FIRST REVISED EDITION
PRIME ONE TIMELINE
(MODIFIED GRAHAM/MANDEL)

1

FEDERATION SPACEFLIGHT CHRONOLOGY

TERRAN ORIENTATION

TERRANGLO LANGUAGE VERSION

AUTHORIZED
PERSONNEL ONLY
SECURITY LEVEL TWO

Cover art by Paul Davies

This work is dedicated to Geoffery Mandel, who started it for all of us.

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INTRODUCTION

The faculty of Star Fleet Academy here on Terra is both proud and privileged to have had the opportunity to develop this revised edition of our space flight chronology. This edition represents an ambitious effort to provide Academy midshipmen with the latest, most up-to-date illustrated history of Terra's development of space flight and its unique relationship to the Federation Star Fleet. Likewise, the volumes in this series dealing with the development of space flight on other Federation prime worlds is likewise being updated and will be required reading at their local campus of Star Fleet Academy.

It is important to note that when the United Federation of Planets was first conceived in 2127, humanity's progress towards the stars was comparable to that of the other worlds of the Local Group. Humanity was unique in that it had the drive and the will "to boldly go where no one has gone before," as is recorded in the original United Earth Star Fleet Charter. It was primarily for this reason that the other members of the Local Group looked to Terra for leadership in matters regarding the advancement of space technology. It is a practice that continues to this day.

This work is designed for use in conjunction with other Academy texts for the instruction of fourth-year midshipmen in space flight history. Serious students of starship history should augment this knowledge with other reference works, such as the online edition of the FEDERATION ENCYCLOPEDIA OF SPACECRAFT, edited by April and April. Students wishing to focus their studies on the military vessels of Star Fleet should consult SHIPS OF THE STAR FLEET, edited by Mastercom / SFHQ. Other recommended civilian works include the STARSHIP RECOGNITION HANDBOOK by Interstellar Associates, JAYNZ' SHIPS OF STAR FLEET from Memory Alpha, and JACKILL'S REFERENCE SERIES by Jackill Publications.

This work is divided into twelve sections dealing with selected periods of human space flight development from its earliest inception to the present day. It closes with speculations about what the future may hold for Star Fleet and Federation civilian starship development. Each section is comprised of an overview of the period, a listing of major starship types, major alien vessels encountered, significant planetary surveys or alien cultural encounters, and finally a series of articles dealing with important historical topics as they relate to human space flight development. Also included at the end of this work is a chart of all the key spacecraft types covered in this work.

The reason this format was chosen is to facilitate its use during a normal 16-week Academy semester on Terra. The intended pattern of study is to take one module a week, with the fourth week reserved for reviewing and testing of the material covered in the prior three weeks. Instructors may at their option include comprehensive six-module reviews on the eighth and sixteenth weeks respectively.

The history of human space flight has without a doubt changed the course of history and shaped galactic events as we know them. It will continue to do so in the future. As long as mankind retains and fuels the drive to explore and broaden his horizons, space will always remain the most interesting of places. The final frontier is not an end, but merely a beginning. Mankind has taken but the first few steps down the path. His future in the stars still lies ahead for him to claim.

RADM Charles Westerfield, Commandant
Star Fleet Academy
Terran campus, San Francisco, 2295

20th CENTURY

The Space Age (1901-2000)

PART ONE

1900-2000: THE SAGA BEGINS

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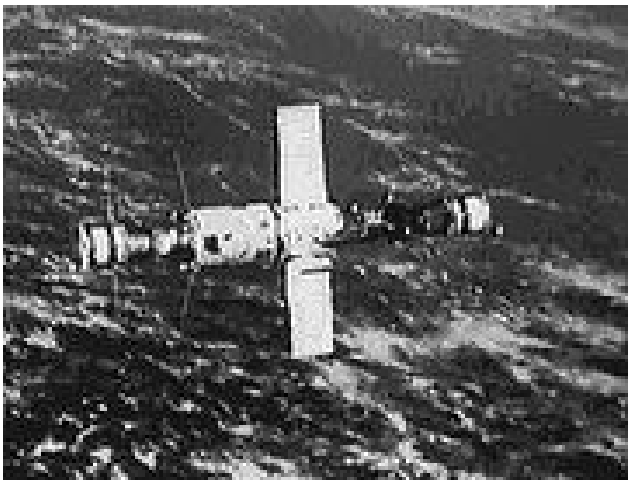
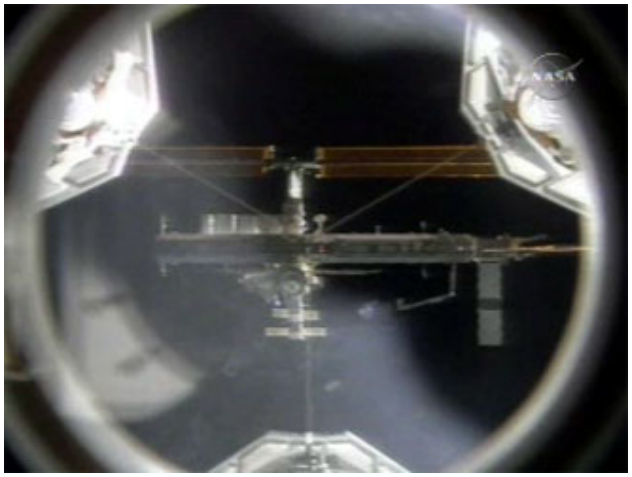
- PROJECT DAEDALUS BECOMES REALITY
- KHAN ESCAPES INTO SPACE
- MOON DECLARES INDEPENDENCE

Saturn V moon rocket, early 1970s

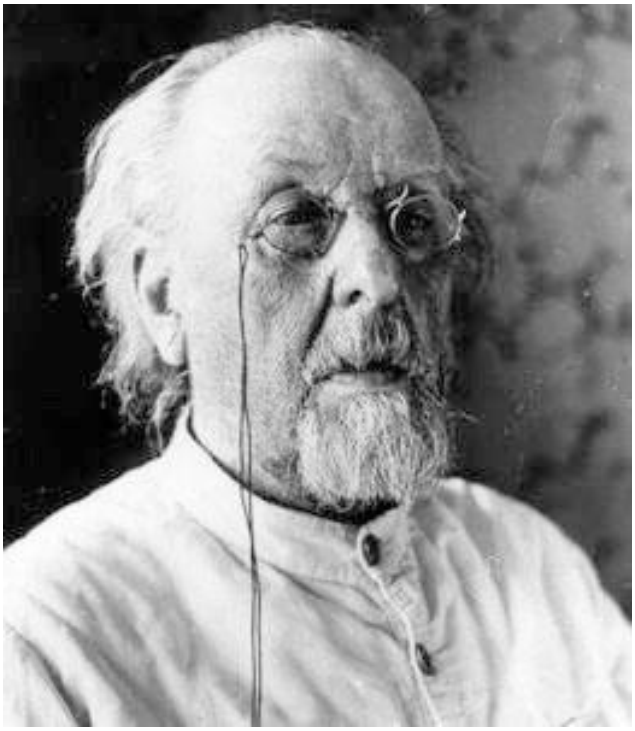


Russian Salyut space station, c.1970s



Space Station Freedom resupply mission, 1986

1900-2000: The Saga Begins



The Earth is the cradle of humanity, yet mankind cannot stay in that cradle forever.

- Konstantin Tsilokovsky (1903)

It is sometimes difficult for Terran midshipmen to grasp the fact that almost three centuries ago their ancestors were only thinking about powered flight. Today the concept of flight is taken for granted. Mankind flies in his atmosphere without a second thought and trips to the stars are commonplace. At the beginning of Terra's 20th century, however, the dream of flight was still very much that: just a dream. It was a myth as old as mankind himself, hearkening back to the ancient legend of Daedalus the craftsman fashioning wings for himself and his son Icarus out of feathers and wax. Humanity is known for its dreams. It is also known for having the knack of turning its dreams into reality.

When two American bicycle shop owners, Orville and Wilbur Wright, left their shop in Ohio for the sandy beaches of Kitty Hawk, North Carolina at the end of 1903 to test something called an *airplane* little did they know how their creation of fabric and wood was about to change the history of mankind. The Age of Flight began with the Wright Brothers and the first successful flight of their frail little airplane. The Space Age, a direct offshoot of the Age of Flight, was about to get underway in a mere four decades. In 1944 the Nazi German government successfully test-fired the A-4 missile, later known infamously by its official military designation of V-2. It was humanity's first true rocket in the modern sense. The success of the V-2 rocket rested on the pioneering research of three different men in three different countries: Konstantin Tsilokovsky of Russia, Robert Goddard of the United States, and Hermann Oberth of Germany. These three men are the godfathers of the early Terran space program. Its midwife was German scientist Werhner von Braun, who designed the V-2, and after World War II would go on to become the chief architect of the early American space program. Often ridiculed by their peers and scorned as impractical dreamers in their day, nevertheless these four brilliant scientists devised the basic theories and technology upon which most of the Terran space effort of the 20th century was based. Without them there would have been no Sputnik, no Vostok, no Gemini or Apollo. America would not have put a man on the moon by 1969 (Terran Old Calendar), nor would the Russians have pioneered the Terran space station, nor would have such revolutionary technologies as the reusable space shuttle and heavy lift vehicle been developed. Without these four men there would have been no Terran space program for decades.

The 20th century was a turbulent time, marked from start to finish by global tensions, political and social unrest, and unprecedented breakthroughs in science and technology. It was one of those rare times in human history when the entire planet went through a

paradigm shift in both lifestyle and philosophy. Two world wars and dozens of smaller ones had a lot to do with that, forcing mankind to up his level of technology again and again in rapid succession. Things that were thought impossible at the beginning of the 20th century, such as computers, became an inexpensive commodity by its end. So it was with the Terran space effort. The visions of the early pioneers in the 1920s and 30s were surpassed beyond their wildest imaginations before the century reached its end.

As with any planetary culture's space program rocket technology paved the way for the rest that would follow. The early efforts of the Germans, which arrived too late near the end of World War II to make their side any difference in the outcome, were capture and eagerly studied by the victorious Americans and Russians. The Russians were on the scene first and got most of the technology and notes. The Americans got the real prize, however. They got Werhner von Braun and his associates. So the official story goes. Whatever else they got, or was possibly spirited away before they could seize it (such as the long-rumored Vrill Program) has never been officially disclosed.

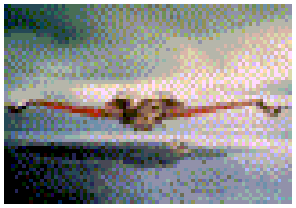
The Russians were first in overcoming almost every major hurdle at the start of the Terran Space Age. They put the first artificial satellite in orbit (*Sputnik I*), they put the first man in space (Yuri Gagarin), the first woman in space (Valentina Tereshkova), launched the first multi-occupant spacecraft (Voshkod), and built Terra's first operational space station (Salyut). It was around this point; however, that the Russian space program failed them. At the risk of oversimplying a complex issue their program had simply become too complicated for its own good. A string of calamites and launch failures over a decade finally resulted in the spectacular catastrophe that was the N-1 manned moon rocket launch test. The resulting explosion not only destroyed the rocket but took out its service gantry and most of the launch complex as well. Successive attempts resulted in equally spectacular explosions. It was at this point that the Russian government finally stepped in and put a temporary halt to the ambitions of Russian space scientists. Not that it mattered by this point anyway, they told their disheartened comrades. The Americans had already beaten them to the moon the year before.

The Americans had started late and a full year behind the Russians insofar as space technology was concerned. Nevertheless they plowed into the fray with all of the gusto and bravado for which their country was known. American President John F. Kennedy, a charismatic politician and a skilled leader to boot (a rare combination), had challenged his people to help their country build a space program that would "put a man on the moon by the end of the decade." His words still carry weight even today: "We do this thing not because it is easy, but because it is hard." He knew that the Americans had the skill, ingenuity, and resources to catch and pass the Russians in the great race to space. Kennedy would not live to see his dream, being slain by an assassin's bullet in 1963; however, the space agency that he founded would make sure his dream became reality. That was NASA, the National Aeronautics and Space Administration and the direct ancestor of UESPA. By the mid 1960s they had successfully duplicated almost every one of the Russian space triumphs. In 1968 they beat the Russians to the moon with the *Apollo* program. The first man to set foot on Luna, the Terran moon, was NASA astronaut Neil Armstrong. Six more missions would follow in the years to come. It was only the beginning of humanity's leap into space.

The biggest problem in getting mankind to the stars was the cost. It was expensive sending up large, one-way rockets that could never be used again. A reusable spacecraft would lessen the costs considerably. Other fanciful dreams such as orbital elevators and tethered satellites were batted around for years. In the end the reusable spacecraft would prove to be the most practical and cost effective approach as far as humanity was concerned. The Americans led in this effort this time around with their OV-100 *Enterprise* class space shuttles, with the Russians playing a close second with their own Buran program. They left the rockets to the Europeans and forged ahead with more advanced technologies. The Russians had pioneered space station technology and were the acknowledged leaders in the field; so naturally they were in charge of the StarLab program. It was the first space station to be built by a joint effort of spacegoing nations, and the first of many such programs on Terra.

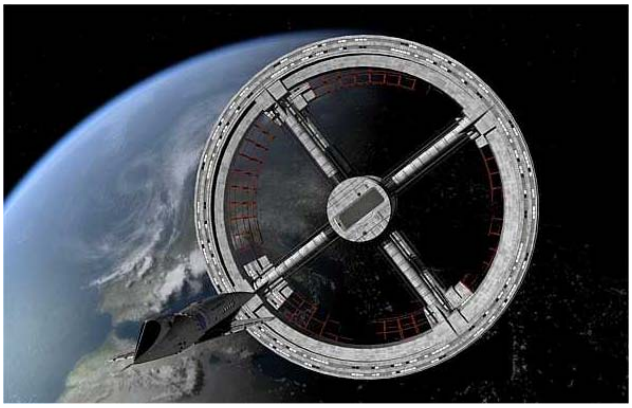
It should come as no surprise that with all of the government activity in space commercial industry and private sector efforts wanted their slice of the pie as well. The privately financed *Conestoga One* rocket program was the first such successful effort, followed shortly thereafter by the Allen-Rutan effort *Spaceship One*. The latter was the first privately built reusable spacecraft, on a smaller scale than but in the same vein as the more expensive NASA space shuttle. These ventures were small, however, compared with commercial ventures. It was largely the backing of private corporations that helped fund the construction of NASA's Goddard Moonbase. Their involvement was purely selfish: zero-gee manufacturing techniques could produce a highly profitable return back on Earth. The same was true for the various planetary satellite networks that provided communications and cheap power on a global scale. Finally, their funding of efforts to explore the inner asteroid belt of the Sol System would bring them financial windfalls the likes of which had not been seen since the petroleum boom days of the turn of the century.

There was also another reason for man to make the move into space. He was not alone in the universe. The fact that other intelligent species existed on other worlds was perhaps the best-kept secret of the governments of Terra in the 20th century. They consistently refused to divulge this information, despite the efforts of such leading scientists as Dr. Hogan Richman, simply for the fear of the impact that such knowledge would have on humanity. The Brookings Report, commissioned by the American government during the Cold War era, had determined that humanity's most probable reaction to a real alien encounter would be worldwide culture shock. Similar studies by the Russian KGB and Britian's U.N.I.T. had come to the same conclusion. Each national government set up one or more secret agencies to collect and collate data on possible and potential alien contacts. Oftentimes even the political leaders of these nations were kept in the dark as to the true nature and extent of such agencies. Their overall plan was to slowly disseminate the knowledge that mankind was not alone in the universe as one might slowly cook a good meal. Too much knowledge too soon and mankind might go into a cultural tailspin from which it might never recover. Too little too late and mankind would not be ready for the day when First Contact would inevitably happen … and it already *had*; at least in officially classified form. Terran leaders desperately wanted their world to be a spacefaring one by the time true First Contact was established. At least then they would be in a better position to bargain and establish something approaching normal relations with their new neighbors in the universe.



By the end of the millennium and despite the brief horror of the Eugenics Wars mankind was about to enter what would seem to be a new Golden Age. Due to the technology developed in the colonization of the Moon and Mars the standard of living went up radically over all of Terra. An agricultural renaissance was about to take place in outer space the likes of which had not been seen on Terra in many lifetimes. Cheap electrical power, in the form of beamed microwave from orbiting space satellites, would eventually account for more than 75% of Earth's power needs. Thus, two of the largest problems facing the people of Earth would be solved overnight. Public support for exploration and utilization of space would never be higher. The future of Man was assured … or so it seemed.

Gerald K. O'Neill, author of *The High Frontier* (1975)



Earth orbital rendezvous (1998)

Hubble Space Telescope (c.1990)

TIMELINE OF EVENTS

1857

- Birth of Konstantin Tsilokovsky.

1882

- Birth of Robert Goddard.

1894

- Birth of Hermann Oberth.

1903

- In his native Russia, academian Konstantin Tsilokovsky publishes the first of what will be many papers espousing the possibilities of manned flight into space via rocket technology. Among the concepts he envisions are the multi-stage rocket, the orbital space station, the space elevator, spacecraft airlocks, and closed-cycle spacecraft life support systems. All of these are generations ahead of their time.
- Orville and Wilbur Wright make the first successful flight of a heavier-than-air powered vehicle, the airplane, on the beaches of Kitty Hawk, North Carolina (United States).

1912

- Birth of Werhner von Braun.

1919

- Robert Goddard publishes *A Method of Reaching Extreme Altitudes*. It describes Goddard's theories about building working solid and liquid fuel rockets, as well as their applications for manned flight. Both the press and his peers will roundly criticize Goddard at the time. Even so, his work will influence the later efforts of Oberth and von Braun.

1929

- Hermann Oberth is the scientific consultant for the Fritz Lang movie *Frau im Mond* (*The Woman in the Moon*). It is the first movie with an off-world setting and helps promote rocket science to the German public. One of Oberth's contributions is to build and launch a working scale rocket as a publicity stunt.
- Part of the team that helps Oberth launch this rocket is Werhner von Braun, one of Oberth's students at the Technical University of Berlin.

c.1930

According to Section 31, the Graham/Mandel *Star Trek* timeline is created when a Depression era bum accidentally kills himself. He does so with a phaser dropped by Dr. Leonard McCoy, a temporally displaced Star Fleet officer suffering from an accidental overdose of cordrazine.

NOTE: This is Prime One, the original *Star Trek* fandom timeline and the one that serves as the basis for this work.

1934

- Werhner von Braun builds and successfully launches two small-scale rockets as a demonstration for the German Army (*Wehrmacht*) working under a grant for the Army's ordinance division. He will later be put in charge of Nazi Germany's ballistic missile development program.

1944

- Nazi Germany initiates the V-2 program, Terra's first successful ballistic missile.
- V-1 and V-2 rockets are used against England in Terra's first ballistic missile program. The technology required for this effort will pave the way for the various Terran manned rocked programs of the later 20th century.

1945

- Nazi Germany begins experimenting with advanced spacecraft propulsion via the secret Vrill Program. Whatever happened to their research remains a mystery to this day.
- After the end of World War II, rocketry pioneer Werhner von Braun surrenders himself to American forces. He voluntarily relocates to the United States via Operation Paperclip. There he will become the father of the United States space program and its official agency, NASA (National Aeronautics and Space Administration).

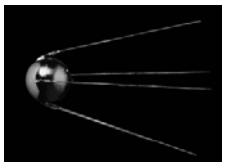
1947

- The crash of a UFO of unknown origin on Terra near Roswell, New Mexico in the United States marks humanity's first recorded official contact with an alien race.

1948

- A "Bumper WAC" (a WAC Corporal rocket mounted inside the nose cone of a captured V-2) is successfully launched by the United States from the White Sands Missile Range. It is Terra's first multistage rocket.

1957



- The Russian-launched *Sputnik 1* becomes Terra's first artificial satellite. Russia takes the lead in Terra's first "space race."

1958

- *Explorer 1* is America's first artificial satellite in orbit around Terra. It is launched by NASA, the ancestor of UESPA.

1961

- Russia keeps the lead in the space race with *Vostok I*, Terra's first orbital manned spacecraft. Cosmonaut Yuri Gagarin becomes the first human in space. The Americans respond with the Mercury program. NASA's long-term goal is to put a man on Luna before the Russians beat them there.

1963

- *Vostok IV* cosmonaut Valentina Tereshkova becomes the first woman in space.

1965

- Cosmonaut Alexei Leonov performs humanity's first space walk from his *Voskhod II* spacecraft.

- The Americans accelerate their space efforts with NASA's Gemini program. They begin to catch up with the Russians, performing five successful missions over the next few years.

1966

- The X-20 DynaSoar project, which would have been humanity's first reusable spacecraft, is cancelled by the United States government due to lack of a clear mission objective.
- "The Cage," the pilot for a new science fiction series named *Star Trek* is shown to television executives. In 1968 it will begin a three-year run on Terra's NBC television network in the Prime One timeline. Its influence on those involved in Terra's various space programs and the youth of its respective countries will resound for decades to come. This event only happens in the Prime One timeline and not in any of its derivatives or "mirrors."

1968

- The Americans beat the Russians to the moon. Commander James Lovell and his fellow Apollo 8 crewmembers are the first humans to view "Earthrise" while in orbit around Luna.

Creation of the Prime One Timeline (c.1930)

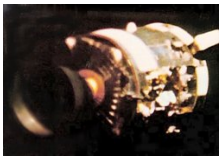
1969

- A massive UFO the size of a 20th century naval vessel inexplicably materializes in the skies above Terra near the Omaha Air Force Base in the United States. Fighters are scrambled to intercept it and force it down but it manages to reach escape velocity and leave Terra's atmosphere before this can happen. At the same time NORAD's computer banks in Cheyenne Mountain monitor and record a transmission burst of highly detailed technical information that could not have come from any nation on Earth. The transmission and incident are immediately classified. The mysterious UFO is subsequently passed off as a "freak atmospheric distortion caused by sunspot activity" despite having been witnessed and photographed by hundreds of people.
- Around the same time (relatively speaking) a freak parallel space-time inversion temporarily switches the main *STAR TREK* actors with their future 23rd century real-life Star Fleet counterparts. This event only happens in the Prime One timeline
- The first Terran space race officially ends in victory for the Americans when NASA successfully sends a manned mission to Luna and back. Apollo 11 astronaut Neil Armstrong is the first human to set foot on another heavenly body, fulfilling an age-old dream of humanity. Seven more manned lunar missions will follow over the next four years before NASA's lunar program is ended by budget cuts. This will curtail human interplanetary exploration within the Sol System for the time being.

1970

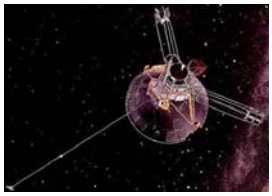
- The "MASTERCOM" transmission of 1968 is discovered in NORAD's computer banks during a routine printout. The official military investigation will eventually determined that the mysterious UFO that appeared in 1969 was the source of the transmission. For political purposes the entire thing is passed off as a hoax. Later, it will be tied into the *STAR TREK* craze and deliberately seeded in 1973 as the most unusual science fiction book of its time. In fact, it is actually part of an unofficial disinformation campaign to discredit the 1969 UFO incident in the public eye.

- The Russian N-1 multistage booster designed to send its own mission to Luna explodes during a launch attempt the Bakinour Cosmodrome. It almost completely destroys its launch facility in the process. Other attempts to launch the massive rocket end in similar catastrophe. The Russian government eventually puts an end to any further attempts to put their own man on the moon.
- Apollo 13 experiences a catastrophic explosion en-route to the moon that cripples the spacecraft and threatens the lives of its crew. They are forced to scrub their lunar landing and return home as quickly as possible before their damaged life support systems fail completely. The saga of their journey and the efforts of NASA Mission Control to ensure their safe return will become one of the legends of the early Terran space program.



1972

- NASA launches the Pioneer 10 long-range survey satellite. This will be the first human object to leave the Sol System.



1973

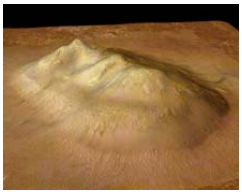
- NASA sends up the Skylab space station to test the realities of long-term life in space. The station's third and final crew remains aboard for 84 days. It is a record that will be broken in a few years by the Russians with their Salyut series of space stations.
- The astronauts of Apollo 18, the last of the early manned missions to the moon, discover the first of the Slaver stasis boxes. Its existence is kept a carefully controlled secret and no mention of it is ever made in the official mission logs. Inside the box is a flying belt, which will prove the key towards development of early Terran antigravity systems in the late 1980s.

1975

- The joint Apollo-Soyuz mission between America and Russia marks the beginning of a new era of cooperation between Terra's two most prominent spacefaring nations.
- The Russian Venera 9 and Venera 10 space probes send back the first images from the surface of the planet Venus before the intense atmospheric heat and density render them inoperable.
- Gerald K. O'Neil authors the book *The High Frontier*. It is a landmark publication concerning the issues in actually building a full-scale colony in space. The term *O'Neil cylinder* and the concept of the LaGrange points (L-4, L-5, etc.) for ideally locating a space station relative to a planet are popularized this work.

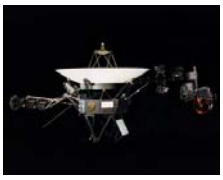
1976

- NASA's Viking 1 probe makes the first successful "soft landing" on another planet in the Sol System. It will be the first of many such missions over the following decades.
- Water is discovered on the surface of the planet Mars by the Viking 2 lander. This supports the notion that human life can be supported on other planets besides Terra in the Sol System



- In the meantime, one of the Viking Orbiters photographs the first potential real evidence of intelligent life other than humanity when it scans the abandoned ruins of a long-dead civilization on the Sidonia plain of Mars. The tantalizing images of "the face on Mars" and "the pyramids of Mars" are posited as relics of a past alien civilization by Dr. Hogan Richman, a former NASA consultant. He and his supporters are roundly criticized by most space experts of the day. They dismiss his evidence as nothing but "shadows" and "image artifacts." The possibility that the images might actually be real will spur future exploration of the Red Planet in the following years.
- The space shuttle *Enterprise*, NASA's first reusable spacecraft, is flown for the first time. It is a test bed for other shuttles to follow and will never go into space itself.

1977



- The first two in what will eventually be a series of six Voyager probes are launched by NASA. The intent of this program is to make a detailed survey of the Sol System outer environs.

1978

- In the largest probe mission of its era NASA's Pioneer Venus mission arrives at its destination. A total of 10 probes are launched from Pioneer Venus and begin making a detailed survey of the planet and its surface.

1980

- NASA's space shuttle program begins in earnest with the successful launch and return of *Columbia*, the first in the series to actually go into orbit. Five more shuttles will transport multiple payloads of various types over the next three decades. NASA's space shuttle program represents the most advanced Terran spacecraft program of its time.

1982

- The United States and Russia fuse their competing space station programs to begin construction on StarLab One. This will be Terra's first permanent manned space station in orbit around the planet.
- Project Galileo departs Earth bound for Jupiter. Upon its arrival it will make the most detailed survey of the Jovian system of its day, including the discovery of water on the Jovian moon of Europa. It will end its life with a dramatic plunge into Jupiter's dense atmosphere, continuing to transmit data until it is crushed by the intense pressure.

1983

- NASA's Space Telescope is launched.
- The end result of NASA's *Pioneer Venus* program is the first detailed map of the planet's normally hidden surface.
- An international consortium of spacegoing nations, with the United States and Russia leading the way, begins construction of a permanent manned base on the moon. It will be named after Dr. Robert Goddard, the American rocketry pioneer.

1985

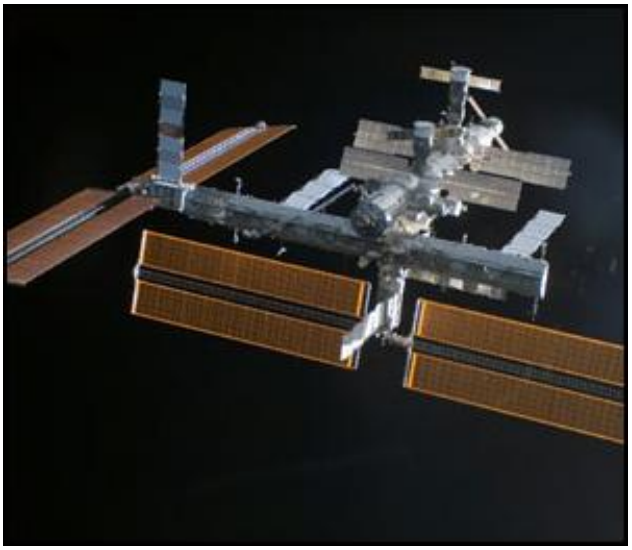
- Beginning this year, a number of Earth space probes launched by various agencies over the next decade will survey the Sol System's most notable comets.
- NASA begins making crew selections for the first manned flight to Mars (Sol IV).

1986

- Mars Probe One, built by Boeing Aerospace under contract to NASA, successfully launches from lunar orbit.
- The NASA space shuttle *Challenger* explodes shortly after launch, killing all seven crewmembers aboard. It is the first tragedy in the space shuttle program the worst disaster in the history of NASA to that date.

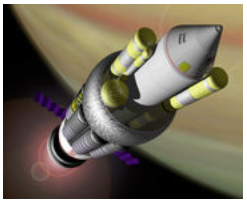
- Goddard Moonbase becomes self-sufficient once its agricultural and hydroponics sections begin operations.
- Initial construction begins on Mars Probe One at Goddard Moonbase. This is to take advantage of Luna's lower gravity. It will be moved into orbit once its building reaches a sufficiently developed stage.

NOTE: According to Section 31 the "Okudaverse" *Star Trek* timeline is created in this year when the technique for manufacturing transparent aluminum is given to humanity years before it was actually discovered by Montgomery Scott. He is temporally displaced and mutinous Star Fleet officer acting in direct violation of the Prime Directive. He is never charged due to his legendary stature in Starfleet. A convenient "temporal accident" will eventually be arranged for him by Section 31 as punishment for his crime. This is Prime Two, the "official canon" *Star Trek* timeline as researched by Mike Okuda for use by Paramount Pictures.



- Construction begins on a second and more sophisticated international space station in Terran orbit. Space Station Freedom is intended to be self-sufficient and a launching point for manned missions to other parts of the Sol System.
- Both NASA and the European Space Agency (ESA) begin surveying the Sol System's inner asteroid belt using a fleet of automated probes with an eye towards future mining operations.
- The United States military's Blackstar program (X-27 Raven and S-3 Condor lifting vehicle) enters service.

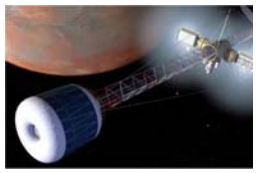
1987

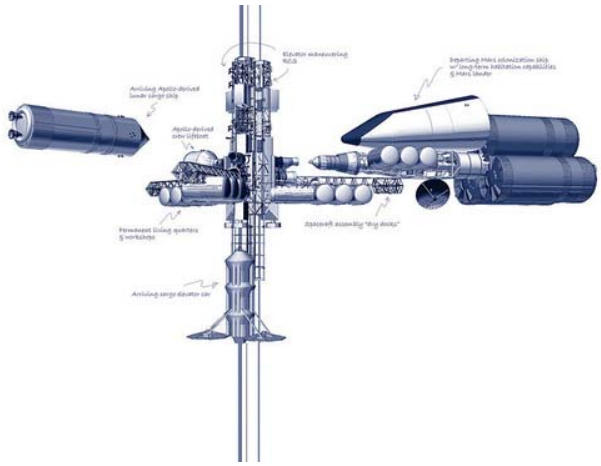


- After almost two years of flight Mars Probe One, aka the *Willy Ley*, successfully inserts itself into orbit around Mars. After several months exploring the planet in surface rovers the Mars Probe One members return to orbit and board the recently arrived *John F. Kennedy*, a faster and more advanced spacecraft newly arrived from Terra to take them back home. The *Willy Ley* will remain in orbit around Mars for use as a waypoint and impromptu space station by future manned missions.
- The various national space agencies on Terra unite under the banner of the United Earth Space Probe Agency (UESPA), originally a United Nations oversight organization.

1988

- NASA's long-delayed Project Daedalus finally sees fruition (thanks to international funding) in UESPA's Advanced Spacecraft Program. The ship is designed by the Dyson-Yoyodyne commercial consortium and will be formally known as the DY-100 class spaceship.
- The *John F Kennedy* returns to Goddard Moonbase with the crew of Mars Probe One. The data that is publicly released from their expedition initiates the decision to build a permanent manned base on Mars. What they discovered concerning the ruins on the Sidonia plain is kept confidential, much to the continuing frustration of Dr. Hogan Richman and his backers at the Enterprise Mission. The truth that he and his followers suspect about the secrets hidden on Mars will not be revealed until the aftermath of the *Charybdis* disaster – long after Richman's death.





1989

- In orbit above Terra, work begins on the massive fission powered *Martian Genesis* colony ship (see diagram, above right). It will serve as both transport and permanent base for the planned Mars colony once it lands on the Red Planet's surface.

1990

- Nuclear fusion power becomes a practical reality. This opens the door for interstellar travel to nearby planets, like those known to be in orbit around Alpha Centauri and Barnard's Star by this time. The design of the DY-100 class spaceships is changed in mid-production to reflect this breakthrough. This comes too late for the completed *S.S. Savannah*, the class prototype. She will remain, like the *Martian Genesis*, an anomaly for the rest of her service life. She is to be the only DY-100 class spaceship fitted with old-style atomic rocket motors.

- The completed DY-100 class spaceship *S.S. Savannah* is put through her trial runs. She is a prototype intended to test the spaceworthiness of the design, much like the space shuttle *Enterprise* before her. Work continues on the next two actual ships in the class, the DY-101 *S.S. Copernicus* and the DY-102 *S.S. Botany Bay*. *Copernicus* is slated for a Jovian mission, while the *Botany Bay* will survey the Martian moons and the nearby inner asteroid belt.
- The *Martian Genesis* colony ship successfully lands on the Red Planet. The colonists begin the difficult process of setting up a permanent, self-sufficient colony. They will also take the first steps toward terraforming the planet's surface – a process that will take decades to complete.

1991

- The Saturn Dual Probe arrives at the Sol System's great Ringed Planet. Its orbiter begins making a detailed survey of the planet and its moon while a heavily shielded lander attempts to penetrate its dense atmosphere. The probe is eventually destroyed by the ever-increasing pressure; however, it relays constant telemetry on its descent up to the point of its demise.
- UESPA temporarily falls back on cheap rockets to send cargoes into Terran orbit as its various shuttle programs prove too costly to do the job. This move will mark the inception of the various heavy lift vehicle (HLV) programs.
- The *S.S. Savannah* makes its first trial run. It travels from Terra to Luna and back again in approximately 22 hours.

1992

- UESPA phases out the space shuttle programs of the United States and Russia at this time. Both programs are soon replaced by the first of the Space Ferry lifting body rockets. These are environmentally friendly, high-performance, heavy payload vehicles whose main waste products are water and carbon dioxide.
- By this date humanity is firmly dedicated to its space program.

NOTE: Due to this early phaseout of the American and Russian shuttle programs the *Columbia* disaster does not happen in the Prime One timeline.

1992-1996

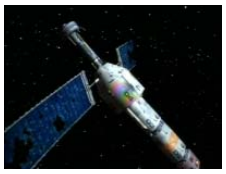
- The outbreak of the Eugenics Wars causes a planet-wide reduction in space launches over the next four years. A number of UESPA facilities in various parts of the world along with their spacecraft are captured, recaptured, and otherwise change hands or go unaccounted for during this time. Among these is the DY-102 *S.S. Botany Bay*, one of the most advanced spaceships of its time.
- 37 million people die in the Eugenics Wars.
- Another result of the Eugenics Wars is that all work stops on building the next generation of commercial heavy lift vehicle. These programs will not resume until after the end of the conflict.
- A popular fad among wealthy humans at this time involves launching the cryogenically preserved remains of loved ones into orbit. This is in the hope that they might be revived someday when more advanced technology becomes available.

1993

- The DY-103 *S.S. Mayflower* is completed on time and on schedule. UESPA immediately puts it to work as a fast transport supplying the Goddard Moonbase on the Terra-Luna run. The move is also designed to keep the ship out of the hands of the warring factions of genetic supermen on Earth, who have already stolen the nearly completed *S.S. Botany Bay* from the UESPA base in Australia where it was being built.
- Five more DY-100 class spaceships will be completed by the end of the year.

1994

- ERMS-2, the first working global climate control satellite, is successfully launched.
- The published research of Miguel Alcubierre proves that faster-than-light travel is possible even given the physical laws of our space-time continuum. His paper, "The Warp Drive: Hyper-fast Travel Within General Relativity," is published by the University of Wales. It causes a sensation among the leading Terran space scientists of the day. Practical applications of Alcubierre's theories are decades in the future, however, given Terra's current technology and the Eugenics War currently raging on the planet.
- A stray ballistic missile from one of the warring factions on Earth hits an orbital cryostorage facility. Dozens of modules are destroyed, while others are blown away into interstellar space to drift forever with no hope of retrieval.

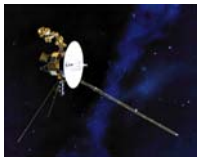


- The last two DY-100 class spaceships are built. Work is already underway to develop and build their successors, the DY-200 class.

1996

- The *S.S. Copernicus* is sent on a mission to Mars to resupply the Martian Colonies. In fact all DY-100 class spaceships still in UESPA hands are sent away from Terra at this time to prevent any more from falling into the hands of the "supermen." The Eugenics Wars are finally winding down and UESPA fears what might happen if one of the factions gains a fleet of advanced spacecraft.
- As UN Coalition forces prepare for their final offensive against the armies of Khan Noonien Singh they are surprised by the sight of the captured *S.S. Botany Bay* blasting off into space. Attempts to intercept it before it can reach space are futile. The *Botany Bay* rapidly accelerates out of the Sol System with Khan and 94 other genetically engineered "supermen" aboard in suspended animation. No UESPA vessel is within range to intercept it. Its last recorded telemetry shows it headed towards Tau Ceti before it disappears from Terran tracking stations.

- *Voyager 6*, the last of the Voyager series of deep space probes, is launched by the United States.



1997

- Antimatter is generated for the first time under carefully controlled laboratory conditions. Alcubierre's Warp Drive Theory postulates that a controlled matter-antimatter reaction is the best means for powering a warp drive starship. The practical use of antimatter in such an engine is still decades, perhaps centuries in the future.

1998

- The science staff of Goddard Moonbase expands to some 70 personnel specializing in the fields of space research and industry. The base itself has now grown well beyond its original three geodesic domes, so much that it can now be spotted with telescopes from the surface of Terra. Goddard Moonbase is officially declared ready to begin commercial operations on 12 September 1998.

- UESPA's *Goliath* HLV cargo rocket program begins operation on Terra. These compete with the Space Ferries on the low end of the cost scale. It soon becomes the favorite "heavy lifter" of Terra's rapidly growing private space industry. Many companies that can't afford a Space Ferry ride or have "cheap" orbital cargoes (such as raw bulk resource shipments) choose a cheap Goliath launch over a costly Space Ferry ride. Other cheap cargo rocket alternatives include Dyson-Yoyodyne's *Conestoga III* and the Rozhenski-Petrov HSFL (Heavy Solid Fuel Lifter).

1999

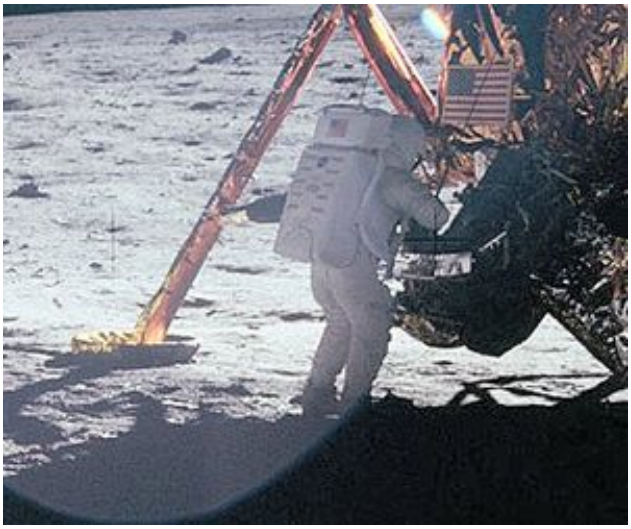
- The Asteroid Belt Lander program confirms what Terran space scientists have long suspected. The inner asteroid belt of the Sol System is rich in raw materials, making it a prime source for mining in the near future to fuel Terra's rapid space industrialization.

2000

- Pre-millennial hysteria proves unwarranted as the "Millennium Bug" fails to paralyze Terra's massive public and private computer networks.
- The Goddard Moonbase and its auxiliary facilities declare themselves to be the independent nation of Luna and requests status as a UN protectorate. The request is granted, forming Terra's first interplanetary government.
- The DY-200 *Brenton* class spaceships begin construction. Their primary mission as designed will be to transport work crews and space mining equipment to the Sol System's inner asteroid belt.

- Morse Code is officially discontinued as a means of communication.
- The Millennium Gate biosphere is constructed by a dedicated group of New Age advocates on Earth. It will serve as the model for the main city of the Martian Colonies in the early 21st century.

NASA Mercury capsule *Aurora 7* (1962)



Apollo 11 astronaut Buzz Aldrin

Apollo 11 on its way to the moon (1969)

Space Station Freedom (c.1990)

Russian Buran space shuttle (c.1995)

SPACESHIPS

VOSTOK

SERVICE ENTRY DATE (OLD CALENDAR): 1961

Vostok I was the first successful manned Terran space vehicle. It carried a crew of one human, Russian cosmonaut Yuri Gagarin, orbiting the Earth in a little under two hours before parachuting back to Earth. Its successful launch and recovery was another first for the Russian space program, keeping them well ahead of American progress at the time. *Vostok IV* carried Terra's first woman into space, Russian cosmonaut Valentina Tereshkova. The design would be quickly phased out of service once the larger and more rugged Vokshod spacecraft became available.

SPECIFICATIONS:

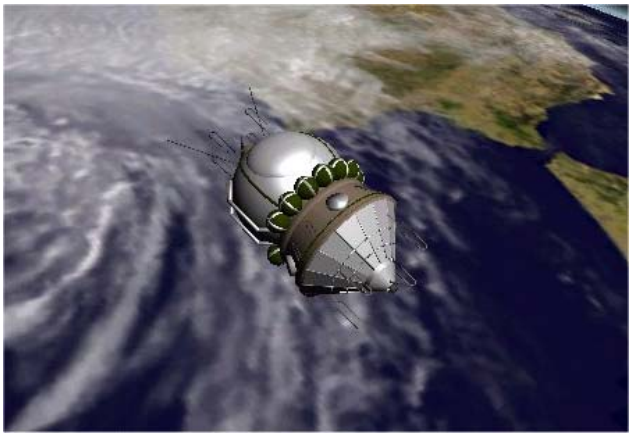
Length: ..... 6.7 m
Beam: ..... 4.3 m
Mass: ..... 4.73 DWT
Number of occupants 1
Range: ..... 12 days at maximum life support capacity

Apogee: ..... 302.3 km above sea level
Perigee: ..... 176.3 km above sea level
Flight duration: ..... 1 full orbit

Innovations/Experiments:

- Conducted audiovisual communications with Earth

VISUAL:



SOYUZ

SERVICE ENTRY DATE (OLD CALENDAR): 1967

Perhaps the most outstanding success of the early Russian space program other than their space stations was this three man orbital spacecraft. It was in service longer than any other pre-UESPA Terran spacecraft. Some were even being flown by private Russian firms after the turn of the millennia. The design was proven and durable, with a long history of reliability and accomplishment. There were even two versions designed for travel to Luna, although they never saw official service. Soyuz spacecraft held the Terran record for longest space flight duration (425 hours) until arrival of the space shuttle programs.

SPECIFICATIONS:

Length: ..... 8.7 m
Beam: ..... 7.3 m
Mass: ..... 6.69 DWT
Number of occupants 3
Range: ..... 18 days at maximum life support capacity

Apogee: ..... 224.0 km above sea level
Perigee: ..... 204.0 km above sea level
Flight duration: .....limited only by available supplies

Innovations/Experiments:

- First three occupant Terran spacecraft
- Most reliable Terran pre-fusion manned spacecraft

VISUAL:

APOLLO

SERVICE ENTRY DATE (OLD CALENDAR): 1968

Soyuz's counterpart in the United States space program was Apollo, a multistage long-range three-person spacecraft. That was also the primary difference between the two. Soyuz was optimized for Earthspace operations, while Apollo was designed to fly its crew on a round trip to Luna and back. When NASA's initial lunar exploration program ended in the 1970s then so did Apollo, making any fair comparison with Soyuz difficult at best.

The primary Apollo spacecraft consisted of the three-person command module and a larger service module that held the main rocket motor, fuel, and life support systems. This service module was jettisoned prior to re-entry in Terra's atmosphere. Apollo moon missions also included a two-person Lunar Excursion Module (LEM, not pictured) with which the main Apollo craft would dock prior to the trip to Luna.

SPECIFICATIONS:

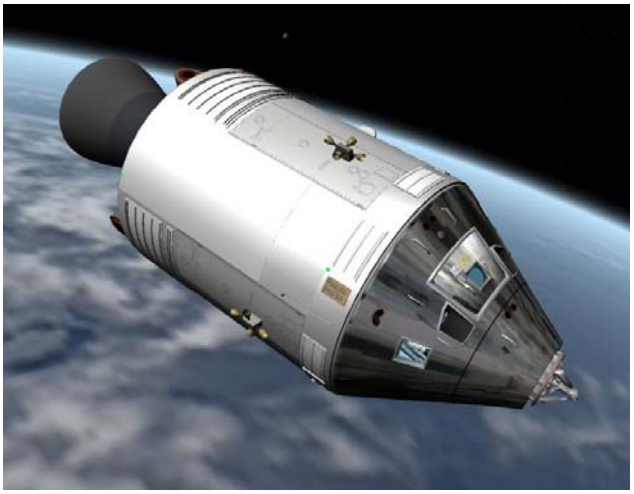
Length: ..... 6.7 m
Beam: ..... 4.3 m
Mass: ..... 4.73 DWT
Number of occupants 1
Range: .....12 days at maximum life support capacity

Apogee: ..... 302.3 km above sea level
Perigee: ..... 176.3 km above sea level
Flight duration: ..... 1 full orbit

Innovations/Experiments:

- First manned Terran craft to leave orbit (Apollo 8)
- First successful touchdown and exploration of surface of Luna, Terra's moon (Apollo 11)
- Discovery of first known Slaver stasis box (Apollo 18)

VISUAL:



SKYLAB

SERVICE ENTRY DATE (OLD CALENDAR): 1973

Skylab was NASA's first space station and Terra's first orbiting space laboratory. As such it is usually regarded as the true ancestor of StarLab even though the Russian Salyut space station was first in orbit. The intent of Skylab was to study the effects of long-term weightlessness and enforced "cabin fever" on astronauts in preparation for NASA's planned trip to Mars. The Russians took the hint and sent up a new Salyut with even more scientific capacity than Skylab.

Skylab was built using recycled Apollo and Saturn hardware in an effort to save costs. Skylab's unlaunched ancestor, the Gemini-based MOL (Manned Orbital Laboratory) was designed in the same manner. As with all early Terran space stations prior to Space Station Freedom it ended its service life by burning up in Terra's atmosphere.

SPECIFICATIONS:

Length: ..... 29.3 m
Beam (excluding solar panels): ..... 7.2 m
Mass: ..... 70.9 DWT
Number of occupants 1
Range: .....12 days at maximum life support capacity

Apogee: ..... 444 km above sea level
Perigee: .....345 km above sea level
Orbital duration: ..... 102 minutes

Innovations/Experiments:

- First full scientific laboratory in orbit
- First Terran tests of extended duration weightlessness

VISUAL:

X-20 DYNOSAUR

SERVICE ENTRY DATE (OLD CALENDAR): 1963

The X-20 DynoSoar (Dynamic Soarer) was a black project designed by the United States military in the late 1950s. Its purpose was to build a reusable "space plane" compatible with the existing rocket technology of the day. The idea was that it would launch either on top of a Titan IIC rocket or, as later proposed, on the back of an XB-70A Valkyrie bomber at high altitude. After orbital insertion the pilot would conduct whatever top secret mission he or she had been assigned, then re-enter and land just like any other airplane.

The production model X-20A, had it been built, would have been longer and somewhat larger than the X-20 prototype. This was for its modular bay (an ancestor of the OV-100's cargo bay), which was designed to accept a variety of mission packages. The X-20B would have had an even larger bay and more option packages. The X-20C would have been capable of carrying and delivering a nuclear payload.

The DynoSoar project never got beyond the working prototype stage. The United States government cut its funding in 1966 mere months before the first manned test flight because they could not see any clear purpose for such a craft. Be that as it may, the concepts and technology that went into the DynoSoar program would be revisited in later years with both the X-27 Raven and OV-100 space shuttle programs.

A popular fictional movie of the day named *Marooned* featured an early X-20 concept design configured with a four-man rescue module. In the movie it was sent up to rescue the crew of a malfunctioning *Apollo* spacecraft.

North American XB-70 Valkyrie Bomber (c.1970)
This would have been the DynoSaur's secondary launch vehicle

SPECIFICATIONS:

Length:	10.8 m
Beam:	6.4 m
Draft:	3.5 m
Mass:	6.5 DWT
Crew	1
Maximum altitude:	90 km above sea level
Flight duration:	1 full orbit
Range after re-entry:	3150 km
Cruising speed:	14,000 km/hr
Maximum speed:	42,500 km/hr

Innovations/Experiments:

- First reusable Terran spacecraft
- Direct ancestor of X-27 Raven and OV-100 space shuttle

VISUAL:

X-20 prototype after atmospheric drop test (1964)

X-20A DynoSoar (conjectural))

X-27 RAVEN

SERVICE ENTRY DATE (OLD CALENDAR): 1986

The X-27 Raven was the United States military's counterpart to the civilian OV-100 space shuttle program. It was for the most part an updated version of the X-20 DynoSoar program but with a more clearly defined mission in mind. After the loss of the space shuttle *Challenger* in 1984 the United States military wanted its own reusable space vehicle. Their reasoning was that since one shuttle had failed others might. They did not want, to borrow a Terran phrase, "to put all of their eggs in one basket" when it came to launching military satellites. Since the DynoSoar had already proven itself in prototype all that was needed was to update the design and avionics for its new mission: that of a reusable military launch vehicle for covert satellite launches. The United States approved this crash black project this time around under the code name Raven, provided that it had to be built entirely out of proven, off-the-shelf (and therefore cheap) technology.

Building the Raven was no problem, given its origins in the DynoSoar, and the extensive use of composites cut its weight in half. Building its launch vehicle without escaping notice was proving to be another challenge; that is, until someone remembered that the United States Air Force still had the parts for a third unbuilt XB-70 Valkyrie bomber in storage at its Groom Lake testing facility. The new launch vehicle, now designated the SR-3 Condor, was built to a modified Valkyrie design to address problems found when flight-testing the original two prototypes back in the 1970s. The only real difference from the original configuration was that the SR-3 would carry the X-27 aloft on a centerline belly mount, as opposed to the above-wing center fuselage mount planned for the XB-70A.

In a normal mission run an SR-3 would launch from Groom Lake (the infamous "Area 51" of UFO lore) with the X-27 riding beneath until a speed of Mach 3 and a ceiling of 31.6 km had been reached. At this point the SR-3 would release the X-27 and then immediately bank out of its way. As soon as the SR-3 was clear the X-27 would fire its rocket engine, boosting it to orbital velocity. Upon reentry it could land as would an OV-100 series space shuttle at any suitably equipped airfield.

The first X-27 Raven underwent aerodynamic testing in 1986 and first successfully launched into space by the end of that year from atop its Condor carrier plane. Operational SR-3s were spotted by civilians in and around the Groom Lake area from 1987 to 2000. The X-27 was first spotted at Holloman AFB, New Mexico in 1994. The tandem combination was only sighted once while in flight in mid-1998. At least two more X-27 Ravens were built over the following decade as well as a second SR-3 Condor lift vehicle. The program remained in service at least as long as did the OV-100 shuttles (possibly a few years longer) before it was officially retired.

SPECIFICATIONS:

Length: ..... 30 m
Beam: ..... 13 m
Draft: ..... x m
Mass: ..... 3 DWT
Crew 1
Armament ..... varied with mission
same as X-20C DynoSaur – one or two standard or MIRV nuclear warheads

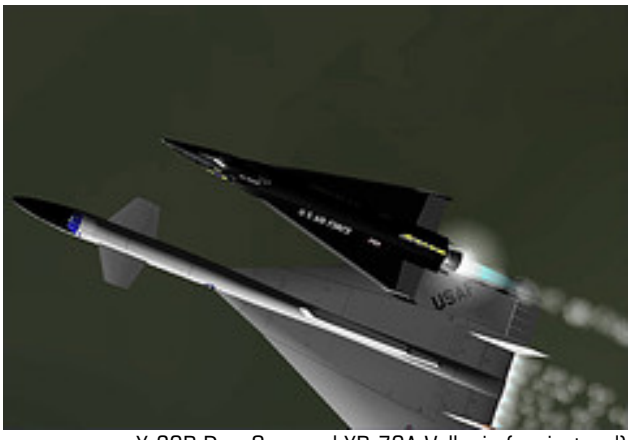
Maximum altitude: ..... 100 km above sea level
Flight duration: ..... 1 full orbit
Range after re-entry: ..... unknown

Cruising speed: ..... unknown
Maximum speed: ..... unknown

Innovations/Experiments:

- Updated version of X-20 DynoSaur concept
- Military counterpart to OV-100 space shuttle
- First mission configurable military space vehicle
- First potentially armed Terran space vehicle (in one discussed configuration)

VISUAL:

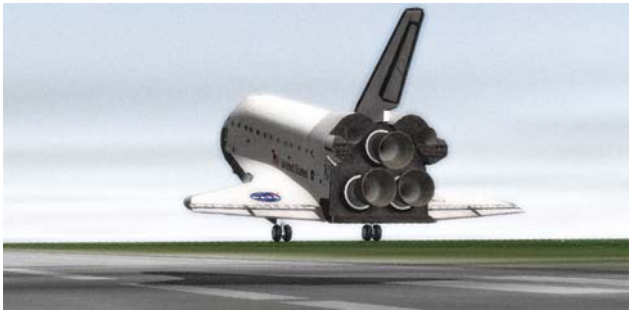


X-20B DynoSaur and XB-70A Valkyrie (conjectural)

SR-3 Condor and X-27 Raven (conjectural)
Note the similarities between the two programs

OV-100 CLASS SPACE SHUTTLE

SERVICE ENTRY DATE (OLD CALENDAR): 1980



OV-100 *Enterprise* during atmospheric test flight (1977)

If Mars Probe One is to be regarded as NASA's crowning achievement, then the OV-100 series space shuttle program was NASA's most enduring legacy. It was the first Terran spacecraft designed for reuse after its return. It was the first multi-launch large cargo space vehicle, which earned it the unofficial nickname of the "space truck" in its day. It was also the first Terran spacecraft designed with an extended lifespan in mind. Properly maintained and serviced, each NASA space shuttle was supposed to last, to borrow a phrase from the era, "10 years or 100 launches, whichever comes first." Most of the major satellites and probes of the day were carried aloft and launched from a space shuttle. Many of the components for StarLab and Space Station Freedom were hauled aloft in a space shuttle. Although operational for only 12 years, the space shuttle became such a fixture that, save for one notable exception, launches became a routine part of normal Terran life.

The basis space shuttle system was comprised of four parts: two solid rocket boosters for initial launch, an external fuel storage tank for orbital insertion burn, and the space shuttle orbiter itself. Only the solid rocket boosters and orbiter were reusable; the fragile external fuel tank was not designed to survive the heat of re-entry. Building it to do so would have made the whole system too heavy for launch. The sheer size of this configuration required the launching platforms that NASA had originally designed for the Apollo program. After launch the boosters would burn until their propellant was expended, then they would be jettisoned and the orbiter's main motors would kick in burning fuel from the external tank. After orbital insertion the external tank would be jettisoned and the space shuttle orbiter would begin its mission in space.

The shuttle's likeness to that of a terrestrial airplane was not accidental. Extensive research with lifting bodies in the 1960s and 1970s had provided NASA with the data necessary to design a shape that would both survive re-entry and be able to glide to a landing like a normal aircraft would. A similar approach was used in the military X-20 DynoSoar and X-27 Raven programs (see separate articles). This long glide was necessary because the orbiter would have no fuel to burn for course correction once it began re-entry. This also dictated a suitably prepared landing area. Four sites in the United States were supplemented by two more in Europe and one in Eastern Russia. This gave any returning orbit plenty of target field s on which to land. The orbiter system was also capable of ditching in a belly landing on water in an emergency.

The OV-100 series shuttle's large payload bay measured 18m by 4.6 meters and could lift aloft any cargo that would fit inside. Most of the time this was used for orbital launches of scientific and communications satellites (as well as a handful of military birds). A specially configured laboratory module called SpaceLab allowed for basic industrial and scientific research of commercial manufacturing processes in weightless conditions as had been done with Skylab years before. A first for a Terran spacecraft was the shuttle's Canadian-built manipulator arm, which could be employed like a giant waldo to pull cargoes out of the bay, put them in, or assist with exterior work on other spacecraft and satellites.

When the OV-100 space shuttles first entered service the entire launch delivery system was painted white. NASA engineers later learned they could save launch weight (and much needed money) simply by not painting the shuttle's external fuel tank. This is why it has an orange or rust color in later images. The avionics systems of the OV-100s were upgraded three times during their lifetime to match rapid advancements in Terran computer technology.

The worst disaster in Terran space history up that time occurred on January 28, 1986 when the space shuttle *Challenger*'s main fuel tank exploded a mere 59 seconds after launch. The orbiter was blown to pieces in one of the most horrifying "live" sights ever captured on Terran media. The entire crew died seconds later when their crew cabin, falling out of control, hit the nearby ocean at a speed of over 300 mph. As a nation mourned the entire space shuttle fleet was grounded while the explosion was investigated. The fault was eventually traced to an O-ring seal in one of the main booster rockets that had failed in the extremely low temperature conditions that existed on the launch pad just prior to launch. This was an environment in which the seal had never been designed to operate. The seal had broken as the shuttle launched, causing ignited fuel to spray directly on the shuttle's main fuel tank and burning a hole through it, causing the explosion 59 seconds into launch. This O-ring system and many other related space shuttle components were redesigned and new safety procedures were put into place before NASA would allow the shuttles to fly again.

SPECIFICATIONS:

Length: ..... 37.2 m
Beam: ..... 23.8 m
Draft: ..... 17.3 m
Mass: ..... 68 DWT
Crew 7

Maximum altitude: ..... 1000 km above sea level
Flight duration: ..... 7-30 days
Range after re-entry: ..... 2035 km

Average landing speed: ..... 335 km/hr

Maximum payload-to-orbit ..... 29.5 DWT
Maximum payload-to-ground ..... 4 DWT

Innovations/Experiments:

- First reusable Terran spacecraft
- First multiple mission, variable payload Terran spacecraft
- First production Terran spacecraft purposely designed for a conventional landing

VISUAL:

OV-105 *Atlantis* launch (STS-71)

DY-100 CLASS SPACESHIP

SERVICE ENTRY DATE (OLD CALENDAR): 1990

While Apollo was Terra's first crude interplanetary spacecraft, the Dyson-Yoyodyne DY-100 was the first practical one. Built to take advantage of almost three decades of Terran space technology it proved to be the most versatile vessel of its time. In both civilian and military roles, as both freight hauler and peacekeeper, and even (in one notable instance) as an escape ship the DY-100 consistently outperformed every other Terran spacecraft of its day. It would eventually initiate an entire series of Terran spacecraft designs, and some of those built to a DY-100 derived design are still in service even today.

The DY-100 *Copernicus* was the first ship in the class and was completed before the fusion power breakthrough in 1990. She was the only one with old-style nuclear rocket engines and is currently on display at the Federation Air and Space Museum on Terra. The DY-102 *Botany Bay* was stolen by former Earth dictator Khan Noonien Singh, who used it to escape prosecution for war crimes along with 96 of his followers in 1996 following the end of the Eugenics Wars. The vessel was not recovered until some two centuries after it had launched – fully operational and will all aboard still alive in suspended animation, a striking testament to the durability of its design.

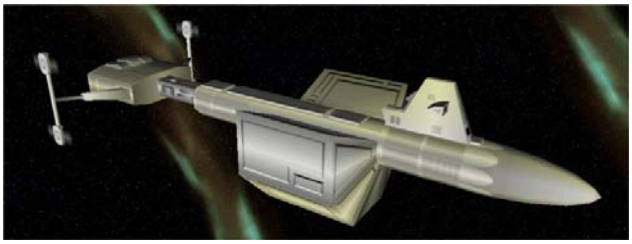
SPECIFICATIONS:

Length: ..... 108 m
Beam: ..... 48.8 m
Draft: .....32.3 m
Mass: .....,, 27.2 DWT
Crew 20
Range: ..... 3.87 megameters maximum limit
Cruising speed: 0.005c
Maximum speed: 0.4c

Innovations/Experiments:

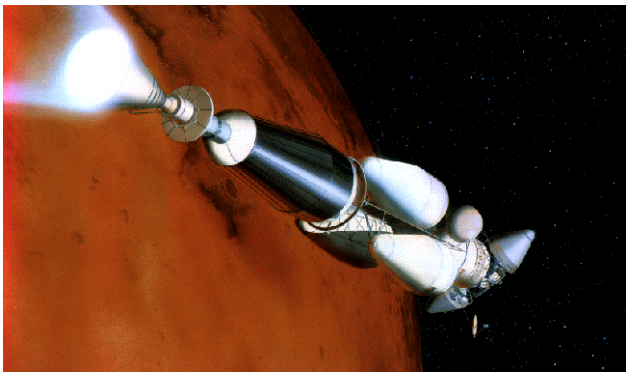
- First mass produced Terran interplanetary craft
- First fusion-powered Terran spacecraft
- Could carry up to ten mission-configurable, multi-link cargo modules

VISUAL:



MARS PROBE ONE

SERVICE ENTRY DATE (OLD CALENDAR): 1996



Mars Probe One was perhaps the single greatest achievement of America's NASA space agency prior to its absorption into UESPA. It had been known for years that Mars had the greatest potential of any nearby Sol System planet for a Terran colony; however, getting there was the problem. The answer was found in Project Orion, a modernized version of the early NERVA nuclear rocket program. The fact that it would be using fission powered rocket plus the need to carry stores and equipment for a round trip of three to four years, plus time spent on the surface of Mars, dictated the sheer size of Mars Probe One. This was the main reason why Mars Probe One was built at the Goddard Moonbase instead of on Terra, where Luna's lower gravity would help in such a massive undertaking.

Mars Probe One was actually two ships in one. The *Willy Ley* served as orbital parent ship while the smaller *John Carter* made the actual surface landings. The *Willy Ley* was built a section at a time (as was the *Carter*), each carried up into space aboard a space shuttle and then ferried to the then-building Goddard Moonbase. A total of 71 such trips were required before Mars Probe One completed construction. The actual pilot module for the *Ley* only required the first trip; the rest was for the ship's massive superstructure and the ferrying of components for the *John Carter* lander. An early form of artificial gravity was provided via centrifugal motion generators attached to a single rotating section of the ship. This was the first and last time such a system was ever used in a Terran spacecraft, as more advanced systems became available shortly thereafter. The craft was designed for a 540-day round trip from Terra to Mars and back again. Once construction was approved on a second ship (the *Kennedy*) this feature became a redundant safety fallback. Its *Carter* lander carried two one-man rovers, a base camp module, a portable interplanetary transmitter, and enough materials and supplies to build and maintain a surface expedition for six months. These would be left behind on the surface for future missions once the initial survey was done. The resultant empty storage space aboard the *Carter* was to be filled with rock and soil samples for the trip home to Earth (or so the official report reads; one wonders why they needed so much room for rocks and dirt).

The initial flight to Mars took 342 days 11 hours, just over two days longer than initially planned, with Mars orbital insertion achieved on 24 April 1987. A mid-course correction had to be made in order to avoid a previously undetected meteorite, resulting in the delay. The crew of the *Carter* spent a total of 48 days on the Martian surface. Only 45 had been planned; an extra three were authorized due to problems encountered near the end of the surface expedition. According to official reports the *Carter* burned too much fuel during its landing approach and several non-critical systems had to be stripped out of the ship in order to lighten the load for takeoff.

Mars Probe One had been originally designed for a Terra-Mars round trip; however, this was changed in mid-mission. A follow-up NASA ship, the *John F. Kennedy*, arrived in orbit just as Mars Probe One was receiving the last of its survey teams for the trip back to Earth. Both crews returned to Earth aboard the *Kennedy*. A thoroughly reprovisioned *Willy Ley* was left in orbit as both waypoint and impromptu space station for the next Terran space mission. It remains there to this day as both museum and monument to this remarkable mission.

The *Willy Ley* was named for the co-author of the 1956 book *The Exploration of Mars*, written with the technical input of rocketry pioneer Werhner von Braun. The *John Carter* was named for a popular fictional character created by Terran author Edgar Rice Burroughs who had a series of adventures on the Red Planet. The *John F. Kennedy* was named for the famous United States president who started his country up the path towards space.

SPECIFICATIONS:

Length: ..... 140 m
Beam: ..... 22 m
Draft: ..... 7.3 m
Mass: ...../..... 19 DWT
Crew 6

Apogee: ..... 16,000 km above median surface level
Perigee: ..... 3,200 km above median surface level
Flight duration to Mars: ..... 342 days 11 hrs

Innovations/Experiments:

- First Terran spacecraft to reach Mars (Sol IV)
- First Terran expedition to visit Sidonia

HEAVY-LIFT VEHICLES

SERVICE ENTRY DATE (OLD CALENDAR): c.1996

The Goliath HLV was an idea that had been kicking around NASA ever since the 1960s, when famed German scientist Werhner von Braun first proposed the idea. At the time he had suggested that the massive Saturn rocket designed to carry man to the moon had other uses, such as putting space station components into orbit. The idea would eventually become a reality with *Skylab*, which was built on a Saturn second stage frame and used a modified Saturn IB rocket to achieve orbit. The space shuttle program was supposed to replace such rockets; however, NASA had little use for such old-fashioned technologies once fusion-powered spacecraft became a reality. The buck was passed to private industry, which already had several ideas of its own on reusable industrial launch vehicles.

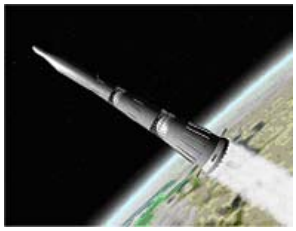
Formal application for the Goliath HLV was made to UESPA in 1995 based on an earlier NASA design study. The first Goliath HLV successfully lifted a test payload to Terran orbit from the Bakinour Cosmodrome the following year. The main body of this first Goliath HLV was retrieved by its Russian owners from the Northern Pacific after its successful splashdown and went on to be reused eighteen more times before it was replaced with another. *Goliath* was the HLV system of choice for the industries of most major spacefaring nations.

There were five other main competitors to the *Goliath* program. Dyson-Yoyodyne's Conestoga III series was based on the original 1970s era HLV design study by Werhner von Braun. Its main drawback was that only the crew/cargo module was reusable; however, this was not seen as a problem by budget-conscious customers with one-shot missions in mind. It proved the most popular because it was the cheapest and used already proven technology. Easy profits from the Conestoga III were used to finance the DY-100 and other similar programs. The British Rocket Group's Space Arrow, based on the old NASA Delta Clipper concept, was the most expensive alternative; however, it had the decided advantage of a completely self-contained reusable craft. It was very popular with Old World European business consortiums. The Chinese Shenzou-10 was the popular model with Asian countries. Finally, the Rozhenski-Petrov HSFL (Heavy Solid Fuel Lifter) was the last gasp of the old Russian space program trying to stay competitive in an already crowded market. It was essentially the old N-1 moon rocket with all of the bugs worked out; consequently, it was the only one of the major competitors to Goliath that could accomplish commercial missions outside of Terran orbit. It saw only a handful of missions in a three-year span, putting communications satellites in orbit around the Moon, before the Rozhenski-Petrov consortium went bankrupt.

Goliath and its surviving competitors would remain in service for almost three decades with budget-conscious space-oriented Terran businesses until fusion powered reusable spacecraft became a practical (and affordable) reality.

VISUALS:

Left – NASA's Goliath
Right – Dyson-Yoyodyne's Conestoga III



Left – Chinese Shenzou-10
Right – Rozhenski-Petrov HSFL

The British Rocket Group's Space Arrow

ALIEN ENCOUNTERS

THE ROSWELL INCIDENT

EXTRACTED FROM THE *WIKIPEDIA* ARTICLE

On July 8, 1947 the Army Air Field in Roswell, New Mexico issued a press release stating that personnel from the field's famed 509th Bomb Group (the Army Air Corp's new nuclear wing) had recovered a crashed "flying disc" from a nearby ranch. This sparked immediate intense public interest. Later in the same day General Roger Ramey, Eight Air Force Commanding General, stated that in fact a weather balloon had been recovered by base personnel, rather than a "flying disc." A subsequent press conference was called, featuring debris said to be from the crashed object that seemed to confirm the weather balloon description. The case was quickly forgotten and almost completely ignore, even by UFO researchers, for some 30 years. Later, in 1978, ufologist Stanton T. Friedman interview former U.S. Army officer Major Jesse Marcel, who was involved with the original recovery of the debris in 1947. Marcel expressed his belief that the military had covered up the recovery of an alien spacecraft. Marcel's story circled through UFO circles, being featured in some UFO documentaries of the time. In February 1980 the supermarket tabloid *National Enquirer* ran its own interview with Marcel, garnering national and worldwide attention for what has since become known as the Roswell Incident.

Additional witnesses and reports concerning the Roswell Incident emerged in the following years. They added significant new details, including claims of a large military operation dedicated to recovering alien craft and even the aliens themselves. The number of downed craft went up to 2 and 11 "crash sites" with corresponding debris fields were also claimed. Consistent with these new tales were reports of alleged witness intimidation by both the military and civilian government personnel involved with the recovery operation. In 1989 former Roswell mortician Glenn Dennis released a detailed personal account of his own purported involvement, in which he claimed that he witnessed alien autopsies being carried out at the Roswell military airfield.

In response to these new reports and a formal congressional inquiry the General Accounting Office launched an inquire into the Roswell Incident. The Secretary of the Air Force was ordered to conduct a full investigation of the matter. The results of this investigation were summarized in two reports. The first, released in 1995, concluded that the reported recovered material was most likely debris from the military's own Project Mogul high-altitude balloon project. The second report, released in 1997, claimed that the alien bodies supposedly seen at the Roswell military airfield were most likely "transformed memories of military accidents involving injured or killed personnel, and the recovery of anthropomorphic dummies in military programs like Project High Dive conducted in the 1950s." The psychological effects of time compression and confusion about when these events occurred supposedly explained the discrepancy of the years in question. These two reports were immediately dismissed by UFO proponents as being either disinformation or simply implausible. Even so, a significant number of serious UFO researchers now discount the probability that an alien craft was in fact involved in the Roswell Incident.

General Arthur E. Exon, an Army officer stationed at Wright-Patterson AFB in the 1950s (where the Roswell debris supposedly wound up), claimed that there was a shadowy group that he called the Unholy Thirteen who controlled the recovery effort and had access to whatever was recovered:

> In the '55 time period there was also the story that whatever happened, whatever was found at Roswell was still closely held and probably would be until these fellows I mentioned had died so they wouldn't be embarrassed or they wouldn't have to explain why they covered it up … until the original thirteen died off and I don't think anyone is going to release anything [until] the last one's gone.

In November 2005 an anonymous source claiming to be part of a high level group within the Defense Intelligence Agency (DIA) began releasing information about the previously unknown Project Serpo. This allegedly confirms that in July 1947 there were two extraterrestrial UFOs that crashed in the state of New Mexico and that this is the same as the Roswell Incident. This source also claims that at least one alien survived the crash, living for five more terrestrial years before dying in 1952..

UFO OVER OMAHA

FROM *UFOs: THE REAL STAR TREKKERS*
BY ALAN ISODORE (TERRA: DOUBLEDAY PRESS, 1995)

Picture if you will a modern naval aircraft carrier a thousand feet long and many, many tons in weight. Big, isn't it? About the size of thirty downtown blocks in any major city you care to choose. Now imagine that same aircraft carrier hanging in the sky over the Nebraska cornfields approximately two miles up in the air. Hard to believe, isn't it? It's true, though. It really happened. The government doesn't want you to believe it. The military sure as hell doesn't want you to believe it. I do. I saw it with my own eyes, just like hundreds of other people did, just like hundreds of others who got their homes ransacked by the Men In Black making off with cameras, photos, film, anything that might have an image of that mysterious thousand-foot ship in the sky back in 1969. They didn't get all of the pictures, though. Some have survived. The best are printed in this book. You be the judge and decide whether or not this UFO was real.

On July 14, 1969, at precisely 2:06 PM air traffic controllers in Omaha were startled to see a large blip suddenly materialize on their radar screens. It was way too large to be an airplane and the Navy was not operating any airships in the area. At first it was suggested that it was a large meteor coming straight down from space – a near-physical impossibility, but nobody was going to say those nasty three little letters "U.F.O." Only air traffic controller Keenon Martin had the courage to call Omaha AFB and alert them to the situation. He was bluntly informed that "it was a military matter" and that the Air Force would handle it.

The intruder was large enough despite the altitude to be seen from the ground. Mary Hastings, who lived with her parents as a child not from the Omaha AFB north gate, remembers playing in her yard when she heard what sounded like a loud clap of thunder. Thinking it was a sonic boom from an Air Force jet she looked up to see if she could tell what it was. What she saw was completely unexpected.

> I saw this shining thing just hanging in the sky up past the contrails. At first I thought it might be a weather balloon or something, so I ran in the house and got my dad's binoculars. Once I looked with those I knew it wasn't a balloon. It was big – God, it was big. It had a saucer in front and two long sticks hanging out the back. It just hung there, like it was hurt or something. I remember thinking if the boom I heard might have been a missile shot at it. Project Blue Book was all the rage then, you know. Maybe the Air Force finally had themselves a real UFO.

The intruder remained motionless in the sky for eleven minutes. This was more than enough time for Omaha AFB to scramble its ready fighters for intercept. At 2:12 PM a flight of four F-104C Starfighters roared off the main runway at Omaha AFB and immediately went vertical. Their mission was obvious to those of us watching: intercept and down the intruder. The flight was commanded by Captain John Christopher, a Vietnam veteran and one of the base's crack pilots. Accompanying him on the scramble were fellow squadron members Captain Edward Crane, Captain Douglas DeSoto, and Lieutenant A.D. Spencer.

According to the flight transcript, which had to be obtained through multiple FOIA requests and is only available in redacted form, at 2:14 PM Christopher's flight had closed enough to make out visual details on the intruder. He described it as a mammoth craft the size of a ship, with a saucer-shaped forward section, two cylindrical projections to the rear and one underneath. He also reported that the craft appeared to be crippled but was beginning to move under its own power. At this point Omaha ordered Christopher to shoot down the intruder. Even as Christopher responded the intruder put on an amazing burst of speed and began to ascend rapidly up though the atmosphere. Christopher immediately went vertical again, firing his afterburners in a futile effort to get a radar lock on the intruder before it escaped him.

What happened next is still a mystery. Civilian ground observers swear they saw Christopher's plane get caught in some kind of beam from the intruder for a few seconds, held motionless, then let go. At the precise moment the beam cut off the intruder disappeared both from sight and civilian radar track. His story, which he has since shared with author, remained the same throughout.

> It was moving fast, but not fast enough to escape radar lock. Just a few seconds more and I would able to carry out my orders. That's when, and this is hard to describe, everything just seemed to freeze for a split second. Images flashed before my eyes. My plane breaking up. Me being pulled aboard the UFO. A room. Voices? No, couldn't be. I was hallucinating. I had never left my plane. I was still sitting in the pilot's seat streaking upward and the UFO was gone. Vanished like it never existed. I reported in that the UFO was gone and I was returning to base.

The Air Force eventually claimed that the intruder had never been real. It was an atmospheric distortion caused by a low flying, ice heavy cloud that caused "a shimmer in the sky" as it passed overhead. Christopher and his flight were sworn to secrecy for the remainder of their active military service.

THE COVER-UP CONTINUES

BART DELL INTERVIEWS DR. HOGAN RICHMAN AS INTERVIEWED ON *COAST-TO-COAST AM*, 23 NOVEMBER 1996

Mars Probe One return ship *John F. Kennedy*

Dr. Hogan Richman was a longtime regular guest of this popular Terran radio show of the day. The former NASA consultant had called in that night to discuss an unusual discrepancy concerning the return of Mars Probe One.

DELL: Are you there, Dr. Richman?

RICHMAN: Right here, Bart.

DELL: Welcome to the program, Doctor. I had a feeling you'd be calling in tonight.

RICHMAN: Now whatever gave you that idea?

DELL: Does it have something to do with today's return of the *Kennedy* from Mars?

RICHMAN: Right the first time.

DELL: Doctor, this press release … what do you make of it?

RICHMAN: As you know, I'm a scientist, so I'm looking at this as a scientist would. We spend billions and billions of dollars, investing years and untold man-hours into the most advanced spacecraft of our time, the ship that's finally going to put man on Mars and answer all of these doggone questions that's been plaguing us ever since Viking, and Mars Global Surveyor, and what do they find? Rocks and dirt?! You've got to be kidding me.

DELL: Do you think they visited Sidonia?

RICHMAN: They say they didn't.

DELL: Do you believe them?

RICHMAN: Do you?

DELL: Noooooo …

RICHMAN: There you go.

DELL: What do you say?

RICHMAN: There's a singular discrepancy about all of this that just reeks of conspiracy.

DELL: What do you mean?

RICHMAN: Well, some of my friends in UESPA have gotten me some of the mission data on the *John Carter* just before it took off to return to space and there's something awfully peculiar about it.

DELL: Such as?

RICHMAN: When the *John Carter* got ready to take off from Mars – that's the lander, folks, the little ship that actually touched down on the surface – they reported a fuel shortage problem. Remember that?

DELL: Yes, I remember that.

RICHMAN: They reported they had burned too much fuel on landing and wouldn't have enough to take back off again without a margin of error.

DELL: Uh-huh.

RICHMAN: They spent two more days going through the ship stripping out everything that wasn't mission critical so they'd lose enough weight to regain their safety margin.

DELL: Why a safety margin, Dr. Richman?

RICHMAN: In case they have to abort during takeoff. As long as they're below a set altitude they'll still have enough fuel to attempt to land again.

DELL: Makes perfect sense.

RICHMAN: Yes it does – on the surface, anyway. That's what's so odd about this.

DELL: What do you mean?

RICHMAN: They landed with more than enough fuel for a safety margin. Follow me, folks. I've got UESPA's actual landing report posted on the

Enterprise Mission website – just follow the link on Bart's page – and you'll want to scroll down until you see the Mars Probe One banner. Look for the *"John Carter* Touchdown Report" and read it.

DELL: I'm looking at it right now, Doctor, and all I see are a bunch of numbers.

RICHMAN: What you're looking for is the last entry, which is the touchdown entry, and go to the column marked FSF – that's Fuel Safety Factor. Now compare that with the number they gave in the press briefing right before takeoff from Mars.

DELL: Just a … I see it. Well, now! How about that?!

RICHMAN: Now ask yourself, Bart, and all of you folks listening in tonight. Why should that number change when the *John Carter* is sitting still on the surface from touchdown until liftoff? They didn't go anywhere. They didn't report any fuel leaks. Why should it change so drastically right before takeoff and right after they got back from their last rover mission?

DELL: Why, Dr. Richman?

RICHMAN: The ship had too much mass. It was too heavy. Between the time they landed and the time they took off that ship put on some serious weight.

DELL: But weren't they going to take back some soil samples or something?

RICHMAN: Yes, but you've got to work the math. Better yet, I've worked it for you. Just scroll on down my web page and look at the next set of numbers. They show the weight of the *John Carter*, the minimum amount of fuel it needs for takeoff, and the fuel safety margin UESPA wants the ship to have. If you do the math, like I have, you'll discover that this little lander, the *John Carter*, this little metal speck on the surface of a big Red Planet, put on about a full metric ton bef—

DELL: A TON?!

RICHMAN: That's a lot of Mars rocks, isn't it Bart? You want to know how many Moon rocks we brought back during all of Apollo?

DELL: How much?

RICHMAN: 841 pounds from ALL SEVEN moon missions.

DELL: How the hell did that ship gain a ton in weight?

RICHMAN: There's only one answer I can think of.

DELL: They found something.

RICHMAN: Ocaam's Razor, Bart. The simplest answer is the probably the correct one. Where was there something to find?

DELL: Sidonia.

RICHMAN: Bingo. Sidonia was within easy reach of their rovers. Now you're going to tell me they didn't go there? That they brought back a metric ton of rocks and dirt instead of something else?!

DELL: That's not what UESPA's going to say.

RICHMAN: Bart, I'm almost willing to lay you odds that even as we speak there's a big gravel truck pulling up behind UESPA Headquarters at the Cape. Some of those nice red Arizona mesa rocks you and I know very well. There's going to be hard put to explain this one. I can't wait to hear how they're going to talk their way out of THIS.

DELL: (laughs) And neither can I. There you have it folks. They greatest mystery of our time keeps getting deeper and deeper. We've got a hard break coming up but after that, we'll spend some more time with Dr. Richman and try to find out just what really UESPA is doing on Mars. A ton?!? Coast to Coast AM … back in a moment.

TERRAN EXPLORATIONS

LUNA (SOL IIIb)

Terra's moon, renamed Luna after it declared independence in 2000, has long been a source of wonder and mystery to the humans of Terra. Its origins are still unclear, but the most commonly accepted theory is that it was a rogue planetoid captured into fixed orbit by the strong gravity of a still-young Terra. Its close proximity to Terra made landing on its surface an important stepping stone for early Terran space efforts.

Luna is a lifeless world, almost completely devoid of atmosphere save for a few gases and a trace of water vapor. It has very little water. Practically all of Luna's water is in frozen form, either trapped deep beneath its surface or pooled in the shadows of craters. Its presence is detectable; however, it normally takes a directed beam of light and a sharp surveyor's eye to discover what few surface patches exist on Luna's surface. Most scientists believe that if Luna ever had an atmosphere then it was ripped away in whatever cosmic event that made it Terra's eternal partner in space.

There were nine early manned expeditions to the surface of Luna. Only seven of these were successful. Apollo 13, launched by the United States in 1970, had to abort its landing attempt after a catastrophic on-board explosion in mid-flight crippled their ship, forcing a dangerous slingshot return to Earth. *Yueliang 1*, a Chinese attempt to put a man on the moon, was lost with all hands when an on-board emergency resulted in a fatal crash on the dark side of the moon. The wrecked Chinese spacecraft was not found until 2002. All such official independent landing efforts ended when construction efforts began on Goddard Moonbase in late 1983.

Here are the dates and locations of all of the early human landings on Luna.

Apollo 11	1969	Sea of Tranquility
Apollo 12	1969	Sea of Storms
Apollo 13	1970	- aborted -
Apollo 14	1971	Fra Mauro
Apollo 15	1971	Hadley Rille
Apollo 16	1972	Descartes
Apollo 17	1972	Marius Hills
Apollo 18	1973	Copernicus Crater
Yueliang 1	1980	wreck impacted in wall of Jules Verne Crater NNE of Mare Ingenii

VISUAL:

SPECIFICATIONS:

Distance from system star ..... 150 million km
Companion to ..... Earth (Sol III)
Period of revolution (Terran measure) ..... 29.5 days
Period of orbit (Terran measure) ..... 27.3 days
Mass ..... 7.3447×10^{22} kg
Diameter ..... 3476 km
Axial inclination 1.5424º
Average surface temperature ..... -175º C

Planetary Richter Scale rating ..... J
Level of technology ..... current

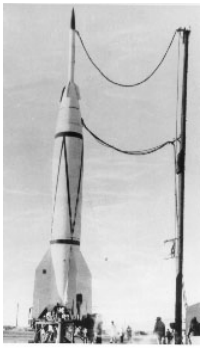
Indigenous culture(s) ..... none
Additional culture(s) ..... Human (*homo terran*)

Major surface features
- Goddard Moonbase (Copernicus Crater)
- Star Fleet Division Shipyards (Aitken Basin)
- Tycho City (Tycho Crater)
- The Mountains of Eternal Light (so named because they remain constantly lit by sunlight due to Luna's synchronous rotation)

HISTORICAL ARTICLES

V-2 BECOMES FIRST SPACE ROCKET

WHITE SANDS MISSILE BASE HISTORICAL ARCHIVE (SELECTED)



Prior to July 1946, Major General H.N. Toftoy, then a colonel and chief of the Research and Development Division, Office of the Chief of Ordinance, suggested the possibility of combining the V-2 rocket and the WAC Corporal. This would provide a two-stage rocket capable of reaching hereforeto unattainable altitudes and would greatly increase the possibilities of upper atmosphere research.

On June 20, 1947, the Bumper Program was inaugurated. This was a co-operative program established among the agencies responsible for the various phases of the basic programs. The purpose of this program was to investigate launching techniques for a two-stage missile and separation of the two stages at high velocity, to conduct limited investigation of high-speed, high-altitude phenomena, and to attain velocities and altitudes higher than ever reached.

In the design finally decided upon, the powder rocket booster normally used to launch the WAC Corporal was dispensed with in order to limit the size of the combination missile and allow the smaller rocket to fit as deeply as possible into the V-2, yet retain enough space in the instrument compartment of the V-2 for housing the indispensable components of its guidance equipment. Also fitted within the instrument section were the guide rails and expulsion cylinders used as a launcher for the WAC Corporal. These cylinders were activated by means of a compressed-air bottle through a pressure reducer and a solenoid valve. This valve was activated by the final cut-off signal of the V-2, causing the fins of the WAC Corporal to slide out of the three slots in the upper part of the warhead launcher.

Eight of these missiles were assembled during the Bumper Program and the first six were launched at White Sands Proving Grounds. The first Bumper-WAC was fired on May 13, 1948. This was the first large two-stage rocket to be launched in the Western Hemisphere. This first combination rocket had a short duration, solid propellant motor propelling the second stage and the WAC attained only slightly more speed and altitude than the V-2. The firing was considered successful in all details.

Bumper 5, fired on February 24, 1949, was the first Bumper to be fired with a fully tanked second stage. This allowed for 45 seconds burning time. The flight was successful in every phase. Thirty seconds after takeoff the V-2 had attained a speed of 3600 mph and the V-2 and WAC-Corporal separated. The WAC, with its power added to that of the V-2, attained a speed of 5150 mph and an altitude of approximately 250 miles. This was the greatest velocity and highest altitude ever reached by a man-made object [at the time].

Through Bumper firings, it was learned that the speed of a rocket or missile could be increased with each successive stage. Step-rockets, fired when the assisting rocket was at maximum velocity, gave the final rocket a speed equal to all stages. Innumerable problems connected with rocket motor ignition and attachment/separation of successive stages were solved satisfactorily, providing a basis for later missile [and rocket] designs requiring similar [conditions]. This program was officially concluded in July 1950.

SOVIET UNION LAUNCHES EARTH ORBITING SATELLITE

FROM *SPUTNIK: THE SHOCK OF THE CENTURY* BY PAUL DICKSON

On a fall Friday afternoon in 1957, five bells rang ominously on noisy teletype machines in newsrooms across Washington, DC as a newswire brought word of Sputnik's launch.

> LONDON, OCT. 4 (AP) - MOSCOW RADIO SAID TONIGHT THAT THE SOVIET UNION HAS LAUNCHED AN EARTH SATELLITE.

The news flash displaced several stories in the works: the tense racial situation at Central High School in Little Rock, Arkansas; the Milwaukee Braves & New York Yankees World Series [baseball game]; and a widespread flu epidemic. Jimmy Hoffa had been elected head of the Teamsters earlier in the day by a vote of 1208 to 453. Yom Kippur was beginning at sundown, and the television series *Leave It To Beaver* would premiere later in the evening on the CBS television network.

Details about the satellite were slow in coming, while information on the launch vehicle, or booster, that put Sputnik in orbit would not be known in the West for years. What was known in the first hours was that the Soviet Union had launched the first artificial satellite to orbit the Earth. It was approximately the size of a basketball, weighed only 184 pounds, and took approximately 96 minutes to orbit the Earth on an elliptical path.

The scientist and engineers assembled at the [Soviet] embassy party were thrilled. Cheers rang out. Within minutes, one of the most impenetrable buildings in Washington was putting out the welcome mat to reporters. The *Washington Daily News* later called it "a veritable open house." Vodka flowed as more news was given out about the satellite. The Americans offered their congratulations, and [American physicist Lloyd V.] Berker proposed a toast, while the Soviet scientists doled out proud quotes. Joseph Kaplan, chairman of the U.S. program for the IGY, called it "fantastic."

Someone brought out a shortwave radio, and soon a beeping noise filled the room. A Russian scientist, Anatoly Biagonravov, confirmed it was Sputnik. "That is the voice," he said dramatically, "I recognize it." John Townsend, Jr., one of the scientists at the party, recalled watching Biagonravov. "I knew him quite well, and I could tell he was a little surprised and quite proud. My reaction was, 'Damn!'"

EXPLORER 1

FROM THE *ABOUT:SPACE* HISTORICAL ARCHIVE

Explorer 1 was the first satellite launched by the United States when it was sent in to space on January 31, 1958. Following the launch of the Soviet Union's Sputnik 1 on October 4, 1957, the U.S. Army Ballistic Missile Agency was directed to launch a satellite using its Jupiter-C rocket developed under the direction of Dr. Werhner von Braun. The Jet Propulsion Laboratory received the assignment to design, build, and operate the artificial satellite that would serve as the rocket's payload.

The primary science instrument on Explorer 1 was a cosmic ray detector designed to measure the radiation environment in Earth orbit. Once in space this experiment, provided by Dr. James van Allen of Iowa State University, revealed a much lower cosmic ray count than expected. Van Allen theorized that the Instrument might have been saturated by very strong radiation from a belt of charged particles trapped in space by the Earth's magnetic field. The existence of such a belt was confirmed by another U.S. satellite launched two months later, and they became known as the Van Allen belts in honor of their discoverer.

Explorer 1 made its final transmission on May 23, 1958. It re-entered Earth's atmosphere and burned up on March 31, 1970, after more than 58,000 orbits.

PRESIDENT JOHN F. KENNEDY RICE STADIUM MOON SPEECH

SELECTED EXCERPTS – 12 SEPTEMBER 1962

No man can fully grasp how far and how fast we have come; but condense, if you will, the 50,000 years of man's recorded history in a time span of but half a century. Stated in these terms, we know very little about the first 40 years, except at the end of them advanced man had learn to use the skins of animals to cover him. Then about 10 years ago, under this standard, man emerged from his caves to construct other kinds of shelter. Only five years ago man learned to write and use a cart with wheels. Christianity began less than two years ago. The printing press came this year, and less than two months ago, during this whole 50-year span of human history, the steam engine provided a new source of power. Newton explored the meaning of gravity. Last month electric lights and telephones and automobiles and airplanes became available. Only last week did we develop penicillin and television and nuclear power; and now, if America's new spacecraft succeeds in reaching Venus, we will have literally reached the stars before midnight tonight.

If this capsule history of our progress teaches us anything, it is that man, in his quest for knowledge and progress, is determined and cannot be deterred. The exploration of space will go ahead, whether we join it or not. It is one of the great adventures of the time, and no nation which expects to be the leader of other nations can expect to stay behind in the race for space.

We set sail on this new sea because there is new knowledge to be gained and new rights to be won, and they must be won and used for the progress of all people. For space science, like nuclear science and technology, has no conscience of its own. Whether it will become a force for good or ill depends on man, and only if the United States occupies a position of pre-eminence can we help decide whether this new ocean will be a sea of peace or a new terrifying theater of war. I do not say that we should or will go unprotected against the hostile misuse of space any more than we go unprotected against the hostile use of land or sea, but I do say that space can be explored and mastered without feeding the fires of war, without repeating the mistakes that man has made in extending his writ around this globe of ours.

There is no strife, no prejudice, no national conflict in outer space as yet. Its hazards are hostile to us all. Its conquest deserves the best of all mankind, and its opportunity for peaceful cooperation may never come again. Buy why, some say, the moon? Why choose this as our goal? And they may well ask why climb the highest mountain. Why, 35 years ago, fly the Atlantic? Why does Rice play Texas?

We choose to go to the moon. We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard; because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one we are willing to accept, one we are unwilling to postpone, and one which we intend to win, and the others, too.

We have had our failures, but so have others, even if they do not admit them and they may be less public. To be sure, we are behind, and will be behind for some time in manned flight. But we do not intend to stay behind, and in this decade, we shall make up and move ahead. The growth of our science and education will be enriched by new knowledge of our universe and environment, by new techniques of learning and mapping and observation, by new tools and computers for industry, medicine, the home as well as school.

To be sure, all this cost us all a great deal of money. This year's space budget is three times what it was in January 1961, and it is greater than the space budget for the previous eight years combined. I realize that this is in some measure an act of faith and vision, for we do not now know what benefits await us. But if I were to say, my fellow citizens, that we shall send to the moon, 240,000 miles away from the control station in Houston, a giant rocket more than 300 feet tall, the length of this football field, made of new metal alloys, some of which have not yet been invented, capable of standing heat and stresses several times more than have ever been experienced, fitted together with a precision better than the finest watch, carrying all the equipment needed for propulsion, guidance, control, communications, food and survival, on an untried mission, to an unknown celestial body, and then return it safely to Earth, re-entering the atmosphere at speeds of over 25,000 miles an hour, causing heat about of that the temperature of the sun – almost as hot as it is here today – and do all this, and do it right, and do it first before this decade is out, then we must be bold.

It will be done … and it will be done before the end of this decade.

Many years ago the great British explorer George Mallory, who was to die on Mount Everest, was asked why did he want to climb it. He said, "Because it is there." Well, space is there, and we're going to climb it, and the moon and the planets are there, and new hopes for knowledge and peace are there. And therefore, as we set sail we ask God's blessing on the most hazardous, dangerous, and greatest adventure on which man has ever embarked.

FIRST MAN IN SPACE

FROM "THESE WE HONOR"
SAN DIEGO AEROSPACE MUSEUM, TERRA, 1984

Colonel Yuri Alexeyevich Gagarin was born of a peasant family in the village of Klushino, Smolensk region in Russia. His education was primarily in the vocations until he entered pilot training at Orenburg in 1957. He graduated with honors from the Zhukovsky Air Force Engineering Academy in 1967.

Cosmonaut Yuri Gagarin was called "the Columbus of the cosmos," an apt and well-deserved title. His epic 108-minute Earth orbital flight on April 12, 1961 was far more than just a successful operational mission. It was man's first encounter with the nether regions of space and the beginning of man's journey to the stars. As pilot of the spaceship *Vostok I* he proved that man could endure the rigors of lift-off, re-entry, and weightlessness, and yet still perform the manual operations essential to spacecraft flight.

Gagarin was superbly prepared for his encounter with history, both physically and technologically. On the night before his flight while others paced and worried "Cosmonaut One" slumbered. When asked how he could sleep so peacefully on the eve of launching Yuri answered, "Would it be right to take off if I were not rested? It was my duty to sleep, so I slept." This is discipline and dedication at its best.

At the conclusion of his flight he was subjected to the most intensive debriefing and scientific examination. It was found in spite of the difficult and strange weightless environment his great skill permitted him to work and to record important data which his fellow astronauts and scientific collaborators would find vital in future space flights.

His impressions of space flight are filled with words of poetry. Joy – beauty – black sky – black stars -- these are the universal words of the pilot who knows and loves the firmament. The light of the bright star of Yuri Gagarin was extinguished on March 27, 1968 in a plane crash near Moscow.

Yuri Gagarin was invested in 1970 into the International Aerospace Hall of Fame.

FIRST OUTER SPACE TREATY

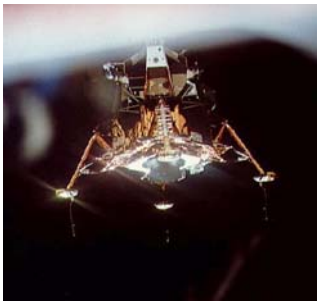
UNITED NATIONS GENERAL ASSEMBLY RESOLUTION 2222 - 1967

The [Outer Space] Treaty was opened for signature by the three depository Governments (the Russian Federation, the United Kingdom, and the United States) in January 1967, and it entered into force in October 1967. The Outer Space Treaty provides the basic framework on international space law, including the following principles:

1) the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries and shall be the province of all mankind;
2) outer space shall be free for exploration and use by all states;
3) outer space is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means;
4) states shall not place nuclear weapons or other weapons of mass destruction in orbit or on celestial bodies or station them in outer space in any other manner;
5) the Moon and other celestial bodies shall be used exclusively for peaceful purposes;
6) astronauts shall be regarded as the envoys of mankind;
7) states shall be responsible for national space activities whether carried out by governmental or non-governmental activities;
8) states shall be liable for damage caused by their space objects; and
9) states shall avoid harmful contamination of space and celestial bodies.

FIRST MAN ON THE MOON

TOUCHDOWN TRANSCRIPT – 16 JULY 1969



(The following transcript extract is taken from NASA archives of the day. It records the actual conversation between NASA's Houston Space Center Apollo Mission Control and the Apollo 11 crew members. *Eagle* was the name given to the Lunar Excursion Module [LEM] that actually performed the landing. *Columbia* is the name for the Apollo craft in orbit around Luna that ferried the LEM there for its landing.)

EAGLE: Houston, Tranquility Base here. The *Eagle* has landed.

HOUSTON: Roger, Tranquility, we copy you on the ground. You've got a bunch of guys about to turn blue. We're breathing again. Thanks a lot.

EAGLE: Thank you.

HOUSTON: You're looking good here.

EAGLE: A very smooth touchdown.

COLUMBIA: How do you read me?

HOUSTON: *Columbia*, he has landed Tranquility Base. *Eagle* is at Tranquility.

COLUMBIA: Yeah, I heard the whole thing.

HOUSTON: Well, it's a good show.

COLUMBIA: Fantastic.

EAGLE: I'll second that.

Six and one-half hours later United States astronaut Neil Armstrong, commander of the Apollo 11 mission, was the first human to set foot on a non-Terran surface. As he did so he said simply, "That's one small step for a man, one giant leap for mankind."

The Apollo 11 landing site, along with all of the other Terran manned and unmanned craft landing sites, are still preserved today as part of the Federation Air and Space Museum's Luna surface tour.

GODDARD MOONBASE OPERATIONAL

AP PRESS WIRE – 14 SEPTEMBER 1998

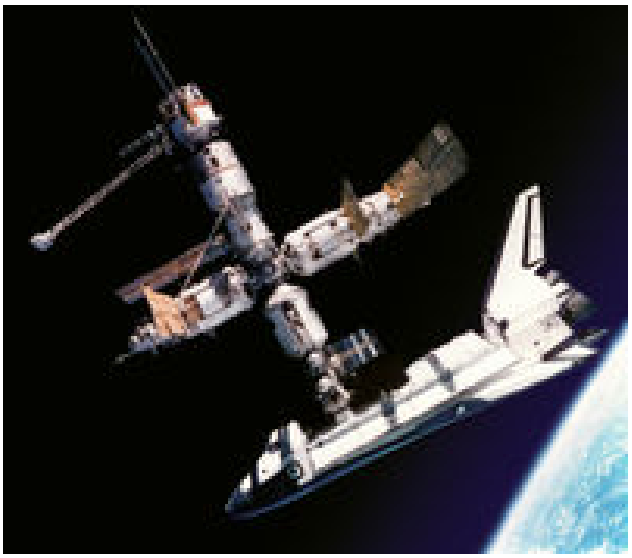
Representatives from the nine major spacefaring nations in the United Nations gathered today a half-million kilometers from their homes to formally dedicate the opening of Goddard Moonbase, man's first permanent outpost on a world other than our own. Encased in three double-hulled geodesic domes, Goddard provides reasonable accommodations for up to 70 people who will live and work at the base along with a limited number of visitors. The base is completely self-contained and self-supporting: using natural water on the moon, generating its own electricity through solar power, and recycling its own air and waste.

Although primarily a research outpost, Goddard marks the first phase of bringing man to the moon in strength. Already extensive commercial mining efforts are being planned and the researchers at Goddard will play a key role in this effort. The high cost of new construction and bringing in new people and materials is expected to be offset by enormous profits gained from low-gravity construction contracts. Plans are already on the board for two significant expansions to Goddard as it grows and becomes more capable of fulfilling the future for which it has been designed.

Goddard, like Apollo-Soyuz before and StarLab to come, is a truly international effort. Both Russia and the United States have used their considerable space expertise in designing and building its first phase. The European, Japanese, and Indian space agencies have also contributed with manpower, tools and technology. All in all Goddard represents the best the world has to offer, as well as the future that it hopes will come.

STARLAB OPERATIONAL

DONALD BUTLER, ASSOCIATED PRESS – 16 OCTOBER 1982



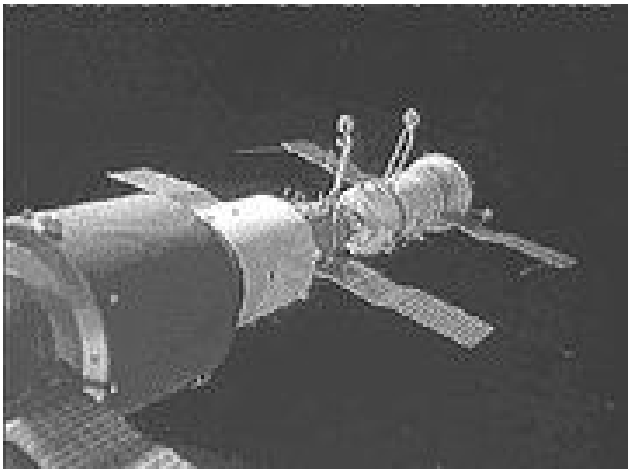
StarLab One, c.1984

The dawn of a new age in manned space exploration began today with the launch of the core module of StarLab One from the Bakinour Cosmodrome in Russia early this morning. Almost simultaneously halfway around the world NASA's *Columbia* space shuttle launched with StarLab's first crew and the first of what will be many modules attached to StarLab in the months to come. This orbiting facility will be man's first permanent foothold in space and marks a new in cooperation between these two former Cold War adversaries. Today they have put the past troubles of this world behind them and are looking ahead to build the new world before us.

The first three-man StarLab crew will spend six days aboard their new home with the *Columbia* astronauts – turning on the lights, making sure the water's running and the space toilets work. After that the *Columbia* will return home and the StarLab crew will spend the next 50 days alone in orbit, conducting numerous experiments and doing additional tests on the new space station. At the end of this time two Russian ships – a Soyuz space capsule and a Progress cargo drone – are supposed to rendezvous with StarLab, bringing new supplies and a new crewmember to swap out with one of the current ones. During this visit the Soyuz crew will pop over to the old Salyut station and finish stripping it of everything that might be of use aboard StarLab before it is allowed to fall from orbit and burn up in the atmosphere. They will then drop by StarLab one more time before returning to Earth. So it will be with StarLab crews, with either the shuttle or a Soyuz visiting about every two months bringing up a new crewmember and shuttling back to Earth with an old one, along with any scientific data or test results needed below.

At present StarLab will have only its core module and the science module being brought up by the *Columbia*. Later missions will add an observatory module, an exercise module, an industrial module, and even a hydroponics module for growing their own food in space. The idea is to make StarLab a testing ground for the types of conditions man will face in the long-term space missions to Mars and beyond that will be coming someday soon. At one time it had been hoped to salvage some of the existing modules from Salyut, but design and wiring differences made this impossible. Instead, some of the Salyut modules that were never launched are being converted to StarLab standards on the ground. The Russians are currently doing this with the observatory and exercise modules. The Americans, on the other hand, are building brand new StarLab modules. This includes the science lab being sent up now and the hydroponics module that is soon to come.

Power for StarLab will be provided by four sets of massive solar arrays once the station is complete. There had been talk of a small on-board nuclear reactor; however, the idea was vetoed due to any problems that might happen once StarLab's days were over and it was allowed to burn up in the atmosphere. Instead, StarLab will run completely on clean solar energy 100% of the time, as there are no clouds in space to block the Sun.



Salyut with Soyuz attached, c.1978
This was the space station that StarLab replaced in orbit

PRESIDENT RONALD REAGAN: REMEMBERING THE *CHALLENGER*

NATIONAL TELEVISED ADDRESS 28 JANUARY 1986

Ladies and gentlemen, I had planned to speak to you tonight on the state of the union, but the events of today have led me to change those plans. Today is a day for mourning and remembering. Nancy and I are pained to the core by the tragedy of the shuttle *Challenger*. We know we share this pain with all of the people of our country. This is truly a national loss.

Nineteen years ago, almost to the day, we lost three astronauts in a terrible accident on the ground. But we've never lost an astronaut in flight; we've never had a tragedy like this. And perhaps we've forgotten the courage it took for the crew of the shuttle; but they, the *Challenger* Seven, were aware of the dangers, but overcame them and did their jobs brilliantly. We mourn seven heroes: Michael Smith, Dick Scobee, Judith Resnik, Ronald McNair, Ellison Onizuka, Gregory Jarvis, and Christa McAuliffe. We mourn their loss as a nation together.

For the families of the seven, we cannot bear, as do you, the full impact of this tragedy. But we feel the lost, and we're thinking about you so very much. Your loved ones were daring and brave, and they had a special grace, that special spirit that says, "Give me a challenge and I'll meet it with joy." They had a hunger to explore the universe and discover its truths. They wished to serve, and they did. They served all of us.

We've grown used to wonders in this century. It's hard to dazzle us. But for 25 years the United States space program has been doing just that. We've grown used to the idea of space, and perhaps we forget that we've only just begun. We're still pioneers. They, the members of the Challenger crew, were pioneers.

And I want to say something to the school children of America who were watching the live coverage of the shuttle's takeoff. I know it is hard to understand, but sometimes painful things like this happen. It's all a part of the process of exploration and discovery. It's all part of taking a chance and expanding man's horizons. The future doesn't belong to the fainthearted; it belongs to the brave. The *Challenger* crew was pulling us into the future, and we'll continue to fallow them.

I've always had great faith in and respect for our space program, and what happened today does nothing to diminish it. We don't hide our space program. We don't keep secrets and cover things up. We do it all up front and in public. That's the way freedom is, and we wouldn't change it for a minute. We'll continue our quest in space. There will be more shuttle flights and more shuttle crews and yes, more volunteers, more civilians, more teachers in space. Nothing ends here; our hopes and journeys continue.

I want to add that I wish I could talk to every man and woman who works for NASA or who worked on this mission and tell them: "Your dedication and professionalism have moved and impressed us for decades. We know of your anguish and we share it."

There's a coincidence today. On this day 390 years ago, the great explorer Sir Francis Drake died aboard ship off the coast of Panama. In his lifetime the great frontiers were the oceans, and a historian later said, "He lived by the sea, died on it, and was buried in it." Well, today we can say of the *Challenger* crew: their dedication was, like Drake's, complete.

The crew of the space shuttle *Challenger* honored us by the manner in which they lived their lives. We will never forget them, nor the last time we saw them: this morning … as they prepared for their journey and waved goodbye … and slipped the surly bonds of Earth to touch the hand of God.

SPACE SHUTTLES TO BE PHASED OUT OF SERVICE

OFFICIAL 1992 UESPA PRESS RELEASE, 11 MARCH 1992 (SELECTED EXCERPTS)

NASA space shuttle prototype *Enterprise* (OV-100)
Static display, Federation Air and Space Museum, Terra

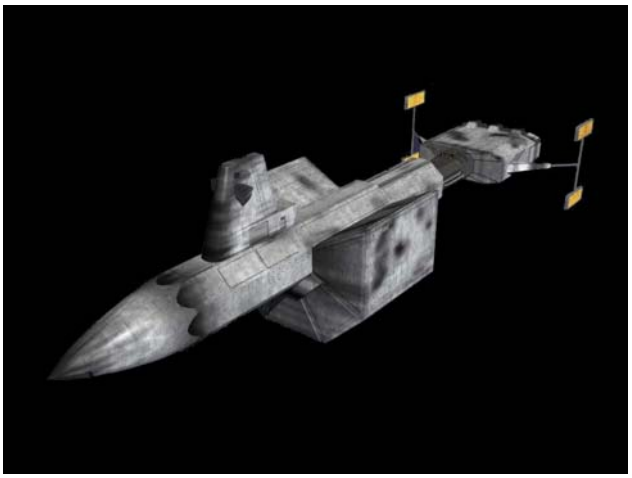
Today marks a historic occasion in the history of man in space. Today marks the end of the space shuttle program, bringing to an end one of the most important chapters in human history.

When NASA first launched the space shuttle *Columbia* some 553 missions ago it planned for its new craft to become the backbone of a new generation of space vehicles. That dream has proven successful beyond NASA's wildest expectations. While the early shuttle flights were oriented more towards science, later missions proved the commercial viability of our very first "space truck." It is only fair to say that this "truck" has done more for mankind in twelve short years than any other space program to date. SpaceLab, the launch of the Space Telescope and countless planetary and interplanetary satellites, early industrial manufacturing under weightless conditions, resupply of StarLab and Space Station Freedom, in-service repairs of orbiting space stations and satellites, the launch of the first Orbital Power Solar Satellites – these are but a few of the space shuttle's many accomplishments.

Success has its downside, though. The largest problem with a successful system is that it often renders itself obsolete. So it is with the space shuttle. Both the *Columbia* and *Buran* class orbiters have worked so well in helping mankind achieve the dream of space that they have inspired their own successor. The next generation that the space shuttle concept hoped to inspire has finally arrived and it is now ready to go into service. With the successful test launch of the first Space Ferry just a short time ago the true successor to the shuttle is at hand. Be that as it may, however, mankind will always hold a special place in its heart and collective memory for this pioneering craft. It made us believe in space. More than that, it made it an everyday reality for us.

PROJECT DAEDALUS BECOMES REALITY

OFFICIAL DYSON-YOYODINE 1988 PRESS RELEASE



In the mid 1970s the British Interplanetary Society conducted a study that is today considered a classic in space science. They set out to design the first ever practical interstellar spacecraft using the technology of the day. They named their spacecraft *Daedalus* after the great craftsman of the Greek myths: the man who made wings so he could fly.

Today, Dyson-Yoyodyne is proud to announce that the dream is now real. The United Earth Space Probe Agency has approved funding for our design for Project Daedalus, man's first-ever ship designed to travel the length of our Solar System and beyond. This is a historic occasion that will go down as one of the great moments of our time. The ship that will come of this effort, the Dyson-Yoyodyne series 100, will also go down as one of the great spaceships of our time.

You will no doubt be surprised by the unusual appearance of Daedalus. It looks like no rocket, shuttle, or airplane you've ever seen. I understand some of you have even taken to calling it the "space submarine." (general laughter) This design was chosen for two main reasons. First, this is a ship optimized for space travel between planets, not flying around near Earth. It is designed to operate in space and stay in space, only landing if it has to. That is why it doesn't look like anything you've seen. Second, the design was chosen for it adaptability. This ring around its middle is actually a series of detachable cargo modules. A second ring can be added behind it for more cargo space. These modules can be built to whatever specifications are needed: freight hauling, personnel transport, science and exploration, and even long-term cryogenic storage. This makes the Dyson Yoyodyne series 100 the most innovative and advanced spaceship of its day.

Ladies and gentlemen, the future of mankind has now arrived.

KHAN ESCAPES INTO SPACE

UNS PRESS RELEASE – 22 SEPTEMBER 1996

At 4:02 pm this evening on the outskirts of Khanton, former capital of the empire of genetic superman dictator Khan Noonien Singh, UN coalition forces closing on the city were startled by the sight and sound of a massive rocket lifting off into space. The visual profile matched that of the stolen UESPA space vessel *Botany Bay*, which Khan had seized from its Australian berth as it neared completion during his rapid rise to power. The *Botany Bay* rapidly ascended into space despite the best efforts of UN forces in the area to shoot it down. Unfortunately no UESPA craft or UNPF space patrols were within range to intercept it before it achieved escape velocity and raced out of our Solar System. It telemetry track indicates that its probable destination is the star Tau Ceti, where at least one habitable planet is known to exist. After the departure of the *Botany Bay* UN forces met with only token resistance and were able to take control of Khanton by the following day. Khan, along with 96 of his closest staff and aides, apparently escaped aboard the *Botany Bay*.

UESPA experts were unwilling to comment on Khan's chances of survival in his desperate escape bid. AP space expert Marcus Riley notes that the visual of the *Botany Bay* taken by UN cameras seem to indicate a long range explorer configuration for the ship. Where and how Khan got the necessary materials to reconfigure the *Botany Bay* in this manner is still a mystery. This would almost certainly mean that Khan and his followers have placed themselves in suspended animation for the duration of the voyage. No human under normal conditions would live long enough for the trip Khan has apparently planned for himself and his people.

Possible UN plans to pursue the *Botany Bay* remain in doubt due to the extended head start Khan's ship has on any that would follow it. Most civilian space experts are of the opinion that Khan is left well enough alone and that the resources required would be better spent on recovering from the aftermath of the Eugenics Wars. Initial estimates place the final death toll at some 33 million. Hundreds of thousands of homeless and shell-shocked survivors live in squalid refugee camps throughout Africa, Southeast Asia, and Australia, where many basic services no longer exist due to years of constant warfare. These portions of the world may be facing a new Dark Age for years to come without massive UN assistance.

MOON DECLARES INDEPENDENCE

UNS PRESS RELEASE -- 01 JANUARY 2000

Today in special session and with the narrowest of votes the United Nations Security Council approved the request of Goddard Moonbase to be granted independent status as UN protectorate, the first such off-planet. The vote was evenly split among Council members, with both the United States and Russian representatives abstaining due to their sponsorship of the initial construction of Goddard. It was Japanese representative Norikio Takashima who cast the swing vote in Goddard's favor, making it in effect the first "nation" in space.

Goddard's path to nationhood was a quick one. Founded in 1984 through a joint American-Russian effort, Goddard quickly grew into a major complex that dominated much of the Copernicus crater on the moon. The European Space Agency was largely responsible for Goddard's first major expansion as the ranks of its scientist swelled and new facilities had to be built to accommodate them. Just two years ago two more domes and a swarm of additional outbuildings began construction, making Goddard just large enough to be spotted from Earth with the aid of a telescope or binoculars. As more scientists and researchers from other parts of the world joined its staff, such as China, Japan, India, Pakistan, Argentina, and Spain, it soon became apparent that Goddard's original administrative system couldn't handle its rapidly growing population. What was needed was a real government, free of Terran national ties and able to deal with the unique problems faced by Goddard due to its location on the moon. Goddard personnel debated among themselves for two months before making their request to be a UN protectorate, and then only after informing their respective sponsor governments.

It is uncertain how today's vote will affect the future of Goddard Moonbase. What is certain is that the pattern of non-Terran independence will likely be repeated again and again with each successful off-world colony man founds in the stars.

to be continued …

ACKNOWLEDGEMENTS

VOLUME 1: 1901-2000

AUTHOR'S COMMENTS:

Welcome to the first issue in what I hope to be a multi-part update to Goldstein and Sternbach's original *Star Trek Space Flight Chronology*. It's been a long time since that book was published and a lot has happened in Trekdom since then. All of us know an update has been long overdue. Since nobody else is doing it, and since I want to make my own contribution to *Trek* tech fandom, well, here I am. I'm an old school TOS/TAS Trekker from the 1970s who was heavy into the tech aspects at the time before military service and later jobs intervened. Now I'm back on the scene and would like to give a hand, if you will. So much for introductions.

I know some of you will be upset by my choice of a modified Graham/Mandel timeline (aka Prime One) as the basis for this work. The reason is twofold. First, it's the timeline on which the really good original TOS/TAS era "Trek tech" is based. You know the works I'm talking about. This is ostensibly a TOS/TAS era "Trek tech" publication so it needs to be consistent with the others. Second, to be honest, it's the timeline that's always worked for me. I have no problem with the original *Star Trek* taking place from 2261 to 2265 and it made sense at the time back in the heyday of TOS/TAS fandom. Also, to this day and other than Dixon's interesting work this timeline remains the only one that doesn't cherry-pick its sources. The "official" Berman-Okuda timeline does, which makes it invalid insofar as I am personally concerned. You fans that have a dictionary up your keester and want to preach to me about sticking with "official canon" can just save your breath. I'm going with what works for me and my fellow old school Trek techhies. Don't write to me claiming that my dates are wrong because they're not. It depends on you base Trek timeline, and mine is definitely the "old school" approach. Now that we've settled *THAT* issue, let's move on.

Oh, and in case you're wondering, Dixon's integrated Trek timeline is Prime Zero for purposes of this work. The "official canon" timeline, aka Berman-Okuda, is Prime Two. The *Trek* magazine/FASA/original SFC chronology is Prime Three and the "mirror universe" is Mirror One. That should be simple enough!

I've tried to hit only the high points with regards to our time and space exploration. There's a lot I left out – the X-15, the NASA lifting body program, the history of Russian space stations, the early probes to Mars and Venus, ESA involvement in the Space Race, the Delta Clipper (other than the lone picture), more data on *Spaceship One*, and so on. So much more. I had to cut if off at some point; otherwise, this installment of my planned series would have become a book in itself.

I included the information on the German World War II V-2 program because that truly marked the start of the Space Age. That's also where von Braun first became famous as a rocket pioneer. As for the inclusion of the Vrill programs? They're one of the greatest of the post-war Nazi science mysteries. One might say that they're indirectly referenced by the technology of the Temporal Cold War in *Enterprise* but I'm not going there. Like Dixon I regard that series as existing in a different continuity than the Prime One timeline. Makes for a great "curious footnote," though.

My contention that the *Star Trek* television series proper only exists in the Prime One *Trek* timeline is based on the movie *Star Trek IV: The Voyage Home*. We know TOS/TAS exists in the original timeline because of "Tomorrow Is Yesterday" and the *Star Fleet Technical Manual*. Given this, Kirk and company should have been instantly mistaken for their real-life counterparts (and the show that made them famous) the moment they set foot in 1986 San Francisco. To be fair, if Section 31 were being truly honest then it was *the actual trip back in time* and not Scotty's "gift" that created this alternate "official canon" timeline. Spock still didn't have his head screwed on right, you know. Who's to say they didn't end up in an almost identical parallel reality? After all, Klingon Bird-of-Prey scouts don't come with tachyon detectors as standard issue equipment. There's no way they could have known they had ended up in a 99.9% identical parallel reality (save for *Star Trek*'s notable absence) without a tachyon detector. "Their" reality (aka the Berman-Okuda timeline) would not have seemed to changed at all. How could they have known that their actions in resolving the Whalesong Crisis would ultimately result in their own version of reality as they knew it? I know a lot of fans agree with this argument because I've read your posts on the Internet. I find no fault with your reasoning; hence its inclusion in my work. It's also as a convenient way as any to account for the existence of the "official canon" within the body of this work.

As you might have guessed Dr. Hogan Richman is the *Trek* universe's fictional counterpart to Dr. Richard Hoagland of the Enterprise Mission. We all know what a big *Star Trek* fan Dr. Hoagland is and I couldn't conceive of doing this work without at least mentioning the topic for which he is best known. I also thought it would be a great way to explain the mysterious loss of the Terran space probe *S.S. Charybdis* as mentioned in the TNG episode "The Royale." *Trek*'s own version of *2001*, if you will. More on this in future installments.

The presence of the fictional Apollo 18 mission, which never happened in our reality, is twofold. First, it gives mankind the chance to discover the Slaver stasis box on the moon as recorded in the original Graham/Mandel timeline. Second, the discovery of the stasis box is the motivating factor behind humanity's great drive towards space at this time that is so conspicuously absent in our reality. The desire to possess "alien tech" has long been talked about in New Age and certain military circles. Think if you will, what would happen to the United States and Russian space programs if they *KNEW* that alien tech existed on the Moon and might exist on other planets in the Solar System. Like a certain Red Planet next door? They'd be knocking themselves out to get into space, which is exactly what we see happening on Terra in the 20th century of the *Star Trek* universe. We'll deal more on the subject of "alien tech" later.

You might be interested to know that Copernicus Crater was the actual planned landing site for Apollo 18. Elements in the United States government at the time had long wanted to land an Apollo mission at Copernicus but were leery of the rough terrain. One might also imply that Goddard Moonbase was also built at Copernicus, although this was nowhere stated in my source materials.

StarLab One in the *Trek* universe roughly corresponds to the Russian *Mir* space station in our reality; hence my use of the photo of *Mir*.

All of the data concerning the Goddard Moonbase comes straight out of Goldstein and Sternbach's original *Space Flight Chronology*. Also, since they accurately predicted the Space Ferry concept I've taken the liberty of using current NASA conceptual art to represent it in the timeline.

Space Station Freedom was the original Reagan-era name for what would become the International Space Station.

The UESPA logo shown in this work is the original design by Geoffery Mandel and Doug Drexler for the classic TOS/TAS "Trek tech" work *U.S.S. Enterprise Officer's Manual*.

There are conflicting accounts on the Internet as to what the "DY" in "DY-100 class spaceship" stands for. I used the "Dyson-Yoyodyne" interpretation simply because I'm a *Buckaroo Banzai* fan (as are many old-school Trekkers). The logo also comes off the Internet but I can't find the source at this time. Hopefully I can correct this in a later issue or revision. I followed Goldstein and Sternbach's naming convention for the DY-100 series (as opposed to the Kevin Willcocks blueprints) for the first three ships since my concept of their development is oriented more towards the original *SFC* than what Willcocks has written.

The phaseout of the OV-100 space shuttle program as recorded in the original *SFC* was based on actual NASA projections at the time the book was written (and boy, did they miss THAT one!). I included the phaseout of the Russian *Buran* class shuttle since it was a copycat project and would have been put in the same class as the OV-100s by UESPA. This early phaseout would preclude the *Columbia* disaster from taking place, as I've noted in the timeline.

The only real sources about what happened during the Eugenics Wars are the non-canon series of *Trek* novels by Greg Cox and various non-canon fan chronologies (first in *Trek* magazine and later on the Internet). I've tried to keep away from these for that very reason; however, it does seem plausible to me that Khan stole the *Botany Bay* early on given the data at hand. The name implies an Australian location for building. We Terrans are so proud of our national origins and prison ships have a unique place in Australian history. By the way, Australia was within Khan's sphere of influence per the various non-canon sources. If I were a military dictator seeking the path to power on Terra c.1990s one of the first things I'd want to capture would be the airfields … or, if they existed, the spaceports. Now if I knew that the local UESPA contractor was building one of the famed DY-100s, supposedly the most advanced spacecraft of the day, and the ship was practically complete … well, I think you can follow my line of reasoning. This would have given him plenty of time to refit it for whatever purpose he wanted, and since the "sleeper ship" concept was one of the options of DY-100 series (long-range exploration or colonization), then why not?

You can read all about the real X-20 DynoSaur project on the Encyclopedia Astronautica web site.

The X-27 Raven is based on the Project Blackstar study as published in the 2006 article in *Aviation Week and Space Technology* article "Did Pentagon Create Orbital Space Plane?"

Mars Probe One is based on the 1968 IMIS proposal by Boeing as modified by NASA in 1971 (also referenced in some sources as the NASA PRMG). The only change that I have made is to retain the original 1968 NERVA-style nuclear rocket engines, which cuts down on the fuel requirements but still requires the "extended boom" construction per the IMIS specs. The *John F. Kennedy* return ship is based on the 1962 EMPIRE flyby proposal by Lockheed. The reason for using these particular studies is that they would have been what were "current" when the original *Star Trek* television series was produced back in the late 1960s. My own personal preference is more modern, being a cross of the Russian RD-0410 and American DRM-4 NTR concept studies. These seem more suited for the "left behind waypoint" concept and also include the idea of aero-braking for initial orbit insertion (as used by the Russian spacecraft *Leonov* in the feature film version of *2010*).

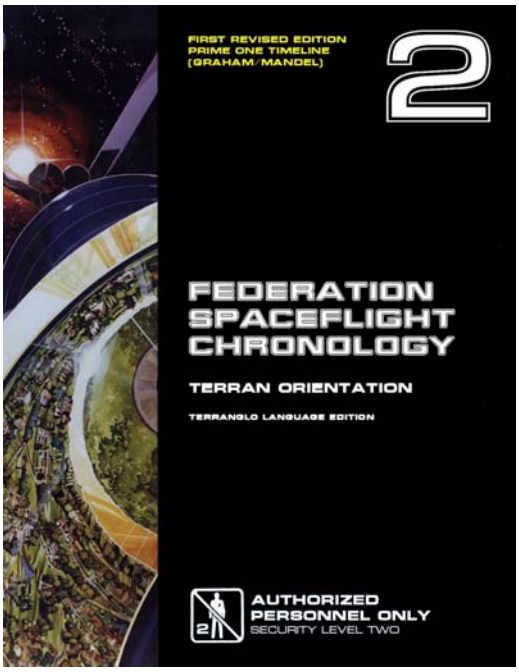
The image and data for the *Goliath* HLV are those for the proposed NASA *Aries* class heavy-lift rocket. The Dyson-Yoyodyne *Conestoga III* civilian "heavy lifter" is based on a 1970s NASA design study using Saturn technology by none other than Werhner von Braun himself (as mentioned in the *Goliath* write-up).

The ALIEN ENCOUNTERS section is where I make a significant departure from the original *SFC*. It has long been the contention of many (Dr. Hoagland being but one voice) that mankind has long been the subject of alien visitation. This section is intended to provide articles dealing with either first contact or significant encounter events with other intelligent lifeforms during the history of Terran spaceflight. Naturally the three most significant events during this time period in the *Trek* universe are the Roswell Incident (1948), the materialization of the time-warped *Enterprise* over Omaha AFB (1969), and Viking's discovery of the face on Mars (1976). This pattern will be repeated in future issues.

Finally, I integrated the history and ship's logs sections of the original *SFC* into a single section titled HISTORICAL ARTICLES. I've taken the liberty of adding a few that were missing from the original work, most notably President Kennedy's speech on the space program and President Reagan's address on the *Challenger* disaster. Both are moving in their own unique way. I can still almost hear President Kennedy saying, "We go not because it is easy, but because it is hard." My eyes still well up as I remember watching President Reagan help our nation deal with the sudden and tragic loss of the *Challenger*. No two speeches better reflect the triumphs and tragedies of this part of the Terran history of spaceflight than these.

Well, that's all for now. See you next issue.

- Richard E. Mandel



The tale of spaceflight development in the world of *STAR TREK,* from the "old school" fandom point-of-view, is continued in Volume 2 of the *Federation Spaceflight Chronology*.

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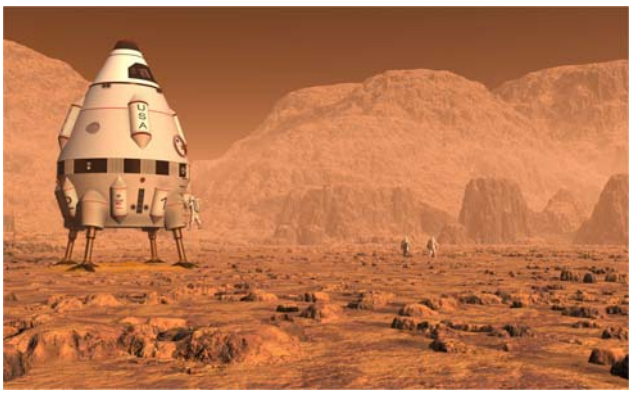
PHOTO AND MESH SOURCES:

Aviation Week and Space Technology
The Enterprise Mission
The National Aeronautics and Space Administration
The National Archives
OrbiterMods
Paramount Pictures
The United States Air Force Museum
The United States Army White Sands Missile Range

CONCEPTUAL ARTWORK SOURCES:

Encyclopedia Astronautica
The Enterprise Mission
Rick Sternbach



John Carter on the surface of Mars (1987)