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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
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FOR RELEASE: WEDNESDAY AM'S
July 21, 1965

RELEASE NO: 65-232

PROJECT: PEGASUS C

CONTENTS

(To be launched no earlier than July 30, 1965.)

NEWS NASA
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FINAL PEGASUS/SATURN WILL CARRY DETACHABLE PANELS

An engineering experiment with the ultimate aim of possibly returning to Earth meteoroid-punctured metal samples from long exposure to space has been added to the Pegasus C/Saturn 10 project of the National Aeronautics and Space Administration.

The launching is scheduled for no earlier than July 30 from Cape Kennedy, Fla.

The test will be the tenth and final flight of the Saturn I launch vehicle before NASA begins development flights of the larger Saturn IB next year. Saturn I has scored nine successes since the first test in October 1961.

Pegasus C will also be the last of a series of three launches in the Pegasus meteoroid technology project which

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has gathered useful meteoroid "strike" data from the Pegasus I and II satellites launched earlier this year.

This flight's primary purpose is to add information on the frequency of meteoroids to be encountered in near-Earth environment, for use in the design of future manned and unmanned spacecraft. The information is vitally needed with the increased emphasis on larger, long-life spacecraft, and the mission of the three-flight Pegasus program is to provide data necessary to determine the magnitude of the meteoroid hazard.

Meteoroid protection in spacecraft design at present is based on limited data and conservative estimates of the potential space hazard.

The engineering experiment consists of 48 aluminum sub-panels or "coupons" attached to Pegasus which could be quickly unhooked by an astronaut and carried back to Earth. NASA officials emphasize that no decision has been made for an astronaut to rendezvous and retrieve the panels.

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However, if the coupons are recovered from the space environment for laboratory study, they could provide actual samples of meteoroid hits. Results of such studies would add greatly to scientists' knowledge of the effects of meteoroids and other factors in the space environment.

Although numerous experiments have been conducted in space, no materials punctured by meteoroids have been returned so far. Meteoroids are the countless small particles of matter flying in space at great speeds. When they enter the Earth's atmosphere, they burn -- as meteors -- and those that reach the ground are known as meteorites.

The large spacecraft is identical to the one and one-half ton Pegasus II spacecraft which has been orbiting the Earth since last May 25. Pegasus I was sent into orbit Feb. 16, 1965.

Pegasus C will be aimed for a circular orbit at 332 miles with an orbital period of 95 minutes and an inclination to the equator of 28.9 degrees. If Pegasus C is successfully placed in orbit, it is expected to return meteoroid data to ground stations for at least one year.

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It may remain in orbit around the Earth for three years or more.

The first two Pegasus spacecraft are now in elliptical orbits, ranging from about 308 statute miles to 464 miles.

Large panels, resembling a pair of "wings," which the satellite will expose to the meteoroid environment measure 96x14 feet, or 2,300 square feet of instrumented surface. As particles collide with this surface, the penetrations will be registered and reported to earth.

The Saturn I vehicle's outward appearance matches that of the last four Saturn I's. Atop the launch vehicle is the Apollo spacecraft: boilerplate command and service modules plus the launch escape system tower. The spacecraft will be folded inside the specially-adapted service module. After injection into orbit, the command and service modules will be jettisoned and the Pegasus satellite will be free to deploy its panels. The two Apollo modules will enter a similar but separate orbit.

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Except for the operation of the launch escape system tower, no engineering tests are planned with the Apollo hardware being flown.

The two-stage Saturn vehicle is 188 feet tall and weighs at liftoff about 1,130,000 pounds.

The Pegasus in orbit will remain attached to the Saturn vehicle's instrument unit and top (S-IV) stage. Overall, this assembly is about 70 feet long and will weigh about 23,100 pounds, although the Pegasus itself will weigh about 3,200 pounds. A breakdown of the weight follows:

Spent S-IV	14,500
Instrument Unit	2,600
Pegasus	3,200
Pegasus support structure and adapter	2,800
	23,100

At the beginning of the orbit about 600 pounds of left-over propellant and gases will remain in the S-IV stage. It will gradually evaporate during the first few orbits, and is not counted in this total.

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The weight of the two Apollo modules, plus associated "hardware" in a separate orbit is 10,100 pounds, so the total "hardware" weight in orbit as a result of this launching will be 33,800 pounds.

Pegasus will be visible to the unaided eye under favorable conditions near dawn and dusk. As in the cases of previous large satellites, NASA plans to issue predictions of possible sightings for major cities.

The Marshall Space Flight Center under the direction of NASA's Office of Manned Space Flight is in charge of Saturn development. Marshall is also responsible for development of Pegasus under direction of the NASA Office of Advanced Research and Technology. The Kennedy Space Center is in charge of launchings, and the Manned Spacecraft Center provided the Apollo hardware. MSFC is in Huntsville, Ala.

Prime contractors are: first (S-I) stage, Chrysler Corp.; S-I engines, North American Aviation's Rocketdyne Division; second (S-IV) stage, Douglas Aircraft Co.;

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S-IV engines, Pratt & Whitney Aircraft; instrument unit, NASA's Marshall Space Flight Center, using major components supplied by International Business Machines Corp. and others; Pegasus satellite, Fairchild-Hiller Corp.; and Apollo spacecraft, North American Aviation's Space and Information Division.

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(END OF GENERAL NEWS RELEASE-BACKGROUND INFORMATION FOLLOWS)

FLIGHT SEQUENCE

The Saturn will be launched from Launch Complex 37 at Cape Kennedy. Nine seconds after launch, the vehicle will begin a roll into the flight azimuth of 95 degrees. The pitch program will begin at the same time. The following significant events occur in the S-I (booster) phase of powered flight:

Roll maneuver ends, T(time from liftoff) plus 14 seconds; Mach one velocity reached, T plus 55; maximum dynamic pressure encountered, T plus 67, (960 mph); pitch program arrested, T plus 138; inboard engines cutoff, T plus 144; outboard engines cutoff, T plus 150.

Booster cutoff occurs at 55 miles altitude, 50 miles downrange from the launch site, while the body is traveling at about 6,070 mph.

In the next two seconds, the S-IV separates from the S-I, S-IV stage ullage rockets ignite, S-I retrorockets fire, and the six S-IV engines ignite. Ten seconds later, at T plus 162, the S-IV ullage motor cases and the Launch

- more -

Escape System (LES) tower are jettisoned. Path-adaptive guidance is initiated at T plus 168 seconds.

The guidance system initiates S-IV cutoff at about T plus 632 seconds. The satellite is placed in orbit with a velocity of about 16,000 mph. Insertion occurs some 1,200 miles downrange from the launch site. Inclination to the equator will be 28.9 degrees.

During flight the vehicle will telemeter to ground stations about 1,204 measurements of rocket performance, as follows: S-1, 375; S-IV stage, 408; and instrument unit, 241. Additionally, the Pegasus will telemeter 180 measurements.

The S-IV spacecraft unit will "coast" for three minutes following S-IV cutoff. At T plus 813 seconds the Apollo command and service modules will be separated from the S-IV, through the use of spring mechanisms, leaving the Pegasus ready to expand. One minute later, at T plus 873 seconds, motors are energized and the structure is deployed in steps covering a period of about 60 seconds.

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Unlike the two previous vehicles, the tenth Saturn I does not carry a camera to provide pictures of Pegasus deploying in space. The vehicle does, however, carry a television camera mounted on the outside of the booster at the top, pointing back toward the engines. Its purpose is to observe the booster's plume or exhaust shape which expands or fans out greatly as the vehicle encounters less dense atmosphere. The image from the camera will be recorded on video tape at Cape Kennedy and will be used later in plume shape measurements and flame attentuation studies.

PEGASUS C SATELLITE

Pegasus C follows its successful predecessors as the third large satellite in the meteoroid technology research program.

Meteroid hit data gathered by Pegasus C -- to be known as Pegasus III if it achieves orbit -- will augment the knowledge gained by Pegasus I and II about the hazard to spacecraft from meteoroids in near-Earth space.

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Besides the first two Pegasus satellites, NASA still collects useful meteoroid data from Explorer XXIII, launched in 1964 by a Scout vehicle.

Development of Pegasus, named for the mythical flying horse, began in February, 1963. The NASA Office of Advanced Research and Technology directs the Pegasus Project, and has assigned project management responsibility to NASA's Marshall Space Flight Center, Huntsville, Ala.; Fairchild Hiller Corp. is the prime contractor. Design and electronics work was done by FH's Space Systems Division at Bladensburg and Rockville, Md. Final assembly and checkout was completed at the Aircraft-Missiles Division facility at Hagerstown, Md.

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Description of Spacecraft

The Pegasus satellite is launched folded inside the Apollo service module. With its detector panels folded inside the service module, Pegasus C is 17 feet 4 inches high, 7 feet wide and 7 feet 11 inches deep. The main sections of the satellite are its center section and "wing" assemblies. The satellite's framework is made of riveted aluminum alloy extrusions.

Pegasus C's center section is mounted on an adapter permanently attached to the forward end of the S-IV second stage. The center section provides a mounting for the satellite's electronics cannister, solar power panels, sensors and the wing deployment mechanism.

The satellite's two wings consist of seven hinged frames. These hinges are spring loaded so that the wings unfold in accordion fashion. The unfolding action is controlled by a scissors linkage connected to a motor and torque tube assembly. The assembly prevents the wings from deploying too rapidly and serves as a standby source of force to complete wing deployment in the event the spring-loaded hinges fail.

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Rectangular panels measuring 20 x 40 inches are mounted in the wing frames. Each wing has one eight-panel frame and six 16-panel frames, or a satellite total of 14 frames providing mountings for 208 panels.

The outer surface of each panel carries a "target" sheet of aluminum. A sheet of Mylar plastic, coated with a thin layer of copper is bonded to the back of the aluminum target sheet. This "sandwich" forms a capacitor when an electrical potential is established between the two metals.

Each capacitor sandwich is mounted on a 20 x 40 inch piece of foam about one inch thick. On the opposite side of the foam "core" another capacitor sandwich is mounted. In this manner a total of 416 capacitors are mounted back-to-back in the 208 spaces in the wing frames.

Eight panels have aluminum sheets .0015 inch (1.5 mils) thick. Data from these panels can be compared with data from similar panels on Explorers XVI and XXIII, earlier, smaller meteoroid satellites launched by Scout vehicles. Aluminum sheets of 17 panels are .008 inch (8 mils) and on the remaining 183 panels .016 inch (16 mils) thick. Back-to-back capacitors are identical.

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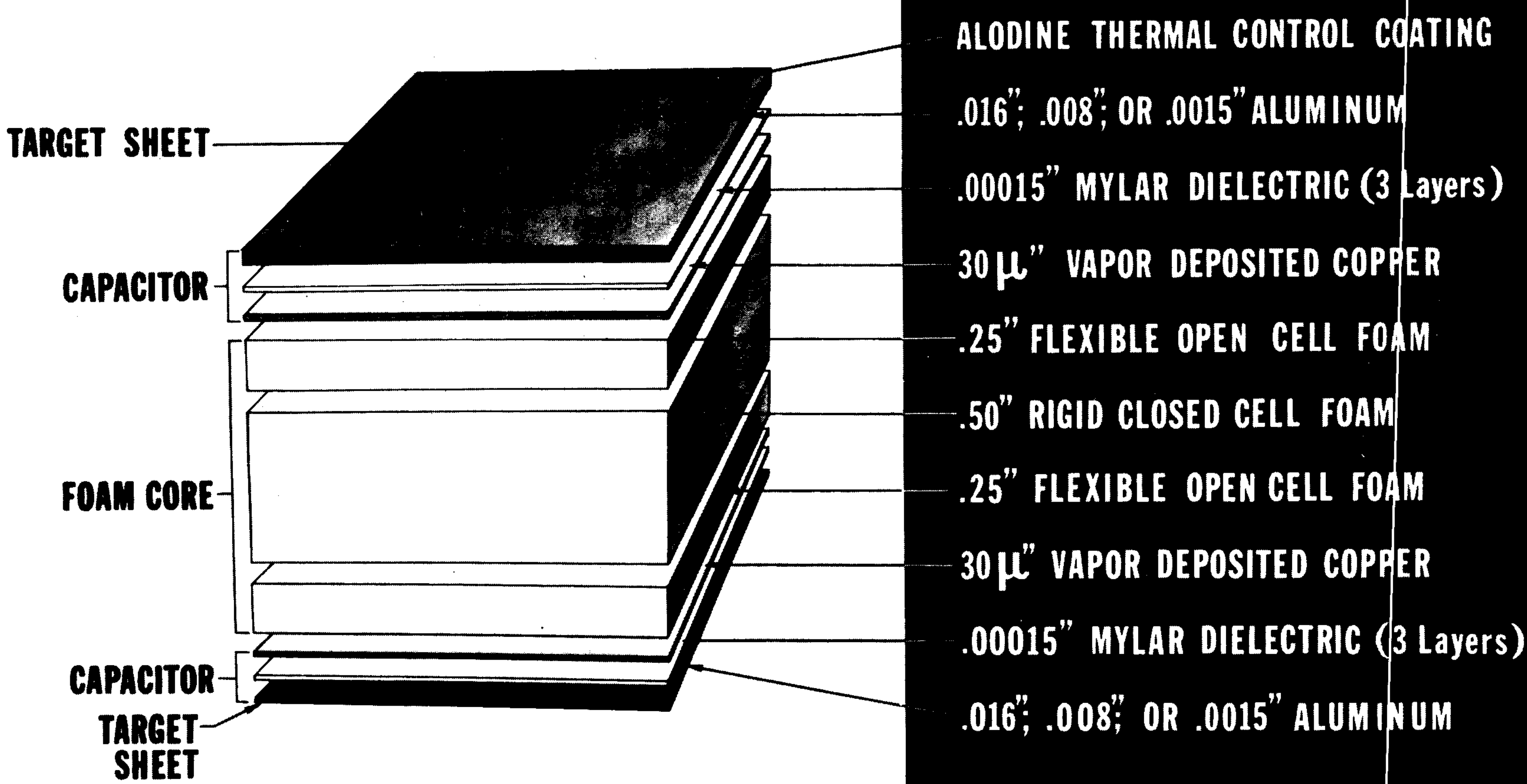
PROJECT PEGASUS
METEOROID DETECTOR PANEL
EXPLODED VIEW



µ= ONE MILLIONTH OF ONE INCH

The Marshall Center made up the eight panels for the special engineering experiment and positioned them at comparable locations on each of the two wings of the spacecraft, four on each side. The frame of the spacecraft was coated with luminous paint to make it easier to recognize in orbit.

There are six "coupons" on each panel, three on each side, for a total of 48 coupons. They are made of aluminum in three thicknesses: 16 of them at .008-inch or 8 mils thick; 24 at 16 mils or .016-inch; and eight at 32 mils or .032 inches.

The coupons are fastened at two points to the main panels and could be removed quickly. The 11 by 16-inch size is easy to carry and can be stored in Gemini or Apollo spacecraft compartments.

The panels are subdivided into 62 logic groups of from two to eight capacitors each. The capacitors are interconnected so that the satellite electronics package sees each logic group as one capacitor. A meteoroid hit on any panel will be registered as a hit on the logic group in which that panel is located.

Some capacitors on Pegasus I shorted in orbit, and it was necessary to remove logic groups disconnecting good as well as bad capacitors from the overall detection system.

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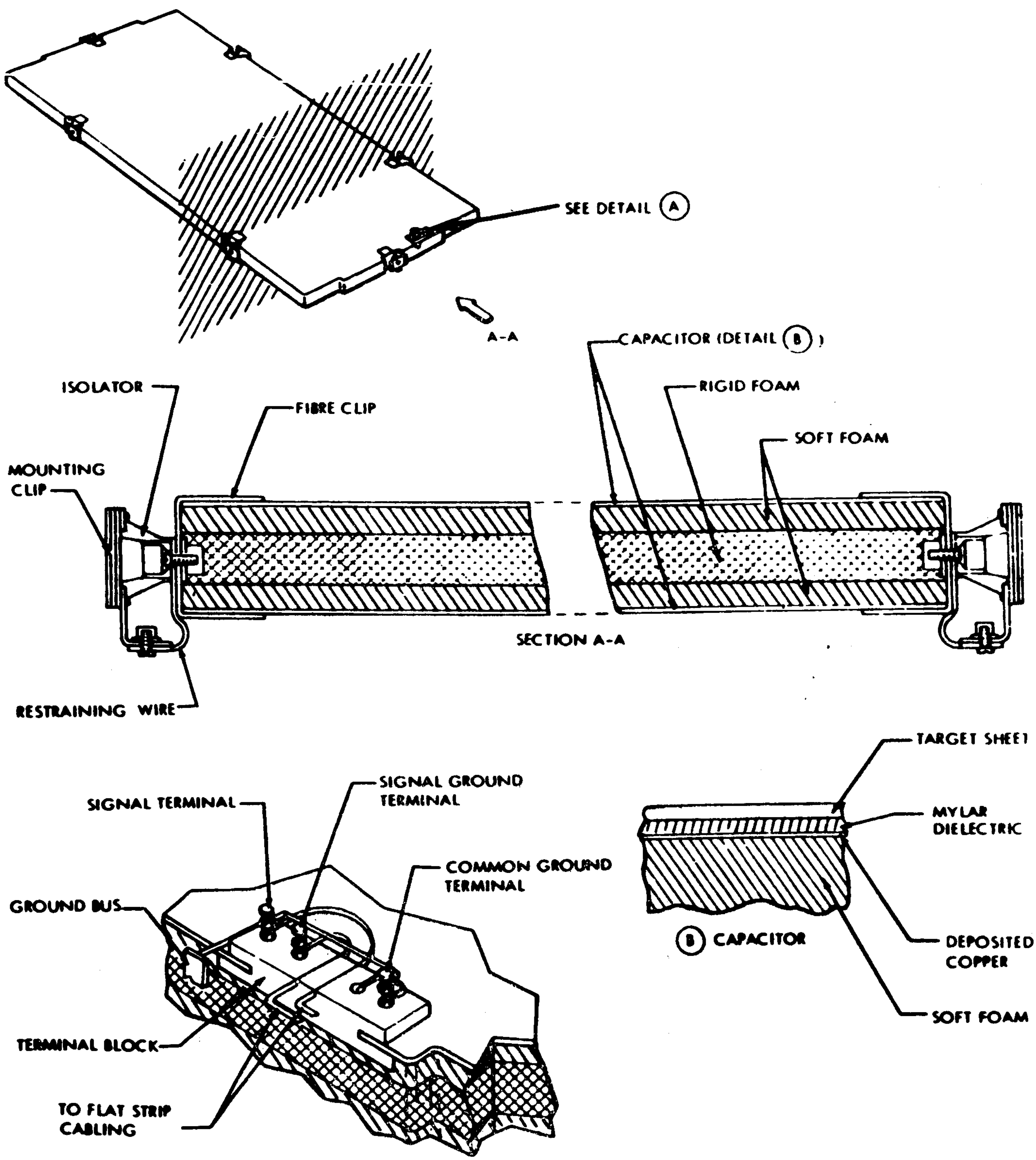
PEGASUS DETECTOR PANEL - SECTIONAL VIEW



(A) ELECTRICAL CONNECTIONS

A new fusing arrangement was incorporated in the meteoroid detection system of Pegasus II to fuse individually each capacitor. This has enabled project personnel to disconnect a single malfunctioning capacitor but leave the other capacitors in the same logic group operating. When a malfunction occurs which is serious enough to warrant disconnection of the entire logic group, this can still be done by ground command. The new fusing arrangement has worked successfully on Pegasus II and has been installed on Pegasus C.

The fuses can be blown by 50 milliamps (.05 amps) of current. The ground command to blow a capacitor fuse may "heal" the capacitor instead of blowing the fuse, depending upon the cause of the short. Each capacitor "healed" in this manner would be a bonus benefit.

Each time a capacitor is penetrated by a meteoroid, the material removed by the impact is vaporized, forming a conducting gas which discharges the capacitor. The gas, called plasma, dissipates almost immediately and the capacitor recharges within three one-thousandths of a second.

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If seen on the screen of an oscilloscope, the "blip" caused by a penetration and momentary discharge of the capacitor would be a sharp saw-tooth below the horizontal line. These blips are characteristic for each group of panels, providing a means of determining which group contained the penetrated panel.

When a panel is penetrated, several items of related information must be recorded: a cumulative count of hits classified according to panel thickness; an indication of the panel group penetrated; attitude of the satellite with respect to both the Earth and the Sun; temperature at various points on the spacecraft; the time at which each hit is recorded; and the condition of the power supply and other equipment supporting overall spacecraft operation.

Various levels of impact energy will be differentiated through use of the panels of three different thicknesses. Directional information will be gained by using a combined solar sensor-Earth sensor system.

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The Pegasus electronic system registers meteoroid penetrations of panel groups and stores a record of panel thickness, group number and time of penetration. Pegasus attitude and certain temperatures are recorded on a timed schedule.

Upon ground command, all recorded information is read out of the Pegasus memory system and telemetered to the ground. A second beacon telemeter transmits "housekeeping" information (e.g., temperatures) and total meteoroid count data continuously throughout the mission. The spacecraft has two telemetry links with a total of 180 measurements.

A digital command system provides for on-off control of various system components, circuit replacement, certain in-flight tests and other control functions. A solar cell battery (nickel-cadmium) power supply provides all power for Pegasus for its one-year life. The batteries are recharged by energy from the solar cells.

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Other Industrial Participants

Other industrial firms involved in significant aspects of Pegasus development and their contributions include: Adcole Corp., Cambridge, Mass., solar aspect sensors; Barnes Engineering Co., Stamford, Conn., horizon sensor system; Aluminum Co. of America, Pittsburgh, structural extrusions; Di/An Controls, Boston, system clock and core memory; Space Craft Inc., Huntsville, beacon transmitter; United Electro-dynamics Corp., Pasadena, temperature sensor; United Shoe Machinery Corp., Beverly, Mass., harmonic drive; G.T. Schjeldahl Co., Northfield, Minn., detector panels; Bulova Watch Co., Flushing, N.Y., timer; Norden Division, United Aircraft Corp., Norwalk, Conn., shaft encoder; Keltec Industries, Alexandria, Va., antenna, batteries and other components; Motorola, Scottsdale, Ariz., diplexer, hybrid ring, low pass filter; RCA, Montreal, FM transmitter; AVCO Corp., Cincinnati, command receiver; Consolidated Systems Corp., Monrovia, Calif., command decoder; Applied Electronics Corp., Metuchen, N.J. Also PCM and PAM commutators; Space Technology Labs., Redondo Beach, Calif., electron spectrometer; General Electric Co., Philadelphia, RTV-11 sealant and enviromental testing; Corning Glass Works, Electronic Products Division, New York, glass resistors; Vinson Engineering, Van Nuys, Calif., actuator (back-up for the motor gearbox); Eastern Air Devices, Dover, N.H., drive motor; Ion Physics

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Corp., Burlington, Mass., design assurance radiation testing; Washington Video Productions, Washington, D.C., technical documentation films; Hayes International Corp., Birmingham, Ala., design assurance particle impact testing; and Dynatronics, Orlando, Fla., specialized PCM Data Readout Units (GSE).

Pegasus Results To Date

Project scientists have not yet completed analysis of the Pegasus I and Pegasus II meteoroid impact data. However, information on the operation of the craft in orbit is outlined here.

After the first six weeks in orbit, Pegasus II had reported 73 penetrations by meteoroids.

Telemetry returned from the satellite confirmed hits on panels of three different thicknesses of aluminum target metal. Nineteen penetrations were recorded on the .016 inch thick aluminum covered detection panel; nine on the .008 inch thick panel; and 45 on the .0015 inch panel.

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During its first three months in orbit, Pegasus I recorded a significant number of meteoroid penetrations. Though useful results were obtained with .0015 inch thick panels, the data obtained with .008 inch thick and .016 inch thick panels has not been fully satisfactory because of a number of difficulties which were experienced in the operation of the detection system.

A new capacitor fusing arrangement, used on the second Pegasus after short circuits in the Pegasus I detection system hampered the capabilities of that satellite, was working well after one month. The new technique enables project engineers to disconnect a single malfunctioning capacitor detector while leaving other capacitors in the same group of panels working.

When a malfunction occurs that is serious enough to warrant disconnection of the entire group, this can still be done by ground command.

Thirty-six capacitors on Pegasus II were found to be working improperly during the first four weeks and were disconnected by ground command to prevent a drain on the satellite's power supply. Of these 36 capacitors, four were isolated and disconnected from their groups without interruption to other working detectors in the same group.

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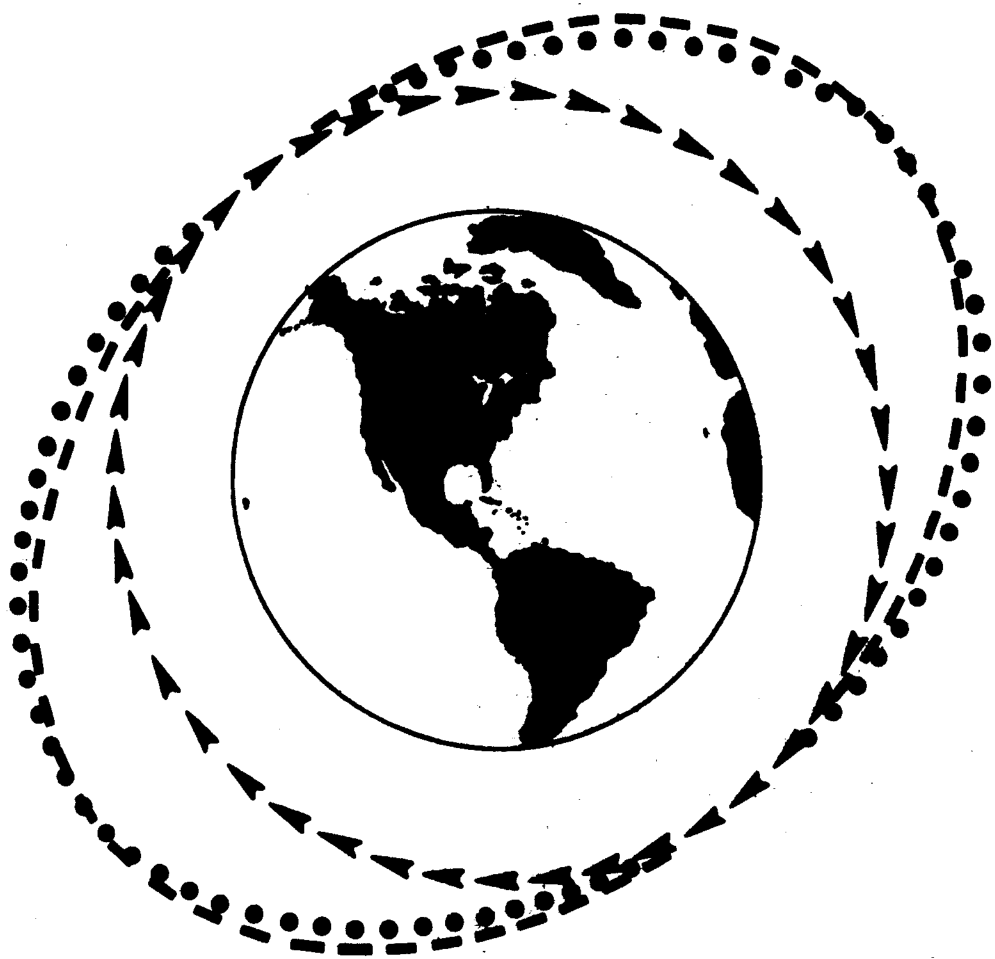
THE ORBITS OF PEGASUS SPACECRAFT



PEGASUS C: Apogee - 332 Statute Miles, Perigee - 332 Statute Miles

PEGASUS I: Apogee - 462 Statute Miles, Perigee - 308 Statute Miles

PEGASUS II: Apogee - 464 Statute Miles, Perigee - 315 Statute Miles

Cancelling the faulty capacitors also prevents the transmission of false meteoroid encounter information, thereby "cleaning up" the data take and easing the work of the Data Evaluation and Analysis Team at the Marshall Center.

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THE TENTH SATURN LAUNCH VEHICLE

NASA's final launch vehicle in the Saturn I series, designated SA-10, is identical to the two previous Pegasus-carrying vehicles.

SA-10 is a two-stage vehicle standing some 188 feet high and when completely fueled at lift-off the rocket will weigh some 1,130,000 pounds.

Booster for the big rocket is the S-1 built by the Chrysler Corp. A Douglas Aircraft-built S-IV will fly as the second stage. The SA-10 will also have a Marshall Center-assembled instrument unit and will have a command module and launch escape tower, furnished by the Manned Spacecraft Center, atop the Pegasus payload.

Saturn I was developed by the Marshall Space Flight Center and associated contractors. Saturn I development work began in late 1958 and is culminating with this flight. The booster flight test program began Oct. 27, 1961.

Previous Saturn I rockets were launched Oct. 27, 1961; April 25 and Nov. 16, 1962; March 28, 1963; Jan. 29, May 28 and Sept. 18, 1964; Feb. 16 and May 27, 1965.

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The Saturn I program has led to the development of two larger space vehicles, the Saturn IB and Saturn V. Saturn IB will use essentially the same first stage as the Saturn I, with up-rated H-1 engines and reduced stage weight.

For its second stage, the Saturn IB will use the 200,000 pound thrust S-IVB. The giant Saturn V moon rocket will have an S-IC booster, and S-II second stage, the S-IVB and Apollo payload.

S-I Stage--Booster for this SA-10 vehicle is the second S-I stage Chrysler has built at the Michoud Assembly Facility in New Orleans.

The 1.5 million pound thrust booster is 21.5 feet in diameter and 80.3 feet long. Eight Rocketdyne H-1 engines burning liquid oxygen and kerosene (RP-1), each developing 188,000 pounds thrust, will give the stage 32 million horsepower at maximum velocity.

At liftoff the stage contains some 600,000 pounds of LOX and 250,000 pounds of RP-1. Propellant consumption per second is 5,900 pounds, or 737 pounds of propellant per second for each engine.

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Eight of the Marshall Center-developed stages were built and static tested in Huntsville. Chrysler built its two stages in New Orleans and shipped them to Huntsville for static testing.

S-IV Stage--This will be the sixth flight of the Saturn I with a liquid hydrogen-liquid oxygen powered S-IV stage. NASA began flying the Douglas Aircraft Co.'s S-IV on the fifth flight in the series.

The S-IV vital statistics are: length, 41.5 feet; diameter, 18.5 feet; weight some 14,500 pounds empty. It carries about 100,000 pounds of propellant for about eight minutes of propelled flight.

The stage is powered by six Pratt & Whitney RL-10A3 engines developing a total of 90,000 pounds thrust. The high energy combination propellant, LOX and LH2, produces more than one-third additional thrust per pound of propellant than more conventional fuels.

The RL-10 engine is the country's pioneer LH2 power plant. Its first in-space operation came in late 1963 when it was used in the Centaur propulsion system. The engines have functioned well in Saturn flights five through nine.

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The S-IV stage is built at Santa Monica, Calif., and is static tested at the Sacramento Test Center, Sacramento, Calif.

Instrument Unit--This is a sophisticated guidance and control unit which maintains the vehicle's stability and alters its flight path as becomes necessary to achieve the desired orbital goal with a high degree of accuracy.

Commands for engine gimballing and inflight sequencing of vehicle systems originate in the IU. The vehicle's trajectory or flight path can be altered by changing the thrust direction of the S-I's four outboard engines or the six engines in the S-IV.

The IU is located between the S-IV and the payload and is an unpressurized version of the unit flown on earlier Saturn I vehicles. It is 154 inches in diameter, 34 inches high and weighs some 2,600 pounds.

Components are mounted on the inside perimeter of the "wafer." The unit has a preflight nitrogen purge system to prevent gaseous oxygen and gaseous hydrogen from collecting in the unit and possibly being ignited by a spark.

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Marshall Center served as prime contractor for integration of the SA-10 instrument unit. International Business Machines Corp. provided some of the components and will assume full integration responsibilities as prime contractor early in the Saturn IB program.

LAUNCH PREPARATIONS

The launch of the tenth Saturn I will be conducted by a team headed by NASA's Kennedy Space Center personnel. The blockhouse of Launch Complex 37 will be manned by about 250 persons during the final stage of the 16-hour, 45-minute countdown.

As in previous Saturn launches, it will be launched from Pad B, Launch Complex 37.

The S-IV second stage of the launch vehicle arrived at Cape Kennedy on May 9. The S-1 booster came in by barge on May 31 and the instrument unit on June 1.

The booster was erected on June 1, the S-IV on June 8, and the instrument unit on June 9.

Pegasus C arrived at the Cape June 22 and was put atop the launch vehicle on July 2, after pre-mating systems checks and panel deployment checks.

The first four Saturns were launched from adjacent Complex 34. It is now being modified for Saturn IB launches scheduled for early 1966.

Complex 37 covers 120 acres and has two launch pads, A and B. Both pads are serviced by a 310-foot tall, 10 million pound service structure and a common blockhouse.

Pad B at Complex 37 consists of a 47-foot metal launch pedestal which has a 37-foot opening for escape of rocket exhaust. At liftoff the exhaust will be dissipated by a metal flame deflector which is wheeled into place on tracks.

The countdown for the launch will cover two days. The first part of the count, 405 minutes, will be on T-1 day. The second part of the count will begin on launch day at T-600 minutes. The last two minutes, 43 seconds of the count will be controlled by an automatic sequencing system.

T-45 minutes--S-IV liquid hydrogen loading complete.

T-25 minutes--Radio frequency systems on.

T-20 minutes--C-band, Missile Trajectory Measuring System (MISTRAM) and Frequency Offset Doppler (ODOP) tracking systems on.

T-15 minutes--Range safety command transmitter on.

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T-10-12 minutes--Telemetry calibration.

T-5 minutes--Ignition arming on.

T-4 minutes--Range clearance for launch.

T-3 minutes, 40 seconds--Arm destruct system.

T-2 minutes, 43 seconds--Launch sequence starts.

T-2 minutes, 33 seconds--S-IV power transferred to internal.

T-28 seconds--S-1, instrument power transferred to internal.

T-3 seconds--Ignition of eight booster engines.

T-0--Liftoff.

TRACKING AND DATA ACQUISITION

The Pegasus C mission requires extensive ground tracking and data acquisition support. To meet this requirement the Manned Space Flight Tracking Network along with certain elements of the Department of Defense Gulf and Eastern Test Ranges will support the Pegasus spacecraft through its first five orbits, after which Goddard Space Flight Center's STADAN (Space Tracking and Data Acquisition Network) will assume responsibility for monitoring and tracking the satellite.

On-board instrumentation will include a telemetry transmitter scheduled to last about 90 minutes and a C-Band radar beacon scheduled for a 20-minute life.

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The instrument unit and the Pegasus each have two 136-mc telemetry transmitters, one set to close down automatically after 18 months of continuous operation and one to remain dormant until interrogated. An interrogation command will activate the transmitter for 90 seconds. Performing only on command, this transmitter will not be shut down after a specified time.

Radar tracking will be accomplished by stations of NASA's Manned Space Flight Network while the C-Band beacon is active. During the first orbit, acquisition aid antennas associated with the C-Band radars will be used while the UHF telemetry beacon is active. After the C-Band beacon ceases to transmit, the radars will employ "skin" tracking (beam-bouncing) techniques until the end of the fifth orbit.

The STADAN will then track Pegasus for the lifetime of the 136-mc telemetry transmitters. Upon beginning of reentry, or 136-mc transmitter decline, orbital data responsibility will be shifted from Goddard's Data Systems Division (STADAN) to its Manned Space Flight Tracking Network computers. The MSFN will simultaneously resume tracking and data acquisition responsibility throughout reentry.

Optical tracking coverage will be provided by the Smithsonian Astrophysical Observatory's Optical Tracking Network (SAO) whenever visibility conditions permit. MOTS (Minitrack Optical Tracking System) will also be utilized.

Operational control of the Pegasus will be through the Pegasus Operations Control Center, Goddard Space Flight Center, Greenbelt, Md. Command functions required by the Marshall Space Flight Center will be accomplished through STADAN command facilities.

NASCOM (NASA Communications Network) will utilize its SCAMA (Station Conferencing and Monitoring Arrangement) capability to interconnect the STADAN Control Center with network stations, Marshall Space Flight Center and Kennedy Space Center. Located within the Goddard Space Flight Center, SCAMA is an auxiliary, manually operated, switching console that instantaneously connects, disconnects or brings together any combination of STADAN and/or MSFN tracking stations throughout the world. It is "home office" and operational nerve center of NASA's worldwide voice communications network.

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Goddard's MSFN real-time computing system will determine orbital insertion conditions, provide the network with acquisition information during early phase of the mission. During reentry period the real-time system will be used for predictions and impact determination. For the Pegasus during deployment phase, GSFC Data Systems Division will provide the network with orbital and prediction data utilizing Minitrack tracking data.

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