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Volume 67, Issue 4

Aeronautica

October 3,1990

Advanced C-130 lands in 1200 feet

by Hoyt E. Brown Aeronautica Editor

Lockheed Aeronautical Systems Company (LASC), in recent flight testing, successfully demonstrated full-STOL landing performance with its High Technology Test Bed (HTTB) aircraft. The HTTH is a transport category flying category which, during its development, set two "Time-to-Climb" world records, STOL (Short Take-off and Landing) operations are not common for an aircraft of the HTTB's size,

The landings were made on a six degree cluded the adddition of glide slope at 80 knots airspeed and with a gross weigh of 130,000 pounds," said Frank Hadden, changes for improving low chief test pilot for Lockheed. Hadden added, "Once we intercepted the glide slope, the aircraft was easily controlled, right down to the

According to Gordon McHan, HTTB test director for LASC, the STOL tests were conducted over a four day period at Dobbins Air Force base in Marietta.

The aircraft, a highly modified C-130 derivative, utilized double slotted flaps, direct lift con-

trol spotters, fully powered extended chord controls and a digital flight control

"We were looking

to land a 130,000 -

touchdown, These tests successfully accomplished that goal," said McHan.

Lockhood began the HTTB program in 1984 after taking an L-100-20, streched commercial version of the military C-130, and extensively modifing it for testing.

The modification inseveral devices and design speed controllability and increasing lift.

The HTTB also was retrofitted with more

propellers. Flight evaluations conducted in 1984 established

qualities. The HTTB has since undergone several "lay up" Lockheed began the HTTB flight was suspended program in 1984 after taking in order to make an L-100-20 and extensively modifications prior to modifing it for testing.

additional testing. The flying labor-



Shorty... powerful engines and The High Technology Test Bed (HTTB), a highly modified C-130 derivative, utilized double slotted flaps, direct lift control spollers, fully powered extended chord controls and a digital flight control system to land within 1,200 feet.

the airplane's baseline performance and flying cated to preparing it for STOL testing. The HTTB is capable of a full stop landing within 1,200 feet. Approach speed for this transport periods during which category aircraft was only 80 knots or 92 miles

> The HTTB is a Lockheed-funded program for developing future tactical transport technology. According to John Hilgenberg, an Aeronauti-

cal Science Assistant Professor and Air Force pound airplane over a 50 foot obstacle within an tory entered the STOL testing phase in the later C-130A veteran, the demonstrated ability of the air distance of 600 feet between the obstacle and part of 1989 following a "lay up" period dedi- HTTB represented enhanced capability and ex-

ceptional performance gains over the early model C-130 he flew for three years.

The C-130A flown by Professor Hilgenberg was limited to a much lower landing weight than the HTTB because of landing gear strength limitations, but still could land in 2000 feet.

He also stated that, "The gains made by the HTTB represent significant improvements in peronautical technology from other aircraft projects, then carefully applied to a transport

Satellite data-link is reality

by Hoyt E. Brown Aeronautica Editor

SATCOM 900, the world's first ARINC-74I-standard satellite communications system for commercial aircraft, received certification on September 21, 1990 aboard a Boeing 747. 400 aircraft. The system was developed and produced by the Collins Air Transport Division of Rockwell International Corporation. SAT-COM-900 provides global communications, unhindered by line-ofsight or atmospheric considerations.

It has been specifically designed for long-range flight where environmental problems may interfere with continuous communication.

The Collins SATCOM-900 system consists of three Line Replaceable Units: the Satellite Data Unit, High Power Amplifier and Radio Frequency Unit. Total system weight is 46 pounds. Collins has received orders from seven major airlines and the Federal Aviation Administration.

The airlines, which will begin to receive units later this month, are: Cathay Pacific, Quatas, Japan Airlines, Northwest, United, Air Canada and Canadian Airlines International.

Taxing...

General aviation is expected to be hit with higher taxes. The AOPA stands staunchly against such measures, however. It see how a paltry \$8 million in revenue justifies

PA's Baker calls tax "outrageo AOPA press release - The possible imposition of a crippling essential flight training, especially given powered aircraft. Our estimates show that a tax on

tion industry, Aircraft Owners and Pilots Association President John L., Baker said recently, "A ries on small aircraft could be the final death blow to an industry that is already in serious jeopardy," said Baker, referring to the dramatic drop-off in new aircraft sales over the past decade. "Furthermore, if the tax is limited to aircraft under 5,000 pounds, the essential aviation services would be severely impacted."

Baker said that flight schools and universities, agricultural operators, and the businessman operating a small aircraft will be the hardest hit. "I hard-

10-percent "luxury" tax on small aircraft would be the predicted pilot shortage," said Baker. "It is unirresponsible and potentially crippling to the avia- conscionable that our government would call flight training, the seeding and protection of our crops, and the conduct of commerce a "luxury.

According to Baker, Capitol Hill budget negotiators are considering a 10-percent "luxury tax on aircraft weighing less than 5, 000 pounds, which includes most of the single- and light twinpiaton-engine fleet of aircraft, or the majority of the imposing a 10 percent tax on small aircraft, thererevenue raised would be lost in the noise level and U.S. aircraft fleet. AOPA estimates that the by jeopardizing essential and vital aviation serprojected sales of these aircraft in 1990 will only generate eight million dollars in ux revenue. "It will cost the government at least that much just to collect it," said Baker,

"If the government is really serious about raising revenue, they should tax the larger and turbine-

The project involves

sites over a wide area of

Oregon, from the Pacific

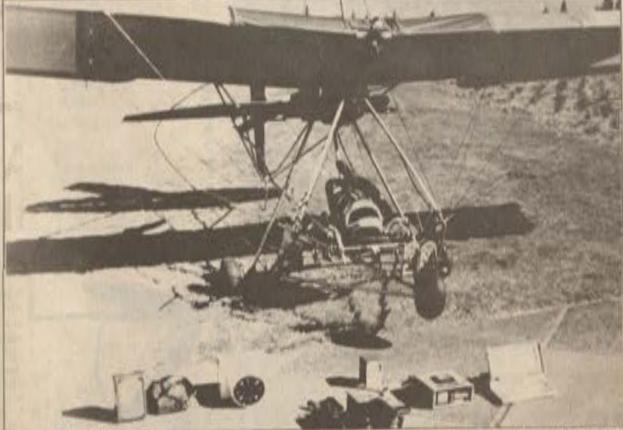
Ocean to the high desert.

aircraft weighing more than 5000 pounds would generate more than \$207 million in 1990, AOPA is outraged that the large aircraft manufacturers have sold out and offered up the small manufacturers and aircraft users as the sacrificial lumb.

"If this irresponsible proposal goes forward, it won't go unanswered, " said AOPA's Baker, "I ant offended that the government would even consider

I am further offended by the large aircraft manufacturers, who have sold out the rest of the aviation industry, despite the fact that they are the 'fat cats' who could actually contribute to the government coffers via a luxury tax."

Quicksilver ultralight doing a big job for NASA in



"OTTER" (Oregon Transect Terrestrial Ecosystem Research) project is utilizing the Quicksilver MXL-I ultralight aircraft and a converted U-2, a DC-8, a C-I30, and orbiting EOS

by Dan Moughamtan Aeronautica Writer

What does a Quicksilver MXL-Lultralight aircraft have in common with a converted U-2, a DC-8, a C-130, and orbiting EOS satellites? They are all involved in a NASA ecological project called "OTTER" (Oregon Transect Terrestrial Ecosystem Research) in Oregon.

The four aircraft are involved in gathering data. While they all produce similar results, the expense of operating the MXL-Lultralight, with a cost-conscious NASA, is significantly different from the other three. Oregon State University's ultradight runs for about \$10 an hour; a C-130 is on the order of \$9,000 an hour. In some cases, the Quickailver ultralight out-performs the more sophisticated aircraft. Richard McCreight, 41, a

scientist and the pilot of the Quicksilver MXL-1, reports that the ultralight aircraft is now being used extensively. Originally, there were no such plans,

When asked about reaction to his proposing the ultralight aircraft for the project, McCreight said, "Well, nobody really laughed me out of the room, but some people thought I was crazy. No one's laughing now because the results have spoken

With this (ultralight) aircraft we have found the data to be of such quality that it has become and will remain part of the planned activities," McCreight continued, "It allows us to simulate some of the coverage of the higheraltitude aircraft in some cases. We can run it out to a site, fly an area, and get basically the same type of data we would look at from the ER-2 (converted U-2 "spy plane") or the C-130 without some of the interference from the at-

mosphere or without some of the associated costs. We can fly it out of clearings of 100 feet and look at areas from altitudes of 300 feet to 10,000 feet, at speeds as low as 25 miles per hour. That kind of versatility is very useful."

NASA is considering the purchase of a small fleet of the new Quicksilver GT-500's for global deployment and use in future phases of the project.

About 30 scientists from NASA, Oregon State University, and several other universities from around the United States and Canada are in Oregon doing the main field work for the \$1.5 million "remote sensing" project.

The project involves sites over a wide area of Oregon,

from the Pacific Ocean to the high desert. All of the work done in connection with "OTTER" is

part of a much larger project. Scientists are testing and perfecting data evaluation techniques as well as sophisticated instruments that are to play a key role in the \$1 billion multinational 1990's project called "Earth

Observing System.

Principal investigators on the Oregon project are David Peterson of NASA and Richard Waring, professor of forest science at Oregon State. Waring has stated that the knowledge gained from the OTTER project could eventually give the world's actentists a "big view" of the planet's biological health. Such in the face of global climate changes techniques will be of growing importance in the face of global climate changes, that will affect forests, agriculture, weather patterns, and other aspects of the planet's life. The type of remote sensing technology being developed in the OTTER project may serve as an "early warning system" of changing ecological conditions or problems, according to Waring.

Trophies awarded to aerobatic champions

by Hoyt E. Brown Aeronautica Editor

Quick OTTER ...

The 1990 International Aerobatic Championships have produced first place winners in four skill levels: Unlimited, Advanced, Intermediate and Sportsman at Fond du Lac, Wiscon-

Richard Massegee, of Albuquerque, took first in the unlimited category. He was flying a new Rebel

His final score was 11,355 points. Second place went to Earle Andrews, who tallied 11,350 points. Massegee

which is treated as a separate competition for unlimited pilots.

Tom Adams continued his winning streak. He has been first in Advanced for two

Aerobatic Championships. Adams, a

Bill Finagin flow his Pitts S-IT in

resident of Springfield, Tennessee,

years at the U.S.

National

competes in a Pitts S-IS.

"It was a small, but smooth and enjoyable years at Fond du Lac and for two

contest...

Olympia Fields, IIlinois, captured the laurels in his twoplace Pitts S-2A.

home with the first place trophy for

In Sportsman, Larry Warren, of

the Intermediate level.

Paul Ordini of New Jersey became the first pilot to compete in Fond du Lac in a Rans S-9. The Sportsman category also saw a stock

J-3 Cub and a HiperBipe. Altogether, 50 pilots gathered for Denison, Texas, September 22-28.

also won the four-minute freestyle, from Annapolis, Maryland, and went the opening day parade.

"It was a small, but smooth and enjoyable contest," said Steve Morris, who became the new president of the International Aerobatic Club during the contest.

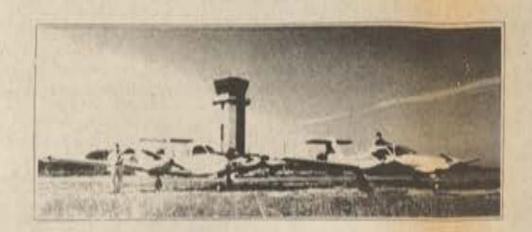
Morris, who also directed the competition, said he expected to make some changes at future Fond du Lao contests to increase participation and broaden the appeal of the event.

The next major event for IAC is the U.S. National Championships at



Champ aerobat ... 1990 International Aerobatic Championships at Fond du Lac, Wisconsin.

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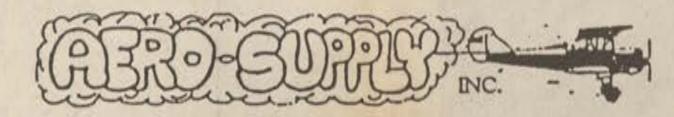
Landings on 7R, 25L, 34, and 25R

Aerobatic Course in Bellanca Decathlon.

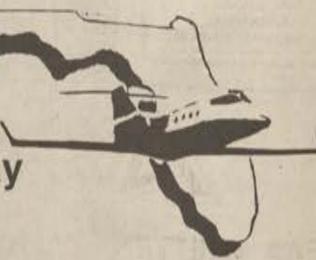
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Space News...



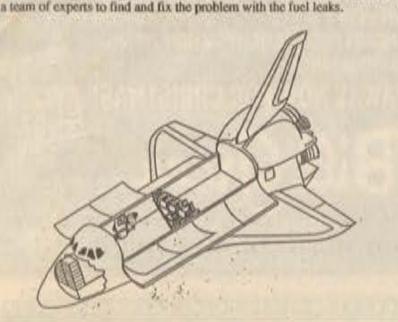
Delta rocket is successfully launched... A Delta II rocket, possibly carrying a NAVSTAR GPS satellite, was successfully launched yesterday around 6:00 p.m. This was the ninth launch of a Delta II rocket. The NAVSTAR satellite is used by the military for Global Positioning of troops.

Aviation problems jointly addressed... The Federal Aviation Administration and NASA have signed a memoranda of understanding under which they will jointly seek solutions to problems of mutual concern in aviation. The effort will focus on technology to further reduce noise, better understanding of noise effects and development of noise reduction standards for newly designed aircraft.

Strategic Defense Initiative subsystem explored... Mo-Donnell Douglas Space System Co, has recently announced that the Space Data Division of Orbital Sciences Corp. has been selected for further negotiations to develop an affordable booster subsystem for the Ground-Based Surveillance and Tracking System (GSTS) program. McDonnell Douglas is conducting the GSTS Technology Validation Experiment for the U.S. Army Strategic Defense Command in Huntsville, Ala. The program, sponsored by the Strategic Defense Initiative Organization (SDIO) will resolve issues associated with midcourse surveillance, track and discrimination. The GSTS is part of the first phase of the Strategic Defense Initiative Organization.

Gamma Ray Observatory readied for launch... The Gamma Ray Observatory, is scheduled to be launched abourd the Space Shuttle Arlantis in late November. The observatory will be gathering gamma ray data generated since the beginning of time, approximately 15 billion years ago. It will help scientists learn more about the origin and the universe itself. The observatory will be deployed in an orbit approximately 279 miles above the Earth. The Gamma Ray Observatory, 17 tons, will be the heaviest payload ever deployed by the space shuttle. The Gamma Ray Observatory is one of the many observatories and spacecrafts designed for the 1990s.

Atlantis rolls over to the VAB ... The Space Shuttle Atlantis rolled over from the Orbiter Processing Facility (OPF) to the Vehicle Assembly Building (VAB) Tuesday night, Atlantis will be carrying the Gamma Ray Observatory on this mission. The launch of Atlantis should occur sometime in late November. The Space Shuttle Atlantis as well as the Space Shuttle Columbia have been plagued by fuel leak problems. The launch should occur in November providing the fuel leaks have been fixed. NASA has assembled



Magellan takes remarkable pictures of Venus

by Marianne Michaels Space Technology Editor

On September 15, 1990, the Magellan spacecraft took a series of photographs of the planet Venus.

The pictures are 10 to 100 times as detailed as

previous pictures taken by American and Soviet

The photographs show wind blown dust



Intriauina...

Magellan took this picture showing an area of Venus with three meteorite impact craters, one of them is 30 miles

deposits, a river of lava that is 200 miles long and a domes, which resemble an upside-down bowl, crater the size of Los Angeles.

The surface of Venus seems to have been bombarded by meteorites despite Venus' thick atmosphere. The pictures relayed by Magellan, feature many active volcanoes.

Several craters, some 20 to 50 miles wide, are unusually deep.

An atmosohere thought to be too dense, five times as dense as Earth's, seemed to show signs of streaks of dust deposited by wind. This came as a surprise to

thought that the atmosphere, which is so thick, would not cause much wind erosion.

There were no signs of liquid water considering that the surface is 800 degrees Fahrenheit (which by the way could melt

Also found in the pictures were volcanic remarkable images.

reveals evidence of mountains rising and collaps-

The most incredible picture taken by Magellan, is a mosaic, or a combination of several individual

pictures, which shows an area of Venus which has been called "the crater farm".

The area consists of three large meteorite impact craters, one crater 30 miles wide, covers an area the size of Wyoming.

The spacecraft was delayed two weeks into its mis-

scientists, who once sion, when engineers temporarily lost radio contact with the spacecraft twice in August.

The surface of Venus

seems to have

been bombarded

by meteorites

despite Venus'

thick atmosphere.

The cause of the problems is still not known. Engineers believe that the problems was caused by static in the wiring linking the spacecrafts com-

Engineers at the Jet Propulsion Laboratory have modified computer instructions in order to prevent further serious interruptions and safeguard the spacecraft.

The spacecraft, only 10 days into its 243-day mission, will continue to provide scientists with

Discovery prepares to launch the Ulysses spacecraft

by Marianne Michaels

Space Technology Editor The Ulysses spacecraft is set to be

launched on Saturday, October 6 at 7:35 a.m. aboard the Space Shuttle

Ulyases will be an international project to study the poles of the Sun. The spacecraft will also study the interstellar space above and below the

Three major topics in solar physics that the Ulysses project will study are the Sun, the solar wind and interstel-The polar regions, an area never

major area of concentration of the the Sun. Ulysses spacecraft. The Ulysses project, named after the Greek adventurer in Homer's epic

poem, was originally called the International Solar Polar Mission (ISPM). The scientific data that will be obtained from Ulysses will provide scientists with valuable information concerning the Sun and outer space.

The Sun's magnetic and electric fields

have strong influence on inter-

planetary space in the polar regions with the Sun in April 1994. The 1994 on its way to the north pole. The and is one of the reasons why previous spacecrafts have studied the Sun in or near the ocliptic plane.

Scientists expect to see strange phenomena in the polar regions because of the shape and structure of the Sun's magnetic field. The instruments on the Ulysses spacecraft will also examine other phenomena from the Milky Way galaxy.

Little is known about the matter that reaches the solar system from nearby stars. This is because when matter enters the solar system, it is influenced by the Sun's magnetic field before studied by spacecraft, will be a and the particles that emanate from

The Ulysses spacecraft can not be launched directly toward the Sun, therefore, it will have to be sent to Jupiter on top of a two-stage Inertial Upper State and a PAM-S (Payload Assist Module).

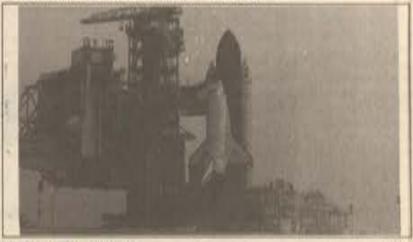
Ulysses will approach Jupiter in December 1991 and Jupiter's gravity will change the spacecraft's trajectory and head for the Sun's southern pole. Ulyanex is expected to rendezvous

Sun, (one astronomical unit is approximately 93 million miles).

Ulysses' trajectory will be bent by the Sun's gravity and is expected to tists with information about the Sun cross the Sun's equator in November

spacecraft will spend approximately spacecraft will spend another four four months in the southern latitude, months at the Sun's north pole. This about 2.2 astronomical units from the is expected to occur in January 1995, The end of the mission will occur in August 1995.

Ulyases will sure to provide scienand beyond.



Discovery awaits...

The Space Shuttle Discovery sits poised on the launch pad awaiting launch on October 6 at 7:35 a.m.

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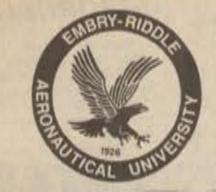
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Lotus 1-2-3 sets its sights on spreadsheet dominance

by Joe Cambron Managing Editor

Many students at ERAU are now making an important choice concerning which spreadsheet package they will be using during college, and perhaps the rest of their number-crunching years. It may not seem important now, but most college graduates will use a spreadsheet package for some task in their future. Whether it be for accounting, business models, mathematics or report writing, students must now make a choice concerning which spreadsheet they will become familiar.

In the beginning... Leading the spreadsheet industry into the future is the dominant force in the industry, Louis. Its 1-2-3 product is the most popular spreadsheet in use today both in business

New and improved for the '90s

Recently, Lotus released the newest version of its spreadsheet and graphics package, 1-2-3 ver. 3.1. This product is the most powerful spreadsheet yet produced by and DOS 3.0 or higher are all Newly designed...

hanced graphics that now have a three-dimensional look, an 80286 operating at 12 Mhz or more is also strongly awe inspiring when operating in tandem. new presentation capabilities, the ability to manipulate cells from multiple worksheets into formulas, and a new "What You See Is What You Get" (WYSIWYG) interactive layout capability,

If all of these features seem complex and arcane, Lotus

has provided perhaps the most comprehensive collection of documentation ever assembled. Indexed and attractively packaged, the program now weighs in at about five pounds.

The requirements for 1-2-3 ver. 3.1 are heavy. An IBM AT or compatible with at least a megabyte of system RAM, a hard drive with five free megabytes, an EGA or VGA video system for color graphics,

recommended.

Choose your version

For those without the equipment to handle release 3.1's muscle flexing. Lotus is also offering a slightly scaled down release entitled ver. 2.2. It generally is available for

about \$100 below ver. 3.1's higher price tag. For those unwilling to make the commitment either to version 3.1 or 2.2, a student version of 2,2 is available in the university bookstore for

Performance

Performing for my fingertips on an 80386SX running at 16 MHz, the program was amazingly fast even without a coprocessor. The raw number crunching ability of both the program and Intel's 80386 is

Massive recalculations involving several thousand cells and requiring the use of several hundred randomly generated numbers took place in fractions of a second. The wave of recalculations seemed to wash across the screen like the ocean. The program manipulated one of my 125K spreadsheets as if it was only a few bytes for the hungry

On a VGA screen, increased numbers of rows and columns can be displayed, thus giving the operator a greater window into his creation. The VOA did provide

Custom screen drivers

one stroke of unhappiness, however.

The ability to install custom video driver sets, which allow some monitors the capability to go beyond standard EGA or VGA, seems to have fallen by the way-side with

Several new types of graphs are now available for the as well as the ability to format them more thoroughly using see Lotus, page 88

Lotus. It incorporates advanced database functions, en-necessary for operation. At least Lotus sports a new logo for the '90s. Flight of The Intruder simulation Spectrum HoloByte ships new

by Joe Cambron Managing Editor

Spectrum HoloByte, the company which brought America the Soviet game Tetriz, now has changed sides and converted Stephen Coonts' best-selling novel into a top-notch HiM AT computer flight simulator. Yes it is that invented Falcon, is now a game. Players may build formations of F-4 Phantom fighters and A-6 Intruder bombers aimed at Vietnam in what we now know was a hopeless endeavor. The game makes it seem much less hopeless. This is not a criticism. In fact, most keyboard pilots will enjoy the ability to complate missions successfully,

The interface utilizes beautiful 256 color VGA graphics for the cockpit instruments, The use of shadow and the wide range of color gives the instruments a sense of depth unique to most aircraft simulations. The use of colors things which sets Intruder apart from is very similar to Broderbund's Wolfpack, submarine game.

The actual video from outside the cockpit is the usual place that flight simulators are found lacking, but not so much in this case. Although the "out-the-window" graphics are not so detailed as Microsoft's Flight Simulator (which results in hard drive accesses which momentarily halt the game), they are far above average (without the pauses). The detail of other aircraft is particularly welldone, and the game offers the chance to get pretty close to them (more about that later).

One good example of the real-life graphics in Intruder is during the classic dogfight. A videouspe which accompanied my test version. when played by two pilots over the a complex video adventure.

of the product demonstrated the gun camera's phone lines via modem, either player can be. The good, the bad, and the ugly footage that the interface was designed to imitate, and it does a relatively good job of matching the realism. The game does an excellent job of portraying the damage caused by hits upon enemy aircraft and ground inscallations. Dog-fights using muchine guns at true, Flight of The Intruder, from the company close range are enough to raise anyone's blood pressure noticeably. It is not unusual for players to pause the game so they may utter a few expletives following a few missed shots. The sound

The sound is also impressive if you have an Adlib music synthesizer. Missiles, guns, engines, and radio communications all have been accurately converted to digitized sound.

Flying closely to other aircraft

Dog-fights are not the only occasion when one has to fly very closely to another aircraft. One of the other simulators is its formation flying scenario. Not only are pairs of Phantoms launched on missions, they often provide cover for a flight of Intruders nearby. The real innovation in this game, however, is the ability to move between any of these aircraft at any time. No, not in the air-in the

Multiple aircraft, multi-tasking?

The player may be the pilot of any aircraft in any formation at any time, and his departure from the cockpit puts the computer in control of that plane. This interface is so flexible that in any plane, the same plane, or even in a MIG fighting against each other.

To the air

The actual simulation follows a myriad of setup screens which may be customized or left at default. The USS Shiloh provides the launching platform for all the missions. After five seconds of preparation, or a simple key press, your craft lumbers down the deck, thrust into the air via catapult. With full afterburners whining in the Phantom, the craft at first slowly climbs out from just above the water to a suggested height of flight level 100, manual. 10,000 feet.

BUILDING ow York Tires

Novel idea...

Flight of The Intruder (see A11) the novel is now

At this point, the games faces it only real shortfall. While other games provide an INS marker which makes it simple to find your target. Intruder offers very little in the way of navigation assistance other than the ubiquitous autopilot (which will take the aircraft directly to target). This situation arises from two problems, one that is unique to the F-4 cockpit. The primary CRT (the cathode ray tube display at the center of the cockpit) offers a wealth of information, but very little of it is decipherable, even with the help of the

The second problem the game faces from a navigation standpoint is the inadequate placement and design of the compass. Instead of having the traditional gyro-compass or a digital read-

out, a square instrument with an N at the top and E, S, and W on the sides serves this function more like a clock with hands moving instead of the face. This leaves precise beadings quite dif-

On the F-4 this problem is confounded by placing the compass on an additional section of the cockpit that can only be shone by obscuring neurly all outside view.

Not to dwell on the negative, the game has several strong suits. Besides the multiple aircraft control, the game has above average viewing capabilities (i.e. behind the plane, above, left, right, from the carrier, from the target, from the missile, and out the windshield) as well as

dramatic panning capabilities (ala ler Fighter) that enable the camera to move in a fluid fashion to any perspective. The game is infinitely customizable from armaments to missions to weather to time of day to difficulty. Finally the games inclusion of gun camenas gives the player a chance to review his combat movements.

All the extras

The game even comes with a copy of the excellent novel that the game is based on. The manual explains the game relatively well, but even so this may be one game where reading the manual is not optional. The keyboard is riddled with controls that are difficult to master without a thorough reading of the manual and its supplements. (At least the pilot does not have to scower the manual to answer a copy-protection scheme question.)

Performing for my pleasure on a Protek 80386SX IBM compatible running at 16 MHz with VGA graphics, the game was smooth and enjoyable with a joystick, cumbersome with the mouse, and painful with the keyboard. The game should probably not be played on an IBM compatible machine with less than alt 2 Mhz 80286 CPU. Intruder is memory hungry as well. A full 640K RAM will be required to run the program. Memory resident software should be closed to conserve space for the VGA graphics and digitized sound.

Intruder should be viewed as a game that did not compromise too much to the "I want to fly an airplane, but what's a yoke" crowd. Even with a shortcoming, the game is an excellent "combat adventure." Forty dollars seems inexpensive when one considers what 377 Navy pilots paid to fly in Vietnam,

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THE WORST PART, THOUGH

WAS THAT SUSIE DERKINS

MON OUR BET ON MHO'D

GET THE BETTER SCORE I HAD TO PAY HER 25 CENTS.

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HAND IT IN, CALVIN YOUR TIME'S UP

> DAY! MAYBE ALL THESE X4 MEAN MY ANSWERS ASS CORRECT! MAYKE "F" THAT MUST BE IT! I WIN THE BET

by Bill Waterson

DON'T FORGET WE HAVE A BET

ON WHO GETS

THE HIGHER

GRADE

DON'T

GAMBILE! NO BETS!









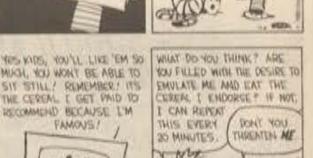








SIY STILL! REMEMBER! IT'S







"Well, they finally came . . . But before I go, let's see you roll over a couple of times."

by Gary Larson-



Far Side

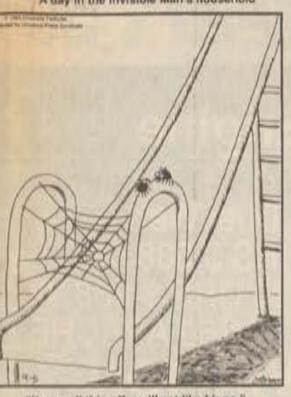
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B9

December graduates to hold meeting

The first meeting for the December 1990 Graduating Class will be held on Tuesday, Oct. 9, 1990 at 8:00 p.m. in the Student Center. Important graduation information will be reviewed and elections for your Senior Class President and Vice President will take place,

If you are interested in running for Senior Class President or Vice President, please set up an appointment to meet with Laurie Ranfos by Friday, Oct. 5, 1990. Immediately following the meeting on Oct. 9, the Senior Class Council will be secured. This group consists of approximately 25 volunteers from the graduating class who will meet weekly and work as a team to raise funds for the Senior Class Party, secure discount hotels for their guests during graduation week, and complete a variety of other goals.

If you are unable to attend the meeting on October 9th, please stop by the Student Activities office located in the Student Center.

Cancer Society to host Casino Night

New directions, the young professional group of the American Cancer Society East Volusia Unit, will host a Great Gatsby Gala and Casino Night on Saturday, October 6.

The event, which will be held from 7:00 pm, until midnight at the Eagle Aviation Hanger in Daytona Beach, will feature casino-style games, entertainment by Daytona Sound Delite, as well as costume and dance contests. Hors d'ocuvres will be provided by Forest Hills Catering. Costumes from the 1920's period are welcome.

Tickets for the event are \$20.00 in advance and may be purchased by sending checks to the American Cancer Society, 1510 Ridgewood Avenue, Suite 201, Holly, Fl 32117. Tickets will be \$25.00 per person at the door.

For more information, contact the American Cancer Society office at (904) 673-3350.

Flying Fit into the 90's

Wellness Week 1990 will be held on Tuesday and Wednesday, Oct. 9 and 10, from 11 a.m. to 2 p.m. in the John Paul Riddle Student Center, Flight Deck. The booths at the event will be health screening by the American Red Cross and Neuman Eye Institute, cholesterol level checks, body composition profiling, health information, stress checking, nutritional news, safety services here on campus, sexuality update, environmental awareness, and handicapped services information.

Special events for the occasion will include a volley ball game between the students and faculty/staff; a Stress, Depression, and Anxiety Seminar; Skin Cancer screening; "Medical Certification & the Airlines" given by Dr. Richard Reinhart; CPR and First Aid class; as well as "Wellness Feud" between Residence Halls.

Please stop by the Counseling Center in the S.C. or call ext. 6035 for more information on Wellness Week or other services offered by the Center.

The Embry-Riddle Aeronautical Wellness Week 90, Flying Fit in the 90's, has been developed to increase campus awareness regarding the importance of positive lifestyle choices and to improve the quality of an individual's life. By increasing visibility and participation in campus-wide wellness activities, the planning committee is promoting the concept of wellness to the entire University.

...Work?

Lotus

(continued from page B5) color and different fonts.

Among the new types of graphs are area graphs which shade areas between lines to show margins, HLCO graphs which are primarily used to show daily stock price shifts, and mixed graphs which combine the other types.

Breaking the third dimension

Much the same Who Framed Roger Rabbit showed that shadow can make curtoons look more realistic, Lotus has used the same technique to make its graphs more impressive. (Who can resist a first quarter performance so impressive that it casts a shadow over last year.) This 3D effect also extends to spreadsheets.

Instead of limiting the user to rows (horizontal) and columns (vertical), Lotus opens up the possibility of using cells from separate spreadsheets (planar).

Windows?

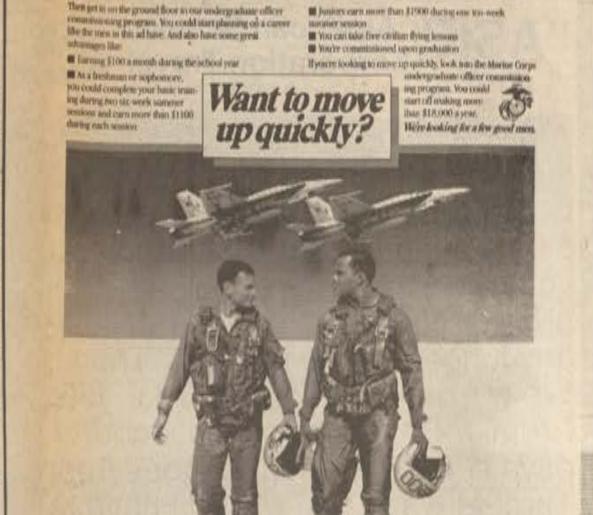
1-2-3 now works with Windows, and as part of the celebration 1-2-3 has borrowed some of its tricks. Lotus has incorporated Windows ability to handle extended memory with their LIM-EMS 4.0 standard. The result is the very effective use of memory whether extended or expanded memory is used. Lotus has also enabled (pardon the pun) 1-2-3 to use hard drive space as virtual RAM even with an 80286.

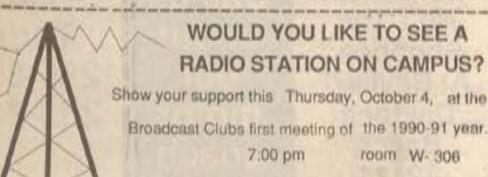
Spreadsheeta may now be stacked in windows, zoomed-in for greater detail, displayed in 244 colors, be displayed over free-hand drawings, and contain up to eight font styles.

Printing has also been improved. Print preview now allows users to see a page prior to print. Graphs and worksheets may now be printed sideby-side. Even multiple ranges may be printed instead of one.

Summing up

All in all, Lotus 1-2-3 has no competition in the race for the finest spreadsheet package. Its capabilities are great enough to run your checkbook or an airline. Its on-line help facility will steer the user effortlessly through its menu based environment. 1-2-3 is the clear winner in the spread-sheet struggle.





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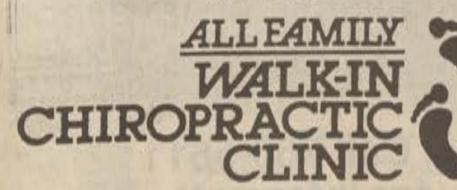




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ATTENTION: Anyone increased in camping, cooking, hiking, etc, should give me a call. My number is 756-2594. Do you wish to help a Sent troop or join an explorer post? Let me know.

ATTENTION VIDEOGRAPHERS: We offer custom editing services. Give us you new footage and we'll remm your finished product. We edit wedding, commercial, and home videos. Special effects, titling, animations, musical enhancements, etc. call 756-2594 after 5pm or drop a note in Box #7035 or #8020.

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with frame. Looks great. Best buy at

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PIPER SEMINOLE FOR RENT. \$85/hr don's \$95/hr tolo. Call 238-0453 ask for Alex. Available immediately

BREAK THE MONOTONY of studying for classes! Volunteer to help local scout unit. Boy scout troops, explorer posts, and the OA could use your experience. Besides, going on a camping trip can really help your grades because it gives you an outlet for the stress of school. Call 756-2594 after 5pm. Ask for Dave.

NEED PAPERS TYPED? Papers professionally done on word processor. Printed on laser printer. Spelling checked, revisions available. Satisfaction guaranteed. Call Valurio x6256 or 761-9580 or Sucx6252 or 676-2473.

ROOMMATES

HOUSE FOR RENT 2 bedroom, 2 both, 2 car garage fully furnished, washer and deyer, 3 mil. from school, \$600 a month. Call Mike Hunderlong at 756-4637.

FOR RENT-1 bedroom, 1 bath, AVSTAR Flight Computer: with instruction condominium, 10 min. from school. Quint book. Less than 1 mo. old. Sell for \$30.00. area, walk in closes, full bath, washer, dryer, kitchen w/ appliances, central heat/ AC. Rent: \$335 a month and depoxit. Contact MR. Hansen 441-4034.

> ROOMMATES NOT WORKING OUT? MOVE IN NOW! Trails town house. 3 bdr/ 2 buth needs one more adult. Bedroom is upstairs with own bath entrance. TV, stereo, Micro, WASH/DRY, Pool lite. Garage for bikes! NICE PLACE! Ask for David 676-

ROOMMATES WANTED for 3 bedroom, 2 1/2 bath house close to school 225 per room ine utilities contact Jeff 239-0827, Box 6288.

ROOMMATE NEEDED! Large one bedroom age. at breakers Apr. \$220.00 per/mo and 1/2 utilities male or female call Joe 234-7791.

PHOTOGRAPHER FOR HIRE- Climat PERSONALS

ANYONE KNOWING WHEREABOUTS of 2 ERAU Immobilization stolen off my Blue Ford Track on Wed. Sape 26. Since I am the prime suspect it would be nice if the person responsible would please turn him or herself in to Security, or at least return the Immobilizers to security. If anyone has any information concerning this please notify either security OR myself at ERAU box 2102 or 778 Jimmy Ann Dry #1611 Phone #253-9607. Any information: will be held confidential or can be anonymous.

HOONEY, Happy B- day Michelle, Injug. Your Friendly Neighbors.

THE FABULOUS FIVE, Thanks for one of the most interesting weekends of my collisis sureer. Wait until Key West. Butt-naked on the edge of eternity BC, don't change cassottes while RG is driving. Sain's Little

OTTO- liveryone could stand a hundred chest x-rays a year. They ought to have them tool-J. Frank Pamell.

Dean IT could easily be accombished with a computer.-Dr. Strangeglove.

HANNA, Finally, a weekend without AARRGGGHHI(Scratch, scratch) So glid you came down to see me. I LOVE YOUT Smoothes.

TO MY PETITE LITTLE PLOWER: Back day I anticipate coming home into your arms. Coming home into your arms, Rack night I dresso of walking to your sweet smile. How Can I get any better? Love, Sweetin.

WANTED: Preny gid, strong, good conk. able to clean and sew. Must own bont and motor. Must be semi-educated and personable. PLEASE ENCLOSE PHOTOTAL boat and motor.

I'm not 5'7", But my blue eyes will pieres your soil, and I'm looking for someone who can best me at tennis! Now Modest, I'm Perfect.

RESPONSE TO TENNIS AD: I ment the prerequisite. Don't have my though. Respond 10 box 8046

IN RESPONSE TO WANTED, I meet 59 percent of your requirements. Blue Hyps included. If interested respond to Box 8578.

SYDNEY DARLING-Bloody good to have you back! Does this mean your love affair with what's his name is over? your loving wife, Dinna.

DID YOU READ THE EDITORIAL LAST CIENSORSHIP ABOUT WEEK Hhmmmm? What are you waiting for? Do something about the mindless, moving masses that are destroying the first Amendment of our constitution. Mentally I'll Snowboarder.

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