in orbit for study of air density in space.

Major Results: Payload failed to achieve orbit due to malfunction in booster and attitude control system for upper stages.

Flight Program

Launch Vehicle: Juno II. Stages: (1) Modified Army Jupiter IRBM. (2) 11 scaled-down Sergeant rockets. (3) Three scaled down Sergeant rockets.

Lift-Off Weight: 121,000 lbs.

Dimensions: 76 ft. high; 8 3/4 ft. diameter

Program: Place third stage instrumented payload casing, and inflatable sphere into Earth orbit.

Program Results: Orbit not achieved.

Perigee (Miles): Not applicable
Apogee (Miles): Not applicable

Inclination: Not applicable
Period: Not applicable

Velocity: Not applicable

Payload And Instrumentation

Dimensions: 12 ft. diameter inflated sphere At launch, folded into 7" x 31" payload package.

Payload Weights: 84 lbs. in orbit; burned out third-stage - 58.5 lbs.; attached payload casing - 25.5 lbs., including 10 lb. sphere.

Payload Configuration: Stainless steel cylindrical shell containing inflatable satellite of Mylar plastic film and aluminum foil. Ejection and inflation mechanism consists of nitrogen bottle, bellows, piston and connecting valve.

Instrumentation: None on inflatable sphere.

Transmitters: 108.03 MC at 50 mw in payload casing.

Power Supply: Twelve mercury batteries.

Additional Data:

Sources: NASA

Date: Prepared September, 1960

BEACON

Project: Discoverer VI (1959 Zeta)

Project Direction: ARPA

Launched: August 19, 1959, 3:25 PM (EDT)

From: Vandenberg AFB, Calif.

Lifetime: Rocket Carrier down October 20, 1959

Major Objectives : Satellite system to gather data on propulsion, communications, orbital performance and stabilization, recovery techniques.

Major Results: Orbit achieved. Separation of capsule occurred Aug. 20, 6:27 PM (EDT), but no signals received from it and no recovery made.

Flight Program

Launch Vehicle: Thor-Agena. Stages: (1) Modified Thor IRBM. (2) Agena.

Lift-Off Weight: 108,500 lbs. (Approx.)

Dimensions: 78.6 ft. high, 8 ft. base diameter

Program: Place satellite in near-polar orbit and recover capsule.

Program Results: Orbit achieved. Capsule ejected but not recovered.

Perigee (Miles): 139 (Approx.)
Apogee (Miles): 537 (Approx.)

Inclination: 84° to Equator
Period: 95.3 minutes.

Velocity:

Payload And Instrumentation

Dimensions: 19.2 ft. high, 5 ft. diameter
Recovery capsule 27 in. long, 33 in. diameter
Payload Configuration: Cylindrical

Payload Weights: 1700 lbs. total including second stage casing and 300 lb. data capsule.

Instrumentation: Includes data capsule to be ejected from satellite by timing devices; small retrorocket to aid re-entry. Various devices to aid in locating capsule.

Transmitters: Not Available

Power Supply: Not Available

Additional Data:

Sources: DOD

Date: Prepared September, 1960

Prepared by Office of Public Information, U.S. National Aeronautics and Space Administration, Washington 25, D.C.

DISCOVERER VI (1959 Zeta)

Project: Lunik II

Project Direction: U.S.S.R.

Launched: 6 a.m. EDT, (Estimated) September 12, 1959

From: Not disclosed

Lifetime: Lunar impact: 5:02:24 p.m. EDT September 13, 1959

Major Objectives Lunar impact. Measurements in flight of temperature and pressure inside vehicle. Study magnetic fields of Earth and Moon, meteoric particles in space; heavy nuclei and other properties of cosmic rays.

Major Results: Probe impacted lunar surface. Details of in-flight studies not disclosed.

Flight Program

Launch Vehicle: "Multi-Stage Rocket" (Similar to Lunik I)

Lift-Off Weight: Not disclosed **Dimensions:** Not disclosed

Program: Impact trajectory to lunar surface.

Program Results: Payload impacted lunar surface.

Perigee (Miles): Not applicable
Apogee (Miles): Not applicable
Inclination: 65° to Equator
Period: Not applicable

Velocity: At lunar impact, more than two miles per second.

Payload And Instrumentation

Dimensions: Not Disclosed **Payload Weights:** 858.4 lbs. (Estimated)

Payload Configuration: Sphere consisting of pentagonal strips of stainless steel and two hermetically sealed shells of aluminum magnesium alloy.

Instrumentation: To measure temperature and pressure inside vehicle; study gas components of interplanetary matter and corpuscular radiation of sun; magnetic fields of Earth and Moon; meteoric particles; heavy nuclei in primary cosmic radiation, sodium cloud generator.

Transmitters: 183.6 MC (altimeter in probe); 39.986 MC (in probe); 19.993 MC (in probe); 20.003 MC (in rocket) and 19.997 MC (in rocket)

Power Supply: Not disclosed

Additional Data: Probe traveled 236,875 miles in 35 hours. Contained instruments and Soviet coat of arms.

Sources: UNOFFICIAL from U. S. and Soviet press and radio.

Date: Prepared September, 1960

LUNIK II (U.S.S.R.)

Prepared by Office of Public Information, U.S. National Aeronautics and Space Administration, Washington 25, D.C.

Project: Transit I-A

Project Direction: U. S. Navy

Launched: September 17, 1959

From: Atlantic Missile Range

Lifetime: Not Applicable

Major Objectives Test feasibility of more accurate system of world-wide navigation.

Major Results: Third stage did not ignite. No orbit. Determined in a preliminary way the feasibility of making refraction corrections and determining orbit by means of Doppler signals.

Flight Program

Launch Vehicle: Thor-Able Stages: (1) Modified USAF Thor IRBM; (2) Liquid engine modified from Vanguard; (3) Solid motor modified from Vanguard.

Lift-Off Weight: 105,000 lbs. (Approx.) **Dimensions:** 90 ft. high, 8 ft. diameter

Program: Place satellite in Earth orbit

Program Results: Orbit not achieved. Reached altitude of 400 miles; 25 minute flight.

Perigee (Miles): Not Applicable **Inclination:** Not Applicable
Apogee (Miles): Not Applicable **Period:** Not Applicable

Velocity: Not Applicable

Payload And Instrumentation

Dimensions: 36 inch diameter **Payload Weights:** 265 lbs.

Payload Configuration: Sphere of two layers of fiberglass with honeycomb structure in between. Broad band spiral antenna painted on shell.

Instrumentation: Includes two ultra-stable oscillators in temperature-resistant flasks; silver painted spiral band antenna; infrared scanner to measure satellite's rotation.

Transmitters: 54 MC; 324 MC; 162 MC; 216 MC

Power Supply: Two silver zinc batteries; two nickel-cadmium batteries powered by solar cells.

Additional Data:

Sources: U. S. Navy

Date: Prepared September, 1960

Prepared by Office of Public Information, U.S. National Aeronautics and Space Administration, Washington 25, D.C.

Project: Vanguard III (1959 Eta)

Project Direction: NASA

Launched: September 18, 1959

From: Atlantic Missile Range

Lifetime: 30-40 years (Est.)

Major Objectives: Place satellite in elliptical Earth orbit for study of magnetic fields, solar X-Rays, micrometeorites and temperatures.

Major Results: Orbit achieved. Provided comprehensive survey of Earth's magnetics field over areas covered; detailed location of lower edge of Van Allen Radiation Belt; accurate count of micrometeorite impacts.

Flight Program

Launch Vehicle: Vanguard (Satellite Launching Vehicle 7) Stages: (1) Liquid. (2) Liquid. (3) Solid.

Lift-Off Weight: 22,600 lbs.

Dimensions: 72 ft. high, 45 in. diameter

Program: Place satellite in elliptical Earth orbit.

Program Results: Satellite placed in elliptical Earth orbit.

Perigee (Miles): 320 (Sept. 1960)
Apogee (Miles): 2,320 (Sept. 1960)

Inclination: 33.3 degrees to the Equator
Period: 130 minutes

Velocity: 18,522 mph at perigee
12,639 mph at apogee

Payload And Instrumentation

Dimensions: 20 in. sphere from which 26-in. tapered tube extends.

Payload Weights: 100 lbs. total including scientific payload of 50 lbs. and attached third-stage casing.

Payload Configuration: As above. Forward section of sphere and tube of fiberglass. Remaining 3/4 of sphere of silicon-monoxide-coated magnesium.

Instrumentation: Proton precessional magnetometer; ionization chambers for solar X-Rays; micrometeor detectors and thermistors.

Transmitters: 108 MC at 30 mw for tracking, X-Ray and environmental data; 108.03 MC at 80 mw for magnetometer and command.

Power Supply: Chemical batteries powered transmission for 85 days.

Additional Data:

Sources: NASA

Date: Prepared September, 1960

VANGUARD III (1959 Eta)

Prepared by Office of Public Information, U.S. National Aeronautics and Space Administration, Washington 25, D.C.

Project: Lunik III (1959 Theta)

Project Direction: U.S.S.R.

Launched: 10 p.m. EDT October 4, 1959

From: Not Disclosed

Lifetime: Presumed down mid-April, 1960

Major Objectives Photograph far side of the Moon

Major Results: Translunar Earth satellite placed in orbit. Produced photographs showing 70 per cent of the Moon's far side.

Flight Program

Launch Vehicle: Details not disclosed. (similar to Lunik I)

Lift-Off Weight: Not disclosed

Dimensions: Not disclosed

Program: Place instrumented satellite in Earth-Moon orbit.

Program Results: Satellite and last-stage rocket placed in highly elliptical translunar orbit.

Perigee (Miles): 24,840
Apogee (Miles): 292,000
Inclination: 80° to Equator just after passing
Period: 15 days (Approx.) /the Moon

Note: Parameters varied during lifetime due to perturbations of Moon and Sun.

Velocity: Varied widely.

Payload And Instrumentation

Dimensions: Cylindrical
Length 87 in.
Maximum Diameter, 47 in.

Payload Configuration: Thin-walled, pressurized cylinder with hemispherical ends.

Payload Weights: Total 4,037 lbs. including 614 lb. scientific satellite and last-stage rocket casing of 3,423 lbs. carrying 345 lbs. of scientific equipment.

Instrumentation: Included two cameras, developing mechanism, automatic devices for triggering cameras, developing and transmission of pictures to Earth. Also automatic temperature control. Other instruments not disclosed.

Transmitters: 183.6 MC estimated at 5-20 watts and 39.986 MC at undisclosed power.

Power Supply: Solar cells and chemical batteries.

Additional Data: Payload separated from last stage and reached closest point to Moon -- 4,372 miles 10:16 p.m. EDT, Oct. 6, 1959. Cameras triggered 40,000 miles from lunar surface on Oct. 7, 1959 and operated 40 minutes. Pictures developed and were transmitted back to Earth shortly before satellite reached perigee on Oct. 18, 1959.

Sources: UNOFFICIAL from U. S. and Soviet press and radio.

Date: Prepared September, 1960

LUNIK III (U.S.S.R.) (1959 Theta)

Project: Explorer VII (1959 Iota)

Project Direction: NASA

Launched: 11:31 a.m. EDT, October 13, 1959

From: Atlantic Missile Range

Lifetime: 20-30 years (Estimated)

Major Objectives : Place composite radiation satellite in orbit for a variety of experiments including solar ultraviolet; x-ray; cosmic ray, Earth radiation and micrometeor experiments.

Major Results: Orbit achieved. Provided significant geophysical information on radiation and magnetic storms; demonstrated method of controlling internal temperatures; first micrometeorite penetration of a sensor in flight;detection of large-scale weather patterns.

Flight Program

Launch Vehicle: Juno II. Stages: (1) Modified Army Jupiter IRBM. (2) 11 scaled-down solid Sergeant rockets in cluster. (3) Three scaled—down Sergeants in cluster. (4) Single Sergeant rocket.

Lift-Off Weight: 121,000 lbs.

Dimensions: 76 ft. high; 8-3/4 ft. diameter

Program: Place satellite in Earth orbit

Program Results: Satellite placed in Earth orbit

Perigee (Miles): 344 (Sept. 1960)
Apogee (Miles): 673 (Sept. 1960)

Inclination: 50.3° to Equator
Period: 101.2 minutes (Sept. 1960)

Velocity: At perigee, 17,285 mph; at apogee, 16,028 mph.

Payload And Instrumentation

Dimensions: 30 in. high, 30 in. diameter

Payload Weights: 91.5 lbs.

Payload Configuration: Two truncated cones joined at bases.

Instrumentation: Sensors for measurement of Earth-Sun heat balance; Lyman-Alpha and x-ray solar radiation detectors; micrometeor detectors; Geiger-Muller tubes for cosmic ray count; ionization chamber for heavy cosmic rays.

Transmitters: 20 MC at 600 mw. on solar power designed for cut-off one year from firing date; 108 MC at 15 mw to operate for two months.

Power Supply: Solar cells and rechargeable nickel-cadmium batteries.

Additional Data: *On June 16, 1960, NASA announced a multipleyer on one of four frequency modulated subcarriers on the second transmitter had become erratic. Information it had been transmitting on three of the seven experiments was no longer intelligible after eight months of operation. Tracking beacon ceased transmitting December 5, 1959. Information being received on remaining three experiments.

Sources: NASA

Date: Prepared September, 1960

EXPLORER VII (1959 Iota)

Project: Discoverer VII (1959 Kappa)

Project Direction: ARPA

Launched: November 7, 1959, 3:28 PM (EST)

From: Vandenberg AFB, Calif.

Lifetime: Rocket Carrier down November 26, 1959

Major Objectives : Satellite system to gather data on propulsion, communications, orbital performance and stabilization and recovery techniques.

Major Results: Orbit achieved. Electrical malfunction prevented stabilization in orbit and separation of capsule. *

Flight Program

Launch Vehicle: Thor-Agena. Stages: (1) Modified Thor IRBM. (2) Agena.

Lift-Off Weight: 108,500 lbs. (Approx.)

Dimensions: 78.6 ft. high, 8 ft. base diameter.

Program: Place satellite in near-polar orbit and recover capsule.

Program Results: Satellite placed in orbit. No separation and no recovery.

Perigee (Miles): 104 (Approx.)
Apogee (Miles): 550 (Approx.)

Inclination: 82° to Equator
Period: 95 minutes

Velocity:

Payload And Instrumentation

Dimensions: 19.2 ft. high, 5 ft. diameter
Recovery capsule 27 in. long, 33 in. diameter
Payload Configuration: Cylindrical

Payload Weights: 1700 total lbs. (Approx.) including second stage casing and 300 lb. data capsule.

Instrumentation: Includes data capsule to be ejected from satellite by timing devices; small retrorocket to aid re-entry. Various devices to aid in locating capsule.

Transmitters: Not Available

Power Supply: Not Available

Additional Data: * Failure of an inverter which provided power for the infra-red scanner and the separation sequencer prevented full stabilization in orbit and prevented separation of capsule.

Sources: DOD

Date: Prepared September, 1960

Prepared by Office of Public Information, U.S. National Aeronautics and Space Administration, Washington 25, D.C.

Project: Discoverer VIII (1959 Lambda)

Project Direction: USAF

Launched: November 20, 1959, 2:25 PM (EST)

From: Vandenberg AFB, Calif.

Lifetime: Carrier rocket down March 7, 1960

Major Objectives : Satellite system to gather data on propulsion, communications, stabilization and recovery techniques.

Major Results: Orbit achieved but not in planned path. Capsule ejected but could not be located. *

Flight Program

Launch Vehicle: Thor-Agena. Stages: (1) Modified Thor IRBM. (2) Agena.

Lift-Off Weight: 108,500 lbs. (Approx.)

Dimensions: 78 ft. high, 8 ft. base diameter

Program: Place satellite in near-polar orbit and recover capsule.

Program Results: Orbit achieved but path not as planned. No recovery made.

Perigee (Miles): 120
Apogee (Miles): 1,000

Inclination: 81° to Equator
Period: 103 minutes.

Velocity:

Payload And Instrumentation

Dimensions: 19.2 ft. high, 5 ft. diameter
Recovery capsule 27 in. long, 33 in. diameter

Payload Configuration: Cylindrical

Payload Weights: 1,700 total lbs., includes second stage casing and 300 lb. capsule.

Instrumentation: Includes advanced engineering test and recovery equipment. Data capsule to be ejected from satellite by timing devices; small retrorocket to aid recovery.

Transmitters: Not Available

Power Supply: Not Available

Additional Data: * Recovery of capsule attempted on 15th rather than the 17th pass, due to the longer orbital period achieved, on November 21, 1959. According to telemetry received, capsule separated from AGENA satellite approx. 4:20 PM (EST), Nov. 21, 1959. Both aerial and sea search failed to locate capsule.

Sources: USAF

Date: Prepared September, 1960

Prepared by Office of Public Information, U.S. National Aeronautics and Space Administration, Washington 25, D.C.

Project: Pioneer

Project Direction: NASA

Launched: November 26, 1959

From: Atlantic Missile Range

Lifetime: Not Applicable

Major Objectives : Place instrumented payload in vicinity of Moon or in a lunar orbit to obtain basic measurements of lunar environment and other data. *

Major Results: Plastic shroud protecting payload fell off shortly after launch. Payload and probably both upper stages were torn away from booster during launch.

Flight Program

Launch Vehicle: Atlas-Able Stages: (1) Modified U.S. Air Force Atlas ICBM. (2) Liquid propellant adapted from earlier Able vehicles. (3) Solid Propellant adapted from Able and Vanguard.

Lift-Off Weight: 255,000 lbs. (Approx.) **Dimensions:** 98 ft. high, 16 ft. base diameter.

Program: Place instrumented payload in vicinity of the Moon.

Program Results: Payload shroud fairing broke away about 45 seconds after launch.

Perigee (Miles): Not Applicable **Inclination:** Not Applicable
Apogee (Miles): Not Applicable **Period:** Not Applicable

Velocity: Not Applicable

Payload And Instrumentation

Dimensions: 39 in. diameter, 55 in. high with four 24x24-in. solar vanes.

Payload Weights: 372 lbs. total, including 194.8 lb. propulsion system.

Payload Configuration: "Paddlewheel" -- sphere with four vanes carrying solar cells. Payload contained a small engine for in-flight velocity corrections. Payload shell of aluminum covered by 50 temperature-controlling "butterfly" patches.

Instrumentation: Micrometeorite counter; high energy radiation counter; total radiation flux counter; low energy radiation counter, photo scanning device, magnetometers, aspect indicator, receiver for natural (background) radio waves.

Transmitters: Two ultra high frequency (UHF) 378 MC at 5 watts.

Power Supply: Nickel cadmium batteries charged by 8,800 solar cells.

Additional Data: *Flight was planned as first use of Atlas with upper stages; first flight test of payload propulsion unit for in-flight velocity corrections, particularly thrust reversal when payload entered vicinity of Moon's gravitational field.

Sources: NASA

Date: Prepared September, 1960

Prepared by Office of Public Information, U.S. National Aeronautics and Space Administration, Washington 25, D.C.

SPACE ACTIVITIES SUMMARY DISCOVERER XIV (1960 Kappa)

Project: Discoverer XIV (1960 Kappa)

Project Direction: U. S. Air Force

Launched: August 18, 1960, 3:57 pm EDT

From: Vandenberg AFB, California

Lifetime: Capsule ejected and recovered August 19, 1960, 7:14 pm EDT

Major Objectives Satellite system to gather data on propulsion, communications, orbital performance, recovery techniques and advanced engineering tests.

Major Results: Orbit achieved. Capsule successfully ejected and snatched 8,000 ft. in mid-air by a C-119 aircraft, 360 miles southwest of Honolulu, Hawaii.

N-83059 S-60-14

Flight Program

Launch Vehicle: Thor-Agena. Stages: (1) Modified Thor IRBM. (2) Agena

Lift-Off Weight: 108,500 lbs. (Approx.)

Dimensions: 78 ft. high; 8 ft. base diameter.

Program: Place satellite in near polar orbit and recover capsule.

Program Results: Orbit achieved and capsule recovered.

Perigee (Miles): 116
Apogee (Miles): 502

Inclination: 79.6° from Equator
Period: 94.5 minutes

Velocity: 17,658 mph

Payload And Instrumentation

Dimensions: 2nd stage & capsule: 19.2 ft. high, 5 ft. diameter. Capsule: 27 in. long, 33 in. diameter.

Payload Configuration: Cylindrical.

Payload Weights: 1700 lbs. including 2nd stage casing and 300 lb. re-entry capsule retrorocket, and recovery aids.

Instrumentation: Includes reentry capsule to be ejected from satellite by timing device; retrorocket and parachute to slow descent; radio beacon and aluminum radar chaff for recovery.*

Transmitters: Not available.

Power Supply: Not available.

DISCOVERER XIV (1960 Kappa)

Additional Data: *Discoverer XIV also carried a ten-lb. tracking experiment as part of development program for Navy's Transit satellite. Includes Doppler beacon and external lights for optical tracking.

Sources: U.S.A.F.

Date: Prepared August 26, 1960

Prepared by Office of Public Information, U.S. National Aeronautics and Space Administration, Washington 25, D.C.

SPACE ACTIVITIES SUMMARY COURIER I-A

Project: Courier I-A

Project Direction: Advanced Research Project Agency, U. S. Department of Defense.

Launched: 3:58 p.m. EDT, August 18, 1960

From: Atlantic Missile Range

Lifetime: Not applicable

Major Objectives: Test feasibility of global military communications network using "delayed repeater" satellites which receive and store information until commanded to transmit.

Major Results: Launching rocket exploded after 2½ minutes of flight when first stage prematurely shut down. Cause being studied.

N-83059

S-60-15

Flight Program

Launch Vehicle: Thor-Able-Star (1) Modified USAF Thor IRBM; (2) USAF Able-Star liquid engine with re-start capability.

Lift-Off Weight: Over 105,000 lbs.

Dimensions: 79.3 ft. high; 8 ft. base diameter.

Program: Place satellite in 600-mile high Earth orbit.

Program Results: Orbit not achieved.

Perigee (Miles): Not applicable
Apogee (Miles): Not applicable
Inclination: Not applicable
Period: Not applicable

Velocity: Not applicable

Payload And Instrumentation

Dimensions: 51 in. diameter

Payload Weights: 500 lbs. total. Includes 300 lbs. of electronic equipment.

Payload Configuration: Sphere ringed by solar cells.

Instrumentation: Includes 4 transmitters; 4 receivers; 5 tape recorders; 2 microwave antennas; transistorized telemetry generator; FM VHF telemetry transmitters; four whip antennas; VHF diplexer; command decoder. Also carries spare equipment to be switched into system by ground command.

Transmitters: Includes 4 microwave FM transmitters, each weighing 26 lbs. Also carries a 50 mw transistorized VHF beacon transmitter subsystem.

Power Supply: 19200 solar cells; nickel cadmium batteries for power storage.

COURIER I-A

Additional Data: Payload and experiments under technical direction of U. S. Army. Courier is successor to SCORE satellite program. Has capacity simultaneously to transmit, receive, and store approximately 68,000 coded words per minute. Operated by two monitoring stations using special 28-ft. dish antennas for tracking. Stations at Fort Monmouth, New Jersey, and Army Space Communication Center near Ponce, Puerto Rico.

Sources: U. S. Department of Defense

Date: August 26, 1960

Prepared by Office of Public Information, U.S. National Aeronautics and Space Administration, Washington 25, D.C.

Project: Spacecraft II (1960 Lambda)

Project Direction: USSR

Launched: August 19, 1960

From: Not disclosed.

Lifetime: Capsule and carrier recovered on 18th orbit, August 20, 1960

Major Objectives Test safety of capsule and recovery system for ultimate development of system for manned space flight.

Major Results: Orbit achieved and capsule recovered after travelling 437,500 miles.

N-83059

F-60-2

Flight Program

Launch Vehicle: Not disclosed.

Lift-Off Weight: Not disclosed. **Dimensions:** Not disclosed.

Program: Place space ship into Earth orbit and recover.

Program Results: Orbit achieved; capsule and carrier recovered.

Perigee (Miles): 190
Apogee (Miles): 211
Inclination: 64.57 to Equator
Period: 90.72 minutes

Velocity: 17,000 mph (Approx.)

Payload And Instrumentation

Dimensions: Not disclosed.

Payload Weights: Satellite without final stage of rocket - 10,120 lbs.

Payload Configuration: Two-part craft similar to one launched in May. Shape not disclosed.

Instrumentation: Includes television camera to relay pictures of animals in flight; radio transmitter relaying information on condition of animals and other experiments; "retro device" for recovery.
Transmitters: 19.995 MC

Power Supply: Not disclosed.

SPACECRAFT II (1960 Lambda)

Additional Data: Capsule reported to contain 2 dogs and a number of rats, mice, flies, plants, fungi, microscopic water plants and some seeds. Capsule reported to have separated from carrier and both objects landed less than 7 miles from predetermined point.

Sources: UNOFFICIAL from U.S. and Soviet press and radio.

Date: Prepared August 29, 1960

Prepared by Office of Public Information, U.S. National Aeronautics and Space Administration, Washington 25, D.C.

Project: Discoverer XV (1960 Mu)

Project Direction: U. S. Air Force

Launched: September 13, 1960, 6:13 pm, EDT
From: Vandenberg AFB, Calif.

Lifetime: Capsule ejected Sept. 15, 1960

Major Objectives Systems evaluation to include launching technique, propulsion, communications, orbital performance, advanced engineering tests and recovery techniques.

Major Results: Orbit achieved. Capsule ejected and landed in sea 1,000 miles south of Hawaii. Capsule sighted but recovery impossible due to rough seas.

N-83059 S-60-16

Flight Program

Launch Vehicle: Thor-Agena. Stages: (1) Modified Thor IRBM, (2) Agena

Lift-Off Weight: 108,500 lbs. (Approx.)

Dimensions: 78 feet high, 8 ft. base diameter

Program: Place satellite in near polar orbit and recover capsule.

Program Results: Orbit achieved but capsule not recovered.

Perigee (Miles): 130
Apogee (Miles): 472

Inclination: 80.93° to Equator
Period: 94.24 minutes

Velocity: 18,000 mph (Approx.)

Payload And Instrumentation

Dimensions: 2nd stage and capsule: 19.2 ft high, 5 ft. diameter
Capsule: 27 in. x 33 in.
Payload Configuration: Cylindrical

Payload Weights: 1,700 lbs. including 2nd stage casing and 300 lb. reentry capsule, retrorocket, and recovery aids.

Instrumentation: Includes reentry capsule to be ejected from satellite by timing device; retrorocket and parachute to slow descent; radio beacon and aluminum radar chaff for recovery.
Transmitters: Not Available

Power Supply: Not Available

Additional Data:

Sources: U.S.A.F.

Date: Prepared September 30, 1960

DISCOVERER XV (1960 Mu)

Prepared by Office of Public Information, U.S. National Aeronautics and Space Administration, Washington 25, D.C.

Project: Pioneer

Project Direction: NASA

Launched: Sept. 25, 1960, 11:13 AM EDT

From: Atlantic Missile Range

Lifetime: Not Applicable

Major Objectives Investigate environment between Earth and Moon and develop technology for controlling and maneuvering spacecraft from Earth.

Major Results: **Abnormal burning in second stage failed to provide necessary velocity. Vehicle either burned up on reentry or disintegrated on impact.**

Flight Program

Launch Vehicle: Atlas-Able. Stages: (1) Modified AF Atlas "D" ICBM (2) Liquid propellant adapted from earlier Able vehicles (3) Solid propellant adapted from earlier Able and Vanguard configurations.

Lift-Off Weight: Over 260,000 lbs. **Dimensions:** 98 ft. high (Approx.)

Program: Place instrumented space probe into lunar orbit.

Program Results: Orbit not achieved.

Perigee (Miles): Not Applicable
Apogee (Miles): Not Applicable
Inclination: Not Applicable
Period: Not Applicable

Velocity: Not Applicable

Payload And Instrumentation

Dimensions: 39 in. diameter sphere with four 24x24 in. "paddlewheels" **Payload Weights:** 387 lbs.

Payload Configuration: Sphere plus four "paddlewheels," each with 2,200 silicon cells which convert heat energy into electric power.

Instrumentation: Includes: Micrometeorite impact counter; high energy radiation counter; instruments to measure total radiation flux and low-energy range of radiation spectrum; two magnetometers, sun scanner; scintillation spectrometer; plasma probe experiment.

Transmitters: Two 1.5 watt UHF operating at 378 MC

Power Supply: Nickel cadmium batteries charged by solar cells.

Additional Data: Spacecraft powered by hydrazine engine with thrust nozzles at each "pole" of sphere for in-flight velocity corrections.

Sources: NASA

Date: Prepared September 30, 1960

Prepared by Office of Public Information, U.S. National Aeronautics and Space Administration, Washington 25, D.C.

Project: Courier I-B (1960 Nu)

Project Direction: U. S. Army

Launched: October 4, 1960; 1:50 p.m. EDT

From: Atlantic Missile Range

Lifetime: Estimated several years. Operating lifetime estimated at one year.

Major Objectives Test feasibility of global military communications network using "delayed repeater" satellites which receive and store information until commanded to transmit.

Major Results: Satellite placed in Earth orbit. Several messages successfully received and transmitted.

N-8305g S-60-17

Flight Program

Launch Vehicle: Thor-Able-Star (1) Modified USAF Thor IRBM; (2) USAF Able-Star liquid engine with re-start capability.

Lift-Off Weight: Over 105,000 lbs.

Dimensions: 79.3 ft. high; 8 ft. base diameter.

Program: Place satellite in high-altitude Earth orbit.

Program Results: Orbit achieved.

Perigee (Miles): 501
Apogee (Miles): 658

Inclination: 28.3° to Equator
Period: 107 minutes

Velocity: At perigee: 16,611 mph
At Apogee: 16,079 mph

Payload And Instrumentation

Dimensions: 51 in. diameter

Payload Weights: 500 lbs. total. Includes 300 lbs. of electronic equipment.

Payload Configuration: Sphere ringed by solar cells.

Instrumentation: Includes 4 transmitters; 4 receivers; 5 tape recorders; 2 microwave antennas; transistorized telemetry generator; FM VHF telemetry transmitters; four whip antennas; VHF diplexer; command decoder. Also carries spare equipment to be switched into system by ground command.

Transmitters: Includes 4 microwave FM transmitters, each weighing 26 lbs. Also carries a 50 mw transistorized VHF beacon transmitter subsystem.

Power Supply: 19,200 solar cells; nickel cadmium batteries for power storage.

COURIER I-B (1960 Nu)

Additional Data: ARPA transferred responsibility for Courier project to Army in September 1960. Courier is successor to SCORE satellite program. Has capacity simultaneously to transmit, receive, and store approximately 68,000 coded words per minute. Operated by two monitoring stations using special 28-ft. dish antennas for tracking. Stations at Fort Monmouth, New Jersey, and Army Space Communication Center near Ponce, Puerto Rico.

Sources: Department of Defense

Date: Prepared October 6, 1960

Prepared by Office of Public Information, U.S. National Aeronautics and Space Administration, Washington 25, D.C.

Project: Samos I *

Project Direction: U. S. Air Force

Launched: October 11, 1960, 4:34 PM(EDT)

From: Point Arguello, Calif.
Pacific Missile Range

Lifetime: Not Applicable

Major Objectives Determine engineering feasibility of obtaining ground observation capability from an orbiting satellite.

Major Results: Orbit not achieved. Possible cause being studied.

Flight Program

Launch Vehicle: Atlas-Agena. Stages: (1) Modified Atlas ICBM (2) Agena "A"

Lift-Off Weight: 273,000 lbs. (Approx.)

Dimensions: 99 ft. high; 10 ft. base diam.

Program: Place satellite in near-polar Earth orbit.

Program Results: Orbit not achieved.

Perigee (Miles): Not Applicable
Apogee (Miles): Not Applicable

Inclination: Not Applicable
Period: Not Applicable

Velocity: Not Applicable

Payload And Instrumentation

Dimensions: 2nd stage: 22 ft. high; 5 ft. diameter.

Payload Weights: Not Available. Total weight in orbit: 4,100 lbs. including entire second-stage casing.

Payload Configuration: Cylindrical

Instrumentation: Photographic and related test equipment. Also included telemetry, radiation, tracking and command equipment.

Transmitters: Not Available

Power Supply: Not Available

Additional Data: * Samos combines the initials of Satellite and Missile Observation System. In planned polar orbit, would have capability of scanning entire Earth surface.

Sources: Department of Defense

Date: Prepared October 19, 1960

Prepared by Office of Public Information, U.S. National Aeronautics and Space Administration, Washington 25, D.C.