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Avion



An Award-Winning Newspaper by Students for Students

Volume 65, Issue 2

Embry-Riddle Aeronautical University, Daytona Beach, Florida

June 6, 1990

Crusader crashes amidst controversy Pilots survive crash Investigators look for clues to crash

by Joe Cambron
Managing Editor

Recently Embry-Riddle suffered its second major air crash in almost as many years. A Cessna T-303 Crusader (N4973V) which was under the control of ERAU student Darwin Folkerts and his instructor, Mike Rapuano, crashed during what the sheriff's department characterized as "an approach to Daytona Beach Regional Airport's runway 7 Left" after a one-hour flight. Both crewmembers escaped serious injury, however, the aircraft was described as a total loss.

The crash took place on May 28, Memorial Day, two miles north of US 92 near Deland. Daytona air traffic controllers reported an issued mayday at approximately 8:15 a.m. to the Volusia County Sheriff's department which led to a ground and air search for the missing aircraft only a few minutes later.

When a Sheriff's Department helicopter arrived at the site of the accident, they found the twin-engine aircraft overturned at the end of a 150-foot furrow dug into the ground by the speeding airplane. The pilots were quickly taken to Halifax Hospital for observation.

The crash area is a large open field owned by a local lumber company. It extends at least 3000 feet in all directions, with large concentrations of trees on all sides and a right-of-way containing high-voltage power lines to the east.



Photo by Joe Cambron

Short field landing...

One of Embry-Riddle's eight Crusaders was destroyed in a recent accident. Pictured above is the aircraft after it was overturned by a forestry service bulldozer.

The pilot, of course, would have been unaware that ruts as deep as nine inches ran north-south through the field. His east-west touchdown bounced the plane through the ruts until the nose gear apparently dug deeply into the ground, throwing the plane and its pilots upside down.

With fuel leaking from the plane, and the electrical system still active, fire fighters continued to hose down the plane throughout the afternoon.

Two 25 gallon drums of aviation

fuel were eventually removed from the aircraft. A bulldozer was then used to turn the plane over and onto its upwardly extending landing gear.

At that point, National Transportation Safety Board and Federal Aviation Administration officials released the aircraft to Embry-Riddle investigators Tacker and Poole.

Sources say that the two pilots stated that a warning light reported a fire in one engine following departure from Deland Airport. In response to

the light, the engine was immediately shut down. It is unclear as to why the aircraft was not able to maintain altitude on a single engine, but as a result of the engine shutdown the aircraft was subjected to a forced landing.

Preliminary investigation of the engine has found no signs of either mechanical failure or burnt either engine, leading investigators to focus on the possibility of a faulty warning light or damage to the electrical system.

Embry-Riddle student pilots had reported that "the engine was running rough" prior to the accident.

A bulldozer was then used to turn the plane over and onto its... landing gear.

"they were under the impression that the gear and flaps were up..."

Dean Martin

satisfactory.

An interesting element of the investigation is that the pilots description of the accident and the condition of the wreckage conflict. "In this particular case, they were under the impression that the gear and flaps were up," Martin said. From what can be determined at the accident scene, "It appears that the gear and flaps were not up." In either case, "There doesn't appear to be an engine related problem with the airplane. There appears to be a possible problem in the electrical system," Martin added.

Of the 297 Cessna T303 Crusaders built, the National Transportation Safety Board lists 18 T303 accidents where the aircraft suffered substantial damage. The NTSB does not list an electrical problem to be a factor in any of those cases.

Martin remarked that two years ago an Embry-Riddle instructor experienced what may have been a similar electrical malfunction, with the engine fire warning system activating inadvertently. But to Martin's knowledge, that is the only parallel incident.

It has been reported that the aircraft involved in the accident was having engine problems two days prior to the crash. The instructor flying the plane that day noticed that the engines were running rough and as a precaution asked for the crash-fire-rescue trucks to stand by. The plane was landed without incident and found to be operating properly. That same instructor flew the plane the day after and observed no problems. Martin stated that there were no reported powerplant malfunctions the day of the crash up to the point of the accident. As a precaution, the flight instructor involved in the accident has been administratively grounded until the investigation team determines that pilot error was not a factor in the accident.

by Brian Cerni
Editor-in-Chief

Three separate investigations are currently being conducted to establish the probable cause of the crash of an Embry-Riddle T303 Crusader on Memorial Day. Although only the initial facts of the accident are available at this time, Embry-Riddle, the FAA and NTSB, and Embry-Riddle's insurance company are looking into all facets of the mishap.

William Martin, Dean of the College of Aviation Technology, stated that until investigations are complete, no information surrounding the accident will be released. Embry-Riddle's own inquiry is being conducted by A.C. Tacker, the University's Safety Engineer, and Mr. Joe Poole, who just retired from the FAA as a Safety Engineer.

Preliminary investigations of the accident have revealed that the pilot and flight instructor flying the Crusader reacted to an engine fire warning light by shutting the affected engine down. They were then unable to maintain altitude with the operating engine. The landing gear and flaps may have been partially or fully deployed during the emergency procedure, causing the instructor to execute a forced landing on a field approximately ten miles east of Deland.

Martin added, "The only thing they knew is that in the configuration the airplane was in, the airplane would not maintain altitude. Now whether that's pilot technique, whether that's and engine not developing full power, whether it's gear and flaps all the way down, or in some intermediate position, a door open, or whatever, all that will be looked at in the ensuing investigation."

Flight Line operations were temporarily shut down for a few hours after the accident to check the fleet for fuel contamination. Samples of fuel taken from fuel trucks and found to be

ERAU instructor charged in sting

by Joe Cambron and Joseph Szarmach
Staff Writers

In a recent reverse-sting operation, agents from three law enforcement agencies from the Daytona Beach area arrested 20 suspects including Embry-Riddle flight instructor and student, Jeffrey Mathew Salan.

Officers from the Volusia County Sheriff's Department and other local police departments posed as dealers of crack cocaine last Friday and Saturday nights, according to a member of the Sheriff's department.

Salan, 43, was charged with purchase of cocaine as well as tampering with evidence.

The sting involved officers posing as dealers with "buyers" being arrested and charged immediately following each attempted purchase of drugs.

According to the Daytona Beach News Journal, Capt. James Lockwood, supervisor of the department's

drug unit, was quoted as saying, "The overall purpose of this type of operation is to make potential purchasers wary of those selling the drug, since they are apt to be purchase narcotics from a law enforcement officer, thereby ensuring their immediate arrest."

When contacted by this newspaper, Salan stated, "I'm not at liberty to comment."

Police stated that Salan was required to post two bonds, one of \$5,000 and another of \$2,500.

The arrest comes on the coattails of the drug testing program that has been started at Embry-Riddle. The program is the first in the nation to be activated at a university.

Only instructors are required at this time to submit to the mandatory drug testing, but the testing will soon apply to all staff and students involved in the flight program at ERAU.

Beginning in the fall of 1990, all students must submit to these tests.

Confederate Air Force lands in Daytona

by Hoyt E. Brown
Aeronautics Editor

Two of aviation legends of the past paid a visit to Embry-Riddle this past week in an effort to educate the young and bring a bit of a bygone age to those old enough to remember it. The Confederate Air Force's B-29 and B-24 flew into Daytona Beach Regional on Monday, May 28 for a week-long stay at the airport. The CAF's B-29, known by the crew as Fi-Fi, is the last flyable example of the airplane called the "Super Fortress".

Both aircraft types played vital roles in the World War II aviation arena. The B-29 is, in a way, more historically significant because of its role in the conclusion of the war with Imperial Japan. On two separate missions a B-29 dropped what was, at the time, the most destructive weapon man had ever built. The atomic bombs dropped on Japan brought about such tremendous destruction that Japan quickly learned that the U.S. was more than prepared to use the devices and soon after surrendered unconditionally.

Fi-Fi was used during the war as trainer, officially designated a TB-29A, therefore it never left the country, but still played a vital role, preparing bomber crews for their future missions overseas. Fi-Fi was first placed in storage after World War II until it was again called upon as a trainer during the Korean conflict. After the Korean War ended in 1955 the B-29 was placed in storage at the China Lake Naval Weapons Center, where a group of B-29's were handed over by the Air Force to the Navy for use as targets and as weapons testing platforms. In 1966 the CAF began their search for a B-29 to add to their collection, in order to fulfill their organizational commitment to having at least one flying example of every type of aircraft flown by all U.S. military services during the period from 1939 through 1945. An initial search of the Air



Photo by Joseph Szarmach

Oooooohhhh Fi-Fi...

The only airworthy B-29 Superfortress recently touched down in Daytona for public viewing. The aircraft was accompanied by a B-24 Liberator.

Force's inventory records showed that no B-29's existed in the Air Force. The search continued, then in 1971 the group of B-29's being stored at China Lake was "discovered". A CAF recovery-selection team was sent to China Lake to choose the best aircraft for recovery and restoration. Most of the severely damaged aircraft were quickly eliminated as candidates. There was finally a field of 3 or 4 aircraft that were suitable for consideration, the team selected the aircraft with the least amount of structural damage. This was not an easy process because all of the aircraft had been sitting in the desert

unprotected from the elements, vandals, and Naval gunners for seventeen years. The aircraft that was selected was SN44-62070, and was named for the wife of the man who provided the funds for Fi-Fi's six-year long restoration.

The B-29 on the Jet Centers ramp contained a Norden bombsight, which was a highly guarded top-secret device for the precise delivery of the bombers ordinance payload. During the Avions visit to the B-29, the crew put Fi-Fi through two engine run-up tests on the number four outboard

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Space Technology

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Space Technology . . .

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Aeronautics

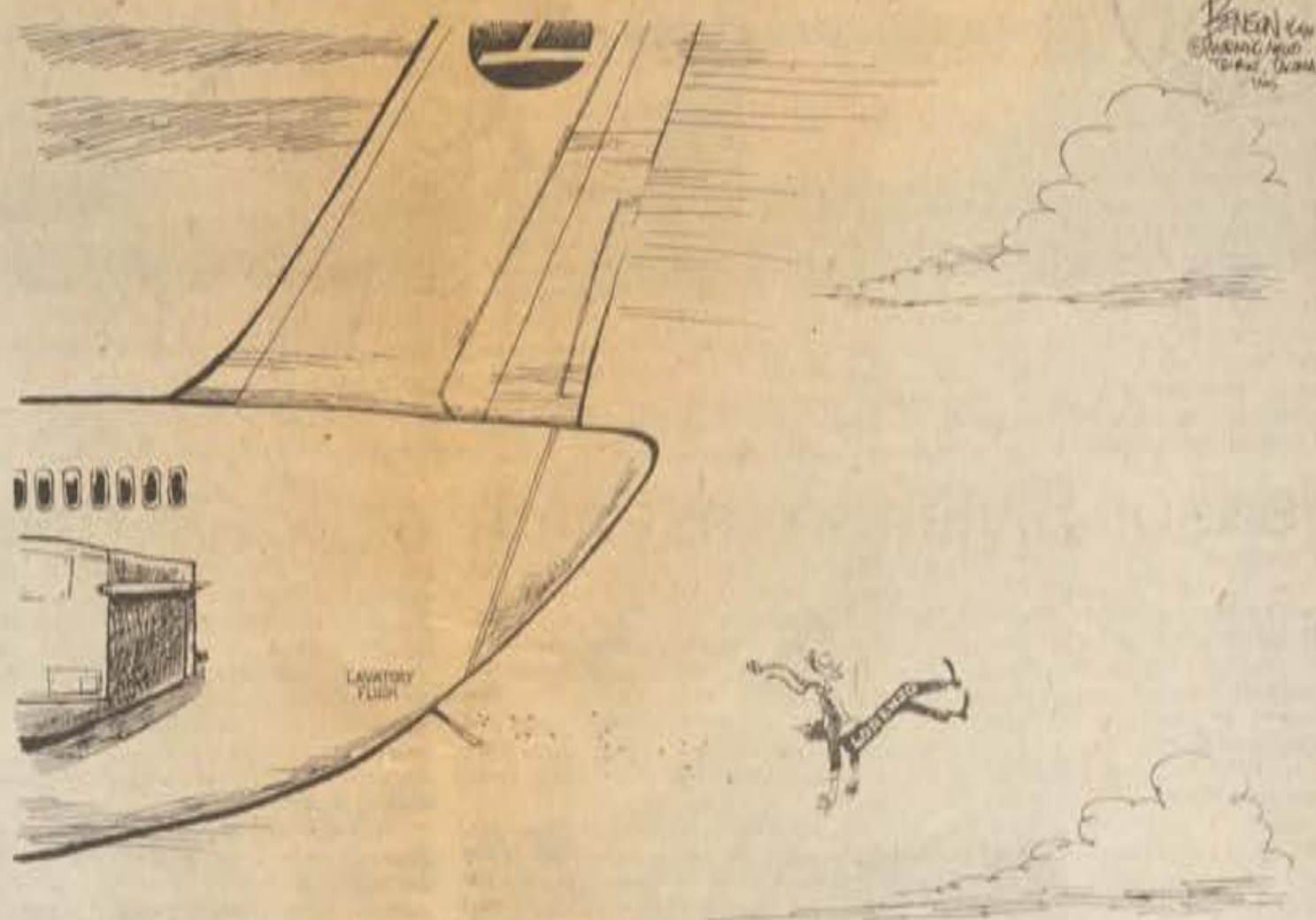
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Letters to the Editor

Don't discriminate

To the editor:
I often wonder at the attitudes displayed by some of the men who go to this school. As much as I hate to generalize, the prevalent feelings among most of the male students is that the female population at Embry-Riddle is "snobbish" and "spoiled."
I'm a male student, but I am strongly opposed to such a blatant stereotype. There is no reason for the women at this school have to contend with an offensive attitude by the overwhelming majority of men. Just because they go to a university that caters to a realm of industry that is predominantly male, doesn't mean that they have some particular pent up urge to "put men in their place."
In my opinion, I think that it would be extremely difficult to go to a nearly all male school if I was female. You can hardly blame the women who are aloof, because the simple fact of the matter is the

difficulty involved in memorizing the names of five thousand men. It is in their best interests to confine themselves to a smaller group of friends, and be content with that, rather than wrestle with the difficult chore of saying "hi" to every man they have in each of their classes.
Imagine walking around a campus knowing that every single eye was upon you. Your level of privacy diminishing every day as more men attempt to learn something more about that "chick in physics." Give me a break, yeah sure it is easy to say, gosh I wish I went to a school where the ratio was reversed, but think about it. Think about constantly fielding offers of dates and various other invitations that you couldn't possibly keep if you accepted every one. It just doesn't work, as much as we would like to believe that it would.
Give the women a break and open your mind.

Name withheld by request

Editorials

Is whining hazardous to your health?

What a bunch of whiners we are! All it seems we ever do around here is complain, complain, complain. We love to complain about everything, from the lack of parking, to the quality of food in the cafeteria. And just when we thought there was nothing else to complain about we can come up with ten more.

But hey, who says complaining is bad, if we didn't complain we could never change anything. It's our right to question things, asking why things are the way they are. Inquiring minds want to know. If there weren't people like reporters to tell us what is going on and what is wrong with the world, we would probably just sit around all fat, dumb, and happy thinking all is right in the cosmos.

Why do we, as Embry-Riddle students, care about anything? We're here and what's it to you? I think the answer lies not only in the way we have been taught to think, but also in the way we have been programmed by outside forces. If there is such a thing like a group consciousness, are Riddle students any more susceptible to it than other college students? How many times have we seen lackluster student participation in elections. Most people just

say, "yeah, well who cares about that stuff anyway?" And yes, you probably said something different than "stuff". Before I started working on the Avion this summer, I too said "who cares?" to

things like SGA elections and other such events. Why is this, are we just lazy, or do we think everything around this school is done by computer. No, I think it has something to do with the way we approach our classes. We want to get the best grade possible, for the least amount of effort. Possibly, we also believe that because we've paid our bills that the school owes us something in return.

I've found that the more you get involved, the more you find out about what's "really" going on around here. Like my job as Aeronautica Editor, I get all kinds of information from aviation companies talking about what's going on in the ever-changing world of aviation. Some of it is worthless and you would probably care less to read about it, so it is my job to weed out the stories that are not newsworthy. It is the same way with the TV news shows, but on a national scale they are choosing what the country knows. Imagine if the reporters that broke the story on the Watergate scandal decided that it wasn't an interesting story to follow and just dropped it. Think about it! Keep complaining and questioning things, how else do we find out how what's going on.



Hoyt E. Brown
Aeronautica Editor

Crash opens difficult and mysterious questions

With the recent mishap involving an Embry-Riddle Crusader still fresh in our minds, there has been a lot of talk as to what may have been the cause. I understand that it is natural for an event like this to spark an interest in understanding what happened, and it is important that we learn from the misfortunes of others. But the lack of consistency I hear in conversations centered on the topic brings to light a troubling issue.

From the information available, it seems that the student and instructor flying N4973V that Monday morning were faced with what was believed to be an engine fire. After inspection of the wreckage, it appears that there was no fire at all, and the fire warning system was activated by an exotic electrical malfunction.

Although we cannot second guess whether their reaction to the engine fire warning system was appropriate or not, it is important that as pilots we prepare for emergency situations before we are faced with them. The best forum for this kind of preventative planning is to talk with flight instructors and learn a generally accepted philosophy which will stand up to the severity a crisis situation.

I assume that most of the flight students at Embry-Riddle have never experienced an actual emergency, and therefore base their reactions to emergency conditions by what they have learned at

this school. What alarms me is that there are differing beliefs circulating as to what is proper procedure in case of an engine fire.

The Cessna T303 manual implies that if the fire warning annunciator illuminates, it should be trusted and the engine fire procedure should be completed, no matter what. Other people add that one should check engine instruments for improper indications before shutting an engine down. Still others believe that one should visually check an engine for spurting oil and plumes of black smoke

before securing it. In light of the recent accident, it also appears that circuit breakers should also be checked before commencing single engine operations.

The obvious deficiency of established procedures for an engine fire situation leads me to believe that Embry-Riddle is lacking in their ability to train flight students in a uniform manner.

If this University is to pride itself on the superior flight training it offers, standardization of the instruction should be one of the central considerations. To be perfectly honest, I have logged 35 hours in the Crusader, and have never heard of checking the circuit breakers for an electrical complication when the engine fire warning system is triggered, but apparently some students have. If closely guarded information like this was a factor in the accident, why am I hearing about it now, after I could have been subjected to similar circumstances.

It is a fact that the cost involved in attaining Embry-Riddle flight training is considerably greater than that of other institutions. With that in mind, we as flight students should expect proficiency which goes far beyond the level one can receive from reading manuals. And this training should be from a staff of instructors who are familiar with all the potential possibilities which create an emergency situation.



Brian Cerni
Editor-in-Chief

Student Forum

The Avion asks: Do you think it's beneficial to have an ATM on campus?



Merle Perry

I used it alot even though I had a service charge. I used it for cash for books.



Kevin Rayburn

Yes. People in the dorms need access to money, if they need money at night, or really anytime, it's more convenient and easier than going to the school cashier.



Gary Landes

There is no other alternative for cash other than the cashiers who's hours are rather limited.



Marc Shaffer

Yeah, I think it is closer than having to run over to the bank (over by the mall)



Russ Jullius

It's helpful to the student because you never know when you need money on campus.



Jieun Park

It's more convenient than having to go to off campus banks.

Students set record

Two Embry-Riddle Aeronautical University student pilots recently set a world speed record as they flew from Alabama to Florida.

Aeronautical Science students Scott Tarves and Thomas C. Jordan took turns flying the Cessna 172 which landed in Daytona Beach two hours and 52 minutes after taking off at Montgomery, Ala. They set a world record for a Class C1C Group 1 aircraft. "We didn't break any record, we established a new one," said Mike Wiggins, training manager on the Embry-Riddle flight line. Wiggins was on board as an observer.

He said the three of them had been taking part in a national air meet at Champaign, Ill., sponsored by the national Intercollegiate Flying Association.

"We were flying home from Champaign and we set this record on one of the legs of our trip," Wiggins said. "It was a neat thing to do."

Art Greenfield, secretary of the Contest and Records Board of the National Aeronautic Association (NAA) in Arlington, Va., confirmed the speed record is now in the books. The NAA is the oldest aviation organization in the country and provides sanctions and approves all records set in the U.S., Greenfield said.

The Montgomery-Daytona Beach trip is officially logged at 333.4 nautical miles.



Need for speed... Recently, a pair of Embry-Riddle students set a world speed record.

Professor Sivjee to research at South Pole

by Phyllis A. Salmons
Special to the Avion

Research conducted in remote locales, headed by Dr. Gulamabas Sivjee, professor of physics at Embry-Riddle, will produce a myriad of scientific benefits. Information from his work will assist scientists in making decisions concerning shuttle launch and re-entry while helping others develop new theories to study means of more efficient production of nitrous oxide, a key compound in nitrates for fertilizer.

Sivjee and his associates will go to the South Pole next antarctic "summer" (December 1990-January 1991) to set up ground-based electro-optical remote sensing devices to study auroral conjugacy effects, atomic and molecular physics, and the dynamics of the atmosphere.

The project, funded for three years by the National Science Foundation (NSF), is a continuation of studies begun by Sivjee over 20 years ago. The experiment is one of five overseen by Sivjee designed to help understand some of the physical mechanisms encountered in the upper atmosphere.

Sivjee explained that charged particles from the sun (the solar wind) are affected by the Earth's magnetic field causing a spiraling toward polar regions. Theoretically there should be an equal number of particles spiraling into the north and south magnetic poles, producing conjugate auroras.

His experiments will measure the conjugate effect by gathering data in the southern polar region which will be compared to observations taken near the North Pole from Alaska, Spitsbergen (Norway) and Sondre Stromfjord (Greenland). Data will also be compared and contrasted with satellite measurements for verification of existing theories.

In addition to studying the interactions of the upper atmosphere and the solar wind, Sivjee will study disturbances ("gravity waves") which are thought to stem from ground-level winds, earth surface topology, and the simple harmonic effects within the atmosphere created by buoyant effects on displaced air.

Gravity waves are produced as dense air from near the surface is displaced upwards (as when wind blows in a mountainous region), the difference between the buoyant force and original weight pushes the dense air downward. Having gained velocity, the dense air overshoots the original position and sets up a harmonic vibration. This causes the disturbance of more air until the entire atmosphere becomes involved. Since the energy (KE + PE) must be conserved, the upper atmosphere, being less dense than air near the surface, must gain tremendous velocity and the amplitude of vibration increases.

Sivjee, originally from Zanzibar, Tanzania, received his Ph.D. from Johns Hopkins University in Baltimore, Maryland. He spent 16 years at the University of Alaska studying atomic and molecular physics of the upper atmosphere. His findings have been published in a variety of professional technical journals, including *The Space Physics Journal*, *Planetary and Space Science* and the *Aerophysical Journal*. Sivjee is the chair of CEDAR (Coupling Energetics and Dynamics of the Atmospheric Region), a national organization of scientists who, though working independently, coordinate their projects so that comparisons can be made. "My primary interest is to study atomic and molecular physics," said Sivjee.

"The idea is to use the space around the Earth as a huge natural laboratory and do experiments which cannot be done on the ground." The predicament on the ground, he explained, is that labs are necessarily finite, limiting the study of "reaction kinetics." Sivjee's experiments, which measure light emission from excited atoms and molecules, are sufficiently sensitive to measure energy which is released (in the form of light) in as little as a 10-millionth of a second, requiring a "lab without walls."

Sivjee's experiments also require a region where the density of the atmosphere is so small that atoms will not run into other atoms and molecules and lose their energy. Also, there must be a steady source of electrons and protons (provided by the solar wind) to excite the atoms and molecules.

"When we combine these requirements," he explained, "we are forced to make studies at high latitudes (polar regions). That's the reason we do experiments in Norway, Greenland, Alaska, and now the South Pole." The primary payoff for Embry-Riddle is the excellent experience provided Engineering Physics majors on the Daytona Beach campus in the design, testing, and operation of the sophisticated state-of-the-art equipment as well as the collection and analysis of data. "We have a satellite hookup with the South Pole which will provide real-time coverage."

Performing experiments at the South Pole will "be a real challenge because the temperature outside the observatory goes to minus 200 degrees." Experiments are highly automated must be maintained under the very hostile conditions since there are no support facilities, no supplies, and no additional equipment can be brought in until the next "summer." "If something breaks, we have trouble—that's why the equipment is as automated as possible and manned by highly trained individuals."

The team that will travel to the South Pole in December must undergo special training including a very thorough physical check and antarctic survival training, provided by the Federal Government. Those who will accompany Sivjee to the South Pole to set up the equipment include Rick Furrner, former avionics professor at Embry-Riddle, and David Handin, a senior majoring in Engineering Physics.

"The results of the Antarctic experiments probably will not be presented to professional conferences for another two years. By then, other projects to trace studies are sure to have been initiated. "This is a never-ending project."



Dr. Gulamabas Sivjee

Career Corner

Create your own Co-op.
"No experience, no job, no pay, no experience..."

The circle is continuous! Every semester new college graduates hear this. Employers want to hire people with experience because they can predict future success by past success. Cooperative Education is a great way to break this "no experience, no job" cycle. It is great because while you are gaining the valuable work experience you are searching for, you can also earn academic credit towards your degree. There are two different types of Co-op positions a student may consider applying for. The first type to consider would be the Co-op positions already established by the Cooperative Education office. These are usually "continuous" Co-ops and can be applied for every semester. The specific descriptions and requirements are available in the Cooperative Education office, which is located in the Career Center. The second type of Co-op is one that you would create yourself. The major advantages of this method would be: 1) you can live at home and save some money; 2) you can cater a job to your specific interests and professional needs; and 3) you can use the contacts you (or your parents) already have established in the aviation industry.

Summer is a wonderful time to do some research into the airports, engineering firms, FBO's, or manufacturers in your geographic area to investigate the possibility of establishing a Co-op position. Start by making a list of all of the appropriate companies in your area with their addresses and telephone numbers. Consider the type of job you want, as well as the type of employer. The next step is to contact the employers. Either in conversation or by letter, tell the employer that you are seeking a temporary Co-op position. Provide a resume and transcript so your qualifications can be reviewed. At this point you should contact Shirley Kennedy, ERAU's Cooperative Education Director (904) 239-6054.

Also, please be sure that you meet the program requirements before you begin this process. You must have earned at least 30 credits and have a current GPA of 2.5. Obtaining a Co-op position seems like a lot of work - but the pay-off will be worth it.

Especially with making the Co-op, you will be required to take the initiative, be persistent, and take on the responsibility of finding a Co-op. It requires work and time, but, the worst that can happen is you learn how to do a job search. The best that can happen is you get a great Co-op doing what you want to do, where and when you want to do it!



Just say no... Daytona Police arrested a trespasser who caused a disturbance in front of the library, yesterday. Security speculates that the man may have been using drugs.

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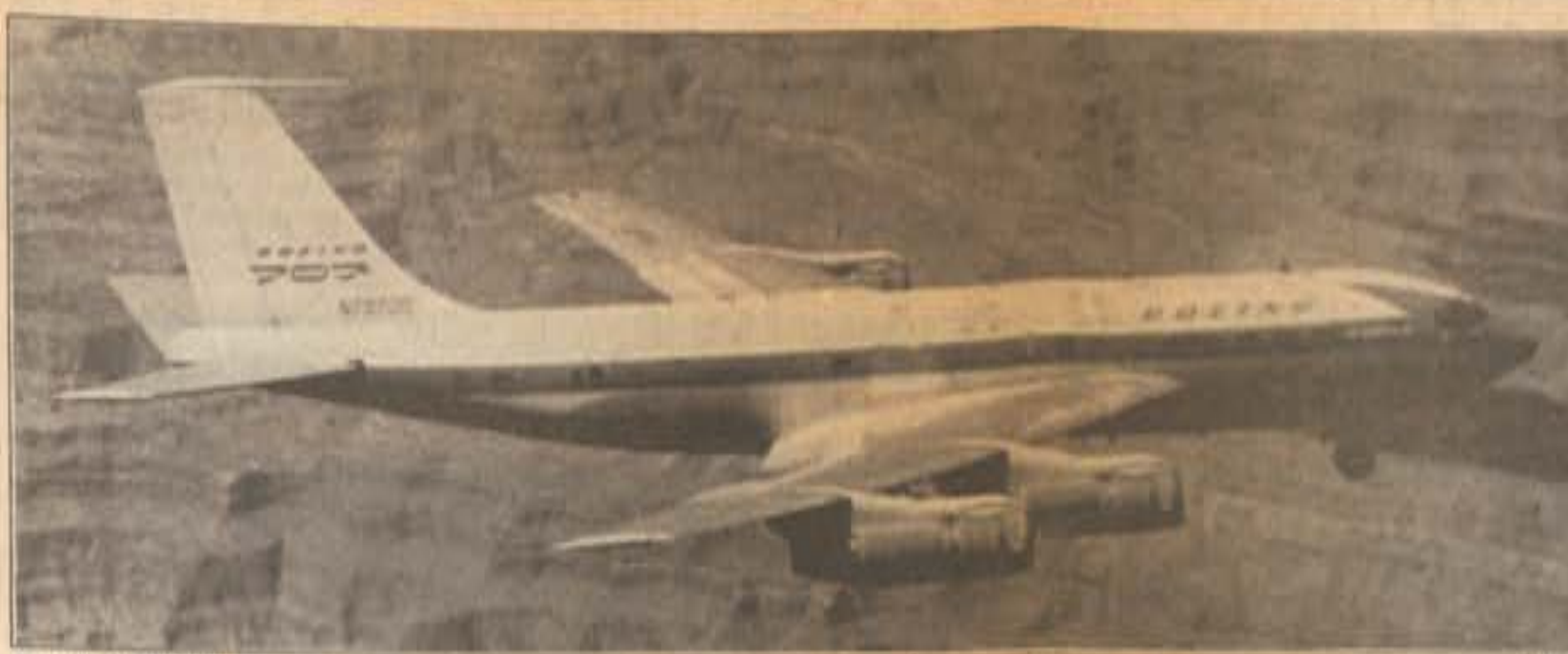
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Home to the nest...
Boeing's prototype for the 707, is seen here flying to Seattle from Tucson, Arizona after spending 18 years in the desert sun. The landing gear had to remain lowered during the flight because of the lack of test facilities in Arizona.

Boeing's first jet returns home

by Hoyt E. Brown
Aeronautica Editor

America's first commercial jetliner returned to its birthplace in May, after spending the last eighteen years sitting in the Arizona desert. The 707 prototype was used after its own initial certification and industry demonstrations as a technology testbed for other Boeing aircraft. The prototype of America's first commercial jet, Boeing's 367-80, has been designated as one of the "12 most important aircraft of all time." More than 6,000 Boeing aircraft owe their origins to this plane. First flown in 1954, it served for nearly two decades as a flying testbed. Stored for 18 years in Arizona, the aircraft flew north over the Grand Canyon to a May 19th homecoming ceremony at Seattle's Boeing Field. The landing gear had to remain lowered during the flight due to the lack of test facilities in Arizona.

The Dash 80 also earned the title of being the world's most modified airplane. Successive test programs made the Dash 80 the most modified airplane in the world. It underwent major structural and aerodynamic changes in the course of developing and testing aircraft features. Many test programs have gone far beyond aircraft flying today, such as airborne simulation of flight characteristics and systems concepts for the cancelled U.S. supersonic transport program. The Dash 80 flew with a fifth engine mounted on the aft fuselage to test installation feasibility for

the trijet 727; it also flew with three different types of engines installed at the same time. It was also used to investigate engine-thrust reversers; engine sound suppressors; rigs designed to cause in-flight engine icing conditions; air conditioners; wing flap and slat modifications; radar and radar antennas and even different paints. In one test series of aircraft landing gear, the 707 prototype landed and took off from mud fields that barely supported the weight of passenger automobiles.

The National Air and Space Museum has owned the Dash 80 since 1972 when Boeing donated the plane at the completion of its test programs. It has been stored since then at Davis Monthan Air Force Base in Tucson, Arizona.

The National Air and Space Museum has owned the Dash 80 since 1972 when Boeing donated the plane at the completion of its test programs.

Under the terms of an agreement completed this year between Boeing and the National Air and Space Museum, Boeing agreed to restore the plane to airworthiness, fly it from Tucson to Seattle, then refurbish the Dash 80 to roll-out condition. In late March, a team of 15 Boeing technicians hand-picked by team leader Gary Horton flew to Tucson where they worked for more than a month to overcome the ravages of 18 years in the Arizona sun. Pilot Paul Bennett who flew the Dash 80 to Seattle from Arizona said Horton's team "did an absolutely super job. We had no problems on the flight up here."

As America's first jet transport, the Dash 80 sparked a revolution in air transportation. When production go-ahead was announced by Boeing on

August 30, 1952 as a company-financed, \$16 million investment, a sum which Boeing's former Chairman, T. Wilson called "amazing... a quarter of our net worth" at the time.

Another entry in the history books occurred on October 26, 1958, when Pan American World Airways inaugurated trans-Atlantic 707 jet service between New York and Paris. Thereafter, the 707 series of aircraft rapidly entered airline service throughout the world.

Powered by four Pratt & Whitney turbojets, pod mounted on wings swept back 35 degrees, the Dash 80 707 prototype established the classic configuration for jetliners to come.

It also set new speed records each time it flew. The most enduring of these took place March 11, 1957, when it streaked nonstop from Seattle to Baltimore in 3 hours, 48 minutes on a gross demonstration flight. The average speed was 612 miles an hour.

Some of the aircraft that owe their existence to the Dash 80 test applications include: Models 707-120 and 720, 320 Intercontinental, Model 727 trijet, 737 twinjet, 747 Superjet, 757, 767, Air Force KC-135 tanker-transport, VC-137 (used for many years as Air Force One Presidential transport), E-3 AWACS, and Navy E-6 submarine communications platform.

On board the Dash 80's 40-minute flight was a contingent of former Boeing employees who played instrumental roles in the Dash 80 program. The most famous (or infamous) of these dignitaries was test pilot Tex Johnston whose 1955 barrel roll of the Dash 80 on a demonstration flight became aviation legend.

B-29

(continued from page 1)

engine. It was quite a sight, the huge reciprocating engine with its four blade Hamilton-Standard props coming to life with a loud cough and sputter, and plume of smoke blowing out of the back cowling. Tom Cloyd, the B-29 squadron and aircraft commander, explained that the crew was attempting to locate a bad cylinder on the number four engine during the run-ups. Mr. Cloyd also said that the B-29 burns 400 gallons of fuel during one hour of flight. When asked what the B-29 was like to fly he said, "It's a big plane, it flies like one. It handles like an 18 wheeler without power steering."

"It's a big plane, it flies like one. It handles like an 18 wheeler without power steering."

war the LB-30 was sold to the owner of the Continental Can Company and used as an executive transport. Later, the aircraft was sold to PMEX, the Mexican petroleum company, and was used as a transport until the CAF bought the LB-30 in 1968. After purchase, the CAF took six months to restore and renovate the aircraft and paint the aircraft with a desert camouflage, as the B-24 would have looked if had served out of Libya during the North African Campaign. The Diamond 'Lil's nose is adorned with the traditional

scantly clad female painting, honored by combat crews as a good luck charm and motivation to come back alive.

The CAF was established in 1951 to save World War II aircraft from destruction. The Ghost Squadrons motto is, "They shall not be destroyed."

Many people criticize the CAF for flying these priceless aircraft around, contending that they should be preserved in a museum. But, for anyone whose been to museum like the Smithsonian Air and Space or the Air Force Museum, there is nothing sadder than a great airplane that has been stripped of its life and will never fly again. The first CAF acquisition was a P-40, and the CAF has grown tremendously since then. The CAF is headquartered in Harlingen, Texas and is classified as a non-profit flying museum.



Diamond Lil'
A B-24 Liberator was also available for viewing by the public.

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Sid Meier's Railroad Tycoon allows the PC user to ride the rails

by Joe Cambron
Managing Editor

Sid Meier's *Railroad Tycoon* (RT) is an attempt to mate model railroading to personal computing. Happily, the attempt was a successful one.

RT not only allows the user to lay down tracks between towns in frontier America and urban Europe, it also features such unexpected capabilities as the power to create schedules individual to each train and to build industry along the train's route. In fact, education is the key to success at RT whether learned in its manual or in transportation principles class.

In the *Sim City* tradition, a budget must be strictly adhered to when building your model empire. Trains must be purchased, tracks must be paid for, right of ways acquired, bridges built, and stations built and improved.

For those lovers of high finance, insider trading in the tradition of the great railroad tycoons of their time must be practiced in order to be successful. As the economy

turns topsy-turvy through endless economic cycles, interest rates fluctuate wildly in those bonds financing your operations.

At the same time, the slightest disappointment to those blood-thirsty stockholders can cause your stock to plummet forcing a mandatory retirement.

Difficulty levels regarding the monetary risks may be set either at the beginning or during the game. Other risks, such as train wrecks which destroy customer confidence can be controlled in much the same way.

As the march of time plods on, at one of three speeds, new trains with better capabilities become available and must be purchased. From steam to diesel, America's trains differ greatly from Europe's newer electric and bullet

In the SimCity tradition, a budget must be strictly adhered to when building your model empire.

Trains must be purchased, tracks must be paid for, right of ways acquired, bridges built, and stations built and improved.

trains.

For those who are not interested in the dollars and cents, the game is still mesmerizing. A region such as the west coast is selected by the user, and a railroad is initiated at destinations

of players' discretion. With \$1,000,000 to work with, most reasonable routes can be served.

For instance, San Francisco to Fresno might be chosen for service based upon natural resources near each respective destination.

Those natural resources are key to success, since raw materials must be transported to areas that are more industrialized in order to produce revenue. By the way, random placement of resources makes no two routes ever the same, even with repeated playings.

One natural resource might be a coal mine or a livestock farm, but the most important resource is a population base. Not only do close clusters of homes provide mail and passengers, they will buy your products for their own use. For these reasons, Fresno might provide coal and oil to San Francisco, while passengers and manufactured goods might be the output from San Francisco, this situation requires a change of cars at both ends of the track in order to take full advantage of all possible revenue.

As traffic grows along a route like this one, additional trains may be required causing traffic problems. In this case tracks may be doubled or signal lights installed, otherwise one train must wait at the side while another passes.

Well, that is certainly enough of a lesson in train economics for today. If this sounds like something that might become habit-forming, then there is at least one redeeming aspect to video railroading.

No matter how large your train set becomes, the price never grows.

Florida residents receive discount to the worlds of Walt Disney

by Erinn Moore
Diversions Editor

In the past, Florida residents and college students with valid college ID were offered the enjoyment of a three park season pass at Walt Disney World. Now Disney World offers a four season pass to the Magic Kingdom, Epcot Center, and the Disney-MGM Studios Theme Park. Plus, passholders now will be able to add on visits to Typhoon Lagoon and Pleasure Island.

Passholders will have unlimited admission to the Magic Kingdom, Epcot Center and the Disney-MGM Studios Theme Park:
May 1-June 10

August 17-September 30
November 25-December 23 (new season)

January 1-February 10 (1991)

Ewoks and a flight to the Death Star await visitors to "Star Tours" presented by M&M's Chocolate Candies, the newest attraction at the Disney-MGM Studios Theme Park. In the Magic Kingdom, passholders will be among the first to experience Mickey's Starland, now open with a brand new show, at Epcot Center, guests can explore the wonders of the human body at the new "Wonders of Life" presented by Metropolitan Life.

For an additional fee during those same months, passholders can add un-

limited admissions to Typhoon Lagoon water park and Pleasure Island, the new nightclub theme park (ages 18 and older unless accompanied by an adult).

Florida residents and students can purchase passes for \$90 (plus tax) for adults and \$80 (plus tax) for ages 3-9. For unlimited Typhoon Lagoon visits during those salute months, the cost is an additional \$14 (adult or child); for Pleasure Island it is \$12. Four-Season Salutes are sold at all Walt Disney World ticket locations, participating Sears stores, AAA, AMC theaters and Florida TicketMaster locations.



Four-Season Salute...

Stars of Disney wait to greet Florida residents who have purchased Disney's new Four-Season Pass which entitles locals to visit Disney during four months of the year for one low price.



Party all the time...

Pleasure Island's new format features New Year's Eve festivities every night.



Headgear...
Field Trip, a new band from the San Francisco area, have swept the alternative charts with their latest album, *Headgear*. Their latest release features the popular song "Pretty Dress."

College takes Field Trip back to youth

by Brian Gerk
Managing Editor

Out of the Bay Area comes Field Trip, a young group of men who do their best to ignore the rest. Their latest album *Headgear* is a coup d'etat in unconventional rock. Lead singer Jim Galbraith's honest lamentations strike home convincingly, with heartfelt songs about his state of being.

Since their 1989, *Beautiful*, Field Trip has progressed a great deal. A more positive feeling permeates this latest album, with a penchant for humor as well.

It is obvious that these fellows take themselves very seriously (which, in my view, is the single greatest asset to continued good work and unity in any band).

Other members of the band contribute more on this album, giving Galbraith a little breathing room. We are treated to a real gem of song with

"Buttercup," an energetic post-punk stomper that glows with energy.

For the sheer charm value though, it will be hard to match "Pretty Dress," a raw, humorous, and somewhat pathetic paen written about a spontaneous run-in with a nice skirt on a beautiful woman, a somewhat adolescent crush that nearly every male on this planet can relate to.

The lyrics are honest, mixing well with their occasional frenetic fits of energy that fill the album. Contributing to the album are Melanie Clarin (of San Francisco's Cat Heads) and even producer Bill Noland (Wall of Voodoo) on organ and cello.

Field Trip's new album *Headgear* warrants purchase by its cover alone. The artistic depiction of a sobbing girl wearing a painful orthodontic retainer is a triumph in modern pop art, and a hilarious testament to the thousands of children who had to put up with this twentieth century iron maiden.

Total Recall plays mental games

by Brian Gerk
Managing Editor

It's unfortunate that *Total Recall* was so heavily billed as "Schwarzenegger's latest movie," because he really has so little to do with it. Sure, he plays the protagonist, and also had the demanding task of performing in nearly every scene of the movie, but the truth is that this movie was made possible by two people: Paul Verhoeven and Philip K. Dick.

The former being the director of *Total Recall* and the latter being the author of the short story that the film is based upon, "We Can Package That For You Wholesale."

Philip K. Dick never accepted reality quite the way everyone else did, and his numerous science fiction stories reflect that fact. Recurring themes of paranoia and altered perceptions have been present throughout his career, up to his death in the mid eighties. Many of Dick's stories dealt with the very fuzzy line between humanity and artificial intelligence. A major topic explored in his novel *Do Androids Dream of Electric Sheep?* (which was subsequently re-worked into the screen play for *Bladerunner*) concerns that facet of technology that attempts to replicate human thinking and functioning, and whether humans are intrinsically better than the self-aware machines they create.

Total Recall is a lavish exercise in sci-fi, good sci-fi, not the Gothic drivel that movies like *Star Wars* were based upon. For one of the first times ever in a major motion picture, the audience is

forced to grapple with complex theories concerning the very fabric of reality. We are swept into the life of the protagonist, and share the same consternation that he does in the confusing life that he leads.

Director Paul Verhoeven pulls this off in a spectacular whirlwind of action-packed scenes and special effects that are occasionally quite grotesque. Nearly every scene in the movie contains some sort of brutal injury or death. This is in keeping with Verhoeven's directional technique, as exemplified in his previous venture, *Robocop*.

Arnold Schwarzenegger delivers his best performance to date, (finally). His loose demeanor and cool attitude contribute to his credible portrayal of an agent sent from Mars to Earth for unknown reasons. He finds that his memory has been tampered with.

While trying to find out what is really going on, the bodies drop like flies around him. He travels to Mars in an attempt to find out what has really happened to his sense of reality and the mysterious dreams that continue to haunt him.

In Mars he is quick to find that he is still a hunted man, facing danger at every turn. He is taken to a section of Mars inhabited by the lower elements of Martian society. This is where we are shown the ridiculous mutants that propagate *Total Recall*.

Why is it that nearly every sci-fi movie contains humans weirdly contorted by some kind of radi-

ation? Is there some director's manual that says "In case of a science fiction movie, make mutants?" Is it a union rule? Will the academy shun the movie if there are no malformed children in it?

I must admit I am somewhat of a novice on the subject, but I thought that radiation made most folks sterile. From the looks of this movie at least half of the Martian populace was zapped by these evil cosmic rays during the Barsoom Baby Boom.

Mutants aside, the action continues at break-neck speed, and the special effects could very well set the bench mark for the nineties. If you aren't terribly concerned about highly exaggerated and over-

blown endings, you will thoroughly enjoy *Total Recall*. You may however be disturbed by the amount of gore in the movie.

At one point in *Total Recall*, we witness Schwarzenegger use an innocent bystander as an impact shield from the gunfire of the "bad guys."

The body is torn asunder as high caliber weapons hit home, much to the delight of the blood thirsty crowd in the theater. As he tosses away the useless sack of bloody flesh the audience erupted in cheers and laughter. I sometimes wonder what it is going to take to satisfy the murderous appetites of future movie goers as scenes like this become common place in the industry.

Total Recall is a lavish exercise in sci-fi...not the Gothic drivel that movies like Star Wars were based upon.

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FIRE BIRDS
Nicholas Cage easily delivers the worst performance of his career as he constantly struts about the screen in a machismo role rivaling even Tom Cruise in *Top Gun*. The young pilot he plays is all brawn and no brain. His snappy and snide remarks call to mind

fictitious South American country to combat drug lords who have their own top-notch helicopter force already in place. For some reason the terrain in this bogus nation is strangely similar to the desert regions in Nevada and New Mexico... hmn, just coincidence I guess.

The heightened drama that this movie attempts to generate is almost comedic. We are treated to un-wavering close-ups of the main characters, as if somehow we may be privy to their innermost thoughts and desires if we can count the pores on their nose. Excepting Tommy Lee Jones, the players are little more than awkward marionettes forced to spill out their lines as an afterthought to the machinery that this movie is a vehicle for (not to mention the potential recruitment possibilities that the army will be rewarded with).

Nicholas Cage easily delivers the worst performance of his career as he constantly struts about the screen in a machismo role rivaling even Tom Cruise in *Top Gun*. The young pilot he plays is all brawn and no brain. His snappy and snide remarks call to mind

all of the worst qualities of a generic Embry-Riddle flight student. The entire movie in fact may have quite possibly been written around the lives of the gonad-encumbered populace we call the "top gunners" on the flight line. Tommy Lee Jones is the one notable exception to this otherwise charmless movie. His dry sense of delivery and believable dialogue seem out of place in this travesty flop of an action thriller. Jones presents us with a grizzled veteran who yearns to be put back into action (and predictably, does get to go into action at the end of the film in the anti-climactic dog-fight scene).

Fire Birds does not deserve an audience, especially one that expects a good conclusion. This movie is more predictable than an "XT". It is an exercise in mundane camera work and flaccid action shots. We are constantly besieged by the same hazy, silhouette of Apaches lumbering in front of wavering red sunsets, this is apparently the only "good" shot that director John Green has in his bag of tricks, and we are forced to sit through pan after pan of these horribly fatiguing scenes.

Space News...



Future shuttles to clean up their trash... On the upcoming STS-35 mission of the space shuttle *Columbia* will be carrying aboard a trash compactor which will be fitted in one of the middeck lockers aboard the orbiter. It will be able to handle printer paper, food, and plastic and metal food containers. It was built by the Johnson Engineering Corporation in Boulder, Colorado. They offer such machines for use on recreational vehicles. The new trash compactor will also be flown on extended duration orbiter (EDO) missions, the first beginning in 1992 and which will last 13 days.

Japanese shuttle astronaut named... When Space Shuttle *Atlantis* lifts off in June 1991, it will be carrying aboard the first Japanese astronaut to fly onboard an American spacecraft. Mamoru Mori, a 42-year old physicist, will conduct materials processing, superconducting and life experiments while on the seven day mission. Mori, a native of the northern island of Hokkaido, will not however, be the first Japanese in space. A journalist or camerawoman from a Tokyo-based network is scheduled to fly on the Soviet space station *Mir* in December of this year.

Atlantis to move from OPF to VAB... Space Shuttle *Atlantis*, which has been undergoing post flight inspections and systems testing and validations of major systems at Bay 2 of the Orbital Processing Facility (OPF), will be moved to the Vehicle Assembly Building (VAB) late tonight or early tomorrow morning. *Atlantis* will be prepared for its STS-38 mission which is scheduled for the second week of July. It was thought that the delay of *Columbia* would also delay *Atlantis*, but NASA officials said that the launch schedule for STS-38 will not be affected. *Atlantis* sixth and last flight, STS-36, was a Department of Defense (DOD) dedicated night flight last February 28. Like its last mission, *Atlantis* will again fly a DOD payload. The pilot and two of three mission specialists will be flying into space for their first time during this mission.

Magellan spacecraft ready to map the surface of Venus... The *Magellan* spacecraft underwent four days of dress rehearsal last week of different maneuvers, data gathering simulation, and communication with ground stations that will be performed when it goes into Venus orbit the morning of August 10. The rehearsal also tested the teams involved in the project and the readiness of the Ground Data System. The test simulated 28 orbits around Venus and returned data back to tracking stations in Spain, California and Australia which in turn relayed the data to the Jet Propulsion Laboratory in Pasadena, California, and at Martin Marietta Corporation in Denver, Colorado. After the test, *Magellan* was turned off and returned to its cruise configuration. The radar instrument which will map the surface of the planet, will be turned on next when the spacecraft is in orbit around Venus. *Magellan's* primary mission is to map 90 percent of the surface of Venus in 243 days (one Venus rotation).

Embry-Riddle to prepare long-term NASA proposal... The understanding of the formation processes of stars and planetary systems, has advanced in recent years. It seems that these processes are closely related and that future progress will require the collaboration between astrophysicists and planetary scientists. Embry-Riddle Aeronautical University and the University of Florida have been awarded a grant by the Florida Space Grant Consortium to prepare a long-term NASA astrophysics proposal. The principal investigator for the Embry-Riddle phase of the study is Dr. Robert C. Fleck, Jr., professor of physics. Dr. Fleck's research have included studies of turbulence in the interstellar medium, star formation and the formation of close binary systems as well as the formation of circumstellar disks and planetary systems. Professor Fleck will be teamed in the research project with Professor James H. Hunter and Assistant Professor Humberto Campins, both well known astronomers from the University of Florida. The total direct cost of the project is \$22,494 of which half will come from NASA funds and half in matching funds from Embry-Riddle and the University of Florida.

Astro-1 will search for invisible universe

by Marianne Michaels
Space Technology Writer

Space Shuttle *Columbia*, mission STS 35, will be carrying the *Astro-1* observatory into space. The *Astro-1* observatory (*Astronomy-1*) is designed to study and explore the Universe by observing the ultraviolet radiation emitted from celestial objects. The targets for observation include planets, stars, star clusters, supernovae (exploded stars), galaxies and clouds of gas and dust. The obser-

vatory will gain detailed information that was never before possible.

It will be used in conjunction with the *Hubble Space Telescope*. Scientists associated with the *Hubble Space Telescope* will target areas of interest and pass them along to the *Astro-1* scientists so that they can be further studied.

Astro-1 consists of four instruments: the Hopkins Ultraviolet Telescope (HUT), the Ultraviolet Imaging Telescope (UIT), the Wisconsin

Ultraviolet Photo-Polarimeter Experiment (WUPPE) and the Broad-Band X-Ray Telescope (BBXRT). All three of these telescopes are mounted on an Instrument Pointing System, developed by the European Space Agency (ESA).

A broad range of radiation from high energy gamma rays to very low energy radio waves make up the electromagnetic spectrum. The visible light spectrum is the portion that the eye can see. Out of the entire range of wavelengths that make up the electromagnetic spectrum, visible light makes up only a small portion. The region between the X-rays and visible light is the ultraviolet spectrum. This ultraviolet light is not able to penetrate the Earth's atmosphere. The *Astro-1* observatory will study this ultraviolet spectrum to better understand the universe. *Astro-1* will possess a unique capability called "coobservational science". This means that all the instruments will be working simultaneously with each other to give scientists detailed information on a target of study.

The four most important instruments that compose the *Astro-1* observatory are briefly discussed ahead:

The *Hopkins Ultraviolet Telescope* (HUT) will study faint astronomical objects such as galaxies in the

ultraviolet range, and quasars. It will also study the interaction between the solar wind and a planet's magnetic field.

The *Ultraviolet Imaging Telescope* (UIT) will study images of faint objects such as hot stars and galaxies. It is a combination of a camera, telescope and image intensifier. It will also detect distant galaxies that have not yet been detected by ground-based observations. It will also determine the temperature of an emitting source to study sources of thermal radiation in the energy spectrum.

The *Wisconsin Ultraviolet Photopolarimetry* (WUPPE) will study the polarization of ultraviolet light from celestial objects. It will also study the size and geometry of stars (which cannot be directly seen because of our sun) by studying the radiation emitted from the object.

The *Broad-Band X-ray Telescope* will measure the amount of energy of each X-ray. Targets of interest include clusters of galaxies, stars and supernova remnants. This telescope was recently added to the payload in 1987. It was to replace the *Wide Field Planetary Camera* which was going to study Halley's Comet.

All these instruments will help *Astro-1* search for the unknown and unseen universe.

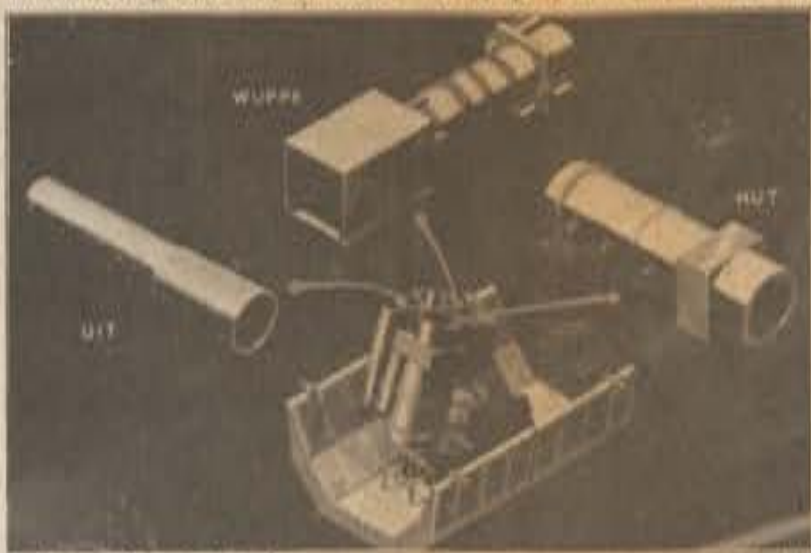


photo by NASA

Integrating Astro-1...

The three telescopes that make up *Astro-1* will be mounted on the Instrument Pointing System that is attached to Spacelab pallets

EVA helps in repairing damaged Soyuz spacecraft

by Jennifer Kimball
Space Technology Writer

Damage to a Soviet *Soyuz* spacecraft has left two cosmonauts on board the *Mir* space station without a reliable means of escape in the event of an emergency. The *Soyuz TM-9* spacecraft, currently docked to *Mir* has three thermal blankets ripped out of place.

The damage to the *Soyuz* is thought to have occurred during the February 11th launch that brought cosmonauts Anatoly Solovyev and Alexander Babadin to *Mir* to replace the two man crew that had been in orbit for six months. The old crew returned to Earth in the undamaged *Soyuz TM-8* spacecraft.

The ripped insulation is causing two serious problems. It is blocking critical *Soyuz* sensors needed to position the vehicle for reentry. Additionally, the lack of insulation has caused the temperature in the spacecraft to drop forming a buildup of water condensation. Ground controllers are worried that the excess moisture could cause electrical malfunctions.

To help with the temperature problem the *Mir* complex has been turned so the *Soyuz* faces the sun to warm the spacecraft. This attitude is not beneficial to *Mir* because it makes less efficient use of its own solar arrays.

An Emergency Extravehicular Activity (EVA) is being planned to repair the damage. Special equipment needed for the EVA including an extendible ladder is being brought up by the unmanned *Krisdall* supply module which is scheduled to launch and dock with the space station in early June.

Ground controllers are unsure yet whether the crew should cut away the damaged insulation or reattach it. Cutting it away, the easier of the two solu-

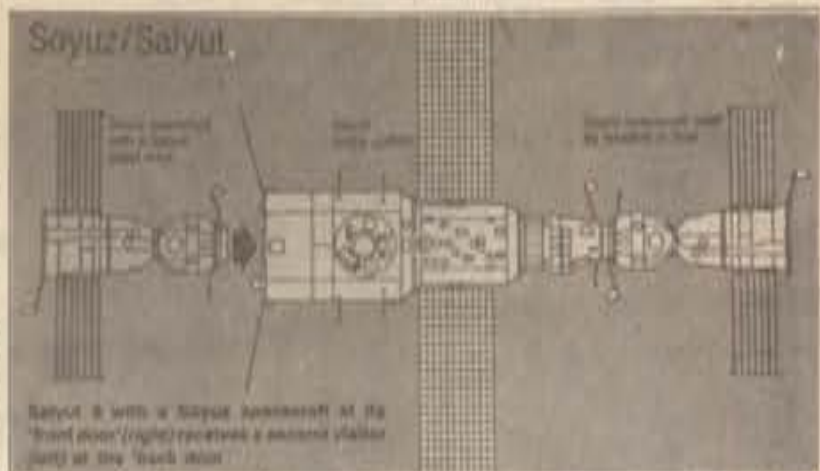


photo by R. Gibson

Soyuz in for repairs...

The *Soyuz* spacecraft which can be seen here will undergo repairs in the near future. The *Soyuz TM* model has been used for transportation between Earth and soviet space stations *Salyut* and presently the much alike *Mir* space station.

tions, would eliminate the reentry sensor problem. Reattaching the insulation would help the temperature control problem.

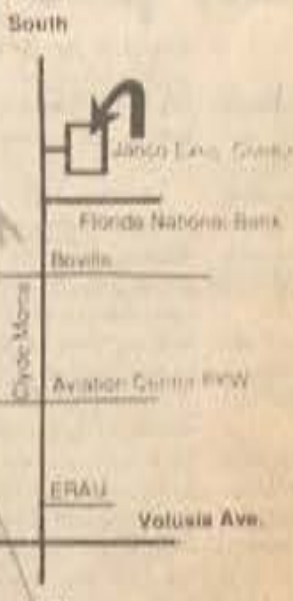
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Delta II rocket launches \$273 million satellite successfully



by Jose L. Vazquez-Delgado Jr.
Space Technology Writer

Last Friday, NASA launched a Delta, unmanned, rocket with a West German scientific satellite. The satellite, ROSAT, was lofted into space from Launch Complex 17 at Cape Canaveral Air Force Station at 5:47 p.m. and boosted into a 360-mile-high orbit 43 minutes later.

After takeoff, ground controllers were unable to confirm whether the spacecraft had separated successfully from the booster or not. The problem was attributed to the temporary loss of radio contact, but once radio contact was achieved again, controllers confirmed that ROSAT was on its own away from the rocket booster. "It is the finest x-ray telescope that's ever been flown" NASA program scientist Alan Bunner said.

ROSAT was supposed to fly on board the space shuttle in 1987, but do

to the Challenger disaster it was postponed until the mid 90's. Unhappy with this delay, NASA and the Federal Republic of Germany's Federal Ministry for Research and Technology (FRG's FMRT) redesigned the spacecraft to fit in a Delta II rocket and hence be able to launch it at a much earlier date than the shuttle could.

ROSAT, a 5,000-pound satellite was deployed into a 53-degree inclined, circular orbit. The spacecraft is equipped with two imaging telescopes, a German Large X-Ray Telescope and a smaller extreme

ultraviolet telescope known as the Wide Field Camera, contributed by the United Kingdom. The United Kingdom is cooperating on ROSAT through an agreement with the FRG.

"It is the finest x-ray telescope that's ever been flown"

Alan Bunner
NASA Program Scientist

contributed by the Smithsonian Astrophysical Observatory and is managed by NASA's Goddard Space Flight Center, Md.

One thousand cosmic x-ray sources are presently known to exist and astronomers hope 100,000 sources

will be identified by ROSAT. As the spacecraft orbits high above the Earth's atmosphere, x-rays which can not be detected from the ground, because they are blocked by the atmosphere, will be seen by ROSAT.

After a two month calibration period, ROSAT will begin a 6-month all-sky survey period of celestial bodies that emit x-rays. Afterwards it will spend the following years making detailed observations of extremely hot stars, black holes, and remnants of supernovas, hot clouds produced by exploding stars at the end of their lives.

The ROSAT program is managed by the Astrophysics Division of the Office of Space Science and Applications of NASA. NASA's Goddard Space Flight Center is responsible for the detailed implementation of the ROSAT program.

We have lift-off...

A Delta II rocket roars smoothly into space with the Roentgen Satellite (ROSAT), a joint project between NASA and the Federal Republic of Germany's FMRT.

What will be Columbia's fate in the near future?

by Jose L. Vazquez-Delgado Jr.
Space Technology Writer

Space Shuttle Columbia is still grounded after its launched was scrubbed last Tuesday. Sensors indicated a high concentration of hydrogen in different areas after 20,000 gallons of liquid hydrogen had been loaded into the external tank. The external tank holds 500,000 gallons of propellant, two thirds liquid hydrogen and one third liquid oxygen.

Helium was flushed through the entire fuel system on Saturday but no

leak was found. "We've pretty much assure ourselves that it's not going to show itself until it's subjected to super cold temperatures of the hydrogen" said Bruce Buckingham, NASA officer.

Another leak test will be performed today. The external tank will be filled five to ten percent of hydrogen at a slow-to-fast rate to see if the leak shows up. If the attempt fails, Columbia will have to be rolled back to the Vehicle Assembly Building (VAB). In the case this occurs, the launch of

STS-35 will be delayed up to a month or more.

If the launch of Columbia is delayed, the schedule of this year's shuttle launches may be affected. Also affected would be the schedule observations of the \$150 million dollar satellite in Columbia's cargo bay, *Astro-1*. Because of the delays, *Astro-1* will probably lose the opportunity to observe a quasar that is 10 billion light years away from Earth that will be beat to observe this month.

Only three other shuttle missions

have been rolled back from the launch pad after attempted launch: *Columbia* (STS-9) on October 1983 due to the replacement of an exhaust nozzle in the solid rocket boosters; *Discovery* (STS-14) on July 1984 due to the replacement of the three main engines; and *Challenger* (51-E) due to timing problems with its payload.

Besides being the first mission dedicated completely to research in the last five years, this mission will be the last flight of Commander Vance D. Brand. Brand will not only be the oldest person to travel in space, but the last of six Apollo astronaut to fly onboard the space shuttle.

The Apollo veteran has also achieved some other records in the space program. On his rookie flight he learned Russian. At the time he was the command-module pilot for the 1975 *Apollo-Soyuz* mission, the first meeting in space between the Americans and the Soviets. On his first shuttle mission, the first successful deployment of satellites from the orbiter's cargo bay was achieved. In his last flight, February 1984, Brand became the first pilot to land a shuttle at the Kennedy Space Center.

In the event that *Columbia* is rolled back to the VAB, one of the STS-40 solid rocket boosters which has already been stacked, will have to be moved out to the launch pad to make room for the orbiter. Space Shuttle



Crew in wait of shuttle repairs...

The *Columbia* crew patiently awaits for the repairs of the orbiter that will fly them into space. The STS-35 mission has been delayed twice already.

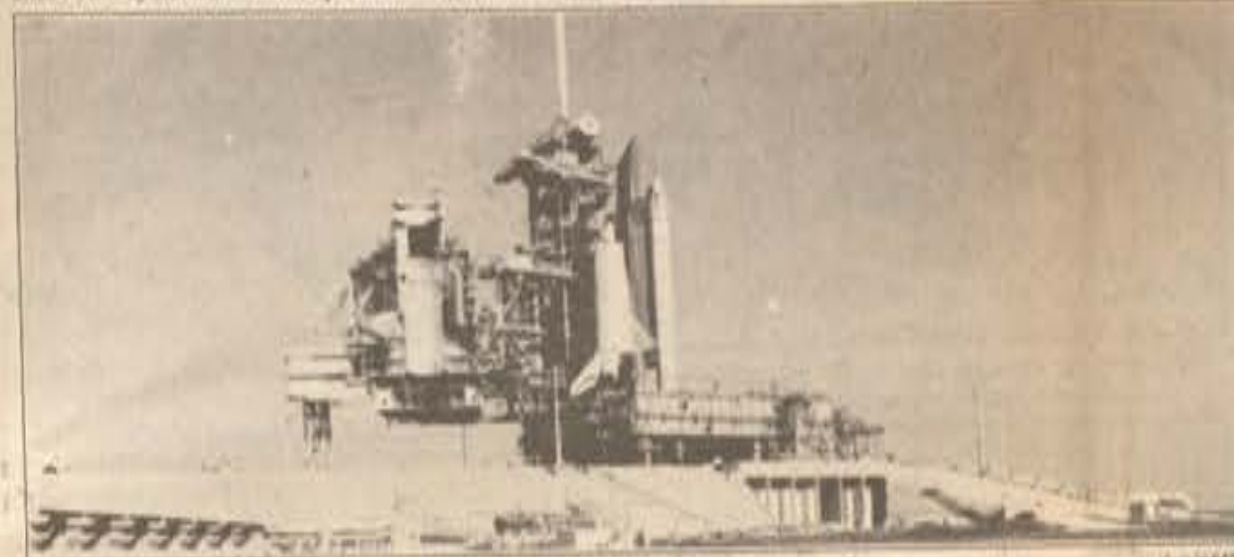
Atlantis will be moved from one of the Orbiter's Processing Facility (OPF) to another of the bays in order to prepare it for its upcoming mission in July.

The crew of *Columbia* includes four astronauts who will operate *Astro-1*'s three ultraviolet telescopes. The mission specialists are John M. Lounge, Jeffrey A. Hoffman, Robert A.R. Parker, Ronald A. Parise, and Samuel T. Durrance. The pilot for the mission is Guy S. Gardner.

Another of the planned STS-35 activities

is to broadcast the first "Lessons from Space". This would occur during the mission's fifth day. The first "Lessons from Space" were originally planned for the *Challenger* STS-51-L mission. The lessons would have been conducted by the first teacher in space, Christa McAuliffe.

Despite all the problems that NASA seems to be encountering, and with packed launch schedules in the future, NASA officials are trying to keep a good perspective.



Shuttle in love with launch pad...

Space Shuttle Columbia seems to have fallen in love with the launch pad since more problems arise in each attempt for lift-off.

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Calvin and Hobbes

by Bill Waterson

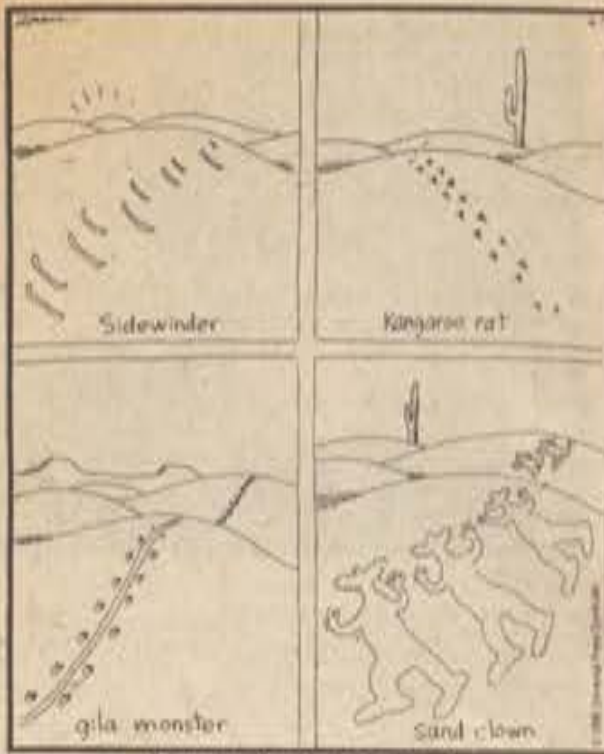


Far Side

by Gary Larson



"Well, here we go again! I always get the gurney with one bad wheel."



Common desert animal tracks



"Yes, with the amazing new 'knife,' you only have to wear the skin of those dead animals."



"You need to see medicine man - me just handyman."



"Ok, Johnson - we've got a deal. We'll let your people and my people work out the details."

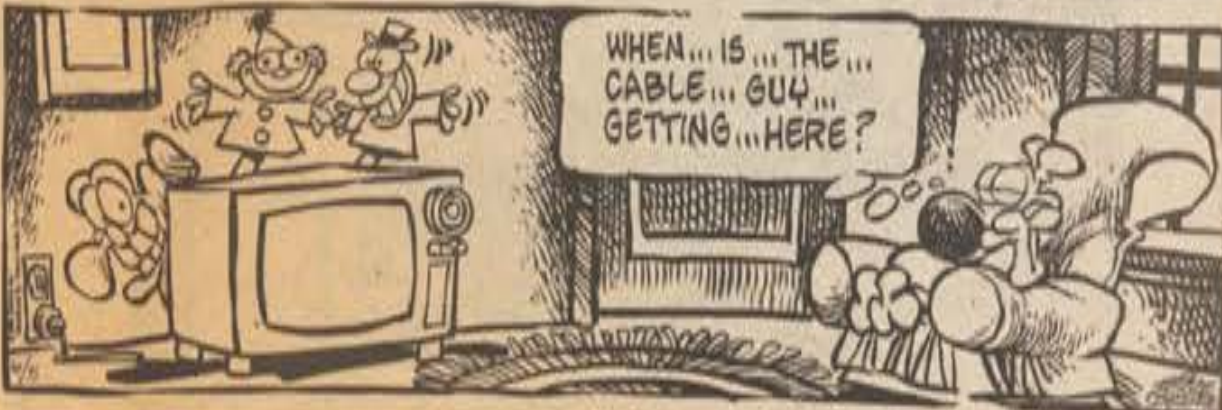
Mister Boffo

by Joe Martin



Mother Goose and Grimm

by Mike Peters



→ Miscellaneous

DATSUN B210-Plenty of rust but runs brilliant. Call Phil 252-4044 (early morning, evenings or weekends.)

84 HONDA PRELUDE--Auto, PS, PB, AM-FM, Sun Roof, Elec. Cond., \$5000 or best offer. 760-4516.

1984 HONDA INTERCEPTOR 500--Excellent condition, very clean, and never down. 16,500 miles. \$1200 o.b.o. Call Doug at 274-5016.

HOUSE TO SHARE--Available June 15th, 1128 North Street. \$375 a month includes utilities. Call Louie for info, at 238-8884 or 238-3887 or leave message.

ROOM FOR RENT--Private bathroom, large bedroom, cable TV, microwave, washer/dryer, furnished, 10 min. from campus. NO LEASE. Quiet residential area in South Daytona. \$250.00/mo. and 1/2 utilities. \$150.00 deposit. Call Bob 761-5828.

GRADUATING--Must sell everything. King size waterbed w/ headboard and rails - \$125, 5 drawer dresser - \$25, 2 desks and chairs - \$15/ set, and several other things. Call Doug at 274-5016.

WANTED--person to share driving and gas. Route is along I-10 and destination is California. Leaving end of Summer. A. Contact Rick at Box 5992.

GUNS--Federally licensed firearms dealer. I have firearms for all your needs. I also carry assault systems rifle cases, etc. Reloads available. PMJ only - 10% over wholesale and tax. Dave 736-0203.

GUNS FOR SALE--AMT backup .380 cal stainless steel, 5 shots, \$225.00. (New-Never Fired). AK-47 Hungarian (1 of 7000 in country) complete with bayonet and 3 mags, \$7500.00 Remington .870 police rifle 12 gauge, \$200.00. Dave 756-0203.

5'10" SURFBOARD--Good condition, \$120.00. Call Luis at 238-7748.

GERMAN CAR REPAIR--Professional service on VW-AUDI, Bug Ghia, Rabbit, Golf, GTI, Jetta, Scirocco, 4000. Factory trained, 10 yrs. exp. Suspension, struts, c.v. joints, brakes, Bosch injection. Routine main, and engine overhaul, only \$14/hour for ERAU students/faculty. No mark up on parts - Labor warranty. Contact Robert Warlick 238-0386 or ERAU box 2193.

NEED ROOMMATE ASAP
3 bedroom, 2 bath/own bedroom/\$210.00/washer & dryer. Contact Wood Forest 257-5929, need apply, 1/3 utilities, free water, Apt. #1727.

ROOMMATE WANTED
Summer II only. \$190.00/month & 1/3 utilities, 2 miles from school. Contact Brian or Pete 255-8022.

FOR SALE:
Double bed like new \$55.00, Desk & chair \$25.00, Chest & draws \$10.00, Sofa (black & white) \$50.00. Call Lisa 252-4044 or afternoon/evening at 255-7497.

IBM AT Clone-\$1199
Don 80286-Landmark 15 MHz. State-of-the-art 266,144 color VGA monitor, 30 Meg Fuji Hard Drive, 1536K RAM, 101 keys, Advanced memory environment. Almost new with software. Leave message for JOE at 238-7355.

1980 Cadillac Supreme. Good cond. very efficient, FM/AM Cassette. Clean interior, new tires. Power windows, AC. Only 80,000 miles. Contact Alton at 252-7612 or Box #1392 or leave message.

Suzuki 1981, GSR500GL, 8200mi. crash guards, cruise control, tail trunk, backrest, new battery, \$800.00, call Mark 761-7836.

21" man Raleigh Marathon Bicycle. 12 speed, very light, excellent condition. Includes lock, trip computer, handlebar & seat bags, toe clips & more. \$225.00, Jim at 252-5007.

Roommate needed Summer II only. 3 miles from school. Own room and bath. \$192.50/mo and 1/2 utilities. Call Mike at 254-4935 or Box 2293.

Roommate wanted: 2 bedroom, 2 bath Apt., Ocean Oaks Apts. 10min. from ERAU. Summer A and/or B. \$2200/mo. \$12 elec. Contact Joe Box 6193.

Free room & board beachside New Smyrna in exchange for Day care Mon-Fri, 8:30am to 6:30pm for two boys, age 5-9. Must own car. 254-8200 x370 ask for Kathleen.

Roommate needed for a 3 bedroom condo near Forest Lake. Rent is \$250.00 including utilities. Washer/Dryer, Pool, Garage. Female preferred. 255-9366 or 788-5505.

Roommate needed. Bedroom with Private Bath. Furn./airfurn. negot. \$175.00/mo. Call 760-3219, leave message.

Student wanted: Learn how to play guitar. Instruction given at residence in Daytona. Call 238-1008. Ask for Sky.

Raven for rent 5 minutes from ERAU. House with washer and dryer, furnished living room. \$200.00 per month plus 1/4 utilities. Call Robt 760-1630.

Private Aircraft owner looking for CFI to instruct in my plane. Have Pvt. & Instr. Need Commercial Inst. Block time avail. 253-3969 evenings.

30MB IBM AT Comp. w/VGA \$1399.
IBM 80286 12MHz Clone with 512K VGA monitor, 1536K RAM, 15.3 times the speed of PC, hard drive, 1.44 Meg floppy, 101 keys, 1:1 interleave, almost unused. Loaded with everything. Leave message for Joe at 238-7355.

David Clark Headsets, Model- H10-80, used approximately 10hrs. \$210.00 each. Call Mark 761-7836.

Graduate Sale: Desk & chair \$50.00, chest of draws \$15.00, stereo cassette player/phone \$50.00, coffee table \$5.00, side table \$5.00, twin bed \$70.00. Tel, Philip 252-4044 or 257-2524 (evenings, mornings)

ERIN,
I miss you!!!
PAT

HEY BABYDOLL,
Just wanted to say thanks for the roses. I love you babe!!
Luv Bunny.

DANNETTE,
We've made it so far, only three more weeks of hell. Keep "shuggin'"--
TAMI

HELLO MY ROMEO
Always remember that I am still in love with you and that I think everyday. You are my one and only persupine-head, the only one who can always make me smile. No one will ever take your place. I love you very much.
YOUR JULIET

JENNIFER
What have I got to do to prove that all Riddle guys aren't jerks, particularly this one.
JOE

ANDY & MITCH
Be nice in the name of Stroat or the Force will get you!!

HEY ROB
What's been happenin'?! Keep in touch or we'll beat you!!
TS & MK

Christina,
Well, did your mushy personal make it in here?
One Of The Joes

Juliet,
You are such a babe... Come work for us!
JOB 1

Brian,
What happened to the party? I wouldn't know.
JOE S.

How I wish I was ROMEO...

MARY ANN,
Just when you thought it couldn't get any worse! A RASH of more problems! I hope it gets better for ya...
MI

ISUZU,
Chill out! Relax! You've got a "BB" What more could you want...
MAGNUM

TO MY FELLOW PHYSICS SUPPORTERS:
Arrgh!!!
PAT

OH JULIET
Where's your Romeo?
MAGAHA'S HU219

LARRY
How about you as Romeo?!!
MAGAHA'S HU219

BUBBLES
You make me so very, very happy. I'm so glad you came into my life.
LOVE, POOKIE

JASON
I think that we should up the ante on the bowl of chowder, how about your computer for mine?
MK

TO THE GIRL THAT TAKES CARE OF ALL THOSE DUMB ANIMALS IN DA BRONX,
I love you with the red hot intensity of a thousands burning suns.
LOVE, MR. HAPPY

SMILEY,
I want to marry your daughter!
LINDBERGH

BRIAN
Is that vomit or chow spit? I can't seem to tell the difference.
JOE

CRISTINA,
I am still waiting for the sexy personal you promised.

BRIAN G.
You need to get some real tapes. May I suggest "Electric Youth" by Debbie Gibson?

QUESTION:
How many staff members does it take to put together an issue of the Avion?

ANSWER:
HUNDREDS... Because they're all slackers.

Don't you have anything better to do than read these personals... Go do some homework...

RACHEL AND KRISTIAN
You were a welcome alternative to the local scene, please save me from the locals...
B.G.

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- Classified advertising is carried out by filling out a classified ad card in the Avion office.
- Only one classified ad per card. Name and address of advertiser must be included for the ad to run.
- Ads will run for two issues and may be renewed by filling out another classified ad card.
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- For more information, stop by or call the Avion office at (904) 239-6049.

Wanted: 3 twelve foot flex-tail kites (used) call 258-5974 and leave a message.

Need help in Math, Physics, or Chemistry. I can help. I am a senior in the engineering program, call Kenny at 760-0241 or drop a note in Box #1156.

For sale: 3 ten foot flex-tail kites. Great condition. Call 258-5974 leave a message.

Furniture for sale: 3 dressers, \$20.00-\$50.00 each, kitchen table w/chairs, \$75.00, plus assorted housewares, everything in great condition! Jim, 252-5907.

Computer for sale: Apple IIe, 128K, Mon/ton, Disk Drive, Joystick, and Epson RX-80 printer. Call Joe at 676-2909.

For sale: STS AV7600 VOR Handheld transceiver. 720 channel comm., 200 channel Nav. VOR NAV. Nicad battery and charger ood \$225.00. Jim 252-5907.

Town & Country Surfboard, 5'10", adjustable tri-fin. Excellent colors and condition. Worth over \$400.00, must see to appreciate. Ask for \$225.00- call 254-0761 or leave a message.

→ Personals

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Petite blonde, SWF, with excellent taste searching for a sugar daddy to underwrite her craving for the good life. Unlimited funds required. Answer this ad and your money will be equitably distributed to a variety of clothing, travel, agents, and entertainment establishments. Respond by placing a personal ad in the Avion.
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- Juniors earn more than \$1900 during one ten-week summer session
- You can take free civilian flying lessons
- You're commissioned upon graduation

If you're looking to move up quickly, look into the Marine Corps undergraduate officer commissioning program. You could start off making more than \$18,000 a year. We're looking for a few good men.



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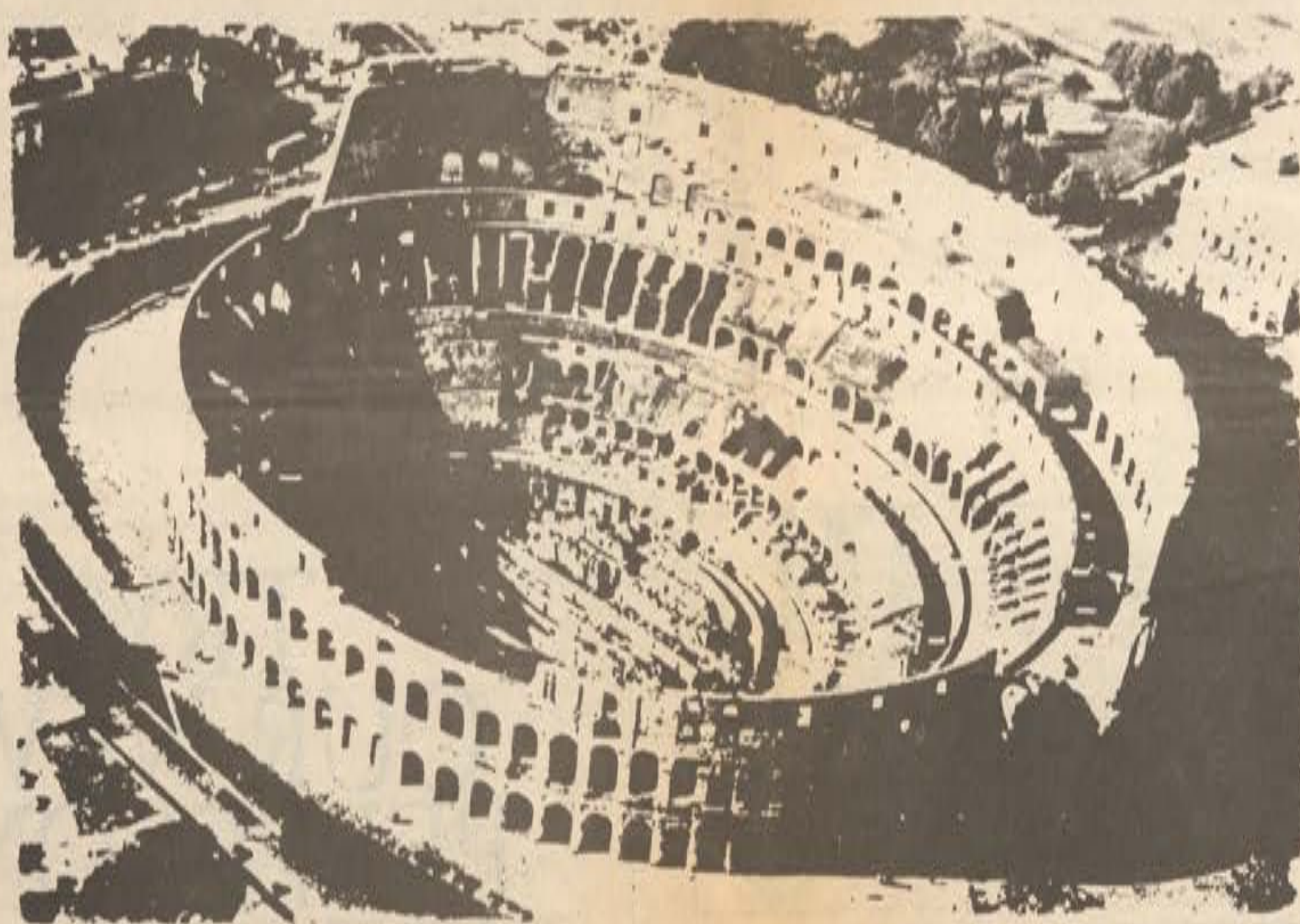
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