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## Space Technology

**B**

Volume 64, Issue 2

January 31, 1990

### B-52 to release Pegasus rocket for flight testing

by Jim Banke  
Special to the Avion

Edwards Air Force Base, California. -- The oldest B-52 bomber flying today will soon be used to launch a small rocket into space, the newest concept in getting small one-ton satellites into orbit.

NASA's B-52 jet aircraft, stationed at the agency's Dryden Flight Research Facility, will carry Pegasus about 45,000 feet over the Pacific Ocean where the three-stage solid rocket will be dropped from the B-52's wing and fired off toward space.

Orbital Sciences Corp., builders along with Hercules Aerospace Co. of Pegasus, approached NASA about 20 months ago with the idea of using the space agencies jet bomber.

At the time NASA was unable to offer its services directly to a commercial organization, said Jack Kolf, NASA project manager for Pegasus. "Since then, with all of this commercialization of space, that's opened up quite a bit." But NASA still needed Pegasus' first customer, the Defense Advanced Research Projects Agency, to request NASA's help. DARPA did.

"So we said sure, we would be more than happy to sign an agreement with DARPA to let them use our services. Since that's another government agency we'd have no problems with that," Kolf said.

NASA's B-52 -- tail number 008 -- is the same aircraft used in the 1960's, to launch the X-15 rocket planes on test flights to the edge of space. It flew 140 missions and a second B-52 -- tail number 003 retired a year after the X-15 program concluded -- flew the 59 other X-15 flights.

"It's a good airplane," said NASA B-52 pilot in command Gordon Fullerton, a two-time shuttle astronaut who now is Dryden's chief pilot. "It's not a sports car. It's more like an 18-wheeler."

The aircraft NASA owns now was originally built by Boeing for the Air Force in 1954 and accepted for flight February 28, 1955. Four years later the Stratofortress was modified by North American Aviation, now Rockwell International, for use as the X-15 launch aircraft.

After the X-15 program ended in 1969, the B-52 was used to drop a series of lifting body rocket-planes and gliders; providing additional research leading to the Space Shuttle. Now the jet is used in testing escape capsule systems for the F-111 fighter.

"By aircraft standards it's almost ancient," Fullerton said. Although 35 years old, it has very little flight time accumulated compared to commercial airliners. When NASA received the aircraft it had about 2000 hours flight time, a figure which has since doubled.

"There's no airplane that we could ever get with the low number of hours that this one had," Kolf said. Commercial airliners can log tens of thousands of hours in the same 30-year period. A high number of flight hours can mean parts wear out and structural pieces can become fatigued, losing their strength.

Often the biggest challenge to keeping the bomber flying is finding spare parts. This particular B-52 is a B model, no longer flown by the Air Force who now use the G and H models. The solution: scavenging parts from other B models scrapped and stored in the southwest Arizona desert.

"On the whole, it's a very reliable airplane. In spite of its antiquated systems it has held up quite well," Fullerton said, adding the aircraft is expected to keep flying well into the 1990's.

The first test of the launch vehicle was flown over the Mojave Desert to test the performance of the B-52 with Pegasus attached. The second test of the dual configuration simulated an actual mission flight plan. The results of this tests showed a slight irregularity in the electrical telemetry between the aircraft and the rocket.

If this test had gone without error, the next flight of the program would have released the Pegasus rocket and tested its capabilities. Instead, a third test of the dual configuration was requested by DARPA.

The third captured flight of the rocket will take place this week and is presumed to be the last before releasing the small launch vehicle. This test will verify the systems compatibility with the B-52 and finalize the captured flight tests.

According to Don Haley of NASA's Dryden Flight Research Center, "If the test is successful the first free-flight test will occur no earlier than the first week of March."

Jim Banke is a 1987 Aviation Business Administration graduate and a former Avion Space Technology Editor, Editor-in-Chief and Aerospace Society President. He currently lives in Melbourne, Florida where he writes for Florida Today, Gannet News Service and USA Today.

**"On the whole, it's a very reliable airplane. In spite of its antiquated systems it has held up quite well,"**

**Gordon Fullerton, NASA B-52 pilot**

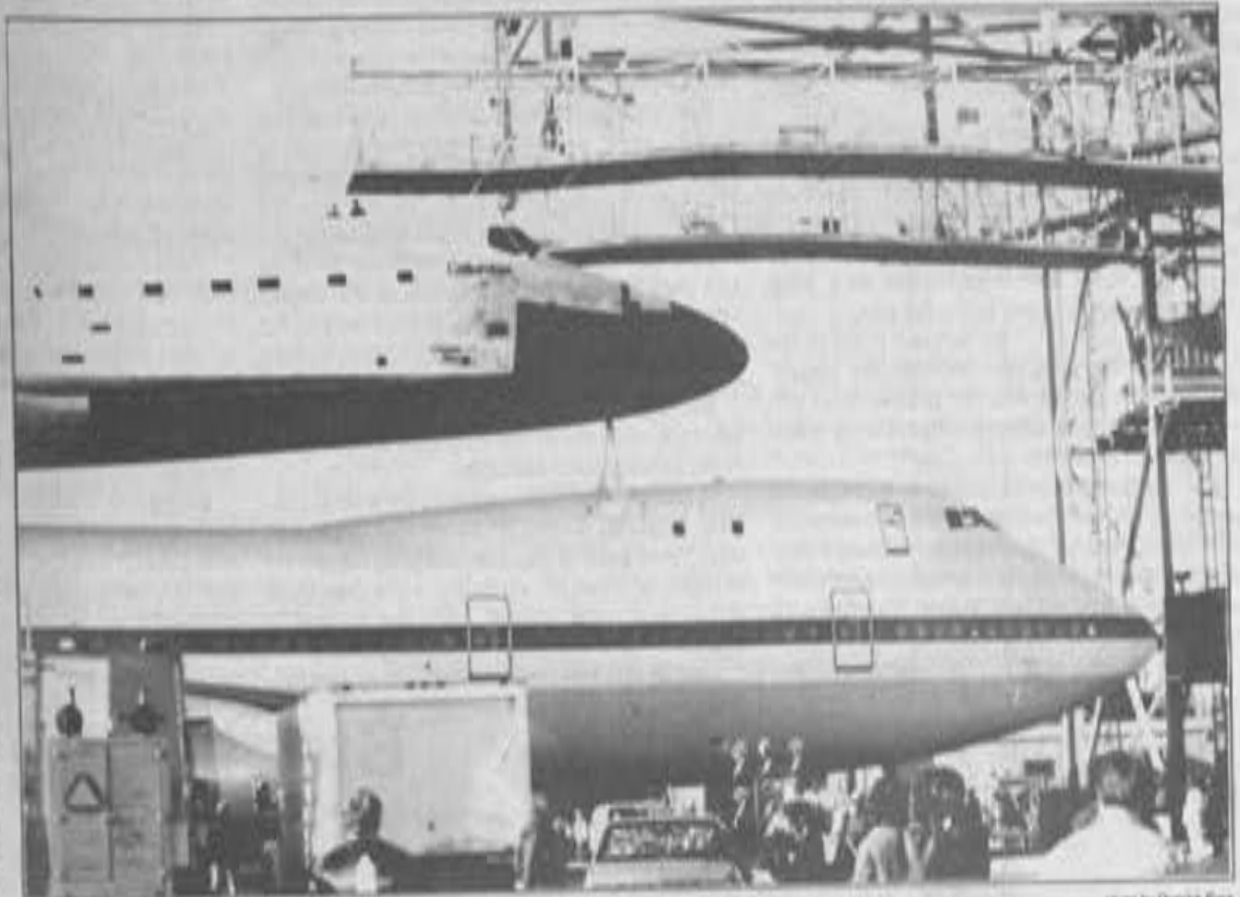


Photo by Dennis Beier

#### Home sweet home...

The Space Shuttle *Columbia* made a ferry flight from Edwards Air Force Base to the Kennedy Space Center Friday, atop the 747 carrier aircraft. Stowed in its cargo bay is the Long Duration Exposure Facility which will be removed in the next few weeks.

### Columbia and LDEF return to KSC

by Derrick Seys  
Space Technology Editor

The Shuttle Carrier Aircraft touched down Friday at the Kennedy Space Center carrying atop it the orbiter *Columbia* and its important scientific payload, the Long Duration Exposure Facility.

The landing occurred at 3:30 p.m. following the lead of a C-141 Starlifter. Aboard the Starlifter were several engineers, specialists, and managers to oversee the handling of LDEF at KSC.

Larry Bramfield, from NASA Langley, was responsible for the flight planning and commented on the complicated handling procedures due to LDEF.

"The precarious handling is to avoid any disturbance to the surfaces of LDEF and done in environmentally controlled containers."

Carol Kaiser, LDEF Chief Engineer, was able to examine the cylindrical shaped lab through the

orbiter's aft windows and airlock. He commented, "surfaces of it (LDEF) fluttered in the purge air of the shuttle." This was in regard to the loose foil that could be seen from the in-orbit images.

When asked about the effects of re-entry on these surfaces he said, "there were no noticeable differences from the photo survey."

*Columbia* was removed from the 747 and placed into the Orbiter Processing Facility where LDEF is being prepared for removal.



NASA photo

#### Along for the ride...

The Pegasus rocket is completing its captured flight tests this week at NASA's Ames-Dryden Center. The vehicle will place small payloads into low Earth orbit.

### Atlantis' crew to wear a patch with significance

by the National Aeronautics and Space Administration

The dominant theme of the STS-36 patch, designed by the five astronaut crewmembers, is, in their words "...the essential role that space plays in preserving the blessings of freedom and liberty for America." The crew used the eagle to symbolize "our country's commitment to strength and vigilance; its domain is not bound by the limits of Earth but reaches out to the stars." "The Shuttle," they express, "majestically beginning its journey into orbit, demonstrates how man and machine work together for the security of our nation." A crew spokesman went on to say the flag represents the patriotism and love for America possessed by each of the five-man crew and signifies the honor accorded them through the participation in national defense.



NASA photo

#### Symbolic...

This patch will symbolize the next Space Shuttle mission set for February 22.

### Get Away Specials celebrate success

Small payloads utilize micro-gravity aboard Space Shuttle

by Joshua S. Mussall  
Space Technology Writer

While preparations are underway for the development of the Space Station *Freedom* here on Earth, there are many experiments that must be done in a gravity free environment before it can become an operational station. The GAS program, Get Away Specials, was originally designed to utilize the remaining space available in the Space Shuttle cargo bay after the primary payloads were installed. A National Aeronautics and Space Administration's decision led to the development of the Small Self-Contained Payload Program which was later renamed the GAS program.

With this relatively new program, domestic and international organizations can and have performed a variety of small space experiments.

The GAS program was originally conceived in the mid 1970's, when the design of the space shuttle program was still in the planning stages. As the program began, it was established that only payloads of a scientific research and development nature, that met the current NASA safety regulations, would be accepted. The payloads chosen would have to adhere to cer-

tain mission parameters.

The parameters include being: self-contained, internal power, a means of data collection, and event sequencing. Expecting a wide variety of experiments, NASA designed a container that could contain potential hazards.

In October of 1976, the GAS program was officially started and reservations for payload began to flow into the office of space flight. Companies were offered a variety of payload plans for their particular investigations.

The payload options ranged from \$3000 for a 2.5 cubic-foot container, for payloads up to 60 pounds, up to \$10,000 for a 5 cubic-foot container for 200 pound payloads, according to a 1986 NASA source.

One important aspect of the GAS program is that it continues to meet its primary objective of providing access to space to everyone. The program offers an inexpensive vehicle through which both novices and professionals can explore new concepts in space at little risk. With major payloads, a failing experiment can be catastrophic; the failure of a GAS experiment can, however, be a useful experience from which both students

and scientists can learn and prepare for bigger missions in the future.

In the past ten years, more than 50 payloads have flown, and through 1988, more than 500 payloads have been reserved; of these, 93 of them have already submitted their payload requirements to NASA for review.

Before the GAS program could begin regular payloads, a flight verification payload was necessary. On March 22, 1982, aboard STS-3, with the space shuttle *Columbia*, the GAS program made its initial flight by recording the vibrations, pressure, and microgravity inside a container, as well as the internal and external temperature levels. The mission was a success and proved the reliability of the program.

With the launch of *Challenger* on STS 51-B, in April 1985, a new era in the GAS program began, as the first two satellites were planned for ejection from the GAS container.

This brought on a new challenge as the GAS team had to modify the existing door assembly and create the full diameter motorized door assembly which would allow a satellite to exit through the full diameter of the GAS payload container. The pioneer GAS

satellite sprang into a twenty-month orbit and was very successful. Unfortunately, a malfunction in the motor door assembly delayed the launch of the Global Low Orbiting Message Relay (GLOMR) satellite. After returning to earth, the problem was analyzed and the satellite was deployed for STS 61-A with *Challenger* in October 1985 and successfully remained in orbit for 14 months. This was longer than the designers had expected.

Many other experiments have been tried and tested in a similar manner to a shortened mission of the Long Duration Exposure Facility (LDEF), which recently returned from its extended stay in space.

Most recently, in October 1989, aboard *Atlantis*, the Shuttle Solar Backscatter Ultra-Violet Instrument (SSBUV) was housed in a GAS container. In the future, the *Columbia* will carry GAS bridges, a structure that spans the payload bay and can carry a dozen GAS containers, planned for August and December of this year, according to the current mission schedule.

Now that the program has shown success and reliability, it is hoped that



NASA photo

#### Mini-lab...

The small canisters of NASA's Get Away Special program are visible in the shuttle's cargo bay.

this program will continue throughout the 1990's and into the twenty-first century. It is hoped that through this program, NASA will be able to serve the general public, and serve the interests and goals of the nation.



# New pilot certificate in a cloud of controversy

by Brett E. Messmer  
Aeronautics Editor

The new recreational pilot certificate is creating quite a controversy in the aviation community. While many people are in favor of the certificate, others are not; they say that the certification process is not strict enough and many unsafe pilots will be allowed to fly.

While this argument might be partly true, there are some advantages to this certificate: the pilot is taught to concentrate more on actually flying the airplane and not using the radios and instruments. While this might cause problems, there are certain restrictions placed upon the pilot to keep him out of dangerous situations.

The recreational pilot certificate got its start when the National Association of Flight Instructors formed a committee to investigate the way pilots are trained and certified. The committee found that most pilots are overburdened by all the rules and information they must know, and simply want to fly for fun.

With this in mind, they wrote a letter to the FAA outlining what has become the recreational pilot's certificate, for people who just want to fly for fun. This certificate took effect on August 31, 1989.

The requirements to obtain a recreational certificate are the same as for the private pilot: must be 17 years of age, have a 3rd class medical, understand, read, and speak English, and pass an oral and written exam. The pre-solo training is also the same for both licenses.

The post-solo training is where the two

**The recreational pilot license is for the people who want to fly, but who only want to fly for fun and the training reflects this.**

licenses differ. While the private pilot training goes into basic instrument familiarization, navigation training, and cross country flying, the recreational pilot concentrates solely on the basic flying and collision avoidance aspects.

Since the recreational pilot receives no training in using a radio (unless the aircraft is equipped with one), there are many restrictions imposed on him.

Since the recreational pilot is only taught the terrain in a 50 mile radius of his home field, he can only fly in a 50 mile radius of the airport where he received training. If he wants to fly outside of that 50 mile circle, he must receive training where he wants to fly.

Because of the lack of radio training, the pilot can only fly in uncontrolled airspace and from uncontrolled airfields.

A recreational pilot can only fly a single engine airplane, with 180 hp or less, equipped with fixed gear. A recreational pilot cannot fly at night, or when the visibility is less than three miles, and must always have the ground in sight.

Due to this last requirement, the recreation-

al pilot cannot fly higher than 10,000 feet MSL or 2000 feet AGL, whichever is highest.

Only one passenger is allowed to be flown at a time, although the recreational pilot may fly aircraft with up to four seats.

A student pilot who started out in private pilot training can switch over to recreational pilot training whenever he feels that being a private pilot is not what he wants.

The recreational pilot must have at least 15 hours of dual and 15 hours of solo time logged to be certified.

Every time he flies he must carry his logbook with him and it must contain written verification of completion of all required training.

The recreational pilot rule has also affected private pilots. The minimum visual requirements have been raised from one mile to two miles of visibility.

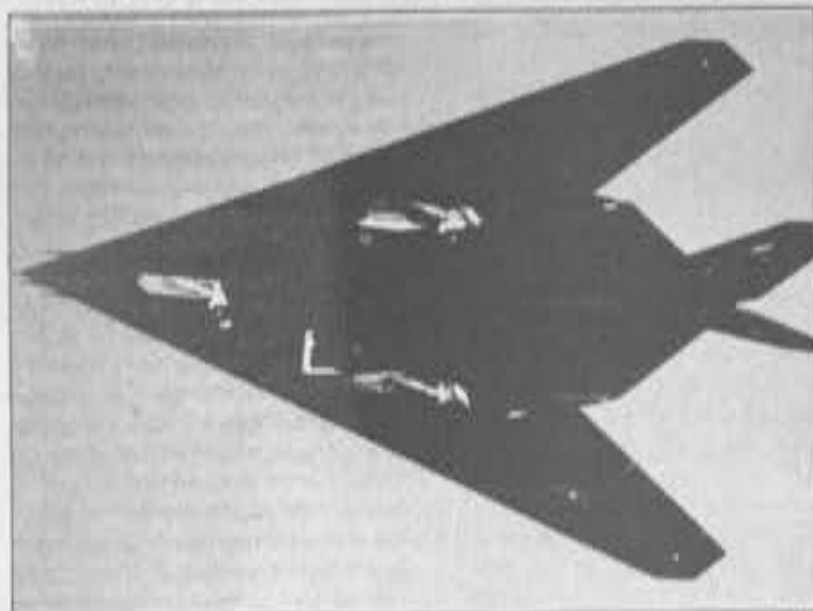
Non-instrument rate private pilots with less than 400 hours must take a two hour flight review, which is made up of one hour of ground instruction and one hour of flight instruction. Any pilot who has not logged pilot-in-command time within 180 days must receive instruction and be signed off by an instructor.

These rules for the recreational pilot have been created to allow more people to fly and also to keep these people safe. Some pilots feel that the extra emphasis on "stick-and-rudder" training is going to produce more competent pilots. Hopefully this will carry over into the private pilot training.



Basic fun...

Aeroplanes like this Piper Cadet are the types of aircraft that recreational pilots are allowed to fly. Since the main emphasis during training is aircraft control, the recreational pilot must adhere to strict rules to fly, thus keeping the air safe for everyone.



Black skies...

F-117s, like the one shown, were used in the invasion of Panama for precision bombing. According to the Air Force, they performed admirably.

## Stealth Fighter utilized in Panama invasion

by Peter E. Miller  
Aeronautics Writer

During the early morning hours of December 20, 1989, the Lockheed F-117A Stealth Fighter completed its first actual combat mission over the Rio Hato area in Panama. Its mission provided support for the incoming Army Rangers moving into the area by a massive United States Air Force air drop.

The F-117A has been the most secretive of all the United States Air Force's "Dark Programs." While it's famed counterpart, the Northrop B-2 bomber, received mass attention and criticism, the F-117A has silently past unobserved by a wide spectrum of the nation.

The F-117A was designed and built by Lockheed, who constructed the aircraft in their famed "Skunk Works" factory. The aircraft incorporates

state of the art stealth technology and numerous features to help it obtain complete invisibility to modern radar systems.

The F-117A was declared combat capable on October 26, 1983, but until now it has never been used in a military combat operation.

According to Air Force officials, the F-117A was used for one key reason: that of extreme accuracy.

The F-117A stationed at Tonopah, Nevada flew to Panama where it was given a tactical support mission of dropping two 2,000 pound bombs near a Panama Defense Forces barracks.

The main objective was to deposit the bombs as close to the barracks as possible, without doing any harm to the occupants within. This was used as a diversion method for the incoming troops.

The mission, being a complete success for the new aircraft, left many people wondering whether the United States Air Force should have used the F-117A rather than any of the numerous attack aircraft in their existing inventory.

The F-117A had no trouble entering unobserved on the morning of the 20th. It's sophisticated technology had only a small, unmanned Air Traffic Control TI ASR-2 radar to worry about.

With the numerous mountains in the area, it merely slipped into its target, completed its mission, and left.

Additional Air Force officials stated that the F-117A was used in the mission due to the uncertainties of what type of combat capable aircraft were available to the Panamanians through Cuban aid.

The F-117A Stealth Fighter has an

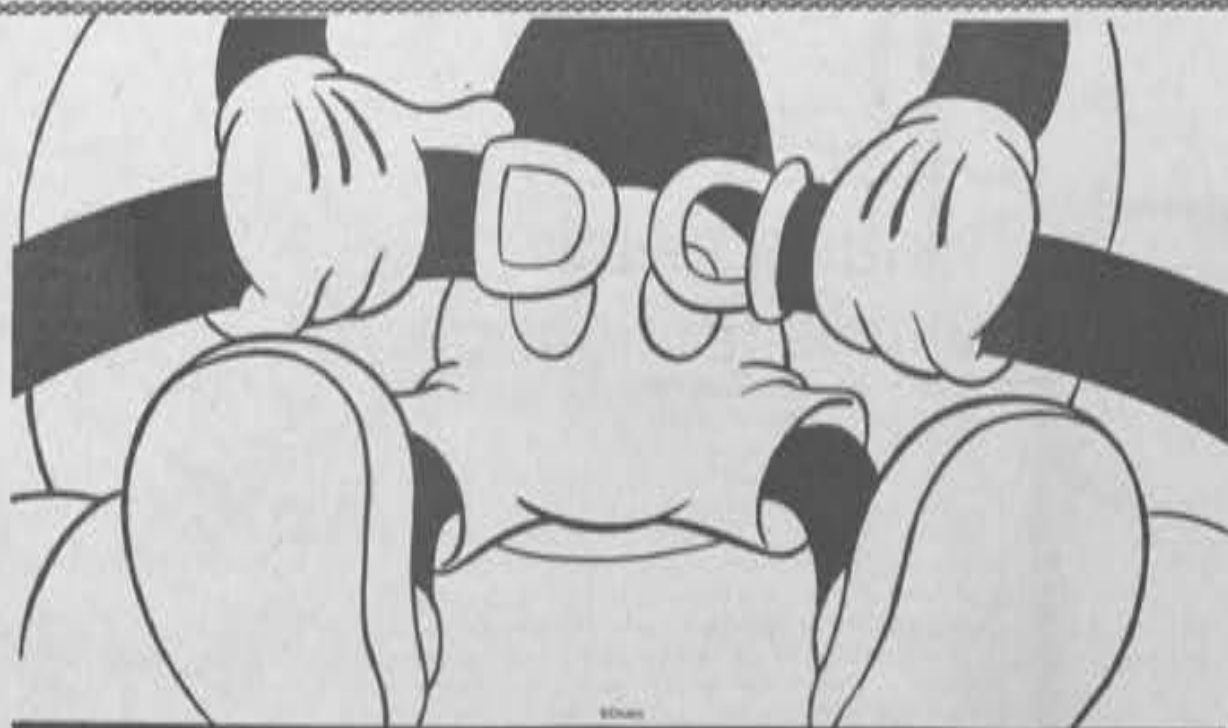
unusual surface area, with sharp contours and high elevated angles. This is to help the aircraft obtain its stealth characteristics.

The F-117A also carries all of its weapons internally for further stealth properties, thus it must open its weapons bay doors to drop any type of defensive or offensive weapons.

The F-117A is believed to have high transonic capabilities, but is not able to reach supersonic speeds.

With recent day flights over its home base, the F-117A is becoming day after day, a more open topic to the public and the aviation community.

The F-117A program will, however, remain secretive for at least the next few years due to the fact that the F-117A is one of our most current and advanced aircraft.



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## Midwest Aviation Museum offers the most for warbird enthusiasts

by Ron Young  
Aeronautica Writer

When it comes to historic military aircraft, the Midwest Aviation Museum, located in Danville, Illinois offers both flying and static aircraft displays to the Warbird enthusiast. The museum combines various military artifacts and other aviation related items to compliment its growing aircraft collection.

In 1977 the museum's founder, Butch Schroeder, started out his collection with the purchase of a North American T-6 Texan. Three years later, a P-51D Mustang became the museum's second Warbird purchased. Over time, a second P-51D was added along with a rare Fairly Firefly and a recently purchased North American T-28A.

A strong interest in the growing Warbird movement has continued to lead Mr. Schroeder in extending his museum from not only collecting ex-military aircraft, but to acquiring other military related items as well. Displays include military literature and posters, American, German and Japanese artifacts, uniforms of the armed forces, a rare Norden bombsight and scale aircraft models by Joe Davis. These displays, combined with assorted aircraft engines and various components provide the visitor with an overall view of past military aviation.

Currently, only one of the museum's aircraft is in airworthy condition. Several others are in various stages of restoration. The museum's chief mechanic, Mike Vadeboncoeur, has the onerous task of maintaining and preserving the museum's wide variety of aircraft. A breakdown and history of each is provided.

The North American T-6 Texan was the Army Air Force's principle advanced trainer used throughout WWII. The museum's T-6 was originally a navalized version, designated the SNJ. It was later remanufactured into a T-6G for the newly formed USAF where its primary duty was that of an instrument trainer. Upon release from the military, the trainer saw use in cloud seeding operations

until being sold to a private individual. In 1977 the museum acquired the trainer and promoted it at various local airshows.

In 1986, it was decided to restore the T-6 and reassemble it in stock configuration. This involved taking the fuselage down to the frame, overhauling the engine, and cleaning and inspecting all components. All control surfaces and cables have also been replaced. The only items not taken apart has been the wings. With the quality of work shown and the attention to detail this will be one of the finest Texans flying. Completion of restoration is targeted toward late July in hopes of attending the annual Oshkosh Convention and Fly-In.

Currently the museum's only flying aircraft remains the North American P-51D Mustang. The P-51D was one of America's best all-around fighters of WWII. The museum's P-51D served faithfully with the Air National Guard units of Indiana, Iowa and Pennsylvania before being placed in military storage. In 1968, the fighter was remanufactured to like-new condition by Cavalier Aircraft Corporation of Sarasota, Florida where it was then sent to El Salvador to be used with their own Air Force. The plane was then sold surplus in 1974 and returned to the United States. In 1980, the Midwest Aviation Museum purchased the aircraft where it was then given the nickname *North American Maid*.

The second P-51D Mustang, owned by the Midwest Aviation Museum, is a very rare F-6D reconnaissance version. The main difference of this model included the addition of three aerial cameras and their associated viewing windows. This particular aircraft is also unique in that it has never been flown in civilian hands. The military history of this particular plane is also presently unknown.

Restoration of the F-6D is currently underway. The project began in 1981, shortly after purchase and has slowly progressed through the years. Little corrosion was found upon inspection and most original parts were found intact. Approximately 90 percent of the fuselage has been res-



Mustang muscle...

The North American P-51D, *North American Maid*, saw service with the Air National Guard and El Salvador's Air Force before falling into civilian hands. This aircraft regularly attends local Midwestern airshows. A second P-51D is currently undergoing restoration.

kinned and all control surfaces have been rebuilt where necessary. All structural work done was of the highest quality. Much credit must be given to Robert Young for his effort. The final aim of this project is to make the Mustang as original as possible, this includes guns, radios, and cameras.

The only non-American aircraft in the collection is the Australian Fairly Firefly. It was primarily used as a carrier-based anti-submarine fighter in the 1950's, and last flown in the early 1960's. The museum's Firefly is one of only a handful left in the world. The plane is fairly complete minus the vertical stabilizer. Plans are to eventually restore the aircraft when time permits along with "Americanizing" all hardware and assorted components.

The last and most recently purchased aircraft in the collection is the North American T-28A Trojan. It last saw service with the Mexican Air Force as their advanced trainer before being sold surplus to an individual in Indiana. It eventually made its way to the museum last summer. Overall, the Trojan is in fairly complete shape, with the only damage arising from minor shipping problems. Expected plans include inspecting, repairing and detailing as necessary to make the trainer flyable once again.

The Midwest Aviation Museum is located at the Vermillion County Airport just outside of Danville, Illinois. Quality restorations, attention to details and a desire to preserve historic aircraft make this museum noteworthy of much attention and praise.

**Currently, only one of the museum's aircraft is in airworthy condition, several others are in various stages of restoration.**

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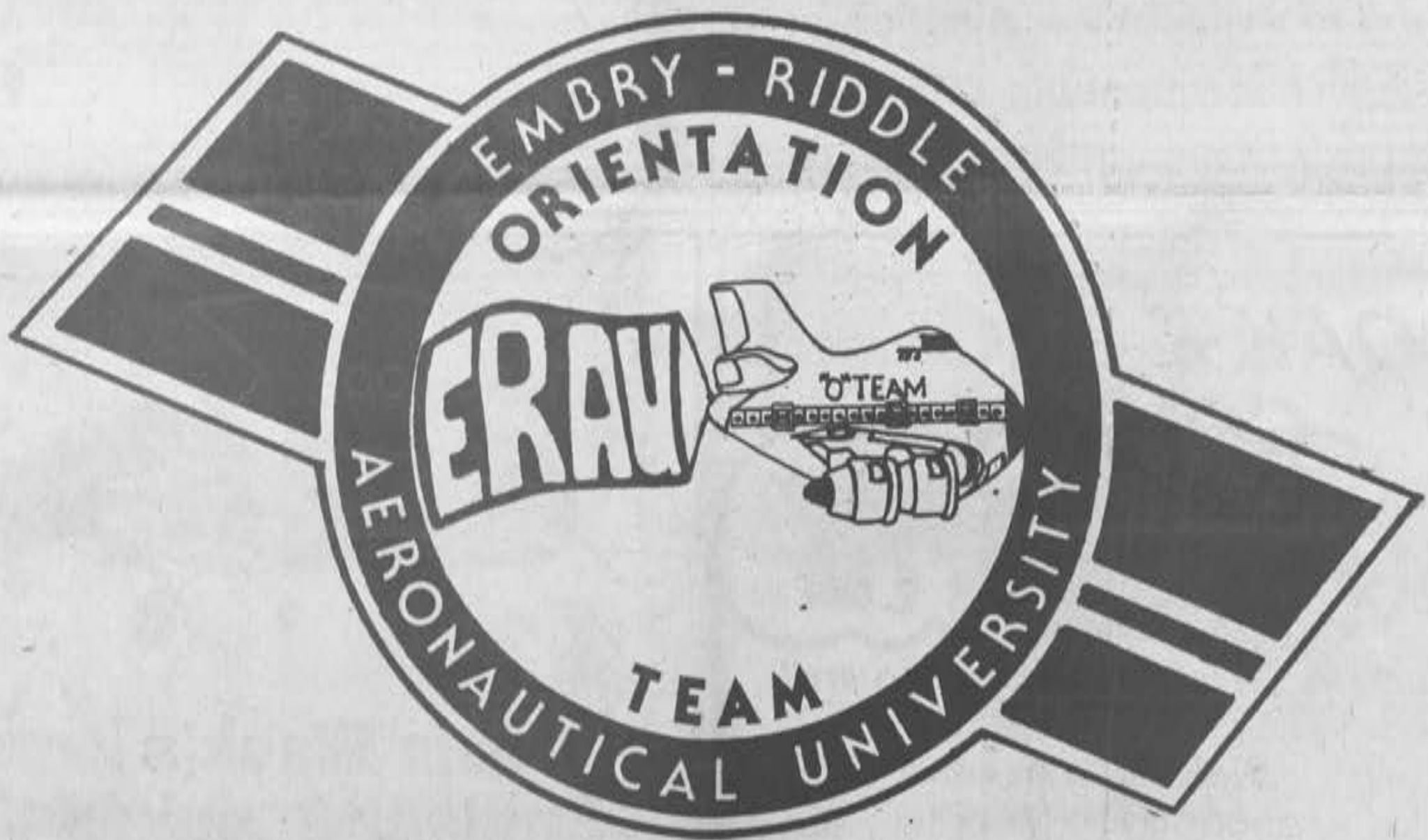
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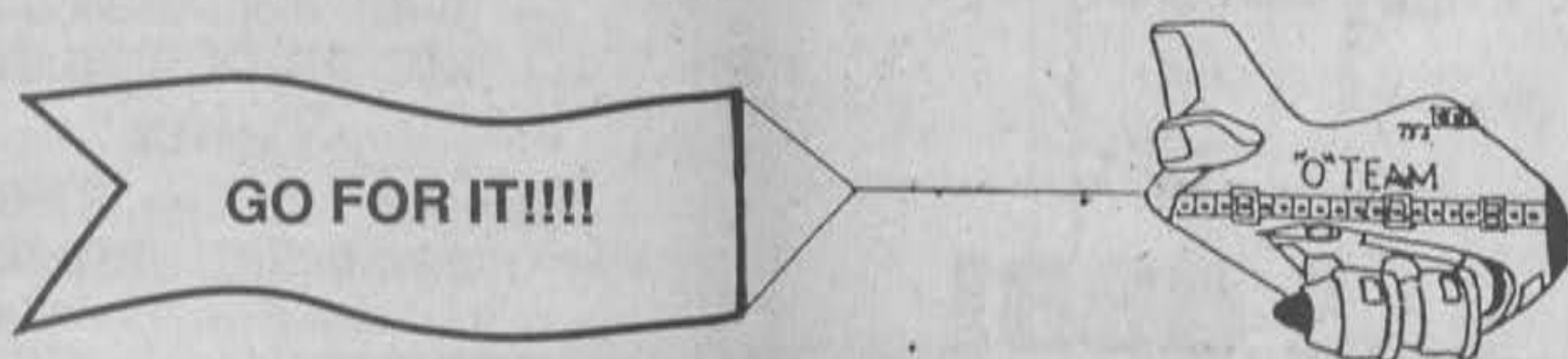


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# Commodore Amiga moves to forefront of technology

by Jason Simon  
Data Tech Editor

There are many different computers available on the open market today. But there is a relatively new competitor in the field. It stands in the shadow of big blue IBM and the big Apple, but this new computer is making the major competitors sweat. This computer is the Commodore Amiga.

The Commodore Amiga's roots lie in Europe, where in the early 1980's a small group of entrepreneurs started out with an idea for a state of the art computer. The company was known as Amiga-Lorraine. Due to financial problems the company ended up being bought out by Commodore in the Fall of 1984. Unfortunately Commodore, as a company, was in terrible financial shape. As a result, Commodore 64 and related systems had fallen off tremendously. In addition, Commodore owed its creditors over 65 million dollars. Even the best financial minds thought that Commodore was ready to fall into bankruptcy. The purchase of the Amiga company was their last hope to stay alive.

Commodore released the first working model of the Amiga in October, 1985. After sinking most of what money was left into research and development, there were limited funds left to promote the computer. Despite the

silent entrance into the computer field, the machine thrived on its own merits. After only six months on the open market, the Amiga 1000 computer allowed Commodore to climb out of debt and shock even the best investment analysts.

But what makes the Amiga so special? First, while many computers only offer 16 or so colors, Amiga offers 4096 colors on screen in a stock machine. Secondly, Amiga offers the best, if not the only, four channel stereo sound. In addition the Amiga is the only personal computer to offer true multitasking abilities.

"Multitasking is the ability of a computer to be able to perform separate tasks, running in separate screens, actively at the same time," said Lynn Willis, owner of Computers Plus. "Amiga is the only computer to offer this. In an IBM you can have, as an example, a spreadsheet, a database and



Over a billion colors...  
The Commodore Amiga can choose from a palette of over one billion colors to display 4,096 simultaneously.

a word processor resident at the same time, but they all can not run separate tasks at the same time."

Debbie Willis adds, "Don't be fooled by other companies that offer the ability to format a disk while running a word processor and call it multitasking, because that is not multitasking."

But is the computer user friendly? Lynn Willis states that "The Amiga is the most user friendly system available, the system uses a mouse and icons [a special type of on screen picture] to activate programs and other commands." Basically all you need to know how to do is the mouse button to run this machine.

Amiga is also a leader in the world of emulation. There are many IBM PC clones out there, but Amiga, with an

expansion card, can emulate a true IBM. But for those who only need to use an IBM on occasion, there is a software package that can partially emulate IBM. In addition there is the AMAX system. For around \$300, the Amiga can transform into a true Macintosh. Where else can you get a computer that can run two other computers for much less than the cost of the three computers separately.

Many companies use Amiga in the workplace, ABC used the Amiga to provide background for the cancelled Max Headroom television series. Disney currently uses the Amiga to run the sounds and many of the explosions found in the Indiana Jones ride at the new MGM studios, in addition to the rendering of the Three Men and a Baby movie logo. Locally, the Amiga is used to generate and control the laser light show at the Daytona Beach Planetarium.

This computer must be expensive, right? Wrong. An Amiga 500 computer package with an NTSC color monitor, capable of rendering all 4096 colors, costs about \$1000.00. A relative bargain for a computer today.

Overall it seems that the Commodore Amiga is taking the computer industry by storm. It may well end up as the computer of the 1990's. For more information on how an Amiga could benefit you, feel free to contact your local Commodore Amiga dealer.

# IBM clones gain respectability for both price and quality

by Joe Cambron  
Managing Editor

Many new, and even some veteran, computer users are unaware of the savings they may take advantage of by buying "clone merchandise." Clone merchandise is defined as a close replica of a name-brand product, in this case computer equipment.

### The history of clones

Most clone merchandise is built around the IBM PC, XT, and AT series of computers. Each of these computers is successfully faster and more capable and, of course, more expensive. IBM no longer makes any of these systems, for they have moved on to a new standard, Personal System 2.

The present problems at IBM are representative of the forces rushing against the sides of the clone industry. Their new standard is much more expensive than even their older, overpriced equipment was. This, and the general lack of applications (software, modems, memory cards, disk drives) for the new standard are slowing its potential grip on the industry.

Ironically, it is the overwhelming support by other product vendors that made IBM's first personal computer line so successful. So successful, in

fact, that clone vendors are in no rush to upgrade to IBM's new equipment standard. This is partly because IBM is closely watching its patents, and charging lucrative fees for the privilege to imitate its newer products.

A group of clone makers have even banded together to closely duplicate, or even improve upon, IBM's mysterious Microchannel (an architecture that allows a computer to interact with its respective parts). This elusive difference is effectively the only improvement over the system and the clones that IBM has left behind.

These days a careful buyer can nearly duplicate even IBM's newest products for between 30% and 80% less than IBM charges its customers.

### Computer types

Three main designations are important to remember when buying IBM compatible computers, although the lines between the products are blurring.

The IBM PC/XT standard:

The original IBM PC/XT came from IBM with an 84 key keyboard, a Monochrome Display Adapter(MDA) and monitor, an 8088 microprocessor (the computer's

**Most clone merchandise is built around the IBM PC, XT, and AT series of computers. Each of these computers is successfully faster and more capable.**

brain), 256K memory, a 180K 5.25" floppy disk drive, and as an option a five or ten Megabyte hard drive (a built in data storage device).

By the way, for those confused about memory, one bit is either a zero or a one to a computer, and bits are all a computer can understand. On or off is the extent of their capabilities. Eight bits form one byte. Two (on or off) to the eighth power is 256, which is how many characters (letters, numbers, asterisks, etc.) the computer can recognize. Therefore, one byte is the ability to store one letter.

Thus, a 180K disk holds 180,000 characters of text, K stands for kilobyte, or one thousand bytes. A 10 Megabyte hard disk holds 10,000,000 bytes or characters, so it could store a 10,000,000 word report.

Getting back to the PC, though. When it was built in the early eighties, 180K floppy drive, and a 10 Megabyte

hard disk were more than most people could use. These days floppy drives routinely hold 1.4 Megabytes and hard disks can be bought to hold nine gigabytes (a billion bytes). These days one program often takes two megabytes of disk space.

The microprocessor, an 8088, is an 8 bit processor, meaning it can process one byte or character at a time at a speed of 4.77 MHz.

A PC is still a PC, even if larger drives are installed and the memory is increased. When you change the microprocessor and the circuit board it sits on, however, it becomes something else.

The IBM AT standard.

An AT from IBM generally contained a megabyte of memory, a 1.2 megabyte high density drive, a larger drive, and most importantly a 6MHz 8086 sixteen bit microprocessor.

The 8086 allows the computer to operate well-over twice as fast as the XT's, thus cutting down the time spent waiting and making spreadsheets and graphic related programs much more usable.

The internal improvements on the AT are numerous and two complicated to mention, or even understand. These improvements are all contained on circuit board of the 8086 processor.

PS2 is the last of these designations and since clones of these systems are not available they are not relevant to a discussion of clones.

### Buying clones

A clone XT these days usually comes equipped with a 360K 5.25" floppy drive holding twice as much data, a retrooled 8088 Turbo processor which operated at as much as 15 MHz—three times faster, a Hercules monochrome screen (Hercules allows the viewing of green shaded graphics where as MDA could only display those 256 characters), 640K memory, and they often include the newer 101 key keyboards.

A clone system like this one can typically be bought new for less than \$650. Adding a hard drive usually costs about \$200-\$400, depending on

its size. A clone AT usually contains an 80286 microprocessor which enables it to operate about ten times faster than the PCs. The 80286 is sixteen bit. An 80286 system with a 10 Megabyte hard drive, 1.2 Megabyte floppy drive, monochrome monitor, and 1 Megabyte of memory usually costs about \$1250.

For about \$400 more, one can purchase an 80386 based machine which is a 32 bit machine. This boosts its performance to as much as fifty times the speed of the PC. The recently released 80486 is a 64 bit machine that can operate about 60-80 times PC speed.

Although nearly all clone vendors offer warranties, customers are usually reluctant to ship their PC or AT off to an outside repair facility.

On the other hand, the possibility of more than one part failing after a week of operation is infinitely small, even with clone merchandise. Best of all, these repairs nearly always require only a screwdriver.

With the world moving towards what seems to be the infinite use of data technology, there has never been a better time to buy a computer.

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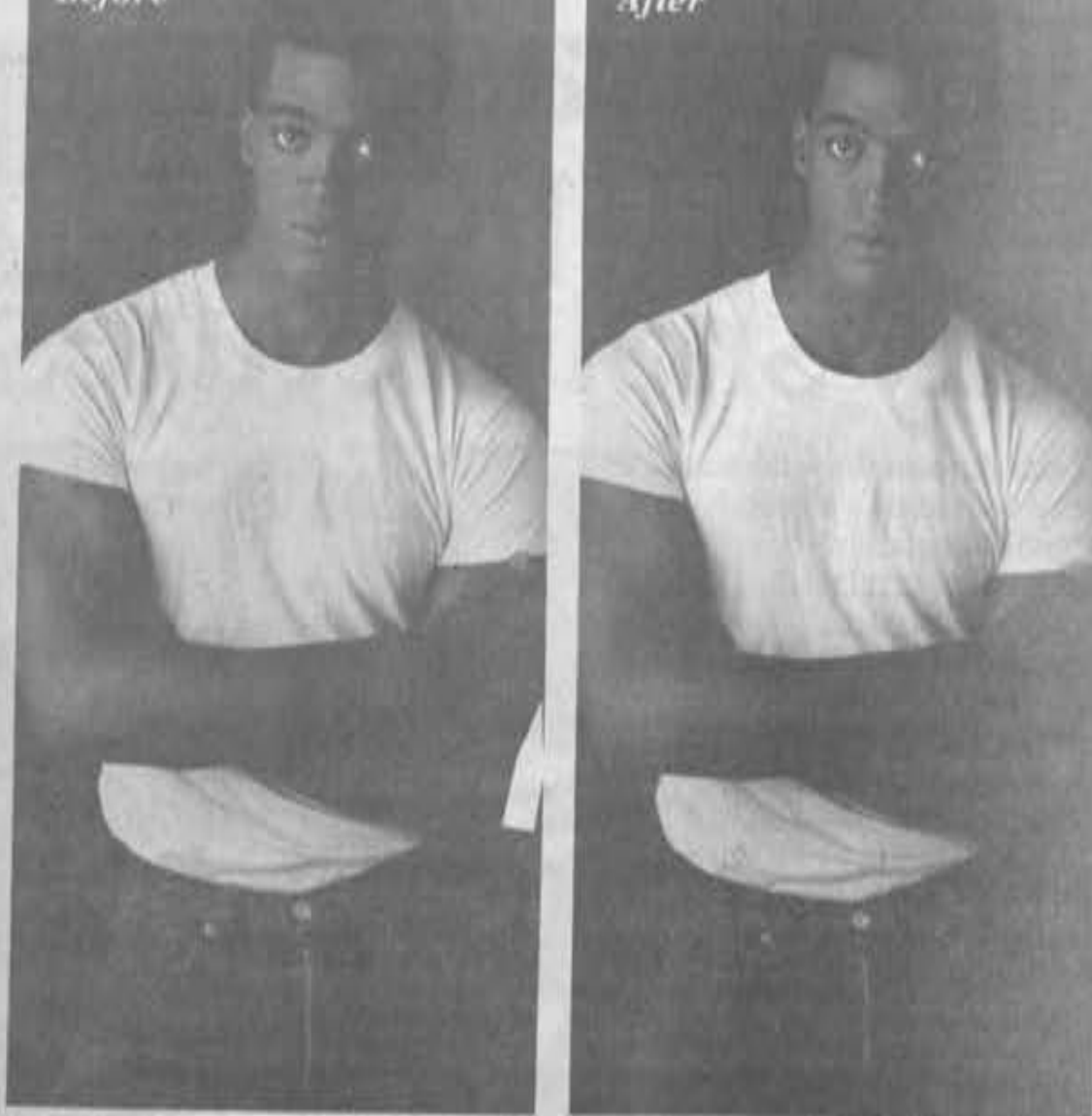
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**When you turn 18, register with Selective Service. It's quick. It's easy. And it's the law.**



# Red Hot Chilli Peppers strive to overcome party band image

by Brian Gerk  
Diversions Writer

The Red Hot Chili Peppers have been consistently plagued by the disparaging label "party band." Following the crest of the waning Los Angeles hard-core era, these energetic youngsters carved their own niche in the alternative music industry. Though we have recently seen numerous bands trying to emulate their unique style, the "Red Hots" maintained a singularity all their own for a number of years following their first underground hit "Fight Like A Brave."

This bad bunch of the L.A. basin frequently played sold-out gigs that were always memorable if not entirely safe to those patrons that ventured too close to the stage. Damaged fans and venues have always been a part of the Chili Pepper phenomenon. Popularity, energy and good times for all were synonymous with this band.

Then Hillel Slovak died. For a moment, a small portion of L.A. stood still and mourned the loss of the guitarist that helped catapult the Red Hot Chili Peppers to their contem-

porary position in the rock industry. Musicians and critics alike mulled over his demise, an anti-climactic drug overdose in the decade of "just say no." The three remaining band members expressed their concerns over the survival of the band, much less their own mental welfare without Slovak. The goofy image of the band playing sets wearing nothing but strategically placed Argyle

**For a moment, a small portion of L.A. stood still and mourned the loss of the guitarist**

socks wore understandably thin in retrospect. With the release of *Mother's Milk*, we see more than anything the tremendous influence that Slovak had on the personal and musical lives of the Chili Peppers. The album is brimming with testaments to Slovak, but if you are looking for weepy odes, you'll be hard pressed to find anything so base in *Mother's Milk*. Instead this band lets loose with a barrage of hard-hitting cuts that can be fast, off-beat and funky, such as their cover of Stevie Wonder's "Higher Ground," or the other end of the spectrum, "Knock Me Down" their memorable opus about Slovak himself.

The album begins with "Good Time Boys," a thundering creed to what the Red Hots strive to be, one of the most fun bands in the world. They pledge allegiance to a complete lack of professionalism and good conduct. They deliver whimsical kudos to fellow Los Angeles irregulars like Thelonus Monster, FIREHOSE, and ex-X leadman, John Doe. The Los Angeles Lakers even received their own adulatory song, appropriately called "Magic Johnson."

Deep down though, *Mother's Milk* cannot be taken lightly, the death of Slovak forced the Chili Peppers to reckon with the issue of drug abuse in their own lives and the lives of others. They have done alot of growing up in the past two years. We hear Kiedis sing of his memories of Hillel in "Knock Me Down."

"I think of you most every day, why did you have to go away... I'm not bigger than life, if you see me getting high, if you see me getting mighty, knock me down."

*Mother's Milk* makes pointed jabs at another group that the Red Hots have had to share L.A. with, Guns & Roses. Their understandingly low opinion of the highly commercial Axl Rose is made apparent in "Pink Rock Classic,"

which ends with a guitar riff that sounds disturbingly similar to "Sweet Child O Mine."

"Compromising each and every ounce of soul, I'm doing anything for the records of gold..." mocks lead singer Kiedis "put us on MTV, all we really need, begging on our knees, please please please please."

The Chili Peppers also include their version of the Hendrix classic "Fire" that they had previously released on their popular E.P. *The Abbey Road Sessions*. This was one of the last songs that Hillel Slovak ever recorded, and his spontaneity, if not technical superiority, shines through. Above all though, we see how bassist/all around musician extraordinary Flea has progressed through the years. His absolute mastery of music is truly brought to light with "Pretty Little Ditty." The name seems to discount the serious nature of this song, but it is a rare gem among the usual treasures that the Chili Peppers provide us with on this album. Granted there are some songs that are little more than stomping concert fillers for the fans to work themselves into a frenzy over, but in the end this is easily the finest effort that the Red Hot Chili Peppers have delivered to date.



**Sizzling veggies...**  
Red Hot Chili Peppers have been able to flourish despite the death of their guitarist Hillel Slovak.

## Movie Rating System

- \*\*\*\*\* **In Flight**  
An excellent, movie worth seeing twice
- \*\*\*\* **Takeoff**  
A good movie, worth the money
- \*\*\* **Taxiing**  
A fair movie, worth seeing
- \*\* **At the Gate**  
Wait for the videotape
- \* **Crash and Burn**  
Not worth time, or money

## Top videocassette rentals:

- |                 |                   |
|-----------------|-------------------|
| 1. Working Girl | 6. Beaches        |
| 2. Roger Rabbit | 7. Dream Team     |
| 3. Rain Man     | 8. Naked Gun      |
| 4. Major League | 9. Her Alibi      |
| 5. Pet Semetary | 10. Tequilla Sun. |

## New videocassette releases:

- |                                                   |                                                                                |
|---------------------------------------------------|--------------------------------------------------------------------------------|
| 1/31<br><i>Indiana Jones and the Last Crusade</i> | 2/8<br><i>Lethal Weapon 2</i><br><i>Rude Awaken.</i><br>&<br><i>Parenthood</i> |
| <i>Pink Cadillac</i>                              |                                                                                |

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# Always rates as perhaps the best post-war flight film

by Joe Cambron  
Managing Editor

It now appears that Steven Spielberg is responsible for one of the most gripping tales of aviation in the post war age. Though this is not the focus of the film, it does provide the background to a remake of the Spencer Tracey war classic, *A Man Called Joe*.

This version of the old film is entitled *Always* and features a competent and well-known cast in a story of letting go. Richard Dreyfuss plays a hot-shot pilot doing battle with the forces of nature in his B-25. Dreyfuss and his friend, played by John Goodman (*Rosanne*, *Raising Arizona*), are seemingly little more than glorified fireman, but that is hardly the case. Their quest to extinguish forest fires is often breathtaking, as is demonstrated in the film's opening scene.

The movie opens as two fishermen cast their lines on a quiet Idaho lake. In the distance, a seaplane makes a slow approach, undetected by the fishermen. About a half mile away the plane touches down on what appears to be a collision course for the small skiff.

The fishermen, seeing their predicament, attempt to start the engine but are unsuccessful. Just as a collision is eminent, the plane lumbers back into the air, now carrying a cargo of water desperately needed to douse the

forest flames.

Putting out fires, however, is not quite like dropping bombs from the safety of the near stratosphere. "Fire bombers" must drop their loads from tree top level, an altitude where heat and danger are inescapable (Whether this is truly the case is in dispute). Smoke and burning branches often obscure any chance that visual confirmation of the ground level is possible. Even at the low speeds of a B-25, this process is in the least hair-raising, "seat-of-the-pants" flying.

The base from which the pilots operate is sequestered in the Idaho mountains where little else than flying is available as entertainment. Dreyfuss' character takes his entertainment seriously, and therefore takes every risk presented to him. Urging him to give it up is his girlfriend, played by Holly Hunter. Constantly worried and known to



wake up "in cold sweats" thinking about his flying, she finally convinces him to accept an instructor position in Flatrock, Colorado, but not before a final mission. One from which he does not return.

His death is not easily forgotten by either Hunter or Goodman, but least of all of Dreyfuss himself. After facing his death, he is directed to assist another pilot in overcoming his lack of flying confidence at what is now Goodman's flying school in Flatrock. His new assignment, however, is merely a ploy by the powers of spirit that is instead intended to allow Dreyfuss to let go, of life. For it is his trainee that falls in love with Hunter, causing him great pain.

*Always* is an unusual movie, even by Spielbergian standards. Its grasp of the supernatural is often strange and

primarily not expected, but it does not intrude. It must simply be accepted, much like *Ewoks* and *Vulcans*.

John Goodman gives his consistently outstanding performance as the befuddled friend. As with *Sea of Love*, Goodman's part is large enough to let a good deal of his personality shine through, to the delight of moviegoers.

Holly Hunter, who also appeared in *Raising Arizona* with Goodman and *Broadcast News* with William Hurt, was again vivacious and lovable while proving convincing. Cast as a feminine tomboy, Hunter is hard to resist. She cannot understand, though, why Dreyfuss' character is so willing to give his life for something as mundane as a tree.

*Always* bears great resemblance to a war movie which is where *A Man Called Joe* was set. The officers club/bar at the isolated fire field would have fit well into rural England in 1943. Still, the change of scenery is breathtaking, as are the special effects which place you over the pilot's shoulder through a rain of fire and smoke. As Goodman's character put it, "In the war they bombed to start fires. We bomb to put them out."

*Always* should be a joy to any aviator, or any fan of its participants. (\*\*\*\*\*)

## Dissidenten breaks onto scene despite barriers

by Jason Simon  
Diversions Writer

*Out of This World* is the latest album by the German group Dissidenten. While the titles and the language used may throw off some prospective listeners, the songs are well conceived and feature dynamic use of both rock and classical instruments.

*Out of This World* features some unusual titles for the songs. Side one features "Three Fish In The Desert", "Cairo By Night", "Walking The Camel", "Shake The Sheikh" and "The Dreams And The Loaf Of Bread".

Side two features "Grand Babylon Hotel", the title track "Out Of This World", "Radio Arabia", "Urban Derivish" and "This Is Not America".

The group itself is comprised of Friedo Josch (flutes and vocals), Uve Millich (bass, guitar and vocals), Marlon Klein (keyboard, drums and vocals) and Roland Spremberg (keyboards). In addition to the members of the group, Dissidenten (which is German for "dissidents") features many Arabic musicians which adds to the quality of *Out of This World*. But the most impressive background came

from the National Orchestra Of Morocco.

The best way to describe the musical experience derived from *Out Of This World* is lighthearted rock with a blend of modern classical music. All tracks feature excellent listening music, the only real detracting feature is that the vocals, in some parts, do not fit the music being played.

The main difference between Dissidenten and other foreign groups, such as Roxanne, is that the songs on this album are sung in Arabic instead of English. Band member Uve Millich explains, "Much of the world receives English music, yet doesn't understand the lyrics. We thought, why not do it in Arabic?...Our lyricists, Cherif Lamrani and El Housaine Kili, are talking about real things in north Africa. That's a big part of our success in those countries. The lyrics are real."

Overall Dissidenten proved themselves to be a driving force in modern music. Those who enjoy light listening as well as those who enjoy rock would be impressed by the quality of this music, which is aptly described as "Moroccanroll".



### Moroccanroll...

German group Dissidenten provides a novel sound that is easy to listen to despite a language barrier.

## SGA Video View:

### Nightmare on Elm Street: The Series lives up to its reputation

by Jason Simon  
Diversions Writer

This is the movie that started the series of nightmares, the original Freddy film. *Nightmare On Elm Street* started a small cult among horror movie fans and even after four sequels this movie stands alone.

The movie starts out in a boiler room with Tina, a young high school student, running away from an unseen stalker. She soon gets trapped, then, for the first time, the scorched face of Freddy Krueger. He doesn't kill her yet, just trying with her. Eventually he kills off Tina in one of the most violent slasher scenes ever written into a *Nightmare* script.

Tina's friends, Rod and Nancy, are worried that they will be next in line for Freddy's knives, because they are having the same nightmares.

Freddy goes on to kill Tina's boyfriend Rod, who was implicated

in Tina's death. Then kills off Nancy's boyfriend, causing a tidal wave of blood to come spewing out of his bed.

Nancy is now next in line for the ax, but she remembers a saying her dead boyfriend once had. He said "If you turn your back on the creatures in your nightmares then you rob them of their powers." Nancy also discovers that she could be able to pull Freddy out of her dream when she wakes up. So she sets up an ambush to trap him.

Unfortunately the back up support she needs from her father never comes and she must fight her way around Freddy until, realizing that he is a figment, she turns her back on him and he becomes powerless.

But this is not the end of the movie. To find out what comes next go down to the SGA office where you can rent *Nightmare On Elm Street*, or choose from over 200 other titles in their vast collection.

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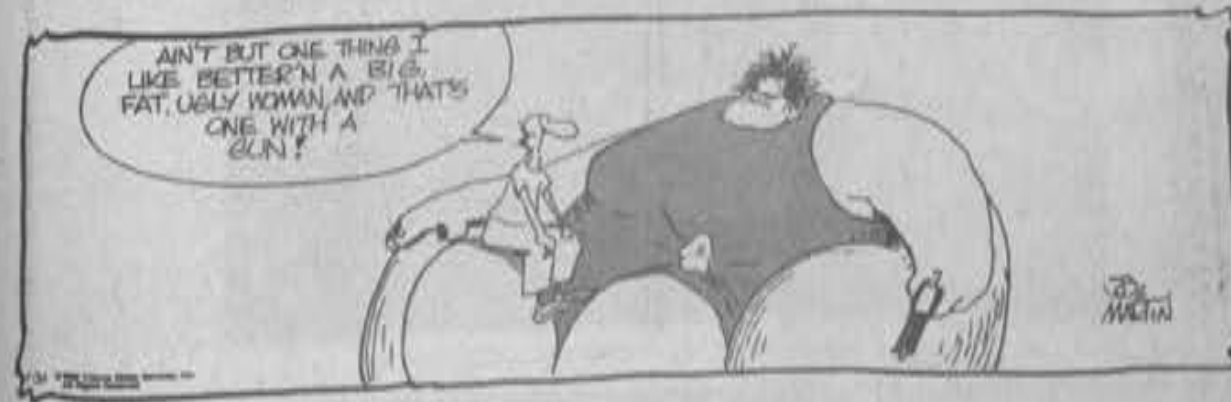
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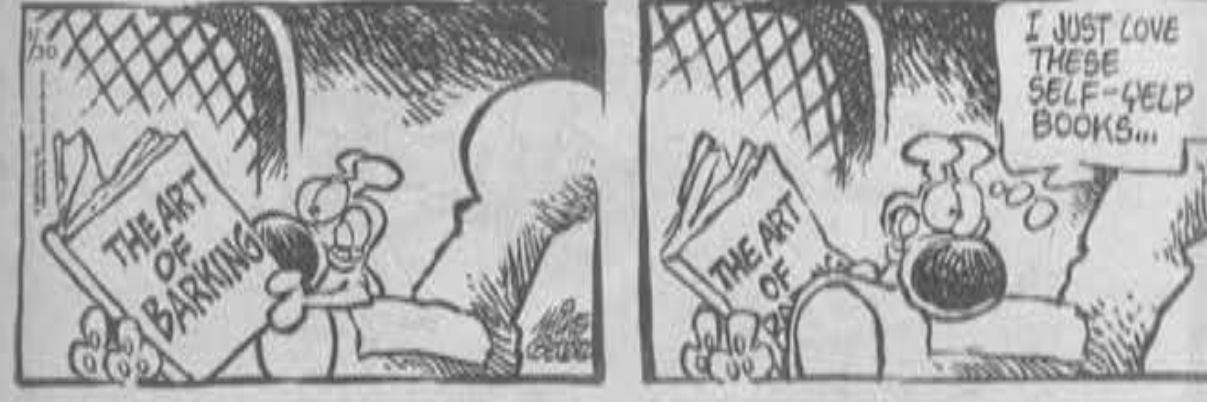
While Farmer Brown was away, the cows got into the kitchen and were having the time of their lives — until Betsy's unwitting discovery.



"What are you gonna tell your dad, Chuck?"

Mother Goose and Grimm

by Mike Peters





Notices

Counseling Center Programs Spring 1990

Experience+Plus!

We are looking for "non-traditional" students who are interested in getting with other such students to join our group called "Experience +" here at ERAU. A "non-traditional" student is defined as someone who initially entered college after a break of four years or more from academic studies. The purpose of this group is to form a supportive social network as well as to discuss issues that affect the non-traditional student. The group will meet for monthly luncheons.

If you are interested, please contact Lynne Norris or Patty Ruddy in the Counseling Center, 239-6035 for further information.

Communicate! An Experimental Group

One of the largest pitfalls in today's relationships occurs because of the misperceptions that cause conflict between people. Statements such as "I can't understand my girlfriend/boyfriend/the other sex..." will be addressed through viewing video clips from current popular television programming. The group will meet weekly for two hour sessions, during the weeks of February 5 - February 26, 1990. The group size is limited. Interested persons need to make an appointment, to discuss the group, in the Counseling Center during the week of January 29 - February 2, 1990.

Self-Management and Motivation

Tuesday, February 6, 1990 from 1:30 to 2:30 pm in the John Paul Riddle Student Center, Conference Room. Learn how to manage your time so that you can relax without guilt. Also learn how to get going when your get up has gone and went.

Passion Panel

Tuesday, February 6, 1990 at 8 pm in Dorm J Lobby. Relationship counselors, medical professionals and students will address questions regarding sexuality, dating, communications and related issues.

Lecture Note-Taking

Tuesday, February 13, 1990 from 1:30 to 2:30 pm in the John Paul Riddle Student Center, Conference Room. Information on how to efficiently take legible, helpful notes.

Self Hypnosis for a "Change"

Learn how to use self hypnotic techniques to build your ego, improve study habits, eliminate negative habits, solve problems, develop positive habits, explore your inner self and much more... The self hypnosis group will meet for five two hour sessions during the weeks of February 26 - March 26, 1990. The group size is limited. Interested persons need to make an appointment, to discuss the group, in the Counseling Center, during the week of February 19 - February 23, 1990.

Orientation leader position

Applications for Orientation Leader are now being accepted. Position descriptions and applications are available in the Counseling Center. Deadline to apply is Wednesday, February 7, 1990.

Degree completion and commencement

According to University Academic Policies and Procedures, every student must make formal applications with the Registration and Records Office for degree completion. Due to the fact that there are now two commencement ceremonies per year, new procedures have been devised. Formal application for degree completion may be made with the Registration and Records Office. A second form designates which commencement ceremony the student will attend, information for ordering cap and gown and information for commencement program. Both forms must be completed and submitted to the R & R Office no later than the application deadline published in the University calendar and the AVION "Notice" section.

Forms are now being accepted for April '90 and August '90 degree completion. If you are requesting April ceremony attendance, there is a separate form to fill out. Any Summer '90 degree completion people desiring Fall '90 ceremony attendance should so note it on this form. If you do not wish to attend either ceremony, only fill out the "Degree Completion" form. Forms will be left with the R & R Office and checked for eligibility. If you are found ineligible for degree completion or ceremony attendance, you will be asked to re-apply at a later date.

Applications received after the published deadline may cause the prospective graduate to relinquish privileges for participation in commencement exercises, publication of student information in the program, eligibility for Chancellor's award and announcement of graduation honors. Diplomas will not be available after the ceremony for "late" applicants.

Anyone who has already applied to the R & R Office for April '90 degree completion (and ceremony attendance) and received a preliminary evaluation need not re-apply.

Please be aware of your responsibility for reapplication in order that your degree completion may be a smooth one.

Attention April graduates

The first meeting for April graduates will be held in the Student Center at 8:00 p.m. on Wednesday, Feb. 7, 1990. Graduation information will be reviewed at that time. Elections for Senior Class President and Vice President will also take place.

If you are interested in running for Senior Class President or Vice President, please schedule an appointment to meet with Laurie Ranfos by Friday, Feb. 2, 1990. The Senior Class Council will be secured after the meeting on Feb. 7, 1990. The group consists of 20 to 35 volunteers for graduate's guests, raise funds for the class party, keep the class informed of their progress, and socialize prior to graduation. If you are interested in being on the council, we will meet immediately after the graduation meeting. (After the Senior Class President and Vice Presidential candidates meet with Laurie Ranfos please come or call the Avion office to schedule an interview to be included in the paper on Feb. 7. The deadline for interviews is Monday, Feb. 5 at 12 noon. Don't be late.)

Simuflite scholarship

The Simuflite Corp. of Dallas, Texas, has provided two scholarships per year to Embry-Riddle Aeronautical University students. This scholarship is composed of approximately \$8,000 in training in either the Citation or the King Air Phase II simulators and \$1,000 for expenses.

To be eligible for this scholarship, the following criteria must be met: 1) complete all degree flight requirements at ERAU, 2) currently enrolled as a full time student at ERAU, 3) Have a minimum CGPA of 2.8 with a minimum GPA of 3.0 in Flight and in Aeronautical Science course work, 4) Possess Commercial Instrument and Multi-Engine ratings, 5) Recommendation from a previous flight instructor and the appropriate flight training manager, 6) Two letters of recommendation from Aeronautical Science faculty. Candidate must have had each of the faculty members for at least one upper level course.

Pick up applications at Aerospace Office, 123 (New AWS building). Application data due into Aerospace by end of day on Friday, Feb. 2, 1990.

SGA elections

It's election time again! The SGA is now accepting applications for the positions of: President/Vice President, Student Finance Board/Student Representative Board and Chief Justice of Student Court.

Eligibility requirements must be met by all applicants. The completed applications must be returned to the SGA office by Friday, Feb. 9 at 4:00 p.m.

For any further information or questions please contact:

Tony Delauro 252-1103  
Mike Henderlong 756-4637  
Christy Kieth 252-9242

Colloquia Spring 1990

Date	Speaker	Topic
Tuesday, February 6	Dr. Yong Sun Florida Institute of Technology	Mathematics
Tuesday, February 20	Dr. Gary Howell Florida Institute of Technology	Mathematics

All colloquia will be held at 1:30 pm. For further information call Wanda at 239-6709.

Sign up for fall 1990 housing

New contracts for university-managed housing for Fall 1990 and Spring 1991 will be available in the Department of Housing during Feb. 5-16 in Room 278 of Residence Hall II. If you are interested, you need to complete the contract, pay \$150 prepayment, have the Cashier validate your contract, and then submit it to the Housing Office. You may complete this process anytime during this two week period; however, any contracts submitted after Feb. 16 will be placed on a secondary waiting list. Contracts for continuing students will be randomly selected for the available spaces. Therefore, this does not guarantee everyone a space.

Housing fees for the Fall 90 and Spring 91 terms are as follows:

Residence Hall I	\$860.00
Residence Hall II	\$860.00
Apartment Complex I	\$808.00
Apartment Complex II	\$860.00

Creations editors and submissions needed

All those who expressed interest in "Creations" in Fall 1989 are requested to contact Ms. Berg ASAP so the staff can read and organize submissions. Submissions are being accepted now at Rm. A-230, mailing A-EH or student box 5998.

Editors please contact Ms. Berg in Rm. A-230 right away, so we can get rolling on this.

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- Take a stroll on the beach at 3 a.m. all by yourself.
- Take lots of cash and cram it in your pocket—along with your credit cards.
- Tantalize thieves with an overstuffed purse.
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Visit Capt. Jaffry, University Center, 5-7 February 90, 10:00-2:00pm



## → Autos for sale

1980 VW Scirocco—Good engine, clean interior, sun roof. Needs some body work. Runs great—a nice sports car! Only \$850 Call: 239-9437.

1980 Dodge Omni—4 dr, good condition, automatic, AC, PS, PB. All repair receipts. Asking \$1300 O.B.O. Call Don 756-2377.

1976 Toyota Corolla—AC, stereo, great gas mileage. Runs super. \$800 Steve Box 1284.

1980 VW Rabbit—Hit front left. Still runs. \$200 238-3751.

1984 Jetta GLI—83K miles, AM/FM stereo. Good condition. \$3000. If interested, contact Liqueur Box 1112.

1986 Pontiac Sunbird—Great condition, mechanically sound, grey, sunroof, trunk rack, one owner. \$3800 O.B.O. Call Patrick 257-2043.

1987 Ford Ranger XL-T, 46,000 miles, PS, PB, AC, AM/FM Cassette, Bedliner, \$6500. 253-7159

1983 Chevy Chevette—Great condition. Just \$950. Call 255-2100 Wed.-Sun. 12 noon to 10 pm.

1983 Mazda 626—Still in good shape, reliable transportation, all automatic, air, warranty on transmission, I need your cash. \$2495. Call Mike after 5 pm 760-6618.

1988 VW GTI-16v, Sunroof, Trip Computer, AC, Red, excellent condition. Extended factory Powertrain Warranty. \$8500. 238-0800

1983 Nissan Sentra—Only 49000 miles, New Battery, Clutch, Exhaust, and Brakes, 5-speed. Ixc. Good \$2400. 788-3209.

1975 Oldsmobile 98 Regency—interior excellent, runs great. Very little rust, 1/4 quarter panel needs sanding and paint. PS, PB, power windows. Graduating and moving. Alan 238-0587.

Live on an airport! Room for rent in airport home at Massey Ranch Airpark. 3 bedroom, 2 bath, washer/dryer, jacuzzi. Taxway access to runway. Call Ron 426-0622. 20 minutes to ERAU. Male/female nonsmokers only.

Roommate wanted. Cypress Landings, Non-smoker, 1/2 utilities. \$270 a month. Call 257-6951.

Roommate needed to share a beautiful, clean, spacious 2 bedroom apartment. Fully furnished, microwave, dishwasher. \$205 monthly. Very low electric and telephone bills. Call Dan 238-0533.

Furnished room for rent. Only 1/2 mile from school. Rent includes electric, water, heat, central air, washer and dryer, and fully furnished bedroom. Cable TV, etc. No lease is required. Only \$230 per month. Call 255-9170 and leave message on machine.

Roommate wanted for summer A/B, and possibly fall/spring 90-91. Nice 2 bedroom furnished apartment in Island Club Pool, hot tub, tennis courts, cable, water, electric and phone. All for \$325 a month. Call Jeff 760-7417.

Roommate needed to share 3 bedroom, 2 bath house. 1 mile from ERAU. \$250 A month. Male or female. Must be non-smoker. 239-0065.

Roommate needed to share nice house in Port Orange. Close to ERAU. Very quiet central heat/air, washer/dryer, microwave, dishwasher, coffeemaker. Male preferred. \$235 a month, \$200 deposit. This price includes utilities!

2 rooms for rent. Furnished, private, with all utilities \$160 and \$180. Very clean and quiet. Kitchen use also. For sober, non-smoker gentleman. No lease. 258-5901.

Female roommate wanted. \$175 a month. Own room 3 miles from campus. 238-3339.

Roommate wanted—non-smoker, 2 bedroom, 2 baths from Ocean Center, \$160 a month plus 1/2 phone and electric deposit. Call Paul 257-5587.

Forest Lake Townhouse—\$3500 Cash, including all closing costs. Just assume our low interest FHA Mortgage Non-Qualifying Inst. 1 1/2 bath, 2 story w/ loft, Utility room, pool, lake, clubhouse. Close to ERAU & shopping. Must Sell 788-5503.

## → Misc. for sale

\*\$599 100% IBM Compatible \* Unopened, complete, super fast XT operates at 2.1 times IBM PC. 640K Memory. 101 Key Keyboard. Monitor included. Add \$200 for Hard Drive. Call 238-7355.

\*\$999 100% IBM Compatible AT \* This unopened, extra-quick, complete IBM AT286-12 Clone runs at 15.3 times IBM PC speed. Up to 4 Meg RAM possible. 0 Wait State. 1.2 Meg Floppy. Hard Drive and Monitor. Call 238-7355.

Rotweiler Pups—Podigreed Females, \$350. Call 253-6937 ask for Jean.

For Sale—Couch with Hilo-A-Bed-560, Beachmaster-535, Directors Chair-515. Call Kelly at 253-1125, leave a message.

For Sale—Waveless Water Bed. A complete water bed with 2 lamps, head board. Queen size. Valued for \$500 wants to sell for only \$230. Call Mad 238-0769.

For Sale—Water bed, super single, free flow with under-dresser. Asking \$100. Leave a note in Box 6364 or call 238-0375.

For Sale: Apple IIe computer with 2 megabytes RAM. Includes Multiram RGB, Multiram Plus, Monitor, all Cables, Software, and much more. Call 239-5965 or 253-9105 or ERAU 3325.

Hewlett Packard 12C Calculator for corp finance, managerial accounting or any finance class. Call me at 257-4233 and by one for \$50.00. Ask for Bob.

Rotweiler Pups—Podigreed Females, \$350. Call 253-6937 ask for Jean.

For Sale—Commodore 64 w/ printer, disk drive, and software. \$225 or best offer. Call Jon at 258-2445.

For Sale—20 Pro-Printer/Pro-Printer II ribbons. \$3 each or 5 for \$10. Contact Forest at Box 2247.

For Sale—40 Channel Cobra Base Station, 80 usable side bands. Asking \$200. Also Silver Eagle Mike with Presidential Seal. Asking \$100. Will sell combination for \$250. Call Greg at 257-1239 or Box 9265.

Selling \$300.00 off my CUSTOM CARD for only \$200.00. All legally transferable to your own card. Call Alyssa at 760-7106 or leave message at Box 8907.

## CLASSIFIED AD POLICY

- Non-commercial classified advertising and personals are free to the student body, faculty and staff of Embry-Riddle with a 35 word limit.
- All other non-commercial advertising is \$10 with a 35 word limit. Each additional word is 10 cents.
- Commercial advertising is available through the Avion advertising department.
- 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.
- No classified ads will be accepted over the phone.
- For more information, stop by or call the Avion office at (904) 239-6049.

Pilots: Dave Clark headset (1) H-1080 (1) H-1040 wholex intercom and P.T.T. Comes with bag. Almost new! Cost \$750. Sell for \$450. Aviate \$20. Steve 747-0786.

Sail Boat, 13 foot Bantree monohull with car rack. Easy to mount on any car! MUST SELL. \$400/best offer. Tom 760-3053. Leave Message

4-Sale: Commodore 64 computer, includes keyboard, disk drive(new), printer, and MANY games (copied and store bought). \$400.00 complete O.B.O. call Jay at 239-6567 Evenings or Box 4558.

Disks For Sale!!! 5 3.5" Disks with labels \$8.00; 1 3.5" Disk with labels \$2.00; 1 Disk Case \$5.00. Contact Jerry at Box 7703 or Computer Lab or Call 760-4992 to Place orders. Call for Prices on Qty. of 20 or more.

Waterbed For Sale Queen Size, Waveless, 1 yr, old, \$85.00. 238-0709 Call Dan or Mark.

12-Speed Schwinn Black World Sport, good Cond., \$160.00 neg., call Russell 238-1249.

For Sale Large Dorm Refrigerator, \$95 or best offer. Will Deliver. Brian or Dennis 760-7501.

Twin bed for sale. Nearly new - excellent condition. \$60. call 788-5051.

Why Pay More? Used prices less than Bookstore, Books, tools, and study aides for: MA 111, MA 112, MA 140, MA 141, HU 006, HU 123, HU 180, PS 101, ET 107. John 252-4240 or Box 8261.

16' Hubble Cat 4-sail. Wome w/tilt trailer, 1 bucket seat, cables for 2 trapeze, extra rudder and arms, extension stick, rigged for 1 man 68-up, misc. pieces. \$1600 firm. Possible finance w/9-100 down and \$100 per month. Todd 756-3933.

Inable Book For Sale Comes with Formatted Disks, \$40.00 Contact Raff, box 7321 or Call 760-7343.

For Sale—Weight bench plus over 200 lbs. of weights. Worth over \$150. Will sell for \$100 or best offer. Contact Matt at 255-3057 or Box 6767.

Flight Computer Aviate for Sale. Brand New \$35 - OBO. 252-5907.

Diamond Engagement Ring for sale - 3-diamond ring is centered by one marquise cut diamond surrounded by two round brilliant cut diamonds. Mounted in 14 karat gold. Appraised \$1,150 will sell for \$700. Call Scott 257-6847.

Need your papers typed? Let me do it for you. Typed, spelling and grammar corrected for only \$1.00 a page. Contact Matt at 255-3057.

Wanted: Dedicated Female workout partner for early morning workouts, 3 to 5 times a week. Cross-Train. Run, Swim, Bike, Nantilus. Call Jim, 252-5907.

Interested in learning FRENCH or currently enrolled in a FRENCH, and need some help. Please contact Agnes in Room 248 Dorm I, or at 258-9968, or leave a message in Box 1035.

Looking for all rated helicopter pilots. Would like to form club. Call Blake 239-0682

Wanted: I would like to buy or lease a PS303 book for the spring semester. Call Matt 274-1937.

Attention baseball card collectors: Are you interested in buying misc. cards? Players include but not limited to Mark Grace, Dwight Gooden, and Darryl Strawberry. Send your name and box # to box 5907.

Learn to SCUBA dive! PADI courses starting now. Join the scuba club and become a certified diver. Call James 255-5326.

Wanted: Used beach bike. Can pay approx. \$50.00. Call Terri 253-9062.

French conversation. Half-price for students. \$7/hr. Lady from Paris. Need only 6 months to speak properly. No books needed - only pen and paper. 258-5901.

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Attention! Do you want to cook inexpensive, nutritious Hungarian dishes? It can be frozen too. \$3.50 per hour for class of 3-4 persons. Call anytime 258-5901.

Need your racket re-string? Call Wood Racquet Stringers. We do tennis, racquetball, squash rackets of all types. 255-1619. USRSA certified.

## → Personals

Li, What about this weekend? We will see what happens. Call ya at 3. Or should you call me?

TO BORED WITH "VAL": Yes, I could use some more chalk! THE AUTHOR OF "I'M SORRY VAL".

JEFF & KHALID, What really happened? JEN

DAN, don't think that you can ever enjoy your candy machine. It's impossible!

RENIE:

Lonely girlfriend seeks lifelong companion—preferably a short, little fuzzy guy with beautiful, bright blue eyes. If you're the man I'm looking for—and if you're willing, then you know when to find me. March is looking far away. Please hurry! I miss you so much! Love, your short, little non-fuzzy girl.

JOE, Don't forget—a week from Friday! BRIAN

TRACI, Don't be a stranger, come up and see us. YOUR LITERARY FRIENDS.

JACK, When the dishes need to be done, you know when I'm not.

CORBEN, I'll watch my back, but my offer still stands.

INDIA, If your going to come down. Tell me! I want to know how you feel. A FELLOW SHIPMATE

7 LB. 15.5 OUNCES, 19.5 inches, on January 24, 1990 before 3:30 am. We were joined by Michael David Purtil!

JULIE The party can't be over yet. Where did you disappear to? How about dinner sometime. Reply Box 7492 THE CURLY HAIRIED DANCER FROM WOODFOREST.

TO THE STUDENT BODY, She lied to me, so I burned a letter that she wrote to me. THE AUTHOR OF "I'M SORRY VAL".

A little patience- It has to BE again for there is too much there.

KHALID & JEFF, Isn't it great that friends can trust one another. JEN

CHUCK, you just can't go to hell and throw the peanuts. FRIENDS OF CHUCK.

CHUCK, Promise 'em anything, but give 'em a pez. FRIENDS OF CHUCK

KELLY, Don't you know I have eyes for you. THE SECRET ADMIRER

TO SANDY, I'm glad we are in the same floor class again. Have fun programming. A FELLOW COMPUTER PERSON

DARIN, Wake up and read the screen. BINO

JENNY, Who go nominated for what? So far no one has bothered me as much as dear OLD Gus.

BRIAN, Here's to a hopefully better trip than New Orleans. Maybe we can get Kress to sing "These boots are gonna walk all over you." Who knows, he may get an even better response in San Francisco?? BINO

KRESS I still remember those horrible things you did to my feet. I haven't fully forgiven you. Watch yourself, or you could end up in a lot of trouble.

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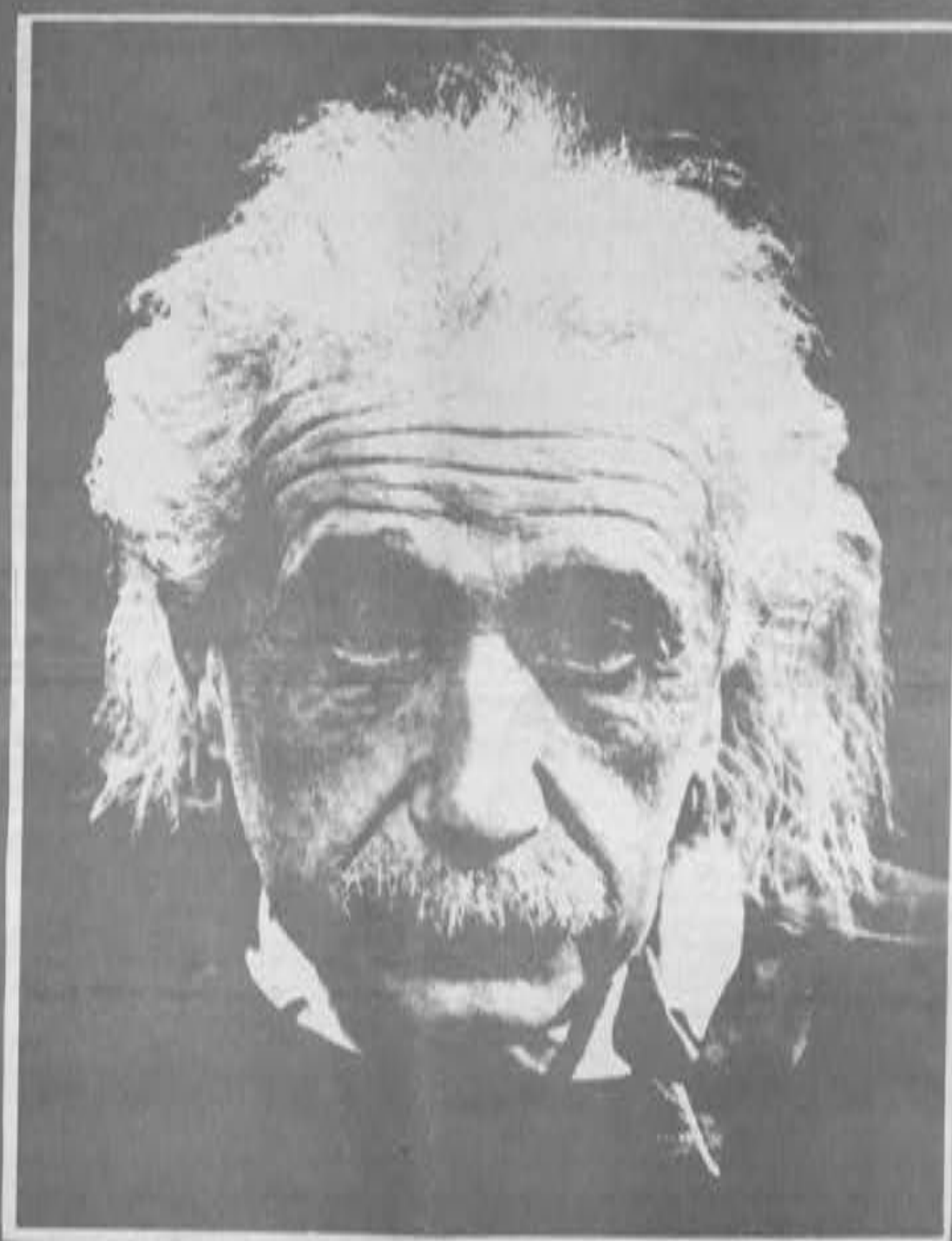


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