

NASANational Aeronautics and
Space AdministrationLyndon B. Johnson Space Center
Houston, Texas**Spirit of '76**Twenty-five years ago this month, four
Gemini astronauts made the first rendezvous
in space. Story on Page 3.**Nick at JSC**Santa Claus paid his annual visit to JSC this
week, stopping at the JSC Child Care Center.
Photo on Page 4.

Space News Roundup

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No. 50

SEASON'S GREETINGS

As I stood in mission control during the last space shuttle mission of 1990, I watched and listened as leaders from the world's two most powerful nations talked to the astronauts aboard *Columbia*. They spoke in both English and Russian, and the replies were in kind. They talked about their mutual admiration and their belief that the development of space is important to the future of mankind. The conversation took place as an unprecedented 12 human beings orbited the Earth at the same time—a dozen people simultaneously taking part in mankind's greatest adventure—seven Americans, four Soviets and a Japanese. The moment made me think about how far we've come since the early days of manned space flight, when every launch was a volley fired in the competition for which country could do something first. The rules of the race have changed and so have the competitors. We've gone from a one-against-one sprint to a multi-national marathon with no clear finish line. As the Advisory Committee on the Future of the U.S. Space Program has just reaffirmed, NASA is destined to remain one of the favorites in this new contest to reap the political, technological and economic benefits of space exploration. In the coming year, we will mark the 10th anniversary of the first shuttle flight and the 30th anniversary of this center. We will also christen the newest orbiter in the most technologically advanced fleet on Earth. Our rich heritage will support us as we continue to strive for the excellence that will allow us to achieve our goals. To all of you, I wish a very happy holiday season and an exciting new year.

Aaron Cohen

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m.-2 p.m. weekdays.

- General Cinema (valid for one year): \$4 each.
- AMC Theater (valid until May 1991): \$3.50 each, increases to \$3.75 Jan. 1.
- Holiday in the Park (through Dec. 31, Astroworld): \$5.50.
- New Years Eve Dance (7 p.m. Dec. 31, Gilruth Center, music by Fourth Wave Rhythm and Houston Society Jazz Orchestra): \$15.
- Ice Capades, "That's Romance featuring the Simpsons" (3 p.m., Dec. 29, Summit): \$8.

JSC

Gilruth Center News

Sign up policy—All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a badge or EAA membership card. Classes tend to fill up four weeks in advance.

EAA badges—Dependents and spouses may apply for a photo I.D. 6:30-9 p.m. Monday-Friday.

Defensive driving—Course is offered from 8 a.m.-5 p.m., Jan. 26. or Feb. 16. Cost is \$15.

Aerobics and exercise—Both classes are on-going.

Country and western—Six-week class begins Jan. 7 and meets Mondays; openings available only in intermediate class. Cost is \$20 per couple.

Balroom dancing—Eight-week courses for beginners, beginner-intermediate, intermediate and advanced students will begin Jan. 3. Cost is \$60 per couple.

JSC

Technical Library News

The following selections are now available in JSC's Technical Library, Bldg. 45, Rm. 100.

1991 NASA Authorization: National Aeronautics and Space Administration Fiscal Year 1991 Authorization Request and Budget Estimates, 1990. KF32 .S393/01 1990.

Directory of Federal Laboratory and Technical Resources: A Guide to Services, Facilities and Expertise, 1990. Q179.98.D57

Numerical Recipes in Pascal: The Art of Scientific Computing, 1989. QA76.73.P2 R87 1989.

Introduction to Random Processes: With Applications to Signals and Systems, William A. Gardner, 1989. QA274 .G37 1989.

Celestial BASIC: Astronomy on Your Computer, Eric Burgess, 1982. QB51.3.E43 B87.

JSC

Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Send ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2. No phone or fax ads accepted.

Property

Sale: 2 trls. on 2 acres in Santa Fe, well, septic, \$32K cash. (409) 925-8081.

Lease: Room in house, \$270/mo., util. incl., near NASA. Eric, x38420 or 484-9179.

Lease: Friendswood/Forest Bend, 3-2-2, formal dining, fan, FPL, fen., no pets, \$625/mo. 482-6609.

Rent/Lease: CL condo on marina, 3 level, all appli., FPL, wet bar, 2-2.5-2, \$950/mo. 326-5652.

Rent: Lake Travis cabin, dock, CA & heat, equipped, accomm. 8, dly/wkly, \$80/\$325. 326-5652.

Sale/Lease: Lakeside condo, The Landing, 2-1-2CP, boat slip, \$650/mo., util. incl., \$43K, fin. avail. w/20% down. Carol, 244-9647 or 667-7023.

Sale: 60 acres on Hwy. 80, 3 mi. from Karnes City, TX, 50 mi. from San Antonio; 2-story house on 1.5 lots w/fruit trees in El Campo. 783-9164.

Sale: 3-1-1, near Edgemoor, CA/H, fen., 2 stor. sheds, \$1,500 down (nego.), assume \$503/mo. for 20 yrs. 947-1696 or Joanna, 621-3833.

Lease: Sagemont, 1.5 story, 4-2-2, 2,200 sq. ft., gas heat, FPL, new paint/carpet, fans, fen., \$675/mo. plus dep., no pets. 484-4944.

Lease: L.C. Countryside, 3-2-2, FPL, fans, fen., no pets, \$75/mo. plus dep. 486-9811.

Sale: Lot, Pearland Dixie Hollow, all util., concrete st. x39530 or 482-5003.

Sale: Bayfront lot in Seabrook, \$125K; 2 waterfront lots near NASA, \$38,500/ea. Don, x38039 or 333-1751.

Lease: Webs./Ellington, 2-1 apt., \$425/mo. Dave, x38156 or Herb, x38161.

Lease: Egret Bay condo, split 2-2-2, cov. parking, FPL, fan, W/D, frig., \$550/mo. plus dep. Larry Best, 282-4026 or (409) 925-2798.

Rent: Galv. condo, furn., sleeps 6, dly/wkly/wknd rates, cable, Seawall & 61st. Magdi Yassa, x33479 or 486-0788.

Sale: Univ. Green townhouse, 3-2-2, fans, FPL, whirlpool, loft, alarm sys., decked crtyrd., 2 min. to JSC, \$90K. Dennis, x34405 or 480-5076.

Sale: Pipers Meadow, 3-2.5-2, formal LR/DR, FPL, loft, wet bar, fans, gar. door opener, deck, new paint, 15 min. to JSC, 10% assum., \$92K. Dennis, x34405 or 480-5076.

Lease: 3-2-2, Pearland, \$610/mo. plus dep. Don, 244-9830 or 485-1821.

Sale: Kerrville, TX, 12x60 mobile home, furn., good cond., lg. carport, patio, \$7K. Hot Spring Village, Ark., wooded lot, util., \$9,800, OBO. 333-6150 or 326-1254.

Cars & Trucks

'80 Honda Accord, 2-dr., new brakes/timing belt, \$1,200. Paul, x31883.

'85 Buick Park Ave., ex. cond., all pwr., loaded, \$5,800. David, 334-2766.

'78 Datsun 280Z, 107K mi., new tires/clutch/stickers, AC, 5-spd., \$2,800. John, x31114 or

480-5439.

'82 Buick Century Limited, 4-dr., V6, auto., loaded, 73K mi., new tires, \$3,200. Gilles, x36267 or 486-0833.

'87 Chev. Cavalier, 4-dr., auto., AC, 37K mi., ex. cond., warr., \$4,500, OBO. Dave, x39579 or 482-6187.

'87 Grand Am, auto., 4-dr., low mi., \$5,975. x36252 or 358-9598.

'84 Buick Century Ltd., 4-dr., V6, new tires/brakes, ex. cond., 60K mi., needs some AC work, \$2,600. Bob, x33149 or 488-7036.

'87 Honda Civic DX, 1.5 eng., ex. cond., 2-dr. hatch, auto., \$5,300. Sheryl, 333-4743 or 996-6438.

'84 Lincoln Continental, 4-dr., loaded, ex. cond., 60K mi., \$5,700. 488-4188.

'86 Toyota Camry, 4-dr., ex. cond., auto., 64K mi., \$5,997. 474-3507.

'88 Ford Mustang LX, 2.3L, 5-spd., 27K mi., \$5,500, OBO. x32567 or 488-3314.

'86 Chev. PU, needs eng. work, \$1,250. Paul, x31883.

'75 Chev. Van SWB, AC, 3-spd., OD, \$1,500. x39382 or 486-9811.

'85 Buick Regal, good tires, \$2K. x32987.

'86 Honda Prelude, 5-spd., sunroof, new tires/brakes, \$6K. x31237 or 488-8614.

'84 BMW 528E, 4-dr., 78K mi., \$7,500; '82 BMW 733i, 125K mi., ex. cond. 485-3490 or 554-2881.

'85 Cadillac Limo, ex. cond. Diane, 471-5291.

'87 Hyundai Excel, 1.5L, 4-cyl., 5-spd., new tires/bat., 3-dr., 35K mi., \$4K. Patrick, x32635 or 488-1079.

'83 Plymouth Turismo, 2-dr. hatchbk., ex. cond., 62K mi., 5-spd., \$2,100, OBO. Dennis, x34405 or 480-5076.

'78 Toyota Corolla, auto., AC, needs a little work, BO. 333-7861.

'79 Chev. PU LWB, 350 auto., loaded, new tires, duals, \$2,500. Ron, x38785 or (409) 945-8787.

'82 Plymouth Reliant, 4-dr., auto., new eng./tires, \$800. 482-2425.

Cycles

Schwinn Le Tour 10-spd., Shimano derailleurs, Zepal pump, good cond., \$95. Ruben, x33829 or 486-0817.

'86 Honda 700 Magna, 5,500 mi., ex. cond., 2 helmets, \$2,600. 996-9526.

'80 Honda CB 750, good cond., \$650. 337-1896.

Basso racing bike, 57cm frame, Columbus SI main tubing, Sp stays, Campy super rec. hubs, Avocet speedometer, Shimano 600 components, Look pedals, Trek 600 frame, other gear, \$450. Steve Gorman, x37626.

'81 Honda custom 750 Wind Jammer, low mi., good cond., \$800, OBO. Bruce, 485-0396.

'81 Suzuki GN400, 9,200 mi., new rear tire/tags, helmets, \$500. Dave, 480-1225 or 538-1626.

'82 Yamaha Virago 750, 7.8K, ex. cond., \$1,200. Mike, x38799 or 532-2126.

Boats & Planes

'79 Renegade 1540 ski boat, 140hp Evinrude, SST prop, trlr., ex. cond., \$2,500, OBO. 333-6868 or 486-7846.

'19 '87 Victory Vip ski boat, 165hp Mercury Mercruiser I/O, trlr., \$9,500. x32230 or 992-2613.

JSC

Dates & Data

Today

Cafeteria menu—Special: fried chicken. Entrees: fried shrimp, baked fish, beef stroganoff. Soup: seafood gumbo. Vegetables: okra and tomatoes, buttered broccoli, carrots in cream sauce.

Monday

Cafeteria menu—Special: meat sauce and spaghetti. Entrees: franks and sauerkraut, sweet and sour pork chop with fried rice, potato baked chicken. Soup: cream of potato. Vegetables: French beans, buttered squash, lima beans.

Tuesday

Christmas Day—All JSC offices and the JSC Visitor Center will be closed in observance of the Christmas Day holiday.

Wednesday

Cafeteria menu—Special: salmon croquette. Entrees: roast beef, baked perch, chicken pan pie. Soup: seafood gumbo. Vegetables: mustard greens, Italian green beans, sliced beets.

Thursday

Cafeteria menu—Special: stuffed cabbage. Entrees: beef tacos, ham and lima beans. Soup: beef and barley. Vegetables: ranch beans, Brussels sprouts, cream style corn.

Dec. 28

Roundup not published—Due to the Christmas and New Year's Day holidays, the Space News Roundup will not be published Dec. 28.

Cafeteria menu—Special: Salisbury steak. Entrees: fried shrimp, deviled crabs, ham steak. Soup: seafood gumbo. Vegetables: buttered carrots, green beans, June peas.

Dec. 31

Cafeteria menu—Special: hamburger steak. Entrees: beef Burgundy over noodles, fried chicken. Soup: cream of chicken. Vegetables: buttered corn, carrots, green beans.

Jan. 1

New Year's Day—Most JSC offices will be closed in observance of the New Year's Day holiday.

Jan. 2

Cafeteria menu—Special: Spanish macaroni. Entrees: broiled fish, tamales with chili. Soup: seafood gumbo. Vegetables: ranch beans, beets, parsley potatoes.

Jan. 3

Cafeteria menu—Special: chicken fried steak. Entrees: beef pot roast, shrimp chop suey, pork chops. Soup: navy bean soup. Vegetables: carrots, cabbage, green beans.

Jan. 9

AFCEA meeting—The Armed Forces Communication and Electronics Association will meet at 11:30 a.m. Jan. 9 at the Nassau Bay Holiday Inn. The speaker will be Major Gen. Thomas Eggers, commander of Air Force Special Operations Command at Hurlbert Field. For more information contact Veronica Mullins at 283-7342.

Jan. 22

BAPCO meets—The Bay Area PC Organization will meet at 7:30 p.m. Jan. 22 at the League City Bank and Trust. Call Earl Rubenstein, x34807, or Tom Kelly, 996-5019, for more information.

Jan. 30

NCMA classes—The National Contract Management Association and University of Houston-Clear Lake are

sponsoring a course in negotiation of contracts. The classes will begin 8 a.m. Jan. 30-31 at the University of Houston-Clear Lake in the Bayou Bldg. Cost: \$100 per person. For further information contact Jean Stell at 283-3122 or 283-3120.

Feb. 2

AAS conference—The American Astronautical Society will host the Rocky Mountain annual Guidance and Control Conference Feb. 2-6 at the Keystone Lodge in Keystone Village, Colo. For information, call Alice Little at (303) 939-5147.

March 5

Space conference—The Space Foundation will co-sponsor the third annual Space: Technology, Commerce & Communications Southwest conference March 5-7 at the Nassau Bay Hilton. For more information contact Roseann Tully at 617-862-7174.

Apr. 23-26

Space Congress—The 28th annual Space Congress will be April 23-26 in Cocoa Beach, Fla. The Canaveral Council of Technical Societies will host the conference with a theme of "Space Achievement—A Global Destiny." For more information contact Stuart Shadbolt at (407) 383-2200, x2202, or John Glass Jr. at (407) 383-2200, x2207.

May 3

AACE workshop—The American Association of Cost Engineers Houston Gulf Coast Section will present its annual spring workshop May 3-4 at the Hobby Airport Hilton. Dennis Lawler of JSC's Intelligent Systems Branch, will be one of several speakers. For more information, call Ralph O'Neal at 492-3922.

'78 25hp Johnson OB motor, short shaft, tiller steering, ex. cond., \$450. David, x39041 or 534-2247.

Audiovisual & Computers

Apple IIc, printer, monitor, \$675. 996-9690.

Hyundai PC w/360K, 720K drives, Magnavox EGA monitor, \$700; Panasonic KX-P1091 printer, \$150; computer desk w/hutch, \$75. 332-7939.

MGA ster. sys., integ. amp, tuner, turntable, spkrs., \$350. x33572 or 996-1382.

Pair of Advent Prodigy tower spkrs., \$250, Advent Baby II, \$175. 996-1382.

Macintosh 512 enhanced, 800K drive, \$550. 280-8796.

ATI VGA Wonder Card w/512 KB RAM, ATI V4 video bids, capable of driving EGA display (640x350 Resolution) on RGB (CGA) or TTL monochrome monitor, and VGA and SVGA (800x600/256 colors or 1024x768/16 colors) on VGA analog and multisync monitor, \$175. David, x32751 or 326-1069.

Hayes-Brand PC/XT/AT compat. int. modem, Model 1200B w/Smartcom SW, manuals, \$99 nego. David, x32751 or 326-1069.

AT&T 6300, 640K, monochrome, 20 MB HD, 1-360K FD, mouse, modem, MS-dos., \$675. John, 335-4394.

Lost & Found

Lost: Round Ray Ban sunglasses, left in FCR 2, Bldg. 30, Cathy, x30415.

Found: Wheel cover, x39393.

Pets & Livestock

Blk. Lab pups, AKC reg., 5 wks. old, blk. mother, choc. father on premises, \$150. Karen, x31385 or 947-2025.

Free 10 wk. old 1/2 reg. Golden Retriever, fem., solid blk. Scott, x35343.

Tiny Toy Poodle pup, male, AKC reg., champion bloodline, born 10-31-90, apricot, \$300. Heather, x30582 or 332-9221.

Photographic

Minolta XG-1 35mm cam. w/45mm F2.0 lens, 132X auto. flash, 2X TELE, case, manuals, ex. cond., \$125. 332-8119.

Household

Lg. microwave, ex. cond., \$100. (409) 925-8081.

Sleeper sofa, \$125. 996-9690.

Desk, 48x18, good cond., \$95. Ted, x36894.

42" round table w/4 chairs, \$100; port. FPL w/tr., \$125. Chuck, 282-4596 or 781-5477.

Sharp Carousel II microwave, 1.0 cu. ft., ex. cond., \$150, OBO; bedspread, quilted maroon chintz, queen sz., \$75, OBO. Linda, x49658 or 486-8873.

Queen sofa sleeper, beige, good cond., \$75; coffee table, 2 end tables, \$40; avocado recliner, \$55. Janet, x33844 or 534-2247.

Queen sz. wtrbd. w/liner, htr., matt., all wood, \$175; oblong wooden coffee table, \$50; heavy duty thick plastic mop bucket on rollers, HD mop head squeeze plus 3 new mop heads, mop handle, \$50. x30768.

Full sz. bed, matt., box spring, ex. cond., \$100; Scandinavian couch, off white, good cond., \$275, OBO. 333-7345 or 474-2339.

Draperies w/valance for 2 wndws., pink, \$40;

antique dbl. brass bed w/matt., \$300; bunk/twin beds w/ladder, 1 matt., \$80; Sears recording adding mach., \$5; bumper mount bike rack, \$10. Samouce, x35053 or 482-0702.

51-pc. china set, April Showers design by Castlecourt, 7-place setting plus serv. pcs., ex. cond., \$150. 944-3380.

New ster. component cab., \$100, OBO. x33846.

Leather sofa, chair, ottoman, \$325, OBO. 480-6539.

2 lamps, console color TV, \$250; baby swing, carrier, clothes, ster., pictures, kitchenware, toys. Wendy, x30351 or 331-9625.

Leather couch, love seat, spa exer. bike, color TV, VCR, microwave, TV stand, microwave stand, coffee table, end tables, wtrbd. (ped. 8 drws., 4 cab.), W/D. Patrick, x32635 or 488-1079.

Fam. room set, queen sz. hide-a-bed, love seat, 3 tables, \$400; BR set, antique green, full sz. bed compl., \$750; G.E. dishwasher w/pot scrubber, needs adjustment, \$75. Magdi Yassa, x33479 or 486-0788.

Wanted

Want TI-99/4A educational/games SW cartridges for children, age 5 and up. Ed, x36969 or 332-0442.

Want roommate to share house in Sageglen, \$270/mo., util. incl. Eric, x38420 or 484-9179.

Want riders for vanpool starting from SW side and Braeswood-610 locations to JSC. Chau, x31451.

Want Christian fem. roommate to share 3-2-1 house in Friendswood, non-smoker, no pets, \$260/mo. plus 1/2 util., ref. 282-4308 or 482-3683.

Want '82 Datsun 200SX hardtop coupe, auto. Fred, 944-0493.

Want Gynpac or similar wgt. equip. that uses pins to select wghts., leg attach., pulldown, bench press. Laszlo, 282-3287.

Want volunteers or substitute teachers for JSC Child Care Center; janitorial or groundkeeping companies to work, must have ref. and insurance. Georgia Strain, x34734.

Want van pool riders from Sugarland, Westwood Mall, Fondren and Loop 610 Park & Ride to JSC. Alice, x35234.

Want good used sofa, 2 bar stools w/backs. Lynda, x30766 or 326-1880.

Want old wrist and pocket watches, any cond. 480-7338.

Want scuba gear for man, suit, BC, reg., reas. priced. 280-8796.

Want toy trains and Starwars toys. Ron, 482-1385.

Want to purchase Pres. & 1st Lady memberships, Exec. Gold or Charter Gold. Ken, x30637.

Want van pool riders from Friendswood/Sagem

Remembering Rendezvous

First orbital rendezvous celebrates 25th anniversary

[Editor's note: Twenty-five years ago this month, four Gemini astronauts performed the first orbital rendezvous, demonstrating one of the key capabilities needed in the Apollo, Skylab, Apollo-Soyuz and Space Shuttle Programs. Veterans of that first rendezvous got together with today's rendezvous experts last week in Teague Auditorium.]

By Kelly Humphries

The story goes that when Marvin Czarnik, one of the mission support room workers who helped design the first orbital rendezvous for the Gemini "76" mission, took off his headset perspiration dribbled out.

"When we finally got the word over the communications hookup that they had rendezvoused and were circling, I took my headset off and water ran out of the earpiece," he remembers. "I was just a little tense."

The perspiration Lead Flight Director Christopher Kraft Jr., remembers was that of Frank Borman and Jim Lovell in the Gemini VII capsule.

"Those guys were damned tired sitting up there," Kraft says. "They were sweating their asses off in those suits with the heavy rings and no liquid-cooled garments. Lovell's most salient comment was that 'It was like spending 14 days in the men's room.'"

The combined perspiration on the ground and in orbit probably was greatest on Dec. 15, 1965—the day when two manned spacecraft first maneuvered to within a foot of each other. But it was still just the melting tip of an iceberg of sweat that went into developing the vehicles, testing the rendezvous procedures and turning a failure into a success.

Theorized as early as 1923, rendezvous development began in earnest in 1961 when the debate over whether to go to the Moon and back directly or by using rendezvous and docking met head-on with President Kennedy's 10-year deadline. It took the work of many people like John Houbolt, NASA's first "rendezvous leader," who stuck by his data and insisted in the face of strong opposition that rendezvous was not only possible but necessary for far-ranging space exploration.

"The greatest drawback of this approach was its novelty," wrote Barton C. Hacker and James M. Grimwood in "On the Shoulders of Titans," the official Project Gemini history. "No one knew how hard a rendezvous in space might be. . . . It promised a quicker and cheaper road to the Moon, if it could be achieved.

The 'if' was a big one in 1961, big enough to justify the expense of a full-fledged manned space flight project to resolve it."

The initial rendezvous was to be between Gemini VI, carrying Astronauts Wally Schirra and Tom Stafford, and an unmanned Agena target vehicle. But shortly after its Oct. 25, 1965, launch, Agena telemetry was lost and Public Affairs Officer Paul Haney was forced to relay to the world that the Camarvon tracking station "report keeps coming back—No joy—No joy."

According to the Gemini historians, the gloom of the failure was not felt by some, including Gemini VII Astronauts Borman and Lovell and McDonnell Douglas spacecraft chief Walter Burke and his deputy John Yardley. Burke reportedly asked Yardley why a second Gemini couldn't be launched as a target vehicle for Gemini VI. The stage was set, but a torturous analysis and backing by people like Kraft, Manned Spacecraft Center Director Robert Gilruth, Flight Crew Operations Director Deke Slayton and Kennedy Space Center's Spacecraft Operations Director John Williams was needed before Deputy Administrator for Manned Space Flight George Mueller and NASA Administrator James Webb would approve. President Lyndon Johnson's press secretary, Bill Moyers, announced the gutsy Gemini VII-VI-A rendezvous plan to the world from the President's ranch near Austin on Oct. 28.

Mission planners, rendezvous experts and the crews immediately began a flurry of activity to get ready for the joint mission. The Gemini VI-A crew, already well trained for its mission, took a back seat in the simulators to the Gemini VII crew. Flight controllers began pulling long shifts.

"It was required, 12 to 16 hours a day," says Clifford Charlesworth, the retired flight director who was Gemini 76 flight dynamics officer. "Sometimes we'd be in there at 4 a.m. because that was the only

time we could get time on the computers to run whatever cases we wanted to run."

"Training was a big part of that," Czarnik agrees. "A lot of simulation, a lot of long hours by many people. One of our strengths as an organization was a lot of flexibility in being able to respond to changing events."

With only Launch Pad 19 capable of supporting a Gemini-Titan launch, the plan required the launch team to embark upon a shell game in which Gemini VI-A, already partially processed for its first

knew GLV-6 had not moved. . . ."

It turned out the errant plug was not the only problem. Engineers found strange thrust-trace data readings. But it was 9 a.m. the next morning before engineers discovered that a dust cap in the gas generator port had been left on.

An unprecedented turnaround put Gemini VI-A back in position for launch on Dec. 15, but in the meantime the Gemini VII astronauts were struggling with the reality of spending 14 days in the tiny Gemini spacecraft. Special "soft"

space suits had been designed for the endurance record-setting mission, but even those were unbearable in the close quarters. Borman and Lovell both had planned to remove their suits after a two-day check of the environmental system but that changed when Mueller and Associate Administrator Robert Seamans got wind of it. The new rule was that one

crewman should be suited at all times.

Lovell was the first to remove his suit, and reported much more comfort. But Borman, even with his suit unzipped and his gloves off, sweated. After 146 hours of flight, Borman removed his suit so that the surgeons could check the effects of suited and suitless conditions on both pilots. Lovell sweated.

The suit question intensified as daily reports showed concern about how alert the crew would be for the rendezvous. Borman asked and got permission for both crewmen to take their suits off after officials at MSC, KSC and Marshall Space Flight Center finally concurred.

Despite the uncomfortable conditions, the Gemini VII crew efficiently put their spacecraft into a nearly circular orbit of 186 miles.

At 8:37 a.m., Gemini VI-A was spurred into orbit with Schirra urging "for the third time, go." As they went into a 99 by 160-statute-mile orbit, the crewmen in Gemini VII put on their suits and waited for company to arrive. It would take six hours of maneuvering for Gemini VI-A to execute its "M equals 4" rendezvous profile.

"The big decision involved what's called the 'M' number, the number of orbits prior to rendezvousing," remembers Czarnik, a McDonnell Douglas guidance and control expert who helped design the profile. "We ended up with 'M equals 4.' After launch we'd have ideally three orbits to get ready and rendezvous on fourth orbit. Then if there were problems with insertion or bigger errors than anticipated, our plans were flexible and we could delay rendezvous for full day of 16 orbits."

Achieving rendezvous on orbit 4 meant Schirra and Stafford had to go to work right away. At insertion, Gemini VI-A trailed its target by 1,235 miles. Over New Orleans, after 94 minutes in space, Schirra lit the thrusters and accelerated his spacecraft so that its apogee was up to 168 miles. Being nearer to Earth and therefore moving faster, Gemini VI-A moved to within only 728 miles of Gemini VII and closing.

Half an hour later Schirra began a phase adjustment burn that put the two vehicles even closer together and raised Gemini VI-A's perigee to 85 miles. Another half hour later, Schirra turned the spacecraft 90 degrees and ignited the thrusters again to put Gemini VI-A and Gemini VII in the same plane. The distance between the two was now only 299 miles.

"We knew we could maneuver on orbit," recalls Charlesworth. "What we didn't know was whether we could perform the tracking well enough, compute the maneuvers and execute them without having a lot of residual errors. You came barreling in there pretty fast."

Another half hour later, the Gemini VI-A crew got a flickering radar signal and then a solid lock-on at 269 miles. Another half hour and the chase capsule's thrusters fired again, putting Gemini VI-A into a 167 by 169 mile, almost circular orbit. The spacecraft were now only 197 miles apart and closing slowly.

"My gosh, there is a real bright star out there. That must be Sirius," exclaimed Schirra. But the star turned out to be Gemini VII just 62 miles away. More firings and the two spacecraft were closing at about a mile a minute. At a range of 330 feet, Schirra began firing the forward thrusters to slow Gemini VI-A. The two coasted to within 15 feet of each other and at 2:33 p.m. Dec. 15, 1965, the world's first space rendezvous had been achieved.

That's when Marvin Czarnik took off his headset and Clifford Charlesworth breathed a sigh of relief. The rest of the Mission Operations Control Room waved small American flags while Kraft, Gilruth and others lit their cigars.

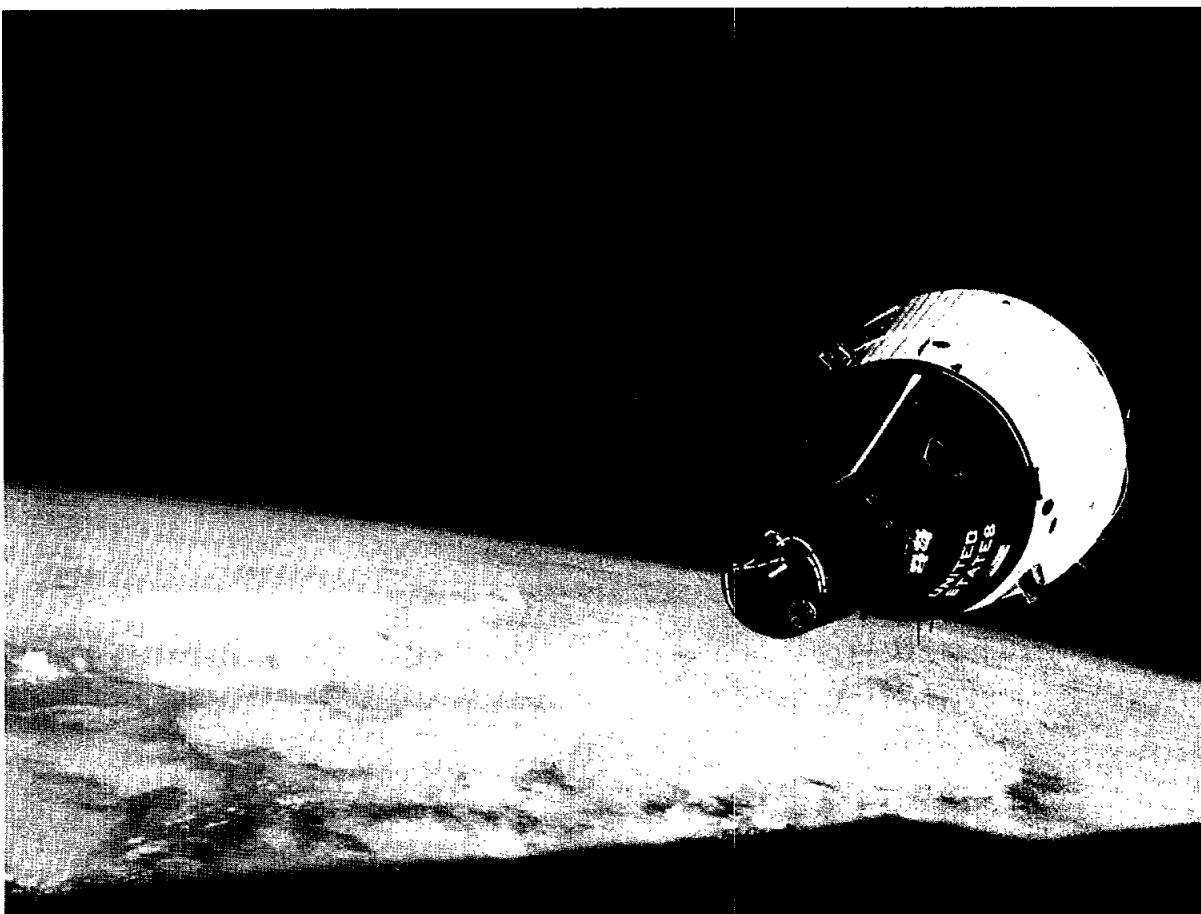
"It was probably as exciting as the Apollo flights," said Charlesworth. "I don't think it could equal Apollo 8 or 11, but it was pretty exciting at the time. We had been pointing toward this since the Gemini program started. We needed to demonstrate that we could in fact do rendezvous because that was key to going to the Moon."

"It was the proof of the pudding and the culmination of a lot of hard work and a lot of investment," Czarnik says. "A lot of us had our careers hinging on this thing. Industry had its skeptics back in those days. People had written we've never be able to rendezvous and later on that we'd never be able to dock. They said the basic equations of motion wouldn't allow it."

The two spacecraft played orbital tag for several hours, each pilot taking a turn, and then Schirra turned his spacecraft and made a short separation burn. The two crews settled down to sleep about 10 miles apart.

On the following day, several hours before Gemini VI-A was to fire its retro rockets and come home, an excited Stafford reported: "Gemini VII, this is Gemini VI. We have an object, looks like a satellite going from north to south, probably in polar orbit. He's in a very low trajectory. . . . looks like he may be going to reenter pretty soon."

Then, on a small four-hole harmonica and a set of small bells, the two Gemini IV-A astronauts began playing "Jingle Bells." All was right with the rendezvous and the world.



We knew we could maneuver on orbit. What we didn't know was whether we could perform the tracking well enough, compute the maneuvers and execute them without having a lot of residual errors. You came barreling in there pretty fast.

—Clifford Charlesworth

launch attempt, was taken down one stage at a time and stored under plastic cover and Gemini VII was erected on the same pad. Gemini VII blasted off on its long-duration flight at 2:30 p.m. EST Dec. 4, and the launch team immediately sprang into action, cleaning up the scorched pad for a Dec. 12 launch of Gemini VI-A.

After a trouble-free reassembly and countdown, the Titan roared at 9:54 a.m. but was quickly strangled. At 1.2 seconds, an electrical tail plug dropped from the base of the rocket and the valves that supplied fuel to the rockets snapped shut.

"One of the most suspense-filled moments in the whole Gemini program followed," wrote Hacker and Grimwood. "If ever there were a time to use the spacecraft ejection seats to get away from a cocked and dangerous rocket, this seemed to be it. . . . At the moment of crisis, the veteran test pilot (Schirra) remained calm. With no trace of emotion in his voice, Schirra reported, 'Fuel Pressure is lowering' . . . Schirra relied, with icy nerves, on his own senses. He

Top: Gemini VII is photographed from the Gemini VI-A hatch window on Dec. 15, 1965. During the first orbital rendezvous of two manned spacecraft, Gemini VII crew members Frank Borman and Jim Lovell and Gemini VI-A astronauts Wally Schirra and Tom Stafford reported they could clearly see cabin lights and pen lights inside each other's capsules. Right: Flight Director Christopher Kraft Jr., left, and Manned Spacecraft Center Director Robert Gilruth, right, light cigars following a successful rendezvous as Astronaut Cooper looks on.



NASA Photos

Truly to move out aggressively on group's advice

Holiday message stresses utility of advisory committee's recommendations

NASA plans to move out aggressively in implementing the recommendations of the Advisory Committee on the Future of the U.S. Space Program, Administrator Richard Truly told employees Tuesday in a televised holiday message.

"This is not a report that J.R. Thompson and I intend to study to death," Truly said. "Our driving objective after we come back from the holidays is to work with you to make our decisions so that, together, we can get on with the business of the space program."

Truly said he and the top NASA managers from Headquarters and all the field centers met with Chairman Norman Augustine at a NASA leadership meeting last weekend to clarify several points made in the report.

"We're making plans to move out aggressively across the board, particularly in robust space transportation and more particularly in heavy lift," he said.

In addition to acting on the committee's 15 main recommendations, Truly said he also is moving quickly to implement several internal management changes it suggested. He said he plans to establish an associate administrator for exploration and an associate administrator for human resources right away, but that he hasn't made a final decision on whether to separate the agency's operations and development efforts.

To help him develop a specific overall implementation plan, he said he has asked JSC Director of Flight Crew Operations Don Puddy to "drop everything" and go to Headquarters to

help.

Truly looked back on the successes and difficulties of 1990, noting with special pride the observation of the 75th anniversary of NASA and the National Advisory Committee on Aeronautics, and the Cosmic Background Explorer complete sky survey. He said he liked one of COBE's pictures of the Milky Way so much he put it on his Christmas cards.

He also noted the successful deployment of the Hubble Space Telescope, Galileo's flybys of Venus, Earth and the Moon, Magellan's radar mapping of Venus' surface and the ultraviolet and x-ray astronomy of the recent Astro-1 shuttle mission. He pointed to six safely flown shuttle missions, the last three in just 60 days, and the longest shuttle mission to date that retrieved the

Long Duration Exposure Facility.

He recalled that 23 new astronaut candidates were selected, including the first female pilot and first Hispanic female, and that NASA has invited Canada, Japan and the European Space Agency to provide two mission specialist candidates each for the class of 1992.

He said international relations, technology utilization and education programs also were highly successful in 1991.

Truly ended with a display of the "Ho, Ho, Ho" socks his wife, Cody, had given him and a personal message:

"To each of you in the NASA family, I want you to drive safely as you go visit your family because we're going to need you to start this new year."

Berry accepts more information resources duties

In addition to his duties as director of the Information Systems Directorate, Ronald L. Berry recently has been designated JSC's senior information resources management official.

Berry's expanded duties are part of an effort to consolidate JSC's management of information technology, said Don Simanton, Information Systems assistant director. The consolidation also is an effort to decentralize the signature authority wherever possible, he added.

Berry's new duties will include the approval of the annual JSC Information Technology Systems Plan; various information processing resources use, acquisition, and disposition reports; and all JSC acquisition plans and related procedures.

Berry will appoint all JSC representatives and alternates to various NASA committees dealing with the management of data processing. He also will have the authority to appoint the manager for the Information Processing Resources area, designate a center computer security manager, and approve the JSC Automated Information Systems Security Plan.

All acquisition plans that leave JSC and those competitive acquisition plans greater than \$1 million which previously required the center director's signature now will require only Berry's signature. However, officials said it is not necessary to change the signature page on acquisition plans already in the approval process.



JSC Photo by Scott Wickes

BETTER WATCH OUT—Excited children gather around Santa Claus as he makes a visit to the JSC Child Care Center on Tuesday. Santa's visit was arranged by Gregg Baumer, a safety engineer in the Payload Safety Branch. Kelle Pido, right, treasurer of Space Family Education Inc., gave Santa a hand.

Four crews get nod for upcoming shuttle missions

By Barbara Schwartz

NASA announced crew members Wednesday for upcoming space shuttle flights involving the Upper Atmosphere Research Satellite, Tethered Satellite Systems, Intelsat and United States Microgravity Laboratory.

Navy Capt. John O. Creighton will command the STS-48 UARS mission, scheduled for November 1991. UARS will study the Earth's upper atmosphere on a global scale with nine sensors providing comprehensive data on energy inputs, winds, and chemical composition of the stratosphere.

Pilot will be Navy Cmdr. Kenneth S. Reightler Jr. Mission specialists will be Marine Col. James F. Buchli, Air Force Col. Mark N. Brown, and Army Maj. Charles D. "Sam" Gemar.

Creighton, 47, was pilot on STS 51-G and commander on STS-36. Reightler, 39, selected as an astronaut in 1987, will be making his first shuttle flight. Buchli, 45, has flown on STS 51-C, STS 61-A, and STS-29. Brown, 39, flew on STS-28. Gemar, 35, flew on STS-38.

Air Force Col. Loren Shriver will command the STS-46 TSS flight, scheduled for March 1992. TSS is a tethered satellite that will be deployed from the orbiter payload bay on a 12-mile-long tether to collect electrodynamic data in the upper reaches of the Earth's atmosphere. The European Retrievable Carrier, a free-flying reusable platform dedicated to materials science and life science experiments, also will be deployed.

Pilot will be Navy Cmdr. James D. Wetherbee. Mission specialists will be Marine Maj. Andrew M. Allen, and previously named Franklin R. Chang-Diaz, Ph.D., Jeffrey A. Hoffman, Ph.D., and Claude Nicollier, European Space Agency astronaut. A prime and backup payload specialist will be selected from the two announced candidates, Umberto Guidoni and Franco Malerba of Italy.

Shriver, 46, was pilot on STS 51-C and commander on STS-31. Wetherbee, 38, was pilot on STS-32. Allen, 35, a member of the astronaut class of 1987, will be making his first

shuttle flight.

Astronaut Office Chief Daniel C. Brandenstein, a Navy captain, will command the STS-49 Intelsat rescue mission, scheduled for May 1992. On this first flight of the new orbiter *Endeavour*, crew members will attach a new booster and redeploy the Intelsat satellite, which has been stranded in a useless orbit since its launch. Three additional extravehicular activity spacewalks will be performed in an extensive test of techniques to be employed during assembly of Space Station *Freedom*.

Pilot will be Air Force Maj. Kevin P. Chilton. Mission specialists will be Navy Cmdr. Pierre J. Thuot, Kathryn C. Thornton, Ph.D., Richard J. Hieb, Air Force Maj. Thomas D. Akers and Coast Guard Cmdr. Bruce E. Melnick.

Brandenstein, 47, was pilot on STS-8 and commander on STS 51-G and STS-32. Chilton, 36, selected as an astronaut in 1987, will be flying his first mission. Thuot, 35, flew on STS-36. Thornton, 38, flew on STS-33. Hieb, 35, is scheduled to fly on STS-39 in March 1991. Akers, 39, flew on STS-41. Melnick, 41, flew on STS-41.

Navy Cmdr. Richard N. Richards will command the STS-50 USML-1 mission, scheduled for June 1992. USML-1 is a complement of microgravity materials processing technology experiments to be flown on the first extended duration orbiter mission aboard *Columbia*. This planned 13-day flight would be the longest to date.

Pilot will be Air Force Col. John H. Casper. Mission specialists will be Navy Lt. Cmdr. Kenneth D. Bowersox, Payload Commander Bonnie J. Dunbar, Ph.D., and Air Force Lt. Col. Carl J. Meade. Two prime and two backup payload specialists will be selected from announced candidates Lawrence J. DeLucas, Ph.D., Joseph M. Prael, Ph.D., Albert Sacco Jr., Ph.D., and Eugene H. Trinh, Ph.D.

Richards, 44, was pilot on STS-28 and commander on STS-41. Casper, 47, was pilot on STS-36. Bowersox, 34, selected as an astronaut in 1987, will be flying his first mission. Meade, 40, flew on STS-38.

Shuttle management integration reorganizes

Information Systems, Configuration Management offices added

The Space Shuttle Program Office has created two additional offices within its management integration area.

The Management Integration Office, mail code GM111, has reorganized and added the additional offices, the Information Systems Office at mail code GM211 and the Configuration Management Office at mail code GM311.

The reorganization, effective immediately, has resulted in some new personnel assignments.

Robert Mitchell now is the manager of the Information Systems Office, and

Robert Heselmeyer is the manager of the Configuration Management Office. David Schultz will continue as manager of the Management Integration Office. Prior to their new assignments both Mitchell and Heselmeyer were technical managers within the Management Integration Office.

Schultz said the two groups essentially had been functioning in the capacity of separate offices before the reorganization.

"This reorganization recognizes the need for creating supervisory management positions to lead significant areas," Schultz said. "These

guys both have contractor people who report to them from Downey, Kennedy Space Center, Marshall Space Flight Center as well as Houston."

Additional personnel assignments include: Management Integration Office, Rosalinda Garza-Flores; Information Systems Office, Yolanda Bejarano, Roseanna Dubbin, Thomas Harmon, Marilyn Kimball and Robert Ligons; and Configuration Management Office, Andrea Julian, Garland Bauch, Baley Davis, Anita Jenkerson, Carolyn Lowrimore, Russell Morton Jr. and Evelyn Williams.

President gives employees Christmas Eve half-day off

President Bush has issued an executive order excusing all federal employees from duty for the last half of the scheduled workday on Monday, according to Acting Human Resources Director Harvey Hartman.

The four hours on Christmas Eve will be considered a holiday for pay and leave purposes, he said, and any employee who already has received approval for leave for the last half of the Dec. 24 workday will not be charged leave for that period.

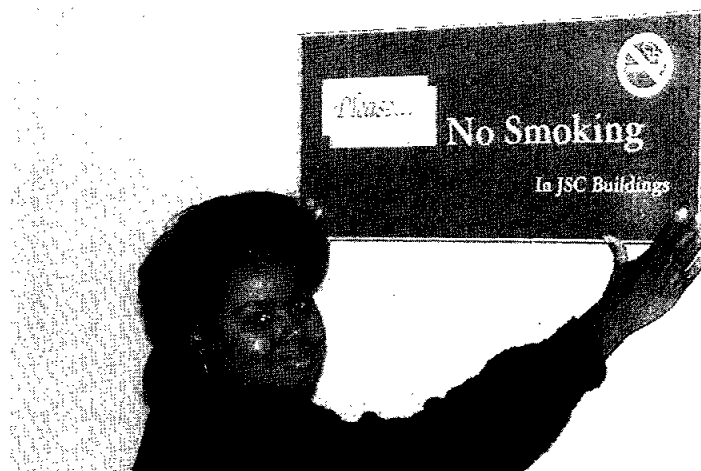
Civil service employees who are not excused because their services are required for essential operations of the center will be paid holiday premium pay for the last half of their

regularly scheduled tour of duty on that day.

Employees who have scheduled "use or lose" annual leave for the last half of the workday will forfeit that leave unless they are able to schedule another time off on annual leave by Jan. 12, 1991.

Employees who are in a leave without pay status at the end of the first half of the Dec. 24 workday and at the beginning of the first workday after that period will not be entitled to pay for the holiday period.

Employees who have questions should contact their personnel management specialist at x36251 or the Payroll Office at x34832.



JSC Electronic Photo by Robert Markowitz

SIGN OF THE TIMES—Omniplan Corp. employee Geraldine Yancy installs a new JSC "No Smoking" sign in the lobby of Bldg. 45. Diagonal strips reminding everyone of the Jan. 1, 1991, deadline are being placed on each sign until the deadline passes.

On-site college classes available next semester

The Human Resources Development has scheduled on-site college courses for undergraduate students during the upcoming spring semester.

The classes, presented by San Jacinto College Central, will include English 1301 (English Composition I) from 1-4 p.m. Tuesdays, Math 0305 (Introductory Algebra) from 5-8 p.m. Wednesdays, and Accounting 2301 (Accounting Principles I) from noon-4:30 p.m. Thursdays. Classes will be held in Bldg. 45, Rm. 251.

Registration will be from 1-2:30 p.m. Jan. 9 in Bldg. 45, Rm. 251. A JSC Form 75 is required and will indicate management's support of attendance during duty hours. Call Estella Gillette at x33077 for more information.