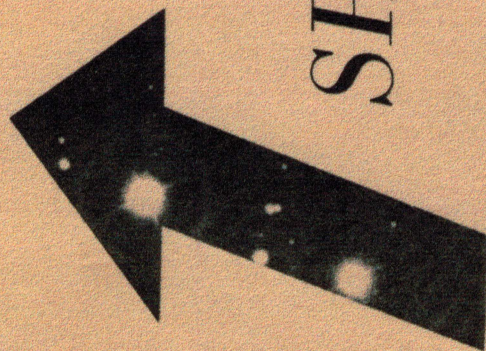


SPACE LOG

S P A C E T E C H N O L O G Y L A B O R A T O R I E S , I N C .

STL SPACE LOG

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Editor
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and
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EARTH SATELLITES

1957 Alpha I*	Sputnik I Case	1959 Gamma	Discoverer II
1957 Alpha II	Sputnik I Payload	1959 Delta I	Explorer VI Payload
1957 Alpha III	Sputnik I Nose Cone	1959 Delta II	Explorer VI Case
1957 Beta	Sputnik II	1959 Epsilon	Discoverer V
1958 Alpha	Explorer I Payload	1959 Zeta	Discoverer VI
1958 Beta I	Vanguard I Case	1959 Eta	Vanguard III
1958 Beta II	Vanguard I 6-in. Payload	1959 Theta	Lunik III
1958 Gamma	Explorer III Payload	1959 Iota I	Explorer VII Payload
1958 Delta I	Sputnik III Case	1959 Iota II	Explorer VII Case
1958 Delta II	Sputnik III Payload	1959 Kappa	Discoverer VII
1958 Delta III	Sputnik III Nose-Cone Piece	1959 Lambda	Discoverer VIII
1958 Delta IV	Sputnik III Nose-Cone Piece	1960 Alpha	Pioneer V
1958 Delta V	Sputnik III Protective Device	1960 Beta I	Tiros I Case
1958 Epsilon	Explorer IV Payload	1960 Beta II	Tiros I Payload
1958 Zeta	Atlas — Score	1960 Gamma	Transit IB
1959 Alpha I	Vanguard II Payload	1960 Delta	Discoverer XI
1959 Alpha II	Vanguard II Case		
1959 Beta	Discoverer I		

* International designation for earth satellites put into orbit

CONDENSED LOG OF SPACE PROGRAMS, 1958

Name	Designation	Launch Date and Status	Payload			Type	Perigee (miles)	Apogee (miles)	Period (minutes)
			Dimensions	General Shape	Weight (pounds)				
Sputnik I Case	1957 Alpha I	Oct 4, 1957 - Dec 1, 1957 (57 days)	22.8 in. in diameter	Sphere	184	Earth satellite	142	588	96.17*
Payload	1957 Alpha II	Jan 4, 1958 (92 days)							
Nose cone	1957 Alpha III	Status unknown							
Sputnik II	1957 Beta	Nov 3, 1957 - April 14, 1958 (162 days)	Not disclosed	Tandem assembly of 2 spheres and 1 cylinder	1,120	Earth biomedical satellite	140	1,038	103.7*
Vanguard (Test Vehicle 3 backup)	None	Dec 6, 1957 - ** ₀	6 in. in diameter	Sphere	3.25	Earth satellite	0	0	0
Explorer I	1958 Alpha	Jan 31, 1958 (3 to 5 years)	80 in. long; 6 in. in diameter	Cylinder	30.8	Earth satellite (inert)	215	1,225	108.4 ^σ
Vanguard (Test Vehicle 3 backup)	None	Feb 5, 1958 - ** ₀	6 in. in diameter	Sphere	3.25	Earth satellite	0	0	0
Explorer II	None	Mar 5, 1958 - ** ₀	80 in. long; 6 in. in diameter	Cylinder	31.5	Earth satellite	0	0	0
Vanguard I Case	1958 Beta I	Mar 17, 1958 (est. 200 to 1,000 years)	4 ft long; 20 in. in diameter	Cylinder	50.0	Earth satellite (active)	402	2,682	138.2 ^σ
Payload	1958 Beta II		6.4 in. in diameter	Sphere	3.25		401	2,445	133.8

* All Russian numbers are unofficial and based on press reports

** Failed to achieve a successful orbit

^σ As of 12 April 1960

CONDENSED LOG, 1958

Name	Designation	Launch Date and Status	Payload			Type	Perigee Apogee		Period
			Dimensions	General Shape	Weight (pounds)		(miles)	(miles)	
Explorer III	1958 Gamma	Mar 26, 1958 - Jun 28, 1958 (93 days)	80 in. long; 6 in. in diameter	Cylinder	31.0	Earth satellite	121	1,746	115.87 ^{σσ}
Vanguard (Test Vehicle 5)	None	Apr 28, 1958- ^{**} 0	20 in. in diameter	Sphere	21.5	Earth satellite	0	0	0
Sputnik III Case	1958 Delta I	May 15, 1958 - Dec 3, 1958 (202 days)		Cylinder					
Payload	1958 Delta II	Down Apr 6, 1960 (692 days)	11 ft 9 in long; 5 ft 8 in. wide at base	Cone	2,925	Earth satellite	105	238	89.7 [*]
Nose-cone piece	1958 Delta III	Status unknown							
Nose-cone piece	1958 Delta IV	Status unknown							
Protective device	1958 Delta V	Status unknown							
Vanguard (SLV I)	None	May 27, 1958- ^{**} 0	20 in. in diameter	Sphere	21.5	Earth satellite	0	0	0
Vanguard (SLV II)	None	Jun 26, 1958- ^{**} 0	20 in. in diameter	Sphere	21.5	Earth satellite	0	0	0
Explorer IV	1958 Epsilon	Jul 26, 1958 - Oct (18-24), 1959 ^{σ*} (85-91 days)	80.4 in. long; 6.25 in. in diameter	Cylinder	38.4	Earth satellite	163	1,380	110.27 ^{σσ}
Thor-Able I (no name)	None	Aug 17, 1958- ^{**} 0	30 in. high; 29 in. in diameter	Toroid	83.8	Lunar Probe	(Altitude: 40,000 to 70,000 feet)		

* All Russian numbers are unofficial and based on press reports

** Failed to achieve a successful orbit

σ* Exact entry date not observed

σ⁰ Satellite Launching Vehicle
σσ Initial orbits

CONDENSED LOG, 1958

Name	Designation	Launch Date and Status	Payload				Type	Perigee Apogee (miles)		Period (minutes)
			Dimensions	General Shape	Weight (pounds)					
Explorer V	None	Aug 24, 1958- ** 0	80 in. long; 6 in. in diameter	Cylinder	38.4		Earth satellite	0	0	0
Vanguard (SLV III)	None	Sep 26, 1958- ** 0	20 in. in diameter	Sphere	21.5		Earth satellite	0	0	0
Pioneer I		Oct 11, 1958- Oct 12, (43 hours and 17-1/2 ** minutes)	30 in. high; 29 in. in diameter	Toroid	84.4 (including 4th stage)		Lunar probe	(Altitude: 70,700 miles)		
Beacon	None	Oct 23, 1958- ** 0	12 ft in diameter (inflated)	Sphere (after inflation)	31.5		Earth satellite	0	0	0
Pioneer II		Nov 8, 1958- ** 0	30 in. high; 29 in. in diameter	Toroid	86.4 (including 4th stage)		Lunar probe	(Altitude: 963 miles)		
Pioneer III		Dec 6, 1958- Dec 7, 1958 (38 hours and 6 minutes)**	23 in. high; 10 in. in diameter	Cone	12.95		Space probe	(Altitude: 63,580 miles)		
Project Score (Atlas 10B)	1958 Zeta	Dec 18, 1958- Jan 21, 1959 (34 days)	85 ft long; 10 ft in diameter	Cylinder	8,750.0 (includes communications payload, 150.0 lb)		Earth satellite	110	920	101.46 ^{σσ}

** Failed to achieve a successful orbit

o Satellite Launching Vehicle

^{σσ} Initial orbits

CONDENSED LOG OF SPACE PROGRAMS, 1959

Payload									
Name	Designation	Launch Date and Status	Dimensions	General Shape	Weight (pounds)	Type	Perigee (miles)	Apogee (miles)	Period (minutes)
Lunik I (Mechta)	Artificial Planet I	Jan 2, 1959 (est. millions of years)	Not disclosed	Sphere	3, 245	Space probe	In orbit around sun on 15-month period*		
Vanguard II Payload Case	1959 Alpha I 1959 Alpha II	Feb 17, 1959 (est. 100 years or more)	20 in. in diameter	Sphere	20. 7	Earth satellite (inert)	347	2, 049	125. 4 ^σ
Discoverer I	1959 Beta	Feb 28, 1959-Mar 5, 1959** (5 days)	19. 2 ft long; 5 ft in diameter	Cylinder (one end pointed)	1300. 0	Earth satellite	347	2, 279	129. 6 ^σ
Pioneer IV Payload Case	Artificial Planet 2 Fourth stage	Mar 3, 1959 (est. millions of years)	20 in. high; 9 in. wide at base 68 in. long; 6 in. in diameter	Cone Cylinder	13. 4 12 approx	Space probe (inert)	In orbit around sun on 406. 95-day period In orbit near payload		95. 9 ^{σσ}
Discoverer II	1959 Gamma	Apr 13, 1959-Apr 26, 1959 (13 days)	19. 2 ft long; 5 ft in diameter	Cylinder (one end pointed)	1610. 0 (includes 245 lb of communication, telemetry, etc., and a 195 lb re-entry vehicle)	Earth satellite	142	220	90. 5 ^{σσ}
SLV V ⁰	None	Apr 13, 1959-0**	30 in. sphere (inflatable); 13 in. ball with 17-1/2 by 2-1/2 in. cylinder extending from it	Sphere	23. 32	Earth satellite	0	0	0

^σ As of 12 April 1960

^{σσ} Initial orbits

^{σ*} Radio signals stopped; presumed to have entered on this date

⁰ Satellite Launching Vehicle

^{**} Failed to achieve a successful orbit

* All Russian numbers are unofficial and based on press reports

Payload

Name	Designation	Launch Date and Status	Dimensions	General Shape	Weight (pounds)	Type	Perigee (miles)	Apogee (miles)	Period (minutes)
Discoverer III	None	Aug 3, 1959 - 0**	19.2 ft long; 5 ft in diameter	Cylinder (one end pointed)	1600.0 (includes 245 lb of communication, telemetry, etc., and a 195 lb re-entry vehicle)	Earth satellite	0	0	0
SLV VI ^o	None	Jun 22, 1959 - 0**	20 in. in diameter	Sphere	21.5	Earth satellite	0	0	0
Discoverer IV	None	Jun 25, 1959 - 0**	19.2 ft long; 5 ft in diameter	Cylinder (one end pointed)	1600.0 (includes 245 lb of communication, telemetry, etc., and a 195 lb re-entry vehicle)	Earth satellite	0	0	0
Explorer VI Payload	1959 Delta I	Aug 7, 1959 (est. more than 1 year)	29 in. high (including interstage attachment); 86 in. in envelope diameter (paddles extended) 18 in. in diameter, 56 in. long	Unsymmetrical spheriod	142.0	Earth satellite (inert)	115	24,618	753.6 ^{σ*}
Case	1959 Delta II	Status unknown		Cylinder					
Discoverer V Payload	1959 Epsilon I	Aug 13, 1959 - Sep 28, 1959 (47 days)	19.2 ft long; 5 ft in diameter	Cylinder (one end pointed)	1700.0	Earth satellite	136	450	94 ^{σ*}
Capsule	1959 Epsilon II	In orbit			More than 300	Earth satellite (inert)	120	1,003	103.2 ^σ

** Failed to achieve a successful orbit

^o Satellite Launching Vehicle^{σ*} As of 12 April 1960^{σ*} Initial orbits^σ As of 12 April 1960

Name	Designation	Launch Date and Status	Payload				Type	Perigee Apogee (miles)		Period (minutes)
			Dimensions	General Shape	Weight (pounds)			(miles)	(miles)	
Beacon II	None	Aug 14, 1959-0440	12 ft in diameter (inflated)	Sphere (after inflation)	25.5 (including sphere of 10.0)		Earth satellite	0	0	0
Discoverer VI	1959 Zeta	Aug 19, 1959-Oct 20, 1959 (63 days)	19.2 ft long; 5 ft in diameter	Cylinder (one end pointed)	1700.0		Earth satellite	138	537	95.28 $\sigma\sigma$
Lunik II	Lunar probe	Sep 12, 1959; impacted on moon on Sep 13 at 5:02: 24 p. m. EDT	Undisclosed	Sphere	858.4		Lunar probe	Traveled * 236.875 mi		Total flight time approx 35 hours
Transit IA	None	Sep 17, 1959-0440	36 in. in diameter	Sphere	265.0		Earth satellite	0	0	0
Vanguard III	1959 Eta	Sep 18, 1959 (est. 30 to 40 years)	20 in. in diameter	Sphere with extended 26 in. tapered tube	100		Earth satellite (inert)	315	2,322	130.0 σ
Lunik III	1959 Theta	Oct 4, 1959; In orbit	Undisclosed	Undisclosed	634*		Earth satellite (active)	Not known		
Explorer VII Payload	1959 Iota I	Oct 13, 1959 (est. 20 to 30 years)	30 in. high; 30 in. in diameter	Toroid	91.5		Earth satellite	342	670	101.1 σ
Case	1959 Iota II	In orbit	68 in. long; 6 in. in diameter	Cylinder	12 approx			342	670	101.1
Discoverer VII	1959 Kappa	Nov 7, 1959-Nov 26, 1959 (19 days)	19.2 ft long; 5 ft in diameter	Cylinder (one end pointed)	1700.0		Earth satellite	104	550	95 $\sigma\sigma$

* All Russian numbers are unofficial and based on press reports
 $\sigma\sigma$ As of 12 April 1960

** Failed to achieve a successful orbit
 $\sigma\sigma$ Initial orbits

CONDENSED LOG, 1959

Name	Designation	Launch Date and Status	Payload				Perigee (miles)	Apogee (miles)	Period (minutes)
			Dimensions	General Shape	Weight (pounds)	Type			
Discoverer VIII	1959 Lambda	Nov 20, 1959 - Mar 8, 1960 (110 days)	19.2 ft long; 5 ft in diameter	Cylinder (one end pointed)	1700.0	Earth satellite	120	1,056	103.7 ⁰⁰
Atlas-Able IV	None	Nov 26, 1959 - 0 ^{**}	108 in. in diameter (paddles extended); 55 in. high (nozzle-to-nozzle)	Sphere (includes 16.6 lb of experiments, 104.6 lb of telemetry and power, 194.8 lb of propulsion, and 55.6 lb of structure and shell)	372	Lunar probe	0	0	0

** Failed to achieve a successful orbit

σσ Initial orbit

CONDENSED LOG OF SPACE PROGRAMS, 1960

Name	Designation	Launch Date and Status	Payload			Type	Perigee (miles)	Apogee (miles)	Period (minutes)
			Dimensions	General Shape	Weight (pounds)				
Discoverer IX	None	Feb 4, 1960-0**	19.2 ft long; 5 ft in diameter	Cylinder (one end pointed)	1700.0	Earth satellite	0	0	0
Discoverer X	None	Feb 19, 1960-0**	19.2 ft long; 5 ft in diameter	Cylinder (one end pointed)	1700.0	Earth satellite	0	0	0
Midas I	None	Feb 26, 1960-0**	22 ft long; 5 ft in diameter	Cylinder (one end pointed)	Not announced	Earth satellite	0	0	0
Pioneer V Payload	1960 Alpha	Mar 11, 1960 (est. millions of years)	26 in. in diameter; 96 in. in envelope diameter (paddles extended)	Sphere	95	Space probe (active)	In orbit around sun on 311.64-day period; aphelion 0.9931 AU and perihelion 0.8061 AU**		
Case	Third stage	In solar orbit	6 in. in diameter; 68 in. long	Cylinder	12 approx		In orbit near payload		
Explorer VIII	None	Mar 23, 1960-0**	Casing: 7 in. in diameter; 21 in. long; solar cell panels: 9 in. long 12 in. wide	Cylindrical casing with four solar cell panels, arranged as a box, mounted along upper end	35	Earth satellite	0	0	0
Tiros I Case Payload	1960 Beta I 1960 Beta II	Apr 1, 1960	42 in. in diameter; 19 in. high	Short cylinder	275	Earth satellite (active)	435 435	460 460	92.2 ^σ 99.2

** Failed to achieve a successful orbit
σ As of 12 April 1960

σ* Astronomical units, as of 12 April 1960

CONDENSED LOG, 1960

Name	Designation	Launch Date and Status	Payload				Type	Perigee (miles)	Apogee (miles)	Period (minutes)
			Dimensions	General Shape	Weight (pounds)					
Transit 1B Case	1960 Gamma I	Apr 13, 1960						175. 4	408. 6	95. 25 $\sigma\sigma$
Payload	1960 Gamma II		36 in. in diameter	Sphere	265		Earth satellite	175. 4	408. 6	95. 25
Discoverer XI	1960 Delta	Apr 15, 1960	19. 2 ft long; 5 ft in diameter	Cylinder (one end pointed)	1700. 0		Earth satellite	109	380	92. 35 $\sigma\sigma$

$\sigma\sigma$ Initial orbits

SPACECRAFT DETAILS

Name	Launching Vehicle	Payload Instrumentation	Test Results
Sputnik I *	Not disclosed	Experiments: internal temperatures, pressures, and "other data." Shell Composition: aluminum alloys. Antennas: four spring-loaded whip antennas, 4 ft, 10.5 in. to 9 ft 6 in. Transmitters: a) 20,005 mc; b) 40,002 mc. Power Supply: chemical batteries. Transmitter Lifetime: a) and b) stopped Oct 27, 1957	Successfully launched. Speed (perigee): 18,000 mph; speed (apogee): 16,200 mph. Inclination to equator: 65 deg. For detailed explanation, see Aviation Week, 5-26-58, pp. 50-59
Sputnik II *	Not disclosed	Experiments: Cosmic rays; solar ultraviolet and X-radiation; test animal "Laika" (dog); temperatures; pressures. Shell Composition: aluminum alloys. Antennas: (not disclosed). Transmitters: a) 20,005 mc; b) 40,002 mc. Power Supply: chemical batteries. Transmitter Lifetime: a) and b) stopped Nov 10, 1957	Successfully launched. The available acceleration of this satellite led to the discovery of significant solar influence on upper atmosphere densities. Speed (perigee): 18,000 mph; speed (apogee): 15,000 mph. Inclination to equator: 65 deg. Details not announced
Vanguard (Test Vehicle 3 Backup)	Three stages. First: liquid; second: liquid; third: solid. Gross takeoff weight: 22,600 lb. Height: 72 ft. Diameter (base): 45 in.	Experiments: Micrometeor impact and geodetic measurements. Shell Composition: magnesium-aluminum-silicon monoxide. Antennas: one turnstile antenna; one dipole antenna with total of six 12-in. rod elements. Transmitters: a) 108 mc at 10 mw; b) 108.03 mc at 5 mw. Power Supply: a) mercury batteries; b) six groups of solar converters	Vehicle lost thrust after 2 sec and was consumed in flames. Cause: malfunction in first stage
Explorer I	U. S. Army Jupiter C. Four stages. First: elongated Redstone (liquid); second: scaled-down Sergeant rockets (solid). Height: 68.6 ft.	Weight of payload instrumentation: 18.13 lb. Experiments: cosmic rays; micrometeorites: a) microphone; b) gauges; temperatures: internal, rear skin, front skin, and nose cone. Shell Composition: steel with eight aluminum oxide strips. Antennas: one turnstile antenna with four whip elements, each 22.5 in. long; one dipole antenna using skin of satellite itself. Transmitters: a) 108 mc at 10 mw and b) 108.03 mc at 60 mw. Power Supply: mercury batteries. Transmitter Lifetime: a) stopped May 23, 1958; b) stopped Feb 11, 1958; began again Feb 24; stopped finally Feb 28, 1958	Successfully launched. Explorer I is credited with what is probably the most important discovery of the International Geophysical Year, i. e., a radiation belt around the earth identified by Dr. James A. Van Allen, head of the University of Iowa Physics Department. Inclination to equator: 33.34 deg
Vanguard (Test Vehicle 3 backup)	Same as Vanguard Test Vehicle 3	Same as Vanguard Test Vehicle 3	After a successful liftoff and 57 sec of flight, a connection between units of first-stage control system failed to function. At an altitude of 20,000 ft, the rocket veered off course with such force that it snapped apart and fell
Explorer II	U. S. Army Jupiter C (same as Explorer I)	Weight of payload instrumentation: 18.83 lb. Experiments: cosmic ray count; micrometeor impact count; cosmic ray measurement. Shell Composition: No. 410 stainless steel. Antennas: two dipole antennas using skin of satellite itself. Transmitters: a) 108.03 mc at 60 mw; b) 108.00 mc at 10 mw. Power Supply: mercury batteries	Last stage failed to ignite. Vehicle did not achieve orbit. Flight time: 823 sec

* All Russian numbers are unofficial and based on press reports

Note: All distances are given in statute miles above the surface of the earth.

SPACECRAFT DETAILS (Continued)

Name	Launching Vehicle	Payload Instrumentation	Test Results
Vanguard I	Same as Test Vehicle 3	Weight of payload instrumentation: 3.25 lb. Experiments: Geodetic and temperature measurements. The crystal of one radio was placed in thermal contact with the internal structure, and the other crystal was placed in thermal contact with the outer shell. The absolute temperatures of the two structures could be determined from the change in signal frequency of each radio while transmitting. Shell Composition: the satellite aluminum shell is coated with a thin film of silicon monoxide to control the internal temperature; the film radiates infrared as a function of its thickness. Antennas: one turnstile antenna and one dipole antenna with a total of six 12-in. rod elements. Transmitters: a) 108 mc at 10 mw; b) 108.03 mc at 5 mw. Power Supply: transmitter a) used mercury batteries, and b) is still powered by six groups of solar converters. Transmitter Lifetime: a) transmitter ceased operating April 5, 1958; b) is expected to transmit for the lifetime of the satellite	Successfully launched. The solar-powered radio should transmit indefinitely. The Army Map Service has been making electronic observations of the satellite from Pacific islands to pinpoint their location more exactly. The satellite is also being used for more exact determination of the earth's shape
Explorer III	U.S. Army Jupiter C (same as Explorers I and II)	The scientific instrumentation payload constituted only a little over half (18.56 lb) of the total payload weight (31.0 lb) injected into orbit. The integral last-stage solid-propellant rocket motor case made up the other large portion of the total weight. Experiments: an omnidirectional cosmic-ray counter recorded its findings on a miniature tape recorder while the satellite was beyond range of U.S. ground stations. This device had a recording capability of 100 min and could be read out in six sec as it passed over a receiving station. Micro-meteor impacts were detected by two systems: a diaphragm/microphone assembly and several wire-covered gauges. Skin and internal temperature measurements were taken. Shell Composition: steel with eight aluminum oxide strips for balancing internal and absorbed heat with that radiated into space. Antennas: two dipole antennas using skin of satellite itself. Transmitters: a) 108 mc at 10 mw, b) 108.03 mc at 60 mw. Power Supply: mercury batteries. Transmitter Lifetime: a) telemetering and beacon signal stopped May 10, 1958; beacon transmitted again May 15 - June 16; b) first stopped May 14; responded erratically May 22 - June 5, 1958	Successfully launched. Yielded valuable data on the radiation belt discovered by Explorer I as well as data on micrometeor impacts (density of cosmic dust) and internal and external temperature of the satellite
Vanguard (Test Vehicle 5)	Same as Test Vehicle 3	Experiments: measurement of X-radiation from the sun and environmental measurements. Shell Composition: highly polished silicon-monoxide-coated magnesium. Antennas: four metal rods. Transmitters: 108 mc at 80 mw, tracking and telemetry. Power Supply: mercury batteries	Two minor components (electric relays) malfunctioned and failed to signal the third stage to fire. Second and third stages impacted 1500 mi from launch site

SPACECRAFT DETAILS (Continued)

Name	Launching Vehicle	Payload Instrumentation	Test Results
Sputnik III [*]	Not disclosed	Experiments: atmospheric pressure and composition; concentration of positive ions; satellite's electrical charge and tension of earth's electrostatic field; tension of earth's magnetic field; intensity of sun's corpuscular radiation; composition and variations of primary cosmic radiation; distribution of photons and heavy nuclei in cosmic rays; micrometeors; temperature measurements. Shell Composition: aluminum alloys. Antennas: folded dipole antennas and trailing rod antennas. Transmitters: a) 20.005 mc (transmission at 40.01 mc is harmonic of 1st). Power Supply: a) chemical batteries; b) solar batteries	Successfully launched. Speed (perigee): 18,837 mph; Speed (apogee): 14,637 mph. Inclination to equator: 65.3 deg. Details not announced
Vanguard (SLV I) ^o	Same as Test Vehicle 3	Experiments: Solar Lyman-Alpha radiation and space environment. Shell Composition: highly polished silicon-monoxide-coated magnesium sphere. Antennas: four metal rods. Transmitter: 108 mc at 80 mw. Power Supply: mercury batteries. Transmitter Lifetime: same as flight time, i.e., 20 min	Second stage did not cut off properly, causing vehicle to fly with nose upward rather than parallel to earth. Caused third stage to fly in high arc-like trajectory. Third stage of vehicle reached peak altitude of 2,200 mi and traveled 7,500 mi from Cape Canaveral, landing near east coast of Union of South Africa. Flight time: 20 min
Vanguard (SLV II) ^o	Same as Test Vehicle 3	Experiments: measurements of X-radiation from the sun and environmental measurements. Shell Composition: highly polished silicon-monoxide-magnesium sphere. Antennas: four metal rods. Transmitters: 108 mc at 80 mw, tracking and telemetry. Power Supply: mercury batteries	Second stage motor cut off prematurely due to low chamber pressure and terminated the flight
Explorer IV	Same as Explorer I	Weight of payload instrumentation: 25.8 lb. Experiments: two Geiger-Mueller counters and two scintillation counters to measure corpuscular radiation at several intensity levels. The subcarrier oscillator was calibrated to give internal temperature measurements. Shell Composition: stainless steel. Antennas: two dipole antennas using the skin of the satellite itself. Transmitters: a) 108 mc at 10 mw; b) 108.03 mc at 24 mw (each transmitter broadcasts all channels of information simultaneously and continuously. The first transmitter is primarily for tracking). Power Supply: mercury batteries. Transmitter Lifetime: Sep 3, 1958: telemetry on channels 2 and 5 ceased; Sep 9, 1958: 108.00 mc transmitter ceased operation; Sep 19, 1958: last intelligible telemetry on 108.03 mc transmitters; Oct 6, 1958: 108.03 mc transmitter ceased	Successfully launched. Same as Explorer I and III, i.e., valuable data on radiation belts, etc. Inclination to equator: 50.29 deg

* All Russian numbers are unofficial and based on press reports

^o Satellite Launching Vehicle

Name	Launching Vehicle	Payload Instrumentation	Test Results
Thor-Able I (no name)	Thor-Able I stages: four. First: Thor (liquid); second: modified Vanguard second stage (liquid); third: X2 Allegany Bal- listic Laboratory (solid); fourth: Thiokol (solid). Gross takeoff weight: 112,000 lb. Height: 88.1 ft.	Weight of payload instrumentation: 25 lb. Experiments: measurements of radiation in space; magnetic fields of earth and moon; density of micrometeoritic matter; internal temper- atures; electronic scanner. Shell Composition: fiberglass. Antennas: two 12-in. whips. Transmitters: a) 108.6 mc at 300 mw (telemetry and doppler command); b) 108.09 mc at 1 w. Power Supply: mercury batteries. Transmitter Life- time: 10 days	Engine failure in first stage caused vehicle blowup 77 sec after launch
Explorer V	Jupiter C	Weight of payload instrumentation: 25.8 lb. Experiments: measurement of corpuscular radiation at several intensity levels. Shell Composition: No. 410 stainless steel. Antennas: two dipole antennas using skin of satellite itself. Transmitters: a) 108.03 mc at 10 mw; Power Supply: mercury batteries	All stages fired. Orbit was not achieved because of a collision between parts of the booster and the instrument compartment which carried the three high- speed stages. The high-speed stages fired in wrong direction. Flight time: 659 sec
Vanguard (SLV III) ^o	Same as Test Vehicle 3	Experiments: two infrared photocells to scan earth's cloud cover. Shell Composition: magnesium. Antennas: one turn- stile antenna with four 30-in. spring-loaded rod elements. Transmitters: 108.00 mc at 10 mw and 108.03 mc at 1 w. Power Supply: mercury batteries	Second stage failed to give minimal performance which caused vehicle to fall back into atmosphere and burn up. It is believed to have made one com- plete orbit of earth before falling back and burning up over Central Africa
Pioneer I	Thor-Able I	Weight of payload instrumentation: 39 lb. Experiments: measurements of radiation in space; magnetic fields of earth and moon; density of micrometeoritic matter; internal temper- atures; electronic scanner. Shell Composition: fiberglass. Antennas: two 12-in. whips. Transmitters: a) 108.06 mc at 300 mw (telemetry and doppler command); b) 108.06 mc at 1 w (controls). Power Supply: mercury batteries. Transmit- ter Lifetime: 10 days	Successfully launched. Re-entered atmosphere over South Pacific Oct 12, 1958. a) Determination of radial extent of radiation band. First obser- vation that radiation is a band. b) Mapped total ionizing flux. c) First observation of hydromag- netic oscillations of magnetic field of earth. d) Discovered departure of magnetic field from theoretical prediction. e) First determination of the density of micrometeors in interplanetary space. f) First measurements of the interplanetary magnetic field
Beacon	Jupiter C	Weight of payload case: 18.3 lb; rocket case; 11.27 lb. Weight of inflatable satellite when free of payload case: 9.26 lb. Experiments: Ejection of sphere from payload pack- age; sphere itself would be used to study atmospheric density at various levels during lifetime of about 2 weeks. Shell Corn- position: Mylar polyester film and micro-thin aluminum foil. Transmitters: none	Part of the cluster including payload, separated from the booster prior to booster burnout. Flight time of payload: 424 sec. Flight time of booster: 526 sec

^oSatellite Launching Vehicle

SPACECRAFT DETAILS (Continued)

Name	Launching Vehicle	Payload Instrumentation	Test Results
Pioneer II	Thor-Able I	Weight of payload instrumentation: 34.3 lb. Experiments: total ionizing radiation; cosmic ray flux; magnetic fields of earth and moon; density of micrometeoritic matter; internal temperatures; electronic scanner. Shell Composition: fiberglass. Antennas: two 12-in. whips. Transmitters: 108.06 mc at 300 mw (telemetry and doppler command) and 108.09 mc at 100 mw (telemetry). Power Supply: mercury batteries. Transmitter Lifetime: 10 days	Third stage failed to ignite. Re-entered atmosphere 28.7°N, 1.9°E. a) Evidence that equatorial region about earth has higher flux and higher energy radiation than previously considered. b) Suggestion that micrometeoritic density is higher around earth than in space
Pioneer III	Juno II stages: four. First: Jupiter (liquid); second: 11 clustered Sergeants (solid); third: three clustered Sergeants (solid). Gross takeoff weight: 121,000 lb	Experiments: measurement of radiation in space. Shell Composition: gold-washed fiberglass. Antenna: cone itself serves as antenna; gold is conductor. Transmitters: 960.05 mc at 180 mw. Power Supply: mercury batteries. Transmitter Lifetime: 90 hr	Successfully launched. Discovered second radiation belt around earth. Re-entered atmosphere over French Equatorial Africa on Dec 7, 1958. Designed velocity: 24,897 mph; attained velocity: about 24,000 mph
Project Score (Atlas 10B)	WS 107A-1 (Atlas). Power plant: two boosters (approx 150,000 lb each) and one sustainer engine (all liquid) plus two verniers. Gross takeoff weight: about 244,000 lb. Height: 85 ft. Diameter: 10 ft	Experiments: twin packages of radio transmitting, recording and receiving apparatus, each weighing 35 lb. Other components included a battery, a voltage converter, radio beacon, and a control unit. Shell Composition: stainless steel. Antennas: slot-type, flush with body of the Atlas. Transmitters: FM: 132.435 mc and 132.905 mc. Minitrack Signals: 107.97 mc and 107.94 mc. Power Supply: mercury batteries. Transmitter Lifetime: 12 days	Successfully launched. First time a human voice has been beamed from outer space. Message from President Eisenhower recorded and transmitted. Satellite accepted and relayed messages from ground stations in Texas, Arizona, and Georgia. It came down in vicinity of Midway Island in Pacific Ocean
Lunik I* (Mechta)	T-3 stages: three. Speculated total thrust: 580,000 lb. Height: 110 ft	Experiments: instruments to measure temperature and pressure inside vehicle; instruments to study gas components of interplanetary matter and corpuscular radiation of the sun; magnetic fields of earth and moon; meteoric particles in space; heavy nuclei in primary cosmic radiation and other properties of cosmic rays. Shell Composition: pentagonal strips of stainless steel made of two hermetically sealed shells of aluminum-magnesium alloy. Antennas: (not disclosed). Transmitters: three: a) 19.997-mc and 19.995-mc signals of 1.6-sec duration; b) 19.993-mc signals of 50.9-sec duration; c) 183.6 mc	Successfully launched. In orbit around sun on 15-mo cycle. Details not announced
Vanguard II	Vanguard rocket (same as Test Vehicle 3)	Experiments: cloud cover. Shell Composition: highly polished silicon-monoxide-coated magnesium. Antennas: four metal rods. Transmitters: a) 108.00 mc at 10 mw; b) 108.03 mc at 80 mw triggered from ground. Power Supply: mercury batteries. Transmitter Lifetime: a) 23 days; b) 27 days. Satellite contained two photocells designed to produce crude images of cloud cover for 2-week period	Successfully launched. Inclination to equator: 32.88 deg. In general, the satellite and its instrumentation functioned as planned. However, interpretation of data has been difficult because satellite developed a wobbling (precessing) motion

* All Russian numbers are unofficial and based on press reports

SPACECRAFT DETAILS (Continued)

Name	Launching Vehicle	Payload Instrumentation	Test Results
Discoverer I	Thor-Hustler Standard Thor booster with a second stage designed to go into orbit. Both liquid fueled. Weight: about 108,400 lb. Height: 78.6 ft	Weight of payload instrumentation: 245 lb. Objectives: check out propulsion, guidance, staging, and communications. Antennas: one directional and one whip antenna. Transmitters: classified, but included telemetry and tracking beacon. Power Supply: nickel-cadmium batteries	Successfully launched. Difficulty in stabilization caused tumbling which hampered consistent tracking acquisition. After about 5 days, it is presumed from tracking reports the satellite burned up on re-entry into atmosphere at an unknown point. Inclination: 3 deg off north-south axis of earth
Pioneer IV	Juno II (same as Pioneer III)	Experiments: measurement of radiation in space. Test photoelectric sensor in vicinity of moon. Shell Composition: gold-washed fiberglass. Antennas: cone itself serves as antenna; gold is conductor. Transmitter: 960.05 mc at 180 mw with three subcarriers. Power Supply: mercury batteries. Transmitter Lifetime: about 90 hr	Successfully launched. Probe achieved its primary mission (an earth-moon trajectory), yielded excellent radiation data, and provided a valuable tracking exercise. It is now orbiting the sun. While the probe reached the vicinity of the moon, it did not come close enough (20,000 mi) to trigger photoelectric sensor or sample moon's radiation. The probe passed within 37,300 mi of moon at 5:24 p.m. on Mar 4, 1959. It passed 7.2°E and 5.7°S of moon at 4,490 mph. Probe reached perihelion, 91.7 million mi., at 9 p.m., Mar 17, 1959; injection velocity of 24,790 mph was 188 mph below planned velocity. Pioneer IV was traced for 82 hr to distance of 407,000 mi
Discoverer II	Thor-Hustler (same as Discoverer I)	Experiments: to recover capsule; maintain temperature and oxygen sufficient to sustain life; emulsion packs to measure radiation. Antennas: one directional and one whip antenna. Transmitters: classified, but included telemetry and tracking beacon plus a tracking beacon in recovery capsule. Power Supply: nickel-cadmium batteries. Transmitter Lifetime: telemetry ran to Apr 14 as planned; tracking beacon ran until Apr 21 as planned. Capsule Composition: classified	Successfully launched. All equipment worked as programmed except timer which ejected capsule. Timer difficulty made capsule impact in vicinity of Spitzbergen Islands Apr 14 instead of Hawaii vicinity where it was to be recovered either by airplane or ship. Capsule, which contained radiation emulsion packs, has not been found. Temperature-oxygen instruments showed life could be supported. Inclination: 0.2 deg off north-south axis of earth

SPACECRAFT DETAILS (Continued)

Name	Launching Vehicle	Payload Instrumentation	Test Results
Vanguard (SLV V) ^o	Same as Test Vehicle 3	Experiments: Vanguard 3A contained a precise magnetometer to be used to map earth's magnetic field. Vanguard 3B was to measure drag in space. <u>Shell Composition</u> : 3A was made of fiberglass and phenolic resins. 3B was laminated aluminum foil and plastic sheet. <u>Transmitters</u> : for 3A: 108 mc at 10 mw for tracking and 108.03 mc at 80 mw for telemetry on ground command. <u>Power Supply</u> : silver-zinc batteries. <u>Antennas</u> : four spring-lock rods	Second stage failed to operate properly, which caused a tumbling motion. Payload and third stage fell into Atlantic Ocean several hundred miles off Cape Canaveral. Total flight time: about 500 sec
Discoverer III	Thor-Hustler. Two stages; first: Standard Thor modified to accommodate Discoverer III; second: Lockheed (designed to go into orbit). Gross takeoff weight: 8,400 lb. Height: 75.9 ft. Diameter (base): 5 ft	Experiments: measurement of cosmic radiation, biomedical environmental research, and capsule recovery techniques by C-119 aircraft patrolling recovery area. <u>Antennas</u> : one directional and one whip antenna. <u>Transmitters</u> : classified. <u>Power Supply</u> : nickel-cadmium batteries	Telemetry indicated second stage fired. Tracking stations did not receive telemetry from satellite; doubtful it achieved orbit
Vanguard (SLV VI) ^o	Same as Test Vehicle 3	Experiments: measurements of solar-earth heating process which generates weather. <u>Shell Composition</u> : magnesium alloy. <u>Antennas</u> : four metal rods. <u>Transmitters</u> : a) 108 mc at 10 mw; b) 108.03 mc at 100 mw. <u>Power Supply</u> : mercury batteries	A faulty second-stage pressure valve caused failure. A regulator designed to control helium flow, which drives second-stage propellants into engine, did not respond to command. Pressure then built up within helium reservoir which ruptured about 40 sec after second-stage ignition. Without sufficient pressure on the propellants, second-stage engine ran roughly. Helium tank burst when vehicle was at 40 to 50-mi altitude. The rocket rolled over in a ballistic trajectory at an altitude of about 90 mi. Third stage ignited before plunging into Atlantic Ocean some 300 mi northeast of AMR
Discoverer IV	Same as Discoverer III	Capsule contained telemetry equipment to measure its performance	Failed to achieve orbit. Telemetry reports indicate that second stage fired. Satellite was not acquired by tracking stations on its first or subsequent orbits. Insufficient velocity caused failure

^oSatellite Launching Vehicle

SPACECRAFT DETAILS (Continued)

Name	Launching Vehicle	Payload Instrumentation	Test Results
Explorer VI	Thor-Able III. Stages: first: Thor (liquid) minus guidance; second: modified Vanguard second step (liquid); third: X-248 solid rocket made for Vanguard program. Gross takeoff weight: 105,000 lb plus. Height: 90 ft	Experiments: 1) measurement of three specific radiation levels of earth radiation belt; 2) TV-like scanning device to relay cloud cover picture; 3) solar cells (8,000 in all; 1,000 on each side of four paddles) to create voltage to recharge the satellite's chemical batteries in flight (electronic gear in satellite includes 3 transmitters and 2 receivers); 4) micro-meteorite detector; 5) two types of magnetometer to map earth's magnetic field; 6) four experiments to study behavior of radio waves, all aimed at learning more about deep space communications. Antennas: two dipole aluminum rods. Transmitters: a) 108.06 mc at 500 mw; b) 108.09 mc at 500 mw; c) ultra-high frequency (undisclosed). Power Supply: nickel-cadmium batteries rechargeable by 8,000 solar cells mounted on 20 x 22-in. vanes jutting from satellite's equator	Successfully launched. Experiment successful. Data being analyzed as of Aug 16, 1960. Details will be published when available
Discoverer V	Thor-Agena. Two stages. First: standard Thor; second: Agena	Same as Discoverer IV	Successfully launched. Satellite went into orbit, all equipment working as programmed. However, re-entry capsule was not recovered due to malfunction following its ejection from satellite
Beacon II	Modified Juno II (AM-19B) Stages: first: Jupiter (liquid); second: 11 clustered Sergeants (solid); third: 3 clustered Sergeants (solid). Gross takeoff weight: 121,000 lb	Experiments: inflatable satellite of Mylar plastic film and aluminum foil. Satellite itself contained no instrumentation. Ejection and inflation mechanism consisted of nitrogen bottle, a bellows, a piston, and a connecting valve. Shell Composition: stainless steel. Transmitter: 108.03 mc at 50 mw (in rocket casing). Power Supply: 12 mercury batteries	Payload failed to achieve orbit due to premature fuel depletion in booster and malfunction in attitude control system for upper stages. Time to third-stage burnout (normally time of injection into orbit): 11.07 min
Discoverer VI	Same as Discoverer V	Same as Discoverer IV	Successfully launched. Same as Discoverer V
Lunik II*	Multistage rocket. Weight of second stage minus fuel: 3,324 lb. Other details: undisclosed	Experiments: instruments to measure temperature and pressure inside vehicle; instruments to study magnetic fields of earth and moon; meteoric particles in space; heavy nuclei in primary cosmic radiation and other properties of cosmic rays. Shell Composition: pentagonal strips of stainless steel made of two hermetically sealed shells of aluminum-magnesium alloy. Antennas: not disclosed. Transmitters: a) 183.6 mc (altimeter in probe); b) 39.986 (in probe); c) 19.993 mc (in probe); d) 20.003 mc (in rocket); e) 19.997 mc (in rocket)	Successfully launched. Lunar probe hit surface of moon at 5:02:24 p.m. EDT. 1 min and 24 sec later than predicted by Russian scientists. The probe contained scientific instruments and the Soviet coat of arms. When it hit the moon, the container was traveling more than 2 mi/sec. Details not announced
Transit 1A	Standard three-stage Thor-Able	Shell Composition: two layers of fiberglass with honeycomb structure in between. Antennas: broad band spiral antenna painted on outside of shell. Transmitters: a) 54 mc; b) 162 mc; c) 216 mc; all at 100 mw. Power Supply: two silver-zinc; two nickel-cadmium; latter two powered by solar cells	Satellite failed to achieve orbit. The second stage fired on schedule, but the third stage did not fire

* All Russian numbers are unofficial and based on press reports

SPACECRAFT DETAILS (Continued)

Name	Launching Vehicle	Payload Instrumentation	Test Results
Vanguard III (SLV VII) ^o	Three stages. First: liquid (G. E.); second: liquid (Aerojet); third: solid (ABL). Gross takeoff weight: approx 22,600 lb. Height: 72 ft. Diameter: 45 in.	Weight of payload instrumentation: 50 lb. Experiments: measurements of earth's magnetic field, solar X-rays, and environmental conditions in space. Shell Composition: highly polished silicon-monoxide-coated magnesium. Antennas: four metal rods. Transmitters: a) 108.00 mc at 30 mw, tracking and X-ray and environmental; b) 108.03 mc at 80 mw for magnetometer and command. Power Supply: chemical batteries. Transmitter Lifetime: programmed for about 90 days	Successfully launched. Details to be announced at a later date
Lunik III*	Not disclosed	345 lb of scientific equipment (last-stage rocket). Experiments: two cameras, developing mechanism and automatic devices for triggering cameras, developing processes and transmission of pictures to earth. Also, automatic temperature control mechanism. Other experiments not disclosed. Shell Composition: Not disclosed. Antennas: four metal rods. Transmitters: a) 183.6 mc at (estimated); between 5 and 20 w; b) 39.985 mc at (not disclosed). Power Supply: solar cells and chemical batteries	Successfully launched. Rocket left earth at 25,000 mph. Payload separated from the last stage and reach closest point to moon, 4,373 mi, at 5:16 p.m. Oct 6, Moscow time. When satellite was about 40,000 mi from moon's surface, the cameras were triggered. They produced photographs of high precision showing 70 percent of moon's backside. Cameras were operated on Oct 7, 1959 for 40 min. Pictures were transmitted to earth shortly before reaching perigee on Oct 18, 1959. Details not announced
Explorer VII	Juno II (19A) modification by the addition of a support cylinder to the fourth stage to support the weight of the payload	Experiments: radiation balance; Lyman-Alpha X-ray; heavy primary cosmic ray; exposed solar cell; temperature measurements. Shell Composition: fiberglass and sand-blasted aluminum foil. Antennas: 20 mc turnstile antenna, consisting of four flexible quarter wavelength elements which are unreel in the plane of the satellite equator from a motor-driven drum on the spin axis; 108 mc is a turnstile antenna with four rod elements. Transmitters: a) 108 mc at 12 mw; b) 20 mc at 600 mw; the second and third harmonics at 40 and 60 mw were fed to the antennas at 15 and 5 mw, respectively. Power Supply: solar cells and rechargeable nickel-cadmium batteries	Successfully launched. Satellite went into predicted orbit, all equipment working as programmed. Details of data reduction will be published when available. Inclination to equator: 50.3 deg. Velocity at perigee: 17,285 mph; velocity at apogee: 16,028 mph
Discoverer VII	Same as Discoverer V	Not disclosed	Successfully launched. An electrical malfunction in the rocket prevented capsule from ejecting. This caused burned-out second stage, with satellite attached, to tumble slowly through space rather than follow a steady course

* All Russian numbers are unofficial and based on press reports

^o Satellite Launching Vehicle

SPACECRAFT DETAILS (Continued)

Name	Launching Vehicle	Payload Instrumentation	Test Results
Discoverer VIII	Same as Discoverer V	Advanced engineering test and recovery equipment	Successfully launched. Capsule was ejected from satellite at scheduled time. approx 26 hr after launch. Positive indication of successful operation up to the point of parachute deployment. Because orbit was not as planned, capsule missed the 50 by 200-mi target area west of Hawaii. Indications are that capsule fell southeast of Hawaii. Recovery of capsule, which was part of test, was not accomplished. The capsule could not be found

Note: Information on launching vehicle, payload instrumentation, and test results on spacecraft launched after Discoverer VIII will be given in a future issue, after facts become available.

BOX SCORE OF U.S. SPACECRAFT LAUNCHES

	Failures	Successes	Total
1957	1	0	1
1958	12	5	17
1959	7	12	19
1960	4	4	8

SIGNIFICANT U. S. "FIRSTS" IN SPACE

Sounding Rocket, Satellite, and Space Probe Research

Sounding Rockets

First scientific flight above atmosphere (250 miles in Bumper-Wac)
First detailed photo of solar ultraviolet spectrum
First photo of complete tropical storm
First penetration of equatorial ionospheric current sheets
First detection of X-rays in high atmosphere
First detection of auroral particles in high atmosphere
First exposure of animal life above atmosphere (Aerobee rocket)
First re-entry tests from satellite altitudes (Jupiter-C)
First flight of animal life to high satellite altitudes (1400 miles) and first successful re-entry from these altitudes (Mouse-in-Able Flights 2 and 3 in Thor-Able 0 vehicles)
First motion pictures of earth from space (Thor and Atlas re-entry vehicles)
First injection of radioactive "clouds" into the exosphere (Argus rockets)

Satellites

Discovery of the first Van Allen Radiation Belt (Explorer I)
First micrometeorite observations in a satellite (Explorer I)
First use of solar cells for electrical power (Vanguard I)
First precise geodetic use of an artificial earth satellite to obtain refined information on the size and shape of earth (Vanguard I)
Discovery that the Van Allen Radiation Belt consists of more than one zone (Explorer IV)
Discovery of second radiation belt (Pioneer III)
First achievement of an elementary communication satellite (Score)
First injection of cloud-cover experiments into orbit (Vanguard II)
First earth satellite to be put in a polar orbit (Discoverer I)
First radio communication beyond the moon (407,000 miles in Pioneer IV)

SIGNIFICANT U.S. "FIRSTS" IN SPACE

Satellites (Continued)

First comprehensive mapping of Van Allen Radiation Belts (Explorer VI)
Discovery of betatron acceleration in outer atmosphere (Explorer VI)
First study of dumping and filling of outer Van Allen Radiation Belts during a magnetic storm (Explorer VI)
First still TV photo of earth from a satellite (Explorer VI)
First computer operating in space with the instrumentation (Telesat in Explorer VI)
Discovery of large current system in outer atmosphere (Explorer VI)
First direct flux measurements of low-energy electrons in outer radiation belt (Explorer VI)
First satellite to be controlled in altitude on orbit (Agena A)
First successful use of a weather satellite (Tiros I)
Development and use of MICROLOCK, the extreme-sensitivity, radio-telemetry system using phase-lock techniques
Development and use of TRACE, the fully tracking space-communications tracking and telemetering system
Development and use of CODORAC, the fully coherent extreme-range, two-way Doppler X-band system

Space Probes

Discovery of fluctuation zone in geomagnetic field where it meets the interplanetary boundary (Pioneer I)
First verification of Pioneer I discovery of a magnetic field fluctuation zone (Pioneer V)
First measurements of interplanetary magnetic fields (Pioneer I)
First radial traverse of Van Allen Radiation Belts, determining dimensions (Pioneer I)
First observation that radiation discovered by Explorer I is a band (Pioneer I)
First radio communication at interplanetary distances (Pioneer V)
First observations of solar disturbances and associated magnetic storms simultaneously from interplanetary space and on earth (Pioneer V)
First micrometeorite observations in interplanetary space (Pioneer V)
Verification that the current system discovered by Explorer VI is annular in configuration (Pioneer V)

HISTORY-MAKING PIONEER V IS NOW 6 MILLION MILES IN SPACE

This morning at 10 a.m. PDT 26 April, Pioneer V, designed and constructed by STL, under the auspices of NASA and in coordination with AFBMD, was 6,211,309 statute miles outbound in space, and traveling onward at the rate of 6,187 statute miles per hour. Since its launch on 11 March, the compact paddlewheel planetoid has been hailed around the world as one of the most significant contributions to date in the conquest of space.

A second successful launch for the nation was achieved virtually on the heels of Pioneer, as the meteorological satellite Tiros I was hurled into orbit on 1 April. In addition to responsibility for placing the payload in orbit, STL conducted SE/TD of the entire project and effected the usual conversion of the Thor-Able rocket stages.

In addition to transmitting data on its several experiments, Pioneer V also is transmitting confirmation of the fact that its basic equipment continues to function according to pre-launch expectations. "Paddle voltage, conditions, and operation continues excellent; battery and paddle temperatures, and battery voltage normal," is the typical daily report since launch of the payload from Cape Canaveral.

The satellite already has been the source of new data on world encircling radiation belts, "solar winds," and

other phenomena which influence life and specifically communication on earth, and will influence space flight.

In communicating data from the distances from earth that it has, Pioneer V has also established a record. Its five-watt transmitter has proven that interplanetary radio transmission is not only possible, but an accomplished fact. Its voice is merely a steady, high-pitched tone to the human ear, but translatable by the computer into data on the satellite's environment.

Built by STL for the Air Force and NASA, Pioneer V was shot into space atop a launch vehicle which had Douglas' Thor as its first stage, and liquid propellant second stage by Aerojet and solid propellant third by Allegany Ballistics Laboratory. STL provided system engineering and technical direction for all phases of the project.

Following launch, the payload was tracked by the STL-Air Force tracking network. The stations at the Cape, Jodrell Bank, England, Singapore, and South Point, Hawaii, commanded the satellite and received its transmission. It has now traveled so far into space that only the most powerful stations, South Point and Jodrell Bank, receive data.

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