

NASA report

Computers not all bad

If you are having trouble with a computer that keeps sending you your brother-in-law's book club bills, we don't blame you for being piqued.

But we feel obliged to say a kind word about computers as they are used by the National Aeronautics and Space Administration and their value to space exploration.

Take the problem of calculating the trajectory necessary for the safe return of the Apollo 13 crew in April 1970.

Using the IBM-360 computer in the Mission Control Center Real Time Computer Complex in Houston, 12 six-minute computer runs were made toward determining the proper return trajectory for Apollo 13.

Nine of these were transferred to the Return-to-Earth Console for examination. From these, three were selected for return-

to-Earth candidates, and two additional computer runs of two minutes each were made on these three before the final return-to-Earth trajectory was chosen.

From the initial computer runs to the six two-minute runs on the final return-to-Earth candidates, a total of 84 minutes computer time was required to determine the initial return trajectory for Apollo 13.

Somebody (we don't know whether he used a computer or not) figured out that those 84 minutes are the equivalent of 1,040,256 man-years of manual calculations.

That's how long it would have taken one man to calculate the correct trajectory for the burn of the Lunar Module Descent Propulsion System engine to place the Apollo 13 crew on a free return trajectory.

If a desk calculator had been

used, the time to figure the correct trajectory would have been shortened to a mere 60,480 man-years.

If all the people in the Mission Planning and Analysis Division at that time (220) had been assigned the task, it could have been manually computed in just under 4,730 years or by the year 6700.

That's a long time to wait to find the way home.

So, just forward that unpaid bill to your brother-in-law and don't knock the computers too much.

Houston firm donates device for training

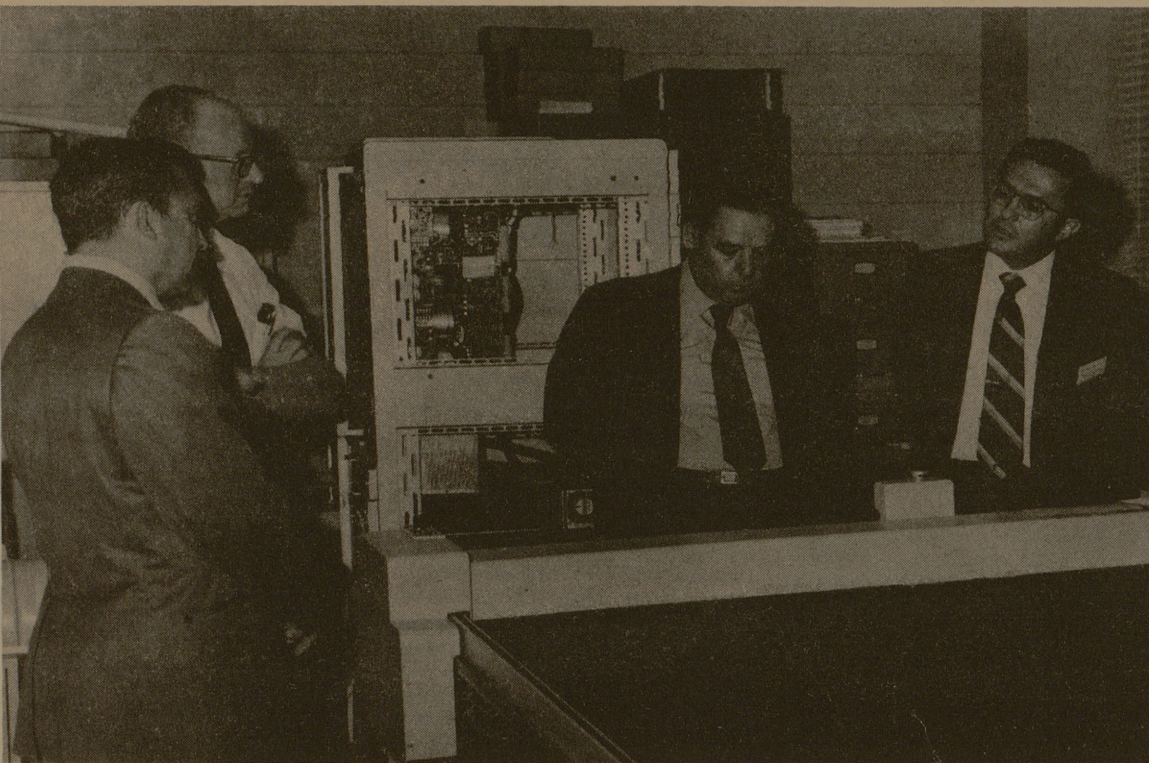
Seabek Products Inc. of Houston has donated a \$2,000 teaching aid to the Engineering Extension Service's Telephone Technicians Training Center here.

Chief Instructor Art Blake said the cable pressurization model will be used in a training course designed to explain recent innovations in cable pressurization.

C. B. Tinsley, a Seabek employee, designed the unit and installed it at the training center. The mobil unit, mounted on large plywood boards, can simulate natural telephone plant conditions.

"Mr. Tinsley has designed and built a teaching aid that makes instruction to students many times easier," Blake said.

Seabek Products Inc. is a manufacturer of cable pressurization equipment.



THREE REPRESENTATIVES from the College of Engineering, Instituto Tecnológico Y De Estudios, in Monterrey, N. L. Mexico, recently reviewed the programs and facilities of the Departments of Industrial and Mechanical Engineering to explore programs of mutual interest. Touring the Numerical Control Laboratory of the Industrial Engineering Department are Dean Francisco Vera (left), Dean of the College of Engineering at the Monterrey Institute; Dr. A. W. Wortham, head of Industrial Engineering here; Professor Armando Garza Cardenas, head of Mechanical Engineering at the Monterrey Institute; and Dr. Benito Flores, head of Industrial Engineering at the Monterrey Institute and alumnus of Texas A&M University.

Couple first one to complete engineering co-op program

A pretty green-eyed blonde and her husband — Brenda Ann and Kevin J. Chilcoat, the first married couple to graduate from Texas A&M through the Cooperative Education Program — have settled in Waco where Kevin accepted employment with General Tire Company.

Assistant Engineering Dean

J. G. McGuire, coordinator of the program, said Brenda also is the second woman to receive an engineering degree at Aggieland and the first in mechanical engineering.

Nancy Nielsen of San Antonio received a B.S. in nuclear engineering in 1970 and is employed by General Electric in Fayetteville, Ark. Linda Gonzales of Dallas will get her chemical engineering degree in midsummer and go to work for Union Carbide in Sea-

Jefferson. Brenda spent five sessions, first from Lamar Tech and later from Texas A&M after transferring in 1969.

While earning their degrees majoring in mechanical engineering, the couple took several courses at the same time and had six classes together.

Diplomatically, perhaps Brenda outscored her husband in only one of the last three, tied him in another, and lagged behind one mark in the third.

"Kevin likes heat and power better, while I find structures more interesting," she explained.

While getting married changed her mind about working as an engineer in the immediate future, nothing has shaded her interest in engineering or her strong belief that women have a definite place in the profession.

"My degree may hang above the kitchen sink," Brenda laughed, "but I'm one wife who knows what her husband does on the job. And I may take a job later or join Kevin in consulting work some day."

"In a few years many more women will be in engineering," she continued. "They're finding out that all engineering jobs are not greasy."

She lists design of homes, residential lighting, home appliances, and toys as a few examples of tasks which are natural for women.

Brenda was asked if she had any regrets.

"I'm glad I had the experience of taking part in Cooperative Education," she said. "I'm glad I'm an Aggie. And I'll always be glad I got my engineering degree a few seconds before my husband got his."

Kevin worked four semesters at

Active duty pay increased for state guard

AUSTIN—Gov. Preston Smith has signed into law a bill raising the minimum pay a National Guardsman may receive while on state active duty.

The law applies to only the first four low-ranking pay grades, according to Maj. Gen. Ross Ayers, Texas adjutant general.

According to the bill, as authorized by Rep. John Traeger of Seguin, the minimum pay is set at the per diem rate paid state employees for travel. This is now \$14 a day, he indicated.

The per diem rate increases to \$16 daily effective in September.

Traeger said the law would pitch the level of pay so Guardsmen wouldn't take too large a financial beating while on state active duty. State active duty includes aiding in civil disorders or natural disasters.

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