

9-12-1990

## Avion 1990-09-12 (B)

Embry-Riddle Aeronautical University

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## Space Technology



**What's next?...**  
 The Space Shuttle *Columbia* shown here with *Discovery* in the background awaits launch following several delays caused by fuel leaks.

### Columbia delayed by another fuel leak

by **Roland Houle**  
 Space Technology Writer

The Space Shuttle *Columbia* has once again encountered a lengthy delay because of a hydrogen leak. This leak has delayed launch until the week of September 17.

The crack in part of the recirculation pump package to the main engines was leaking ten times the allowable amount of liquid hydrogen.

This pump package recirculates the liquid hydrogen between the main engines and the external tank. This keeps the lines between the two components at cool temperatures to insure there are no gas bubbles in the line.

The pump was replaced on the pad Sunday, while *Discovery* stood less than two miles away on Pad 39B. *Columbia's* delay should not effect the launch of *Discovery* scheduled for October 5.

The seven *Columbia* astronauts for STS-35 had returned to Johnson Space Center for additional training. The astronauts will be undergoing exercises in a shuttle simulator. They are scheduled to return two days prior to launch date.

Highlighting mission STS-35, the 36th flight of the space shuttle and the tenth mission of the orbiter, *Columbia*, will be the fact that it is the first space shuttle mission dedicated to a single scientific discipline - astrophysics.

The ultraviolet astronomy observatory (*Astro-1*) will examine the invisible universe of ultraviolet and X-ray astronomy during the nine day mission.

*Astro-1* consists of three ultraviolet telescopes and one X-ray telescope mounted on special support structures from the European Space Agency's *Spacelab*. The fourth telescope on *Astro-1* is the Broad Band X-Ray Telescope which was designed by NASA's Goddard Space Flight Center to view high-energy objects such as active galaxies, quasars or supernova.

The operations of the three ultraviolet telescopes will be directed from the Payload Operations Control Center (POCC) at Marshall Space Flight Center, Huntsville, Ala. The fourth telescope will be operated by a special POCC team at Goddard Space Flight Center, Greenbelt, Md.

Mission STS-35 will be headed by Commander

Vance D. Brand. Brand has flown as a commander on two previous shuttle flights and as the *Apollo* command module pilot on the *Apollo-Soyuz* Test Project. The mission pilot, Guy S. Gardner (Col., USAF), also piloted STS-27 in 1988.

The three mission specialists are John M. "Mike" Lounge, an astrophysicist, Jeffrey A. Hoffman (Ph.D.), an astrophysicist, and Robert Parker (Ph.D.), an astronomer. Lounge has been a mission specialist on STS 51-L in 1985 and STS-26 in 1988. Hoffman flew on STS 51-D in 1985 and Parker was a mission specialist on STS-9, the *Spacelab-1* mission in 1983. The two payload specialists, who are making their first space flights, are astronomers Ronald A. Parise (Ph.D.), of Computer Sciences Corp., Silver Springs, Md., and Samuel T. Durrance (Ph.D.), of John Hopkins University, Baltimore, Md.

After the nine day mission, the shuttle is scheduled to land at Edwards Air Force Base, Calif. The nearly 30,000-pound *Astro-1* spacelab payload will be returned to earth instead of being deployed into space like most shuttle payloads.

After landing, *Columbia* will be returned to Kennedy Space Center for removal of the payload from the cargo bay.

**Columbia's delay should not affect...Discovery scheduled for October 5.**

### Computers aid in the enhancement of the Space Telescope's images

by **Jose L. Vazquez-Deigado**  
 Space Technology Writer

When the Hubble Space Telescope (HST) was launched last April, scientists and astronomers rejoiced with pride at the fact that the multi-million dollar telescope was finally off the ground. It was called the most ambitious mission yet. Speculations were high and the waiting list of astronomers who wanted to use Hubble grew on and on. But the hopes of not only the scientific community, but also of millions of Americans that followed Hubble findings were shattered when the images sent back by Hubble were not what they expected. The much publicized mission, STS-31, all of the sudden seemed a failure. For being the biggest instrument put into space in the decade of the 90's, the Hubble Space Telescope became a controversy; it was defective. Hubble had eye problems; it was myopic.

Action had to be taken to salvage the ailing Hubble telescope. A rescue mission to fix it was out of the question for at least two or three years. What then? Computer restoration. The photographs and images taken by the HST appear with fuzzy halos around the stars. The halos are not physically there. They are the result of the faulty focus of the HST from light which reflects off of the outer edge of the primary mirror. Image processing methods can help solve the problem until the Hubble is repaired. The computer algorithms used in the image processing remove the halos which can be seen around stars in the processed im-

ages. Fortunately, the cores of the images have enough light so that individual stars can readily be distinguished, even in very crowded regions such as the center of the 30 Doradus Nebula.

Once the Hubble is fixed, clear pictures could be taken not having to use computer restoration.

The process of restoring the image is very simple. It is known that every star will turn out with a halo, so the position and brightness of the stars are measured and then the halos are subtracted from the images. This not only produces a cleaner image, but it also makes it easier to detect faint stars which are partially obscured by the haze from nearby, brighter stars.

A question that

came up with the computer restoration was why not apply it to the ground-based telescopes? But it is much harder to do so because the images from ground based telescopes lack the well-defined cores of the HST images and because the atmospheric blurring changes continuously, making it impossible to determine a fixed stellar profile.

Even though the processing seems good for now, there are two factors which limit the accuracy of removing stellar halos. The primary factor is that if it is not known exactly how the halos look, they cannot be subtracted perfectly. This is very limiting since the knowledge of the "point spread function", the image expected for a star for particular colors is limited.

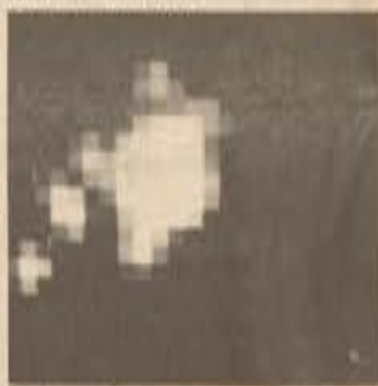
Another limiting factor is the noise in the images. Very faint stars observed by astronomers are on the basis of counting the individual particles of light or photons collected by the telescope. The light particles for faint stars are few and its brightness cannot be accurately measured. This counting noise makes it impossible to subtract the halos and even detect the presence of faint stars amidst the glare created by many overlapping halos.

In spite of the recent setbacks that hampered NASA's confidence in being reliable and the leaks that developed in *Columbia* and *Discovery*, NASA is still strong and stands firmly on all its future projects like Space Station *Freedom* and a manned trip to Mars and the Moon.

The most time-critical mission for now is the *Astro* mission in October. *Astro* is another kind of telescope that would help and supplement the HST. If it is not flown in October, it would have to wait 13 more months and risk being a controversy like the delayed, costly and defective Hubble Space Telescope.

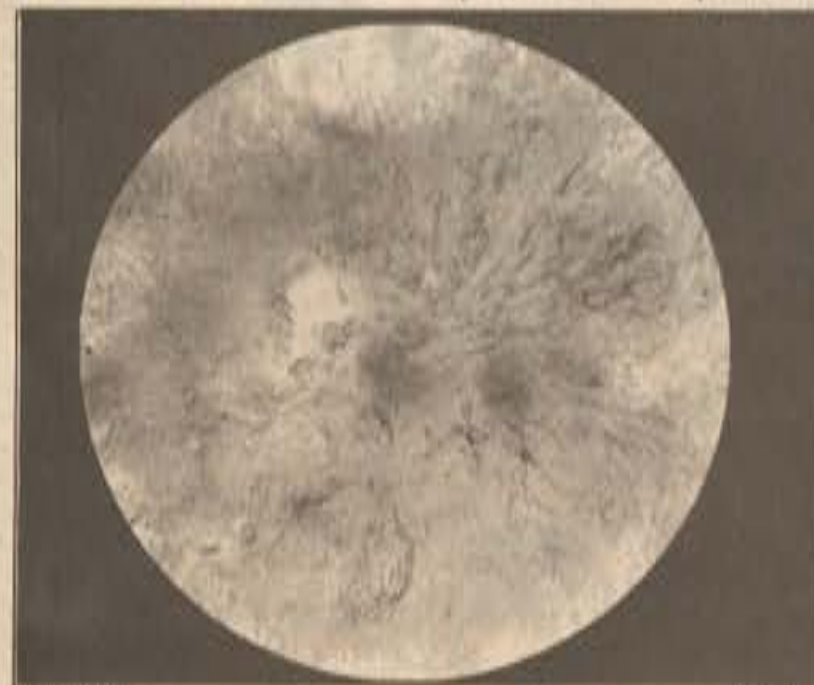
Never-the-less, the unprocessed HST images taken by Hubble are significantly better than images from ground-based telescopes. Image processing methods promise to generate images which are, for many purposes, even better than the raw images.

For the time being, it seems that the Hubble Space Telescope will be stuck with a pair of glasses until its 20/20 vision can be restored.



**Flawed?...**

A comparison is made between the European Southern Observatory in Chile (left panel) and the Hubble Space Telescope's image (right panel), shows that even with a flawed mirror, the Hubble Space Telescope still produces images of great quality.



**Revelling...**  
 Pictures of the surface of Venus (shown here) obtained by the Soviet *Venera* orbiter will aid the *Magellan* spacecraft.

### Magellan spacecraft arrives at Venus

by **Joshua S. Mussat**  
 Space Technology Writer

The *Magellan* spacecraft, on a mission to map the surface of Venus with imaging radar, successfully slipped into an elliptical orbit around the planet on Friday, August 10, 1990.

The *Magellan* probe was launched aboard the Space Shuttle *Atlantis* on May 4, 1989. This is the first interplanetary probe sent by NASA since 1978.

*Magellan* has been designed with existing hardware and has incorporated with a large amount of spare hardware used on other projects.

The spacecraft fired its solid fuel rocket motor for 83 seconds to slow the spacecraft from a cruising speed of 24,600 mph to an orbital speed of 18,675 mph.

The spacecraft will gather "strips" of data as it moves between Venus' north and south poles. The

data will be beamed back to Earth and will be received by the Deep Space Network tracking stations located in Spain, Australia and California where computers will transform the information into images.

Each data strip will represent an area about 16 miles wide and about 10,000 miles long. The strips will be laid side by side, like a mosaic, until a nearly complete map of the planet emerges.

During *Magellan's* primary mission, which will last 243 days, one Venus rotation, spacecraft will map as much as 90 percent of the Venusian surface. The probe is expected to last well into the 1990s.

NASA will try to use the information that it obtains from the *Magellan* spacecraft to create a video which will simulate a three-dimensional image of what it would be like to fly over the surface of Venus.

**Engineers will continue trying to identify the cause of the two communication failures.**

There are several similarities between the Earth and Venus. Scientists are interested in the fact that the two planets have approximately the same diameter, mass and density.

After the initial test period, *Magellan* was supposed to start mapping the surface September 1, but due to problems in communication, it has been postponed. *Magellan* lost touch with Earth for 14 hours starting August 16 and for 17.5 hours beginning August 21.

Engineers will continue trying to identify the cause of the two communication failures. However, tentative plans call for the radar to be turned on again September 14 for a new series of radar tests to start the next day.

There have been two previous attempts to map Venus with space probes. A Soviet mission mapped about one quarter of the planet in 1982. The second probe was the U.S. Pioneer spacecraft in 1978.

The *Magellan* spacecraft will provide scientists with valuable information that will help them unlock the secrets of the solar system.

### Space News...

**Titan rocket explodes in California...** Shortly after 11 a.m. last Friday a Titan Advanced Solid Rocket motor ignited after being dropped in a test area at Edwards Air Force Base in California. A hazardous plume containing hydrochloric acid rose to a high altitude and dispersed away from any populated areas, nine people were confirmed injured and one person is missing presumed buried under the rubble. The exact cause of the accident is not yet known but seems to be a result of an accidental release by a lifting crane. The Astronautics Laboratory is the Air Force Systems Command unit responsible for developing and testing new rocket technologies.

**Listen to the astronauts...** The National Space Society offers a Dial-A-Shuttle service line which allows the public to listen in on the live communications between the shuttle and mission control. This service is available from liftoff to landing. Callers can dial 1-900-909-NASA 24 hours a day throughout the mission and listen in as the astronauts conduct their duties in space. Dial-A-Shuttle is a service offered by the National Space Society, a nonprofit, publicly supported membership organization dedicated to the creation of a spacefaring civilization. The toll charge for the calls are \$2.00 for the first minute and 45 cents for each minute thereafter.

### NASA prepares to launch shuttle vehicles

#### Discovery's team rehearses lift-off

The countdown dress rehearsal for the Space Shuttle *Discovery* was successfully concluded at 11:07 on Tuesday, September 11. This dress rehearsal is an electrical testing of the Space Shuttle systems and launch complex systems. The crew of this flight arrived at the Kennedy Space Center on Sunday in order to begin the test.

Also discussed was an exercise conducted by the payload test team to simulate the problems which could arise during an actual countdown.

The storage assembly was removed in order to allow access to the payload

bay. The *Ulysses* payload was installed in the payload bay last week and a verification test was conducted this week.

Technicians began testing of *Discovery's* cooling system over the weekend and it showed that the small Freon leak will not worsen and that it would be safe to fly. The leak will be monitored daily and it leaks at a rate of about 1% per day.

The launch is scheduled for October 5.

#### Columbia's team replaces pump

The work to install the liquid hydrogen recirculation pump package

has been successfully completed.

The helium leak test which is designed to test the hydrogen side of the main engines and main propulsion system was rescheduled to yesterday. The payload bay doors were opened last week to access the *Astro-1* payload. The launch of the Space Shuttle *Columbia* is still tentatively scheduled for the early part of next week.

#### Atlantis' team prepares for rollover

The removal and replacement of the flash evaporator is continuing, while tile repairs are continuing and

the thermal control blankets are being installed on the forward section of the orbiter.

The Space Shuttle *Atlantis* is being prepared for rollover to the Vehicle Assembly Building (VAB) at the end of September. The tentative launch date is scheduled for December.



# Grand Opening!

September 17th through the 21st

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						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

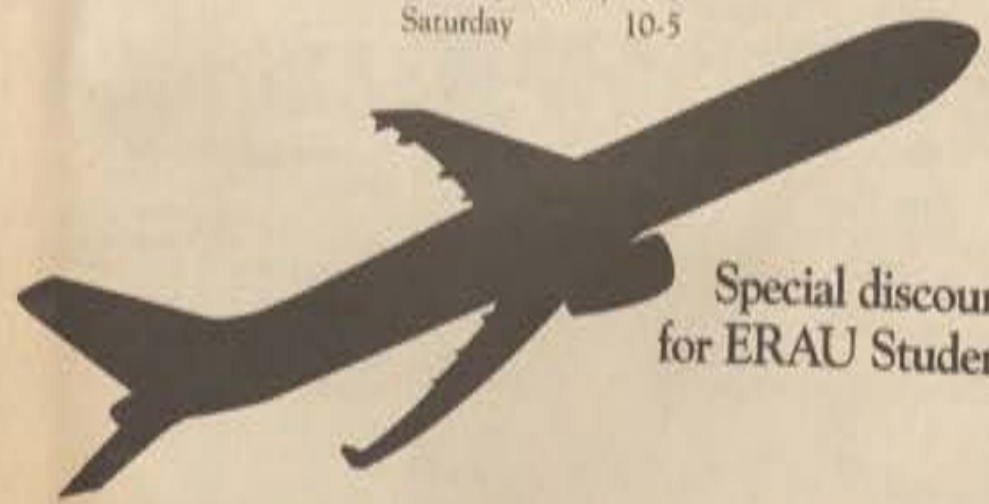


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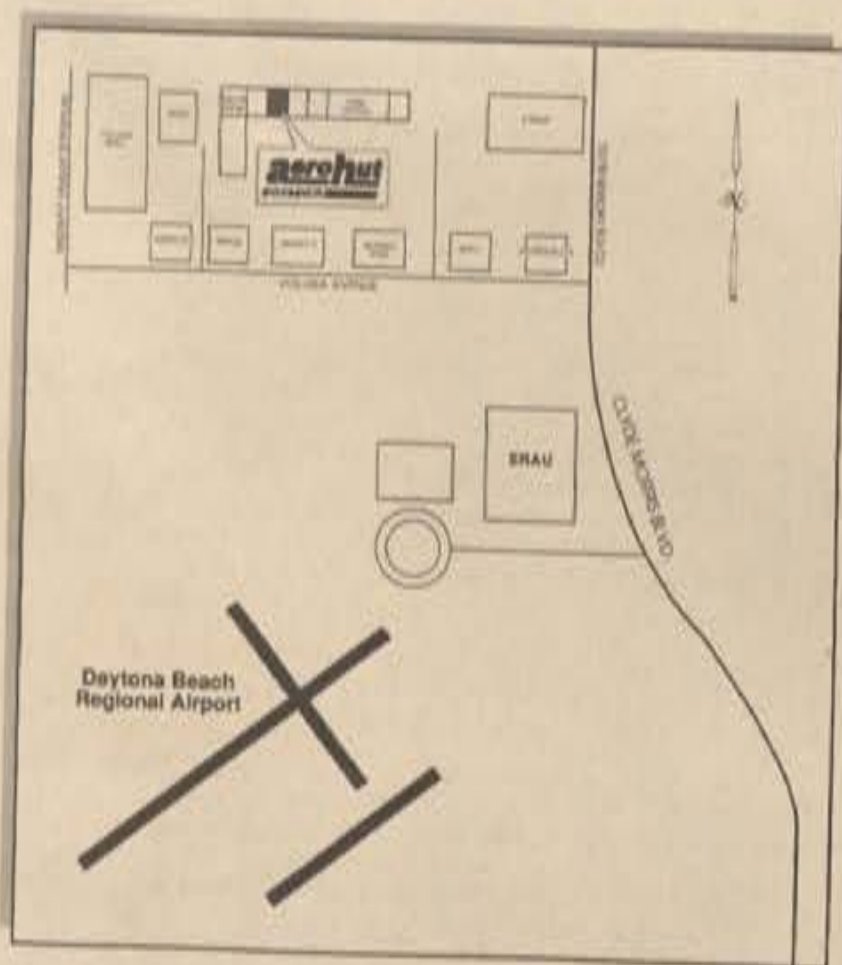


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# LETTERS

(continued from page A3)

## ON BEHALF OF THE SGA

To the Editor,  
A recent editorial by the Avion criticized the help and guidance of SGA Advisor, Dean Becky Robertson. That article was written with a lack of experience and knowledge. The feelings expressed in this editorial, are those of many SGA members with much more knowledge of the Student Government Association.

On May 24, 1990 the Student Finance Board held the first meeting for the 1990-91 school year. As a member of that Board, I can speak for the majority, five members, that were new to the administration. We had no idea what was going on. We were young, eager and ready to go. But we did not know what to do.

With the help of a veteran member, SGA Secretary/Treasurer Linda Johnstone and Advisor Becky Robertson, we became familiar with the processes and formalities of the SFB. Without this guidance, the SFB may have possibly made detrimental decisions affecting the entire student body.

The SFB controls how your SGA fee is spent. Do you want uneducated students making irrational decisions with your money, or do you want the Advisors of the SGA to do their job and guide us through the unknown, teaching us how to cope with requests and how to make the right choices when we are confused?

If you have attended meetings where Dean Robertson seems to dominate the conversation, it may be due to the fact she is the only one present that has the answers to questions asked by students. This situation occurred at a Student Representative Board meeting where the Drug Testing issue was brought up. Dean Robertson gave her input because she was the only person on hand that had any information on the subject. Would you, as a student, want her to share her knowledge, or just sit there quietly?

Personally, I am thankful for the veterans of the SGA, and I make this an open invitation to our Advisor, Becky Robertson, to give information dealing with pertinent issues at hand when she feels it is appropriate.

Robert E. Young, III  
Student Finance Board Member

## CRUSADER CRITICIZED

To the Editor,  
I am not familiar with the characteristics of the ERAU Crusader involved in the recent mishap nor with the conditions under which the mishap occurred. However, after reading the comments by your editor-in-chief, Brian Cerni, about emergency procedures (Avion, June 6, 1990), I want to express my opinion based on many years of experience in naval aviation.

It will never be possible for a staff of flight instructors and for the writers of flight manuals to cover

every possible emergency and every condition under which an emergency can happen. With generalization and standardization most conditions will be covered, but dealing directly with every possible combination of malfunctions and other conditions, e.g. weather or geographical position, is simply not possible. This is probably one of the reasons why human beings are equipped with "common sense". What I mean to say is: apply the standard procedures without getting yourself into more trouble than you are already in. For instance, shutting down an engine with a fire indication as soon as the indication is observed is usually considered standard procedure. And for good reasons. Fire in an engine mounted in a wing can cause the wing to break off within a relatively short period of time. But "common sense" tells me that I should think twice before adhering to this procedure when this will result in loss of control and crash in a densely populated area.

The book may say: do not attempt to restart an engine that was shut down due to a fire indication. Again "common sense" tells me to consider the possibility of a restart in case the single engine configuration develops into an even worse situation.

Memorize and practice the standard emergency procedures as much as you can, but always apply them with common sense. That is airmanship. Do not listen to those who develop their own procedures because they think that they are

smarter than the guy who wrote the book. One day they will find out the hard way that they are not!

Henk Huyding



# The Salvation Army

The Salvation Army of Daytona Beach Now Has A Reconditioned Trailer. That Is Being Used As A Means For The Faculty, Staff And Students Of ERAU to Drop Off Unwanted Items Such As Clothing, Etc. That They Are No Longer Using. The Trailer Is Located Just Behind The Salvation Army Building At 560 Ballough Rd In Daytona Beach. This Building Is Located At The Corner Of Anita Ave. And Ballough Rd. With These Donations We Are Able to Help ReClaim Lives That Have Been Affected By Chemical And Or Alcohol abuse. In Other Words Your Discards Are Saving Lives At No Cost To Anyone!

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# The Avion pays a visit to Pensacola Naval Aviation Museum

by John McDermott  
Aeronautics Writer

The National Museum of Naval Aviation in Pensacola, Florida is a must see for anyone interested in aviation. During the break between Summer and Fall terms, I had to drive to Tallahassee and took the opportunity to drive on to Pensacola. For some time I have wanted to tour the museum and see a friend from my former Marine F-18 squadron, who is an avionics technician with the Blue Angels now.

The museum contains many rare and interesting aircraft from 1911 to the present day, including several on loan from the Smithsonian Institution. The aircraft on display in the museum are currently crowded together in four large groups, but this will change soon. A large addition to the building, is nearing completion and will more than double the display area. The extension will be dedicated on October 12. The new wing will include a carrier deck mock-up where several aircraft will be displayed. There will also be an atrium where four of the Blue Angel Skyhawks are to be hung in a diamond formation.

The museum's aircraft range from early Navy and

Marine Corps biplanes to a modern F-4S and the only F-14 on display is mounted in front of the museum. Other unique aircraft are the NC-4, a four engine flying boat that made the first transatlantic flight; the YF-17 (prototype for the F-18) and the 1973 Apollo-Skylab Command Module. There are numerous displays including powerplants and the Navy's Lighter Than Air program.

Admission to the museum is free, it is open from nine to five, seven days a week, and it is closed Thanksgiving, Christmas, and New Years Day. The museum is located on Naval Air Station Pensacola, which has several other interesting sights such as Fort Barrancas and Fort San Carlos.

The air station is the home of flight training for the Navy, Marine Corps, Coast Guard, and home of the Blue Angels. Other points of interest in Pensacola are the U.S.S. Lexington when in port, Pensacola Beach, and last but not least Trader Jon's Tavern in downtown Pensacola. Trader Jon's is an aviation museum in itself with photos and artifacts from World War I to the present. If you have a free weekend to get away, have a good time, and learn something, then visit Pensacola.



On display... The only F-14 on display is mounted in front of the National Museum of Naval Aviation in Pensacola. The museum's aircraft range from early Navy biplanes to a modern F-4S.

## Airliner market in dire need of 14,000+ new planes by the year 2010

by Dan Moughamian  
Aeronautics Writer

Louis F. Harrington, a senior official for McDonnell Douglas, told members of a London Financial Times sponsored conference that commercial aerospace competition will increase in the coming two decades. This came as a bit of a surprise when the already mammoth airliner market, valued at nearly \$850 billion, was taken into consideration.

Harrington is the general manager and vice president of the McDonnell Douglas MD-11 program, said that more than 14,000 new airliners will be needed over the next twenty years unless the current Middle East crisis raises the price of oil to high levels over the long term. If oil prices return to a normal, Harrington believes that world-wide production of aircraft could reach as much as 700 per year.

Mr. Harrington also believe that current plans by countries such as Japan, Korea, Brazil, Turkey, and India to expand their manufacturing

capacity, will expand the worldwide capacity to a level that could sell out even more aircraft than is already predicted. The U.S. and Western Europe have already begun extensive expansion processes. "...The emphasis will be on production process optimization," said Harrington. McDonnell Douglas is engaged in its own optimization process, known commonly as TQMS or Total Quality Management System. The system is basically directed at the building of aircraft.

**On August 7, 1990, a test bed MD-11 completed the longest flight a tri-jet has ever made.**

TQMS uses advanced planning to eliminate production problems before they happen on the line.

The program which Harrington heads, the MD-11, has 10,000 employees directly involved and thousands more in support roles. Four of the three-engine aircraft have been built and are currently under testing. On August 7, 1990, a test bed MD-11 completed the longest flight a tri-jet has ever made. (9,080 miles in 16 hrs. and 35 min.). Certification of the MD-11 is expected before the year's end.

## Three Californians killed in plane crash

(AP) Three men were killed when a single-engine plane crashed and burned on takeoff from Gallup Municipal Airport after refueling, authorities said. Dental records were en route from Visalia, Calif., to aid in identifying the victims, said Linda Teague of the state Office of the Medical Investigator in Albuquerque. She said names might not be released until Tuesday. Meantime, police said relatives of those believed killed were notified Sunday of the crash.

The men were remembered in a sermon Sunday broadcast by the Rev. Harold Meers of the First Baptist Church of Visalia over radio station KJUG-AM in Visalia. They included John Brown, 41, president of Cellufax Co. of Visalia, and builders Tony Romo, 33, and Rick McDonald, 36,

relatives said. "They were extremely good friends," Brown's wife, Carol, said in a telephone interview Sunday from Visalia.

The men had picked up a newly purchased plane in Iowa and were flying it home to Visalia when the crash occurred. Mrs. Brown said. She said a funeral was tentatively scheduled for Thursday. Brown is survived by his wife and three children. Romo's wife, Naomi, said all three funerals would be done together.

"My husband had never been out of California," Mrs. Romo said. "This

was his first chance to see the country. He wanted to go with his buddies and see the country."

He said it was beautiful. I talked to them the morning before they were killed." She said she and her husband, who had been sweethearts since age

13, had three children. She said there's no doubt he was aboard the plane because his wedding ring was found. A federal crash investigation team arrived Sunday and spent much of the afternoon at the scene, a field just west of the Gallup airport runway.

The plane took off here just before 3 p.m. Saturday, but apparently failed

to gain enough altitude. The pilot radioed that he was having trouble and attempted to return to the airport, Fire Department Lt. Joe Chavez said. "They apparently had engine trouble and decided to return," Chavez said. "They tried to circle back and didn't make it." Chavez said the plane ignited on impact. Firefighters from an airport fire station extinguished the flames but couldn't help the victims, Chavez said.

"We were there within 30 seconds, but it (the plane) was a-already fully engulfed," Chavez said. Chavez said two victims were found in the plane's front seats and the third was in the back seat.

Gallup police Officer Johnson Claude said the plane apparently had landed at the airport to refuel less than an hour before taking off.

**"They apparently had engine trouble and decided to return...they tried to circle back and didn't make it."**

**"It was coming in for a landing and crashed under unknown circumstances..."**

## Light plane crashes into tree in Oklahoma

(AP) Three members of an Illinois family were injured Sunday afternoon when their privately owned small plane crashed into trees at Mohawk Park near the Tulsa International Airport, authorities said.

Nancy Lefler, 41, of Colchester, Ill., was in critical condition at Hillcrest Medical Center, a hospital spokeswoman said.

Her husband, Roger Lefler, 41, was in serious condition and their 14-year-old son, Jason, was in fair condition, the spokeswoman said. "It crashed

into the trees there in a park north of the airport," said T.C. Miller of the Federal Aviation Administration in Fort Worth, Texas. An investigator from the Flight Standards office

in Oklahoma City is expected to arrive at the scene Monday morning, FAA officials said.

The single-engine Bonanza, which originated from Austin, was trying to land when it crashed into the trees about 2:30 p.m.. The crash occurred near the approach end of the airport, FAA officials said.

"It was coming in for a landing and crashed under unknown circumstances," said an FAA spokesman in Fort Worth, who declined to give his name.

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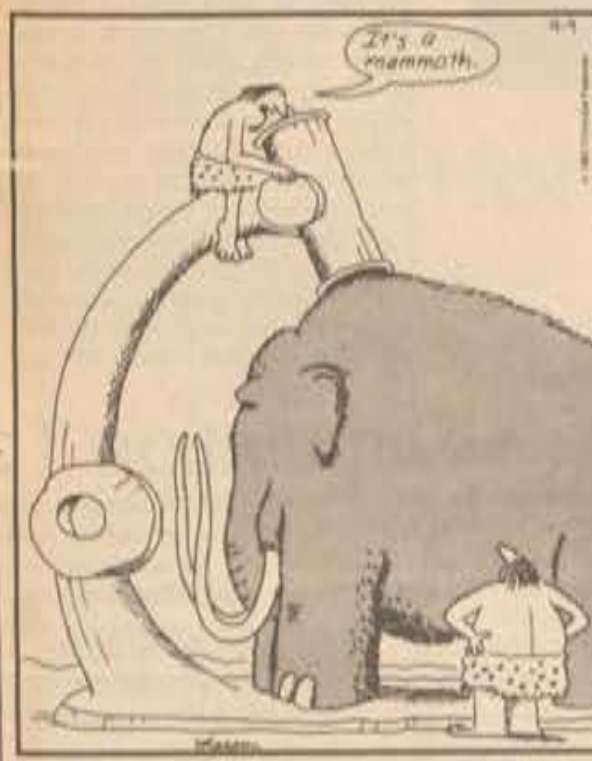
by Bill Waterson

Far Side

by Gary Larson



Humor at its lowest form.



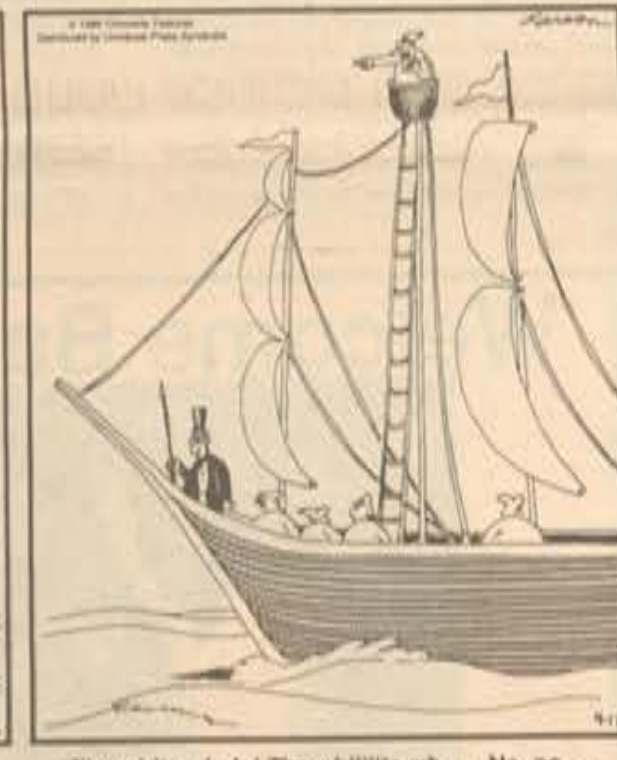
Early microscope



Snake dreams



"C'mon, c'mon, buddy! The heart! Hand over the heart! ... And you with the brains! ... Let's have 'em!"



"The white whale! The whillite wh... No, no... My mistake! ... A black whale! A regular blaasack whale!"

Mister Boffo

by Joe Martin

Mother Goose and Grimm

by Mike Peters





# Sharp's Wizard pocket computer boon for business

by Jason Simon  
Data-Tech Editor

There has always been many different pocket sized scientific computers available for the engineering student, but it seemed like the business major was left out in the cold. Fortunately Sharp has come to the rescue with the Wizard pocket sized business computer.

The Wizard was designed with business person in mind. Upon the opening of the case, the user is greeted by a large liquid crystal display, calculator and alphabet keys, the various function keys and the touch sensitive transparent keypad for use with the interchangeable data cards. All of these features are designed to make the Wizard easy to use.

There are seven major functions built into the Wizard. The first function is the calculator. The calculator has two modes, standard and paperless printer. In standard mode the calculator acts like a normal calculator. By pressing the calculator button twice one enters paperless printer mode. In this mode the calculator scrolls the number entries up the LCD display. This is ideal when one calculation requires a large number of entries because one can check if the numbers have been entered correctly and if this is not so, corrections can be made without destroying all the previous work. All one has to do is use the arrow keys and scroll up to the bad number and replace it with the right

number. Instantly the numbers recalculate and, hopefully, the user will get the answer he wanted.

There are two clock functions available, home and world. These two functions allow the user to check the time in over two-hundred and ten locations world-wide. So if one really wants to know what time it is in Port Moresby, Papua New Guinea or Antananarivo, Madagascar he can check by merely pressing a few keys on the Wizard. Unfortunately, the designers forgot to include Greenwich England in the list, but London is close enough for those who are flight majors.

The memo function is useful not only for temporary data storage, but also for data computations. Memos are input through the keypad and stored in the respective area. Memos can be recalled through a direct search, keyword search or sequential search when needed. However, the nicest function is the ability to transfer price data from the memo section to the calculator section and calculate the cost of multiple prices. This would be very useful to the person who has to make many multiple purchases of many different items.

The telephone function stores over seven-hundred names and numbers in the three files programmed into the Wizard. Each file name can be edited easily by the owner to suit his or her sorting needs.

The calendar function retrieves date information ranging all the way back

to the year 1901 and as far forward as 2099. Almost instantly one can check what day of the week the Wright flyer flew for the first time or what day New Years Eve falls on in the year 2000. Clearly Sharp designed this computer to last at least one generation.

The calendar is integrated with the schedule function. If a black dot appears next to a day on the calendar, then there is a message in the schedule function related to the day. Important future dates, as well as anniversaries can be stored in this function.

There are several sub functions as well. These include such items as memory check, where the user can find out how much of the thirty-two kilobyte memory is used up, LCD contrast, user dictionary, file name editing and data deletion.

For those who are worried that someone has prying eyes, Sharp was smart to include the secret mode. The password can contain up to seven letters or symbols, which makes the password hard to crack. There is no way anyone can get past this area without deleting the information stored in it, so if the owner forgets the password he has no choice except to delete all of his secret data and re-enter it. It's a high price to pay, but it

guarantees data security.

The best feature of this computer is the removable data card slot. This slot allows the user to insert the various data cards available for the many different applications this computer performs. Cards such as the time expense manager, dictionary with thesaurus, eight-language translator scientific function and even video game can be purchased for use in the slot. The card slot uses the transparent keypad to relay data to the Wizard. This is truly the best feature of the Wizard, but it is also the most expensive since the data cards cost anywhere from \$80 to \$150.

There are several peripherals that can be attached to the Wizard to make it more powerful. Cables can be purchased so that the Wizard can be connected to another Wizard or cassette player for permanent data storage. In addition, the Wizard can be connected to a PC through its serial port and optional cable. A thermal printer is also available. Unfortunately, like the cards, these devices are also very expensive.

Overall, despite its expensive peripherals, the Sharp Wizard is an excellent computer based for the businessman or student. It is definitely a pocket computer that was designed for this generation, and possibly the next.

**The telephone function stores over seven-hundred names and numbers in the three files programmed into the Wizard.**



Off to use the Wizard...

Sharp's Wizard combines the features of a calculator with the high-tech feel of today's smart business computers.

# Wolf Pack Takes Sub Simulation To New Depths

by Joseph Szarmach  
Staff Writer

In a computer world full of increasingly overpriced, poorly animated attempts at real world simulation, Wolf Pack truly is a breath of fresh air.

As you boot up Wolf Pack, you have a choice between several missions supplied, or you can make up your own mission with the mission editor.

In addition, you can select which side you wish to command. For example, you can be the submarine commander and command a (wolf) pack of submarines, or the surface ship commander. This unique feature makes Wolf Pack actually two games in one.

The setting for Wolf Pack is the North Atlantic during World War II. In the early years, the submarines clearly had the advantage. Sur-

face ships are sitting ducks as you command your wolf pack to attack American and British ships supplying the war effort.

These missions are ideal for the beginner. Attacking during the day is somewhat more difficult as the surface ship will see your periscope and return fire.

But in later years, after the invention of sonar, submarines face more difficult situations and you as commander, face more challenging game play.

As submarine commander, you can control any one of your submarines at any time. By clicking the mouse on a map (or pressing the Tab key) you can instantly jump to the submarine of your choice. In addition, you can set any of your subs to "auto" which will enable

that submarine to continue to battle while you are commanding another submarine.

By far, the submarine's prime menace are the Allied destroyers. As a submarine commander, you must avoid being hit with a depth charge or deck gun. A single direct hit with a depth charge can sink your submarine. A hit by a deck gun usually

**As a submarine commander, you must avoid being hit with a depth charge or deck gun.**

results in the loss of your periscope. The destroyers are not easy targets and will not keep on a steady course for more than a minute. Strategy is a must while playing Wolf Pack.

To counter, you can surface to periscope depth, and launch your torpedoes. Or you can dive to greater depths, slow your engines, and

drop a pillenwerfer (decoy) in an attempt to evade the threat.

Your ultimate goal is to sink as much tonnage as possible. If you are clever enough to evade the destroyers, merchant ships are yours for the taking.

Wolf Pack also supports several sound systems. Wolf Pack was tested with an Adlib sound card, and the Adlib sounds were found to be excellent. With an Adlib sound card, you can actually hear your sub getting "pinged" as enemy sonar attempts to locate you and the depth charges ex-



Dive..Dive..Dive..

Wolf Pack brings the excitement of submarine simulations home to the user.

ploding all around you. Wolf Pack, with its full graphics, sound and challenging game play, is a first rate simulator and will provide for hours of fun and excitement.

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## Rape center needs volunteers

The Rape Crisis Center of Volusia County is in need of volunteers to help victims on the Rape Hotline and also to provide crisis intervention for victims at the Center. A four-session training program for interested volunteers will begin on Saturday, September 15, from 9:00 to noon.

A small agency like the Rape Crisis Center depends heavily on community volunteers to provide program services, according to Kathy Wilkes, Executive Director.

"We have a very small staff trying to help hundreds of rape victims each year on a 24-hour basis. We can not do that without volunteer support."

Training will include information about the crime of rape and the effect it has on the victim, listening and counseling skills, the medical exam, collection of evidence, and judicial procedures in rape cases. For further information, or to register for the training, contact the Rape Crisis Center at 254-4106.

## Aeronautical science degree changes

Due to the recent curriculum changes in Aeronautical Science, the following courses will be discontinued in the near future:

AS 150, Aeronautics I, (5 credits)

AS 180, Basic Navigation, (3 credits)

AS 255, Aeronautics II, (3 credits)

AS 256, Aeronautics III (3 credits)

If you need any of these courses to complete your degree program, please enroll in them during advanced registration for the Spring 1991 term. Otherwise, they might be discontinued before you can complete them.

Anyone anticipating problems completing any of the above courses, please see Mr. Graber, Airway Science Building, Room 123 as soon as possible.

## Campus ministry welcomes new students

The office of Campus Ministry welcomes all new and returning students. The office is located in Residence Hall 2 in room 277. All faiths, as well as particular Christian denominations, can get information about religious services off-campus by consulting the office at extension 6580. Office hours are Monday through Friday 1pm to 10pm. The prayer reading room is open during office hours. University chaplains are Kenan

Morris, O.F.M. and John P. Wheeler.

Religious services on campus will be held as follows: Catholic Mass - on Sundays at 10am, 7pm, and 10pm in the Spruance Hall Atrium and on weekdays at 10pm Monday and Wednesday, 5pm Tuesday and Thursday in the office of Campus Ministry; Protestant services will be held on Sunday at 11:15am in the Spruance Hall Atrium.

## Wright brothers on video

Embry-Riddle students and faculty have an opportunity to buy Paul Garber's series about the Wright Brothers' First Flights at a special price. In this series there is original footage taken from both the ground and the "cockpit." In addition, this series provides a biography and a history of the Wright brothers and the Wright Flyer.

The video tape series is 145 minutes (2 hours and 25 minutes) long and worth every cent of the price charged by the Smithsonian Institute. Moreover, this offer is made as a non-profit activity initiated by an ERAU student. The cost to for this series depends on the response to this letter.

For example: 102 copies ordered-\$25.00 per copy, 203 orders-\$20.00 per copy, 304 orders-\$18.00 per copy.

The more copies we can order as a group, the cheaper the per unit cost.

If you are interested, please send your name, box number (or address), or some way to contact you in the event enough people want to own a copy of this unique series. My ERAU address is Box 6752.

If enough people are interested, I will then ask for your money to buy the series from the Smithsonian Institute. Don't let this opportunity get past you!

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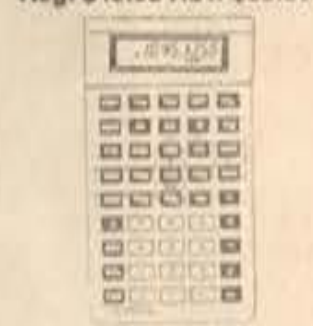
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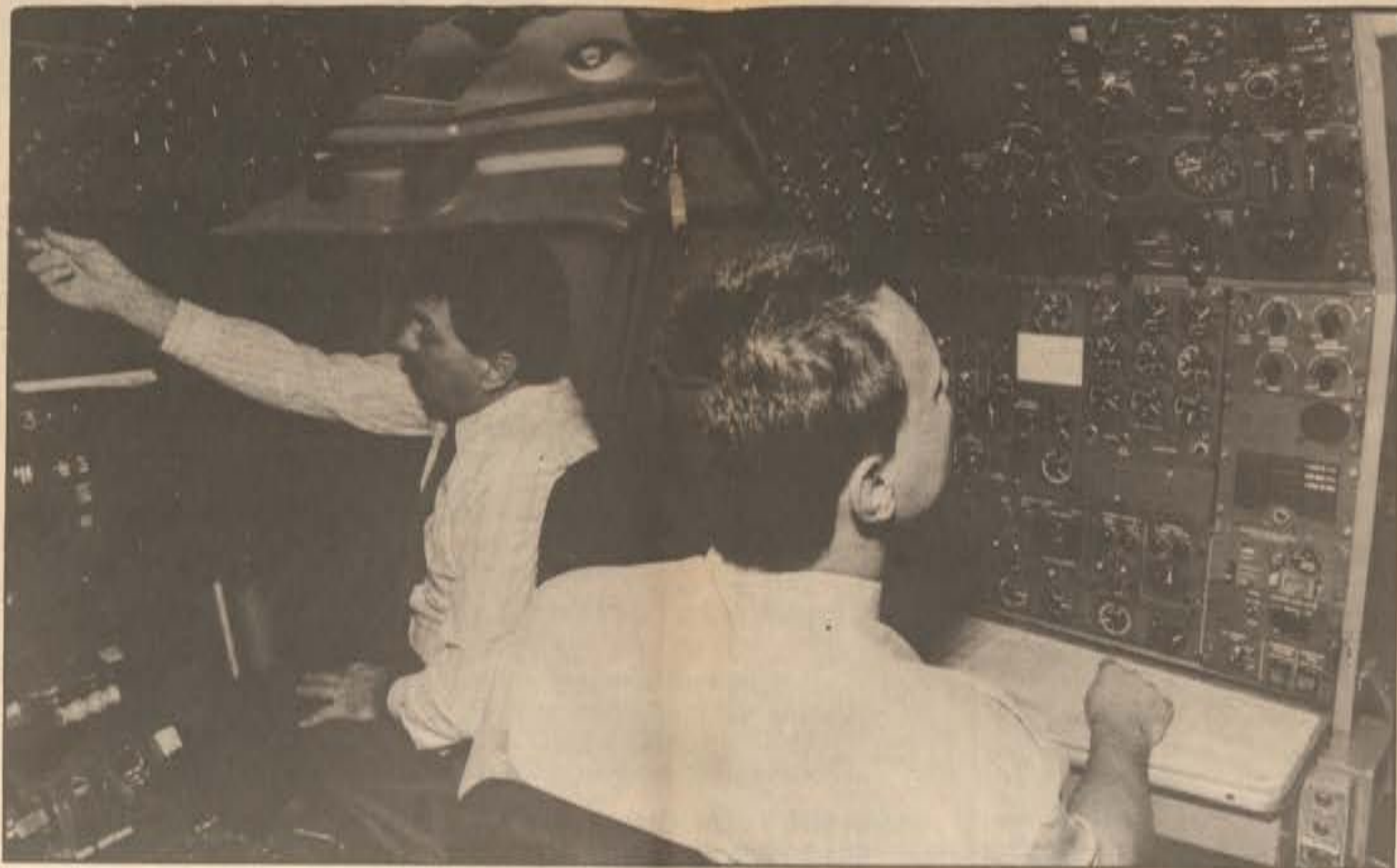
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### Autos for sale

1978 FORD Fairmount 6 cyl, AT runs good. \$500 o.b.o. call Jeff at 255-6674.

SUBARU XT Turbo 4WD, '87, black, power everything, sun/m, cassette, new clutch \$8,500, Call 255-4767 and ask for Ramiro.

1988 CHEVROLET Spectrum, clean, excellent condition, air, automatic transmission, tint windows, reliable transportation, all original parts. Need to sell for \$3,795. Call Mike at 760-6615 after 5 pm.

1979 DATSUN 280 ZX, 2+2, 5 speed, power everything new clutch and battery, runs well, \$2500, o.b.o., Need money for graduation. Call 254-0761.

1980 VW RABBIT, ice cold air, AM/FM cassette, 4 speed, \$1200 o.b.o., Leave message at 257-6126.

1980 CUTLASS Supreme, very good condition, power brakes, windows, steering, new tires, plush interior, AM/FM cassette radio ice cold air, only 82,000 miles, call 252-7612 for more information.

1981 MERCURY Lynx, needs work, \$550/OBO, call 257-6126.

1983 BUICK Skylark, runs great, excellent transportation, call Jeff 257-6126, or Linda 756-3298.

### Cycles for sale

82 HONDA 750 Nighthawk, bike wrecked, engine, tires, brakes, electrical still good. All for \$250 tel:239-0597, P.S. 2 helmets are included.

1986 NINJA 600R needs front turn signals, low mileage, runs excellent. New tires, front and back, \$2100, call Jeff 257-6126.

FOR SALE: RALEIGH 12 speed bike. Like new! Includes handle and seat packs, mounted lock, waterbottle, and car rack. \$250.00 - negotiable. Call Matt 255-2130.

FOR SALE: Raleigh Grand Prix 10 Speed. Sunracer components. Leather Saddle. Excellent Condition. \$50.00 Contact Professor Vebury at X-6765 or Call 767-7305.

### Miscellaneous

FOR SALE: Four channel model aircraft with true Futaba six channel radio. Only been flown a couple of hours, re-enforced nose, has never been crashed or abused. Six channel Futaba comes with six Futaba servos that have never been used or placed in an aircraft. I am no longer interested in the sport and need the money. Excellent for the starter who wishes to upgrade in the future! Asking \$560 neg. Call Jason 239-5973. The sky can be yours!

FOR SALE - Chinon CP-5, 35mm camera with power winder, 80-200 zoom lens, 50 mm lens, and bag \$225.00 call 274-2645

MAONAVOX video writer complete word processor with spell check \$325.00 Call 274-2645.

FOR SALE: 10 channel programmable realistic scanner \$100.00 Call 274-2645

FOR SALE: .22 MARLIN midgen magnum. Bolt action 7 round clip, scope and bag \$130.00. Call 274-2645

FOR SALE: Table lamps (2), Ariana microwave, Sears Canister vacuum cleaner with powermate, mask tables (chrome-glass), engineering drafting set, IBM navigation calculator, tape recorder (for classroom or home) phone 672-2663.

FURNITURE for sale: wooden desk, hide-a-bed couch. Best offer. Call 677-5724 Ask for Jim or John.

FOR SALE: 4 drawer dresser - good condition, lots of room. \$30.00 Call Rog or Andrew at 756-5784.

HP-41 CX Engineering calculation. with advantage chip and all manuals, a must for engineers. Like new. \$150 OBO call 254-0761.

LOOKING to buy an expensive IBM PS/2 or a cheap no-name made in Japan clone?--Don't! I'm selling at a low price, a Zenith Data Systems (made in U.S.A.) 248 AT compatible computer with an Intel 286 processor, a 40 megabyte 28 millisecond Seagate hard drive (fastest 40 meg drive in the market today), both 5.25 and 3.5 inch floppy drives, and a high resolution color monitor. Additionally, will give away free secret bonus on purchase of computer, worth many times the price of it. Contact Lou, box 5466 for details.

FOR SALE: Living room furniture set. Great condition, couch, loveseat and chair. Tan with blue and gray design. \$300 or best offer 767-2561 Please leave message.

FOR SALE: Sofa bed, good condition \$75 760-6264 ask for Pam or Dave.

FOR SALE: Good table and four chairs. Only \$150.00, contact Thomas at 253-0737 or Box 7914.

FOR SALE: Single bed with frame and headboard, stereo with cassette and 2 speakers, Sony turntable, 26" color T.V. (Zenith), Black box for a Ford T-Bird. Contact Bryan in evenings 756-2433.

BOTTLED Water only 3 cents per gallon! Are you tired of drinking water with all that chlorine in it? Save 97% or more over store bought water. Call 257-6126 or Box 6606.

SMITH CORONA Electric XL 2000 Spellright II 50,000 word dictionary paid \$212 sell for \$100 Doug 237-1819 or Box #7216.

BOAT FOR SALE: 15 ft bowrider with 75HP outboard. 6 place, 35mph, no problem pulling slalom skier, engine rebuilt 6/90, have all paperwork. Asking \$2200.00 See boat in front of Sigma Chi House 520 S. Ridgewood. Call Matt 239-6547 or 252-2277.

3.5" disks \$1.25 each, 5 or more \$1.00 each. Contact Brian box 8013 or 258-1459.

9MM EXCAM TA90, new condition call 257-4721, ask for Dave or Dean.

IBM PC/XT comp., 640K Ram, 2 3.5" floppy drives, 101 keyboards, Hercules graphic adapter, 10 MHz, also software, sell for \$599, for additional info. call Mike at 760-6615 after 5 PM.

FOR SALE: Only 8.5 miles from campus! 12' x 60' Mobile Home, 2 bedrooms, central heat/air, low lot rent (\$157.00 per month), large lot: 50' x 100', washing machine included, storage shed, covered patio, small pets and children welcome. Park amenities include tennis courts, swimming pool, children's playground. On bus line. Close to shopping. OWNER ANXIOUS TO SELL! Call Laurie: Days, Mon-Fri est. 6039, evenings, 767-9834. Only \$12,500.

ITEMS FOR SALE: white and gold ornate 3 way lamp with clock, \$15; lg. seascape picture, \$5; single foam mattress, \$10; straight chair (good at desk), \$10; lg. still life oil painting, \$20; small still life oil painting, \$15; Misc. household items (glasses, etc.) Call Harriet, 239-6901 between 8-5.

C64 Add-on: graphics pad with software \$15.00 modern with terminal program that displays 40-80-106 columns on a stock C64. \$20.00 call 760-5219 or leave message in Box 4412.

FOR SALE: TI-74 with extra Ram cartridge and mathematics cartridge all for just \$80.00 (paid \$150.00) call 760-5219 or leave message Box 4412.

FOR SALE: Kenmore washer and dryer, \$400 OBO. Call Mark at 756-6757.

FOR SALE: Both must sell - 1 HO water sk (foamite) excl. cond. beginner to intermediate \$125 OBO - 1 Schwinn Sprint 10 spd Extras included 1 yr. old \$115 OBO. Contact Scott Stevenson down 1 mi. 256 pl# 252-9409 or 252-9242. Box 8591.

SURFBOARD: Town and Country 5'10" adjustable tri-fins, excellent color and condition. Must see to appreciate \$250-Call 254-0761.

FOR SALE: CX-1 flight computer \$35.00. Call Will at 239-8640.

1985 SUPRA BEAST SKI BOAT 19'6" 454 cu. in. engine, oil heat cooler, full cover and trailer with surge brakes. Must sell soon. Price nego. Call Will at 239-8640.

FOR SALE: Disk for sale \$25.00. Call 760-1754.

GUITARIST, please buy my "Rockman" soloist audio processing unit. Clean, distorted, reverb. Boosts small ary or play with lead plums. I have a 100 Watt I don't need the rockman now. Original box \$75.00 call Neal 254-8406.

MOVING - Must sell. Weight System (new) \$150, King size bed \$75, dresser \$20. Call Pat 760-7063.

DAVID CLARK H10-80 headsets for sale used under 10 hours. Best offer accepted. Call Geoff at 257-1764.

MAZDA RX-7 owners: Need work done to your car? Quality work reasonable prices. Call Steve at 253-9617 Please leave message.

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DJ SERVICES: \*\* Rock, dance, progressive, and oldies. Parties, B-B-Q's, receptions, etc. Optional light show. Reasonable prices. For more info. call Rick at 257-1284 and leave message.

ARE YOU INTO video games? If so I am interested in starting a video game club for all types of systems. Contact miles at PO box 4386 for details.

DRUMMER AND VOCALIST wanted for forming Rock Band. Please contact John at 254-8122.

HELP WANTED: Need Part-time beauty advisor to work in cosmetics and skin care. Shop near school. Call 252-2380 for an interview appointment.

WANTED: Remote control trainer airplane with Radio, must be dirt cheap. In any condition. Ross Box D-219.

LOST: Black baseball cap with F-16 printed on it. If you have it please turn it in to lost and found (information in U.C.)

PRIVATE TUTORING: need help in math, physics or chemistry I can help. I am a senior AE student. Call Kenny at 760-0241 or drop a note in Box 1156.

TUTOR NEEDED: PS 104 must be qualified 760-1688, Box 7148.

JET SKI CLUB: people who are interested in renting, riding and working on Jet Skis please contact Tim 3221.

NEEDED: Students interested in joining the Phoenix Staff. (in a yearbook) contact Christine LoManto Phoenix Editor.

### Roommates

ROOMMATES NEEDED: 4 bedroom, 1 1/2 bath, house in South Daytona, needs 3 more people. Quiet neighborhood, furnished house, \$200/mo and 1/4 utilities. Call Kim at 756-8560.

One bedroom apartment with covered parking. Walk to beach or Seabreeze clubs. \$255/mo. \$250 security. Female/male welcome. Interested parties contact Chris Box 5835. Immediate occupancy.

WANTED: 2 ROOMMATES to share 3 bedroom house. \$255/month. Includes utilities, washer, and dryer. Contact Jeff 239-0827.

ROOMMATE wanted to share 2 bedroom apt. 2 mi. from school \$205/mo and 1/2 util., phone. A/C, dishwasher, pool, tennis, security guard, call Andie anytime 253-0808.

ROOMMATES WANTED: Private lake front house 2 1/2 miles from school. Two rooms, Florida room with private entrance \$190 a month, other rooms \$210. Shared utilities, central A/C, washer/dryer, big garage (for bikes only), male/female. Please call between 7:30-11:30 am weekdays at 254-3824, or leave message in box 5696 after the 29th.

Room for rent, girls only, non-smoker, 5 mi from school, 3 br., 1 1/2 bath, house, 170 mo, and 1/3 util. Box 5575 or 761-3181.

ROOMMATE WANTED: \$195.00/mo, 1/3 utilities. Roomy townhouse in Forest Glen. Bedroom unfurnished. Call 238-1337 or 239-6049 ask for Brian or Kress.

ROOM FOR RENT: Share an "all student" 3 bedroom, two bath house, approx. 4 miles south of I.R.A.U. House is fully furnished, room is not. Within walking distance to public library and public bus to and from school. \$185 a month and only 1/4 utilities. Compare if you dare, then call for more details. 767-5917. Ask for Jeff.

ROOMMATE needed at Camp Green. 3 bdrm. house with everything. In Port Orange. \$250 mo. Call 756-9476 or contact Theo at box 5870.

ROOMMATE NEEDED: 3 bedroom house, pool, washer/dryer, and other utilities. One mile from school. Call 760-1754.

### Personals

IF THE NEW weight flyer is a completely accurate re-creation, why would the prop cut off the tail? SANDMAN

HEY MOLLIE! Chick, when are you? Return to Riddle will ya Sunshine? The usually ill SNOWBOARDER

TO ALL YOU SPUDS, WELCOME BACK! This will be THE YEAR! We're forever yours, Carper and Moen (Sigma Phi Delta Little Sisters).

SPLASH! Looking for that special mermaid! Can be found sunbating at the pool everyday at 5:00 PM. Don't be shy come take the plunge.

BLOND HAIR, blue eyes, seeks waterproof jocks to train with at pool. Help me with my stroke. See ya at the pool around 5:30.

MS. "COBIA" Happy Birthday...I hope you had a Great Time. I dit. Love, EMB

TO THE LITTLE RED HAIRED GIRL IN THE RED PULSAR. I want to ask you out, but Linus tells me you have a boyfriend. Is this true? CHARLIE BROWN

TRACY S. Since my eyes have fallen upon Theo, I have had but one fantasy. Walking on the beach. You and me, (The dolphins jumping out of the sea. This is where I want to be. My life would be complete. If only you and I could meet! THE KNACK

SANDY, Welcome Back! Class should be fun this semester. And did you know the possibilities are endless? Friends. THE G MAN

BEACHSIDE operations have been established. Welcome Freshman, particularly the females and Mr. Demkowicz (p) Good Luck with GQ vs. AHP. Yours (THE ANTENNA CLUB).

HAS ANYONE seen the "pink scooter"? Grey Citation is leaving. Respond if it matters.

BABYDOLL, I hope you had a Happy Birthday. Don't forget to stop at the liquor store on the way home. I love you. LOVEBUNNY

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