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Embry-Riddle Aeronautical University

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AVION

An Award Winning College Newspaper

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Embry-Riddle Aeronautical University, Daytona Beach, Florida

July 26, 1989

Stealth program off the ground

by Kress Latham
Aeronautics Editor

Pentagon officials watched with fingers crossed as the B-2 stealth bomber left the ground for the first time last Monday. It was the culmination of 18 years of development, according to Air Force officials and exists now as a revolutionary advancement in intercontinental bombers.

Despite the successful first flight, congressional opposition remains to the radar-evading aircraft that at \$530 million a copy is the most expensive in history.

The Pentagon hopes to buy 132 planes at a cost of about \$70 billion. In fiscal 1990, the defense department has proposed spending \$4.7 billion for the B-2, but last month the House Armed Services Panel cut \$800 million from the budget.

The B-2 program has been shrouded in secrecy for over ten years, but as opposition to the expensive aircraft has grown in Congress, the Air Force has been more forthcoming with information.

Last week, Air Force secretary Donald Rice and Chief of Staff Larry Welch briefed members of the House Armed Services Committee in an open session that included a color slide presentation on the plane.

Money for the B-2 is expected to be the most controversial item next week when the House and Senate consider the defense bill. The B-2 utilizes an unorthodox design of curves and contours which make it "invisible" to sophisticated enemy radar detection systems.

The stealth technology is not designed to elude enemy radar, but to actually absorb it, thus reflecting air back to return to receivers as possible.

General Bernard P. Randolph is talking about an aircraft now that basically

negates the air defenses built up in many places around the world over" said General Bernard P. Randolph, who directs research, development and testing of aerospace systems for the Air force.

There were many who believed that this flying boomerang of an aircraft would never get off the ground, but John Kirsch never had any doubts. He had seen a "flying wing" take to the sky back in 1947 when he worked in the sheet-metal department of Northrop Co., the defense contractor that produced the B-2, when the company produced the YB-49 prototype - a bomber closely resembling the stealth.

Although it is interesting to see the "flying wing" design come into prominence again, Kirsch said the price tag disturbs him. "To a guy like me who went through the Depression, it seems so

wasteful," he said. Kirsch said waste was common when he worked at Northrop. "They wasted material like it was nothing," he said. "Of course they don't care how much it costs to produce a plane because their profit is based on cost."

The YB-49 featured four jet engines and a bubble cockpit in the center of the wing's arch. The two aircraft share dimensional similarities as well as design. The wingspan of these aircraft that were born more than 40 years apart, both measure out at 172 feet - slightly less than the wingspan of a B-52 Stratofortress.

The YB-49 was held in high regard by many test pilots of the day. Fabricated entirely from aluminum, this aircraft was not intended to elude enemy radar. Hardly any was in use at that time. It was capable of flying at altitudes in ex-

see STEALTH, page 3

"We're talking about an aircraft now that basically negates the air defenses built up in many places around the world over..."

General Bernard P. Randolph



It's a bird...

No, it is the \$550million dollar version of the B-49. The B-2 bomber is now fully operational and is undergoing daylight testing in California. The controversial airplane performed its preliminary testing flawlessly.

Riddle Alumni killed in banner towing accident

by Phyllis A. Salmons
Copy Editor

Michael William Miller, 23, an April 1989 graduate of Embry-Riddle Aeronautical University died Wednesday, July 12 from injuries sustained when the single-engine plane he was piloting crashed while flying over Berlin, Md. At the time, Miller was employed by Ocean Aerial Advertisement, Inc. of Ocean City, Md.

The accident is currently under investigation by safety officials who will make a final determination about the cause of the accident.

In telephone interviews with a representative of the *Ocean City Times*, the newspaper covering the accident, and Robert Bunting, owner of Ocean

Aerial Advertisement Inc. for about four weeks and "had been doing a good job" according to Bunting, who says he has employed a number of Embry-Riddle pilots over the years.

Miller graduated from Embry-Riddle with a B.S. in Aeronautical Science and had earned his Commercial Multi-Engine Instrument Rating.

He served as Vice President of the Student Government Association and Chairman of the Student Finance Board. He was the founder and president of the Windsurfing Club, a member of the Naval Aviation Club, and Sigma Tau Delta. He served on the Senior Class Council, the Readmission Com-

mittee, the Aeronautics Committee, and was the Chairman of the Spring Fling Committee. He was also a community volunteer for the YMCA of Daytona Beach.

The University held a memorial service for Miller on July 17 which was attended by his parents, brother and sister as well as numerous friends among the student body, faculty, and staff of Embry Riddle. Miller's father spoke of Michael's involvement in the activities of the University, the good friends he had made at Embry-Riddle and his love of flying. Mr. Miller concluded that Michael spent some of his happiest days at Embry-Riddle being with his friends and doing what he loved. We who knew him will not forget him.



Michael Miller

Advertisement Inc., the accident occurred at approximately 11 a.m. The weather on the morning of the accident was clear. Miller had failed in his first attempt to hook a banner in the 1974 Bellanca Citabria and he performed a normal go-around pattern, climbing and then banking left. Upon missing again on the second attempt, the airplane had not climbed as it should have and when it banked to the left, an apparent stall ensued. The plane fell on high-voltage wires and burst into flames.

Bunting said the airplane appeared to still be developing power and a survey of the wreckage showed that all control cables were still intact. Officer Paul Fort of the Maryland State Police told the *Ocean City Times* that Miller died instantaneously.

Miller had been working at

Engine 1 & 2, have caused fatal crash

by Kress Latham
Aeronautics Editor

As the smoke cleared from the wreckage of United Airlines Flight 232, which crashed last Wednesday after a complete hydraulic failure, the death toll had finally stabilized to 110 people.

This number differs from United Airlines count of 109 persons. The discrepancy in the numbers comes from an uncertainty as to how many passengers actually boarded the aircraft as opposed to the number of tickets sold. The latter being used by the NTSB as a basis for their estimate.

United was sticking by its previous figure of 293 people aboard, United spokesperson Ann Thoma said today in Chicago. "A person may have checked in at the ticket counter, gone to the lounge and had a glass of beer and missed the plane," City Manager Hank Sinda said, explaining a possible reason for the two person discrepancy.

Or they might have got on the

plane, gotten off to use the washroom and missed the plane."

The 15 year old DC-10 was just passing over western Iowa enroute to Chicago and Philadelphia when an explosion in the rear of the aircraft knocked the flight attendants to the floor.

One unidentified attendant, went into the cockpit and found the flight crew struggling to regain control of the airplane.

Down on the ground, Mitch Quirin found a dome shaped metal object, 6 or 7 feet high and 6 feet long, lying in the field behind his house. It was immediately obvious to him that it was part of an airliner.

"My first thought was, I wonder what's happening to the plane," said Quirin, vice president of Mellow Dent Seeds Inc.

About 4 miles southwest, three more pieces of the aircraft fell to the ground. One was a 6 foot metal band engraved with: ENG2.

An off-duty pilot had made his way to the cockpit and was now on his

knees before the throttle quadrant, trying to help the flight crew control the aircraft by manipulating the throttles of the two wing-mounted engines.

"What you have here is a situation of two men desperately trying to get

see CRASH, page 3



The aftermath...

One of the larger sections of fuselage is trucked away from the Iowa cornfield where United Airlines Flight 232 came violently to rest last Wednesday.

Tuition payment grace period eliminated

by Brian Cerni
Campus News Editor

Beginning this fall, a new tuition payment policy will be instituted, requiring all students to pay their tuition the first day of class or sign a tuition payment agreement. A letter has been sent to students stating that "Under the agreement, a \$100.00 deferred payment fee will be assessed and 1.5% service charge will be accrued each month until the account is paid in full. Payment must be received no later than October 18, 1989 after which date the student will be administratively withdrawn."

Although this new policy comes as a surprise to many students, Cherie Armstrong, Director of Student Financial Services, said that the payment policy is no different from the past. "Tuition has always been due the first day of class. We're trying to get the commitment from the students, whether the payment itself or the intent to pay." Under the old policy, students had 2 weeks to pay their tuition before the \$100 fee was charged.

Armstrong stated that the purpose of the new policy is to help both the University and the stu-

dents. "We're trying to get tuition payment agreements taken care of in the mail." This will help the University by moving up the tuition processing and provide less hassle for the students by eliminating the long lines that students had to wait in on the last

"Students will always put payment off to the last minute."

Cherie Armstrong, Director
Student Financial Services

day of the old grace period. Although there is now no official grace period, Armstrong said that the \$100 fee will not be immediately assessed to a student's account because it will take the University approximately two weeks to determine whether the delinquent account is the student's fault. Therefore, the deferment agreement will become void if tuition is paid during this time.

The new policy was instituted by the Tuition and

Fee's Committee on Armstrong's recommendation. Students were represented in this decision by one SGA representative who sits on the Tuition and Fee's Committee.

While students who have pre-registered are being notified of their bill 30 days in advance of the first day of class, students who register for classes at the beginning of the semester will be forced to sign the deferment agreement as they receive their new bill. Armstrong said that the extra time for these students to come up with the money is the tuition agreement itself. Add/Drop will be handled in a similar manner, with students owing at the end of the Add/Drop period, although Armstrong says that Add/Drop normally does not change a student's account.

When asked whether this payment plan will make the University look more greedy, Armstrong said, "Students will always put payment off to the last minute." As in the past, students who do not pay their tuition before October 18, 1989 will be administratively withdrawn.

see TUITION, page 6

Inside
the Avion
this week

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Trivia:
On July 27th 1942, the P-51 Mustang thundered into service over Europe. On this date the infamous aircraft flew its first operational sortie.

Guest Editorial

By John L. Baker

It is with a sense of urgency that over the last year the aviation industry has been calling for strong federal leadership in establishing a comprehensive National Aviation Policy. The call was born of the frustration of years of watching U.S. civil aviation fall farther and farther behind in its ability to keep up with America's growing demand for air transportation. Little has happened in the intervening year that could be construed as progress toward such a national policy.

Until now. Last week, a resolution a year in the making was introduced into the 101st Congress by Rep. William Clinger (R-PA), ranking Republican on the House Aviation Subcommittee, and Rep. Dan Glickman (D-KS), co-chairman of the Congressional Aviation Forum, and 70 co-sponsors, including William Lehman (D-FL) and Lawrence Coughlin (R-PA), Chairman and ranking Republican on the Transportation Appropriations Subcommittee.

Within a few weeks, the Resolution will be introduced into the Senate by Sen. John McCain (R-AZ), ranking Republican on the Senate Aviation Subcommittee, and Sen. James Exon (D-NE), a senior member of the Subcommittee, and 13 co-sponsors.

A dispassionate look at the circumstances confronting civil aviation at the national level would indicate that we have simply squandered a year—with little or no progress made towards expanding the system in any meaningful way.

And there is plenty of blame to go around. Responsible to a large degree are all of us in the aviation community. We have lacked the courage and the vision to set aside narrow, short-term benefits to ensure the long-term health and vitality of civil aviation.

But we in the aviation community are not alone if we are to assign responsibility or blame for the failure to keep up with the demand for quality air transportation. Congress and the Office of Management and Budget—who have taken the trust out of the Trust Fund—have, by impounding, systematically underfunding and treating the Fund's surplus as a gigantic pork barrel that would fund every half-baked scheme that strikes a politician's fancy, contributed mightily to the inadequate progress made in the nation's aviation system. To this group add those local politicians who, in an attempt to buy votes, have squandered the wonderful resource aviation represents by equating airports to garbage dumps and nuclear waste sites.

Blame also those both in and out of aviation who, for their own purposes, have used the media to inflame, confuse or distort aviation's generally outstanding safety record. And those in the media who, with a view towards sensationalism, have allowed themselves to be used in such a callous manner. It has become fashionable, as the result of some fairly sensational press coverage, to see only 400-passenger airliners as contributors to the nation's air transportation needs.

see OPINION below



Letters to the Editor

Thank you ERAU

To the Editor:
Since my graduation from ERAU in 1981, the opportunities and involvement bestowed on me have been numerous and rewarding to say the least. I have advanced myself through many different scopes in the aerospace and aviation related fields. June 7, 1989 was the highlight of my growth since my graduation from ERAU - I have secured a position as a Quality Inspector with Rockwell Division of Rockwell International, Space Shuttle Main Engine Division at the John F. Kennedy Space Center in Florida. Words alone cannot describe the overwhelming pride I feel in you about my past and future since 1981, but it will be a tire book. I feel compelled to write

send the entire working body at ERAU this note with sincere thanks for providing me with the initial knowledge I sought which in turn opened all the doors for me since my tenures began in 1981. I want to express my gratitude to the entire ERAU body!
Respectfully yours,
William J. Mond Jr.

Ticket to ride

To the Editor
I am curious about tactics of our Safety and Security Department. When a student parks on campus, they are fully capable of locating the student's name, box number, and of course they are capable of making charges to our student accounts. They seem to lose their skill for such matters however, when it comes to seeing if the student has really purchased a valid parking sticker.

There are a number of reasons why a valid parking sticker may not be visible to our safety personnel. For instance, those who drive a convertible, and leave the top down may have properly displayed the sticker on the back window, but it is temporarily out of sight. Next there will be a rule saying that convertibles must leave tops up. Other people choose not to put the sticker on the car at all. Those who own really nice cars may not want to have the sticker on the car. Besides, the stickers are capable of being removed without destroying them, so they are no safer on the car than on the dash of a locked car. Lastly, there is some advantage when out and around town, not to be identified as an Embry-Riddle student. We don't always get treated with open arms in this fair city. I have a sticker, and though it is not

technically "properly displayed", I prefer to place it on my dash instead of on my car. If I should forget to place it in the window, and the safety department takes the time to look up my life history, why can't they just check their records and see that there has been a sticker issued and that it goes with the make and model of the car?
Ticket to Park

Editor's note: Letters appearing in the Avion, do not necessarily reflect the opinions of the newspaper or its staff. Letters submitted may be edited for brevity and may be printed provided they are not lewd, obscene or libelous. Letter writers shall confine themselves to a single topic. All letters must be accompanied by the signature of the writer. Names may be withheld on request at the discretion of the Editor.

Student Forum

The Avion asks: What is your opinion of the school's new tuition payment plan?



Geoff Waxman

This just adds more pressure for to the students to come up with cash. Another turn of the screw.



Maurice Cadaval

Payment should only be due after your final schedule is made, in order not to complicate things.



James Russonello

I don't have any complaints. However, I have not received any notice explaining it.



Steve Worth

If (Embry-) Riddle is trying to make things more difficult for students and complicate tuition procedures, they will succeed.



Jovlyn Fraser

It will make it extremely difficult for students who have financial difficulties to afford this institution.



Dan Ruckert

We need a payment agreement that you can make small payments on your account without being penalized

OPINION

This startling insight is usually delivered by some "expert" in an attempt to rationalize the increasingly severe breakdown of the air transportation system in terms of both airport runway shortfalls and the abject disaster seen in federal attempts to modernize and expand the capacity of the air traffic system.

If we are to have a "national system," we must find a way to accommodate the various classes of machines, each with unique capabilities and each with special contributions to make to the system.

It is important from the public's perspective to recognize that all classes of aircraft make a significant contribution to the American economy.

The perception must be changed that small airplanes are the cause of delays at major airports. The fact is that general aviation does not contribute in any measurable way to the aviation gridlock we read about in the national media. If general aviation went away tomorrow, there would be no appreciable relief from the mess that exists on the nation's major airports and in the airspace surrounding them.

If we allow this pervasive attitude to persist, real damage will be

done to the American public's ability to travel by air.

What is overlooked is that biasing access to airports and airspace on the basis of aircraft size will reduce whole sections of the country to second-class citizenship. Travelers in such areas will be denied the ability to travel in the nation's intermediate and long-haul transportation system. We cannot—must not—allow this to happen.

In the last 10 years America has failed to invest in the public infrastructure outside the defense establishment. This frightening circumstance has prevailed at the federal, state and local levels.

Witness the inexorable deterioration of our roads, bridges, harbors, schools, research facilities, and most importantly from the aviation industry's perspective, airport maintenance, expansion and creation.

When this situation is coupled with federal deregulation of the airlines, have defined the prescription for aerial gridlock. Throw on top of this pile irrational scheduling by the airlines—bunching traffic into a relatively small number of available operating hours; extensive hubbing as standard operating practice, compounding the already insuperable problems with thou-

sands of daily flights on which passengers simply pass through hub locations; and the absolute refusal by many local politicians to recognize the overriding national interest in expanding existing facilities; and you have defined the parameters for gridlock, economic disaster, the potential for diminished safety, increased public dissatisfaction, and ultimately political overreaction.

If we are to systematically address the solutions to these problems, we must begin with an in-depth national dialogue that confronts head-on the gut issues that have been consistently avoided at both the national and local levels.

If air transportation is a national system, it must serve a broad cross-section of the population and all sections of the country. This can only be done by tailoring a system to accommodate the disparate sections of the country and allow aircraft use that is suited to the population densities in each area.

Must we have a National Aviation Policy that integrates all the competing interests into a common, mutually agreed upon set of goals and aspirations? Again, if aviation is a vital, national public transportation service, common sense seems to demand that the system be standardized across the nation. This

brings us head-on into the debate concerning the preeminence of the national versus local interest—the classic question of federalism.

Clearly, we cannot have an effective national system if one of two vital components is subject to local whim with different aspirations, widely differing operating rules and noise parameters, and varying perceptions of an airport's utility and its impact on local definitions of quality of life. Will this effort provide magic near-term solutions and relief? No. But there are interim steps to be taken that will buy us additional time. We can, if the resolve is there, quickly expand capacity at existing airports, buy interim air traffic control equipment, standardize noise and other environmental requirements, and refine existing aviation operating rules.

Will these steps take us comfortably into the 21st century? Again, the answer is no. But they will allow us to survive with minimum burdens on both the user and the operator involved in aviation. And they will allow aviation to continue to serve the nation's transportation needs as we build, following a well-defined strategic policy, for the future.

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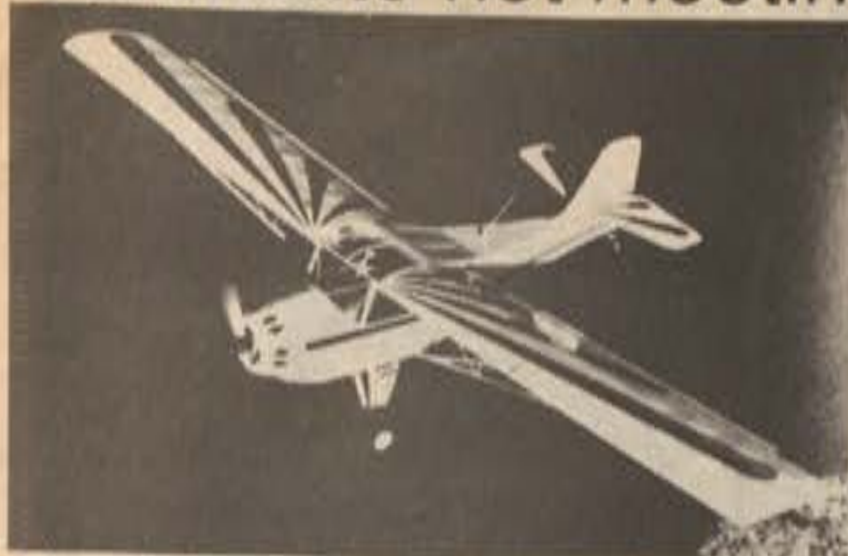
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This week's staff: All of the Above

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Certificate not meeting goals



a risk in granting the recreational pilot proposal. Should one of these restricted pilots wander into controlled airspace over a busy airport, well, you can guess the implications.

The recreational pilot will have a new bible to abide by. Although the license will allow the operation of aircraft with up to four seats, the pilot will only be allowed to carry one passenger.

The aircraft must have fixed gear and a maximum of 180 HP and all flights must not exceed a distance of 50 nautical miles from their point of origin.

Visibility must be no less than 3 miles at all times and no VFR on top flight will be permitted. No flight before dusk or after sunset is allowed and altitude is limited to 10,000 feet MSL, at least until the terrain rises above 8,000 feet, in which case flight up to 2,000 feet AGL is allowed.

The recreational pilot rating does not meet International Civil Aviation Organization standards, therefore, no international flight is allowed.

Each recreational pilot carries a logbook endorsed by a CFI at a specific airfield. This airfield becomes the pilot's home base which he or she must keep within 50 nautical miles of.

A third class medical is required to attain the license and a written and practical exam must be passed.

The list of reg's reads on, and one must ask him or herself if the difference of 13 hours and \$350 to get a daytime-only restricted private pilots license warrants the practicality of the recreational pilots license.

Thou-shalt-nots...

Will the recreational pilot's license fly under the weight of all its restrictions?

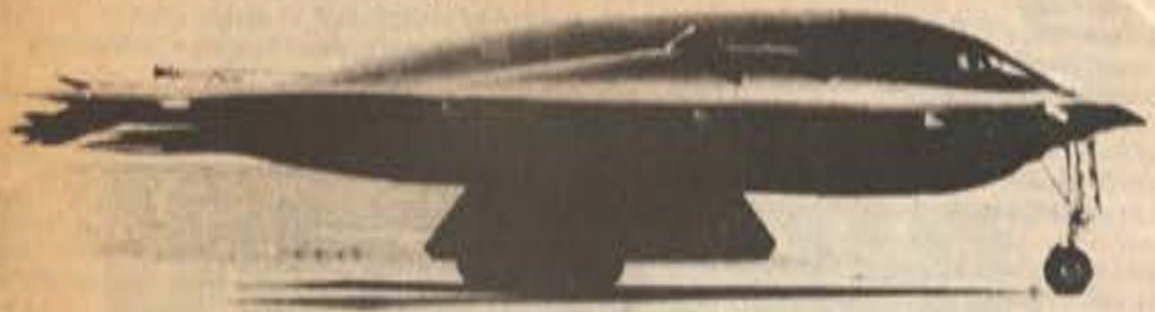
by **Kress Latham**
Aeronautica Editor

Samuel K. Skinner, Transportation secretary for the FAA, recently resurrected a notice of proposed rule-making that had been collecting dust in the FAA's filing system since 1985.

The proposal was for the creation of a new, recreational pilot's license directed at individuals who had no desire to fly in or out of controlled airports, or at night, or to fly for wide ranging personal transportation.

These individuals may have their own homebuilt or an old I-3 Cub that they're restoring and a regular pilots license is overkill for their needs.

The FAA has, as unusual as it may sound, taken a bit of



Batplane...

Flat profile and engines tucked well within the wings keep this bird invisible to radar screens. This defense is new, but the design is old.

STEALTH

(continued from page 1)

cess of 40,000 ft at speeds of nearly 600 miles per hour. Northrop was ordered to scrap the remaining prototype and all seven of the YB-49's that were in various stages of production, after a crash in the Mojave Desert killed Air Force test pilot Glen Edwards. The Mojave Desert Air Force base that now bears his name has become a focal point of advanced flight test research.

The stealth bomber is 17 feet high and 69 feet long, only slightly longer than an F-15 fighter. It is powered by four General Electric engines mounted on top of the wing. According to the Air Force, the engines are a derivative of those currently used on the F-16 and F-14 fighters.

Since an aircraft that cannot be seen does not need to rely on speed as a defense, the bomber flies only at subsonic speeds. It is capable of hugging the terrain closely or flying at altitudes as high as 50,000 feet, Air Force sources say.

The B-2 has an operational range of more than 6,000 nautical miles at altitude and over 10,000 nautical miles with the use of aerial refueling. The aircraft can carry both conventional and nuclear weapons, the Air Force said.

The test flight lasted two hours with the landing gear always in the extended position. Northrop test pilot Bruce J. Hinds, 50, and copilot Air Force Colonel Richard S. Couch, 42, said they flew the bomber at three speeds and guided it through numerous turns to test its stability. Couch described the B-2 as "a very nimble aircraft and the landing approach was 'rock' steady."

Now that the B-2 is back safely on the ground, military and civilian aviation experts will begin evaluating data from the plane's on-board computers as well as through

physical examination of the aircraft. The outcome of these tests will be the determining factor in when the date will be set for the next phase of flight testing.

"They basically will be testing all of its systems to make sure everything is fine," said Air Force spokesman Lt. Col. Jan Dalby. "So far things look real good."

Dalby said the analysis of the flight will be conducted at the base under a shroud of secrecy. There are "hundreds, perhaps thousands of readings" to be analyzed, he said.

"They are going to be studying the structure of the aircraft: How it withstood turns, the impact of landing," he said.

"They will study the avionics: How did it fly? Did it do what it was supposed to?"

Information gleaned from the inspection and analysis will be used to prepare the bomber for its next flight, probably within the next four to six weeks, said Dalby. The test will be kept secret for security reasons.

Over 5,000 Boeing employees have been involved in the stealth bomber project, along with nine other Washington state companies.

It has been 42 years since the last, or original, "flying wing", cast its batlike silhouette against the sky over the Mojave desert. At that time, it must have seemed to many observers that such an awkward looking contraption would never find a place in the current bomber regime.

After all, how could an airplane without a fuselage expect to fly?

Maybe that original YB-49 just needed some time for the rest of the world to catch up.

The B-2 has an operational range of more than 6,000 nautical miles at altitude and over 10,000 nautical miles with the use of aerial refueling.

CRASH

(continued from page 1)

whatever control they can out of the aircraft," said NTSB spokesman Jim Burnet.

Seven minutes before he attempted an emergency landing at Sioux Gateway Airport, pilot Al C. Haynes told the control tower, "Whatever you do, keep us away from the city," Burnet quoted.

The flight crew were in communication with the airline's experts for the last 25 minutes of the flight, desperately seeking advice for help controlling the crippled airplane. "If you have any suggestions, holler," one of the three crewmembers radioed to workers at United's maintenance headquarters. Forty-one minutes after the explosion of number two engine, Flight 232 crashed short of the runway as it tried to land, killing at least 109 people.

Apparently, the DC-10's rear engine exploded in flight, sending compressor blades slicing through the aluminum structure of the aircraft and

The flight crew were in communication with the airline's experts for the last 25 minutes of the flight, desperately seeking advice for help controlling the crippled airplane...

severing hydraulic plumbing of all three separate hydraulic systems.

It has also been established that the failed engine was involved in repairs the day before the crash. But the supervising federal investigator determined Friday that there was no indication that the work "would have or could have" affected the engine in

Wednesday's crash.

The work was done to a pneumatic system attached to the General Electric CF6-6 jet engine. This type of engine, used exclusively on DC-10 and Lockheed Tri-Star aircraft, have had six previous failures in which damage extended beyond the engine.

According to the engine builder and the FAA, the CF6-6 has a very good track record. David Lane, Spokesman for General Electric's aircraft engine division, said 469 CF6-6 engines are currently in service.

He said they show a rate of one departure delay or flight cancellation due to an engine problem for every 2,000 flights.

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SAVE SOMEONE'S LIFE

NASA plans full schedule

Michael Fried
Space Technology Editor

The space shuttle is back in full swing with a total of six planned launches for this year and nine for 1990. *Columbia* will be the only shuttle launched this summer on a DOD mission planned for early August. The STS-28 mission will carry a crew of five while the details of mission duration and exact launch time are unknown.

STS-34 will follow in October 12 with the launch of *Atlantis* with its Galileo probe destined for Jupiter. The five man crew will launch the nation's second planetary probe of this year signifying a return to the planets.

Discovery's fate is currently unknown as the pilot for that mission was killed in a plane accident. The mission is currently scheduled for November 19 on another DOD mission. NASA will try to find a replacement pilot in time for flight.

Columbia will return for an important mission in December for the Long Duration Exposure Facility (LDEF) retrieval. The satellite is in danger of falling out of orbit and burning up in the atmosphere. STS-32 cannot afford a long delay as the time becomes critical. LDEF was launched five years ago and has been

stranded in orbit because of shuttle setbacks. The five man crew will also launch a Syncom 4 satellite early in the mission.

In 1990 NASA has planned nine launches with the first to begin on February 1. *Atlantis* will fly a DOD mission with the specifics on the mission being classified.

Discovery will return on mission 31 that will deploy the Hubble Space Telescope. The HST has been waiting for its launch date for years and will allow astronomers to look far ahead into the future.

The next mission will be on April 26 using the shuttle *Columbia* for an astronomical observation mission. The flight is planned for nine days which will be the longest post-*Challenger* mission and also carry a seven man crew.

STS-37 will fly the Gamma Ray Observatory on June 4 using the shuttle *Atlantis*. From then on, five more missions will take place.

NASA is planning a total of eight flights in 1991 and a jump up to twelve flights in 1992. The reason for the jump is that the new shuttle *Endeavour* will be making its debut on February 2 of 1992.



Up Next...

The crew for the upcoming STS-28 space shuttle flight poses for their crew portrait. The mission is dedicated to be a Department of Defense flight, which will reduce the amount of detailed news available for the mission. The STS-28 crew consists of Commander Shaw, seated center front, pilot Richards, seated left, and mission specialists, left to right, Brown, Adamson and Leetsma. This launch of *Columbia* will be in early August.

Magellan still operating normally

by **Michael Fried**
Space Technology Editor

The *Magellan* spacecraft continues to perform normally on its way to the planet Venus following the launch from the shuttle *Atlantis* in May.

On May 21, four of the eight thrusters were fired to correct the spacecraft's trajectory toward Venus.

It was the first of three maneuvers to keep *Magellan* on course for its rendezvous with Venus in August of 1990. However, the maneuver went so well that the next planned maneuver will be less than anticipated. The third maneuver is set for August 1990 when the spacecraft is inserted into orbit around Venus.

The first maneuver only required 4.2 kilograms of the liquid hydrazine fuel used by the rocket

engines and thrusters on the spacecraft. Engineers had planned for a possible 20 kilogram use. If there is a big savings in fuel that will translate into a longer stay time in Venus orbit. The current mission duration is a 243 day mapping cycle.

Magellan will be taking a 15 month cruise. During that time spacecraft teams will do a daily checkup of the vehicle.

On a typical day, the team will check six major subsystems and discuss the results to determine an impact on the mission.

Every two weeks engineers will upload a new set of commands for the spacecraft's command and data system.

Also, once a day, *Magellan* performs a star scan. This involves turning the spacecraft to a computed position and the vehicle will get a reference off the stars to

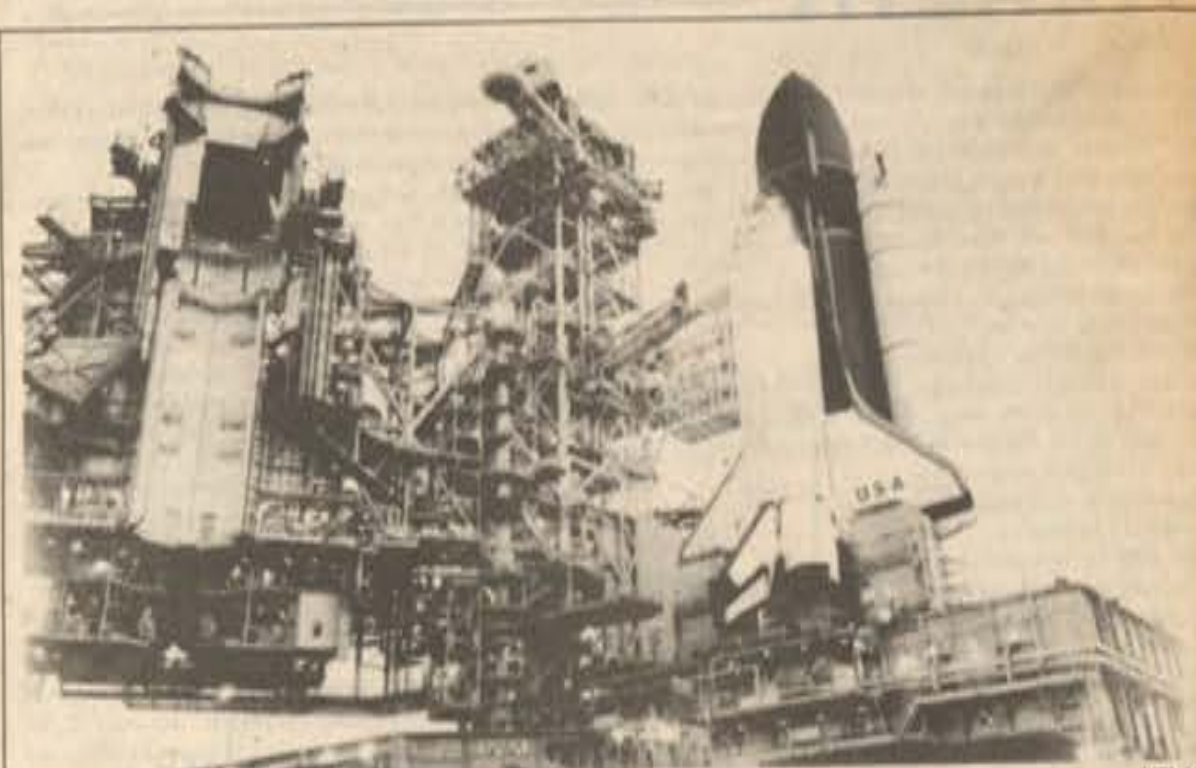
update its navigational system.

The Deep Space Network is the main listening post for U.S. interplanetary mission and is receiving *Magellan's* data.

The DSN uses large antennas located on three continents of the U.S., Spain and Australia. The network's operations control center is at the Jet Propulsion Laboratory.

The DSN provides the tracking information on course and direction of the flight, velocity and range from Earth for all NASA's unmanned mission in deep space. It receives engineering and science telemetry and sends commands for spacecraft navigation and scientific instrument operation. In addition to *Magellan*, the DSN also is tracking *Voyager*, *Mariner* and *Pioneer* spacecraft.

The DSN is expected to receive *Voyager* spacecraft data from as far away as 3.7 billion miles.



The space shuttle *Columbia* arrives at Pad 39-B early in the morning last week. The rollout to the pad had been delayed several days due to difficulties in the orbiter being mated to the external tank and solid rocket boosters. *Columbia* is dedicated to fly a Department of Defense flight in early August. The exact launch date will be determined later this week by NASA and contractor management. As the *Avion* was going to print, possible anomalies were discovered in liquid oxygen valves within the main engines that plagued the *Atlantis* mission earlier this year. Kennedy Space Center employees are working to determine exactly what the malfunction is and how it should be repaired. *Columbia* must leave the pad by late August to make room for the October *Galileo* planetary mission.

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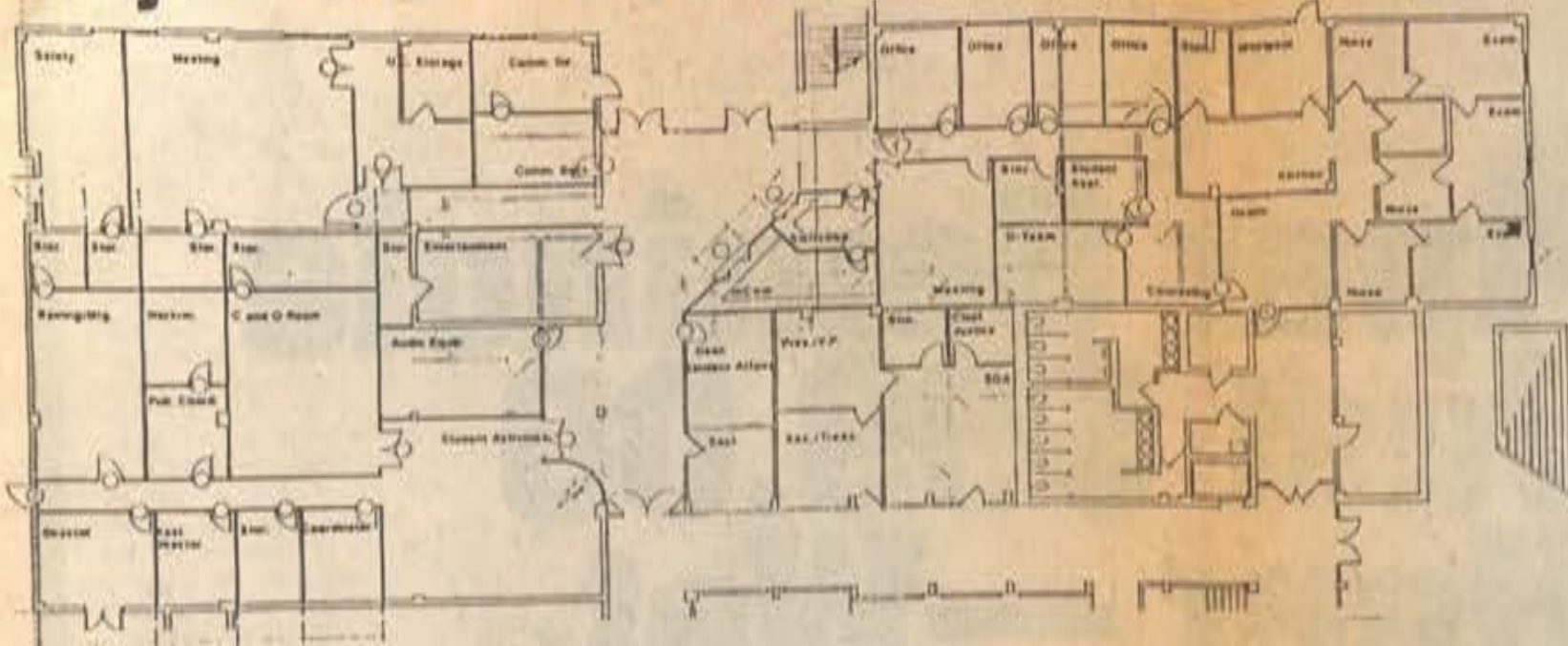
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Major U.C. facelift is underway



First Floor Demolition/New Construction

by Brian Cerni
Campus News Editor

Construction will begin soon to renovate the first and second floor of the south side of the University Center. Bomar Construction will be the contractor for the job and work should be finished in 3 to 3 1/2 months.

Dr. Jim Harrison of Facilities Planning stated that the remodeling is being done to better utilize the space made available by the new U.C. addition. The project will include the relocation and demolition of walls to increase space for the Health Services

Center, Career Center, Avion/Phoenix office, and SGA offices.

Dr. Harrison added that the plans were drawn up after "All occupants stated their needs." Although the new configuration should relieve many of the logistical problems of the past, Harrison still contends that "Our space (in the U.C.) is not adequate for the activities which go on."

When asked about the problems of renovating a building which is still occupied, Harrison said that the situation will probably try everyone's patience. To minimize conflict, the project will be completed

in stages, and personal will be temporarily relocated to the portions of the U.C. not being worked on while their new offices are completed. The lobby and hallway areas are scheduled for renovation first so that these heavy traffic areas can be clear when the fall semester begins.

Because cost estimates are still being revised, Harrison could not give a set figure on the price of the 14,300 foot renovation, but estimated it at about \$300,000.



Photo by Gail Whitehouse

Upward Bound gives students a head start

by Brian Cerni
Campus News Editor

The six week summer session of the Upward Bound program has brought local Daytona teens to the Embry Riddle campus for a program designed to motivate high school and jr. high students. Because the Summer B term tends to be the slowest enrollment wise, Upward Bound takes advantage of that, and gives their students a chance to utilize the facilities here at the Daytona campus. Beginning June 25, the session will last till August 3. During that time, the students will take classes, and participate in projects and athletic activities. The students also get an introduction to dormitory life, residing in dorm one.

Carol Grandinetti, Upward Bound Project Director, said that Upward Bound is a federally funded program for low income students and first generation students. First generation students are those whose parents have not attended college. Including Embry Riddle, there are 8 Upward Bound programs in Florida and 420 nationwide. Although many Embry Riddle students think that Upward

Bound is a new summer camp type organization, the well established program has actually been on campus for 14 years, and continues to do a superior job in fulfilling its goals. Although Grandinetti feels Embry-Riddle provides an excellent environment for the program, she is not sure why the University was initially chosen.

This year 65 students from 3 local high schools and 4 junior high schools are enrolled in Upward Bound. Along with the summer activities, the students also participate in a tutoring program during the regular school year where they spend 18 Saturdays at Embry Riddle receiving instruction from local county teachers.

Grandinetti stressed that, "The program helps to portray college life." Because Upward Bound boasts a 98% success rate, meaning that 98% go on to college, the experience in a college environment is very valuable to their performance as students. Grandinetti added that the 2% not attending college enter military service.

The Daytona Beach program is unique in that it is the only program in the

see BOUND, page 6

Ninety nines pay lasting tribute

by Phyllis A. Salmons
Copy Editor

John Paul Riddle, the late co-founder of Embry-Riddle Aeronautical University, was memorialized once again in the International Forest of Friendship, Atchison, KS. The Embry-Riddle Aeronautical University Chapters of the Ninety-Nines have sponsored a bench in his name along a pathway known as Memory Lane. Susan Selig of the Daytona Beach Chapter and Amy Herbert of the Prescott Chapter of the Ninety-Nines attended the ribbon cutting ceremony on June 17.

In 1988, John Paul Riddle was honored by having his name placed in Memory Lane. The suggestion to memorialize John Paul Riddle with a bench in his name along Memory Lane came from Fay Gillis Wells, a charter

see BENCH, page 8



File Photo

Susan Selig, Daytona 99's, Nora Jessen, International 99's Amy Herbert, Prescott 99's

TUITION

(continued from page 1)

SGA President Jeremy Greenidge commented on the policy saying, "I certainly find it shocking." Greenidge mentioned a new tuition payment policy at The University of Utah which postpones payments until after they've dropped or added classes. In the past, students would pay their fees, then drop or add classes, and as a result, be confused about the status of their financial account. Greenidge said, "It goes totally against what The University of Utah did to clear up this type of system."

Notices

Graduating Seniors with loans

If you have borrowed from the Perkins/National Direct Student Loan Program and anticipate degree completion during Summer B, you must complete an exit interview before leaving the university.

An exit interview is required by the U.S. Department of Education for every student loan borrower under the Perkins/NDSL Program during his/her last semester of enrollment as at least a half-time student. The purpose of the exit interview is to provide you with repayment terms for your student loans as well as benefits available to you during repayment of you loans. It is very important that you be fully aware of your Rights and Responsibilities as a student loan borrower to avoid any future possibility of default.

If you are anticipating degree completion by the end of Summer B, the group meeting is scheduled for August 10, at 10 a.m. or 3 p.m. in Davidson Theater (A-101).

You must schedule one of these sessions by calling the University Collections Office at 239-6040.

If you have questions, call Sherry Cunningham, University Collections, 239-6040.

Avion needs Sports Personnel for Fall

The Avion is in need of a sports editor and sports reporter for the Fall Semester. With Embry-Riddle's entrance into varsity sports, there is great opportunity for sports writers and photographers. Intramural sports and non-varsity team sports will give ample opportunity for publication. If interested, contact a member of the editorial staff of the Avion.

December '89 Graduation Applications

Applications are being accepted at this time at the Registration and Records Office on the second floor of the UC annex.

If a prospective employer requests a transcript for a job interview, we must have a written request from you before the information can be released. Stop into the Registration and Records office for request forms. After you leave, NO REQUEST can be done without a written request and a \$2.00 fee, if an Official Transcript is needed.

Lecture Note-Taking Tips

This session will provide information on how to efficiently take legible, helpful lecture notes. Wed, July 26, 1:30p.m. - 2:30 p.m. in the Common Purpose Room of the University Center.

Avion needs reporters and photographers

Reporters and photographers are needed in the areas of campus news, space technology, aeronautics, sports and diversions. Writing for the Avion provides invaluable experience in writing and dealing with administration, faculty, staff and fellow students. Communication skills are the most important talent you can offer your future employer. The Avion will

provide you with experience expressing yourself. Contact a member of the editorial staff for information.

Free Tutors Available

The Mathematics and Physical Science Department provides free tutors from 10:30a.m. to 3:30p.m. weekdays in Room A-106.

Library Hours for Summer B

Mon - Thurs	7:15a.m. - 10:00p.m.
Fri	7:15a.m. - 10:00p.m.
Sat	9:00a.m. - 10:00p.m.
Sun	1:00p.m. - 10:00p.m.

Campus Recreation

Anyone interested in participating in a swim meet, miniature golf, or 1 on 1 Basketball, should sign up now at the rec. office. Deadline for swimming and basketball is Friday, 7/28. Miniature golf deadline is Wed., 7/26. There is a \$4.00 charge for golf, and it will be held at Legendary Golf of Friday, 7/28 at 6:30P.M.

FAA Written Exams

Embry-Riddle will administer FAA pilot and/or instructor exams for the following:

Exam	Questions/times allowed
1. Private Pilot-Airplane	50/6 hrs.
2. Commercial Pilot-Airplane	100/5 hrs.
3. Flight Instructor-Airplane	100/6 hrs.
4. Fundamentals of Instructing	50/4 hrs.
5. Ground Instructor-Basic	100/6 hrs.
6. Ground Instructor-Advanced	100/6 hrs.
7. Airline Transport Pilot-Airplane	100/6 hrs.
8. Aircraft Dispatcher	100/6 hrs.
9. Instrument Rating-Airplane	100/6 hrs.
10. Flight Instructor-Inst-Airplane	50/6 hrs.
11. Ground Instructor-Instrument	50/6 hrs.
12. Flight Engineer-Basic	50/6 hrs.
13. Flight Engineer-Turbojet-727	50/6 hrs.
14. Flight Engineer-Turbojet/Basic-727	100/6 hrs.

July 29 at 9:00a.m. in H-113 GRW Complex

Students intending to take an FAA written exam are required to sign up in Office D-200 or call extension 6800 prior to the examination day.

At the time of the examination, the student will be required to bring a receipt from the Cashier's Office, a Written Authorization Form and present a Personal Identification.

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- Treat your car like a good friend—pamper it. Regular check-ups, plenty of gas, good running condition. Check those tires while you're at it.
- If your car dies in spite of it all, pull off to the side of the road—hood up, doors locked. "Help! Call Police" banner in rear window or light colored rag tied to driver's door handle. Don't unlock your door or accept a ride from any passerby.

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match. Very clean, great stereo. Asking
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Sony - Ford EXP 1984, excellent condition,
under 50,000 miles. Five speed, sun
roof, stereo/cassette player. \$4,200 or best
offer. Must Sell! Call 767-3544 - ask for Trish

1978 Chevy Nova, 305 Automatic, Dual exhaust,
\$730 o/b/o. Call 788-2860.

1976 Window Van, \$1000 o/b/o, 318, Automatic,
Air, Ice Box Bed. Call 788-2860

'75 Ford Formula. In great condition mechanically - body rough. Phone 253-1542.

1971 VW Van: Excellent body, no rust, A/C,
new brakes & clutch. Graduating,
must sell. Asking \$900. Call Greg after
7p.m., 257-7661.

1985 Buick Regal Sport: White - beige
interior, 2 door, excellent condition, digital
dash. Asking \$3900. Call Lynne 239-6228
(days) or 255-3404 (nights and weekends).

Cycles for sale

1986 GSXR 750:
Low mileage. Very well maintained and in
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must sell. \$3200. Call George at 253-1846.

Motorcycle for sale: Honda XL 600R. Excellent
on-off road bike! Only 2,600 miles.
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Motorcross Helmet. Call Alex at 257-2027
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Misc. for sale

FOR SALE:
Apple IIIe, like new, with graphics capability
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Call to make me an offer!
David at 258-6137, leave a message.

For sale: Matching couch, 4 chair (den set).
Good condition. \$50 or best offer. Call 756-3207.

Graduation sale: Drafting board and kit,
couch, loveseat,
dinning seat, desk, chair, lamp, sewing machine - as seen on T.V., T.V. Console, and
stereo rack. Call 673-6492 or 238-5027 anytime.

Furniture for sale: Desk and lamp (oak wood) \$40, 2 kitchen chairs, excellent shape \$15, living room lamp with attached table \$20, living room chair, metal frame and cushion \$15, book stand or wall unit - excellent shape \$40, coffee table (all wood) \$15. Call 760-1339 or leave a message.

For sale: 2 Drawer metal filing cabinet \$45,
Sears Kenmore dorm size refrigerator \$45,
Graphic tennis racquet \$30. Call 257-8212
and leave your number after the beep.

Moving sale (must sell) Water bed, queen
size, almost new \$90. Oak desk \$50, White
tile end table \$35, lamp \$25, loveseat \$60.
Call 258-6552 leave message.

For sale: Living room set, excellent condition!
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BENCH

(continued from page 6)

member of the Ninety-Nines. The International Forest of Friendship was begun in 1976 as a bicentennial gift to the population of Planet Earth from the City of Atchison and the International Ninety-Nines. The Forest is the only living, growing memorial to the history of aviation and aerospace.

The Ninety-Nines is an organization of women pilots founded by Amelia Earhart in 1927. Its charter membership of 99 has grown to be hundreds and there are chapters all over the world.

The forest graces a quiet, sunny slope south of Atchison at Warnock Lake. The lovely site is dedicated to a special dream of Amelia Earhart, peace on Earth and the fellowship of mankind.

The International Forest of Friendship has trees from the 50 United States and from 41 other countries where the Ninety-Nines have chapters. It has a tree grown from a seed which traveled to the moon aboard Apollo 14 in 1971. The "Moon Tree" stands in the center of a memorial to the 10 American astronauts who have lost

their lives in space exploration.

Memory Lane is a walkway honoring more than 400 individuals who have contributed to, or are connected in some way with, the aviation and/or aerospace industries. Bronze plaques in the walkway bear the names of honorees, including Charles Lindbergh, the Wright Brothers, Chuck Yeager, Bob Hope, Will Rogers, and Sally Ride.

The idea for the International Forest of Friendship is attributed to Wells who thought it would be interesting to have trees from all over

the world planted in a forest setting and have the roots intertwine in world peace. The forest began with a \$5,000 federal grant and private contributions for the project.

Care of the trees is the responsibility of the Atchison Park Department. The Forest was designed by James J. Nighswonger of the Forestry Extension Service of Kansas State University.

Atchison, Kansas is the site of the International Forest of Friendship since it was the birthplace of Amelia Earhart. Earhart, who first soloed in 1920, was the first female

passenger on a transatlantic flight and the first female pilot of a transatlantic flight. She was awarded the Distinguished Flying Cross after her 1932 transatlantic solo flight. Her unexplained disappearance in 1937 in an attempt to become the first woman to pilot a plane around the world is still the subject of much speculation. Navigator Fred Noonan was also aboard that fateful flight.

country where the students get a chance to fly. Grandinetti said that flight is used as a motivational tool and each student can take trips to Orlando and Mayport Naval Air Station.

Upward Bound students also compete with the other 8 state programs in an annual athletic and academic match. Daytona Beach has won this competition the past four years.

BOUND

(continued from page 6)

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