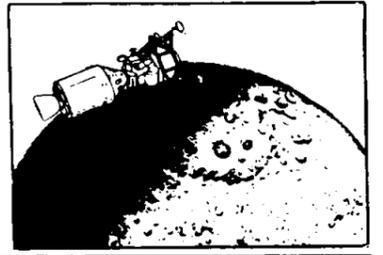


ROUNDUP



NASA LYNDON B. JOHNSON SPACE CENTER

HOUSTON, TEXAS

Vol. 13 No. 25

Friday, November 8, 1974

Soviet Flight Controllers Undergo Training at JSC

Approximately 20 Apollo Soyuz Test Project Flight controllers from the Soviet Union recently completed two weeks of training at JSC in preparation for the joint U.S.-U.S.S.R. mission.

NASA flight controllers were in the Soviet Union for two weeks of training in September.

Representing the various flight control disciplines for the ASTP mission, the Soviet group attended a series of sessions on Apollo trajectory, spacecraft systems and communications, the docking module, Mission Control Center operations and contingency flight planning.

The Soviet Union Flight Controllers include flight directors, flight control specialists representing the mission control disciplines of capcom, flight dynamics and trajectories, spacecraft systems, docking, life support, engineering and development, and inter-control center communications, plus interpreters.

During the actual mission, only about eight of the Soviet Union Flight controllers representing the above disciplines will be in the Mission Control Center here.

The launches of the two spacecraft for the joint mission are now scheduled for July 15, 1975, with the joining in space of the two vehicles scheduled for the third day of the mission.

The crews will transfer back and forth between the two spacecraft, perform experiments

and then return to their respective vehicles and separate after two days. The Apollo and Soyuz will then continue separate missions for the remainder of their flights.

JSC Employees Complete MDP

Thirteen Center employees have successfully completed JSC's second Management Development Program. JSC Director Dr. Christopher C. Kraft, Jr. presented certificates of graduation to Douglas S. Lilly, Cecil R. Gibson, Joseph D. Atkinson, Jones Roach, Donovan L. Teegarden, Charles B. Mormon, John H. Gurley, William E. Jobe, Sharon L. Henderson, Arthur G. Notling, Richard G. Snyder, Wayne L. Draper, and Ralph J. Taeuber. JSC and the University of Houston since 1971 have cooperated in a management executive program for Center employees at the GS13-14 levels.

The two-year program includes twelve hours of graduate instruction in management, organizational behavior and political science.

Management Development Programs III and IV are now in progress and include some 32 employees.

Dr. Winford E. "Dutch" Holland is Director of the MDP.



ASTP FLIGHT DIRECTORS—These two men are flight directors for the joint U.S.-USSR Apollo-Soyuz Test Project mission scheduled for July 1975. Cosmonaut Aleksey S. Yeliseyev (left) is the Soviet ASTP senior flight director; and M.P. Frank is the American ASTP flight director. They are seated beside a Docking Module training mock-up in Building 35 at the Johnson Space Center. Cosmonaut Yeliseyev heads a delegation of flight controllers from the USSR now in training at JSC.

JSC Hosts Annual Facilities Conference

Some 100 employees representing all the NASA field centers and Headquarters gathered at JSC's Gilruth Recreation Center October 23-25 for the 1974 NASA Facilities Conference.

Held annually, the Facilities Conference provides a concentrated exchange of "common interest" information among personnel throughout the Agency who are directly involved with the design, construction, maintenance and operation of NASA facilities.

This year's conference focused on facility organization and staffing, energy conservation, safety and environment considerations, construction in

today's economy, rapidly rising utility costs, space utilization management, and similar topics. The format included formal presentations and workshop sessions.

General Robert H. Curtin, Director of Facilities, NASA Headquarters, remarked that the conference workshops are ideal methods of discussing "grassroot subjects" on Agency facilities. He emphasized that communications is essential to

problem-solving and added that the annual conference serves the NASA facilities program "extremely well" in that capacity.

Joseph V. Piland, Director of Center Operations at JSC and one of the principal conference planners, said the annual gathering not only provides an exchange of information, but also establishes a significant facilities data flow for the following year.

Satellite Relay System Tested

A spacecraft antenna that beamed communications across the quarter million miles between the earth and moon in Project Apollo, and a communications satellite designed to relay educational television into remote areas of the earth, will join forces in next July's Apollo-Soyuz space mission.

Applications Technology Satellite 6 (ATS-6), orbiting 35,882 kilometers (22,296 statute miles) above the earth, and the Apollo S-Band steerable high-gain antenna operating together will provide data, voice and television coverage from Apollo for more than half of each orbit.

Communications engineers at JSC and at the Goddard Space Flight Center in Greenbelt, Maryland performed a joint operational test of the satellite relay system on October 23. JSC's Electronic Systems Test Laboratory, where space communications systems are tested for compatibility and performance, was the focal point of the eight-hour test.

The Apollo antenna and

portions of the Apollo communications equipment were mounted in a special trailer located outside the Electronic Systems Test Laboratory, and the remainder of the equipment was inside the Laboratory.

Command signals and voice were uplinked from a ground station at Rosman, North Carolina through the ATS-6 satellite to the Apollo equipment. Engineers at JSC will evaluate the quality of the voice and command signals.

Voice, television and simulated telemetry data was transmitted from Houston through ATS-6 to the Rosman ground station in a test of downlink reception. Performance of the telemetry channel was evaluated at Rosman by Goddard engineers. Voice and television signals received at Rosman were transmitted by land lines back to JSC for evaluation.

ATS-6 is presently "parked" above the equator at 94 degrees west longitude over the Galapagos Islands and has seen service in relaying educational tele-

(Continued on Page 4)



MDP GRADS—The employees, pictured above have completed the second JSC Management Development Program sponsored by the Center in conjunction with the University of Houston. From left to right, back row are Douglas S. Lilly, Cecil R. Gibson, Joseph D. Atkinson, Jones Roach and Donovan L. Teegarden; front row, Charles B. Mormon, John H. Gurley, William E. Jobe, Sharon L. Henderson, Arthur G. Notling, and Richard G. Snyder. Not pictured: Wayne L. Draper and Ralph J. Taeuber.



EMPLOYEE—Pictured above is JSC employee Larry Armstrong. Employed in the Center's Flight Control Division, Larry is standing in front of one of the consoles in the Mission Operations Control Room (MOCR).

Feathered Friend Fancies JSC Fish

It is not unusual to see various types of birds here at JSC, along with the deer and rabbits; but a "passive bird watcher" recently spotted a bird uncommon in this area.

While sitting in his office facing one of the ponds, Dr. Donald E. Stullken of the Flight Control Division saw an osprey flying near the fish pond, the home of its main food. Being a fish hawk, the osprey—though not listed as a threatened species—has definitely declined in number through the years. Along with the pelican, it was affected by extensive use of DDT; the eggs were made fra-

gile, thus were easily broken by warm, pudgy mothers.

The osprey is superficially similar to the bald eagle except for a smaller size. More common in the Louisiana/Alabama bayou area, these birds build large, bulky nests near riversides. This is not osprey nesting season, so this one was probably migrating; still, Dr. Stullken said it was the first he had seen in four or five years.

Sailing Club Sets Winter Schedule For Hardy Series

The scheduled dates for the Clear Lake Sailing Club's annual Hardy Sailors Series are November 10 and December 1 of 1974, and January 5, February 2, and March 2 of 1975.

Two races will be held each date, regardless of weather with no cancellations, postponements, or make-ups. Skippers meetings will be held at 1:45 p.m. each time at T Pier at the Harris County Park on Clear Lake, 5001 NASA Road 1.

The series is an opportunity for sailors to keep in tune over winter months when sailing is at its best. Multiboat owners can now sail their neglected second or third boats while fleet racing is less active.

This year there will be three classes: Boardboats, including Sunfish, Starfish, Scorpion, etc.; Sloops, including Windmill, Laser, Thistle, Finn, etc.; and Catamarans with all multihulls as one class.

Race committee Chairman is Dave Cavers who can be reached at 481-6747; additional information from Pat Butler at 333-4764.

Underwood To Speak To JSC Toastmasters

Richard Underwood, Technical Assistant to the Chief, Photographic Technology Division, will be guest speaker at a dinner meeting hosted by the JSC Toastmaster's Club. The meeting will be held in the Barcelona Room of the Nassau Bay Motor Inn, 1600 NASA Road 1 at 6:30 p.m. on November 19.

Underwood's speech will focus on the applications of photography from space and will be highlighted by a photographic presentation on the history of manned space missions.

The JSC Toastmasters is an organization whose members are dedicated to self-improvement of leadership and communication skills. Club meetings held at 6:30 p.m. each Tuesday are open to the public.

To make reservations for the November 19 meeting, contact Burt Edwards, 488-4167 or Malcolm Jones, 483-3991.

**Take stock in America.
Buy U.S. Savings Bonds.**

JSC Personality Profile: Larry Armstrong

If you attend auctions and garage sales, and visit antique shops regularly, chances are sooner or later you will run into JSC employee Larry Armstrong.

Intrigued with antiques since he was a "kid", Larry frequents the above-named places in an attempt to increase his antique collection which ranges from coins to furniture.

"I'm primarily interested in how things were made long ago as compared with the way they are made today," he says.

Larry remarked that his interest in obtaining general antiques is evolving into a special-

ized hobby of collecting old clocks.

"At first, I was fascinated with refinishing old furniture and fixing old things up. Then I became interested in clocks. Initially, I would just refinish the cases; however, after collecting about 40 clocks, I got the urge to see them running."

Thus emerged Larry's second hobby: "making his clocks tick." He estimates that he spends about 20 hours a week repairing clocks.

Larry feels it is important to have outside interests. "Some people are so engrossed in their

careers that they fail to take time for extra-curricular events. To me, these people miss so much from life," he stated.

Along with his antique collecting, Larry enjoys fishing and camping. He says he misses "going to the mountains" which was one of his favorite pastimes in Vancouver, Washington, of which he is a native.

Larry has been employed in the Flight Control Division since 1962. He was one of the Operations and Procedures Officers during the Gemini, Apollo and Skylab missions. He was also one of the Instrumentation Communications Officers (INCO) during Apollo 14-17. His current assignment entails working on Shuttle ground systems requirements.

Like most people, Larry enjoys traveling. Prior to his career with NASA, he was in the United States Air Force and says that combining his traveling with the Air Force, with NASA, and for personal vacations, he has been across the United States about 10 times. He has also traveled to the Philippines, Australia, and the Far East.

Larry also likes participating in sports and has been active in JSC-sponsored leagues including basketball, football, softball and golf. Currently, he is on a bowling team here.

Athletic competition, Larry says, is an ideal way to build character and teach aggressiveness. He remarked that competition in any fashion is healthy, as long as it is not carried to extremes.

"Life is a challenge and everyday is a competitive day to some extent. However, people should keep in mind that you can't always be a winner. Like an old coach of mine said, 'you have to be a good loser before you can really be a good winner,'" he added.

CL Junior Rifle Club Recruiting

The Clear Lake Junior Rifle Club is now recruiting new members to strengthen its small bore rifle competition program which is designed to promote firearm safety and marksmanship for juniors 11-18 years of age.

The club's six point 50-ft. indoor firing range, located in the Seabrook Community House, is a part of the Seabrook Recreation Program and is managed and operated by the Clear Lake Junior Rifle Club in affiliation with the National Rifle Association of America.

No gun ownership is necessary as the club has .22 caliber rifles that will be furnished along with shooting equipment such as jackets, mats, slings, spotting scopes and gloves. The annual club dues of \$12 cover the cost of medallions and brassards given in recognition of shooting excellence as the junior progresses.

Before joining the club the

prospective member must take a safety course and have an adult sponsor to support the club's activities. The sponsor should be the junior's parent or guardian willing to take the safety course to qualify to act as a range officer.

The next NRA firearms safety course covering rifle, shotgun, and marksmanship will be held on three consecutive Saturdays at the Harris County Clear Lake Park Building on NASA Rd. 1, across from the Boy's Home, from 9:00 a.m. to 11:30 a.m., beginning November 9. The charge will be \$6 to defray material costs for both junior and adults with an additional \$1 for those over 12 years of age desiring to obtain the Texas Hunter Safety Certificate.

Registration for the safety class and application for club membership can be made in person at the beginning of the first class session on November 9.

V.A. Commander Elected

Betty Hall, Industry Affairs Office, was elected State Commander of the Disabled American Veterans Auxiliary during the State Convention held in El Paso recently. Betty is immediate past Senior Vice Commander and Membership Chairman of the Auxiliary.

The Auxiliary's primary purpose is to aid Disabled Veterans and their families. The members are active in local community service projects and child welfare projects including drug abuse programs, schools for mentally retarded children, orphanages, and scouting programs. They also serve as volunteers in both private and Veterans Administration Hospitals. In addition, the auxiliary sponsors an educational loan fund for dependents of Disabled Veterans.

For additional information regarding the programs of the Disabled American Veterans Auxiliary, contact Betty, 748-2464 after 5:30 p.m.

Buy U.S. Savings Bonds.



BETTY HALL

Bonds can make buying a house a lot easier. Just sign up for the Payroll Savings Plan where you work. Every payday, an amount you specify is automatically set aside from your check and used to buy U.S. Savings Bonds. Before you know it, you'll have a nest egg big enough to buy a little nest of your own. U.S. Savings Bonds. A good blueprint for a house of your own.



ROUNDUP

NASA LYNDON B. JOHNSON SPACE CENTER

HOUSTON, TEXAS



The **Roundup** is an official publication of the National Aeronautics and Space Administration Lyndon B. Johnson Space Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for JSC employees.

Editor: Janet Wrather

Photographer: A. "Pat" Patnesky

EAA Attractions

CHRISTMAS DANCE

Tickets to the JSC Christmas dance are now on sale at the Bldg. 11 exchange store. Tickets are \$10.00 per person, and table reservations are made when tickets are purchased—a first come, first choice basis. Tables seat either 8 or 14 persons, so if your party does not fit these numbers, you will be seated with other couples to fill the table as tickets are purchased. You may choose a table in the auditorium with slow music, or the gym with a rock band. Ticket sales are limited to 700 - 350 per side. Remember, it's Friday, December 6, from 6:30 to 1:00 a.m. with a prime rib dinner and free drinks all evening.

TABLE TENNIS

The JSC semi-annual Table Tennis Tournament has been moved from November 16 to Saturday, November 23. The time is still from 9:30 to 4:00 in rooms 204 and 206 at the Gilruth Recreation Center. There are still several openings in the 32 player field. For more information call Steve Jacobs, X3561.

KING'S RANCH

A special 10% discount is again offered by King's Ranch for Girls at Bandera, Texas to all E.A.A. members for each of the two 1975 summer camp sessions.

All E.A.A. members are invited to attend a slide presentation of the camp facilities and activities Saturday, Nov. 9 at 1:00 p.m. in the Gilruth Recreation Center.

An additional \$25.00 discount will be given for enrollment of daughters or grand-daughters (ages 6-16) before January 1, 1975.

The Ranch has complete camp facilities on 120 acres of land with a mile of frontage on the Medina River. Activities include archery, arts and crafts, dramatics, water skiing, horseback riding, and hiking.

For additional information contact Jim McBride at X5384.

ORGANIZING

A Women's Exercising Club

will organize on November 14, room 215, Gilruth Recreation Facility at 7:00 p.m.

An Arts and Crafts Club will be organized on November 21, room 215, Gilruth Recreation Facility at 7:00 p.m. For more information contact Doug Burns at 483-3594.

TENNIS CLASSIC

Winners in the 1st Annual JSC Fall Tennis Classic Doubles Events were: Men's "A" Bracket—1st, Tim Elsea and Charles Spencer; 2nd, Ed Tribble and Jeff Lacy; Women's Bracket—1st, Wanda Voss and Amy Young; 2nd, Marilyn Grayson and Betty Magin; Mixed Bracket—1st, Gio and Betty Weber; 2nd, Bob and Wanda Voss; Men's "B" Bracket—1st, Jack Boykin and Phil Shannahan; 2nd, Carl Peterson and Bill Scheuch.

SLOWPITCH

Final Standings—Tuesday league: 1st place, Blazers, Jim Larey, coach; 2nd place, Hombres, Charles Lowe, coach; & 3rd place, Marvels, Leroy Penn, coach. Wednesday league: 1st place, Mets, Jack Boykin, coach; 2nd place, Nads, Rich Holtje, coach; 3rd place, Dynamos, Dan Remington, coach. Thursday league: 1st place, Bandits, John Engvall, coach; 2nd place, Streakers, Willard Hebbe, coach; & 3rd place, Easy Riders, Scott Millican, coach.

The top eight teams will meet in a double elimination tournament on Friday, November 8 and Saturday, November 9. Trophies will be awarded to the League Champions and first, second, and third place tournament teams.

BOWLING LEAGUE

As of October 31, Jimmy Warren Bowling League standings are as follows: 1st, Fireballs 29-7; 2nd, Chokers 27-9; 3rd, Spoilers 21-15; 4th (tie) Mixers, Pin Pounders, Strikeouts, and Ballbusters 19-17; 8th, Alley Oops 18-18; 9th, Jokers 17-19; 10th, Hexes 15-21; 11th, Hertz 14-22; 12th, Clowns 12½-23½; 13th, Team X 11½-24½; and 14th, Ascenders, 11-25.

High Team Series—Chokers 3061; High Team Game—Spoilers 1098; High Individual Series—Brahm 619 (105) - 724; High Individual Game—Kane 248 (34) - 282.

TICKET CORNER

Six Flags—Closes Dec. 1, adults \$5.60, children \$4.70. Lion Country Safari—Free Safari cards good for 10% discount. Sea Arama—Year round—adults \$3.00, children \$2.00. ABC Theatres—\$1.00 coupon good for admission to any ABC Interstate Theatre. Dean Goss Dinner Theatre—through November 17 only, \$15.00 coupon for 2 (\$20.00 reg.) Aeros Hockey—All season—\$4.40 gift certificate (5.50 seat) Disney Magic Kingdom Club, free.

(Continued on Page 4)

Roundup Swap-Shop

Swap Shop advertising is available to JSC and on-site contractor personnel. Articles or services must be offered as advertised, without regard to race, religion, sex or national origin. Ads should be 20 words or less, including home telephone number. Name and office code must accompany, but need not be included in ad copy. Typed or printed copy must be received (AP3 Attn: Roundup) by Thursday of the week before publication.

MISCELLANEOUS

Four 14x6 Ford chrome slotted mags, 8 locks, gd cndn, orig cost \$138, will take \$60, Clowdis, 5341.
Stant-board weight lifting and exercise bench, in nw, \$10, 488-3966.
Used upright piano, gd cndn, in-tune, \$385, Redding, 332-1092.
Window AC, 220v, 1.3 ton, RCA Whirlpool, used 3 summers, \$125 Bullock, 488-6095.
Minox B Camera, mint cndn, \$100, golf clubs, cart, bag, \$50, Poindexter, 474-2203.
Yamaha Coronet, silver, new, nvr used, still sealed in case w/warranty card, \$230 retail, \$100, Langooc, 482-2369.
2 anchor mates (anchors excluded) gd cndn, \$35 for pair, 474-4704 aft 6.
Musical bass guitar and amp w/ 2 fifteen in. JBL speakers and cabinet \$225 ea or \$400 all.
2 KLH Model 6 speakers, \$50, ea, realistic 8 band radio, \$50, 649-7753.
Complete set American Peoples Encyclopedia w/ all Year Books and Science supplements, \$250 or make ofr, Wilmeth, 935-5826.
Grand piano, 6 ft ebony Kawai, nw cndn, \$3,000, McBryer, x3286.

HOUSEHOLD ARTICLES

Kitchen range w/ oven/hood, avocado, \$60, 2 kitchen sinks w/ faucets, white, \$25 ea, 1 garbage disposal, \$20, 946-4458.
Contemporary sofa, nvr used, black and white herculon, xint cndn, \$95, Clara, x2281.
Couch and love seat, bic, leather, spanish, see to appreciate, \$250, 487-4228.
Ampex Micro 95 stereo cassette recorder, player, remote speakers, plays 6 cassettes in stack incl about 15 cassettes, \$145, 482-3100.
Box springs and foam mattress, twin size, \$15, 482-3100.
Voice of music stereo phono, modern cabinet, earphone, jack \$50, 482-3100.

VEHICLES

26' Allegro motor home, 12v/120v electrical system, LPG stove, furnace, water heater/ systems, refrig, LPG/12v/120v system, 350 HP, 73 Chevrolet eng, Chassis, \$700 equity/ assume payments, Hall, 483-3645.
New Raleigh chopper bike, \$100, Whitnah, 481-2654.
72 Datsun PL510, LDR Sedan, factory air, FM stereo-cassette radio, custom alloy wheels, steel-belted radials, carefully maintained, \$1995 or make ofr, Satterfield, 474-3127.
69 Trium GT6, nw rear tires, Koni shocks, rebuilt engine, mags & wire whs, xtras, \$1000, 488-5037.
Men's 26" Schwinn bike, gd cndn, \$25, 333-4669.
71 Honda SL175, gd cndn, Dan Kennedy, 488-5691, \$275.
71 Pontiac Catalina, 2-dr, beige, vinyl top, auto, air, pwr, 350 V8, nw tires, 36,000 mi, xint cndn, 483-5293.
73 Vega GT, Hatchback, 4-spd, AM/FM stereo-tape, air, *1800, Betty, 333-2775 aft 6.
71 Vette, T-top, 4 spd, am/fm, Tilt wh, air, 454 cu. in. xint cndn, 6355 or 644-7540.
73 Gremlin X '04 V/8 23 MPG, contact to see and drive, Carolyn, X6105.
Buick Riviera, 68, blu w/ tan vinyl top, exceptionally clean and xint cndn, \$1350, 488-1874.
69 Alfa-Romeo Berlina, 5-spd, o'head cams, fuel injected, electronic ignition, stereo, to mi, \$1595 firm, 334-3329.
73 Matador, 3-seat wgn, 19,200 mi, am/fm stereo, ac, radials, full 6 mo factory warranty, \$3,200, 333-2182.
68 Firebird, 1w mi, wide oval tires, console, gd cndn, \$900, 488-4276.
73 Toyota Corolla, 2-dr Coupe, auto, air, blue, 24,000 mi, \$2000, Mike, 488-4371.
Sm Yamaha, some parts missing, won't

run, go for parts, \$25, Underhill, 482-3100.
Mini Bike 2.5 hp, great for beginner, \$45, 482-3100.
70 Yamaha twin 90 street legal licensed, won't run, nds tune up, \$125, 482-3100.
72 Honda 750, fairing, wind shield, saddle bags, floor boards, dual chain, \$1400, Underhill, 482-3100.

PROPERTY AND RENTALS

Trade houses, near Patrick AFB Florida, 5/4-3-2, ten room, 16x36 screened pool, patio, central air, heat, tile roof, citrus, 488-5445.
CLC, Oakbrook, 3-2-2, 1700 sq ft, 6% FHA loan assumption, \$186/mo, Jones, x5811, 488-3976.
Lake Livingston resort/retirement home, 3-2-1, attractively furnished, Cape Royale, weekly, monthly, yearly rates, 488-4487.

BOATS

LIDO 14 sailboats, information on prices and condition of used LIDOs for sale by owners, Hoover, 334-2392.
Sunfish sailboat w/ trailer and spare wh, vry gd cndn, \$375, 488-3966.

PETS

Puppies, half AKC Labrador, half Leopard dog, 8 wks, wormed, \$5 to covr medical expenses, Donahoo, x4401 or 925-2139.
Registered Irish Setter, male, mahogany red, 4 years old, \$100, House, 482-7016.

WANTED

Roommate to share 2 bdrm, 2-bath Pasadena apt, only bdrm furniture needed, references required, Carol, 487-3540.
Duck decoys, if you've quit hunting and want to sell decoys, contact Fritz, 333-2162.
Need 1 person to carpool from Westminster Village Alameda Mall area, 8-4:30, Nick, 941-6572.

LOST AND FOUND

Zippo cigarette lighter, in North Bldg 30 parking lot, describe, 483-2408.

Pioneer 11 Says Eat Your Heart Out Guinness Record Book

How fast is 106,000 miles an hour? Faster than a speeding bullet—a whole lot faster.

That's how fast Pioneer 11 will be going as it zips past Jupiter on December 2 and boomerangs back across the solar system toward Saturn.

Speed records have toppled like tenpins since Pioneer 10, sister spacecraft to Pioneer 11, was launched March 2, 1972. That spacecraft blew all previous land, air, space and sea speed records into a cocked hat. Pioneer Jupiter/Saturn equaled that speed when it was launched April 5, 1973.

Pioneer 10 got to Jupiter a year ago—December 3, 1973. As it sped within 81,000 miles of the planet's boiling clouds it reached 82,000 miles an hour.

Pioneer 11 will burst through that speed going in. As the newest interplanetary voyager brushes by Jupiter at an altitude of 26,613 miles, it'll speed up to more than 106,000 miles an hour.

Both Pioneers have been smashing such records right and left. The Pioneer Project is managed by NASA's Ames Research Center, Mountain View, California. The spacecraft are built by TRW Systems Group, Redondo Beach, California.

Pioneer 10 is heading clear out of the solar system. In 1987 it will cross the orbit of Pluto, outermost of the nine planets. Then Pioneer 10 will be the first man-made object to cruise interstellar space.

The new Pioneer will be the

first spacecraft to use one outer planet to kick itself—like the rock in David's sling—from one outer planet to another. A 620-million-mile trip to Jupiter isn't enough, Pioneer 11 will come all the way back past the Sun, then head out again to twice the distance of Jupiter. In September 1979 after a billion mile trip, Pioneer 11 will send men their first closeup pictures of the rings of Saturn.

And mileage records are falling like autumn leaves, too. A good U.S. auto will get about 15 to 20 miles per gallon of gasoline.

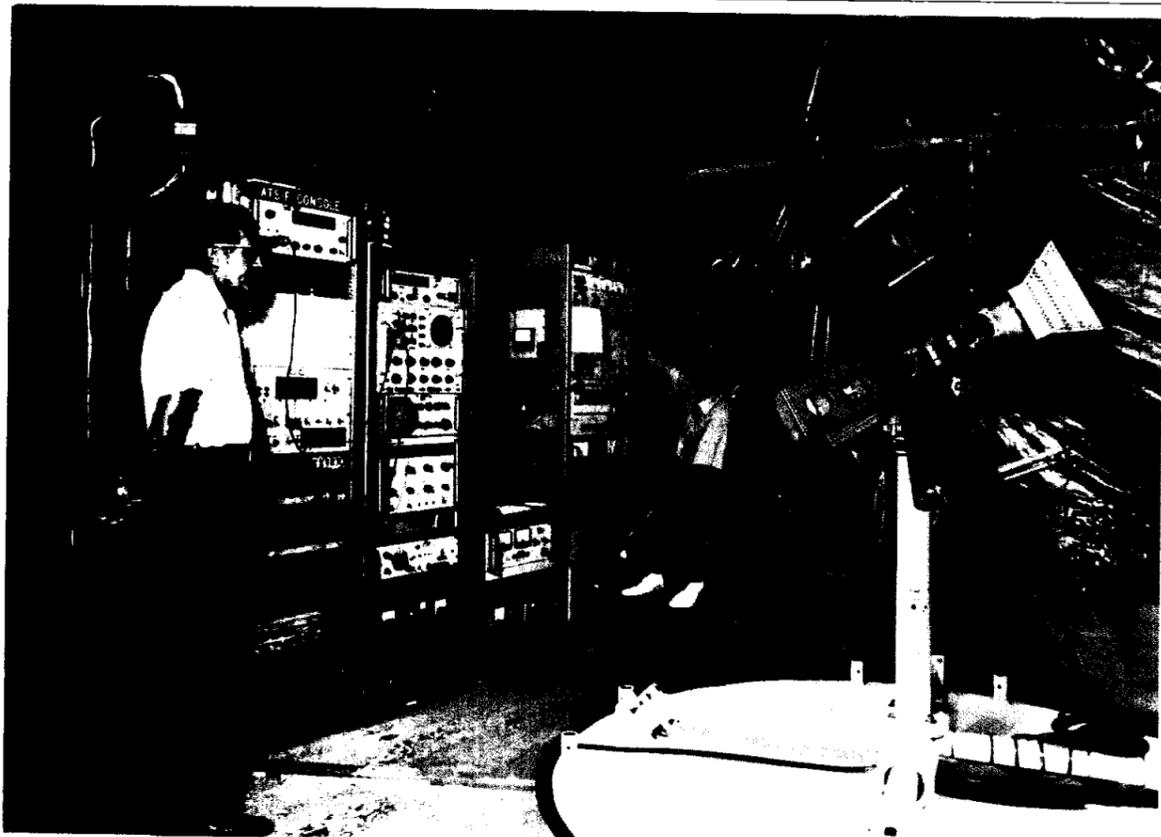
Not the Pioneer spacecraft! When Pioneer 10 reached Jupiter last year it had traveled about 620 million miles on its 41,000 gallons of rocket fuel.

That's about 15,000 miles per gallon, or 1,000 times better than our typical auto.

By the time Pioneer passes Jupiter and comes back across the solar system to Saturn it will have traveled well over 2 billion miles. On the same initial load of fuel, Pioneer 11 will have traveled almost 50,000 miles to the gallon.

During their 620-million-mile journeys to Jupiter both spacecraft have been tracked and controlled so precisely that Pioneer 10 arrived at Jupiter within seconds of the time predicted at launch. It passed behind the Jovian moon called Io only a second behind the pre-launch predicted time.

Astronomers have studied



COMMUNICATIONS SYSTEM CHECKOUT—Larry Sutton, right, and Robert Crabb, left, of the Tracking and Communication Development Division, perform Communications Checkout prior to the ASTP/ATS6 test which took place recently at JSC.

Satellite Relay (Continued From Page 1)

vision to remote areas of Alaska. Prior to the U.S.-Soviet Union Apollo-Soyuz mission in July, ATS-6 will be moved to a new station over Kenya at 35 degrees east longitude.

Voice, data and television from Apollo during the mission will be relayed through ATS-6 to a mobile ground station at the NASA Space Flight Tracking and Data Network station at Madrid, Spain. The mobile station at Madrid will route the signals both ways between Apollo and the Mission Control Center in Houston.

The October 23 test involved voice and data handling circuits in Mission Control Center and the television facilities in JSC's Photographic Technology Laboratory in a simulation of actual mission conditions. Relay through ATS-6 during the Soyuz mission will be the first spacecraft-to-satellite-to-ground routing employed in the

manned spaceflight program. Previous earth-orbit missions have been limited to coverage only when a spacecraft was within line-of-sight of a ground tracking station, with long periods of "LOS" (loss of signal) as a spacecraft's orbit drifted off the network because of the earth's rotation. Lunar missions had continuous communications between the spacecraft and Mission Control except for about 47 minutes of each lunar orbit when the spacecraft was behind the moon. Communications from a lunar module landed on the lunar surface were continuous.

From its new position over Kenya, ATS-6 will serve as a relay station for educational television beamed to remote regions of India. The satellite was launched May 30, 1974, from NASA Kennedy Space Center atop a Titan IIIC launch vehicle. The deployment mechanism for the ATS-6 parabolic antenna was tested in the fall of 1973 in JSC's Space Environment Simulation Laboratory 65x120 foot vacuum chamber.

Patent Licensing Conference Scheduled

Another in NASA's series of patent licensing conferences is scheduled to be held November 19 in Salt Lake City. The conference is part of the agency's ongoing program to encourage the transfer of space-developed technology to non-aerospace uses.

Aimed primarily at business and industrial executives in the Rocky Mountain region, the one-day conference will outline NASA's patent licensing program and explain how licensing rights to space technology with commercial potential can be obtained.

Senator Frank E. Moss of Utah, chairman of the Senate Committee on Aeronautical and Space Sciences, will be guest speaker at the conference-luncheon.

Almost 3,000 NASA-held patents are now available for either exclusive or non-exclusive licensing to qualified users. Under procedures set up in 1972, NASA can grant exclusive licenses in appropriate cases as soon as nine months after the invention announcement.

The conference is being sponsored jointly by NASA, the University of Utah, and the University of New Mexico's Technology Application Center. It will be held at the Rodeway Inn, 154 West 6th South in downtown Salt Lake City.

Topics to be covered in the conference program include: A review of the NASA patent licensing program; the role of Regional Dissemination Centers

and NASA Field Center Patent Counsels in helping individuals in obtaining patent Licenses; and examples of technology transfers to the business and industrial community.

A registration fee of \$20 will be charged attendees. This includes a free copy of NASA patents available for licensing, general information packets and lunch.

Persons wishing to attend the conference should call 505/277-4000.

Pioneer 11

(Continued From Page 3)

Jupiter through telescopes since 1610 when Galileo initiated the practice. But no one had seen Jupiter at close range until Pioneer flashed past and took several hundred pictures. Even today, no one has looked at Jupiter's polar regions. Pioneer 11 will give us the first view of them, and scientists are betting they'll be surprised at what they see.

Jupiter itself is a record-setter. The dominant planet in the solar system, it could swallow 1,000 planets the size of Earth and still have room for dessert. It's the first planet we know of that has no solid surface; most of it is made of liquid hydrogen, the stuff that's used for rocket fuel.

Jupiter is so huge its gravity is staggering. A 150-pound man would weigh 396 pounds at Jupiter's cloud tops.

The big planet also has more satellites than any other. Astronomers thought they had done well to find 12. But recently Dr. Charles Kowall, an astronomer at California Institute of Technology, found a 13th satellite in a picture he took with one of the telescopes atop Mt. Palomar.

Records have fallen and they'll continue to fall.



BRIEFING—Three flight controllers from the Soviet Union are briefed on Apollo-Soyuz Test Project training facilities at the Johnson Space Center by Robert R. Kain (right), a crew procedures training officer. They are L.S. Shibanov (left), an MCC communications specialist; N.D. Roditelev (center background), an onboard autometrics specialist; and O.I. Babkov (second from right), a control systems specialist.

Defensive Driving

An educational program, featuring defensive driving techniques, road hazards, and tips on driving in inclement weather will be presented by Lt. Poplin of the Texas State Highway Patrol Safety Division. The presentation will take place in the auditorium of Building 30 at 2 P.M. on Tuesday, November 19th.

Wanted 10,000

Campbell Soup Labels to be traded in for Audio-Visual Projector needed for Holy Family Kindergarten. Deadline: December 10, 1974. Contact: Qua Patin 944-9937.



ASTP FLIGHT CONTROLLERS—A group of flight controllers from the USSR visiting the Johnson Space Center for Apollo-Soyuz Test Project training look over a Docking Module mock-up trainer in Building 35. They are I.V. Milukov (lower left), a Soviet interpreter; Ye.V. Yesipov (center foreground, light suit), a command, data measurement complex specialist; V.V. Illarionov (right), a crew communications specialist; Yu.I. Savitzkey (center background, wearing glasses), a communications specialist; G.S. Guzev (leaning on mock-up), a command, data measurement complex specialist; V.D. Blagov (in center, next to Yesipov), a flight control specialist; and A.A. Kalashnikov (in center, next to Guzev), a command, data measurement complex specialist.

