

# Telecom News

University Telecommunications  
The University of Arizona

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## Progress, Progress, Progress

A trench in the street by your campus building or some removed ceiling tiles above your desk may seem like disruptions in the business of the University, but they are signs of progress in the carefully integrated schedule of TIPS.

The person counting phone and data jacks in your office last fall was gathering information that engineers used to gauge the number and kind of cables that are now being placed in that trench by your building.

The person now taking inventory of telephone equipment in your office will provide information necessary for technicians to place improved wiring above your ceiling.

Although some TIPS phases are more visible than others, each phase is progressing. Major phases and their benefits include:

**Conduit Construction:** Digging and the placement of underground conduit, which will house new communications cable, is now over 50 percent complete. Phases I and II have been completed, and Phase III, on the west side of campus between North Campus Drive and South Campus Drive, has begun.

All involved with conduit construction have been working hard to reduce inconvenience to those people in buildings affected by digging. Meetings with those people, notices on and off campus, and adjustments in construction schedules have been made.

The new underground cable will provide greater communications

speed, capacity, and reliability to meet the growing needs of the UA.

**Telephone Equipment Inventory:** "Absolutely terrific," says TIPS project staffer Doris Tofel about the Telecommunications Departmental Coordinators (TDC's) who have been accompanying her and the rest of the inventory team. The TDC's were selected by their respective departments to help coordinate such TIPS activities.

Data from the inventory will be used not only to determine new wiring inside of buildings but also to map capabilities for the start-up of the University's new AT&T 5ESS switch. Phone users will benefit because present functions of their phones will be duplicated by the new switch in a greatly improved and expandable communications system.

The telephone equipment inventory is 50 percent complete.

**5ESS Switch:** The basement of the new addition to the Computer Center building will house the UA's new switch. This switch is state-of-the-art and has been chosen by the country's premier universities for their telecommunications upgrades.

A total of forty 3-inch communications cables will be pulled through underground conduit from around campus into the room where the switch will sit. These cables will be connected to the switch by a 9-foot tall, 80-foot long distribution frame, which is now 75 percent complete.

AT&T began assembling the switch in Oklahoma City during April.

Representatives from the University Telecommunications department will go there to observe testing of the switch in June.

**Engineering Walk-Through:** Whistling engineers on a stroll through your building? No, not what the name of this phase might suggest.

Instead, representatives from U S WEST, with their building wiring designs, and representatives from the UA's University Telecommunications, Risk Management, and Physical Resources departments, "walk through" buildings to scrutinize these wiring designs a final time.

Underground cables entering buildings will be connected to individual floors of buildings by the use of these designs. During walk-through, the Risk Management department helps assess and prevent any hazards to people, equipment, or environment that could occur when this connecting work is done.

Walk-through is on schedule and is 75 percent complete.

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## Universities Show Consensus on Networking Issues

The TIPS project will provide the framework for future campus-wide connectivity at the UA. But, the vision of the UA and major campuses is universal connectivity—linking every scholar to every other scholar across the globe. In April, TIPS project managers from University Telecommunications met with over 200 educators, vendors, and government officials who share this vision at National NET '89 in Washington, D.C., to discuss networking issues.

**Unfamiliar with the UA data communications environment or the National Internet? Join University Telecommunications staff at an informal mini lecture called *A Data Communications Overview—Fiber Plant Plans*, on Friday, June 2, 2-3 p.m., Computer Center 319.**

Sponsored by the EDUCOM Networking and Telecommunications Task Force (NTTF) and several organizations such as the National Science Foundation (NSF) and the Association of American Universities (AAU), the National NET '89 conference covered about 40 presentations on the proposed National Research and Education Network (the National Net), the status of existing regional networks, and reports of traffic growth from campus networks. Political, technical, funding, and planning issues were debated, ending with an overwhelming consensus to support various NTTF and NSF initiatives.

### The Price of Success

The National Science Foundation network, NSFNET, has become the barometer of national networking usage in education. NSFNET is a major part of the National Internet, the collection of interconnected networks across the country that communicates using the TCP/IP protocol. (The UA's principal connection to NSFNET is through a regional network called WESTNET,

a 5-state consortium of 16 universities located in Arizona, Colorado, New Mexico, Utah, and Wyoming.)

NSFNET became accessible to universities in 1986. During 1987, traffic began to grow exponentially. Bill Wulf, NSF Assistant Director, describes NSFNET traffic statistics as "mind boggling." As of February 1989, 600 million packets of data go through the network on a monthly basis. This volume removes all doubt about the need for increased capacity, Wulf comments.

Networking is way ahead of schedule in usage and implementation. For example, NSF planned connection to 200 universities for 1991, but it was achieved in 1988. Plans for 1993 include connection to over 400 universities and increased bandwidth, which will allow large file transfers at higher speeds.

### National NET '89 Highlights

Conference highlights include:

- Financial support is the key problem which will continue to confront network planners and users at all levels (national, regional, campus).
- On the national level, NTTF and NSF are jointly lobbying for Congressional funding support for a National Research and Education Network.
- Some regional and state networks, in anticipation of decreasing NSF funds, have instituted "membership subscription fees."
- In a panel discussion on the October computer virus incident, Cornell, Princeton, and Michigan lamented the panic, overreactions, and exaggerated reports. Ira Fuchs, Princeton VP and BITNET president, conducted a survey among faculty which did not yield a consensus on needed security measures.
- The development of security and ethics guidelines will become more important as networks grow. The National

Security Act of 1987 is a model that's now being followed by government agencies.

- Library networking is an emerging telecommunications application. The Library of Congress, the Online Computer Library Center (OCLC), and various universities reported on Open Systems Interconnect (OSI) development projects. Successful linkages to the National Internet were described.
- Implementation of Integrated Digital Services Network (ISDN) is being studied in several universities. ISDN is viewed as a supplement rather than a replacement of networks in place.
- Coalitions with corporations and business organizations will increase. Executives from IBM, Bell South, MCI, and Bell Atlantic agreed.
- The Corporation for Open Systems (COS) reported on benchmarks and conformance testing of various OSI implementations.
- Networking in Europe has also grown; collaboration with U.S. networks is expected to continue.
- More government agencies, such as the Department of Energy, Senate Judiciary Subcommittee on Technology and the Law, U.S. Patent Office, and the Defense Advanced Research Projects Agency (DARPA), are supporting national networking.

Dick Celeste, Governor of Ohio, seemed to best summarize the theme of the conference when he said, "network facilities should reach not only some, but everyone." (*For a copy of the National Research and Education Network Policy Paper, call Telecommunications Services, 621-7227.*)

### Correction

In our April issue, we reported that University Medical Center's new telecommunications system will have a new, single prefix. However, instead of 496, that new prefix will be 694.

## News Briefs...

**NASA Gateway Installed** - NASA researchers who are connected to the UA campus extended ethernet can now reach other NASA researchers via the NASA Science Internet (NSI) gateway. This 56 kilobit per second gateway connects NASA sites and research facilities that use the TCP/IP networking protocol.

**High-Speed Modem Standard to Be Announced** - A recommended modem standard for high-speed communications at the UA will soon be announced. A campus user group, led by Joel Snyder in the Management Information Systems department, recently evaluated responses to a Request for Proposal released in November 1988. University Telecommunications will be purchasing rack-mounted modems that are compatible with the recommended standard.

**Phone Registration Lines Increased to 64** - Thirty-two more phone lines have been connected to the UA's phone registration system. The registration system, which allows you to register for courses via a touch-tone phone, first became available for spring 1988 registration. The phone-line expansion was based on usage statistics gathered over the past year.

**Harvard Selects 5ESS** - Harvard University is joining the UA on the leading edge of technology with the recent selection of the 5ESS switch for its telecommunications upgrade.

**Short Course on Network Interoperability and Performability** - May 31 through June 2, the Electrical and Computer Engineering department, in conjunction with the Tucson Chapter of IEEE, is offering a tutorial short course on protocols and performance/dependability evaluation in internet-work environments. For information and an enrollment form, please call the Office of Special Professional Education at 621-3054.



**Telephone Equipment Inventory in the Education Building.** From left to right, Eugenie Potter, Telecommunications Departmental Coordinator for the College of Education, assists Linda McKelvey, U S WEST Rep., and Susan Ewing, TIPS project staff member.

## Thanks and Please Bear With Us!!!

Telecommunications Departmental Coordinators (TDC's) "have been invaluable help with the telephone equipment inventory," says Susan Ewing, a member of the TIPS project staff. The TDC's were selected by their respective departments to help coordinate such TIPS activities.

Thanks to you, TDC's, the inventory is on schedule and the goal of TIPS is

closer: uninterrupted telephone service on the way to a greatly improved communications system.

Some TIPS work, such as the inventory of phone equipment or the installation of new communications wiring in your building, involves some inconvenience and noise. We appreciate your continued patience and cooperation.

### *(Progress, continued from page 1)*

**Inside Wiring:** Drilling holes through exterior walls of buildings, through floors, and through interior walls is a noisy business. Pulling new cable through those holes and then stringing new wire above ceilings and into offices is a cumbersome procedure. But this is the necessary work of inside wiring.

Kay Jolly, a program coordinator for the University Telecommunications department, schedules TIPS work with campus departments. "It's a balancing act," she says, "balancing the necessity of giving departments adequate advance notice of this work

while at the same time respecting the work schedule that our contract requires of U S WEST."

The new inside wiring will be capable of accommodating each building's expanding communications needs and will make installation of new communications services faster.

Although inside wiring work has such high visibility that it sometimes seems a project all of its own, it is only one of a number of phases carefully integrated into TIPS. These phases are progressing well and will help improve communications at the UA.

## TIPS Q & A

This column is featured each month in *Telecom News*. It provides answers to frequently asked questions about the TIPS project. If you have any questions, please call 621-TIPS, 9 a.m. to 4 p.m., Monday - Friday.

**Q. I now have IDX lines. Will there be changes in the IDX after TIPS? Will I have to pay for installation for currently active lines?**

A. Your IDX line will be migrated to the new transmission plant at no additional installation cost. All active IDX lines will be cut over to the new wiring plant.

**Q. My department has an ethernet network and needs connectivity**

**to the campus and the national internet. Do we need to wait for the fiber plant to get this connectivity?**

A. The new campus wiring plant, which includes fiber optic cable to 77 buildings, will not be in place until early 1990. Departments requiring ethernet connectivity may be connected now and be switched to the new wiring plant later. One way to connect a department now is to use T1 technology (1.5 Mbits/sec) to carry network traffic over the existing wiring plant. Our networking staff is available to discuss your requirements and the feasibility of connecting your network.

## New Telecom Personnel

Janet Fisher - Hired as a Computer Applications Specialist II for Network Management, Janet is working on the new Telecommunications Management System (TMS) that University Telecommunications will be using for equipment management and billing.

Louis Norman - Louis has joined the Network Operations group as a Computer Field Service Engineer II. He provides support for the IDX-3000 and related equipment.

Joseph Zaepfel - Formerly in Research Computing, Joseph has moved to Network Management as a Computer Software Specialist II. He performs postmaster functions and provides BITNET support.

### Telecom News

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## **Telecommunications Improvement Project Services (TIPS): A Pictorial Review**



**Cross-section of 3-inch black communications cable containing 3600 copper wires. The #5ESS telephone switch will make the connection between all campus phones over these wires.**

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