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Yale University

.....Ruth A. Michalecki, Editor

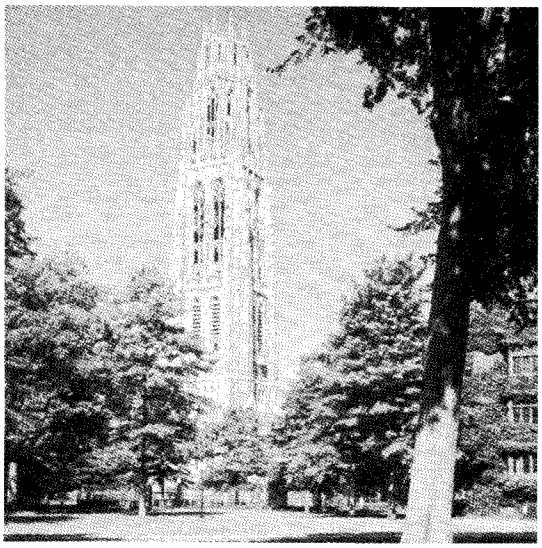
This month ACUTA News features **YALE UNIVERSITY,** located in New Haven, Connecticut. YALE is a private non-profit institution with an enrollment of 10,317 students; 5,106 undergraduate students, 2,260 graduate school students and 2,951 students in their professional schools. They have 2153 faculty and 5650 support staff. They are the largest employer in New Haven and better than 40% of all New Haven residents are associated with Yale.

YALE was established in 1701, has over 200 buildings and covers approximately 820 acres. Divisions of YALE include: Yale College, the Graduate School, Schools of Medicine, Law, Art, Music, Forestry and Environmental Studies, Architecture, Nursing, Drama, Divinity, and Organization and Management. There is also an Institution for Social and Policy Studies. Yale is noted for many areas of excellence, but especially in their Law and Medicine programs. The Yale Repertory Theatre is considered one of America's leading repertory theatres. In addition the Yale Center for British Art has the most comprehensive survey, outside of England, of British Art from Elizabethan times until the 19th century. Yale sponsors over 1,000 musical events every year ranging from symphony orchestra concerts, jazz ensembles, chamber orchestras, glee clubs, individual recitals, etc., all free and open to the public.

As well-known as the academic area is, believe me they will be hard pressed to keep pace with the dynamic telecommunications department at YALE. The Director of Telecommunications is ACUTA's own Mike Grunder, who holds the position of Finance Chairman for ACUTA. The activity we are talking to Mike about all started about four years ago when they began a careful evaluation of what they were doing then, determining where they felt the needs of the university would be in the short and long term, and defining clearly what interim steps would be required to protect the university during the planning stages. Mike Grunder and his staff have made giant strides in developing a telecommunications plant that is a vital resource to the university, not just a necessary monthly bill from a utility company. As Mike so clearly pointed out in his interview, what is happening at YALE has been the result of over four years of hard work by a dedicated and innovative staff and to quote Mike, all he had to do was select good people and turn them loose. We all know there is nothing more difficult to achieve than something that sounds so easy and is successful.

The local telephone company is SNET (Southern New England Telephone Company). SNET, as many of you recall, is one of the two Bell Operating Companies considered to be independent companies at the time of divestiture, leaving them quite unique in what they could do as compared to the remaining Bell telcos restructured under the seven regional Bell Companies. The Yale main campus was being served by a Centrex System, #5 Crossbar System (and we will talk more about it later). All of the operators are located at the medical center, using consoles from both systems, to provide directory assistance and information services for the Yale University Faculty, Staff and Students, and for the Yale-New Haven Hospital. They provide a Doctor's Answering Service; provide patient information for the hospital; maintain and run both an overhead and radio-paging system for the medical center and they monitor probably 85% of the fire alarms, security alarms and other types of alarms from the console positions. Operator services are provided 24 hours a day, seven days a week. About six months ago, the telecommunications department installed a stand-alone computerized directory assistance system for the operators that has proven highly successful and reliable. Mike had nothing but positive things to say about the asset this system has been to their overall operation.

The Yale Medical Center incorporates the Yale-New Haven Hospital (legally and corporately a separate entity from Yale University), the Yale School of Nursing and Yale School of Medicine. In mid to late 1981, they purchased a Northern Telecom SL-1 XL switch for their Medical Center and it was cutover June, 1982. They set up a management office to run the switch and estimate they have achieved a savings of about 20% as compared to the costs they would have paid for CENTREX service over the same period of time. Right now, they are contracting with Northern Telecom to maintain the switch and to perform the adds, moves and changes.



Harkness Tower
YALE UNIVERSITY

YALE UNIVERSITY, CONTINUED:

They will be establishing their own in-house service bureau to perform these tasks and feel they will save about 10% in addition to receiving better response to service calls. The decision to buy and operate their own switch proved to be a valuable asset in later planning and decision making activities. Since they had already successfully implemented a cost-effective and efficient switch, they were viewed differently by top administrators and were able to get approval for their campus-wide project without much difficulty.

When deregulation/divestiture rumblings started rearing it's ugly head, Mike and his staff started taking some steps with their local telco to help maintain a stable rate environment during their planning and implementation stages. SNET renamed the CENTREX service to a new tariff item called DCOSW (Dedicated Central Office Switched Service). This special tariff offering actually changed the CENTREX service to a PBX service, and allowed YALE to buy terminal equipment, riser cabling, station wiring, and intercoms. The telco provided the central office switch, maintenance and those sections of the backbone cable SNET couldn't legally sell. In essence, this move stabilized the rate structure and afforded YALE the opportunity to reap the savings achieved from owning their own system while still being served on the central office switch.

This is just another example of what can be done by working with the local operating company, not against them. As Mike said at the ACUTA Conference in Boston last summer, SNET is an important industry in New Haven. As YALE started looking at all the issues involved, SNET and SONECOR had some assets that made it highly desirable for them to do business with and YALE offered SNET and SONECOR some advantages they couldn't disregard and they had little to do with being just down the street from one another. SNET is one of the largest employers in Connecticut and as Mike stated, they simply couldn't afford to ignore their influence in the community. Since I come from the same type of situation, I know exactly what Mike was saying and I couldn't agree more. In both of our situations, I suspect the university has been the winner.

In 1974, YALE installed one of the first WATSBOX for routing and control of their long distance network. Currently they have 108 out-going lines on the WATSBOX, consisting of a combination of both intrastate and interstate FX, WATS, MCI and DDD. Their rate structure is for the most part, the same as ATT, following their discount rates and hours. They base their pricing on mileage bands, not a flat rate per minute and have built in a special discount rate to encourage usage in the daytime at peak off-busy hours. The rates paid by their users average approximately 4 to 5 cents per minute below MCI or Sprint rates. This rate allows them to recover their costs, no easy achievement in today's competitive long distance market. Their network handles about 130,000 calls per month, using from 550,000 minutes to 600,000 minutes per month.

I found it very interesting when Mike said that so far, nothing that has happened in the various rate changes for WATS and FX has hurt them, in fact, he felt some of them had actually benefitted them, although he felt it would take a little more experience with the newer rate structures, such as usage sensitive pricing as compared to flat rate pricing, before a determination could be made.

Last year, they implemented a small test program to add the students to the WATSBOX. That test proved so successful they opened up the network to YALE students with the start of Fall semester, 1984. About 1300 students can use the network after 6pm and that traffic has helped reduce the per minute rate for all users. The students generate traffic during a time when the rates are lower and the network is idle for the most part, providing a double benefit. I asked Mike if access to the network was limited to students living in campus provided housing facilities. Mike said YALE has about 5,000 undergraduate students living for the most part on campus, in twelve residential colleges. A Residential College is different from a dormitory in that it is an academic unit all to itself. Patterned after Oxford and Cambridge, a resident college has a Master and a Dean. Each residence college is a complete living unit with eating facilities, recreational facilities, library facilities and is a total academic unit unto itself. An undergraduate student receives a degree from Yale College. Some graduate students live in campus residence halls, but these halls are not part of the current telephone system. With the new switch these graduate housing units will be wired and service will be provided by Yale Telecommunications.

Mike had nothing but good things to say about their experiences with the WATSBOX, and although they plan on retiring it from service when their new system is cutover, they feel it has paid for itself many times over. Yale was one of the very early users of the WATSBOX; it was upgraded once and then they converted to the Roadrunner Series a few years ago and had the system optimized once. They elected to use the alternate routing feature of their new switch for ease of maintenance and simplicity's sake, not because of any dis-satisfaction with the WATSBOX Roadrunner.

We have talked all around the subject of the new switch, not about it though. The switch is called "System 2001". It was purchased through **SONECOR SYSTEMS**, the unregulated marketing division of SNET. System 2001 is manufactured by NEC and is in reality the NEAX 2400. The System 2001 will serve the main campus and the students, on two switches hooked together with a fiber optic link, (the two switches are necessary because of the space limitations for electronic sets.) It will interface with the SL-1 in the medical center through telco-provided tie lines or with some form of Yale owned bypass facility, such as T-1 carrier, Microwave or Fiber link. At the present time, access between the main campus and the medical center is through the local business lines. To access one another, users at either facility dial 9 plus the seven digit number, and although Mike said they didn't like this arrangement at first, they have accepted it very well and it has saved Yale considerable dollars in costly tie line facilities. Following the cutover of their new switch, main campus users will dial access code 5 plus 4 digits and from the medical center, users will dial a three-digit access code plus the 4-digit number.

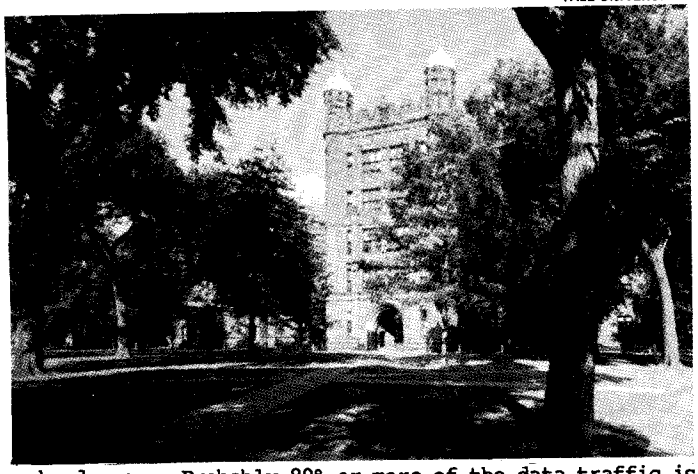
As stated earlier, they will replace the existing WATSBOX with the alternate routing facility in the System 2001. Users on the main campus will have a two-level access to the long distance network. They will be able to dial 8 + the long distance number and the call will be billed back to the station making the call (ANI), or if they want to bill their call to any one of several grants, or desire more security than ANI offers, they can dial 9 and the long distance number plus their auth code (forced authorization code level). Students will use authorization codes, but traceable back to the station making the call, through the SMDR feature on the new switch. Mike feels he will rest easier working with student resale when he has the SMDR facility. Users from the medical center will continue to use forced authorization codes.

During the earlier planning activities, the vital issue of cable plant was looked into. Rough estimates indicated it would add about $6 million to the overall project if Yale elected to install a completely new cable plant. They elected to try and use the existing one, and Mike is predicting the decision was the correct one and time will prove it (even though most of the speakers at the various ACUTA functions say the opposite). He felt one thing in their favor was dealing with the subsidiary of their local operating company probably gave them an edge of sorts in

determing the life and condition of existing facilities. Part of their deal says that if the cable can be used, it will be---if it is not worth saving, then it will be replaced in those sections deemed necessary to replace. They have an extensive amount of 25-pair cable in the buildings since they have a lot of key equipment. As a very interesting part of their deal, the telecommunications department designed a unique jack that SONECOR manufactured for them and will install, permitting YALE to use the required wire for single line service, while wiring to these special jacks the spare pairs left in the 25-pair cable facility so they can use them for whatever they want in the future. They predict they will have a lot of this so-called left-over copper pairs, since they intend to be at least 65% single line service after the new switch is cut over. In some cases, they have already discovered it is cheapper to replace some cable runs instead of trying to salvage them, and where that has proven the case, they have pulled in new cable. Mike said one of the things that really surpised and pleased them was the quantity of good cable that they found, especially since all he has ever heard anyone talk about was the vast amount of bad cable, the improper installations, the so-called `rat's nest' of telco terminal rooms and entry cable; when in reality about the only thing he found that the telco probably did wrong, was they probably laid more cable than was ever needed. He said that at the price they were able to buy the cable out, they couldn't afford to ignore it (even if all the seminar speakers were correct) it was still cheap if they used it only as pull-wire. For the first year or so following the cut, YALE will contract with SONECOR to provide maintenance/management functions for the cable plant, then once everything has settled down, Mike and his staff intend to convert to their own in-house maintenance crew, very much like they handled the medical center facility. For cost analysis purposes, he approached both projects using contract maintenance, but has proven additional cost savings by providing in-house staff at the medical center.

We really hadn't talked much about data communications, and since Mike is somewhat of a data expert, I couldn't let the opportunity pass. First of all, Mike said they couldn't come to grips with exactly where YALE wanted to go with data communications. The University's primary data communications network is a Gandalf PACX network which uses a number of data switches as opposed to a voice switch. They have three nodes with 5 or 6 Gandalf switches, one node in each of their computing centers (computer science, administrative computing center and academic computing center). That particular network is managed by the YALE Computing Center Technical Services Department. It uses 4-wire twisted pair Limited Access Data (LAD) Circuits, which the telecommunications department provides upon request from the computing center. The computing center provides the terminal equipment, data switches and manages the network and Mike says this will continue, since they have no plans for telecommunications to become suppliers of data terminal equipment and

Phelps Hall
YALE UNIVERSITY

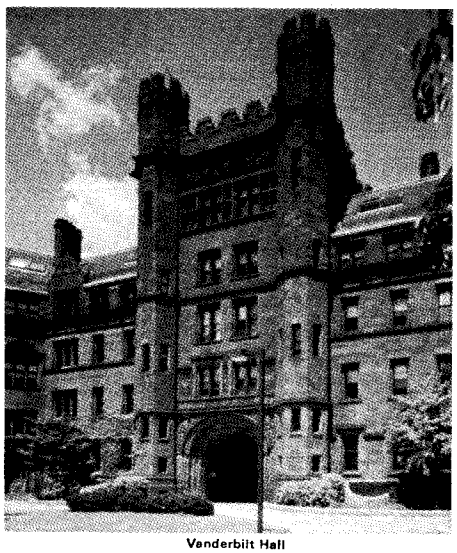


hardware. Probably 80% or more of the data traffic is carried over the PACX Network, currently supported by telecommunications and they plan to continue this support when they complete the new installation and changes in the cable plant. Mike says they work very closely with the computing center and maintain excellent communications with them. His earlier statement about `not coming to grips' with the data situation was merely stating a truth and he personally would doubt that anyone in such a complex and varied situation would be able to state truthfully that they knew exactly what the future of data needs would be. As we all know, it is still an issue for most of us, waiting for directions and answers. The second part of his answer reminds us the new voice switch is capable of transmitting and switching data at speeds up to 19.2 asynch and 56 kilobits synch, should they opt to use it for that purpose. Mike feels there will be applications for switching data, some local area networks where that specific application will prove very cost effective. The important thing is, they have the capability of switching data through the voice switch and can decide when and how to use the facility, with no additional charge until they elect to use it... Just another item for the Joe Massey `war-bag'. It will also support accoustically-coupled data and it is amazing how much of that is still going on. The interesting part of this scenario was the fact that SONECOR is anxious to establish their organization as a leader in the industry, not only in terminal equipment, but in fiber-optic technology. As a part of YALE's contract with SONECOR, they are installing fiber-optics between a number of the major buildings on the campus. The purpose is strictly for the future. They have absolutely no plans on using this fiber backbone at the present time or in the switch cut, but they do plan on using it in the future for all kinds of data applications, expanding it as their usage requirements change, both in volume and speed. In addition, when planning the construction facilities for the fiber backbone, they included the construction of extra ducts to handle the BMOC (Building Management Operations Center) energy management facilities which uses predominately coaxial cable. Wherever they are installing duct work for fiber, they are automatically installing extra pipes for whatever they might want in the future. They are currently looking at the possibilities of installing a pre-defined pilot broadband data network; right now just a pilot project to see if it has any applications for YALE and to determine the cost-effectiveness of such a network. If it proves to be something they can use, they will already have the duct work in place. It was decided early in the planning stages not to cloud the voice switch issues with the highly volatile and ever-changing data communications issues; issues that had lots of questions and for which there were few answers; that they would look at what was reasonable for data in the near future and take care of the

(YALE UNIVERSITY, continued)

exceptions as they went along. Have they covered all the bases??? "We really don't know", Mike said in answer to his own question, "but providing the facilities as outlined above, puts us in pretty good shape in the forseeable future".

My next question was about billing and charge-back procedures. They do have an equipment and service billing system and they charge the users for the equipment they have, in much the same way as before they went on the DCOSW tariff. Prior to deregulation, they simply passed through the bill from the telco to the using department. Even though, under the new tariff, they no longer receive a monthly equipment bill from the telco, the users still are paying the same amount for the equipment as before, and they get a detailed monthly statement from their telecommunications office. They didn't change their basic charge-back procedures or rates when they switched to the DCOSW tariff. If a department installs three phones and it costs the telecommunications $100 to do the work, they charge the department $100. It has always been handled as a pass-through charge, not a profit center concept. Their overhead has always been maintained from the careful optimization of the WATSBOX. When they installed the SL-1, Mike and his staff developed an in-house automated billing system that controls long distance billing, local service, equipment charges, moves and changes. He said it worked very well, but it was the biggest single effort they had been involved with. They are hoping it can be expanded to include those basic billing items for the new switch and they are looking at a couple of vendors with packages to handle cable plant, inventory, and order entry that automatically updates the switch at the same time. However, he felt they just might look at upgrading their own in-house billing system to include those items. Almost as critical as cable plant and switch selection is the decision on how to manage and control the facilities. A good automated management system takes a lot of planning with careful and thorough study of all the details. Believe me, they don't come about by accident or overnight.



Vanderbilt Hall
YALE UNIVERSITY

Estimated date for cutover of the SONECOR SYSTEM 2001 is June,1986, (although they plan on making a few interim cuts starting two or three months earlier and hopefully doing the total cut in June-86). This will bring the station count at YALE UNIVERSITY to 13,500 including the 5,000 plus stations at the medical center facility.

ACUTA News thanks Mike Grunder and his excellent staff for all their cooperation and assistance during this interview. These things take time, something it looks like is in short supply at such a busy campus. We will keep you updated as to the progress along the way.

P A R T Y L I N E

.....Ruth A. Michalecki

Enjoyed receiving a note from Jacqueline Anne Larson, Cleveland State University. Jackie has become very involved with the Michigan Ohio Telecommunications Association, and is the editor of their newsletter called **MOTAVATION.** She sent a copy of it to me and I will be using one of the articles in our next issue of ACUTA News.

Jackie did say Cleveland State University has hired the Omni Group of Chicago, Illinois as telecommunications consultants to assist them in writing bid specs for an integrated voice/data switch. Jackie was appointed Project Manager for the University. They anticipate mid-year/1985 for installation.

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If you haven't read Mark H. McCormack's book **"What They Don't Teach You At Harvard Business School: Notes From A Street-Smart Executive",** do yourself a favor and buy it for yourself for an after-Christmas gift. Author McCormack defines "street-smarts" as "an applied people sense" and he believes his book can teach you how to read people, how to influence their reading of you, and how to apply or customize both to any likely business situation---to fill in the gaps between a business school education and the street knowledge that comes from a day-to-day experience of running a business and managing people.

Learning to read people involves seven fundamentals, according to Mr. McCormack:

(1) Listen aggressively—not only to what a person is saying, but how he/she is saying it.
(2) Observe aggressively--you should be able to interpret certain motions or gestures to really "hear" a statement.
(3) Talk less--ask questions and then don't begin to answer them yourself.
(4) Take a second look at first impressions. Some sort of "thinking out" has to take place between your initial impression and your acceptance of it as a tenet of a relationship.
(5) Take a moment to think what you know about a person and what reaction you want if you're about to make a presentation or a phone call.
(6) Be discreet in telling people all the things they are doing wrong and in telling them about your accomplishments; let them learn about your qualities and achievements from someone else.
(7) Be detached. Step back from any business situation, particularly one that is heating up, and your powers of observation will automatically increase.

Mark McCormack is the founder, chairman and chief executive officer of International Management Group (IMG), which serves as marketing consultants, financial planners for executives and celebrities and as producers of TV sports programming. Among IMG's many clients are Arnold Palmer, Jack Nicklaus, Martina Navratilova, Chris Evert Lloyd, and others. IMG's annual revenues are upwards of several hundred millions..... If you are interested in the art of management, this is an interesting book.

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REMEMBER: San Diego Seminar - March 3-5, 1985
call: 402-472-2000

Dallas Seminar - March 31-April 2
April 2 -April 4

THE INTELLIGENT CAMPUS

.....B. J. Blustein, AT&T-IS
Systems Architecture Networking

The "Intelligent Campus" is a model integrated information systems providing:

-----Information access on demand
-----Homogeneous campus distribution
-----Centralized administration and control

Timely access to information is a fundamental requirement of every member in a campus community. Administrators, educators, students, and staff make thousands of decisions daily on the basis of available information that can be obtained at any given time. Based on that information, decisions made affect organizational effectiveness, operational continuity, profit, loss and learning.

Local Area Networks (LANs) are the facilitators of this need.

AT&T Information Systems has a LAN.

The Information Systems Network (ISN) is designed to respond to the need for premises data networking. ISN can provide a cost-effective network solution for a single local area, a building, a building complex, or campus environment. ISN is capable of handling traffic from large numbers of terminal devices--PCs, workstations, minicomputers, peripherals, and mainframes.

It is a product that can provide users of these devices easy and ready access to other devices or to data they need. The design principles and performance characteristics of ISN ensure that connections through the network are available on demand for users.

Decision Support Systems

In order to provide comprehensive decision support systems, organizations have built very elaborate and vital databases to help ensure information availability. These databases originally had an applications' orientation.

Today the information needed to affect many decisions is distributed among many databases. Some are in mainframes, some in minis, some in shared disks, and of course, new information is being constantly generated in, through personal computers and at workstations.

Campus decision makers have to rely on their ability to span multiple databases, and even entire information systems, to support decisions...or they have to be confident in their ability to communicate with each other well enough to bring out the same effect.

As decision complexity increases, so does the need for more and more inter-system transactions. . .or data exchange by many with many. This is the environment where ISN can help a high performance Local Area Network become a campus asset.

The Information Systems Network is a tool for better user communications in environments characterized by:

-----Complex applications, requiring interaction by large terminal user groups and reliance on extensive data transfer and computations--e.g. engineering, science departments, admissions, student services, accounting, etc.
-----Multiple host environments carrying numerous databases which are accessed frequently by a large number of users, e.g., inquiry/response, systems analysis and design.
-----Growing organizations where desktop computers, minis and micros are proliferating to keep up with the decision support requirements of the organizations, e.g., spreadsheet, engineering plans, facilities management.

ISN is a networking resource, which can link users and devices in facilities campus wide. By design, it can be your blueprint for a cohesive information management system.

Access on Demand = Performance

A high performance architecture is the key to realizing the benefits of integrated decision support systems.

ISN relies on packet switching to provide high speed transport of data on demand. All devices share a single common path for message switching. Messages from devices are divided into short data packets of 180 bits each. The packet switch interleaves data from all types of users at very high speeds. The ISN packet controller is capable of handling 48,000 packets per second.

Packet switching is especially effective for data traffic patterns with very long holding times. For example, when terminal users log onto a computer all day, with only intermittent interactive activity, dedicated circuits would be inefficient.

Performance = Perfect Scheduling

ISN "utilizes" perfect scheduling of packet transmissions. Unlike other methods, there are neither destructive collisions nor periods where the bus is idle with packets awaiting transmission. Perfect Scheduling and Equitable Access combine to ensure that ISN provides consistently high performance.

Perfect Scheduling (Collision-free Protocol)

The short length of the bus is key to executing the collision-free access protocol of ISN.

In order to place packets on the transmit bus, the device interface modules contend for access on the contention bus, which operates at one-tenth the speed of the transmit bus. Each module with a buffered packet begins contending by transmitting its contention code (priority code and module address) on the contention bus. (see figure 1). Bits in the contention code are sent sequentially (see figure 2). If a module sends a zero and any other module sends a one, the modules sending zero will stop transmitting immediately and wait until the next contention round. Due to the short length of the bus, a contention bit "win" is recognized in the same bit time by all contending modules. It takes about two hundredths of a microsecond for the digital pulse to propogate on the bus, small compared to the contention bit transmission time of about one microsecond. Since contention codes are unique, there will always be only one winning module from each contention interval accessing the transmit bus. The result is collision-free access. After winning contention, a module will transmit its packet in the next time slot on the transmit bus.

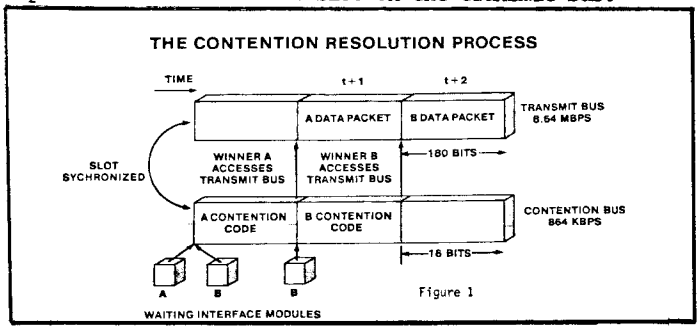

Figure 1

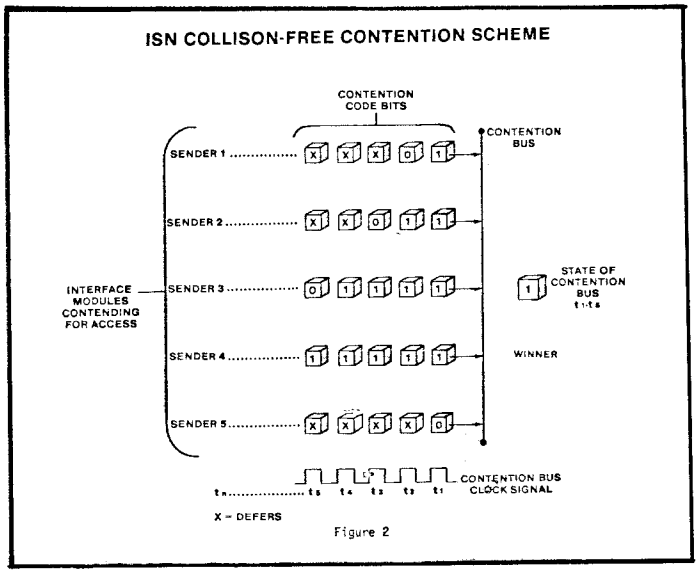

Figure 2

Equitable Access

The priority code is used to achieve fair allocation of bandwidth among devices. The implementation scheme is referred to as Equitable Access.

When a module first contends on the contention bus its Equitable Access (EA) bit is set a 0. If it loses contention because the winning contending module had its EA bit set a 1, it continues to contend with its EA bit set at 0. If it loses contention because the winning module had its EA bit set at 0, then it contends in the next time slot, and all subsequent slots until it wins, with its EA contention bit set at 1. Whenever a module wins contention, its EA bit is reset to 0 before contending again. A contention cycle ends after all modules with packets to send have had the opportunity to send one packet. A new cycle begins immediately with the EA bit set to 0 in all contending modules.

In effect, each module is given the opportunity to transmit one packet in each contention cycle, with the provision that a packet newly arriving to an interface module must wait until the next cycle before it can be transmitted. Hence, equitable sharing of the ISN bandwidth is achieved.

The priority code is also used internally by ISN to give priority to network management messages. A total of nine bits are available in the priority code and unused bits may be exploited in the future to provide other services.

Homogenius Distribution Systems

As information processing needs grow, fragmented distribution systems appear all over the facilities of large campuses. Some of these wiring schemes are geographically limited; some are hard-wired for limited number of users, as in applications networks; and some were just not intended to handle large numbers of users.

This fragmented approach, in installed wiring, results from system specific/unique wiring requirements. There is no community in distribution links...some are coaxial cable, some are twin axial cable and some are expensive shielded copper wiring. Connectors are often incompatible and custom designed.

The solution is a common, easy to manage Premises Distribution System that is good for today and for tomorrow. It should be easy to plan and administer.

ISN employs a Dual Media Distribution System. A high speed fiber backbone is used as riser cable to connect concentrators placed in satellite closets, to the packet controller. 26 guage twisted pair copper wire links terminal devices to these concentrators. This wire is both economical and capable of carrying data at rates in excess of 1 megabit.

The optical fiber cable used is 62.5 micron, in diameter. It is capable of handling transmission rates in excess of 150 megabits per second. At present concentrators and host interfaces only use 8.64 million bits per second transmission rates, equal to that of the packet controller backplane speed.

62.5 micron fiber cable can be used well beyond current generations of equipment.

The ISN Distribution Plan is simple, and it blends the existing and the new. ATT-IS can provide the fiber/copper composition custom-tailored for campus needs. ISN gives you a data networking solution that is powerful, easy to manage and very cost-effective. It provides an alternative to point-to-point hard wiring and tying up of host ports. Operating at 8.64 Mbps, the ISN is "center-stage" in buildings to link devices efficiently, facilitating higher speed information transactions.

Centralized Administration and Control

ISN provides a simplified alternative to separate, multiple networks. This includes user friendly menu screens and administration software. ISN provides user status, network utilization, fault isolation and error detection. The system has been designed for large user populations.

ISN's star topology provides for centralized control of the operations of the network as a whole, making it easy to alter the configuration of the system as needs change, to keep track of network performance, and to locate malfunctions. As a result, system operations are reliable and manageable.

System features include:

-----capacity for network expansion, device rearrangement, and module addition and deletion without disruption of network service as a whole.

-----rapid, automatic notification of faults and their location, down to the level of replaceable modules.

-----secure, nonvolatile storage of configuration and fault data in the event of power failure, with automatic system recovery when power is restored.

ISN supports system administration and maintenance with automated tests and reports as well as a set of system management commands using English words and simple syntax. A system manager can enter instructions and receive messages and alarms from the system's automated maintenance routines at a dedicated Systems Control Console and printer, but the manager can also perform the same functions at any other terminal on the network (even one connected through the modem pool) by using a special login and password. Although ISN's simple system management techniques demand no specially qualified personnel, customers can contract with ATT-IS to perform administrative and maintenance tasks remotely.

NOTE: ACUTA thanks both L.H. "Lee" Bockelman, Technical Consultant with AT&T-IS (a long-time friend and valuable resource for technical expertise second to none) and B. J. Blustein, author of the above article for their time. I asked Lee to give me an article on ISN for our newsletter, and true to his word, in a few short weeks, I had the article on my desk. We look forward to more contributions from AT&T-IS in the future.....

C E N T R E X / E S S X S E R V I C E

....William T. Holloway, BellSouth Services

Several individuals and a few consulting groups have tried for the last two years (since the court ordered divestiture of the Regional Bell Operating Companies [RBOCs] from ATT) to bury ESSX/CENTREX. The problem is that BellSouth has proven that the service **is not dead;** not even sick; in fact advancements in technology, pricing strategies and new-age thinking have put ESSX in the fore front of communications service, especially for higher education and other large customer groups.

Lets be realistic for a moment. Recent BellSouth statistics indicate that about 1.5% of BellSouth customers generate approximately 34% of the total revenue for the company. These are the larger communications users (government, education, and banking). It would be ridiculous to think BellSouth would abdicate that amount of revenue by allowing the major service offering (ESSX/CENTREX) to die. On the contrary it would be most beneficial to expend the capital required to enhance the service and broaden its market applicability.
Bell Communication Research recently announced an upward trend of CENTREX/ESSX lines installation through the first part of 1984. BellSouth is totally committed to offering all that technology can provide from the central offices. Dick Snelling, Executive Vice President-Network for Southern Bell, said "ESSX service is extremely important to us now and will be into the next century."

ESSX must meet the needs of our customers and we are using internal and external sources to review that need and provide input for future advancements.

One of these groups, Eastern Management, concluded a study for BellSouth in June of 1984. Their research prioritized several features required by our ESSX/CENTREX customers. The following is a sample of such advancements and BellSouth's relative position in filling those needs:

The Advanced Communications Package (ACP):

As part of the continuing development effort to improve ESSX services, ATT Technologies introduced the Advanced Communications Package, one of several products to be offered by a host of other vendors.

By combining the power of the 1A ESS(tm) ESSX feature capabilities with the new 3B computer family, the Advanced Communications Package provides a flexible, user-friendly 1A ESS switch/customer premises interface. This system expands ESSX communications capabilities and simultaneously provides office management.

At the heart of the Advanced Communications Package is the 3B computer---either the 3B2, 3B5, or 3B20. Each computer is designed to support modular software using the standard UNIX(tm) Operating System -- ensuring the customer of upward compatible software systems as their needs change.

The Advanced Communications Package is geared toward a modular building block approach to provide user-friendly software for better business management in the areas of communications management and office management.

Communications Manager:

---CENTREX Electronic Key Sets (CEKS), supports single button activitation of CENTREX/ESSX features, and originating and terminating calls for multiple directory numbers on skinny wire using electronic multi-line sets.

---Advanced Station Message Detail Reporting (ASMDR) - providing database processing of call records to provide real-time access as well as customized call record information.

---Customer Station Rearrangement (CSR) - A trial of the 1A ESS CSR is underway at the University of North Carolina.

---Facilities Management (FMS) - provides real time access to facilities data and allows customer control of authorization codes, automatic route selection patterns,and facility restriction levels.

---Automatic Call Distribution Management Information System (ACDMIS) - provides management with the ability to monitor and control ACD activity.

Office Manager:

---Executive Planning, Information and Communications - performs four basic kinds of services: automated calling; electronic messaging; information and news retrieval; and calendar keeping.

---General Processing (GP) - allows customer premises based 3B computer, to provide the capability to do word processing, spread sheets and workbenches.

Because the Advanced Communications Package was designed to allow for flexible marketing approaches, it uses standard Input/Output ports and Peripheral Unit Controller (PUC)/DL links to the 1A ESS switching system and allows the 3B computer to be located either in the central office or on customer premises.

As a regulated BOC we can only provide certain of these features from a 3B processor located in the BOC central office. We cannot legally provide ACD-MIS, the Office Manager features or the customer premises portion of CEK. For this reason, the customer may choose to purchase the 3B from a vendor of his/her choice. However, in some instances the 3B will be located in the central office for special applications and to allow marketing to smaller customers.

These are but a few of the advancements planned in the feature area. It is important to remember that new pricing options are also being planned for introduction in 1985 to allow our customers to benefit from digital technology as well as analog capabilities. This may include contract assembly for large customers which will price systems by the cost to provide the service rather than the old way of average pricing.

The important point is that as technology continues to bring new capabilities, CENTREX/ESSX users will have a distinct advantage in the least cost deployment of those advancements.

NOTE: This article was the ultimate result of a talk I had with Paul Singer, General Manager for Southern Bell of Florida during a coffee break at the Boston Conference. Paul felt the CENTREX Panel was a one-sided view of CENTREX (not intended to be by ACUTA), and that our members should hear both sides. I certainly agreed with Paul and asked him to give me an article on the subject for the newsletter. The above article was written by Wm. T "Tom" Holloway, Education Market Manager for BellSouth Services Company. It promises to be the first of several articles of general interest to ACUTA members and we thank both Paul and Tom for their continued interest and support of ACUTA!

POTPOURRI

.....Connie Gentry, Emory University

We are well underway with the installation of our new phone system——**at last!!** I'm back to working 12 and 14 hours a day and my nightime dreams of frolicking on a desert isle with Tom Selleck have been replaced with nightmares about cable runs, conduit and manholes! There are also days when I am sure that I could be certified brain-dead, however....there are also days when I am so excited about what's taking place at Emory that I can hardly stand it, so I guess it will all work out somehow. I sure do miss Tom Selleck, though!

Here's a few words of wisdom to those of you contemplating the installation of a new phone system. If you do not have an up-to-date campus map showing conduit, cable runs, poles, manholes, building cable entrances, etc., etc.,you better get one **before** you send out your RFP. If you have such a map you're not being paid nearly what you're worth because you're the only communications manager in the country who does! In addition, if you do have such a map, you also need to know the condition of the duct runs and whether they're full, collapsed, or usable...so hire a company to rod the ducts; it will be well worth the money. Make sure you include a copy of this map with your RFP. Another consideration for you....do you have complete floor plans for all your campus buildings??? If you do, give yourself another raise; if you don't, do not pass "GO", do not collect $200; hire yourself a couple of temporary draftsmen and get the plans drawn...and make sure that existing phone and/or computer outlets appear on them. These plans will be invaluable and save a heck of a lot of time when you start wiring for your new system.

The "You're a day late and a dollar short" department: Southern Bell has notified me that a "Special Assistance" group has been formed to help large user accounts with any problems related to Bell service or repair. This group is supposed to help us get things done faster and more efficiently. I think this is a real nifty idea. But where was this group last year when I really needed them and their services. I can't get real excited about it since we'll be freezing all order activity as of March 8th. Oh well! I guess it's the thought that counts!

I don't know about you, but I've been getting four or five calls a week from these telephone research and marketing firms who want to either send me a questionnaire to fill out or take 15 to 20 minutes to ask questions about long distance companies. When I first started getting these calls I was nice, it was an inconvenience but I did it. Now, I'm telling them that if they don't stop calling me I'll report them to the FCC for harrassing phone calls! Enough is enough! I just don't have the time to spend answering these questions.....

We have chosen COM-NET to provide our facilities management software which will run on the University's IBM 3033 mainframe. I'm really excited about getting this set up and will report to you in a later column on how things are progressing.

You'll be interested to know that the central idea of my last POTPOURRI column, "the art of raising Hell", was evidently not an original thought. It seems that Plato once said (and I will paraphrase)...the art to being angry is knowing when to do it, with whom to do it, and to what degree. Just think, once upon a time I couldn't even spell "philosopher", and now I are one!

——see you next month.....

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PARTY LINE, continued:

Maxine Allen from Bowling Green University had the honor of coordinating communications with the special white house telecommunications staff to handle a recent visit to their campus by President Reagan. Believe me when I say this is no easy task, and I know from many such first-hand experiences, (our university has been blessed with visits from several presidents——Kennedy, Nixon (twice), Ford and Carter). As Director of Telecommunications, your work starts considerably in advance of the actual visit; interviews from the Secret Service; locating secure areas where the White House communications force can be established; reviewing special procedures regarding radio communications both prior to arrival and after departure. However, it is a good feeling after all is over and things are back to normal——and you have a special bracelet or a pendant or a pen/pencil set with the White House seal as a keepsake for all of your efforts. I am sure Maxine and her staff enjoyed the extra activity, I know we did!

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In the latest issue of**MIS WEEK**, Dixon Doll had some interesting predictions for the coming year. Here are a few of them:

.....Continued erosion in LD and CPE prices (interLATA LD), and upward pressure on local costs.
.....Radical changes in distribution, merely a continuation of the problems we have been experiencing over the past 12 months. However, major suppliers in the industry such as ATT and IBM are clearly taking the systems approach in dealing with their larger customers. Suppliers of smaller, lower cost units willcontinue to find it difficult to distribute through direct channels and will lean more and more to distribution through system integrators, OEM agreements and more reliance on the RBOCs.
.....Multivendor network management systems will be one of the hottest product categories of the 1985's. It is one of the user's biggest requirements and no major supplier is actively devoting major resources to this market segment——but look for it to happen fast.
.....Inter-LATA carriers will make a push to re-establish end-to-end connections to the customer premise in 1985.
.....Look for significant growth in supercontrollers and T-1 networks. Expect a downward trend in pricing for T-1 and DDS services. The RBOCs will push this to ward off anticipated bypass activity.
.....Dramatic acceptance of voice mail technology——has far too many benefits to be ignored.
.....Northern Telecom must respond to the Wang/Intecomm, IBM/Rolm actions, so look for NT to team up with one or more major office systems vendors this coming year. Should have a wave of Telephone/PC offerings.
.....The continuing shortages of competent professionals in the telecommunications area will further push frustrated user organizations that cannot solve their own personnel and staffing problems to turn towards facilities management solution alternatives. Leading network services vendors are moving in this direction, but they are not the best long-term choice for user network facilities management. However, a new breed of facilities management services will emerge——namely those who understand how to exploit the best networking technologies as the core of their service offerings.

It would pay you to take the time to read the complete article by Dr. Dixon Doll. Once again, it is in **MIS WEEK**, December issue.