President's Message
—John W. Sleezeman, Case Western Reserve

On my desk, patiently waiting my time to sort over, is a stack of about thirty announcements of meetings that I can be privileged to attend on a variety of subjects. It seems that in order to learn enough about my job to perform competently, I must quit my job to be able to learn enough!

It isn't quite that bad. But the changes of technology and divestiture have certainly meant a major increase in the requirements for continuing education in the telecommunications field. We hope that ACUTA is meeting a part of those needs, through an expanding series of seminars and content which is hopefully relevant.

But it doesn't end there. Everyone who receives this letter must consider their own background. Telecommunications has been, and still is, taken for granted. As such, people still assume that nothing needs to be learned, or alternatively, that the data people can assume telecommunications and voice responsibility without additional training.

As someone who has a variety of responsibilities on "both sides of the house," let me observe that everyone needs some new training. Voice involves a lot of work— unlike computers, everyone is an expert on telephones and expects perfect service. Data requires better understanding of speeds, protocols, and other transmission characteristics. Both require a better understanding of network problems and interactions. And everything requires better understanding of the computers and CPU's that control modern telephone switches and local area networks.

What should you do? Find time to read. You must find funding to attend seminars. The consequences for both you and your institution of doing nothing are too great. Two schools have called me in the past two weeks: they are now at the threshold or past the point of making commitments, but are being forced by the pressure of technology to move in the wrong order—they waited too long to examine the managerial problems associated with telecommunications. With the projected demographic decline in the number of people reaching the traditional college age, none of our institutions can afford to waste money on bad decisions. We must all be competent managers of resources—and we must continue to enhance our personal skills to be competent in the profession over the years to come.

PARTY LINE
—Ruth Michalecki, Nebraska

The Fall Seminar in Burlington, Vermont was simply outstanding. It had the highest rating we have received from our participants. Comments like "I wish I had attended a seminar like this prior to installing our plant", and other like remarks were on almost every rating sheet. Obviously a lot of our attendees had already been through the process of installation and were agreeing with our speakers on where the problems were. We also heard a lot of comments like, "at least I know now how to prepare for on-going maintenance". The session covered in-depth the many issues that need to be carefully examined prior to the RFP. The information was especially helpful because it was designed to look at the problems involved with installing plant on the university/college campus. Unlike many large organizations installing a premise switch in a single building, most campus installations involve many buildings, cross busy streets and/or highways and cover acres and acres. Let me share with you a few of the do's and don'ts specifically discussed by Fred Chanowski and John Powers and echoed by Mal Reader, Mike Grunder and Art Brautigan: three fellow ACUTA members with recent experience in installation of a premise switch. Mal Reader has a Northern Telecom S5100; Mike Grunder is installing the SONSEOR 2001 and Art Brautigan has the RCOM CDX.

1. IMPORTANCE OF PLANT:
   a) Often up to 50% of total bid in campus environment.
   b) Will tear up your campus.
   c) One chance in 10-20 years to do it right.
   d) Consider large spreads in vendor pricing.
   e) Areas for contractual disputes.
   f) Can cause sever project delays.
   g) Rarely installed by vendor of switch.

2. NEED TO EVALUATE EXISTING FACILITIES:
   Involve Physical Plant; Academic and Administrative Computing; Telecom; Local Operating Company. Get Campus Facilities Maps, Utility Maps, Telco Plant Maps. Don't overlook inside plant!

3. SPECIAL DATA REQUIRED:
   Location and identification of manholes. Manhole survey must include all elevations; size quantity of ducts; diameter of each duct; is duct empty/full; % utilization; type and condition of duct; routing of duct; type of cable; and manhole hardware inventory. John Powers stressed the importance of actually getting into the manholes and seeing for yourself the problems. Pole Survey to include ownership; what utilities are currently on poles; what are the 'make-ready' requirements. Cable survey must include type of cable (filled-air core-twisted); cable guage; cable protection. Building Entrance Survey must cover location of entrance; number of ducts; disposition of ducts; location of IDF in relation to entrance routing to IDF. Inside Plant should include the location of

Remember ACUTA Winter Seminar - Phoenix, Arizona - January 19 thru January 22, 1986
DEJA VU

—John W. Sleasman, Case Western Reserve

In last October's ACUTA News, I wrote about several strategic issues regarding equal access to long distance services. Now that equal access has come to my campus, I thought that an update would be appropriate.

First, a brief review. Equal access allows a telephone user to reach a chosen (default) long distance carrier (ATTCOM, MCI, GTE Sprint, etc.) by dialing "1." The Bell operating telephone companies and GTE by consent are generally required to make equal access available to their customers by fall 1986; there are some exceptions due to equipment and economic limitations. The long distance carriers are permitted to choose whether or not they will service various exchange areas, and what type of services they will offer. Also accompanying, but not strictly part of, equal access, is the ability to dial carriers other than the default choice by dialing "1" "0" and a three-digit code, thus allowing for override of the default carrier.

The user also has the privilege of not choosing a default carrier; in this case, one of two options is possible: calls using the present 1+ system could be blocked, a proposal originally made by Pacific Telephone, but later retracted; or users who do not choose a carrier can be assigned on a random basis to the various carriers, a practice followed initially by Northwestern Bell and subsequently mandated by the FCC for the other companies.

I would refer you to last October's article for more details about problems and strategy; the purpose of this article is to discuss the practical problems of working on this issue. Some background: At Case Reserve, we use automatic route selection behind our Centrex system. Thus, the majority of our long distance calls are placed over private line facilities, FX and WATS lines. Equal access does not directly affect our choice of carriers for these services; there have been competitive offerings in the Cleveland Metropolitan area for some time. However, that choice of competitive offerings has been somewhat limited by the ability/willingness of the carriers and/or Ohio Bell to provide Centrex station identification and magnetic media to the University for proper cost allocation and billing. We cannot deal with a situation where multiple carrier offerings with different account billing codes were required; neither can we allow a situation to exist where users cannot be properly charged for services.

We started to discuss routing problems with Ohio Bell in May 1984, anticipating a particular problem: What was going to happen after equal access arrived and users started dialing additional access digits? At first glance, this seems simple: if you don't subscribe to a particular carrier, you either wouldn't know the code, or calls won't be completed. The former is a weak assumption: people will subscribe to a different carrier at home, and since the codes are "standard" across the nation, they will be quickly known. As to the latter, remember that the routing switch intercepts the dialed digits. It must be reprogrammed to either ignore those digits and route the call over the private facilities, interpret the digits as illegal calling and return an intercept, or override the ARS features and complete the calls over the public switched network to the chosen carrier, a prospect which would result in inefficient usage. The first prospect is the most desirable; it can be technically provided; and the software is delayed, with uncertain availability and no cost determined as of today [September 26th]. Thus, after over one year we have no satisfactory solution to the routing problem, and equal access is here. The existing software does the worst possible thing: It bypasses the private line network of a carrier accessed. Oh, it can be reprogrammed to block any carrier coding, but that means that no carrier can be reached other than the one which big brother John chooses. But John better decide soon, as those bills are coming in little bits and pieces, alike and alike, and require manual processing. If too many people find out that they can dial at random, here comes the paper stack. From the standpoint of Centrex services, the inability to adequately deal with equal access may well kill Centrex faster than the alleged unavailability of features.

Now, as to the overflow from the private lines: we have a choice of eleven carriers that are eager to handle our business. They range from the national carriers through regional groups with some financial stability to a probable subsidiary of the Grace Ferguson Storm Door and Airline Company [with apologies to Bob Newhart]. They all - yes, all - share certain attributes: they have sales and marketing people assigned to this account who do not have the vaguest idea what they are doing, most of them have no realization of our size, complexity, or anything; only a few can indicate how they will bill us. When faced with questions like: "Will you provide a magnetic tape with station identification?", blank stares are a normal response. Cold calling is a favorite tactic: "Do I really dial a code?" is one of the dumbest questions I've heard in a long time: I think some clarification of sales prospects could be useful.

Once we disqualify half the choices for basic incompetence (that's a strong word: you who know me know that I don't tend to show anger. The level of performance of some of these people leads me to much stronger language), we can begin to evaluate more significant issues. To quote from one mailing piece: "THE SAME NATIONWIDE STATE-TO-STATE COVERAGE AS ATT "

Now, note carefully that little asterisk. Repeat after me: asterisk. In the case of this particular vendor, it doesn't mean much - the form letter warns that intrastate coverage may be limited. Further, this vendor is professional enough to identify that with large type and a readable footnote. But remember the Storm Door Company? Do you think that they warned me? We could go on and on.

The real issues as we have analyzed them:

- How will billing be handled? Can appropriately formatted magnetic media be obtained? Will message details be maintained? Station identification? At what costs to add to the basic low rates?

- How are calls to "off-network" cities handled? Is there a different rate schedule? What happens to quality of the service "off-network" (if you are a state institution with an agricultural network to the rural areas, you will find out quickly how good the data service quality is)?

- How about odds-and-ends, such as directory assistance? International dialing? Operators? If the carrier doesn't provide these, how are they handled?

At this point, I should be telling you our decision. For now, we're consciously choosing to let the decision be a default - not to choose a carrier. The reason for that is simple: we haven't found any carrier, including ATT, that meets all our requirements. We got lucky in the random lottery: Ohio Bell will automatically assign us to ATT, a reasonable option at this point. There are other carriers we will consider, but they too need to respond on a better basis. Our biggest concern is that we use a lot of after-hours data service, and we have some very basic problems with
line qualities from some of the carriers (see articles last spring in Datamation and Teleconnect for details). We do believe that ATT will not be the long term choice, unless lower rates are forthcoming. The other reason for no choice now: we can select a carrier only once for free: paying again doesn’t seem that attractive, and we need better data and response to be sure of the right choice. I guess I shouldn’t expect much: our institution isn’t a giant: I’m only a $450,000 a year long distance account.

P. S. - I also have a lovely choice. I can designate a different carrier for each Centrex line. Guess how many pages of phone numbers with little blocks next to them where we can be privileged to insert a three-letter code to identify the chosen one it takes to identify every station from 368-2000 to 368-8999? [The winner gets a list of the carrier access codes we know of to date].

PARTY LINE, Continued:

MDF to IDF; Riser diagram; Closet space and closet ownership; cable guage and type; quantity of station pairs; identify return “air plenum ceilings” or other special conditions. Sources for your survey include Physical Plant; Outside Plant Engr Firm; Consultants; Local Telco.

4. EVALUATION OF REUSE OF EXISTING PLANT:

Need to consider: Ownership, Pair counts, condition of entire plant, spare capacities, protection, documentation, installation and cutover problems created by using same cable plant purchase price, maintenance, and technical requirements.

We were told the apparent standard wire guage is 24, although 22 guage might gain a few extra feet advantage for long runs. Largest single problem with installation of plant is to underestimate growth.

RFP must be a PERFORMANCE specification. DO NOT ask questions—give specifications. Include all items covered in your design consideration process such as concrete, protection; conduit versus direct burial versus aerial; use of existing manholes; pair counts (in and out). Limit the options for bidders. Cover all controversial issues such as distance limitations; equipment responsibility; crushed or unusable ducts; ledge of other special conditions; permits (cost—who-what if); subcontractor issues; aerial ‘make-ready’ costs; supervision and inspection; inside plant concealment requirements, etc.

I really can’t do justice to the seminar in this small space. We will be holding a repeat of the Inside/Outside Plant Considerations and Maintenance Issues, In-House versus Contract in Phoenix, Arizona January 19th thru 22nd, 1986. Believe me, if you are considering installing your own premise switch, or if you currently own your premise switch and are concerned with the many problems of maintenance and service—you should make every effort to attend this exceptionally good seminar. Our speakers have really done their homework and as I said earlier, they discuss the entire subject from the viewpoint of the university/college environment. They are comprehensive and yet all-important to the successful management of a premise switch. We learned some very interesting things about the IBM and ATT Wiring Plan.

I really found the session on Maintenance to be a real eye-opener. Geoffrey Tritsch said maintenance begins in the RFP. You will never have more leverage or negotiating power than when signing a contract. You need to define everything and use the RFP as the basis for the final contract. Do Not accept the Vendor’s Standard Agreement "AS IS". Add the statements "RFP overrides standard agreement" and "Negotiations overrides RFP". Get vendor to commit to level of support, spares, response times, etc.

He covered the pros and cons of in-house maintenance versus contract and gave a rule of thumb to help you determine when developing an in-house support group proves to be cost-effective. The importance of having a "Contingency Plan" was covered and included what should be in plan. He defined Major Failures, effects of failures, and various technical and software causes of failures. He said that if your switch fails, the question will not be so much what happened and why, but:

---What was done to prevent the failure and/or minimize its impact?
---How did you respond to restore service in a reasonable time frame?

Remember—the performance of the system can and will directly affect your career. Although the vendor may be contractually liable to keep the system functioning, you the telecom professional, will feel the heat if he doesn’t. The vendor is only contracted for maintenance. You are responsible for management!

If you are interested in attending the repeat session of the Inside/Outside Plant Design Consideration and Maintenance Issues in Phoenix (January 19-22) you should return the combination seminar and hotel registration form to John Sleasman so space can be reserved for you. Space is limited and interest is quite high. If you need another registration card, give me a call and we will send you one. It is the yellow card that was sent to you in September.

As usual, ACUTA is grateful to those vendors and service organizations that sponsored a function for us in Burlington, Vermont. We have an opportunity to learn first-hand about the various products and services available and to meet, on an informal basis, the representatives of those organizations. Their continued support helps keep our yearly dues at a low rate and allows us to bring you a seminar for a very reasonable registration fee that includes at least two meals a day. ACUTA would like to thank the following for their support:

---Northern Telecom
---MidAmerica Long Distance Company
---RBM Corporation
---American Computer and Electronics
---GTE/MTO
---GTE/Sprint
---DEKA Telephones
---Universal Communications Systems
---Software Systems
---ATT-Communications
---University of Vermont

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Thanks to all who have returned the information card for updating the ACUTA Roster and mailing list. We are almost through inputting the corrected data and will be soon going to press with the roster. If you haven’t updated your card and mailed it back, please do so right away. Sure hate to miss any of our members. See you next month.

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21st Century Telecommunications

Cornell's new voice-data link will serve the 1990s—and beyond

by Patricia Paul

INSTALLATION of high-speed telecommunications system to link telephones and thousands of computers in laboratories, classrooms, dormitory rooms and offices throughout the Cornell University campus to the rest of the world was announced last October. It is scheduled for completion early in 1986 and will be one of the largest, fastest and most adaptable data networks of any American university.

Cornell's new telephone system will include more than 11,000 phones and will be the most up-to-date and convenient one possible with today's technology. The data communications capability will help turn microcomputers into terminals associated with on-campus and external networks. The new system will give students, faculty, and staff the opportunity and challenge to expand the use of personal computers and work-stations into the daily work of the university.

Cost of the $17.4 million university-owned system, which is being installed by AT&T Information Systems (AT-IS), is expected to be recovered in about eight years, mainly in savings from owning and operating it. The company will receive $12 million for installing the major portion of the system; the balance is for building renovations, engineering, consulting an emergency power facility, a contingency fund, and other charges.

Installation began almost immediately after contracts were signed and will take about 66 weeks to complete. AT&T-IS will have more than 30 workers in Ithaca (New York) during the construction period, the equivalent of a new small industry added to the local economy.

In the three months immediately following the contract signing, teams of personnel from Cornell's Telecommunications Department and AT-IS performed the monumental task of inventorying each and every existing telephone set on the university's campus. Each department assisted in this process by marking floor plans to help the project team prepare for the physical inventory. The departments also filled out questionnaires describing how their existing telephone system was utilized. This functional information was gathered to facilitate system planning.

The underground construction is almost complete. The installation of the outside plant cable and interior building wire is also progressing and this work will continue through late fall. The hardware orders were processed early in the year. Manufacture of Cornell's System 85 was completed this summer and delivery of the equipment was made in late summer.

The months of May and June were spent in a process called "station review." Each department on campus selected a representative to assist in the software design within its area. During the station review process this departmental coordinator was interviewed by representatives of the project team. The input from the station reviews, along with thousands of additional software components, will comprise the programs that will tailor the system to meet Cornell's specific requirements prior to its shipment from Denver.

Cornell's existing Centrex system is located in the local telephone company central office. Installation of the System 85, however, had to be made on the Cornell campus. The equipment configuration that worked the best for Cornell required the construction of eight individual switchrooms dispersed across the campus to house the equipment. It was very difficult to find acceptable space in which to construct the necessary switchrooms. Existing space was found for the seven subtending switchrooms, but construction of a new building was necessary to house the main switching components as well as the offices for Department of Telecommunications. A building on campus, recently vacated by a move to a new facility, had been allocated for renovation to turn it into a consolidated facility for Cornell's Computing Services Department. Due to the tighter alignment of voice and data communications, it was decided to locate the telephone switching equipment close to the new computer building. An existing addition on the back of the building was demolished and is being replaced with a four-story structure to house both telecommunications and portions of computing services. This new addition will be completed and occupied by the end of the year while the main building is slated for completion toward the end of 1986.

By early 1986, Cornell will own almost all the telephone, video, and computer lines and equipment on its Ithaca campus. The wiring, switching equipment, and most telephones on the 17,500-student campus are now owned by New York Telephone Company and AT-IS.

The replacement and upgrading of the underground cable plant will allow Cornell to provide its own alarm and energy management circuits. These lines, as well as data and other special facilities, have been traditionally leased from New York Telephone. The features of the system may be used in the future to augment existing equipment that monitors circuit status and relays information to centralized facilities.
Some state public-utility commissions are considering requiring universities to register as long-distance providers and to file their tariff schedules, notes Susan F. Fratkin, director of special programs at the National Association of State Universities and Land-Grant Colleges. The threat of such actions may be keeping some institutions from considering the service, she says.

Students are often motivated to use a university's service by the ease of phoning on a WATS system, according to Mr. Borchelt. At Texas A&I, students now must pay a $100 deposit merely to get an account with the local long-distance calling service. To make calls on it, they must dial a local number, an identification code, and then the number they are calling. If Texas A&I had a campus system, students would not have to pay a deposit and could make long-distance calls by dialing just the area code and number, Mr. Borchelt says.

Penn State's Mr. Kuhns looked into alternatives to the service offered by AT&T Communications, but he found that with other companies "there are sometimes different rates on the lines they own and the lines they lease from AT&T, and it may not be cheaper than using AT&T directly." 

The above article was reprinted from the Chronicle for Higher Education, October 2, 1985, issue.

TEST YOUR IN-WATS LINES EVERY DAY

by Harry Newton

TELECONNECT has three IN-WATS 800 numbers. The main number is 800-542-7279. And the two next numbers rotary on if the first or second is busy. If the three are all busy, you get a busy signal.

Our 800 numbers are only interstate. You cannot reach them inside New York State.

There is no comprehensive way to check if our 800-numbers are working—short of having someone in every telephone central office in every part of the country (outside New York) call us.

ATT Communications does not provide a way to check 800-numbers. It claims that the service is so reliable its customers should not have to worry about it.

To a large extent this is true. But a long-haul circuit is only as weak as its weakest link—which happens often to be the final central office to which it is connected.

TELECONNECT's 800 lines have "crashed" on several occasions. In each case the problem lay with the local central office. Nobody, as yet, has come up with a logical technical explanation of what actually happens.

It has something to do with our local central office "crashing" for a very short amount of time, a minute or two. In the process of crashing, it loses some software/programming relating to our IN-WATS lines.

There are several solutions: First is to call ATT Communications and report the trouble to their nationwide IN-WATS trouble number. This is next to useless. Our trouble report seems to be lost in a morass of paperwork and nobody ever gets back to us. The second—and far more effective method—is to contact somebody senior in your local telephone company. In our case we contact our division manager, distribution services.

He gets right on it. The problem is usually solved within minutes. And somebody from his office calls back immediately and confirms the trouble has been cleared.

There is only one way we know to check our 800-numbers and that is to call their local number equivalent. Every 800-number has a seven-digit local number equivalent, which looks exactly like a normal seven-digit number, with the same first three numbers as that exchange.

Every morning we call each of those numbers. We call the first, then the second, then the third. We also call the first, leave it off hook; then call it back again, do the same with the second; leave it off hook and call the first again. This checks to see if the numbers are rotating over.

There are two ways you can get your local "test" number for your IN-WATS lines. You can beg them from your local telco. Or you can pay for them. Some of the local Bell telephone companies have filed tariffs.

Tip: When you're testing your lines, get off fast. You're charted not for a local call, but for an IN-WATS line, at $20 an hour, plus.

Watch Out For Coded Trunks

On August 23 I ordered three additional IN-WATS lines to hunt from the bottom of the three existing ones. I did this because our three IN-WATS lines were busy too often.

On September 13, as the new lines were being installed, I asked the installer what the new plant test numbers would be. He told that we would have 206-6870 and five coded trunks, i.e. trunks with non-dialable numbers.

I hit the roof. Within ten minutes I'd dialed everybody from Moses to Randy Tobias. The upshot:

My representative at ATT Communications, Dennis McLynn, admitted he had incorrectly placed the order for our new lines. He had not specified that TELECONNECT was to receive "Actual Line Assignments." He had specified nothing. And "The System" had assumed that one main test number and five coded trunks would suffice.

Rule: Never, ever buy coded IN-WATS trunks. You, the customer, cannot dial them. You cannot check them. You are totally at the mercy of "Them." And irony of ironies, it costs no more or less to get real line assignments.

The above article is from TELECONNECT, October, 1985, issue. Harry Newton is Publisher of TELECONNECT, a Monthly Telecommunications Magazine.
ATT Tries to Sell Colleges on Plan to Provide Long-Distance Phone Service to Their Students at Low Cost

By Judith Azker Turner

The American Telephone and Telegraph Company has launched a campaign to get colleges to purchase WATS long-distance service and then re-sell it to students.

The company has selected 200 institutions as potential customers for the service in the current academic year. Some of them are buying, but others are taking a second look at administrative costs and other expenses before making a decision.

WATS, which once stood for "Wide-Area Telecommunications Services" but is now what ATT officials call "a generic name," is bulk long-distance service. For each WATS line, customers pay a per-hour charge for long-distance calls to a defined area (which can be within a state, between states, or the entire continental United States), no matter how many calls are made. The price drops after 15 hours of calls and again after 40 hours. ATT Communications officials say, with the best rates offered for more than 80 hours' use a month. Rates are higher during business hours than at other times.

Other companies, such as a General Telephone and Electronics Corporation's company's SPRINT Communications, MCI Communications, and Satellite Business Systems, also offer WATS-type service. All are trying to lure more customers to those services, but so far only ATT Communications is making a special effort aimed at the campuses.

Elements in ATT Offer

ATT is trying to persuade colleges that they cannot only cover the cost of providing day-to-day WATS service, but also make enough money to pay for installing the telecommunications hardware and software necessary to support a WATS system, says Antoinette H. Beseecher, a distribution manager for ATT Communications. The package the company offers includes:

► A survey by ATT to determine where and when students make long-distance calls.

► A detailed proposal for an appropriate network and the necessary hardware and software to support it—that takes into account both student and university long-distance calling patterns.

► A student telephone guide for each campus, prepared and distributed by ATT, that includes not only information about how to use the phone system and what kind of bills to expect, but also the telephone numbers of everything from ski resorts to local pizza parlors.

► Student marketing agents, hired and trained by ATT Communications, to help sell the service and register new student customers.

► Regular reviews of calling patterns to make sure the network meets a campus's needs.

The last service is particularly important, says William R. Root, assistant vice-president for auxiliary services at the State University of New York at Binghamton, which has provided long-distance phone service to students since 1983.

"There are different calling patterns throughout the year," he says. "The maximum number of trunk lines are necessary in September and October, when freshmen are calling their parents and boyfriends and girlfriends more often."

Long-distance calls hit their nadir during final examinations and the winter holidays in December and January, rise again with the spring term, and drop during the summer. At Binghamton, arrangements are made months in advance to increase and decrease the number of WATS lines to meet the needs.

If it has too many lines, Mr. Root explains, the university may not generate the 80 hours of long-distance calls it needs on each line to get the lowest rate. If it has too few, calls may spill over to the direct-dial long-distance lines—at much higher rates. Mr. Root says Binghamton's system is set up to allow some spill-over, which is cheaper than adding another WATS line to accommodate an occasional few calls.

Some institutions do not allow any spill-over to direct-dial lines, programming their systems to give users busy signals if all WATS lines are in use.

'Skittish About the Risk'

Mr. Root characterizes Binghamton's service as "sharing," not "reselling," because, he says, the university only breaks even. The students, however, save money on their long-distance calls by using the university system, he adds.

But Henry E. Schaffer, assistant provost for academic computing at North Carolina State University, argues that colleges benefit because they spread the cost of providing long-distance service over a larger group.

Even so, North Carolina State has not yet decided whether to start selling long-distance services to its students, Mr. Schaffer says.

"The business office is attracted to trying to make money, but it is skittish about the entrepreneurial risk," he explains. "Right now, if a student makes 10 calls to Afghanistan and then disappears, the telephone company eats it." If the university were providing the long-distance service, it would have to bear the cost.

Any university that provides long-distance phone service to students has to cover its costs, Mr. Schaffer says, and to do that it has to take in much more than the raw cost of the phone calls. "Cost recovery means including personnel, management, maintenance, the cost of stock and spare parts, even depreciation, in your pricing," Mr. Schaffer says.

At Behrend College of Pennsylvania State University, the 900 students living in dormitories have access to the campus phone system, including the long-distance service over WATS lines, says Jeffrey C. Kuhns, director of voice services at Penn State.

Students pay for more than just the cost of their phone calls, however. Handling billing and collections "requires a major administrative setup that did not previously exist," and students must pay their share of that, Mr. Kuhns says.

Collecting Fees

Texas A & I University is another institution that is concerned about billing and collections in offering a phone service for students. "Our intention is to offer the service at a point in time when ATT can model us a system we can make money off of," says Lawrence F. Borchelt, director of computing and information services. "Our problem is not the capacity of the system, but the administrative problem of collecting fees."

The university would need $30,000 a year in addition to actual telephone costs to cover the administrative expenses, he says.
POUTOURRI

—Connie Gentry, Emory University

On August 16th Emory University joined the ranks of those colleges and universities operating their own phone systems. I feel somewhat like the little old lady who, after a very turbulent plane ride, asked the pilot, "Did we land, or were we shot down?" After a very bumpy 18 months ride preparing for the cutover, I think we landed safely! The switch is humming along like a champ and the worst problems (of course) are with the users.

It never ceases to amaze me that faculty or administrative staff will go out and plunk down thousands of dollars for sophisticated PC's or word processors, expecting to be trained in their use, but can't be bothered to learn how to use one of the most important and sophisticated tools at their disposal - the telephone! While we were setting up training classes I received a note from one professor who cautioned me that academic types, by their very nature, were more eye oriented than ear oriented, and that rather than expecting people to go to class I should just make sure that plenty of printed dialling instructions were distributed. I resisted the impulse to ask him if he made the students in his classes submit their questions in writing.

Now that I've survived cutover, there are a few "pearls" of wisdom I'll pass on for those of you getting ready to cut. Regarding training, you might as well face the fact that no matter how well you organize training classes, or how well you schedule or publicize these classes, unless you have people escorted under armed guard, a large percentage of your users just will not bother to attend classes. These will be the first to call and report their phones out of order and to let you personally know how rotten they think the new phone system is. If you are not planning to continue training classes after cut, please re-consider. Assuming your switch, cable plant and station equipment are not defective, you'll solve 75% of your post cutover problems with continued station user training.

Another thing to keep in mind is that no matter what kind of station equipment you choose, 80% of your users will want their six, ten, twenty button sets back. In truth, no matter how sophisticated your switch is, no matter how wonderful your station equipment, you're going to have some departments where 1A2 key equipment should be left in place. Don't fight it.

While I'm on the subject of station equipment let me caution you about one type of Unity set. The Unity III, a single line set with four programmable keys, a hold button and a message waiting light also provides, at no extra charge, (an unintentionally) the ability to intercept radio frequencies. You might have some faculty who like carrying on a phone conversation with music or news in the background: ours were not amused (or appreciative!). We've also had problems with NTI's electronic sets, in both the display and non-display versions. We were supposed to get the specially modified sets. Did we? Of course not! So, we've had to change out a lot of defective sets. Nevertheless, they are very popular with the users. They must be popular with somebody because we're finding it hard to get them from Northern. We placed an order for 150 display sets the first of September and were told it would be FEBRUARY before we could get them. Needless to say, that did not sit very well. I'm working on it.

I have a bone to pick with Mal Reader. While I'm down here in the sunny South biting my fingernails to the knuckles, pulling my rapidly greying hair, grasping my teeth and drinking Maalox by the gallon to get ready for cut he puts on the AGUDA conference the same week he cuts his switch! What a show-off! If I didn't love him so much I'd punch his lights out!

I'll be passing on more information to you later but right now I've got to go check out a report that a display set in the Theology School is picking up The Old Time Gospel Hour on the receiver while the display seems to be picking up the Playboy Channel. Ah! the wonders of modern technology!

See you soon.......Ø
TELECOMMUNICATIONS, Continued:

Several individual paging systems will be tied to the System 85 to enhance their capabilities without compromising necessary restrictions.

"One advantage of owning the telecommunications system is economic; we can gain control over costs, and can stabilize those costs over the years," said Harold D. Craft Jr., Cornell director of telecommunications.

Without a university-owned system, Cornell's bill from New York Telephone could have been at least $4.1 million a year by 1986. With the new system, that amount is estimated to be around $800,000. Retained savings of about $3.3 million a year will help repay the cost of the new system. Initially, the university will finance purchase and installation of the telecommunications system with bonds sold through the New York State Dormitory Authority.

Almost all major universities in the U.S.—including Yale, MIT, and Stanford, as examples—are now in some stage of planning a telecommunications system. Cornell, though not the very first, will be among the leaders, according to Kenneth M. King, Cornell's vice provost for computing.

By installing a system now, Cornell's network will take advantage of continued recent technological developments. However, telecommunications systems built five years from now won't necessarily be better than Cornell's, the vice provost says.

"We have only a vague idea of what will happen with communications and information management technology in five years," explains Craft, an electrical engineer and specialist in radio astronomy who left the directorship of Cornell's Arecibo Observatory to lead the telecommunications planning effort.

"If the number of personal computers on campus 'explodes,' the architecture of the communications system will allow us to expand. We hope to be able to evolve gracefully in whatever direction is appropriate."

Users of the new telephone system will find it more helpful and flexible than the present one. It will include standard features such as all tone dialing, call transfer, "hold" capability, forwarding (allowing flexible call screening), abbreviated dialing, queuing, conference calling, integrated local distance calling system, and streamlined WATS capability.

Voice communication, computer data, and video images will travel through a multipurpose system made up of optical fiber lines, coaxial cable, and conventional copper wire. Existing copper wire will be replaced for improved quality and speed of transmission.

Data transmission

As convenient and economical as the new telecommunications system will be, the most noticeable potential for change in the university's instructional and research activities will come from the data transmission system which will include:

- a new, multipurpose wiring plant, including optical fiber lines, coaxial cable, and computer-controlled voice and data switches, which will permit significantly increased speed of data transmission beyond present capabilities, with some parts of the system capable of transmitting at least 64 kilobits per second, more than 50 times the typical speed (in the near future, substantially higher speeds should be available for most locations);
- a backbone network, made up primarily of optical fiber and coaxial cable lines, which can interconnect at high speeds with Cornell's mainframe computers, departmental minicomputers, and personal computers and will be accessible to any computer user on the campus;
- small networks in the dormitories through which students with microcomputers in their rooms can take advantage of shared facilities, such as printers and disk storage equipment;
- links from dormitory rooms to larger campus networks to incorporate a student's microcomputer in the more comprehensive university computing system, which could allow communication by electronic mail and provide access to centralized facilities such as data bases, high-speed laser printers, and modem pools—furthermore, faculty or students on one side of campus could use the telecommunications system to control a one-of-a-kind computer device in a laboratory on the other side of campus.

The new Cornell communications system, for all its power and flexibility, will still remain only as a tool to be used by faculty, staff and students, Craft said. "Its exploitation must await their ingenuity and creativity," he added.

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Patricia Paul is acting director of the Department of Telecommunications at Cornell University and newly appointed membership chairman of ACUTA.

BRUCE B. HOWAT SCHOLARSHIP FUND

For anyone associated with ACUTA during the very early years, the name Bruce Howat is pretty significant. Bruce was the publisher of Communications Roundup and during our struggles to gain recognition as an association, Bruce gave us a lot of coverage in his publication. In addition, we could always count on him to appear at our annual conference, serving as our Keynote Speaker or our Banquet Speaker and always encouraging us to provide our members the opportunity for professional development. For me, he made me see how important the ACUTA News was to our membership and gave me many tips as to how to pull it together. Bruce Howat retired from active participation in Communication News and earlier this year several of his friends decided to establish a Telecommunications Scholarship Fund in his honor. ACUTA was contacted about making a contribution to this fund and your Board of Directors thought it was very appropriate for ACUTA to participate, and did so. I received a letter from Bruce Howat this Fall and I would like to share a few lines from it with all of you.

"Thank you very much for your contribution to the Bruce Howat Telecommunications Scholarship Fund. The following universities received awards this year. I am hoping that interest earned from the fund plus additional contributions in future years will assure larger awards to even more universities.

...Ohio University; Texas A and M; University of Southeastern Louisiana; George Washington University; Ball State University; Golden Gate University; New York University; Southern Methodist University; University of Kansas.

Please convey to the members of ACUTA my thanks for their contribution to this scholarship fund.

Cordially,

-----/s/ Bruce B. Howat

ACUTA thanks you Bruce for your many years of support—we needed it!