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Association of College & University Telecommunication Administrators

VOLUME 13, NUMBER 10 NOVEMBER, 1984 RUTH A. MICHALECKI, EDITOR

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PARTY LINE

.....Ruth A. Michalecki

The ACUTA Fall Workshop, held in Madison, Wisconsin, was another very successful workshop. Madison is a lovely city and it was wearing it's best fall colors while we were there. Mike Toner did his usual outstanding job of seeing that everything ran like clock-work, not a glitch anywhere. Our special thanks to the University of Wisconsin and Bob Devenish for allowing Mike and his crew the time required for hosting such a large workshop. Madison has a special spot in my heart---that's where I first heard about ACUTA.

Mal Reader put together an excellent workshop. Our speakers were Geoffrey Tritsch and John Powers of **Telecommunications Management Corporation.** They did their homework well and the chemistry between them and the participants was great. The industry panel session was very good and it gave our members attending the workshop an opportunity to see the many different ways telecommunications management is approached by the various vendors in the field.

As I said earlier, the workshop was a big success. We had somewhere around twenty or so members that couldn't attend because we simply ran out of room. We have decided to run this workshop again during the last week of January. You will be getting a flier later this week advising the exact dates and hotel selection. The location will be in San Diego, California. If you are interested, I strongly advise you to return your reservation card as soon as possible so you can be assured of a reserved spot at the workshop. The brochures will be printed as quick as we are sure of the hotel selection and rates. The last few workshops and the Boston Conference were filled to capacity and we had to turn away some people wanting to attend. I am pleased to see our sessions so successful, but it is hard to turn away members simply because they were late getting their reservations in.

Telecommunications Management Systems are of major concern to most of us struggling with the issues forced on us since divestiture/deregulation. It is absolutely critical that we get a handle on this resource as soon as possible and that whatever system we select is flexible enough to meet our changing needs, yet large enough to do all the things we require.

Just a brief review of why we need an automated telecommunications management system and then a list of what should be included in your many data bases. The source of my information comes from the workshop notes.

Why Manage?

.....In the good old days, we had one source; maintenance included in rentals; no losses to worry about; no data to manage. Some of the old methods of management included: loose leaf binders and 3x5 cards (which were never up-to-date and were very labor intensive); let the telco do it; or an attitude of "it will manage itself".

.....In todays environment we cannot afford the luxury of doing nothing, it simply costs too much. We now have a multiplicity of vendors; no longer are we getting the P-CAB billing detail, our bills are bulk billing with little, if any detail; moves and changes activity are too great to keep track of on a manual basis; we now have the problem of paying for calling the wrong maintenance personnel for repair; who do we call for new equipment; when and how to make changes; what equipment belongs to you and what is leased; and a host of other problems we can all identify with.

.....We also have the added blessing of visibility---as the telecommunications budget item grows, top management will ask and expect **expert** answers. We no longer have the luxury of ball-parking an estimate. System acquisition is a major asset and **MUST** be managed.

.....Nine major data bases were identified and fully detailed. I will list the nine data bases and after the San Diego Workshop, I will try to summarize them in detail for our members not attending the workshop session. (1) SMDR; (2) Equipment and Peripherals; (3) Key sheets and button assignments; (4) Directory; (5) Inventory/Asset tracking; (6) Cable maps/Cable records; (7) Trunks/Private Lines/OPX's; (8) Networking/ARS; (9) Work order generation which includes moves and changes and maintenance records.

Again, this is such a major item for all of us, I would strongly recommend attending the workshop in San Diego. One comment that was made by the TMC Speakers was that in the University environment, machines were often easier to finance and acquire than people. We all know how true that is!

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Was great to see Connie Gentry at the Madison Workshop. She has been one busy lady from all we hear, but I am glad to report that she is back with her delightful column and let's hope it is only the first of a regular monthly spot by Connie. She has so much to offer, a wealth of wisdom and wit. Welcome back Connie! Joe Brown, one of our newer members, from the University of Wisconsin-Stout gave me an article for ACUTA News. It is in this issue and I hope you will enjoy it as much as I did. Joe puts into words his first impressions of an ACUTA Workshop and Joe Massey. Thanks Joe, and please don't stop with just one article. Pat Paul from Cornell promised to do a short article on their decision to go with the ATT System 85 for their telecommunications needs. I am almost afraid to use the word install the System 85----it doesn't seem to actually describe the event. I hope we can run her article in the December issue. It is great to see the

PARTY LINE (Continued):

responses we are getting for contributions to the newsletter. So many of you are doing various things for different reasons, and it would be great if you would share your solutions with us. Don't worry about spelling or grammar, we will try to catch it here, but if we slip, don't worry about it. The important thing is the story. While we were in Madison; Virginia Penikis shared a document with anyone interested in it, on the problems they have experienced with the cut-over of the Northern Telecom DMS100. They are being served by their local telco, and have converted their CENTREX system to the DMS. Some of the problems concern incompatibility with automatic answering machines, Calls dropping off in middle of conversation, CENPAC problems, consoles dropping out of system, features being dropped from system, etc. I am sure if you are having problems in this same area, Marvin Eckard (Telecom Manager at University of California) will be happy to talk to you about their experiences and solutions. Marv's number is 415-642-6518.

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Now for a few items of general interest.... New York Telephone Company recently cut its monthly rate on CENTREX new lines by $3.55 per month in an attempt to keep CENTREX service competitive with PBX Systems. New York Tel boasts over 3,000 customers with more than 600,000 lines using CENTREX Service. About 13.9% of these customers will be affected by the drop in the CENTREX rate. The reduction was designed to offset the FCC-levied access charge paid on new CENTREX lines. As you know, the original FCC order established two rates for CENTREX service. Lines ordered prior to July 23, 1983 were charged $2.00 per line and lines ordered after that date were charged $5.55 per line. New York Tel reduced all CENTREX line rates by $2.00 earlier this year which completely offset the CALC charges paid by some customers. The new rate reduction will result in a complete offset of CALC for all CENTREX customers of New York Telephone Company. That should be good news for our members in New York....

Western Union has announced a new software program designed to provide instant electronic communications to users of otherwise incompatible personal computers, word processors, terminals and mainframe computers. The **Easylink Instant Mail Manager** reportedly provides word processing, data base and disk file management and communications capability in one integrated software package. The software runs on the IBM Personal Computer and the IBM/XT. Functions include a text editing program, status display indicators including page width and length of file, address data base management, and several delivery options including electronic mail and telex. For further information, contact Western Union, One Lake Street, Upper Saddle River, N.J.,07458....

Indiana Bell has signed a contract to provide Directory Assistance to long-distance customers of MCI. MCI recently announced they will offer long-distance directory assistance on a nationwide basis under agreement with Bell Operating Companies. Indiana Bell will bill MCI directly for the service and MCI will bill their customers.

All for this month.....

WORDS OF WISDOM:

...Don't believe your opportunity lies elsewhere. You carry it with you!

ACRONYMS, ABBREVIATIONS, DEFINITIONS:

ACU: Automatic Calling Unit.

ASYNCHRONOUS TRANSMISSION: Transmission in which each information character, or each word or small block, is individually synchronized, usually by the use of start and stop elements.

ANI: Automatic Number Identification.

BANDWIDTH: The difference in cycles per second, or hertz between the high and low frequencies of a band.

BAUD: Unit of signalling speed. The speed in bauds is the number of discrete conditions or signal elements per second.

BCD: Binary code decimal---6-bit alphanumeric code.

BINARY CODE: An electrical representation of quantities expressed in the base 2 number system.

BIT: Contraction of Binary Digit. The smallest unit of information in a binary system. A "BIT" represents the choice between a mark or space condition.

BIT RATE: The speed at which bits are transmitted, usually expressed in bits per second (bps).

BLOCKING: Inability to interconnect two idle lines in a network because all possible paths between them are already in use.

BROADBAND: Communication channel having a greater bandwidth than a voice grade channel, and is therefore capable of high speed data transmission.

BYTE: A small group of bits of data that is handled as a unit. In most cases it is an 8-bit byte.

CARRIER: A continuous frequency capable of being modulated, or impressed, with a second (information carrying) signal.

CARRIER FREQUENCY: The frequency of the wave (carrier) which is modulated to transmit signals.

BOCS: Bell Operating Companies.

CIRCUIT: A means of two-way coommunication between two of more points; a group of components connected to form a specific function.

a) two-wire---a circuit formed by two conductors insulated from each other that can be used as either a one-way transmission path, a half/duplex path, or a duplex path.

b) four-wire---A communication path in which four wires (two for each direction of transmission) are connected to station equipment.

EBCDIC: Extended binary code decimal interchange code: an 8-bit alphanumeric code.

EAS: Extended Area Service (flat rate).

FIRST IMPRESSIONS

.....Joe Brown, University of Wisconsin-Stout

A year ago my supervisor handed me a cushy assignment: "Learn about telephone systems and see if you can reduce our bill." It did not occur to me to ask to be relieved of some other responsibility because telephones seemed so simple. I called Mike Toner in Madison and asked his advice on the quickest way to gain expertise in telephone systems. He advised attending an ACUTA meeting in Nashville, Tennessee.

Not long after our conversation I was attending a very nice reception in the Opryland Hotel and congratulating myself for taking Mike's advice. I also thought it might even be interesting to learn what a LATA was. The end of the reception was the end of the fun

The following morning a gentleman named Massey was lecturing in a mostly foreign language complicated by a Georgia accent. He was obviously crazy. I thought someone should stop him but realized I was not attempting to stop him myself. Better to let him ramble until he's tired. Everything I understood confirmed that the man was not rational. Switches, those small electrical devices used to turn lights on and off, were going to cost millions! The man claimed to have three maiden aunts, all named ENFIA, distinguished from one another only by their three middle initials A,B,and C. He talked about equal access to his aunts (as if anyone wanted access to them). He talked about a twisted pair. I thought "well, at least he has a friend".

He had invented a new way to tell time. Using his method I calculated that it was now about 12ccs after the tenth erlang, and Massey was still going strong. He talked about a foreign exchange but refused to identify the foreign country. It wasn't until he mentioned the Local Loop, a nearby tavern, that I began to understand what was wrong.

Needless to say, I decided to have nothing more to do with ACUTA. Much better, I decided, to subscribe to a variety of publications and purchase books from the Telecom Library. It was slow going but I did learn to appreciate that telephony was not as simple as I had imagined. None of the books mentioned LATA's or equal access.

Several months later, Mike Toner called and suggested I attend yet another ACUTA meeting in Orlando at the end of March. I made up excuses. I didn't want to embarrass a colleague, and Mike was president of this organization. I swore to Mike that I hated the thought of missing the tail end of a Northern Wisconsin winter. Finally, Mike convinced me that a highly respected consultant would be discussing the differences in major PBX's. Well, he was right. I couldn't afford to miss that.

I arrived in Orlando very late, missed the reception, slept late, missed breakfast but arrived at the meeting on time. Behold! Crazy Joe Massey is there and he is the "highly respected" consultant. What, therefore, is wrong with Mike Toner?

Actually it was not as bad as I make it out to be. Massey was recovering. Some of what he said made sense. I took notes, I listened and I learned about different PBX's. At the meeting Massey said he thought IBM was going to buy ROLM. Massey had gone from the irrational to the improbable. He was on the road to recovery.

I returned to campus and to my books and other publications. I learned two things out of this material: not all of what I heard at the ACUTA meeting was nonsense and the telephone industry was changing so fast that the books were out of date the day I purchased them. They did, however, help me to understand some principles regarding telecommunications and seemed to support much of what Massey had said. I wondered, in all fairness, if I shouldn't rethink my original impressions of Joe Massey and ACUTA.

I continued to read and study and that process, too, became less difficult. I had made some acquaintances at my two ACUTA meetings whom I could call when I had trouble undertanding something.

JOE MASSEY AT ORLANDO SEMINAR

One day an announcement of the ACUTA Annual Conference arrived. I decided at once to attend. By now I had questions for which I wanted answers. So, it seems, did a lot of others. This was a big meeting! For four days I listened to a number of excellent speakers discuss a wide range of topics current to the telecommunications field. And yes, crazy Joe Massey was there, and I am happy to report, he is fully recovered. Two months after the Boston meeting I am still trying to digest everything I heard there.

And the truth? I am beginning to believe that Joe Massey was never ill at all!

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(NOTE FROM YOUR EDITOR):
Thanks to Joe for his first impressions of ACUTA's long-time friend and supporter, Joe Massey. I am glad to report his first impressions were not lasting.

(Boston Conference - Host Jim Shea)

EVOLUTION OF THE MODERN PBX

Mark S. Bergman and Courtney A. Klinck, Hambrecht & Quist Inc.

The modern PBX has evolved dramatically over the past few years. Only a short time ago the PBX was used almost exclusively for voice communications. Gradually, somewhat unsophisticated data communications capabilities were added so that low-speed data terminal users could switch data calls. This function was of marginal benefit to the PBX users but opened the doors to much more sophisticated data applications now available in state-of-the-art PBX products.

With the emergence of local area networks (LANs), PBX vendors have provided very sophisticated LAN-type capabilities as an integral part of their PBX products. As a result, the earlier function of voice communications, while still the essence of most PBX products, has been augmented dramatically with a number of data communications and office automation capabilities ranging from electronic mail to wideband data communications interfaces to mainframe computers.

New PBX companies such as Prolink, CXC and Ztel are emphasizing distributed PBX functions built around a LAN approach to integrated voice-data communications. In addition to these new suppliers of PBX products, the major, traditional PBX suppliers, such as Rolm and Northern Telecom, along with the relatively new entrant, InteCom, have also moved aggressively into the more sophisticated, LAN-type PBX architecture, Rolm's "Gateway" (providing non-IBM terminal access to IBM computer systems) and Northern Telecom's "Open World" (providing interface standards for connecting dissimilar equipment) are major system concepts built around distributed, multifunctional PBX-based systems providing access, through the PBX, to a wide variety of computer systems and office automation equipment. InteCom, the first PBX supplier to provide a truly sophisticated integrated voice/data PBX, offers its LANmark system to address the distributed LAN integrated office requirements of today's users.

For the past few years there has been a heated controversy regarding the extent to which modern PBXs, as opposed to the emerging local area network (LAN) systems, would play the major role in office automation. The PBX advocates have held that the PBX approach to office automation has advantages in terms of installation, ease of voice/data integration, reliability and cost. LAN advocates have emphasized the distinct LAN advantage of high bandwidth and related very high transmission speeds for applications such as video conferencing and computer-to-computer communications where the 56 to 64 Kbps limit of most third generation PBXs will not suffice.

With enhancements to the third generation PBX products and the emergence of fourth generation PBXs, which offer even more sophisticated high speed data communications capabilities than those of the third generation, the distinctions between a purely PBX solution versus a purely LAN solution are blurring considerably. The current thinking relative to office automation design is that the modern PBX and the emerging LAN technologies will co-exist and be integrated into an optimum system configuration where the best features of the PBX's switching capabilities can be achieved. As a result, the latest emphasis is how to best marry PBX and LAN technologies to achieve the optimum total system performance and cost objectives.

The increasing need to develop a totally integrated office system employing both the latest PBX technology as well as the latest LAN advances, places a great burden on all suppliers as well as the user, who, in many cases, must be the "prime contractor" in putting all the pieces together into a unified system. The PBX suppliers who are able to develop the technical sophistication and product marketing awareness necessary to provide the required system interfaces to the LAN world, as well as to external packet networks, satellite facilities and other sophisticated communications systems and services, will have a distinct advantage over their competitors. More and more, an isolated PBX product will suffer in the marketplace because of user demands to increasingly integrate their various office functions.

Integrated Office Systems

It appears obvious, regardless of the specific applications involved, that PBX vendors must view their product as an integral element in the office systems environment. Without an understanding of diverse, integrated office automation requirements and computer systems interfaces, tomorrow's PBX vendors will find themselves hard-pressed to compete. The distinction between workstations, computer systems, communications networks and voice telephone switches is becoming so blurred that a product which does not envision the integration of these functions will soon be of limited interest to most major corporations.

Enlightened corporate information systems planners addressing office automation issues are striving to incorporate the functions of communications processing, user workstations, local area networks and other related computer and communications processors and peripherals into an integrated, mutually compatible information system. PBX vendors, to be successful, must understand this new level of sophistication.

The new PBXs, in order to be truly competitive, must offer features such as fully integrated voice/data transmission; administrative management capabilities; interfaces to T1 and other wideband communications facilities; interfaces to data processing equipment; interfaces to local area networks; packet switch networks and store-and forward message switching systems; and gateway functions allowing various office systems to interface with one another.

Of course, many users will not require the full-blown sophistication offered by the new PBXs and, for the next few years, will still be primarily involved with voice communications and very little data. For these users, PBX systems which are extremely modular and expandable in architecture will be very attractive. Users with limited data and other office automation requirements will ideally start out with a small voice-oriented system which can later be upgraded to include, on a modular basis, any needed enhanced features which may be required down the road.

Analog Versus Digital

In 1981, roughly 90 percent of the PBXs manufactured were analog; by 1990 this figure will be less than five percent. This shift from analog to digital PBXs is being fueled by the rapid growth in digital trunks throughout the telephone network. As digital trunks replace analog trunks in the network, the cost and maintenance logistics of interfacing the analog switch to the predominantly digital network will become prohibitive. An additional impetus to the growth of digital versus analog switches is the lower cost per line of digital switches. Additionally, the added functionality of the new digital switches and the integration of these systems into sophisticated office automation environments will make analog switches unacceptable.

PBX Generations

The evolution of modern PBX systems and the existing distinctions among systems as regards technical capabilities may be defined by means of assigning "generations" to various products. These somewhat simplistic distinctions, however, are rapidly becoming blurred as older products are being upgraded with new technology. Most PBX manufacturers resist being pigeonholed into a specific generation and prefer to focus on system features and capabilities.

The PBX generations, as most commonly discussed today, may be defined as follows:

...First Generation. First generation PBXs include electromechanical, crossbar and electronic crosspoint systems. These types of PBX systems are now considered obsolete.

...Second Generation. These systems were the first of the so-called intelligent PBXs incorporating stored program control (software driven). Both space division switching and time division multiplexing systems fall into this category. Second generation PBXs do **not** provide significant data switching capability. Only analog trunks are supported.

...Third/Fourth Generation. The distinctions between third and fourth generation PBXs have really become more a matter of **degree** than actual functional difference. For the most part, fourth generation PBXs differ most significantly from third generation systems in that the former are more highly modular and distributed. Third and fourth generation PBXs are digital in nature. They also use stored program control and have extensive data switching capability. PBXs in this category generally employ pulse code modulation/time division multiplexing and are much more heavily oriented toward software features than are second generation PBXs. Both analog and digital trunks are supported as well as standard analog telephone instruments or digital "feature phones." Sophisticated voice/data workstations can be accommodated. Highspeed, multiplexed trunk interfaces to T1 carrier facilities are provided as are interfaces to LANs and mainframe computers. Applications such as voice store-and-forward and electronic mail are supported. Traffic is non-blocking or "essentially non-blocking."

It should be noted that full scale production versions of so-called fourth generation systems such as CXC and Ztel have yet to be installed. InteCom's IBX was the first true third generation system on the market but the company now contends that its latest product, the IBX S/80 has sufficient features and capabilities to be classified as "fifth generation." Rolm with its CBX II, Northern Telecom with its SL-1XN and SL-100, and ATT with the Dimension System 85 Release 2 all lay claim to at least third generation status. All these systems are very powerful, regardless of what "generation" label is attached.

Third and fourth generation PBXs have three basic characteristics:

.....A non-blocking switching matrix

.....A distributed architecture

.....Integrated voice and data switching.

The non-blocking approach uses a fixed time slot for each port. The PBX system's control processor continuously scans each port sequentially at a high rate of speed. This heavy overhead required a powerful control processor. Non-blocking systems typically employ separate processors for ancillary applications, such as voice store-and-forward and electronic mail, so that the control processor can more efficiently service primary voice and data traffic.

PBXs with distributed architecture connect the central switch to remote or distributed switching nodes via fiber optic or coaxial cable as opposed to twisted pair wiring. In the case of a distributed PBX system, the distributed switching node has the capability to handle some of the central PBX's processor workload. The system design complexities are significant in distributed PBX systems; however, the gains in flexibility, reliability and cost savings associated with distributed architecture in many cases justify the added complexity.

InteCom's Integrated Business Exchange (IBX) employs distributed architecture, as do several other of the third and, more recently, fourth generation PBX products. In the case of the IBX system, control of the total system is not completely distributed with all nodes having equal control functions, but is, rather, hierarchical, with major controls resident in the central switch and lesser controls in distributed system elements.

True integrated voice and data indicates that the PBX design is able to handle voice and data on an equal basis without separate transmission paths, sub-multiplexing schemes, alternate use ports, dedicated voice and data ports or doubling up of ports required when both voice and data are handled. The third generation PBXs support simultaneous data and voice transmission with data rates up to 64 Kbps.

A third generation PBX operates basically as a circuit-switched transport network which connects the user to a variety of communications systems and features such as computers, voice recognition equipment, electronic mail systems, voice store-and-forward systems, etc. Other functions such as protocol conversion, code and speed conversion, etc., may also be provided.

With ATT's divestiture of the BOCs, billions of dollars worth of second generation PBXs will be available for purchase. While these PBXs do not offer the sophisticated features described above for the third and fourth generation systems, some users will be able to handle their communications requirements quite nicely with these older systems. If the price is right, and if no sophisticated office automation requirements are envisioned for several years, purchase of the older systems could very well make sense. Most large companies, however, would more than likely be limited themselves by purchasing the second generation products.

Higher Data Transfer Rates

While the data handling capability of third generation PBXs might seem adequate at a level of 56 to 64 Kbps, current high-powered workstations with high-resolution displays such as Xerox's Star, and process-sharing systems such as Apollo Computers' Domain and Three Rivers Computer Corporation's PERQ employ even higher data transfer rates. Consequently, a high speed transmission link, such as offered with LAN systems, is a legitimate requirement which needs to be addressed in total system design involving these types of new sophisticated workstations and terminal devices. Some PBX vendors, such as ATT Information Systems, GTE and Northern Telecom, have addressed this higher transmission speed requirement by providing data compression protocols which reduce the high output data rate from the sophisticated workstations and terminals down to the 56 to 64 Kbps range acceptable to the PBX. Also, the third and fourth generation PBX vendors are able to offer specialized channels which can switch

data up to 1 Mbps supported by standard twisted pair wiring. If data rates above 1 Mbps are required, the LAN approach is generally preferable to the PBX. In particular, specialized services such as video benefit from the high transmission rates provideed by LANs. Again, today's system designers are looking for ways to combine the PBX and LAN technologies into an optimum, integrated total system as opposed to choosing between one or the other.

PBX Vendors Offering LANs

An example of a new PBX which incorporates the best features of conventional voice/data switching as well as LAN capabilities is the NEC NEAX 2400. The NEAX 2400 is an easily expandable system including a local area network (LAN) module which allows the user to extend the system operation to multiple offices and interface with a variety of office automation systems and external public and private communications networks. With the addition of the LAN capability, the NEAX 2400 provides the ability to configure a total network which integrates voice, data, text and video applications. The NEAX 2400 utilizes a combination of twisted pair and fiber optic cable in various loop configurations.

LAN implementations are also offered by InteCom, Ztel and CXC, among others. InteCom offers the LANmark local area network product as an adjunct to its IBX. LANmark supports the Ethernet LAN protocols. Ztel manufactures a fourth generation switch, the Private Network Exchange (PNX), which includes a LAN product consisting of a token ring network carrying voice, data and video simultaneously. The PNX architecture provides for several rings, each of which can operate at 10 Mbps. CXC's fourth generation PBX, the Rose, is based on a broadband LAN distributed concept where up to 64 system nodes can be interconnected.

Problems in Implementing New PBX Technologies

As is the case with many new electronic products, the user community cannot keep pace with the advances in technology in terms of being able to incorporate the new products into their application environments in a timely fashion. The implementation of technology usually lags availability by at least a few years. This lagging in the implementation of new PBX product/technology will probably have a somewhat negative impact on the growth rate of the third and particularly the fourth generation PBX suppliers. Similarly, this lag effect will benefit companies with existing installed bases of older PBX equipment, such as ATT, Rolm and Northern Telecom. These companies have, in many cases, captive customers since the costs and operational trauma associated with changing out a major in-place PBX installation often do not warrant the benefits of a newer product.

Additionally, the features and functions available in the newer products need to be integrated into an overall office automation system. This integration process involves other systems, such as LANs, and computer-based applications being designed and implemented in concert with the new PBX, in order for the total capability to be realized. This process of design and systems integrated is an extremely difficult one and many companies, even the largest and most sophisticated, have been hard pressed to develop a comprehensive, integrated system design and to follow through with implementation and operation.

Further, many of the largest corporations still have not addressed the internal organizational issues of consolidating various communications, data processing and office systems functions into a single organization. The fragmented organizational structures which exist in many large companies are not conducive to the design and implementation of sophisticated, integrated office automation systems.

Note from your editor:
Evolution of the Modern PBX is reprinted from the July/August, 1984 issue of **Business Communication Review**; authors Mark S. Bergman and Courtney A. Klinck of Hambrecht Quist Inc. Our sincere thanks to BCR and the the authors for sharing this excellent article with our members.

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Mr. Klink is a graduate of U.C.L.A. and the Bell System Cooperstown Data Communications Program.

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(SCENES FROM THE BOSTON CONFERENCE)

POTPOURRI

.....Connie Gentry, Emory University

For all of you overworked, underpaid, harried, harrassed, hassled and generally confused telecommunications managers, I am here to give a testimonial that there is life after divestiture and that things really do get a whole lot worse before they get better...but they do get better!

Sixteen months after Emory hired a consultant, 9 months after the RFP was released, six months after the responses to the RFP were received; Emory University has signed a contract for a Northern SL-100 sold through Southern Bell - Advanced Systems Division. I'm so relieved we have finally chosen a vendor that I haven't had time to panic at the thought of what has to be done between now and August, 1985. To paraphrase Prissy in **Gone With the Wind**, "Lawsy, Miz Scarlett, I don't know nuthin bout installin new PBX'S!" Well, I "spects" I'll learn a few things between now and then!

I'll try and keep you posted on the development and installation of our new system so that if you are contemplating installing your own switch or are in the RFP process now, you can benefit from our mistakes and successes.

Other good things have happened to me as a result of Emory's deciding to purchase a new telephone system. The most important is that the University administration finally began to look at the Telecommunications Department as something other than the "switchboard" and order takers/bill payers. With the help of our consultant (who told the administration the same things I had been saying for years, but who was getting paid a considerable sum to say them and was, therefore, to be listened to) it began to dawn on the administration that the Telecommunication Department was much more complex and much more important than they had thought; suddenly we had visibility with top management.

Next, the administration was made aware that one manager plus a clerical specialist, plus one or two part-time student assistants could not begin to truly "manage" telecommunications. So now I have a full time communications coordinator and plans (and funding!) to hire additional personnel. Eventually, with the help of our consultant, I hope to be able to convince the Personnel Department that Telecommunications salaries should be on a par with those in Computing/Data Processing. Talk about your major battles...!!

Another major benefit to be derived from installing our own switch is that FINALLY I will be able to manage our system. I don't know about you, but our Centrex billing and customer service record have been so screwed up since the divestiture that it has become almost impossible to keep up with costs and equipment. In addition, the BOC seems to be having a hard time getting our orders issued without fouling up some part or another.

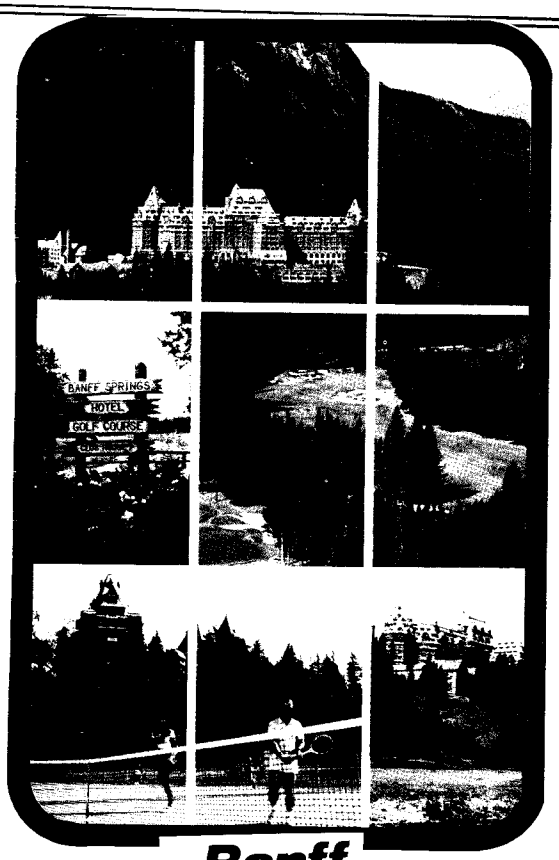
The thing that scares me about the problems with the BOC is not particularly that the orders get issued incorrectly or worked incorrectly; it's that when you try to resolve these errors it's hard to find someone who gives two hoots in Hell whether your order ever gets straightened out. Of course, there are people in the BOC who care...they're just not the same people who seem to have the power to get anything done when a problem exists.

So....it will be nice to be able to reduce the hassle of trying to get an order worked, trying to get the billing sorted out and trying to get a problem solved. I know the new system will not be problem free (I'm not that much of an idealist!) but at least most of the problems will be able to be resolved "in-house."

Let me close with the latest report on the planting of juniper bushes on the side of our new gym...the seventh re-planting seems to have worked. I wonder if the cement mixer full of superglue had anything to do with it???

See you soon....

CONNIE GENTRY AND MAL READER.....



14TH ANNUAL ACUTA CONFERENCE, 1985

REDLINE THESE DATES: JUNE 30-JULY 4

HOST: CALGARY UNIVERSITY

NOTE FROM YOUR EDITOR: This article appeared in the November issue of **Telephone Engineer & Management**, and is reproduced here for the benefits of our members. Art Brothers welcomes comments. His number is 801-534-1424. ACUTA News wishes to thank **Telephone Engineer & Management** for sharing this article with us.

Ten Cents A Minute

A few months ago, I spoke to a plan which had as its objective the elimination of CALC; the $25 "leaky PBX" charges; "Texas" problems where ATT wanted reduced rates for termination traffic; the high cost fund; and all the other hassles we find ourselves faced with as some very smart people out there figure out ways to use the wire line telephone system for less than our revenue requirements to provide the service.

A few of you have written for details.

The plan came from several sessions of the Utah Telephone Association trying to figure out ways to resolve problems for long haul, and get Bell to go along. It incorporates some research done by Fred Foley, a Utah PSC staff engineer who used to be with the California PSC. Raw data came from Mountain Bell. I did some of the thinking as to application beyond traditional telephone concepts, as my past professional experience has been around "bypass" that has been going on one way or another for a couple of decades.

First, a couple of scenarios for consideration. Sears ships jelly beans, radios, and thousands of things to their stores all the time. If they billed everyone in the United States each month five bucks then everything could be cheaper in the Sears stores. This would be a benefit to all Americans.

Or, perhaps if U.S.Steel charged everyone in the United States a dollar or so a month for their costs of shipping steel---then the retail costs of cars would be $500 cheaper and that would benefit everyone in the country as everyone uses cars.

That is how the FCC is ordering us to collect our revenue requirement for the cost of wires from the central office to the end customer. It's called the Non Traffic Sensitive plant, or NTS plant. We're supposed to get a flat rate from all customers. It's a bad plan. Most citizens of this country really don't believe we should provide the use of that NTS plant for free to ATT, MCI, SPRINT, or the bypasser or reseller. They believe we should be paid for what we provide. And, the local telephone system can exist without the long distance network, but the long distance services would have a difficult time without our local distribution system.

Bell's 1982 figures for the entire State of Utah show the following:

-----Revenue requirement for NTS Plant is $180,640,000 year.
-----Minutes of Use (MOU) for state toll was 680,000,000 minutes/year.
-----Minutes of Use (MOU) for interstate toll was 1,057,000,000 minutes/year.
-----Minutes of Use (MOU) for local service was 9,153,000,000 minutes/year.

What this boils down to is that the network was used only 20 minutes per day. We now make a major arbitrary decision after which things tend to fall in place. That is, we will charge for stand-by time of the plant even if it is not in use. The potential for use is a value and we should be paid for it. Examples abound and space does not permit me to detail it here.

Let's assign half the revenue requirement to be recovered from toll---we don't care what kind of toll. Let the other half come from local service and adjust the rates to get it---period.

As we look at the figures, it is apparent that if we apply the revenue requirement to toll and look at the minutes of toll from which we have to get this money---and if we apply it only to terminating traffic, in Utah, we need a dime a minute to pay for NTS in this example. (A little more, but a dime is easy to work with).

To avoid running around plugging up all the possible leaks, let's now make our second arbitrary decision. Make this ten cents per minute chargeable to 100% of all resellers, bypassers, motels who charge, owner-owned coin phones, or anybody else who would try to make a profit by existing loopholes in our pricing or take actions which would shift costs to others by unfair payment for services rendered.

Of course, all the interexchange carriers would pay. States would regulate this NTS charge based on state or LATA costs (their option) which would be pooled. With this type of regulatory control it would really not make much difference is state toll matched FCC or of states gave up regulation of state toll completely, since competition could then have at it (although I would suspect LATA toll should continue to be pooled to maintain the totality of universal service).
What would be the **trigger** point where a customer would come off flat rate **access**? It would be when that user had any bypass facilities of any sort, be it microwave, private lines, optics or you name it. The instant he triggered his change to this class of user , 100% of all his lines or trunks to the wire line network would go on the meter as measured service. (There would be no charge for the trunks or lines other than a small administrative charge).

Charges would be for switching and NTS costs per minute plus any toll extended over our networks. If an employee within the firm using the PBX, et.al., made a call to his wife saying he would be late from work---that call too would be on the meter. Indeed, this is only fair as they are using the NTS loop, the switches, etc.

Non profitable to the user applications would remain flat rated. The politically sensitive aspect of converting everyone to message measured service is eliminated. Trunks or lines used to route traffic to the bypasser would be rated flat rate, whereas circuits used to deliver traffic to us for end delivery would not.

It is expected this plan would permit LATA toll to drop by 30% as those revenues would not have to subsidize the NTS. Nor would ATT.

In order for this type of plan to work, the FCC would have to concur and NECA is the only logical group to propose it as they have the figures and can make the case. If you agree---**tell them!**

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WORDS OF WISDOM:

Beginner's Luck---A college freshman with an idea....

Block---The distance between the ears...

Egotism---The anesthetic that dulls the pain of stupidity.

Happiness---The result of being too busy to be miserable...