

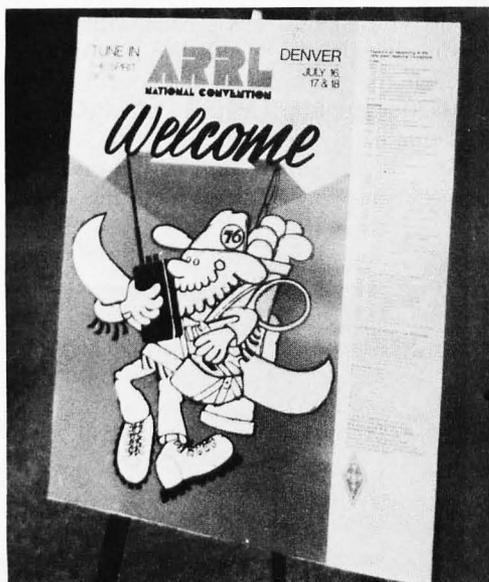
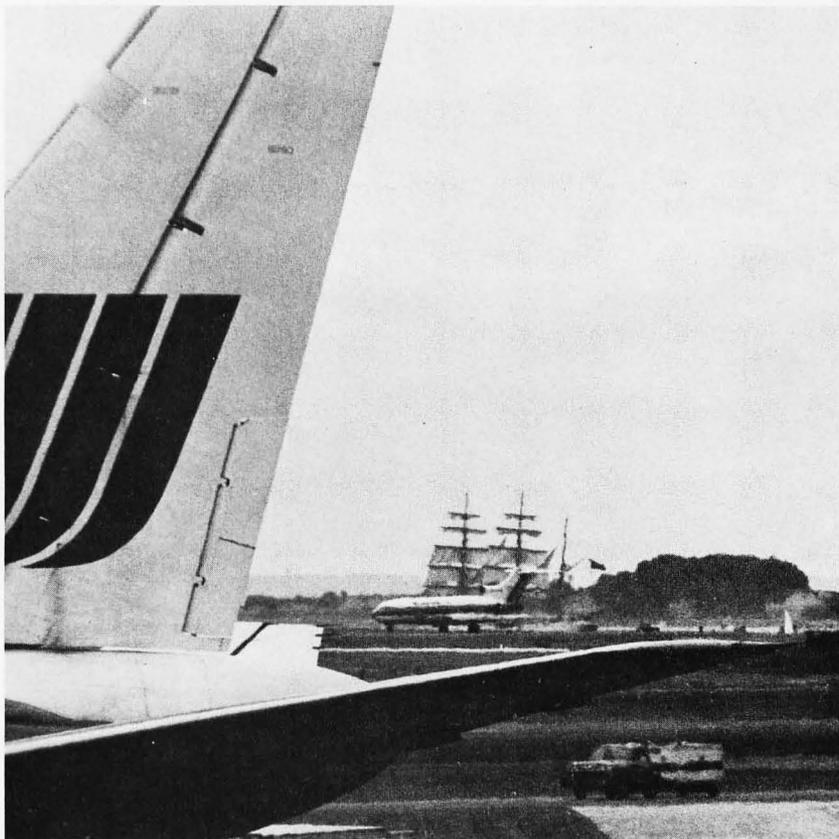
Waiting to leave at Logan Airport in Boston, Ed Zealy captured this interesting juxtaposition of transportation technologies. The tail of a 707 frames the distant image of a 727 masked against a sailing vessel leaving Boston as a part of "Operation Sail."

# Travelogue

... Notes by Carl Helmers, Editor

On July 16, 17 and 18, the American Radio Relay League's 1976 National Convention was held in Denver CO at the Denver Hilton hotel. The ARRL is the amateur radio operator's main organization and representative in matters concerning the legal availability of amateur bands in the radio spectrum. Without the ARRL, amateur radio as it is today and has been practiced since early in this century would not exist. (For information on amateur radio, contact the ARRL at 225 Main St, Newington CT 06111.)

As part of the affair, reflecting the interest of many radio amateurs in computing applications to their field, the Denver Amateur Computer Society was asked to coordinate a series of microprocessor sessions at the convention, and this in turn helped attract a number of personal computing vendors and spectators to the exhibition area. BYTE was present at the con-



A sign in the lobby of the Denver Hilton greets the several thousand visitors to the ARRL convention.

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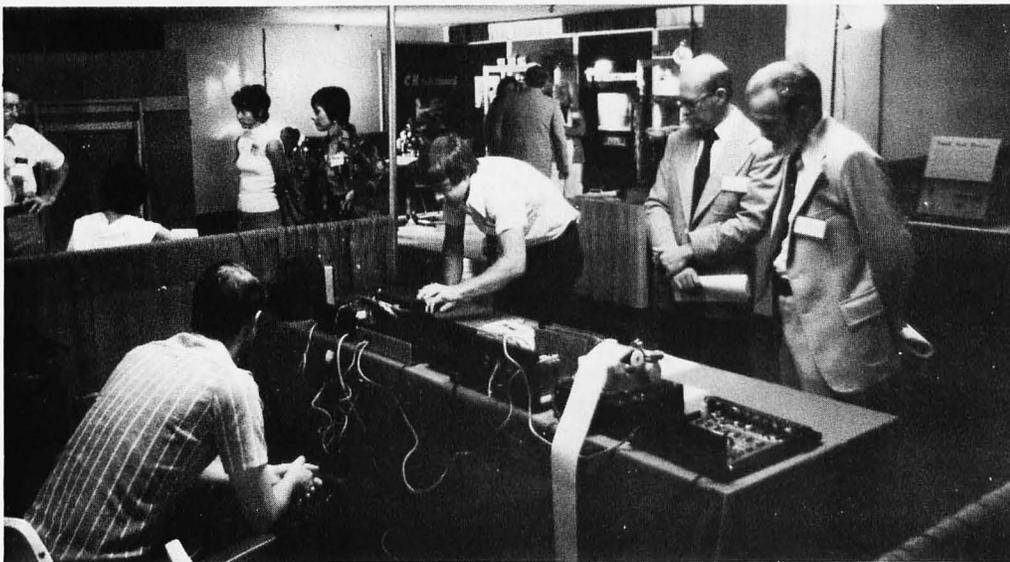
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*Gary Kay (leaning over table) and Joe Deres (seated) of Southwest Technical Products demonstrate their wares at the ARRL convention. The table contains an SWTPC 6800 system, CT-1024 terminal, GT-6144 graphics display unit, and printer.*



*Every manufacturer shows off the product in the factory. At MITS, the new Altair 880B machine is quite effectively integrated with three floppy disks, a Lear-Siegler ADM-3 terminal, and a disk operating system in the display room. Here Dave Bunnell and Carl Helmers are engaged in a conversation with the demonstration system in the background.*

*The interior of the main assembly area at MITS is illustrated in this shot taken during the tour of the facility.*



vention with a booth in the exhibit area staffed by Deena and Ed Zealy, Beth Alpaugh and me. I also participated in one of the microprocessor oriented technical sessions by giving an informal talk at which I shared the forum with Jack Cox WOKMV.

After the convention, we all flew to Albuquerque where we spent some time talking with Ed Roberts and Dave Bunnell of MITS, then Beth and I flew to San Antonio to pay a visit to Dan Meyer, Gary Kay and Joe Deres at Southwest Technical Products. Perhaps the highlight of the whole trip (at least in my mind) was entirely unplanned. While at Southwest, Ron Komatz, the local representative for Motorola Semiconductor Products in Austin TX, walked in. In passing, he suggested something like "How would you like to come back with me to Austin this afternoon and take a quick tour through the Motorola Semiconductor wafer fabrication facility?" With an offer like that, we could hardly refuse . . .

So, after some hurried reservations changes and Ron's call ahead to the people



*A candid shot of Ed Roberts, president of MITS, during an informal discussion in his office in Albuquerque.*

at the Motorola plant, we drove up to Austin in Ron's car for a quick tour (total time, less than an hour and a half including 45 minutes of some informal discussion with several of the engineers and software people at Motorola).

It is in places such as the Motorola plant in Austin where the space age technology of integrated circuits and the technological leads of the American semiconductor manufacturers are so much in evidence. The silicon wafer fabrication plant is like a science fiction image: clean rooms with highly filtered air, workers dressed in lint- and dust-free smocks undergoing cleaning procedures prior to entering the fabrication area, exotic gases and electricity piped into the work areas, intricate optical instruments for the microscopic photo reproduction of IC mask patterns, air bearing transport slides for the disks of silicon being handled by the facility, red glowing diffusion ovens maintained at carefully controlled temperatures needed to dope the silicon chips with precise amounts of impurities at each stage of production.

The result at the end of multiple stages of the fabrication process, which we viewed through glass partitions, is a three inch wafer of silicon with hundreds to thousands (depending on the particular IC) of tiny circuit patterns, waiting to be ground down to less than 10 mils thick, scribed and separated into individual pieces which can be tested in automatic equipment then shipped overseas for assembly. It is the high technology of such semiconductor facilities which makes possible the personal computer as we know it today, and as it will improve and evolve in the future. ■

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