

Space News Roundup

Brand, Hartsfield command 11 and 12

Vance Brand and Henry Hartsfield will return to space next year as commanders for the 11th and 12th flights of the Space Shuttle program, JSC announced last week.

Brand's crew for STS-11 will include Pilot Robert L. Gibson and Mission Specialist Bruce McCandless II, Robert L. Stewart and Dr. Ronald E. McNair.

Hartsfield's crew for STS-12 will include Pilot Michael L. Coats and Mission Specialist Dr. Judith A. Resnik, Dr. Steven A. Hawley and Richard M. Mullane. A sixth crewmember — a payload specialist — may be named at a later date under NASA's new policy which allows major customers to provide a specialist for their payloads.

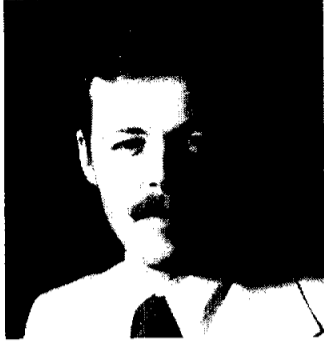
STS-11 will be the fifth flight of the Orbiter *Challenger*, scheduled for launch in early 1984. The payloads will include the Large Format Camera, which will demonstrate stereoscopic high resolution photography of the Earth. Also aboard will be PALAPA B-2, an Indonesian communications satellite, and a test article known as the Payload Deployment and Retrieval System. Duration of the mission will be seven days.

STS-12 will be the first flight of the Orbiter *Discovery*, and is scheduled for launch in March, 1984. The payloads will include the third Tracking and Data Relay Satellite, TDRS-C, and the Materials Experiment Assembly, a self-contained facility for a variety of materials processing experiments.

Brand's previous spaceflight experience came on the Apollo-Soyuz Test Mission in 1975 and as Commander of STS-5 in November. He has logged 339 hours in space.



Vance Brand



Robert Gibson



Bruce McCandless



Robert Stewart



Ron McNair



Hank Hartsfield



Michael Coats



Judy Resnik



Steve Hawley



Richard Mullane

Gibson, a lieutenant Commander in the U.S. Navy, saw service in Vietnam aboard the *USS Coral Sea* and the *USS Enterprise*. He holds several commendations and was named outstanding student of the U.S. Navy Test Pilot School's Class of 1971. Gibson was selected as an astronaut candidate by NASA in 1978. His wife, Dr. Rhea Seddon Gibson, is also a NASA astronaut.

McCandless, a Captain in the Navy, has logged over 3,650 hours flying time and saw duty aboard the *USS Enterprise* and the *Forrestal*. He became a NASA astronaut in 1966 and was a member of the support crew for Apollo 14 and was backup pilot for the first manned Skylab mission. He is one of the lead astronauts for develop-

ment of the Manned Maneuvering Unit.

McNair, a specialist in laser technology, holds a Ph.D. in physics from the Massachusetts Institute of Technology. While at MIT, he performed some of the earliest experiments in chemical and high pressure carbon dioxide lasers. In 1975, he studied laser physics at Ecole D'ete Theorique de Physique in Les Houches, France, with many authorities in the field. He holds a black belt in karate and enjoys performing as a jazz saxophonist. McNair became an astronaut in 1978.

Stewart, the first representative of the U.S. Army scheduled to fly in space, is a Lt. Colonel who has been awarded three Distinguished Flying Crosses, a Bronze Star, 33

Air Medals and the Army Commendation Medal with Oak Leaf Cluster, among others. He flew over 1,000 hours combat time in Vietnam with the armed helicopter platoon of "A" Company, 101st Aviation Battalion, later designated the 336th Assault Helicopter Company. He attended the Naval Test Pilot School and was later assigned as a test pilot to the U.S. Army at Edwards Air Force Base. He has experience in 38 types of airplanes and helicopters and has logged approximately 4,600 hours flight time.

Hartsfield, a NASA astronaut since 1969, last flew on STS-4 in July of last year in the final mission of the Shuttle's Orbital Flight Test program.

Coats, a Navy Commander,

graduated from Annapolis in 1968 and flew 315 combat missions in Southeast Asia from the *USS Kittyhawk*. He attended the Naval Test Pilot School and has logged over 2,600 hours flying time and 400 carrier landings in 22 different types of aircraft. He became a NASA astronaut in 1978.

Resnik, who holds a Ph.D. in electrical engineering from the University of Maryland, also worked as a biomedical engineer and staff fellow in the Laboratory of Neurophysiology at the National Institutes of Health. She is a member of the Institute of Electrical and Electronic Engineers, the American Association for the Advancement of Science and the American Institute of Aeronautics

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Leak found, STS-6 March launch set

Discovery of a small crack in the combustion chamber of a main engine on the Orbiter *Challenger* has cleared the way for an early March launch of STS-6.

Technicians found the hairline crack, about three fourths of an inch long, in the main combustion chamber of engine 2011, which is at the top of the triangular array of three main engines. Analysis showed the crack to be the major source of excess hydrogen which accumulated in the engine com-

partment during two flight readiness firings (FRF) in December and January for the new orbiter.

Based on otherwise satisfactory performance of the engines during the two firings, officials have ruled out the need for a third FRF before launch. Engine 2011 was removed at the pad Feb. 4 and taken back to the Vehicle Assembly Bldg. There its high pressure oxidizer turbo pump was removed and installed on the replacement engine, number 2016, which arrived from Mississippi the same

day. The nozzle on *Challenger's* number three engine was also removed and replaced with the nozzle from Engine 2011.

Engine 2016 was inspected in the VAB and taken to the pad, where it was installed on *Challenger* Wednesday.

Another milestone occurred during the week when the Tracking and Data Relay Satellite (TDRS) and its Inertial Upper Stage booster were transported back to the pad on Friday. The

payload has been to the pad once before, but was removed in January when the decision was made to conduct the second engine firing.

On Tuesday, engineers picked up a critical test to verify the Shuttle's ability to communicate with and receive commands from Houston. In parallel with that test, payload test conductors verified communications links between TDRS and the primary backup Payload Operations Control Centers.

During the Mission Control Interface Test, Houston flight controllers sent commands to *Challenger's* guidance computers through a satellite link between *Challenger*, the Merritt Island Tracking Station and Mission Control. Air-to-ground voice checks were also performed.

The Inertial Upper Stage checks were also completed during the week, and hydrazine was scheduled to be loaded into the TDRS spacecraft beginning today.

NASA FY '84 budget totals \$7.1 billion

NASA's budget plan for Fiscal Year 1984 reflects a four percent increase over last year, for an overall budget of \$7.1 billion.

Major features of the budget include spending of \$5.7 billion on research and development, \$150 million on construction of facilities and \$1.2 billion for research and program management. Under the plan, the JSC budget will be \$204,616,000, an increase of about \$9.4 million. The total number of permanent civil service positions here will remain at 3,293, the same as FY '83.

"This is a constrained budget consistent with the serious fiscal

and budgetary situation facing the nation," said NASA Administrator James M. Beggs. "Nevertheless, it reflects the President's renewed commitment to a strong national space and aeronautics program as outlined in his two important policy statements on space and aeronautics last year."

Some 61% of the \$5.7 billion, or \$3.5 billion, requested for research and development would be earmarked for the Space Transportation System, including Shuttle production and operations, upper stages, Spacelab and the proposed new Tethered Satellite System and for other support equipment and launch vehicles.

"The division of the \$3.5 billion reflects the continuing trend, begun last year, to spend relatively more on operations and relatively less on capability development," Beggs said.

The budget will support a schedule of five flights in FY '83 and eight to nine flights in FY '84, as well as the completion of OV-104, the *Atlantis*, and the acquisition of orbiter structural spares to support the four orbiter fleet.

The budget contains four initiatives, Beggs said, with budget requests totaling more than \$50 million. These will include:

- the Tethered Satellite System, a cooperative U.S.- Italian project designed to provide a new capability for conducting experiments in the upper atmosphere by suspending scientific payloads from the Shuttle at distances of up to 100 kilometers.
- the Venus Radar Mapper, a lower cost version of the Venus Orbiting Imaging Radar, which will map the surface of Venus using radar mapping techniques.
- the Advanced Communications Technology Satellite, a project to develop and flight test advanced technology for satellite communications.

• the Numerical Aerodynamic Simulation project, a large computer system for use with aircraft design methods which would have the potential of cutting down on lengthy and expensive wind tunnel time and flight testing.

With Congressional approval, the budget will also support continued development of the Space Telescope, the Galileo orbiter and probe for launch to Jupiter in 1986, and the Gamma Ray Observatory, planned for launch in 1988. Funds will also be allocated for continued support of the planetary explorations by the Pioneer Venus Orbiter, Pioneers 6 through 11 and Voyagers 1 and 2.

Bulletin Board

AIAA calls for symposium papers

The Houston Section of the American Institute of Aeronautics and Astronautics will conduct its eighth annual Technical Mini-Symposium at the Gilruth Center April 28. Abstracts of proposed papers for the symposium should be submitted to Robert E. Lewis, EH13, by close of business March 1. The symposium regularly provides an opportunity for young engineers to gain professional exposure, as well as for more experienced local engineers to present their work without the cost of participating in a national meeting in another city. Abstracts should be 100 to 250 words long. As in the past, written papers are not required. Presenters should plan on no more than 10 to 15 minutes to deliver their papers, with five minutes for questions. There is no restriction on technical discipline, but the theme this year is Space Operations Systems. Papers are already being received, Lewis said, so early submission of abstracts is urged.

L-5 Space Development Conference set

The second annual L-5 Society Space Development Conference will be held April 1 through 3 at the Astro Village Hotel with the Theme of "Doing Business in Space." Speakers will include former astronaut and head of Shuttle Orbital Flight Tests Deke Slayton and Max Faget, former Director of Engineering and Development. The Conference will have a general and technical program format, with over 1,000 participants expected to attend from across the United States. The Conference topics include "Private Enterprise in Space," "Global Problems, Space Solutions," "Space Manufacturing," "Space Programs Around the World" and a look at future space transportation systems. Also featured will be special showings of "2001: A Space Odyssey" and a presentation by Lucasfilm, Ltd. on "Revenge of the Jedi." For more information on reservations and schedules, contact: L-5, 114 Byrne St., Houston, 77009 or call (713) 864-9660.

Hooks to speak at Feb. 18 observance

Dr. Benjamin L. Hooks, Executive Director of the National Association for the Advancement of Colored People (NAACP), will be the keynote speaker at the JSC program commemorating the 57th annual observance of the contributions Black Americans have made to life and culture in the United States. The theme of the program, which commemorates Black History Month in February, is "The U.S. Constitution and the Black American." Hooks' speech will explore that topic beginning at 1 p.m. Feb. 18 in the Bldg. 2 auditorium. The idea of recognizing the accomplishments of Black Americans was initiated in 1926 by Dr. Carter G. Woodson and is now observed nationwide during February.

Lunar fins to offer SCUBA course

The JSC SCUBA diving club, the Lunar fins, will offer a six-week basic course beginning March 8. The course will include classroom lectures at the Gilruth Recreation Center and supervised practical experience in the pool. Students who successfully complete the course will be certified by NAUI. Enrollment is limited. The club also schedules regular boat trips to coral reefs, sunken wrecks and platforms in the Gulf, as well as diving vacations in the Caribbean. Interested persons are urged to attend one of the monthly meetings to learn more about the club. For more information on the class, call the Rec Center at x3594.

JSC Aero Club continues membership drive

The JSC Aero Club is still accepting new membership applications for flying at club rates. Members may rent a Cessna 150 for \$20 an hour wet or a four-place Piper Archer II, with auto pilot, air conditioning and full IFR panel for \$30 an hour wet. Member dues are \$25 per month. The planes are based at Houston Gulf Airport in League City. Two club members are certified flight instructors available for beginning lessons or advanced flight instruction. Membership is open to JSC employees and contractors. Experienced pilots are desired, but non-pilots may join and learn to fly. For more information or membership application forms, call J.D. Haptonstall at x5285, Dennis Morrison at x5281 or B. Mercantel at x2314.

Youth concerto scheduled at UH/CLC

The annual youth concerto concert of the Clear Lake Symphony at the University of Houston/Clear Lake City will be held beginning at 8 p.m. Feb. 19 in the UH/CLC Auditorium. The program will feature Brahms' Academic Festival Overture, Bellini's Oboe Concerto, Bach's Violin Concerto and piano concertos by Haydn, Mozart, Mendelssohn and Beethoven. Tickets are \$3 general admission and \$1 for students and senior citizens. For more information, call 488-9390 or 488-9288.

Paris Air Show tour being organized

Local aerospace enthusiasts are organizing a group tour to the Paris Air Show May 27 to June 5 and would welcome your interest in attending. The air show is the world's foremost exhibition of aerospace hardware, and this year will be the host for the exhibits for over 25 countries. Over 100 U.S. firms are expected to participate in the show. During the two weekends of the show, flight demonstrations will take place every 10 minutes with many of the scheduled 144 display aircraft expected to take to the air. For more information on the tour, call Alan Dabney, 237-8294 or Paul Maley, x3319. Prices start at \$1,475.

'Dimensions in Blue' to play here

A specialty group from the Air Force's "Band of the West" at Lackland Air Force Base in San Antonio will present a 45-minute concert beginning at 12:15 p.m. Feb. 25 in the Bldg. 2 Auditorium. The group, the Dimensions in Blue Jazz Orchestra, is the oldest specialty group from the Band of the West, and logs about 20,000 miles annually during its average 160 performances each year. The performance will feature the music of such swing and jazz greats as Glenn Miller, Woody Herman, Count Basie, Chick Corea, Quincy Jones and Al Jarreau. The performance is free, and is open to NASA and contractor employees and the general public.

Gate closed due to construction

The Avenue B east gate has been closed to most outbound traffic due to heavy construction on NASA Road One. Management Services Division Chief William A. Larsen said all outbound traffic except for commercial carriers and emergency vehicles will be restricted from using the gate until traffic conditions improve. Inbound traffic will be unaffected unless construction warrants total closing of the gate, he said. Work on NASA One is expected to last another 12 to 18 months, but gate traffic will resume normal operations as soon as conditions permit, he said.

Center renamed 10 years ago

Ten years ago next week, legislation was enacted which renamed the former Manned Spacecraft Center in honor of the late President Lyndon B. Johnson.

The resolution to rename the center was introduced by Senators Lloyd Bentsen of Texas and Robert Byrd of West Virginia shortly after Johnson's death in early 1973. "Just as the Houston facility is a physical center of the space program," Bentsen said in a statement before the Senate Committee on Aeronautical and Space Sciences, "Lyndon Johnson was, perhaps, the spiritual center of it. What better way to honor him, to reflect the new mood of the space effort, than to rename the Manned Spacecraft Center in Houston the

Lyndon B. Johnson Space Center."

Official dedication ceremonies were held several months later, in August 1973. At the time of the dedication, the second Skylab crew had just surpassed the 28-day flight duration record set on the first manned Skylab mission.

During his tenure in the Senate, Johnson was a major force behind the formation of an organized space effort and later was one of the strongest supporters of NASA and space exploration. He believed that a nation which could tap its pioneering spirit through great deeds could ultimately benefit its citizens and the world.

On May 6, 1958, he told a Senate committee: "Space affects

all of us and all that we do, in our private lives, in our business, in our education, and in our Government. We shall succeed or fail in relation to our national success at incorporating the exploration and utilization of space into all aspects of our society and the enrichment of all phases of our life on this Earth."

Ten years later, as the U.S. was preparing for the first flights to the Moon, Johnson told a crowd gathered here: "We do not build rockets and spacecraft to fly our flag in space or to plant our banner on the surface of the Moon. Instead, we work and we build and we create to give all mankind its last great heritage. We are truly reaching for the stars."

Bonds now tied to market rates

U.S. Savings Bonds are earning 11.09 percent interest right now, as the Department of the Treasury embarks on the first market-based rate for the bonds since they were first issued in 1947.

Treasurer of the United States Angela M. Buchanan said the rate is effective for Series EE Bonds purchased between November, 1982 and April 30, 1983, and for Series E and EE Bonds and Savings Notes with semiannual interest periods beginning during those months. The market based rate is applicable if the bonds are held for at least five years.

"The purpose of the market-based rate is to provide a competitive interest rate for bondholders regardless of market conditions," Buchanan said.

Under the market-based interest system that went into effect Nov. 1, new bonds and those already outstanding will receive 85 percent of the average return on five-year Treasury marketable securities when held five years or longer after Nov. 1, 1982.

Interest on EE Bonds is compounded semiannually and paid as part of the redemption value when the bonds are redeemed. Interest accrues on a fixed increasing scale until a bond is held for five years. After that time, interest accrues at 85 percent of the average yield on outstanding five-year Treasury securities for the entire period the bond is held. If market rates drop to very low levels, the guaranteed minimum yield is 7.5

percent if the bonds are held five years or more.

Here's how the rate is set: every six months, the Treasury computes the average market yield on five-year Treasury marketable securities during the previous six months. The savings bond rate is set at 85 percent of the market average.

At the end of five years, the average of the 10 semiannual rates, compounded on a semiannual basis, is computed to determine the bond's five-year yield. If bonds are held for six years, the average of the 12 semiannual

rates, also compounded semiannually, determines the six-year yield and so on. Bonds held less than five years will continue to earn interest on a predetermined, graduated scale as in the past.

Employees may enroll in the payroll savings plan by completing Standard Form 1192 and forwarding it to the Payroll Office, or call your company payroll office for payroll deduction procedures.

For more information on the Payroll Savings Plan and new Savings Bond interest rates, call Wally Grimes, JSC Savings Bond Campaign Chairman, at x5419.

Space News Briefs

Upper stage may be commercially developed

NASA and the Chicago-based Orbital Systems Corp. have signed a Memorandum of Understanding which could eventually lead to the commercial development, marketing and operation of an upper stage compatible with the Space Shuttle. The upper stage would be used to propel payloads into geosynchronous orbits and would complement the three upper stages now in use or development: the McDonnell Douglas Payload Assist Module, the Boeing Inertial Upper Stage and the General Dynamics/Convair Center Upper Stage. For about a year, NASA and Orbital Systems have conferred on proposals for private investment in upper stage vehicles. The memorandum of understanding is expected to lead to discussions in which the potential technical and management roles of the two concerns could be identified. The principal officers of Orbital Systems were involved in a Harvard Business School study which dealt with encouraging commercial investment in space technologies. The Harvard team concluded the time has come for private investment in space enterprises in general, and space service industries in particular.

Cookin' in the Cafeteria

Week of February 14-18, 1983

Monday: Beef & Barley Soup; Beef Chop Suey, Breaded Veal Cutlet w/Cream Gravy, Grilled Ham Steak, Weiners w/Baked Beans (Special); Buttered Rice, Brussels Sprouts, Whipped Potatoes. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin, Selection of Salads, Sandwiches and Pies.

Tuesday: Celery Soup; Fried Shrimp, Pork Chop w/Applesauce, Turkey a la King, Chinese Pepper Steak (Special); Au Gratin Potatoes, Breaded Squash, Buttered Spinach.

Wednesday: Seafood Gumbo; Fried Catfish w/Hush Puppies, Braised Beef Ribs, Mexican Dinner (Special); Spanish Rice, Ranch Beans, Buttered Peas.

Thursday: Green Split Pea Soup; Corned Beef w/Cabbage & New Potatoes, Chicken & Dumplings, Tamales w/Chili, Hamburger Steak w/Onion Gravy (Special); Navy Beans, Buttered Cabbage, Green Beans.

Friday: Seafood Gumbo; Deviled Crabs, Broiled Halibut, Liver & Onions, BBQ Link (Special); Buttered Corn, Green Beans, New Potatoes.

Week of February 21-25, 1983

Monday: Holiday
Tuesday: Split Pea Soup; Meatballs & Spaghetti, Liver & Onions, Baked Ham w/Sauce, Corned Beef Hash (Special); Buttered Cabbage, Cream Style Corn, Whipped Potatoes.

Wednesday: Seafood Gumbo; Cheese Enchiladas, Roast Pork w/Dressing, BBQ Link (Special); Pinto Beans, Spanish Rice, Turnip Greens.

Thursday: Beef & Barley Soup; Roast Beef w/Dressing, Fried Perch, Lasagne w/Meat, Chopped Sirloin, Chicken Fried Steak (Special); Whipped Potatoes, Peas & Carrots, Buttered Squash.

Friday: Seafood Gumbo; Fried Shrimp, Baked Fish, Beef Stroganoff, Fried Chicken (Special); Okra & Tomatoes, Buttered Broccoli, Carrots in Cream Sauce.

NASA
Lyndon B. Johnson Space Center

Space News Roundup



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Editor

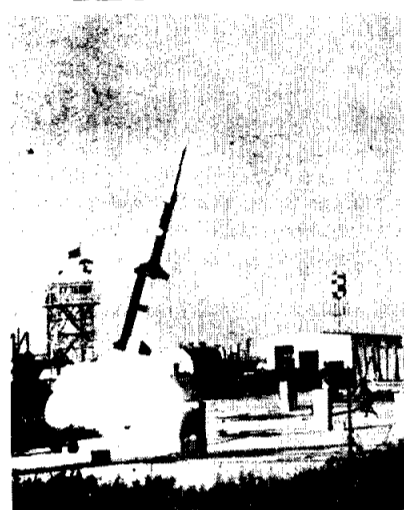
Brian Welch

Interview

Robert O. Piland

From Wallops Island to Space Stations and beyond

Robert O. Piland, whose entire career has unfolded with the National Advisory Committee for Aeronautics (NACA) and with NASA, retired this month after 35 years of service. One of the original members of the Space Task Group, he came to that position by virtue of working for Robert Gilruth in the Pilotless Aircraft Research Division at the Langley Research Center. From 1958 to 1959, he was technical assistant to Dr. James Killian, President Eisenhower's science advisor. In the early 1960's, he was Manager of the Apollo Projects Study Office and Deputy Manager of the Apollo Program Office. In later years, he worked in experiments, science and applications, Earth resources, space and life sciences and engineering and development. His most recent assignment has been as Manager of JSC's Space Station Office. We caught up with him a few days before he retired:



Roundup: What areas of research were you involved in when you began work with Langley in 1947?

Piland: I started there in a section that did theoretical analysis — I majored in mathematics and I was not an engineer — and so they placed me in this section which did stability analysis on airplanes. I stayed there a year. I liked the math alright, but not that much, and I had the opportunity to move to another division that was fairly new, called the Pilotless Aircraft Research Division. Robert Gilruth was the division chief, and it had been formed to use rocket techniques to do missile and aeronautical research, and that division was responsible for starting Wallops Island. It had already been in business for a couple of years by the time I got there, and during the first year I continued doing somewhat the same kind of work I had been doing. Then I got into test work, where we designed and built and did test work with rocket models.

Roundup: Wasn't that about the time that Richard Whitcomb was developing his area rule and John Stack was about to introduce the slotted throat wind tunnel?*

Piland: Well it was just a little bit before that, but it was in that same general time period. We were flying a rocket model of a General Dynamics airplane they were developing, the B-58 Hustler, and the first time we flew it we had goofed up and the thing turned somersaults and exploded over the beach. That was a very traumatic experience, and we learned a few things. But we put it back together, literally. We picked up the pieces and put it back together and flew it again. It was a very crude model, but even that model indicated that it was going to have drag characteristics which would not let it meet its performance requirements. The problem was its range. Its transonic drag was twice what they had anticipated. Nobody paid much attention to this first model, because as I say we had literally picked up broken pieces off the beach and patched it back together. But then

"In the first half of the 1950's, one of the biggest problems of flight was the 'sound barrier,' the achievement of supersonic speeds, and the simulation of passing through the transonic regime in wind tunnels. While PARD's work was going on at Wallops, a young researcher at Langley named Richard Whitcomb developed the Area Rule concept, a theoretical solution to shaping aircraft bodies for achieving speeds in excess of Mach 1. At about the same time, John Stack developed the slotted throat transonic wind tunnel which made simulation possible.
— Editor

we flew the next one of the series and it showed us very high drag also. Actually, the first model showed it very well. Then all kinds of excitement happened. Certain people alleged that the test technique was no good and the data was wrong.

Roundup: Could you explain the technique?

Piland: You would use a scale model, and instead of flying it with an engine, you would put a rocket up it and ignite the rocket to accelerate it to speed and then coast it. During that coast period, you would measure with radars and onboard telemetry. One of the reasons for setting up this transonic facility was because transonic wind tunnels at that time were very difficult to use in themselves. And so a lot of our business at that time was flying the new fighter planes, the Century Series, to get transonic drag characteristics. At any rate, a man named John Stack was one of the several assistant directors at Langley at the time. Gilruth was our assistant director of that division. He was away in Europe, and Stack was looking out for the division. And so he got involved in this thing. Whitcomb worked for Stack over in another division, and so Stack saw the opportunity, the way I would interpret it, to get somebody to listen to this work Whitcomb was doing. It appeared the problems we were measuring were resulting from the same things Whitcomb was finding. So we took our data, did tests in a transonic wind tunnel which confirmed our data, and we even used a technique — the equivalent body technique — which was inherent in this concept of Whitcomb's. Namely, you take the airplane and you just crush it down into a body of revolution. In other words, you take all the volume there and shape it into a body, and that body will have the equivalent transonic drag as when it's all stretched out like an airplane. An airplane looks real pretty, but when you crush it down what you will see is bumps, like something with huge hips on it, and that's what was causing the problem. And so all this data finally

checked out, and the company went back and redesigned the airplane. And the B-58 doesn't look anything like this design we tested. It was redesigned to accommodate what Whitcomb was talking about. They went on to do the same thing with the F-102 and the F-106. It was a pretty exciting business.

Roundup: Would it be accurate to characterize this as a group of engineers out on a sandbar, dealing with the environment and things like mosquitoes which could carry you away, working with equipment which was somewhat dated, but nonetheless who were really on the outer edge of what was then known about flight?

Piland: Yeah, but I wouldn't put it in the context of walking six miles to school in the snow or any of that. It was too much fun to be put in that category.

Roundup: Was it like a big camping trip out there?

Piland: A little bit. They had a dormitory there, however, and you never stayed over a weekend. We would go up on a Monday morning, and if you got your rocket model flown, you'd come back in two or three days. The big trick was how you happened to go to Wallops. It was a horrible place to get to at the time. They've got that nice causeway where you can drive over there now. But back then you didn't drive. We went back and forth in little cutters and that kind of thing. The worst combination that could happen is you would have to go from Hampton to Norfolk and catch the Cape Charles ferry. You went up to Cape Charles and then they met you there in a station wagon. Then you drove about sixty miles and then you transferred into this little boat to go over through the marshes, finally got to the island, got in another car and finally got to where we stayed. But the big deal at Langley was we had a seaplane, and if conditions were right and people were feeling kindly toward you, they'd fly you up there in it, and it took you a whole half hour that way. The other way, good Lord, it took you a day messin' around to get up there.



Piland and views of a rocket launch at Wallops during the NACA days.

Roundup: Do you think the nature of the research PARD was doing contributed in large part to it becoming the nucleus of the Space Task Group?

Piland: Well, I personally think the reason had a lot to do with Gilruth. His capabilities and foresight and so forth. But it wasn't so much the airplane testing that connected us up with the Space Task Group. It was the high speed work we did. The airplane work kept on and it was a bread and butter activity. But very quickly there we got into the business of seeing how fast we could fly things. And this became our biggest effort. Most of my work there was spent in trying to stack up rockets and make them go faster and faster to get reentry heating data. And so we would take these old military rockets and essentially stage them. First we had two stages, then three stages and then four stages and finally five stages. We kept going faster and faster.

Roundup: Were you trying to achieve Earth escape velocity, or was the goal simply to go as high and as fast as you could?

Piland: We tried to get up as high and as fast as possible. The ballistic missile program was under development then, and really that is what we were trying to support, to get high speed heating data that would help design reentry nose cones. I guess just about the most exciting thing in my career was when I was project engineer on a four-stage rocket that we flew faster than Mach number 10, which isn't very much anymore, but at the time nothing had flown that fast. That was about 1952 or 1953. So this got us a certain amount of notoriety. And we kept getting our techniques better and better. So it was really that high speed work, plus the fact that Gilruth was in charge of the Space Task Group and had started the division, that led us into that work. In fact, even around the time when the Russians put up their satellite, we had a plan laid out for a rocket that could put a satellite in orbit. Subsequently, that concept became the Scout rocket.

Roundup: It was about that time that you were sent to Washington

to work with Dr. James Killian, President Eisenhower's science advisor. Could you talk a little about that time?

Piland: Well, the Russians put up their satellite in 1957, so the wheels had started in motion to create a space agency, and Killian had been brought down by Eisenhower and given the job to decide what kind of organization the country was going to have. Somewhere in there the decision was made that it would be a civilian agency, and that they were going to incorporate the NACA into it. Evidently it was front runner all along in the circles that counted, but in the newspapers it was hardly mentioned. Nobody knew what the NACA was. By the time I got up there, a committee had been formed to study this and come up with recommendations. From then until the fall, they went through the process of converting those thoughts into an organization. It was made into a law in September or October of 1958. And of course in that time, all sorts of people got involved. Actually, the two guys who sat down and wrote the Air and Space Act which created NASA were a guy from the Bureau of the Budget and a guy from the Department of Commerce.

Roundup: The same week that NASA came into being, the Mercury Project was officially approved, and there followed what must have been some very busy months. In the midst of that program and the other activities that were going on, do you remember what the atmosphere was in the office the day after President Kennedy committed the U.S. to a moon landing program?

Piland: Yeah, I can specifically remember sitting down there at Langley with somebody, either the same day or the day after, and wondering, 'Now how in the hell are we going to do that?' I can remember that kind of discussion going on. By that time we had already been studying a lunar orbit concept, similar to what the Apollo 8 mission later did. We had already selected concepts for command and service modules and so it was a question of adding a lunar lander to it. In fact, that's what we liked about the circumlunar concept, it allowed us to go on with what we were doing and add another piece and go on and land on the Moon. But we had done our technical studies, and we were deeply involved in moving to Houston as well as supporting the Mercury and Gemini programs. We just had too many things going on. As far as I'm concerned, Gilruth had to very carefully orchestrate a situation there to keep all these balls in the air. I don't think anybody has ever appreciated appropriately just how many things he had going on with limited resources. In my opinion, it was just an outstanding management job he did under those conditions.

Roundup: In retrospect, does it seem surprising that everything went so well?

Piland: Everything didn't go so well. I can remember all the problems and things that didn't work. I can remember them better than the things which did work. There were a lot of broken things along the path.

Roundup: Was it the development of the technology itself, or the management of the program, which strikes you as most significant about Apollo?

Piland: Technical management. I remember a speech Gilruth made right at the beginning of the pro-

(Continued on page 4)

Gilruth Center News

Call x3594 for more information

Basic photography — This course includes basic principles and skills, camera exposures, film types, flash units, composition and more. The class begins Feb. 16 from 6 to 8 p.m. The six-week course costs \$30.

SCUBA — The NAUI-certified basic SCUBA course begins March 8 with classes from 6:30 to 9 p.m. Tuesdays and pool sessions on Wednesdays starting at 7:30 p.m. Cost of this class is \$70, and no equipment is necessary prior to the first meeting. Enrollment is limited.

Race — The next Rec Center Fun Run will be held beginning at 9 a.m. Feb. 26, with an 8-mile and a 1-mile race. The cost is \$2.

Ladies self-defense — There are still a few openings left in this course for learning the basics of self-defense. Class runs from 9 a.m. to noon on two successive Saturdays, Feb. 19 and 26. The cost is \$30 per person, and participants must sign up in advance.

Dog obedience — We train you to train your dog. This course offers a proven training method with professional results. Dogs must be six months or older, and the cost of this ten-week class is \$35. The class runs from 7:30 to 8:30 p.m. beginning March 7.

Basic auto mechanics — This course stresses the fundamentals of automobile repair. The course features three lectures on Thursdays from 7:15 to 9:15 p.m. beginning March 23. A Saturday lab will also be held. Cost for the course is \$20 per person. The class space is limited.

Children's movie — Our next movie will be the Walt Disney production "Benji." The movie will be shown from 10 a.m. to noon Feb. 26. The cost will be \$1 per person and includes popcorn and soft drinks. Tickets are on sale in the Bldg. 11 Exchange Store.

Country western dance — Back by popular demand, this class is available beginning Feb. 28. The advanced dance class meets from 7:15 to 8:45 p.m., while beginners meet from 8:45 to 10:15 p.m. The cost of the course is \$20 per couple, limit 15 couples.

Ballroom dance — Learn the fine art of ballroom dance. The class begins March 3 for eight weeks. Two classes will be offered on Thursdays: intermediates from 7 to 8:15 p.m. and beginners from 8:15 to 9:30 p.m. The cost of the course is \$50 per couple.

Dancercise — Part dance, part exercise, all fun, this class will gradually get you into shape. The six-week course begins March 1 and meets Tuesdays and Thursdays from 5:15 to 6:15 p.m. Cost of the course is \$20 per person.

Piland

(Continued from page 3)

gram. He said individual technical problems could be solved. The question was, could you organize 400,000 people, doing fairly complex tasks, and make it all come together at the same time and place?

Roundup: Technical management is something we work with every day now in the Shuttle Program and perhaps in the future with a space station. What do you see as the major uses for such a facility?

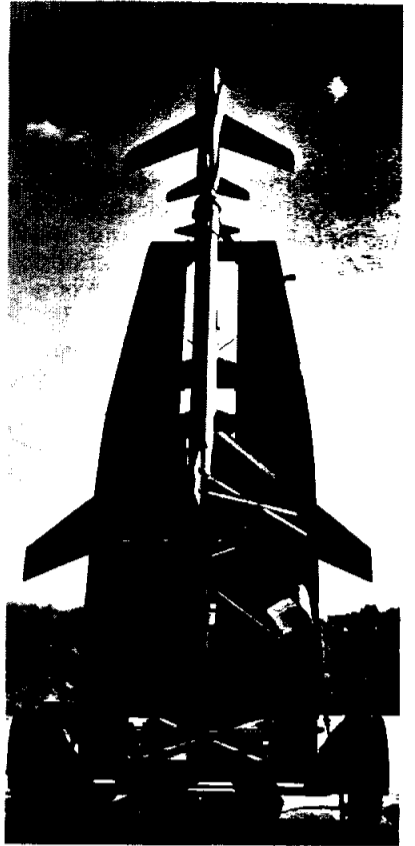
Piland: I look at it from two different vantage points. One is the more general standpoint of, is the country going to continue in manned spaceflight. Given that it wants to continue, then technologically what would appear to be the next rational step in that evolution? That's one way to come at a space station, and to approve the project on that basis is a matter of wisdom. It's a judgment which is not amenable to neat little calculations. Nevertheless, you don't go build it just to keep the country in the business of manned spaceflight. There should be other reasons, and there are. Studies going on now will show you that using a space station in conjunction with the Shuttle can essentially save you transportation costs, especially to geosynchronous orbit. That is a

beneficial thing to do. Also, I think materials processing appears to be a reasonable thing to do and appears very compatible with a space station operation. You can do it without the space station, but it's a question of how quickly you can bring new products on line. A manned space station would give you a marked jump in your capability to do a number of products. Then you can get into all sorts of specific scientific items. But using it in conjunction with Shuttles as part of the transportation business and materials processing are two of the best bets to pursue. But I think the real reason to have a space station is to decide from a standpoint of political wisdom that we want to continue and it is the next rational step. If you go just a little further, in my mind there's no question of the use of a space station and men to construct large satellites, large antennas which really are not amenable to being carried out by a single Shuttle flight. And in the very long run, I still believe something like the space solar power satellite is a very viable concept. Right now it's just a little too big for the world to swallow.

Roundup: Ames Director C. A. Syverston was quoted by a publication of the Harvard Business School recently as saying that if a person ever wanted to see what directions NASA was headed in, all they had to do was see where they've stuck Bob Piland.

Any comment on that?

Piland: Well, he's very kind. I've had the opportunity, it was chance as much as anything, to work on a lot of new things as they came along. And I've enjoyed it.



A scale model of a Grumman F11F-1 fighter awaits launch on a 6,000-lb. thrust rocket at Wallops.

Roundup Swap Shop

Ads must be under 20 words total per person, double spaced, and typed or printed. Deadline for submitting or cancelling ads is 5 p.m. the first Wednesday after publication. Send ads to AP 3 Roundup, or deliver them to the Newsroom, Building 2 annex. No phone-in ads will be taken. Swap Shop is open to JSC federal and on-site contractor employees for non-commercial personal ads

Property & Rentals

For lease: 10 acres, Alvin area, horses, cattle or ? Call L. Damewood, 482-5572.

Southwest Houston: Live here and work there? My situation is the opposite. Let's swap houses. Call Lake, x6337 or 771-8980.

For lease: 3-2-2 University Green patio home, new, avail. March 15, \$700/mo. plus utilities. Call Kumar, x2991 or 486-7643.

For rent: Clean, safe two BR older home in Seabrook near Bay, central air, carpets, large kitchen, tool room, fenced yard, \$450/mo. Call Gene Horton, x6130.

For rent: Galveston By-The-Sea condo., 2 BR, furnished apartment for rent by day (2 minimum), weeks or month. Call Clements, 474-2622.

For sale or lease: League City 3-1, brick, 7 miles from NASA, privacy fence, large living room, \$400/mo rent, to sale \$2,500 move-in, \$450/mo., 8.5% loan. Call Charlie, 480-3260.

For sale: 3-2-2 in Deer Park, fire-place, fence, all schools in walking distance, assume 12.5% FHA. Call 476-9479.

Bedroom for rent, kitchen privileges, washer/dryer, carpool to NASA available, female only, League City. Call 332-5774.

For lease: Energy efficient Forest Bend 3-2-1, fenced, \$490/mo. plus deposit. Call 334-5792.

For sale: corner lot at Lake Livingston, 3 blocks from water, no improvements, \$4,000. Call Jerry, x4528 or 488-2540.

For sale or lease: Friendswood 3-2-1, converted garage, Friendswood schools, large fenced yard, \$495/mo., \$56,000, owner finance. Call 480-1347.

For sale: Forest Park-Lawndale, six adjacent burial spaces, beautiful location, \$2,250. Call 488-1028 after 5 p.m.

For lease: Seabrook/Miramar, 3-2-2, central air heat, fenced yard, 15 minutes to NASA, \$435/mo. plus deposit. Call 488-5380.

Cars & Trucks

1973 Volvo, \$900. Call 337-1160.

Mobile Traveler mini motor home, 1978, sleeps six, fully self-contained except for APU, \$8,200. Call 337-1160.

1966 Mustang, new electrical, fresh tires, some engine and transmission work due, good body, interior rough, ready to restore, \$700/neg. Call Dan, x2156 or 334-7198.

1973 Monte Carlo, AM radio, no rust, well maintained and runs well, \$375 cash. Call Lorraine, 488-3720.

1978 T-Bird, all electric luxury model, low mileage, excellent condition, \$3,800. Call Mike, x4441 or 925-7638.

1978 Olds Cutlass, auto, AM/FM/8-track, bucket seats, center console,

silver/red, 49,600 miles, below Bluebook. Call Steve, x3561 or 777-2173 after 6 p.m.

1977 Ford pickup, \$2,500. Call 474-5406.

1979 Datsun King Cab pickup, AC, 4-speed, 50K miles, very clean, sell below Bluebook wholesale. Call Kirk Janes, x2646 or 946-3339.

1972 Porsche 914, AM/FM/cassette, rebuilt engine and transmission, new clutch, Imron paint, interior excellent. Call Dave, 473-7745.

1979 Ford LTD Landau, fully loaded, power seats, window and door locks, cruise, tilt, AM/FM with tape and CB, 39K miles, excellent condition, \$4,200. Call Frank, x5179 or 332-5975.

1982 Toyota Celica, auto, AC, sunroof, AM/FM, PS, PB, pampered, \$5,600. Call Tom, x4258 or 480-2776.

1969 Open GT, very good condition, no rust, looks like mini-Corvette, \$1,800. Call 486-5217 after 5 p.m.

1975 Ford Granada, 4-door, power, air, 58K miles, good condition, \$1,500 or best offer. Call 486-8057 after 5 p.m.

1969 Lincoln, white with leather seats, shop manuals, driven last in 1980, see at 1824 E. Main in League City. Call Holley, x3066.

1977 Plymouth Volare Premier SW, PS, PB, AC, steel radials, excellent condition, 68K miles, \$2,000. Call Tom Ullrich, x5212 or 487-0307 after 5 p.m.

1981 GMC Sierra pickup, auto, AC, dual tanks, rust proofed, warranty, dark blue, \$5,900. Call V. Bond, x2855 or 534-4339.

1977 Datsun F-10 wagon, 4-speed, radio, AC, 33 mpg reg. gas, 68K miles, \$1,500. Call Craig, x4189 or 559-1795 after 5 p.m.

1968 Cadillac Fleetwood Brougham, full power, tilt, cruise, clean, second owner, \$475 or best offer. Call Norm, x3643 or 488-0035.

1972 Volkswagon van, needs work, \$300. Call 941-2980.

1981 Pontiac Catalina station wagon, three-seat model, low miles, air, automatic overdrive, PS, PB, tilt wheel, luggage rack, priced well below retail. Call Steve, x5111 or 554-2435 after 5 p.m.

Boats & Planes
Piper Lance for rent, AC, club seating, \$85/hr. wet. Call L. Damewood, 482-5572.

For sale: 14' Hobie Cat, good condition, rebuilt trailer, \$1,500. Call 471-1369 after 6 p.m.

For sale: 1983 Hobie Cat, National boat, loaded, excellent condition, white hulls, yellow sails w/colors, \$4,100. Call Tucker, x5871 or 482-4918 after 6 p.m.

15' Wellcraft, drift fishing hull, docking lights, cover mechanical steering, on trailer with 12" wheels, \$500. Call 554-6028.

Cycles

1971 Moto Guzzi with sidecar, new valve job and rings, \$1,500 or offer. Call Lance, x2896.

1980 Yamaha IT 175, very low miles, excellent condition, \$750 or best offer. Call Bob, x6226 or 488-3314 after 5 p.m.

1976 Collector's limited edition Honda Goldwing, needs accessories but is in good condition, new air shocks, best offer. Call Ann, x5827 or 1-925-6634 after 5 p.m.

Girl's 20" bike, just reconditioned and painted, \$15. Call Tex Ward, 488-5445.

Audiovisual & Computers

25" color TV w/wood cabinet, \$300; AM/FM stereo w/record changer and speakers, \$100, seven years old but in excellent condition. Call Williams, x4464 or 333-5470 evenings.

Radio Shack direct-connect, 300 baud modem, lists for \$149, sell for \$100. Call Phillips, 480-7239 after 5 p.m.

Sears 12" black and white TV, works well, \$40; AM/FM stereo record player, \$50. Call Mark, x4436 or 554-2538 after 6 p.m.

Magnavox 72" stereo console with JVC reel-to-reel tape deck, beautiful distressed pecan hardwood finish, like new, \$300, originally \$1,250. Call 479-7815 after 6 p.m.

Magnavox 25" remote control color TV home entertainment center, beautiful distressed pecan hardwood finish, like new, \$500, originally \$2,195. Call 479-7815 after 6 p.m.

RCA 19" black and white solid state TV, has sharp picture and large speaker. Call Dave, x2676 or 480-0150 after 5 p.m.

Want disk drive without controller for Apple II computer. Call 333-2476 after 5 p.m.

Household

Kenmore cooktop stove, three years old, like new condition, self-cleaning oven, black glass door. Call 280-0185 after 5 p.m.

Kelvinator refrigerator, two years old, excellent condition, paid \$750, will sell for \$350. Call D. Howard, x2113 or 762-4673 after 5 p.m.

Lane walnut coffee table, \$25; misc. household items. Call Beth, x4311 or 554-2908 after 6 p.m.

Thermal beige drapes, 100 x 84", w/matching 100 x 84" regular window, shears in white and beige, some triple widths; crib without mattress, very good condition. Call Shannon, x4831.

White heavy duty Whirlpool washer and dryer, one year old, excellent condition, \$150 each. Call 472-3311 after 5 p.m.

Solid wood matching bedroom furniture, double size head and footboard, chest of drawers, mirror and rocking chair. Call 334-4894.

Time-Life books, assorted; teak-look bookcase, \$25; coffee-table, \$50; plush rust couch, 86" long, \$75. Call Burrow, x7474.

Single bed head and footboard, Ethan Allen, \$35; bedroom suite, \$150; vacuum cleaner, \$75; 4 dinette chairs, \$12. Call 482-7546.

Wanted

Want used oscilloscope, good working condition. Call Lake, x6337.

Need car pool partners for pool between Quail Valley, Mo. City and NASA. Call Bob Patil, x6484 or x6485.

Want non-smoking male to share nice modern 2 BR townhouse in Forest Bend w/same, \$225/mo. plus utilities. Call 996-9416 after 5 p.m.

Looking for someone who has skiboat and wants to practice or learn competition skiing through the winter. Call Rich, x5511 or 482-1437.

The Edgebrook/Gulf Fwy. carpool needs a fourth member, work hours 7:30 to 4-4:15. Call Ron, x3526.

Want rowing, sailing dinghy, 6' to 8'. Call Jeff, x2421 or 538-1643.

Want member for Texas City carpool, 7:30 to 4 p.m. Call Joe Singer, x3346.

Female to share 2 BR apartment with same, private bath, near NASA, \$185 plus 1/2 utilities. Call 280-9377 after 9 p.m.

Want used baby bed in good condition. Call John, x4776 or 331-5751.

Male would like to rent a room monthly to live in NASA area. Call Dennis, 486-9178.

Want tank-type air compressor on wheels. Call Dave Dunn, 486-0808.

Pets

AKC Labrador Retriever puppies, champion bloodline, yellow or black, shots and wormed. Call Art Horridge, 488-4047 or 444-2951.

Musical Instruments

Saxophone, used only two years, \$250. Call Jeanette Martin, x3725 or 941-2980.

Upright player piano, reconditioned and mechanically sound, also fine collection of music rolls. Call Haines, x3138.

Electric piano, four octave, \$275. Call 474-3127.

Holton H376 French horn, \$800 or best offer. Call 941-0138 before 9 p.m.

Hofner bass guitar, mint, dual pickup, paid \$1,000 in Germany, sacrifice \$500; electric amp., will carry 2 guitars or one plus mike, \$50. Call Scott, 538-3069 or 334-5746.

Miscellaneous

64 pt. round diamond, American cut, appraised at \$3,200, sacrifice, \$2,000. Call Tom, x4258 or 480-2776.

Two-Horse trailer, 2 1/2 year old bay filly, plus saddle/tack, \$1,200. Call Dan, x2156 or 334-7198.

New General H78-14 on GMC 5-hole rim, \$40; 1 men's size ski boot, \$35; 1 ladies Henke size 6 1/2 ski boot, \$35; 20 gal. BAIR reloading press w/hulls, \$35. Call 554-6028.

Lady's oyster dyed sheared Canadian beaver coat with natural ranch mink collar, stroller length, size 12, excellent condition. Call 523-3185.

Guitar, \$165; file cabinet, \$30; electric eraser, \$35; iron bedframe, \$50; 2 mirrors, \$50; 29" suitcase, \$20; blender, \$25. Call 333-9234.

Full-size keyboard for Sinclair ZX 81/Timex 1000, makes program entry fast and easy, assembled, \$60. Call Dan, 480-0630.

300 lb. olympic weight set, 7' chrome bar with 1,000 lb. capacity, padded weight bench, \$350. Call Rick Rosenhagen, 474-2190.

Space Shuttle coffee mugs or glasses sets, many sizes and styles, ALT through STS-6, Call Roger, x7474.

Firestone 721 steel belted radial, FR78-14, raised white letters, 3,000 miles, excellent condition. Call Bob, 488-5660, x511.

Need witness to accident: Friday, Jan. 21, 7:55 a.m. on Saturn at Gemini, near back gate, for insurance purposes. Call Alice, x3496.

Gas tank, 20 gal., tool box combo for large/small pickup, 14 x 48 x 19, \$120. Call Don, x4825 or 585-5391 after 6 p.m.

Yellow 1982 Bell moto 3 motocross helmet, size 7 1/2, used twice, \$85. Call 488-7899 after 3 p.m.

SCUBA gear, basic textbook and certification, \$30; BCD with power inflator, \$150; Cozumel roundtrip plane ticket, 4 days and nights. Call Charlie, x3421 or 480-3260 after 5 p.m.

Two 14-inch mag wheels with tires for Ford/Mercury, \$25 for all. Call Randy, x4188 or 997-1558 after 5 p.m.

Deluxe water filter system, Culligan "aqua-clear" reverse osmosis system, model H-5, best offer. Call 280-0860.

Executive wood desk, 36" x 72", with swivel chair, \$165. Call Lee, x4651 or 486-7360.

R.C. airplane radios, several planes, etc. Call Ken, x2065 or 473-2602 after 5:30 p.m.

Wedding gown, beautiful long ivory satin, size 8, excellent condition, \$125. Call Irma, 333-2877 or 333-8173.

Hoover vacuum cleaner, \$40; Ansonic slide projector, \$35. Call Chuck Larsen, x2068 or 538-1477.

Sears heavy duty trailer hitch for '74-'76 Torino & Montego, \$40; radiator, \$25; heater, \$20; both for '73 Duster/Valiant 6 cyl. Call Terry, x3751 or 482-8592 after 5 p.m.

FAA pilot ground school, \$10 through Gulf Coast Aero Club. \$8/mo. dues. Call Mark, x4436 or 554-2538.

Ford 1/2 ton hood, left door and gas tank; Sears Coldspot refrigerator, lawn mower, AM/FM car radios. Call 332-4750.