NASA
National Aeronautics and Space Administration
Lyndon B. Johnson Space Center
Houston, Texas

Personnel carrier

JSC designers are working on a new vehicle concept called the Personnel Launch System. Story on Page 3.

Sign of the times

JSC's new Child Care Center has a new, full-color sign to welcome parents and their children. Photo on Page 4.

Space News Roundup

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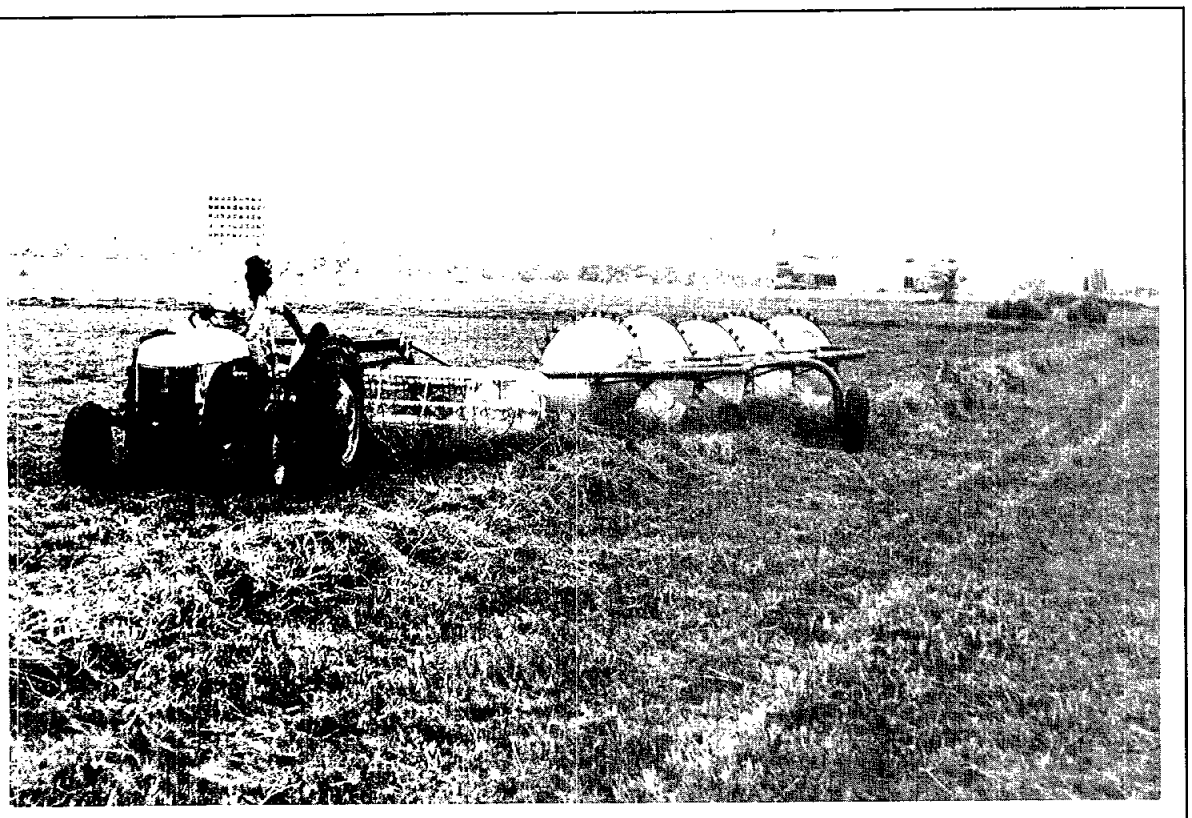


HAY, THERE—A local partnership is making hay at JSC again. NASA has agreed to let David Couch, who works for Brown & Root at JSC, and Kevin Blackwell have the hay for free in return for their cutting the fields. Ranchers have told Couch the hot summer already is turning Southwest Texas pastures bare and "we may save some cattle with this." Above, hired helper Jose Perez looks back to make sure the freshly cut grass is lined up into narrow rows for baling. Right, Blackwell lifts a large rolled bale of hay onto Hughes Linton's truck. Linton, a JSC security guard, is picking up the hay for friends who own a horse ranch.

JSC Photos by Mark Sowa

Investigation team tracing hydrogen leak

By Kyle Herring

The investigation team tracing the cause of liquid hydrogen leaks in the disconnect cavity of *Columbia* and now *Atlantis* is meeting daily in an all-out effort to get to the bottom of the problem that has temporarily grounded the shuttle fleet.

Headed by Leonard Nicholson, deputy shuttle program director, the team is charged with investigating all aspects of the disconnect on the external tank and orbiters.

STS-38

The team was formed by William Lenoir, associate administrator for space flight, following last Friday's mini-tanking test on the STS-38 stack at Launch Pad 39A. The test, which had been expected to verify a good seal, revealed an out-of-specification leak with some similarities to the one discovered on *Columbia* during tanking for the STS-35 mission in May.

"There's no question we won't fly until we understand (the leak), have it fixed, have tested it, verified it and we're ready to fly," Lenoir said in announcing the investigation team.

Tests were scheduled to begin today on *Columbia*'s disconnect, which was removed and sent to California in hopes of locating the source of the leak that scrubbed the STS-35 ASTRO-1 mission in late May. Another tanking test of the STS-38 stack on Pad 39A is planned for Tuesday or Wednesday.

All of the tests are striving to pinpoint that "it's this particular interface and it's this big," Lenoir said Tuesday in an update briefing. He said it will take several weeks to analyze the results of all the tests.

Prior to the July 4 holiday, a pressurization test of the external tank was conducted and revealed no leaks at the 17-inch disconnect area. The tank was pressurized to flight level with helium while engineers monitored for leakage at the 17-inch disconnect.

As part of the test, the tank pressure was decreased incrementally to collect baseline leakage conditions at ambient temperatures. Engineers are reviewing data and getting signatures from the leak detectors and sensors on various parts of *Atlantis*.

Meanwhile, *Discovery* continues processing toward its planned launch in October to deliver the Ulysses probe into space. The orbiter will not be mated to its external tank until the investigation team has completed its analysis of the leak.

The ET/Orbiter Disconnect Investigation Team is split into five groups, each with a specific area to evaluate:

- Design and Analysis Team — reviewing all aspects of the disconnect design and test including mating tolerances, thermal effects, specifica-

Please see **LEAK**, Page 4

JSC plays supporting role for Economic Summit

By Kelly Humphries

JSC won't be a major venue for next week's Economic Summit, but the center will support the international powwow through downtown displays and tours for the high-ranking officials who are able to get away.

This week and next, JSC will host top-level White House and cabinet officials and provide tours for the participating countries' government officials and their families. Most of the visits are tentative, but a few have been officially scheduled.

Japanese Finance Minister Ryutaro Hashimoto will tour the center Sunday, Mila Mulroney, wife of the Canadian prime minister, will visit Monday afternoon, and Sir Antony Acland, British ambassador to the United States, will be here Wednesday.

At the George R. Brown Convention Center on Tuesday, JSC Director Aaron Cohen will chair a panel discussion on Houston's extensive involvement in the space program. Former astronaut Joe Allen, president of Space Industries International, Astronaut Charles Bolden and Dr. Alex Ignatiev, director of the University of Houston's Space Vacuum Epitaxy Center, will serve on the panel at 10 a.m. Tuesday.

"We are pleased that we can provide a supporting role for the planners of the Economic Summit and in so doing we can also display at first hand one of the crown jewels in the American system," said JSC Public Affairs Director Harold S. Stall. "The president's announced determination to push back the frontiers of space is an indication of the importance NASA will have in investing for the future.

"The fact that the space program is one in which our international friends participate with us, share experiences, share the costs, is an indication of its value as an instrument of international policy," Stall said.

The centerpiece of JSC's summit involvement will be a 44-foot-long detailed mockup of the Space Station *Freedom* laboratory. The mockup, complete with representations of the planned scientific experiment racks and graphic depictions of the international enterprise's construction sequence, will be displayed Sunday, Monday and Tuesday on the second-level mezzanine at the Brown Convention Center.

A 42-foot-long composite of NASA photos depicting aeronautics research and space endeavors, enhanced with the flags of the Economic Summit's participating countries and images of NASA's international involvement in space research, will support the larger display. A 16-foot-long space shuttle orbiter model will round out the exhibit.

An information center will be staffed by a diverse group of NASA employees, contractors and volunteers from the Clear Lake community.

Eight volunteers from the Threshold Group are prepared to escort up to 240 visiting news media representatives a day.

Computers may enhance blurred Hubble images

Scientists are optimistic that as much as 50 percent of the Hubble Space Telescope's (HST) first-year science can be performed, and computer enhancement techniques may be able to improve visible-light observations.

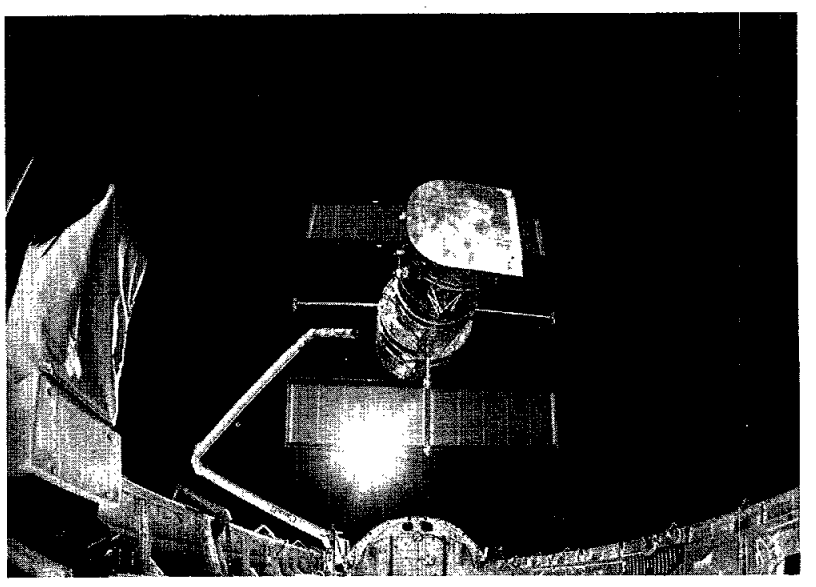
The cause of the optimism is that the "spherical aberration," which won't allow the telescope to focus as precisely as planned, is very symmetrical making any corrections relatively simple. Although the project's scientists and engineers have the ability to change the shape of the primary mirror, they probably won't because it might make correction more difficult.

Meanwhile, Dr. Lennard A. Fisk, NASA associate administrator for space science and applications, appointed a Hubble Space Telescope Optical Systems Board of Investigation to review the facts and circumstances regarding the manufacture, development and testing of the Optical Telescope Assembly.

"We're optimistic about this because the 'highest tech' aspects of the spacecraft seem to be working just fine, it's some of the 'low-tech' stuff that's failed us," HST Program Scientist Ed Weiler said.

Weiler said Hubble is using the quietest gyros ever built, and they are working beautifully. On board are the first nickel hydrogen batteries to be used in low-Earth orbit, and they are working well. The prime guidance sensors are working fine, and the

Please see **TIGER**, Page 4



NASA Photo

A recently released photo taken by the IMAX large-format movie camera shows the Hubble Space Telescope being deployed from *Discovery*'s robot arm in April.

NASA gets title for TDRSS, funds advanced designs

Contel Federal Systems of Chantilly, Va., this week transferred the title of the Tracking and Data Relay Satellite System (TDRSS) to NASA, and NASA announced plans to move ahead with the design of an Advanced Tracking and Data Relay Satellite System (ATDRSS).

The title transfer, effective July 1, will shift ownership of the space communications system 42 months earlier than called for under the original contract. Contel also will get a 21-month extension, to Sept. 30, 1995, to continue operating the three on-orbit satellites and the White Sands ground terminal.

"The early transfer of the title, along

Please see **TDRSS**, Page 4

JSC

Ticket Window

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

General Cinema (valid for one year): $3.75 each.

AMC Theater (valid until May 1991): $3.50 each.

Sea World (San Antonio, year long): adults, $17.25, (2-day, $21.95); children (3-11) $14.75, (two-day, $18.95).

Astroworld (valid 1990 season): season, $39.95; regular, $15.97; children, $9.21; Waterworld, $8.15; two-day—AW/WW, $18.47.

Spaceweek 1990 Banquet (6:30 p.m., July 16, South Shore Harbour Resort & Conference Center): $40 each.

Las Vegas Trip (Aug. 16-19, 2/3 nights): $290-360.

Ringling Bros. and Barnum & Bailey Circus (noon, July 14, Summit): $7.

Riverraft Trip (July 21, includes transportation, rafting, dinner): $35.

Schlitterbahn Trip (July 21, includes transportation, breakfast, lunch, 17 waterslides, paddleboats, mini golf, more): $50.

JSC

Gilruth Center News

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

Defensive driving—Course is offered from 8 a.m.-5 p.m. Aug. 18 and Sept. 15; cost is $15.

Weight safety—Required for use of weight room. The next classes will be from 8-9:30 p.m. July 11 and 21; cost is $4.

Aerobics and exercise—Both classes are ongoing.

Ballroom dance—Classes begin Aug. 2 and meet every Thursday for eight weeks. Beginning and advanced classes meet 7-8:15 p.m. Intermediate class meets 8:15-9:30 p.m. Cost is $60 per couple.

Tennis—Beginning class will be at 5:15-6:45 p.m. on Mondays for six weeks beginning July 9. Advanced beginner will be offered on Wednesdays beginning July 11. The cost is $32.

Scuba—Class starts July 16 and runs for four weeks. Cost is $45 at time of sign-up, plus additional fees.

JSC

Technical Library News

These new publications are available in the JSC Technical Library, Bldg. 45, Rm. 100.

Adventures in Celestial Mechanics: A First Course in the Theory of Orbits, Victor G. Szebehely

Reports of Planetary Geology and Geophysics Program—1988, NASA.

The New Physics, Cambridge University Press.

Fracture Mechanics: Perspectives and Directions, (Twentieth Symposium), ASTM.

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

Cafeteria menu—Special: smothered steak with dressing. Entrees: beef stew, liver and onions, shrimp Creole. Soup: navy bean. Vegetables: buttered corn, rice, cabbage, peas.

Wednesday

JSC Astronomy Seminar—The seminar will be a Rice University videotape featuring Dr. John Imbrie—"Explaining the Ice Ages" from noon-1 p.m. July 11, in Bldg. 31, Rm. 129. For more information contact Al Jackson, x33709.

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.

July 13

Volcano video—The JSC Astronomical Society will have a video presentation of the latest Kilauea eruption at 7:30 p.m. July 13 at the Lunar Planetary Institute. Plans for the upcoming solar eclipse expeditions also will be discussed. For more information contact Anne Hawes, x36923.

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

July 14

Lunar Rendezvous Run—The 12th annual Ford Aerospace Lunar Rendezvous Run will start at 8 a.m. July 14 at the Gilrtuh Recreation Center. Entry forms are available at the gym office. Entry fee is $8 if postmarked by July 7, and $15 after July 7. Those interested in volunteering for the race should contact Len Topolski, 333-5576, or Brenda Clary, 480-0257.

July 16

Spaceweek banquet—Spaceweek will hold its annual national banquet at 6:30 p.m. July 16 at the South Shore Harbour Resort & Conference Center, Crystal Ballroom. Dr. Harrison Schmitt will be keynote speaker with an introduction by JSC Director Aaron Cohen. Contact Tanya Lyttle, 333-3627, for more information.

July 18

JSC Astronomy Seminar—The seminar will be an open discussion meeting from noon-1 p.m. July 18 in Bldg. 31, Rm. 129. For more information call Al Jackson, x33709.

July 19

Debris sensors—The Solar System Exploration Division Seminar Series will present Dr. David Talent, who will speak on "The Debris Collision Warning Sensor Experiment: How it Will Help Us Understand the Orbital Debris Environment and How We Will Apply What We Learn to Space Station," at 3:30 p.m. July 19 in Bldg. 31, Rm. 129. Call Nadine Barlow, x35044, for more information.

July 20

Space society meets—The Houston Space Society will meet at 7:30 p.m. July 20 in Rice University's Space Science Bldg., Rm. 106. Jim Jordan will speak on "Lunar Resources." For more details call 639-4221.

July 24

BAPCO meeting—The Bay Area PC Organization (BAPCO) will meet at 7:30 p.m. July 24 at the League City Bank & Trust. For more information call Earl Rubenstein, x34807, or Tom Kelly, 996-5019.

July 25

SCS meeting—The Society for Computer Simulation will meet from 11:45 a.m.-12:45 p.m. July 25 in the Bldg. 3 cafeteria. Robin Kirkham, 333-7345, or Wade Webster, 486-6450.

JSC Astronomy Seminar—The seminar will be a Rice University videotape featuring Dr. Edison Liang—"Gamma Rays From Nearby Supernovas" from noon-1 p.m., July 25, in Bldg. 31, Rm. 129. For more information call Al Jackson, x33709.

JSC

Swap Shop

Property

Sale: Waterview lots near NASA, mid $30's. Don, x38039 or 333-1751.

Sale: Countryside Sweetgum Dr., 3-2-2, new appli., trees, fans, miniblinds, wkshp., $61,500. Marsha, 488-4445 or 480-9308.

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

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

Trade: 4-3 W. of Austin, prefer 5 yr. old open plan w/in 20 min. of JSC. 471-8795 or 333-6083.

Sale: .37 acres in Club Lakeview in Hockley, TX, $4K, 2 lakes, clubhouse. 996-8086 or 483-3408.

Sale: Heights, 3-2-2, remod., CA/H, FPL, game room, deck. Tom, x31418.

Rent: Lake Travis cabin, priv. dock, CA/H, equipped, accomm. 8, wkly./dly., $425/$85. 326-5652.

Rent: Lake Livingston wtrfrnt. house, 3-2, CA/H, furn., decks, pier, ex. cond., wknd./wk. rates. 482-1582.

Sale: Friendswood, 3-2-2 w/Gunite pool, deck, 2,000 sq. ft., new paint/carpet, fans, $88,500. x34902 or 996-9128.

Sale: 4-2-2, 5 mi. N. of Sugarland, open plan, den, DR, FPL, fans, cov. patio, gas grill, assum. $75K. x30079 or 495-1040.

Trade: Lot in Westwood Shores, near Lake Livingston, valued at $9,500 or trade for car, PU or trav. trlr. of equal value. 554-6541.

Lease: Bayglen, 3-2.5-2 w/garden BA, miniblinds, fans, island kitchen, microwave, gar. dr. opener, avail. July 1, $1,050/mo. Ruben, x33829 or 486-0817.

Sale: 2-2 furn. condo, sleeps 6, hot tub, steam wft. rm., 45 min. from JSC, $12K. Steve, x38204 or (409) 938-3171.

Rent: Bellaire, 3-1, CA/H, remod., hardwoods, stor., avail. mid Aug., $625/mo. 488-2664.

Rent: 1 BR oceanfront condo, sleeps 4, Sarasota, Fla., Aug. 11-18, $600 plus $100 dep. 438-0201.

Sale: Pecan Gap, 30 mi. SW of Paris, 278 acres, 160 tillable, ponds, barns, $800/acre nego. x35398 or 474-7021.

Sale: 80 acre farm near Waco, $675/acre. 485-7629.

Lease: Room, ceiling fan, $270/mo., incl. util./maint. Eric, x38420 or 484-9179.

Cars & Trucks

'63 BW bus, reb. eng., new clutch, runs well, $600. Carl, x31531 or 486-7851.

'85 Ford Exp., 5-spd., new AC, good cond., $3K, OBO. 332-5063.

'82 Citation, 4-dr., V6, good cond., clean in/out, $1,200 nego. Frank, x33573 or 480-9376.

'81 Pontiac Le Mans station wagon, reb. V6 eng., new tires/brakes/shocks/ball joints/tie rods/AC comp. but has leak, $1,200. x33335 or 488-7490.

'74 Merc. Capri, V6, 4-spd., air, good cond., low mi., $1,500 or trade for sm. PU in sim. cond. x36565 or 532-1812.

'84 Chrysler Fifth Ave., loaded, 55K mi., $5,700. Paul, x34232 or 488-5077.

'70 Pontiac Firebird, good cond., $1,750, OBO. Larry, x31235 or 482-6357.

'85 Ford F150 Supercab XL, V8, auto., loaded, SWB, dual tanks, 60K mi., $6,800. Bob, x33502 or 482-0954.

'80 Fiat Spider conv., AC, 57K mi., ex. cond., $4,200. Mark, 474-2195.

'88 Mustang LX, conv., loaded, ex. cond., $11K, OBO. x35786 or 334-1852.

'88 Volvo 740 Turbo, warr., current NADA book. Phil, 282-3600.

'81 Plymouth Reliant, needs timing belt, $750. 643-7827.

'77 Dodge Royal Monaco, pwr., AC, good cond., $950, OBO. Gene, x38020 or 334-1505.

'82 Porsche 924, ex. cond., $5,950. 280-8796.

'75 Fury station wagon, 360 V8, good cond., $650. Ken, x31482 or 488-2497.

'77 Corvette 350, auto., AC, T-tops, ex. cond., 78K mi., $7K. Ken, x37620 or 486-5432.

'86 Pontiac Grand Am LE, 63K mi., loaded, new tires, $6,250. x37999 or 474-5453.

'82 Buick Regal, 94K mi., auto., AC, 4-dr., ex. cond., $2K, OBO. 480-4814.

'88 Dodge Omni, ex. cond., $6,900. 337-2890.

'88 Merc. Cougar LS, 38K mi., pwr., $8,250. 280-2750.

'81 Chev. Caprice, diesel, 79K mi., fully equipped, 1st $1K takes it. 280-5159 or 326-2986.

'53 Chevy 5-wndw. PU, ex. cond., 350, 4-spd., new tires, $5,900. x36160 or (409) 948-4887.

'87 Toyota PU, 32K mi., 5-spd., new tires, ex. cond., $6,500, OBO. Kelvin, x36921 or 488-8173.

'87 Pontiac Firebird, V8, loaded, low mi., $8K. 283-7320 or 334-3185.

'77 Buick Skylark, 2-dr. htchbk., V6 auto., AM/FM cass., good cond., $550. Mark, x32248 or 480-7851.

'65 Olds Starfire sport coupe, 106K mi., orig. owner, $2K, OBO. Tom, x38298 or 488-4089.

'87 Trans Am, loaded, T-tops, ext. warr., ex. cond., $9,900 or take up pmts. Brian, 532-3507.

'90 Geo Metro, 2-dr., htchbk., 5-spd., $6,500. Angela, 945-6878.

'76 Mercedes 300D, sunroof, auto., $3,600, OBO. Jerry, x39287 or 554-6093.

'88 Mits. Precis RS, 3-dr., 5-spd., 34K mi., ex. cond., $4K. Barbara, 488-4102 x202.

'85 GMC S-15 Jimmy 4x4 Sierra Classic, new paint/tires/seals, $5,800. Dan, 554-7348.

'88 Hyundai GL, 4-dr. sedan, 5-spd., sunroof, loaded, BO. Becky, x31420 or 488-0556.

'85 Buick Electra Park Ave., 4-dr., pwr., ex. cond., new tires, 66,500 mi., $6,600. 482-1535.

Cycles

'82 Harley Davidson XLH Sportster, elec. start, low mi., ex. cond., $2,875. x30092 or 481-3637.

'87 Honda Elite CH80 scooter, 80cc, 300 mi., ex. cond., $500. Elena, 333-6078 or 484-3309.

20" boys bike, Diamondback, 8" crank, ex. cond., $45; 20" boys bike, Webco, 7" crank, ex. cond., $35. Ken, x31482 or 488-2497.

'86 RM 125 dirt bike, new piston/rings/exhaust, good cond., $750. Greg, 282-3385 or 532-1012.

'80 CB 750 Honda, good cond., $850. x34270 or 337-2682.

XR 500 Enduro bike, $750 or trade for street bike, ex. cond. Bruce, 485-0396.

27" Schwinn World Sport 10-spd. w/cromoly frame, good cond., $125; 27" Schwinn Le Tour 10-spd., good cond., $100. Ruben, x33829 or 486-0817.

Boats & Planes

15' Tidecraft boat w/trlr., 50hp Mercury motor, $800, OBO. 488-4453.

Sunfish sailboat w/trlr., good cond., $575. 485-7629.

'72 Hollywood trihull w/'73 Chrysler 70hp OB w/trlr., new tires/pump/batt., $1,700. 496-3845 or 332-0365.

'89 Sea Ray 160 I/O galv. trlr., depth finder, 5 yr. warr., $9K. Denny, x32207.

'75 Hustler boat w/50hp Evin., motor guide trolling motor, good cond., $1,200. Doug, x36576 or 332-0704.

Aircraft propeller, Sensenich 74DM6-0-58, fits some Beech, Piper PA-18, PA-22, PA-28 series, $900. 538-2299.

'84 21' Rinker, 170hp OMC, cuddy cabin, porta-potty, fish finder, galv. trlr., $8,300. x35178 or 944-2391.

Windsurfer, Hi fly, 2 sails, fiber. mast, dagger board, $550. 554-6242.

26' Yamaha, ex. cond., $19K; 16' G-Cat, good cond w/trlr., $1K. Bryan, x30385 or 335-1559.

'86 17' Thundercraft ski boat, 140hp I/O, S.S. prop, trlr., 7-pass, ex. cond. 486-4963.

12' Hobie Mono-Cat sailboat, trlr., 2 sails, $400. 280-2523 or 333-1762.

'79 16' Renegade ski boat, 115hp Evin., SST prop, trlr., ex. cond., $2,950, OBO. 333-6868 or 486-7846.

Audiovisual & Computers

Intel 380 comp. sys, 8086/87 comp. w/896K mem., 35m HD, 6 ser., 1 parallel port, RMX-86 real time multiple proc. oper. sys., compl. SW for multiple languages, compl. documen. w/extras, compl. lib. of users group SW, $500. 488-4453.

Apple II plus comp. monitor, new printer w/NLQ, 2 disc drives, modem, SW, $500. Don, x34205 or 488-8105.

Pioneer 60Wx60W amp., new, $130. Tim or Stephanie, 333-6857 or 480-4365.

Kaypro II - 83 (CP/M-80); port. 2-SS/DD, parallel and serial ports; SW incl. Basic, C, 2 assemblers, Wordstar, spreadsheet, $350. Jesse, 280-2770 or 554-2924.

IBM PC XT w/monitor, HD, keybd., $875. x30092 or 481-3637.

TI-99/4A w/mem. exp., ser./parallel interface, speech synthesizer, modem, joysticks, RF mod., cass. rec., game/util. mmod. incl. Extended Basic, Mini-memory, Word Writer, Dow editor/assem., $200; comp. desk, $30; GE 13" TV/monitor, $35. Tom Clark, x39842.

PC-XT, 640K, 20MB, CGA w/monitor, enhanced keybd. James, 554-2929.

Tandy 1400 LT - MS DOS Laptop w/liq. crystal display, modem, mouse, 2 floppy drives, $1,100. Mary Lou, x34306 or 480-2206.

Satellite TV sys. w/descrambler, 10' Winegard antenna, ex. cond., warr., $1,200. Jerry, x38922.

IBM XT, IBM monitor, keybd., HD, $875. x30092 or 481-3637.

Ninetendo set, incl. gun, joysticks, 1 game, $60; powerglove, $45; Ninetendo games, $30, OBO. Eileen, x39072 or 484-5282.

PC-XT, 10MHz, 640K, 20 MHD, 5 1/4" FD, co-proc., Hercules monitor, SW, $700. 282-5301 or 333-2263.

Sansui ster. rec., $50, Jim, x39421 or 484-4926.

Musical Instruments

Lowery organ, good cond., $700, OBO. 996-1442.

Fender acoustic guitar, 6 string, b-in pickup, $450; Epiphone bass guitar, $100; sm. Crate amp, $75. Mike, 333-6821.

King Cornet, $200, OBO. Rob, x31477 or Lynn, 482-5485.

70's Red Fender Mustang elec., $200; Ventura acoustic 12-string, $150. 480-6494.

Peavey 16 chan.. mixer/road case, $850; C-600 spkrs., $17/ea.; Carvin PB 300 bass amp w/footswitch, $275; Fender Rhodes-73, $60. James, x36222 or 332-8837.

Korg Trident MKII, perform. synthiser, splitable 3-voice, 8 note polyphonic keybd., $350 or trade for bass amp. x36565 or 532-1812.

Lost & Found

Lost red tabby persian, neutered, lop-sided tail, CL area, x36689 or 480-1045.

Pets & Livestock

Free 12-wk. old kitten, gray, half persian, shots. Scott, x35343 or Veronica, 334-3730.

1 yr. old Yorkie male, AKC reg., access. 488-8198.

Exotic finches, doves, guinea pigs, $5/ea. 282-3750 or 482-6744.

Rottweilers, 1 M, 1 F. Lisa, x34632 or Bobby, 332-5900.

Free kittens. Denny, x32207.

Cocker Spaniel pups, AKC, $95. 283-4832 or 488-4190.

Free pups, del. approx. July 4, sire mixed Beagle, bitch mixed Dschshund. Aaron Brown, 944-0493.

Baby cockatiels, hand fed. Linda, 484-7834.

6 mo. old male dog, about 25 lbs., brn./blk. x33485 or 333-3349.

Free kittens, orange and calico. Tom, 280-1380 or 532-2087.

AKC Collie pups, whelped 4-26, sable/white, tri colors, $175. 482-8647.

Free, 1 yr. old fem. outs. dog, blk. Lab/Cocker/Setter, shots, spayed. Ursula, 283-4116 or 996-9415.

Household

Queen sz. full-motion wtrbd., bkcs. hdbd., padded side rails, htr., 3 sets of sheets/pillow cases, $80, OBO. Susie, 480-8685.

Antique blanket chest, incl. chest, 2 drwrs., $200; full sz. sleeper sofa, $100. 996-1442.

Queen sz. matt., box springs, frame, good cond., BO; wtrbd., twin sz. w/bkcs. hdbd., sheets, pad, BO. Lane, 333-6456 or 480-8682.

Eureka upright hand vacuum, good cond., $35. x33233.

Lg. U-shaped pre-sch. table, ex. cond., $125. 486-1888.

Round oak DR table, $140; 3 ladderback chairs, $15/ea.; queen sz. wtrbd. w/mirr. bkcs. hdbd., $150; 2 twin beds/comb. couch w/matching table, $80. 486-1888.

Port. GE W/D, $275. Susan, 488-1313.

Chrome/glass etagere, $65; chrome/glass cocktail table, $20; 2 chrome/royal blue director's chairs, $20/ea. 488-4453.

7' Simmons sofa, loveseat, chair, hassock, good cond., $300/all. Carol, 480-0223.

Crystal pic. frame, Home Beautiful/Germany, 8x10 frame holds 4x6 pic., new, $20. 486-8716.

Blk. laq./glass coffee and end tables, $150; TV/VCR/ster. cab., $75. 944-8632.

Antique work/desk table, 3x6, 2 drwrs., oak base/legs, $50; recliner, Herculon brick red tweed/plaid, ex. cond. 488-4487.

2 cust. designed cab., new, nat. birch wood w/glass drs., 24x14x94, $350/ea. Larry 334-2173 or Kriss, x33578.

Queen sz. matt., box spring, $175; 21" color TV, $50; 4 cu. ft. refrig., $75; Hoover upright vac., $50; Proctor Silex steam iron, $15; 8x10 green carpet, $15; Bogen B/W photo enlarger, $25; Metronome, $15. 486-7851.

9-pc. sect. sofa, earthtones, ex. cond., $350, OBO; lg. coffee table, abstract shape, burlwood, $350, OBO. x32567 or 488-3314.

Signature refrig., 24 cu. ft., ice maker, dbl. dr., $325. Edward, 335-2542 or 482-6050.

White French Prov. girls BR suite, dbl. canopy bed, 4-drwr. chest, desk, hutch, bachelor chest, hutch, $350. Margaret, 488-6724 or 333-2570.

2 twin beds, night stand, desk chair, bach. chest, maple, $160. Margaret, 488-6724 or 333-2570.

Antiques: marble top washstand, $300; oak FPL mantel, $175; oak/leather swivel office chair, $250; sm. ballfoot enamel bathtub, $200; wrought iron twin bed frame, $35. Debbie, 334-1505.

Twin bed, $75, OBO. Diana, x31350 or 474-4325.

Dbl. bed matt., box springs, $150, OBO; dbl. Papasan w/peach cushion, $100, OBO; B/W photo paper, chemicals. 337-4204.

Personal

Univ. of Colorado Alumni! Cheer Buffs' on to victory Sept. 22 vs. Texas in Austin, pregame rally w/Gee and Ralphie. Micky, x32523.

Photographic

Sony F-30 8mm Camcorder w/video light, $750; Fujica AX-3 cam., Fuji lenses, 50mm, 35-70mm w/macro, 135mm tele, 28mm wide angle, 300SX strobe flash, auto wind, ex. cond., $500/all. x33233 or 480-5061.

Wanted

Orig. 3-pc. band looking for keybd. player. Bill, x35506 or 996-5749.

Exp. rock keybd. seeking to join existing band or form new one. Alan, 282-4001 or 333-1594.

Want Rockhound book, "Gems & minerals of America" by Jay Ellis Ransom. Jim Bates, x31347 or 944-4687.

Want AC Keihin compressor for '84 Honda Accord LX. Santosh, 333-6001.

Want waitress, part time call in as needed, some exp. needed. Gilruth Center AW, x30326.

Want AD&D players for wkly. game or an open spot for a DM player in an existing campaign, also Dune and Talisman players. Dan Hall, 941-4390.

Want VHS video of Japanese culture. Don, x26735.

Want old garden hoses, soaker hoses, will pick up. Richard, 481-1518.

Want heavy duty bench grinder, drill press, air compressor. x38039 or 333-1751.

Want roommate to share house in Sageglen, $270/mo., no TV, util. pd. Eric, x38420 or 484-9179.

Miscellaneous

Soloflex workout mach. w/leg ext., butterfly attach., access., new, $900, OBO. 337-4204.

Spalding executive irons, 3-SW, 2 yrs. old, $150. Kyle, x38653.

Fischer Price car seat, $25; chest of drwrs., dresser, $200; offshore fishing pole, $80; rocking horse, $25. Phil, 282-3600.

Toyota camper shell, BO. 643-7827.

Sears front-drive, self-prop. mower, catcher, 3 yrs. old., $65. Jerry, x38922.

25' Sportsman shrimp net w/boards, $150. x33224 or (409) 986-6641.

Assembled stationary bike, new, $85. x305554 or 486-4369.

Twin full bedframe, $20; dbl. king bedframe, $40; queen sz. sofa sleeper, new, $200; bike parts, BO. Alan, x34424 or 480-6221.

4x8 2-wheel util. trlr. w/camper cov., ex. cond., $595, OBO. Ed Armstrong, 333-3279.

Recond. typewriters, $50-$150. Bill Tomkins, 534-2276.

Mita copier, desk top orig., $500. 339-3562.

Moving boxes, wrapping paper, used only once. Don, x31983.

Super lobo rem. control car, batt. pack, stick controller, $75. Aaron Brown, 944-0493.

3x6 exec. desk, $175; 48" drafting table, $125; port. drafting table, $65, equipment. x30271 or 480-5727.

Util. trlr., needs work, BO. Bob, x30825 or 921-1715.

Harlequin Rom. novels, 25¢/ea., 10 for $2; Ntl. Geographic back to '69, 50¢/ea. Bob, x30825 or 921-1715.

Water skis, life jacket, tow rope, etc., $100/all. 532-2082.

Sears port. electronic typewriter, Model 500 w/RS232 port, $50. 486-8266.

Norelco microwave, 600 watts, $75; 20 gal. aqua. w/filt. sys. pump/wtr. filt. sys., $80. 480-3424.

'89 Komfort 5th wheel trav. trlr., 28', sell for NADA wholesale. Hix, x35187 or 333-4396.

Tunturi exer. bike, $75; DP 300 rowing mach., $25, OBO. Hix, x35187 or 333-4396.

3 sets of 5x6x8 sliding glass doors, $75/ea., or $150/all. 339-1337.

T-tops and frames for early model '77-'81 Trans Am and Camaro's, $150/set. 339-1337.

Rowing mach., fiberglass frame, $50. 538-3273.

Craftsman planer-molder, new, needs motor, spare knives, calibration tool, $500. 538-3273.

Revell Apollo-Soyuz scale model kit w/Russian/Eng. instruc. book, $200. x34397.

Dynamark riding mower, 8hp w/new mower deck, works, $400 nego. Rick, x32695 or 559-2735.

Office desk, 5x2.5, chair, steel, good cond., $60. 480-4160.

Chev. hood, good cond., for '77-'79 and '80 Malibu, $45. 482-1505.

5 - 2'8" x 5' alum. single hung wndws., good cond w/screens, $20/ea. 339-3562.

Ladies 14K yellow gold bridal set, $2K. Terry, x33814 or 486-5126.

Rolex watch, Presidents, new. 482-6744.

36" sunroof deflector. 488-8198.

Airtemp room AC, 5,400 BTU's, 1 yr. old, $135. 332-0365.

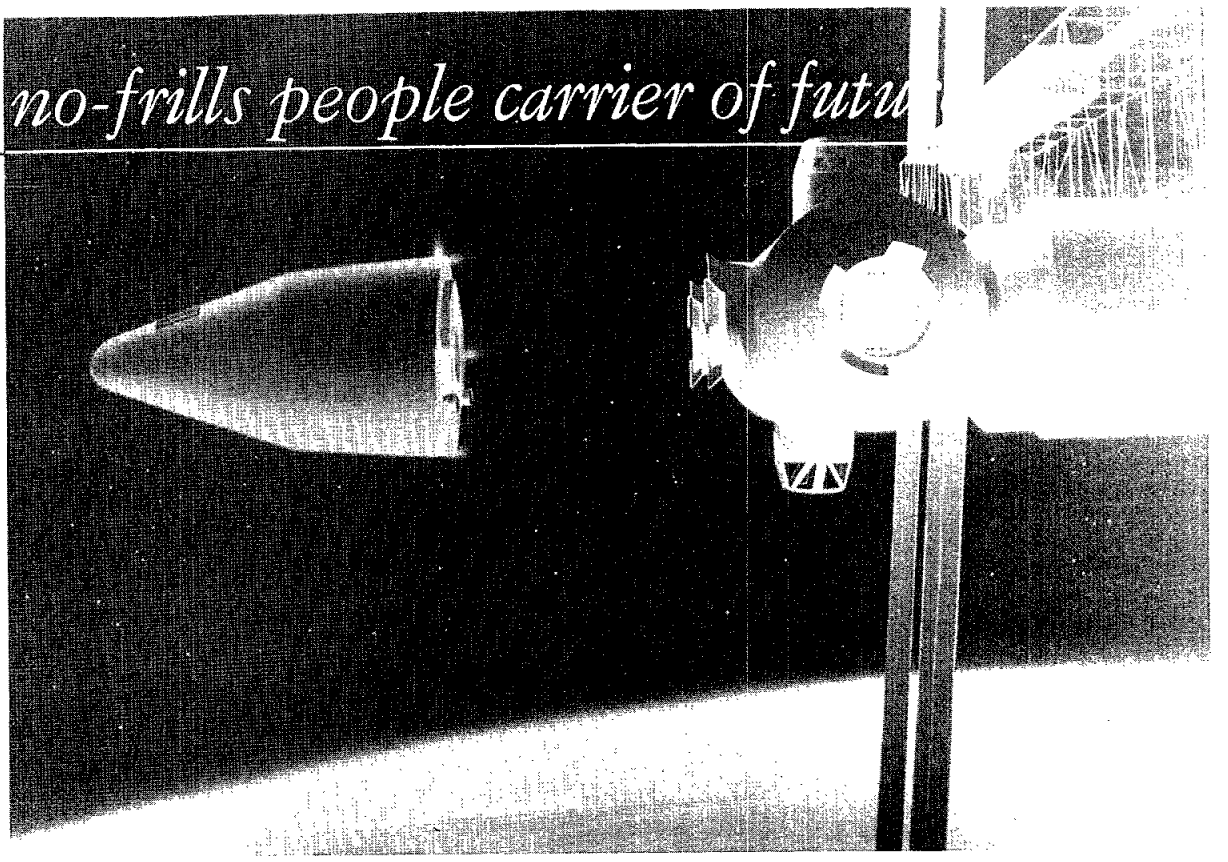
Misc & Gilson 11hp lawn tractor, 4-spd. elect. start, 42" mower, $275; Snapper 8hp riding lawn mower, elect. start, 32" mower, 7 yrs. old, $595; 5 ton GE evaporator, elect. heat, air cleaner, 10 yrs. old, $200. 482-6291.

Formal dresses, teal tea-length w/drop waist, bow; peach long dress w/bustle, ivory lace; irridescent green w/rhinestones, tea length, sz. 7-8. Veronica, 334-3730.

Pool side chase lounges, $60/ea.; liquor carrying case, new, w/access., $30; carpenter wood plane, new, $10; Wen elec. soldering gun, new, $20; 2 silver serv. platters, new, $5/ea.; 8-pc. snack set, new, $5; Yamashita cam. w/built ins, new, $15; Regal slow cooker, new, $15. Sam, 488-9790.

JSC designers working on no-frills people carrier of futu

Personnel Launch System



By Billie Deason

What weighs only 20,000 pounds, carries 10 people to low-Earth orbit, has no wings but returns to dry land?

A simple, rugged people carrier known as a personnel launch system (PLS) is being designed as part of an agencywide study sponsored by Headquarters' Office of Space Flight (OSF).

With a limited number of shuttles to support the long-term operation of Space Station *Freedom* and future exploration missions, agency planners believe a dedicated personnel vehicle could complement shuttle services. The people carrier would be launched on a conventional rocket, complete its mission in low-Earth orbit, then fly home on its own, preferably to dry land.

Safety and life-cycle efficiency are the two priorities of the design project. "We were asked to focus on simple shapes without wings, and to use existing technology," said Andy Petro, lead engineer for the JSC version of the PLS. Boeing Aerospace of Seattle supports Petro's team.

The study began in March 1989 with OSF setting the ground rules and reviewing the initial design concepts. Groups from the four participating centers coordinate through regularly scheduled teleconferences.

Marshall Space Flight Center is designing the PLS launch vehicle. The rocket will have a launch capability at least equal to that of a Titan 4. Kennedy Space Center (KSC) furnishes vehicle processing and launch systems expertise to the other centers' design teams. Langley Research Center is designing another version of the people carrier in the shape of a lifting body with large fins. In the overall course of the study, spacecraft shapes ranging from simple capsules to winged gliders will be considered.

Engineers from several divisions within the Engineering Directorate as well as experts from Mission Operations and Flight Crew Operations work on the JSC team. "We hope that, by involving engineering and operations people from all the centers, we can deal with the challenges of long-term operations from the very beginning," Petro said. "We are not just trying to design a better spacecraft, but a better transportation system. That means you have to question the traditional way of doing things and sometimes challenge the established NASA culture."

"We've settled on a biconic-shaped capsule as the JSC reference design," said Wayne Peterson, co-designer of the JSC PLS. The biconic (meaning two cones placed end to end) shape offers a large open volume and provides the most practical shape for connecting a service module. "I worked on the early phase of the ACRV (Assured Crew Return Vehicle) project, so we tried to take advantage of previous ACRV work, especially subsystem designs. When we began, we researched different shapes including Gemini and Apollo design ideas," Peterson said.

'We are not just trying to design a better spacecraft, but a better transportation system. That means you have to question the traditional way of doing things and sometimes challenge the established NASA culture.'

—PLS Lead Engineer Andy Petro

Petro's past assignments include shuttle evolution and advanced shuttle concepts. "I've been involved in some shuttle lessons-learned projects, so we incorporated those points in our design," Petro said.

"For the PLS, we might be talking about as many as 12 vehicles as opposed to three or four shuttles, so we really have to change how we think about space flight operations," Petro said. A 20-year lifetime is projected for the PLS program. In determining the number of vehicles needed, one goal is to provide for a smooth processing flow. It may be cheaper to build more vehicles and avoid the constant pressure of a round-the-clock vehicle turnaround operation.

A launch escape system is a basic requirement for the PLS. "In an emergency, the capsule would be pushed away from the rocket by four solid rockets housed in a launch adapter, then descend on a parachute into the water. During a launch abort, the passengers could encounter up to 8 gs, but for only a few seconds. That level of acceleration is comparable to the launch escape system of the Apollo program. A nominal launch would bring only 3 or 4 gs, similar to what current astronaut crews experience during a shuttle launch," Peterson said.

A typical mission—for instance, a space station crew rotation—would take two or three days. A small cargo area is included in the design to accommodate passengers' personal items. "We could carry small, high-value, critical cargo if it were necessary," Peterson said. "By carrying fewer people, we could take a little more cargo, but this vehicle is primarily a passenger carrier."

The craft is designed to seat eight passengers and two crew for operating the PLS's control systems. Because the PLS will be highly automated, the extent of flight crew involvement has not yet been determined. Mission control functions for the PLS are likely to be limited in comparison to previous space flight programs.

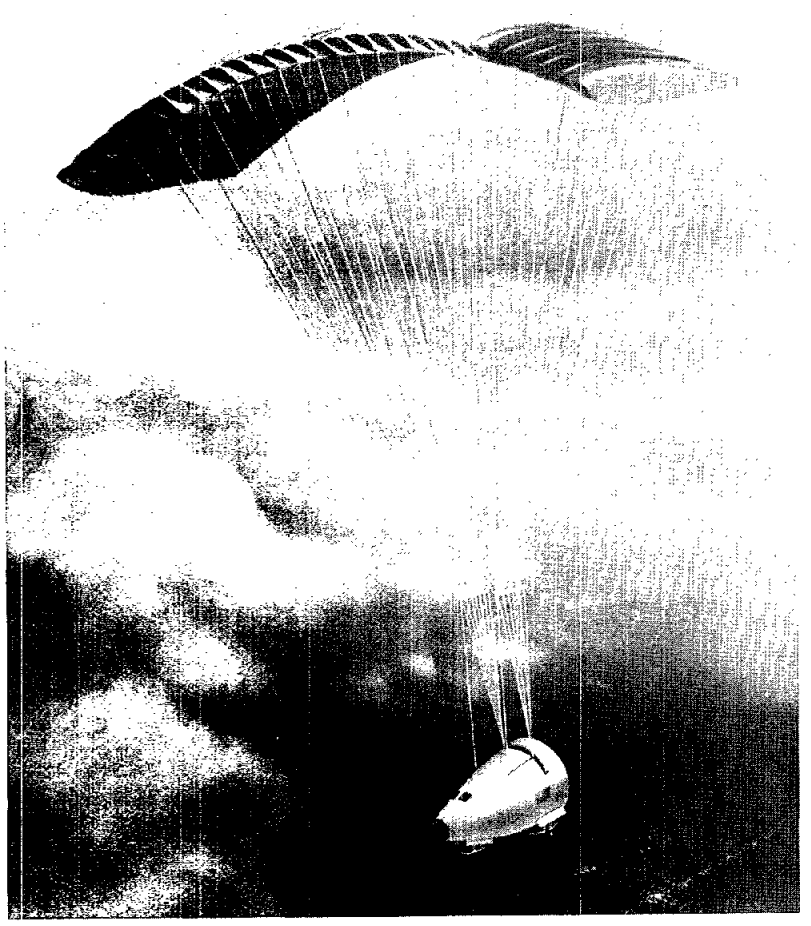
When its mission has been completed, the PLS would return to KSC for processing and turnaround. "I'd have to say the landing system is the biggest technical challenge in the project," Petro said. "To land a reusable vehicle without wings on dry land means using a parachute or gliding chute to slow its velocity and stabilize its attitude before touchdown."

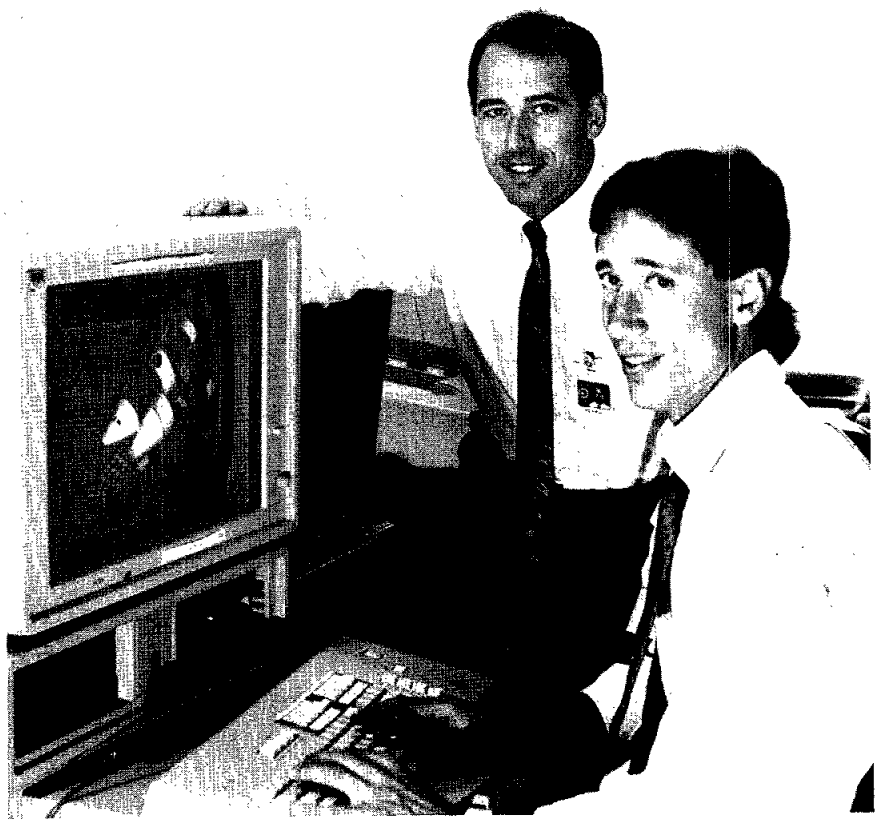
The JSC team's current design uses a small drogue chute followed by a large parafoil canopy that expands outward from the center in three stages, ending in a full flare for landing. The biconic PLS then settles to Earth on large airbags under the aft end, with the nose coming to rest on a deployable, surfboard-sized skid.

To speed up PLS ground processing while reducing safety hazards, the JSC design includes an aft systems module that bolts onto the personnel module. The systems module contains propulsion and power equipment, supply tanks, and several other systems. Once the PLS is back at KSC, the systems module can be removed for separate processing in a hazardous materials facility while the personnel module will be serviced in a facility akin to the shuttle's Orbiter Processing Facility.

"We've carefully studied life-cycle issues for this project to gain more flexibility and a bigger safety margin," Petro said. Although the PLS is not planned to be operational until the year 2000, the project could be accelerated if needed. "The PLS isn't required for Space Station *Freedom* operations, but it could enhance our capabilities," Petro said.

"We expect the space shuttle and future multi-purpose vehicles like it to have a continuing role in manned space flight," Petro said. "But there may also be a need for more specialized vehicles, like the PLS, as part of a growing space transportation fleet."





The personnel launch system (PLS) being studied by designers at JSC could carry eight crew members to Space Station *Freedom* (above) and return the same number to Earth. It would be launched on a Titan 4-class expendable vehicle and land softly on land using a parachute or gliding chute (far left). Andy Petro, left, and Wayne Peterson, are making extensive use of computer-aided design equipment in Bldg. 32 to develop the proposed vehicle and its systems.

JSC Photo by Benny Benavides
NASA Illustrations

Students sharpening skills at JSC

By Kari Fluegel

Seventeen area high school students will obtain a close-up look at the nation's space program as they participate in an eight-week intensive science and engineering apprenticeship program at JSC.

The Summer High School Apprentice Research Program, created in 1980, is designed for high school students who have demonstrated an aptitude for and interest in science and engineering careers.

SHARP students and their high school are James Willis, Kempner High School; Anh-Thu Pham, Clear Creek High School; Sidney Lozano, South Houston High School; Javian Duncan, Lamar High School; Victor Chavarri, Texas City High School; MoiseKapenda Bower, Clear Brook High School; Stacie Bean, Daniel Bustos and Wilbur Lam, Clear Lake High School; Michael Black, Sergio Collins, Jackie Lowell and Traschell Lewis from J. Frank Dobie High School; and Troy Barnes, Fatonia Jones, Nikki Raibon and John Rodriguez from B.T. Washington and the High School for Engineering Professionals.

Participants are assigned to work with a JSC scientist or engineer as a mentor. They participate in an orientation process that provides them with an overview of NASA's mission and activities. During their apprenticeship, the students will complete designated assignments, prepare written reports, make oral presentations and participate in a variety of enrichment activities.

"As apprentices, the students learn and earn," said Howard Bruce, SHARP coordinator. "They participate in an orientation process that provides them with an overview of the NASA center's mission and the activities necessary to accomplish the center's goals and objectives."

SHARP is a feeder program to build a resource pool of potential future NASA employees. The program is specifically designed to attract and serve minorities who are underrepresented in the NASA scientific and engineering workforce.

SHARP is sponsored by the Educational Affairs Division and participating NASA centers. Students who live in commuting distance of a participating center, who are United States citizens, and who will be 16 years old at the time the program begins are eligible to apply.

SHARP participants are, first row, Jackie Lowe, Anh-Thu Pham, Traschell Lewis, Fatonia Jones; second row, Daniel Bustos, Wilbur Lam, Javian Duncan, John Rodriguez; third row, Stacie Bean, Victor Chavarri, Nikki Raibon, Troy Barnes; fourth row, James Willis, Michael Black, Sergio Collins, SHARP Coordinator Howard Bruce, and MoiseKapenda Bower.

Pohl, Musgrave

Council gives top honors to JSC workers

JSC Engineering Director Henry Pohl and Astronaut Story Musgrave have been honored as Technical Administrator and Technical Person of the Year by the Clear Lake Council of Technical Societies.

The seventh annual awards, presented in June, also honored Dr. Rui J.P. DeFigueiredo of Rice University as Technical Educator of the Year.

Pohl was selected as Technical Administrator of the Year from a group of three nominees. Also nominated were Emyre Barrios Robinson of Barrios Technology and James E. Musick of Stubbs Overbeck.

Musgrave was selected as Technical Person of the Year from a group of four, all JSC employees. Nominees were Dr. Mike Duke, chief scientist of the Lunar and Mars Exploration Program Office; Dr. Kumar Krishen, chief technologist in the New Initiatives Office; and Charles R. Price, branch chief for the Robotics Systems Development Branch.

Special awards also were given by the American Institute of Aeronautics and Astronautics, the Institute of Electrical and Electronic Engineers, the Instrument Society of America and the Society for Computer Simulation.

JSC Photo by Mark Sowa

CHILD ZONE—Sign painter Ignacio Trevino, right, and helper Oscar Pedraza put the finishing touches on the new JSC Child Care Center building sign. The hand-painted sign above the front door and others near the circular driveway were installed recently to help identify the center and direct traffic flow.

SPACEHAB signs payload contracts

SPACEHAB Inc. of Washington, D.C., recently signed three contracts to carry nine middeck-class experiment payloads aboard the space shuttle in the company's commercial middeck augmentation module.

The three new contracts, with a combined value exceeding $11.8 million, were signed with the government of Canada, Virginia's Center for Innovative Technology and the Spaceport Florida Authority.

The Canadian Space Agency will sponsor materials science or life science experiments to fly on the fourth SPACEHAB mission, currently manifested for October 1993. Canada has reserved one locker to accommodate the experiments and will be issuing an announcement of opportunity soliciting experiment proposals from Canadian investigators.

Virginia's Center for Innovative Technology has contracted for two lockers on the October 1993 flight on behalf of the Virginia Space Development Consortium, a partnership of corporations and universities developed to expand commercial space opportunities.

The Spaceport Florida Authority, an agency created to develop facilities and programs to promote and support the growth of Florida's space industry, has signed agreements with SPACEHAB for a total of six lockers. Two are manifested for launch of SPACEHAB's first mission currently scheduled for September 1992.

The middeck augmentation modules will expand the shuttle's capability to support astronaut-tended research and development activities in the unique environment of space. The modules will fly in the forward portion of the shuttle's cargo bay.

NASA currently is reviewing and analyzing a SPACEHAB proposal that could lead to contract negotiations that would provide the agency with an equivalent of 200 middeck lockers. That space would be used to fly payloads developed by the Centers for Commercial Development of Space and organizations working with NASA under joint endeavor agreements. SPACEHAB was the sole respondent to the March request for proposals.

Any remaining module capacity is being offered worldwide on a commercial basis.

Tiger team looks at image enhancement

(Continued from Page 1)

pointing control system is working so well that it should be able to correct for the unexpected thermal problems that are causing a slight wobble each time the telescope passes from darkness into light.

"There is a great deal of very exciting science that is going to come from the Hubble Space Telescope as it exists today," said Dr. Lennard Fisk, NASA associate administrator for space science and applications. "The telescope is very usable in ultraviolets, spectroscopy and photometry and it's going to do world-class science."

Weiler said he has established a "Tiger Team" to look at the possibility of using ground computers to enhance the digital images sent back to Earth from Hubble. Bright objects and well-separated objects are the best candidates for such enhancements, he said.

"We're going to let the experts play with our images and see what they can do, but people who know this field say there is a lot of hope there," Weiler said.

Weiler said the Hubble team plans to try to perform some early scientific observations by mid-August. These observations will help characterize exactly how much science can be accomplished with the telescope in its current condition.

He also said he has asked the Jet Propulsion Laboratory to look at accelerating development of a Wide Field Planetary Camera replacement that can be used to completely correct the telescope's myopia.

Such a replacement would be done by spacewalking shuttle astronauts. The first Hubble revisit by a space shuttle is set for 1993, but the possibility of rescheduling that mission earlier is being investigated.

Fisk said the review board, made up of renowned experts in optical systems and quality control, will be chaired by Dr. Lew Allen, director of the Jet Propulsion Laboratory, Pasadena, Calif.

The other members of the board are: Charles P. Spoelhof, retired vice president of Eastman Kodak Co., Pittsford, N.Y.; George A. Rodney, associate administrator for safety and mission quality, NASA Headquarters; John D. Mangus, head of the Optics Branch, Space Technology Division, Goddard Space Flight Center; and Dr. Bob Shannon and Dr. Roger Angel, astronomy professors at the University of Arizona, Tucson.

Quality Partnership Award nominations being accepted

Nominations are now being accepted for the Quality Partnership Award presented quarterly by JSC's Safety, Reliability and Quality Assurance Office.

First awarded in 1988, the honor recognizes individuals outside SR&QA who play key roles in helping JSC employees and support contractors reach a common goal of excellence.

The most recent recipient was Jim Ermel, a design engineer at General Electric, who was responsible for the improvement of shuttle refrigerator-freezers. Ermel developed a complete statusing and tracking system of all existing and potential problems, devised adequate acceptance tests and recommended quality actions resulting in the renovation of non-flight products into quality flight equipment.

Nominations should be submitted to the Quality Assurance and Engineering Division, Code ND, by the candidate's peers or managers. The candidate must not work for SR&QA or the Houston based prime contractor.

Deadline for nominations is July 16.

Questions should be directed to Harry T. Briggs, technical assistant in the Quality Assurance and Engineering Division, x34355.

Leak investigation teams

(Continued on Page 4)

tions, acceptance test procedures and design changes.

- Hardware Processing Team — reviewing all hardware processing procedures, ground support equipment (GSE), and leak check processes including any revisions or changes.
- Data Analysis Team — establishing a formal sequence of events and leak results for the investigation team and analyzing all data including effects of purges, winds, and test configurations.
- Fault Tree/Test Requirements Team — developing a complete fault tree to ensure that all possible causes are being investigated. It will collect requirements and develop plans for any unique tests that need to be performed. The group also will investigate recommendations for revised flight hardware test procedures.
- Independent Review Team — reviewing and evaluating all data from other teams as an independent group.

Space News Roundup

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

Editor ..... Kelly Humphries

Associate Editors ..... Pam Alloway
Kari Fluegel

TDRSS title comes to NASA

(Continued from Page 1)

with other contract modifications, is expected to save the government $16 million," according to William A. Hatchl, TDRSS Project Procurement Manager at Goddard Space Flight Center.

The original 1976 contract covered construction of the six spacecraft and ground communications terminal, maintenance and operations for 10 years.

As for the advanced TDRSS, Goddard announced the selection of Ford Aerospace Corp., Space Systems Division, Palo Alto, Calif.; General Electric Co., Astro-Space Division, Princeton, N.J.; Hughes Aircraft Co., Space and Communications Group, Los Angeles ; and TRW Inc., Space and Technology Group, Redondo Beach, Calif., to negotiate separate firm-fixed price contracts for Phase B definition design studies.

Each of the 11 month ATDRSS contracts is worth $7,500,000. The contracts will become effective approximately Aug. 1. The contracts constitute the second of three procurement phases that will require each contractor to produce a definition phase design including trade studies, a Space Network functionality assessment, and a TDRSS to ATDRSS transition plan.

Proposals for Phase C/D of the procurement for ATDRSS fabrication and implementation will be solicited with a separate request for proposals. NASA intends to select one contractor to perform Phase C/D.

The ATDRSS will continue the function of the Tracking and Data Relay Satellite System (TDRSS) through the year 2012. This program will be jointly managed by the GSFC TDRS Project and the GSFC Space Network Project Office.

NASA-JSC