

DECEMBER 1983

SOUND & COMMUNICATIONS



Annual Economic Report

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Think of EV as your mike expert.

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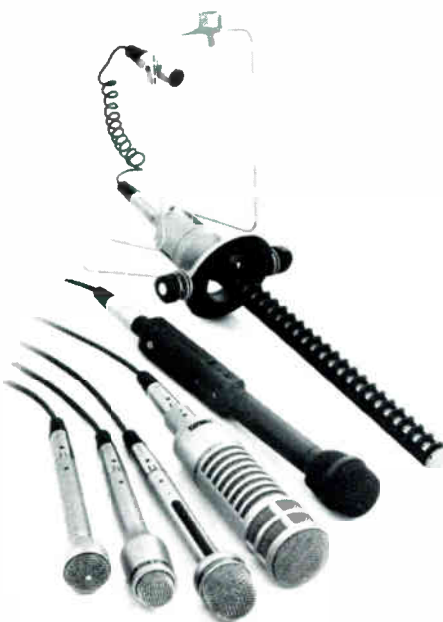
These and many other performance features set the CO94 a giant step above the other miniatures you previously had to choose from. The CO94 is a versatile new kind of tool, and just one more reason why you should think of Electro-Voice as your microphone expert.

Many Electro-Voice Professional Microphone Dealers can arrange a hands-on trial at no cost to you.

For information please contact your EV dealer or write to: Greg Silsby, Market Development Manager/Professional Markets, Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107.

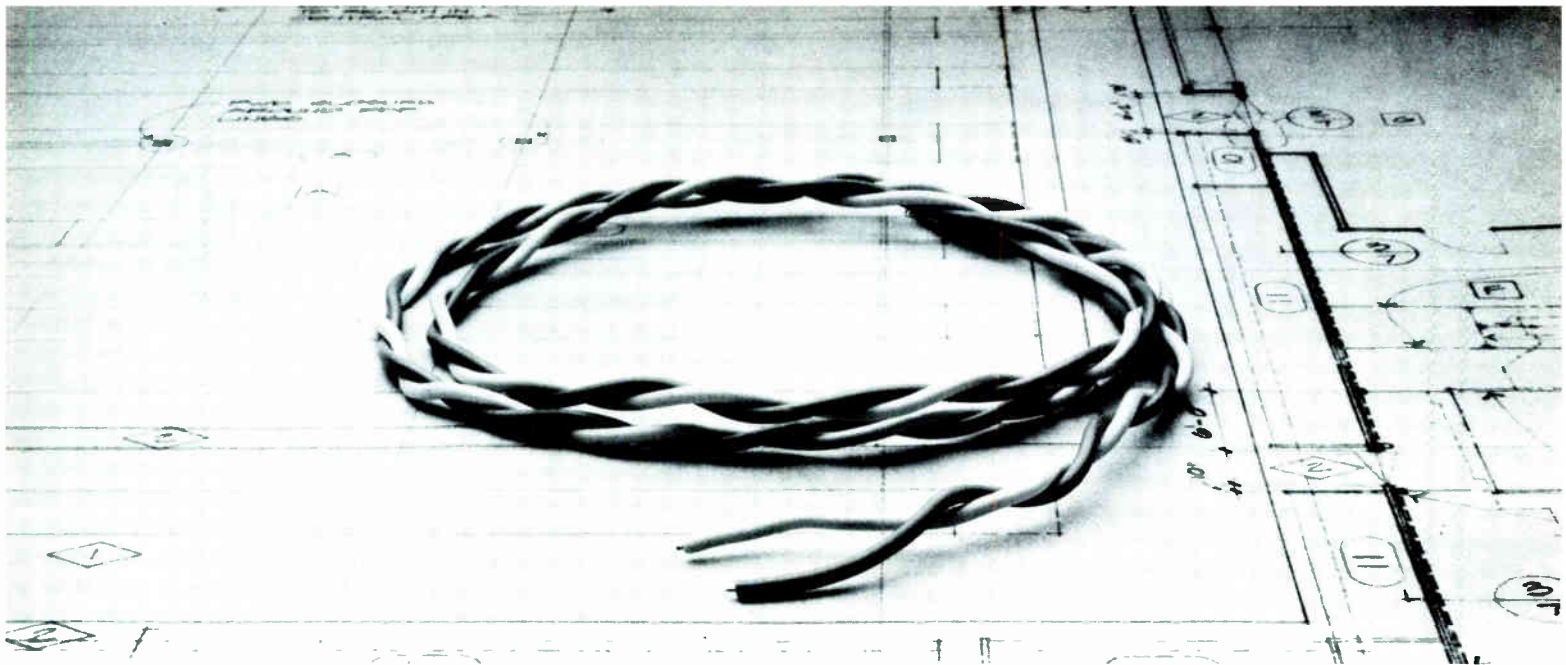


The CO94 package includes CO94 microphone, detachable windscreen, tie clasp mike clip, power supply/buffer with belt clip, barrier recording plate, output cable and storage pouch.



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devoted to the professional and business interests of independent contractors, dealers and distributors of private communications systems, employing audio, radio and telephone circuits, in mixes of interconnect/intercom, sound distribution/reinforcement, 1-way/2-way radio paging and life-safety/security systems; in industrial, commercial, institutional and government applications.

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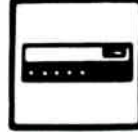
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'83 - AN ECONOMIC ROUNDUP

This is the 8th annual ECONOMIC REPORT.

It includes data from these sources: S&C's survey; the Electronic Industries Association; Frost & Sullivan, Inc.; Arthur D. Little, Inc.; International Resources Development, Inc.; The U.S. Department of Commerce; the Eastern Management Group; the North American Telecommunications Association (NATA); and the business news columns of the *Wall Street Journal*, *The New York Times*, and the *Washington Post*.

With all of that data at hand, and eight years of experience with surveys and their "operating techniques," one would think the composer of this ECONOMIC REPORT would remember. . . "the first answer is never the true answer."

The compiling of data begins in September. The majority of the respondents and industry nabobs end their fiscal year then. If they are a public company, a copy of the annual report is obtainable. If they are not public, a survey form, with a postage-paid return envelope, is directed to top and middle management for information.

The response to the S&C survey, over the past eight years, has been most cooperative. Of course, not everyone replies. Sometimes top executives will provide information via the phone, when they're reluctant to put it in writing. After gathering all the data, written and oral, the art of extrapolation comes into play. Allowing for a 2-percent margin for error, a plethora of letters and phone calls has told us, over the year, that these surveys are "on the nose."

The report in each of the sections, therefore, is an amalgam of dollars, viewpoints and expectations. A subjective view, obviously.

The objective overview is more panoramic, and reveals that 1983 has been a roller-coaster ride, with violent peaks and valleys for every segment of the industry.

Granted, the economy did not bless everybody. But it is hard to reconcile the wide ranging increases, running from 5 percent to 60 percent for pro audio product suppliers. This "fractures" the extrapolation process. Yet, respondents registered the "swing." What did not show in the survey was the number of new entrants into the audio products market with very specialized pieces of gear. They found this introductory year a very difficult one.

The interconnect industry was freighted this year with puzzling problems of new product development, sluggish dealer activity, and a marketplace not quite ready to accept the 4th generation of switches and terminals. More, the markets for the big switch, the 500 and 1000-line jobs, were few and far between.

Additionally, divestiture—the Justice Department's moving between the FCC and AT&T—was for some a bonanza, for others an enigma. The looming competition from the BOCs that are moving away from Big Mama had a freezing effect on some of the dealers. They hurried their plans to solidify or broaden their product base, to meet the evolving threat. For some dealers, the introduction of SCA paging was good news. It moved them into another "subscription service," assuring a modest cash flow to join background music services.

The specialty product distributors—school systems, traders' turrets, hospital systems—found themselves riding in a deep valley because of the lack of new public and private construction. There was some replacement business, but not a sufficient volume to take up the slack.

Albeit, 1983 has been a year of "great business" and a year of "great fall." Numbers—units produced or embedded, dollars realized or a falling off of revenue—are benchmarks, indicative of the resident geniuses in each company responsible for R&D, sales and marketing—with the comptroller watching the coming and going of dollars!

This is the 8th annual ECONOMIC REPORT, for your study.

Read well.

Why it Pays to Page with Bogen

Telephone-access paging is a fine source of income for you as more and more customers find it invaluable for reaching personnel, making announcements, serving their customers, improving productivity.

But it requires the right equipment, at the right price, and with the kind of dependability that minimizes servicing. That's where Bogen shines.



Products Designed for Telephone Applications

We've developed a group of products specifically for telephone paging. For example, our TU-A series amplifiers, 35, 60 or 100 watts, with three 600-ohm inputs and individual volume controls. All connections and control settings are made by screwdriver. 48-56 VDC (positive or negative ground) or AC operation. Built-in protection against shorts and overloads. Rack or wall mounting.

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Our TBA-20A paging/talkback amplifier meets all the stringent requirements of Part 68, FCC Rules, for two-way conversation between phone and speakers, with hands-free response. 20 watts output, 600-ohm input, electronic switching, protection against shorts and overloads. Again, hook-up and adjustments are by screwdriver. Power may be 24 VDC (positive or negative ground) or AC; installation in rack or wall-mounted.

We have dozens of other amplifiers, including the rugged little GA-2, a 2-watt perfect for music-on-hold, and the new MT-C series power amplifiers rated at 60, 125 and 250 watts. The MT-Cs will deliver full power continuously for 250 hours or more and are the first to be listed under UL's demanding 1480 Standard.

New Interface Simplifies Installation

Our new PAM paging access module makes it easy to connect a paging system to a telephone circuit (dial, manual, key or non-key phones, PBX, PABX or Centrex station lines) or dial intercom.

24 VDC positive ground, convertible to 48VDC.

The TG-4B tone generator can produce any of four tones (including chime) continuously or in double bursts. It's ideal for pre-announce or alarm signals, with precedence over an interconnected program source. Operates on 15-26 VDC (positive or negative ground) or AC, with an optional adapter.

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The Bogen line is so extensive that we can only illustrate a sampling here. It includes loudspeakers for wall, ceiling, or outdoor installation, FM/AM tuners to provide music, intercoms of loudspeaker and phone types, systems for emergency alerting, control and intercommunication, and much more. This means you can provide exactly the right units for each requirement, all conveniently from one source. And we are famous for off-the-shelf availability, which means shipment is almost always prompt and complete.

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50 Years of Sound Leadership

Economic Report/Audio

The participants in the 1982 survey of audio products were more productive than prophetic! The estimate for 1983 audio products sales: amplifiers, microphones, speakers and signal processing gear, was pegged at an 8 percent increase.

They reported an actual 10 percent increase, overall, for the industry.

The breakdown:

Amplifier sales to distributor/
contractor: \$106,702,000;
Microphone sales tallied
\$141,680,000;
Speaker sales scored
\$136,100,000;
Signal processing gear amounted
to \$41,799,000.

According to the S&C annual survey, respondents attributed the rise in dollar volume to three invigorating economic events:

1. Inflation's influence in these tallies represents something like 4 percent, a marked decrease from the previous year.

2. There was a high-powered rush to improve facilities by the lodging industry, the leisure industry and the institutional market. For example, within the lodging industry—hotels, motels and resorts catering to the industrial customer—ballrooms and meeting rooms were refurbished to provide sound and recording features, plus video conferencing services. Audio consultants, introducing computer designs for sound reinforcement systems, brought a new dimension to their work, with a wider use of all types of professional audio products.

The leisure market, especially the

sports stadium segment, including professional and college sports activities, ingested a tremendous amount of equipment. The multi-million-dollar contracting organizations reported being awarded jobs that ran a range of from \$100,000 to almost \$500,000. And almost all sound reinforcement systems were standardized with a backup system, incorporating recording facilities and provision for broadcasting, plus VCR equipment.

Within the institutional market (several respondents included the religious area), there was a growing movement toward the upgrading of existing systems. In addition to replacement of product, there was the furnishing of hearing-aid devices for elderly parishioners, and some closed circuit accommodations for security and the serving of overflow audiences for special events.

However, despite the slowdown in public and private construction of hospital and nurse-care facilities, the health care division of the institutional market increased its spending by 3 percent, much of it on computerized equipment, plus silent signalling systems, including radio paging. The nurse/patient station now incorporates a CRT terminal, a console that monitors a ward and resembles a railroad signal tower on the right-of-way, recording the status of traffic.

3. The rush to capture the "big bucks" by the suppliers of pro audio products boosted the dollar sales volume. In this group are the four major suppliers of sound reinforcement systems to the music industry, who, finding their prime market dormant, migrated. Thus, microphone sales perked up—especially wireless mic product, and stacked-

array speaker systems were vigorously merchandised.

Additionally, but not significantly, the interconnect phone dealer made a small contribution, with his paging system sale, plus his music-on-hold feature.

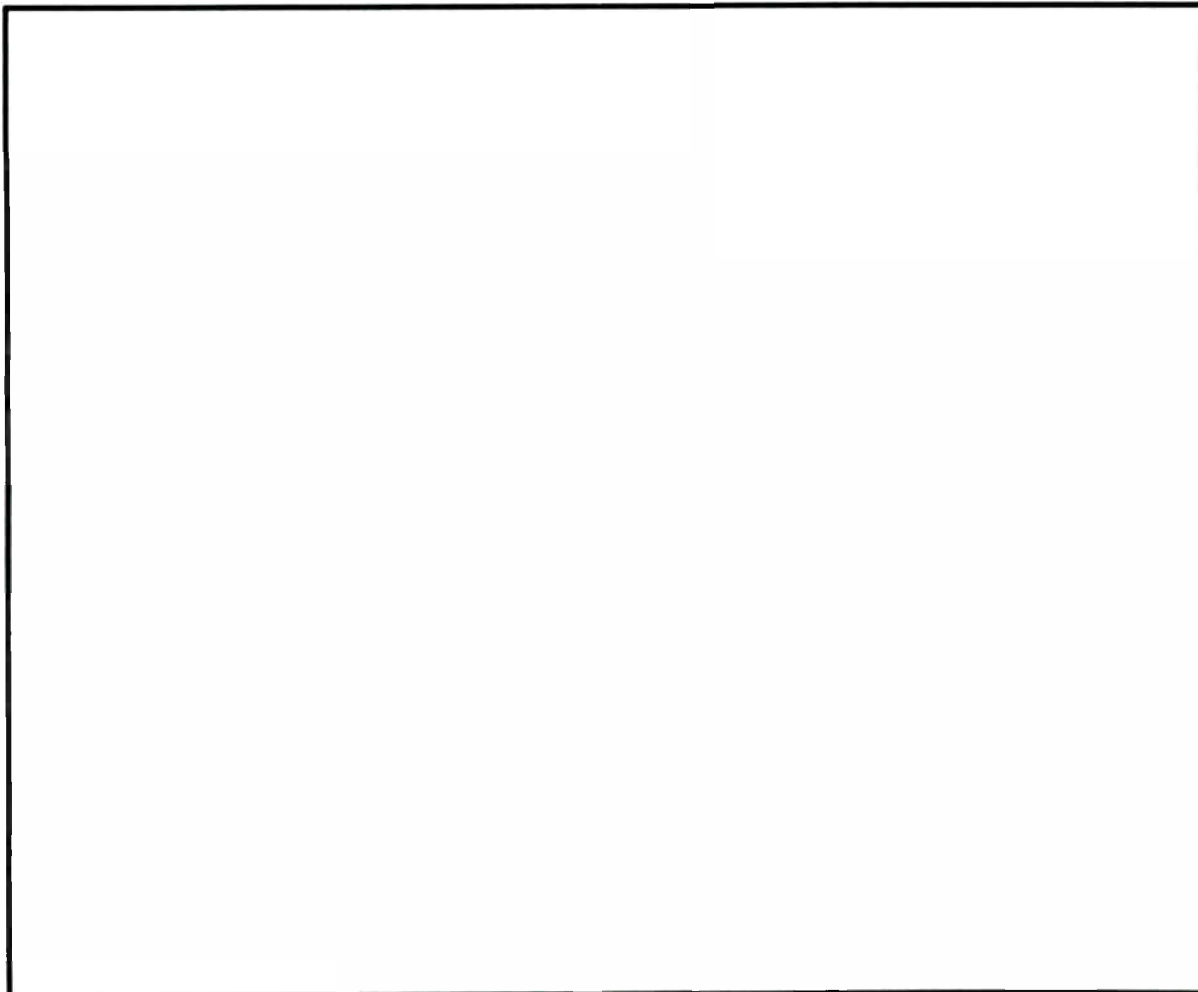
And the background music supplier realized a minimal increase. The difficulty here in obtaining some sales dollar annual figure can be explained in one word: royalties! The licensing bureaus—ASCAP, BMI, SeSac and the Harry Fox Agency—all claim percentages of the annual fees collected by the background music operator. And he's reluctant to reveal anything about his sales volume to an independent survey, save what he's required to tell the Internal Revenue Service.

Yet, several music libraries reported that their sales increased up to 70 percent, all based on increased usage of foreground music. The equipment player people said their sales volume had jumped by as much as 30 percent during the year...much of it assigned to the increased use of the multiple cartridge player, on-premise!

The Electronic Industry Association/Market Data Report states, "While blank audio cassettes have...enjoyed increasing growth, annual factory sales decreased 7% from 201.4 million units valued at \$242.2 million in 1981 to 186.4 million units valued at \$219.4 million in 1982."

Withal, the audio products precincts enjoyed a productive year, despite the wobbly economy of the nation. All respondents expect a 10 percent repeat in sales volume for the ensuing year. □

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The intercom system market bounced to double its sales volume, 1983 (\$23.8 million) over 1982 (\$11.9 million), giving credence to the healthy revival of the 2-track system!

Duplex intercom scored heavily with the contractor/distributor with more than half the reported dollar volume accredited to duplex. One manufacturer reported that his systems registered strongly in both the commercial area and the hospital zone, the average duplex system being 30 to 40 stations!

Simplex intercom system sales—manufacturer to his distributor—managed to keep their head above water with a small gain of 5 percent in sales volume. . . . \$9.8 million for 1983.

Many respondents to the S&C survey indicated that increased sales could be chalked up to the introduction of solid state switching. Although operating features of duplex systems rivalled the key-phone, price separated the two: duplex intercom systems ran about 8 to 10 percent above “standard” keyphone systems.

Heaviest users of duplex intercom systems were reported to be in stock-and-bond brokerage houses, with commodity exchange brokers and international banking firms close on the heels of brokers.

The institutional market continued its buying pace, purchases mirroring the replacement rate. . . that is, a 3 to 5-year turnover of product, or additions through expansions in service departments. In this area, the one-on-one open intercom system seemed to have maintained its volume, especially in the health care market.

Respondents cautiously side-stepped the rising competition from the consumer electronic product retailer (Tandy, et al.), handling some industrial products as “packaged items.” According to one source, these retailers have been chopping out more and more of their “share” of the industrial products users. They have managed to put a considerable dent in the smoke alarm/security system area, with a kit for the “complete do-it-yourselfer.”

As for engineered cable systems, witness:

MATV systems registered a 20 percent gain in 1983—approximately \$12.3 million in product/systems sales.

School sound systems trailed their 1982 sales volume by about 10 percent, realizing slightly above \$8.6 million.

Computer system wiring held to the 1982 cost level of \$10,000 per

installation. And by all counts, more than 800,000 computers were installed.

Teletex and videotex systems have been coming on strong with some analysts (Wall Street) predicting a \$1-billion market by the end of 1985. Currently, videotex services and associated hardware and software amounted to \$250 million in 1982.

These services seem to have split into two dominant areas. Teletex appears to have gone industrial, catering to the cable system operators, carrying sports, stock market reports, traffic conditions, etc., via satellite transmission.

Videotex has gone personal, in the sense that it is devoted to supplying the home with electronic banking services, shopping at home, theater and travel reservations.


These are fast rising subscription services expected to enhance cable TV operations.

Teletex is a 1-way system. Videotex is a 2-way system. Teletex is particularly attractive to the residential market, however, because of its lower cost, over 2-way systems. For television set owners, the cost is no more than that of a decoder, available at about \$200 and going down in price, as the use of teletex spreads.

Videotex 2-way information systems linking terminals to large data bases, either by cable or telephone, offer a much larger data base capacity and more rapid retrieval than teletex. With the systems' 2-way capacity, the videotex computer may also be connected to other remote copiers—expanding the amount of information available and allowing for transaction services much broader than is available with teletex.

Current costs for videotex systems average about \$50 per month, and a terminal costs about \$500. Revenues for 1982 are estimated at \$250 million. □

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Economic Report/INTERCONNECT

The interconnect telephone industry see-sawed through all of 1983!

PBX sales fell. Keyphones leaped into new levels of equipment production and sales. Centrex systems were called upon to stem some of the slippage in PBX sales.

By actual measure, counted by the Eastern Management Group, PBX sales shrunk in size from what they were 10 years ago. "Pure PBX systems remain in place for 7 to 17 years, provided their life cycle is not disturbed," they observed. Hence, the replacement market for PBX stalled. "Since switch replacement is responsible for most PBX sales (other minor contributions being real business establishment growth, installs due to moves, installs due to technology, and installs due to policy), the Eastern Management Group

reports that the inventory of older-generation PBX products is being exhausted. Centrex replacement cannot take up all the slack, and several market windows will begin to narrow commencing in 1985. Most vulnerable is the 100-to-400 line market, which will decline by 29 percent in annual line shipments from the year-end 1982 to year-end 1985."

Estimated dollar sales volume for 1983—\$1.6 billion.

These are the leading PBX suppliers, and their proportionate share of the market:

RoIm—11.4%; Northern Telecom—9.4%; Mitel—6.5%; GTE—5.5%; NEC—5.0%; Siemens—4.6%; DTS/Harris—4.1%; American Telecom—4.1; AT&T—37.2%; others—12.2%.

Some of the factors that slowed interconnection as an industry during 1983 are: the adverse economic conditions, saddled with high interest rates; the telcos' migration strategy, which artificially stimulated demand for new equipment; and the near saturation of some submarkets, noted the Electronic Industries Association.

Interconnect's growth over the period 1981 to 1983 averaged just over 19 percent annually, down from an estimated 28 percent from 1975 through 1980. Interconnect market shares, projected to increase from 12 percent in 1981 to 22 percent in 1986, are expected to level off, according to the EIA study.

Keyphone systems have grabbed off the lead in sales, averaging a 24-percent growth over the past 5 years.

Among the keyphone suppliers, some of the leading brands are (not in order of dollar volume standing): TIE, NEC, Iwatsu, Oki, ITT Business & Consumer Communications, Xtel. Gross dollar volume for keyphone sales, manufacturer to distributor are estimated to be \$367.5 million. Withal, several prime keyphone suppliers reported losses for 1983,

some of them witnessing an 8-percent decline in revenue. Some others began shifting their manufacturing points to newer and cheaper geographic locations; outfitting their production lines to the fabrication of cellular radio products, and/or peripheral equipment—ACD and store-and-forward gear! There's been a slowly diminishing market for interconnect systems. Industry pundits are predicting that by the end of the 1980s, PBX and keyphone sales will hobble along.

Lock-stepped with the fall-off of interconnect sales is the drop in the number of interconnect dealers. During 1983 more prime suppliers of 100 to 400-line systems moved to sell directly obviating the smaller dealer. And the number of multi-million-dollar sales-writing dealers was whittled down through merger, or through the purchase of independent telcos.

The interconnect dealer handling up to 100 lines either combined, merged, retrenched his lines, or sold out.

Meanwhile, many of the top PBX and keyphone makers found some aspects of divestiture an "El Dorado". Some of the sales slack was taken up by sales to the operating public utilities. . . . Bell and independent companies.

The suppliers of peripheral gear ACD, SMDR, information access and processing identified with office automation, and teleconferencing (video, too) systems—chugged merrily along, if all the recent surveys about the 1983 "telecommunications industry business" are accurate.

For your information:

—International Resource Development, Inc. Norwalk/CT, studied the "rapid growth of teleconferencing" and pegged the current video conferencing market at \$100 million per year. Its report observes, "This is a tiny fraction of the \$10 billion which could be available when and if video con-



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and other sales aids. We'll even help you prepare bids. And we're prepared to offer you an interest-free financing plan to help reduce your equipment costs and give you increased borrowing power to finance those really big jobs.

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Are you getting all this from any other intercom manufacturer? (Do we have to tell you the answer?)

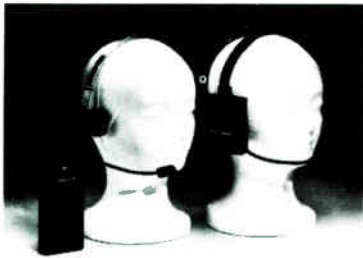
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ferencing technology can be made to work and to substitute for a substantial proportion of business travel." Making video conferencing "work" involves convincing some executives that teleconferencing does not portray them as nerds! That's the biggest hurdle for video conferencing.

—Arthur D. Little, Inc., Cambridge, MA, predicted that "U.S. sales of integrated office information systems will jump from an estimated \$1 billion in 1983 to \$23 billion (constant dollars) in 1988... office automated equipment, exclusive of mainframe or small business computers, (will increase) from an estimated \$11.3 billion in 1983 to \$36.6 billion in 1988... representing an overall average annual growth rate of 26 percent, with integrated office information systems leading the way... Responsibility for office automation systems, data processing systems and voice communication systems is divided among two or three groups, none of which has the authority to purchase a fully integrated system."

—Frost & Sullivan, Inc. New York/NY, reviewed the telephone call accounting systems and discovered the hotel-motel industry to be the biggest market for the "service." According to Frost & Sullivan, in 1982, 1941 units were put in place, at a unit cost of \$20,000, which generated a revenue of \$38,820,000. By 1984, this segment of the peripheral market will put in place 4,345 units, at a unit cost of \$18,000, generating \$78,210,000. 1984 will be a peak year, declares Frost & Sullivan, with a rapidly declining market among the 40,000 hotels and motels in the United States after that.

—Creative Strategies International, San Jose/CA, produced a study revealing that... "the ever-broadening range of communications network products and services promises to expand the market at a compound annual rate of 14.5 percent, to reach \$223 billion in total U.S. revenues by 1990. The movement toward extensive, integrated, automated office systems will contribute to substantial growth in local area networks (LANs)."

An exception to the automated

office is taken by Frost & Sullivan, whose recent study... "shows that customers are staying with their vendors' products, rather than trying to integrate different systems and software. Because automating the office is such a major investment, not only in product cost but in time spent overcoming employee resistance and training them, most users are going to exercise extreme conservatism. By 1992 annual purchase of office automation products will have shot up to \$37.6 billion from \$6.8 billion in 1982 (constant dollars)."

Lastly, the reseller market began to wobble after mid-1983, when it was discovered that being a large purchaser of WATS service from AT&T was "no bargain." Competition is fierce. Bell still accounts for 96 percent of the long-distance market. Then, in addition to AT&T and one another, the resellers have to compete with larger discount long-distance carriers—MCI, Sprint, ITT Telecom. These long-distance resellers have their own "routes," perhaps paralleling AT&T, and are on firmer competitive ground. More, some of the bigger resellers are offering added services: paging and data handling. (MCI Communications reported for the 12 months ended September 30 net income was \$202.9 million, up 51 percent from a net income of \$134.4 million for the 12 months ended September 30, 1982).

Some resellers, realizing that they stand on something of a liquid floor, have begun offering word and data processing as an adjunct to their customers' office automation processing.

What all the surveys add up to is this: by 1990 the interconnect industry will account for about 48 percent of the \$1.1 billion worth of PBXs sold.

Replacement sales will be the force behind the 262-percent growth over the 8-year period. Annual unit replacement PBXs will nearly triple by 1990 to 51,000 from 19,000 last year, while new sales will rise from 9,000 to only 16,000. However, this would still yield an installed base of 330,000 units by 1990, a 46-percent increase over 1982, says Frost & Sullivan. □

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World Radio History

Economic Report/SECURITY

All statistics point toward an annual sales volume in excess of \$800 million—manufacturers' delivered product to the distributing/contracting fraternity.

Included in that figure is approximately \$400 million for closed circuit surveillance systems, representing an increase of over 12 percent for the previous year.

The largest users of security systems are manufacturing plants, shopping malls and hi-rise tenements. Shipment of product and installed system sales are reported to have gone beyond the 1982 projection by as much as 30 percent.

Dominant system sales were registered by intrusion alarm-detection equipment because, according to the FBI, an estimated 65 percent of all burglaries are committed against factories and homes. Electronic Industry Association's year-end report reveals that "one research firm estimates that U.S. sales of home burglar alarms will reach \$240 million in 1984."

Two-way cable systems (CATV) enjoyed an unheralded increase in sales volume, because of their ability to render instantaneous transmission of emergency conditions, superceding the central station security facility. In many instances it has been reported that central station alarm companies have been initiating CATV systems, or buying into established 2-way cable security companies!

Electronic access control systems have come into prominence over the

past 18 months, with the rise of computer system thefts, and the ever present threat of onslaughts against nuclear power generating stations.

The residential market is pictured as the fastest growing area for security systems. Almost two-thirds of all burglaries are committed against private dwellings and apartments. More than 70 percent of all fires in 1980 flared in residences. Nearly 85 percent of fire deaths resulted from residential fires. Yet in the light of these statistics, total sales of all security products to the residential market averaged a bit more than \$11 per household.

A devastating fire, early in mid 1983 in Texas, pointed to a horrifying statistic: there were more than 10,500 lodging fires in 1982, killing 75 people and causing \$89 million in damage.

The lodging industry reports that among its hotel & motel manager group, 65 percent of them reported that more guests are requesting lower-floor rooms.

The trade paper "Hotel & Motel Management" ran a survey to uncover these facts: Cigarette smokers account for about 30 percent of lodging industry fires; arson and fires of suspicious origin account for about 25 percent. The 1980 Las Vegas MGM Grand Hotel fire killed 84 persons. The hotel agreed to pay out \$75 million to settle claims. As a result of that disaster, the MGM Grand Hotel now runs a continuous videotape on a cable TV channel that alerts guests to speakers in each room giving

evacuation instructions in case of fire. Other hotel chains are experimenting with systems that call for hotel employees or fire officials to direct evacuation by means of TV sets in each room. And some hotels are hooking up smoke detectors in individual rooms to the hotel switchboard.

Recently, the Massachusetts Fire Prevention Association has pushed an "official standard" to the 1984 National Electrical Code, placing limitations on the use of corrugated polyvinyl chloride electrical conduit, Electrical Non-metallic Tubing. Following recommendations of its toxicity committee, the National Fire Prevention Association had already restricted ENT to buildings no higher than three stories, on the grounds of potential toxic gas danger in fires.

But Massachusetts considered those limitations inadequate and also prohibited ENT in hospitals, residential care facilities, nursing homes, schools, hotels and motels, and shopping malls of any size.

Further efforts are underway to protect the public from toxic products of combustion. New York State is studying a report by A.D. Little Company on the subject. New Mexico is moving to the adoption of the NFPA code on toxicity by appointing an ongoing committee to make recommendations.

The increase in the sale of product/systems for security and life-safety equipment is hinged, proportionately, on the increases in the crime rate of intrusions, break-ins, arson and terrorist bombing. □

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Remember: Panasonic is a leading name in advanced sound technology. So, if you're looking for Commercial Sound System equipment, follow a leader: Panasonic.

For more information on Panasonic Commercial Sound Systems, please contact: Commercial Sound Systems Department, Audio-Video Systems Division, Panasonic Industrial Company, One Panasonic Way, Secaucus, NJ 07094.

Panasonic
Industrial Company

Economic Report/RADIO

Radio communications—land mobile radiotelephone, cellular radio systems and one-way paging—increased by almost the speed of light in 1983, with the introduction of SCA paging facilities and the opening of cellular services in Chicago and the Baltimore-Washington area.

By the end of 1982, the FCC had issued 488,566 licenses in Business Radio channels, with an estimated dollar value of almost \$50 million.

In one-way paging systems, one manufacturer estimates the sales volume has already reached \$200

million, and by 1990 will be over \$1 billion.

Cellular radio is just getting off the ground. By the end of the decade it will be \$2.7 billion, nationally. Of the 90 major city markets, there are an estimated 250 to 300 applications for licenses to serve those areas. Under the FCC ground rules, one telco and one independent operator will be favored with a franchise to operate in each respective area. A recent market study by Ericsson Company revealed that there are about 175,000 people in the nation with conventional mobile telephone service. By 1990,

as many as 1.5 million subscribers will be receiving cellular radio service from one of the two operating companies in cellular telephony. Present estimates place cellular service at between \$100 and \$150 per customer/per month. A Frost & Sullivan study estimated that the sale of cellular telephone gear totaled \$6.6 million in 1981.

Industry watchers have placed the cordless-type telephone in the radio services category. And the Electronic Industry Association estimates that there were only 300,000 units sold in 1980. However, that number increased to 2 million units in 1982, with a dollar sales aggregate of \$200 million in 1982. The EIA anticipates 1984 sales of \$470 million.

There are about 20 makers of cordless phones, domestically. There are about half that number producing cordless phones in the Far East, while Europe has yet to produce a cordless phone.

Of the 20 domestic cordless phone fabricators, three makers appear to share about 60 percent of the current market: Uniden, Cobra and Radio Shack, with Electra and Webcor following close behind.

Among the other manufacturers of cordless phones are American Bell, General Electric, Panasonic, Sanyo, Mura, Phone-Mate, Code-A-Phone, Sony, GTE, ITT, Fanon-Courier, Audiovox and Sound Design.

Industry observers are inclining toward a shakeout of cordless phone makers and a swift saturation of the marketplace, once the large distributors mount a vigorous merchandising campaign. AT&T must be counted as a distributor of product after January 1/84! If AT&T's past history is any indication, the shakeout may be fast and furious for the smaller domestic and off-shore supplier, and the distributor! □

Move up to the standard of communications with the Beyer DT 109s.



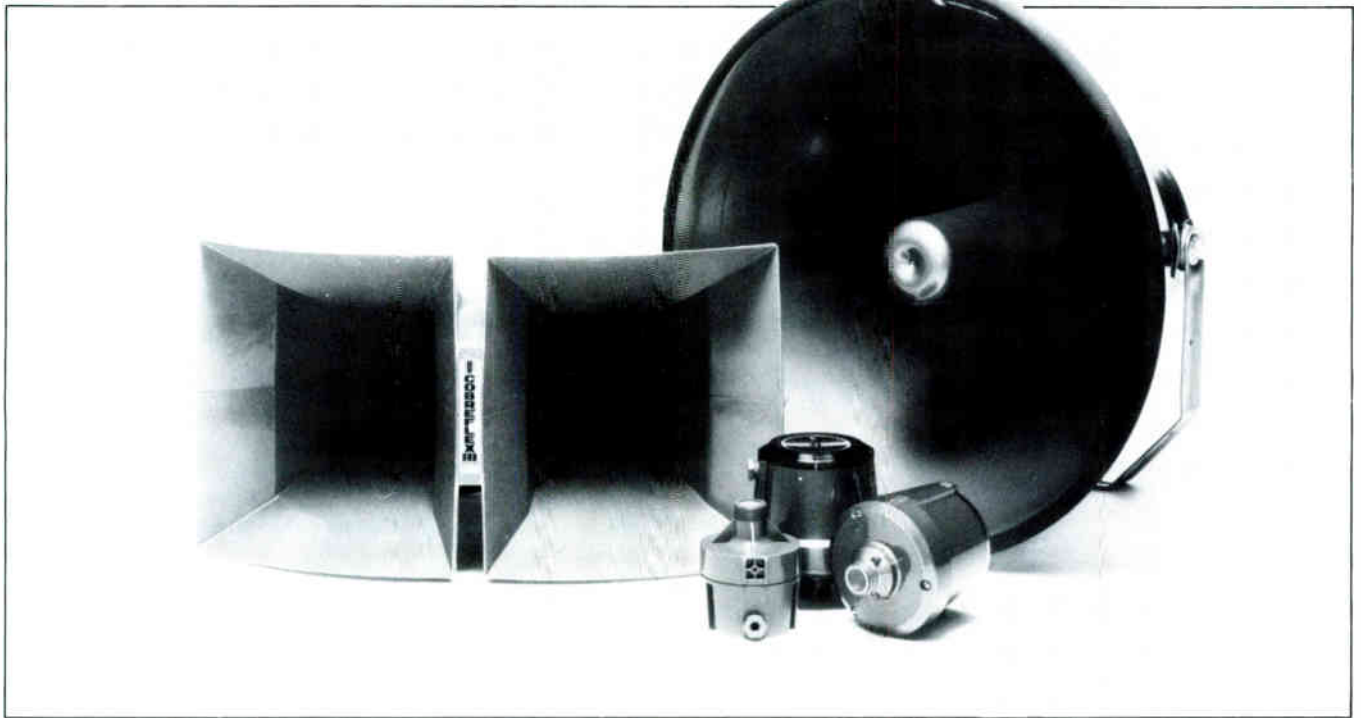
Demanding engineers no longer have to "settle" for marginal or sub-standard communications headsets just because there's nothing else available. Representing a higher standard of communications excellence, the Beyer DT 109s feature a dynamic noise-cancelling boom mic with a frequency response of 40 to 12,000 Hz for unmatched intelligibility and comfortable double-muff headphones to insure isolation and prevent fatigue. Beyer DT 108 single-muff headphones are also available.

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BOOK SHELF

MOBILE RADIO SERVICING HANDBOOK by Leo Sands, is designed to offer answers to the many problems arising out of a breakdown in operations—either base station or transceiver. Data is complete in text and illustration. Technicians need this volume.

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COMMUNICATIONS STANDARD DICTIONARY by Martin H. Weik, D.Sc. clearly defines terms used by designers, developers, manufacturers, vendors, users, managers, administrators, operators and maintainers of communication systems and components. All entries are arranged in alphabetical order and every significant word in a multiple-word entry is also featured in the main listing. There are illustrations, cross-references and easy-to-spot italicized terms.

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SPECIAL COMBINATION OFFER. Two reprints from **SOUND & COMMUNICATIONS'** series on PABX systems, written by Douglas Green, and long considered the "standard" work by the interconnect industry. The work has been hailed by sales managers for its thoroughness in presentation, its clarity, its sweep of the subject, and its expertise. Service managers have declared it the definitive work for training installation crews.

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CONCEPTS IN ARCHITECTURAL ACOUSTICS by M. David Egan is the "textbook" used by Bob Davis/Altec Lansing in his technical seminars on sound distribution systems. Mr. Egan created this work for the professional seeking answers to: How to Ensure Speech Privacy. How to Provide Effective Isolation. How to Choose the Best Room Surface/Shape. Packed with illustrations, tables and step-by-step computations for help in understanding the behavior of sound in the environment.

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SOUND SYSTEM ENGINEERING, by Carolyn & Don Davis, is the masterwork of the professional/engineered sound system field. Starting with basic system configurations, individual chapters discuss Audio Environment, Interfacing the Electrical & Acoustic Systems, Equalizing the Sound System, and Instrumentation. This volume explains fully the steps in designing, testing, installing and maintaining a sound system, along with photos and graphs that enhance the text. Don Davis has included test questions (with the answers) about the mathematical science in acoustics, to hone your skills.

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PRACTICAL GUIDE FOR CONCERT SOUND by Bob Heil is the sum collection of notes, experiments and logs of a man who spent over half a decade building/servicing/fashioning sound amplification systems for some of the country's best known travelling musical combos and rock concert stars. There are 19 chapters, ranging over the full line of amps/mikes/speakers/compressors/crossovers . . . but, there is also a spelling out of balanced and unbalanced lines; the

care and feeding of cables, and the interfacing of hi-fi gear with pro sound equipment.

Soft cover \$10.95

LEASING PRINCIPLES & METHODS by Jack Leonard Green, 320 pages/hard cover, grew out of a series of articles that first ran in **SOUND & COMMUNICATIONS** on money management. The author expanded the six articles into a full explanation of leasing—its advantages over outright purchase—and fleshed out the work with 32 pages of documents and financial instruments, covering every financial exigency. Interconnect phone dealers and duplex intercom distributors will find this volume of exceptional use in crafting lease arrangements for telecommunications systems. \$49.95

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HANDBOOK ON ESTIMATING is the combined knowledge of four men who've accrued almost 100 years of experience in the sound system business, estimating jobs price-tagged from a few hundred dollars to over a hundred thousand dollars. You won't find a circuit diagram, nor a discussion of acoustics, time delays, or installation techniques—this is strictly a volume devoted to the plain arithmetics concerning time, materials, men, overhead, insurance and taxes, that are a vital part of the estimate that brings in the dollars, and **MAKES A PROFIT!** Each element of these items—and more—are given their proper treatment, and are shown in their relation to one another, broken down into pennies (an hour's time for a technician is broken into its 60-minute segments, and the price for that minute is scored and tallied with the rest of the estimate). Equipment suppliers are invited to seek quantity purchase price discounts.

Soft cover \$15.50

MODERN COMMUNICATIONS SWITCHING SYSTEMS/2nd Edition by Marvin Hobbs is a step-by-step treatment of telecommunication switching techniques by the telco, into crossbar and microcomputer switching techniques for the customer-owned system. The elements of Stored-Program Control are detailed, as well as Time-Division Switching Systems. There is a complete presentation of PBX systems. This work will find a ready audience among the interconnect dealers whose installation and servicing crews are "crossing-over" daily with the telco.

Soft cover \$9.95

VIDEO SECURITY SYSTEMS, by Keith Bose, is a work of increasing importance now that security systems are becoming more sophisticated and an integral part of the communications system for industry, commerce, institution, school, and the leisure/housing markets. The technical aspects of the CCTV camera and its peripherals are presented in word and picture—from installation tips to maintenance practices. Two chapters are of especial interest: Cameras, Monitors and Video Recorders covers the range of tubes, signals, night viewing cameras. Signal Processing, Special Effects and Color deals with amplification, equalization; then special effects, screen splitting and character displays.

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The scoreboard/loudspeaker assembly

Tackling Stadium Sound

by William C. Matthews

Although over fifty years old, the University of Illinois Stadium, in Champaign, is in excellent condition and is one of the best in the Big Ten Conference. The stadium's sound system, however, until recently was of vintage design and left much to be desired both as to performance and reliability. It was, in fact, more of a portable than a permanent system, with plug-in type distributed loudspeakers on pipe stands angled up from the perimeter of the field.

When Ronald Johnson was appointed Champaign branch manager for Ancha Electronics, of Elk Grove Village, Illinois, one of his first efforts was to try to interest the university in replacing the old system with a new state-of-the-art installation.

After months of consultation with university personnel, preliminary layout by Ancha Electronics and final design by Peter Tappan of Kirkegaard Associates, an agreement was reached and installation of

the sound system began.

The year before, an electronic scoreboard had been erected in full crowd view at the north end of the stadium. Flanking the scoreboard on both sides, towers were built to accommodate the two stacked arrays of loudspeakers, one for the east and one for the west sides of the stadium.

Installation

Inside the towers, Ancha technicians installed full-height vertical lengths of rectangular steel struts to support the stacks of high and low-frequency horns. For the long throws of six-hundred-seventy feet to the south, each tower was equipped with a high-frequency six-stack array of JBL 2366 bi-radial constant coverage horns with 2842D drivers and a six-stack cluster of BLT Community horns with E-V M15L drivers for frequencies below the 600 Hertz crossover point.

The loudspeaker stacks were low to the ground relative to the height of the grandstands, and four separate 2366 horns, each side tilted

upwards, were required to cover the gradually rising grandstand expanse.

Four 2360 horns on a delayed circuit were remotely installed and directed towards the upper and lower acoustically blind spots in the northeast and northwest grandstand corners.

An operating Altec 1692A console was installed in the announce booth of the press box, with connections from microphone receptacles at the west and east 50-yard lines. Channel one output of the 1692A was used to drive the main system and channel two fed a separate system for the press box areas.

The installation required a little over a month and it was complete and tested well in advance of the first games of the football season.

Adjustments and Equalization

In setting up a well-designed sound system, if the efficiency of the low-frequency loudspeakers matches that of the high units, one should be able to achieve a balanced acoustic response by setting

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Finally, a ceiling speaker that solves all of the problems progressive sound consultants, sound contractors and architects have been dealing with for years. From office/conference room applications to theatre sound surround systems; from parking ramp paging to special sound effects for theme parks; from restaurants to church halls and auditoriums...

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all power amplifiers the same. In most bi-amplified systems, however, the greater efficiency of the high-frequency loudspeaker horns requires that the low-frequency amplifiers be set six to eight decibels higher, to produce a low to high-frequency balance. In this installation just the opposite was true; the low-frequency amplifiers' gain had to be reduced by six decibels for a balance, an impressive indication of the low-frequency horn/driver combination's efficiency.

To meet an unscheduled preliminary use deadline, the system had to be equalized on a windy, drizzling day in between football practice sessions by semi-drenched "Fighting Illini". Real-time analyzers and sound level meters are not yet so sophisticated that they are able to distinguish pink noise from that generated by wind, thunder and rain, and the first equalization attempts resulted in a system response which was somewhat less than ideal.

A second effort was made two days later, under opposite circumstances, when the weather was hot and sunny. Under these conditions it was impossible to read the LEDs on the display of the Ivie IE-30 real-time analyzer. Fortunately, the unit's two memories were available for recording in the sun and reading back in the shade. Seven recordings at selected locations were averaged and the readings plugged into the equalizer settings, resulting in a more scientific tailored system response.

Tests and Measurements

A coverage of plus to minus four and one-half decibels, measuring pink noise per specification at the two thousand Hertz one-third octave band, was achieved throughout the stadium. As in any large outdoor sound system, a crosswind was found to vary the coverage response. During the testing period, with the power amplifiers "loafing," the speech interference level of the wind was not sufficiently great to render speech unintelligible. It was felt that enough reserve power was available to overcome any wind condition short of gale proportions.

The specifications called for a system capability to produce one hundred decibels of sound pressure level six-hundred-seventy feet from

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Innovators in engineering acoustic devices and accessories, Fourjay Industries continues to pioneer labor saving installation procedures and to build better baffles and speakers just as it has during its 27 years of growth.

Fourjay is distinguished as the first to manufacture mounting rings for speakers and baffles—a concept that drastically reduces the amount of labor normally required for installation.

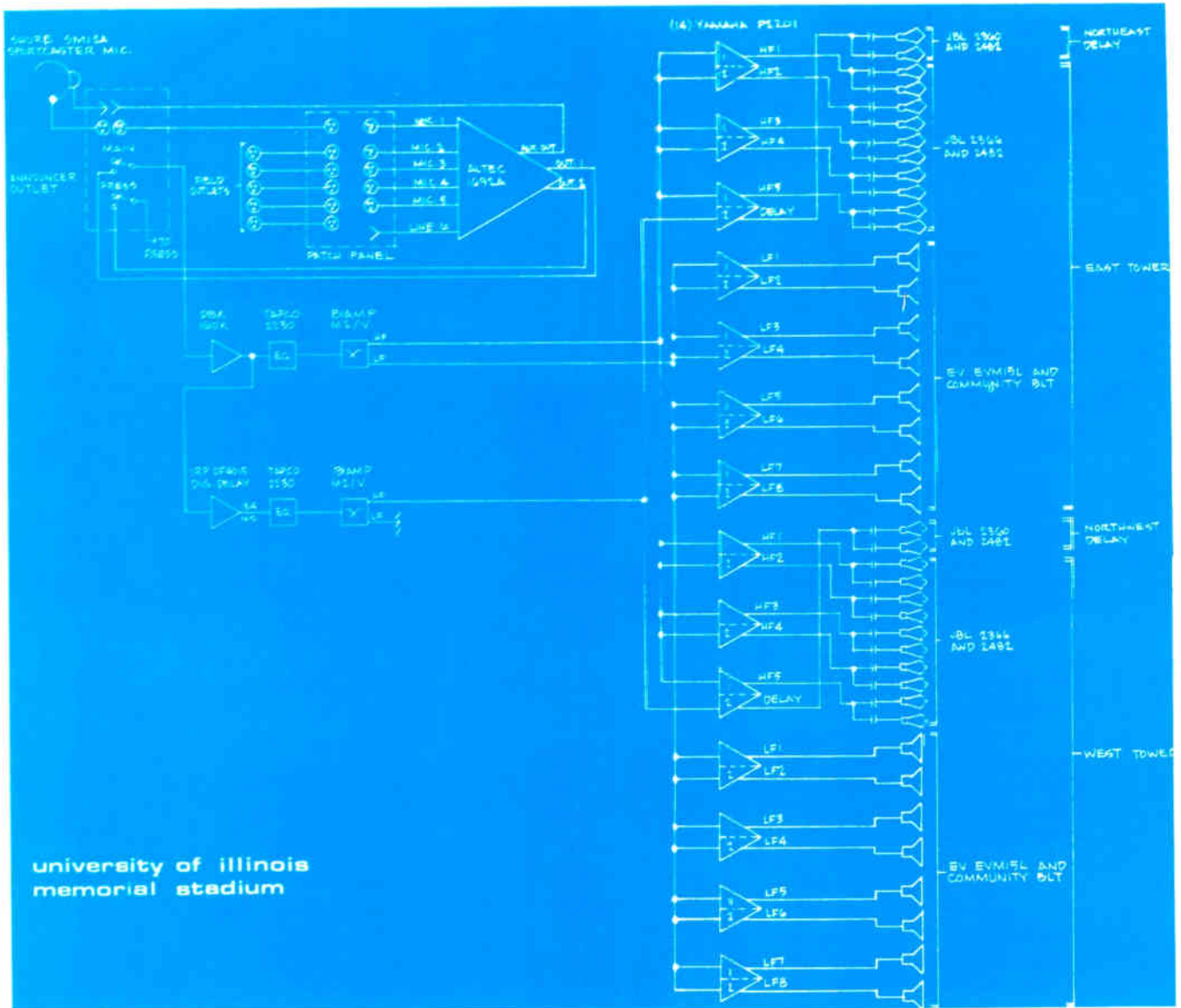
Fourjay is also credited with the introduction of non-metallic baffles to eliminate metallic resonance. First manufactured in fiberglass, Fourjay baffles are now manufactured by injection molding.

In 1975 Fourjay produced the first all non-metallic Re-entrant Paging/Talk-back Horn Speaker. Most recently they introduced the compact Model 440 Thundering Mini, 40 watts continuous speaker with response 500 to 7000 hertz.

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the loudspeakers at the far south end of the stadium, using as a source a warbled sine wave tone from 500 to 1500 Hertz. The system readily handled this requirement.

During the preliminary equalization tests it was found that the coverage on the grandstand's side expanse was too great in variation. To achieve the desired response it was found necessary to relocate two of the side horns directed up toward the stands and to re-aim the other two, another of many verifications that drawingboard projections are not always infallible.

Performance

It would be untrue to state that this installation defied "Murphy's Law" and that everything worked perfectly from the start. There were a few problems, one of which was a "singing" noise when some high

frequencies were reproduced over the system. This was traced to a layer of Saran Wrap between the high-frequency throat and the horn, which had been part of the specifications, the intent being to protect the drivers from moisture. Preliminary tests had indicated that this precaution would cause no noticeable effects on performance, but a swept sine wave showed a resonance of the layer at about 3000 Hertz. All high-frequency horns had to be disassembled and the offending material removed to cure this effect.

Another problem unveiled by the sweep sine wave test at six decibels below full power was a slight rattle at about 250 Hertz. This proved to be due to one of the number ten loudspeaker cables pressing against one of the E-V M15L low frequency cones.

After the elimination of these

difficulties, the system performed very well, as evidenced by unsolicited favorable remarks by listeners who had heard and compared the sounds of the old and the new system.

Wide range music at medium levels brought many compliments from observers near the university's assembly hall several thousand feet to the south concerning "the world's largest hi-fi system."

The big test, of course, was the reproduction of voice and music during the home football games and other stadium events. No sound system has ever satisfied every one of the thousands of fans who fill college stadiums during the football season but, according to Ronald Johnson, the man who followed the installation of this system from inception to completion, this one has come very close. □



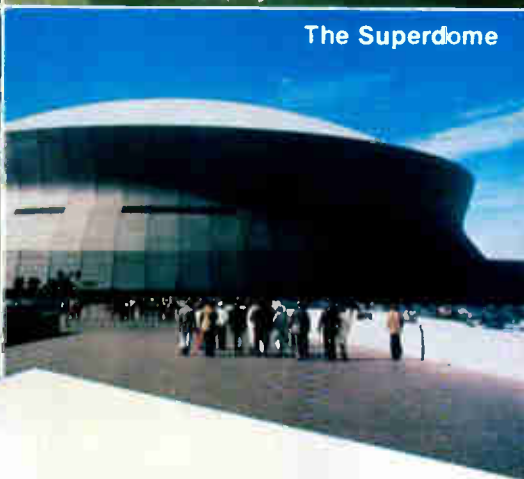
Three Rivers Stadium



Westminster Abbey



Ravinia Festival



The Superdome

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Easy to install and operate, the SK-976 security system includes a high-resolution, 9-inch monitor, a high quality camera with lens, a sturdy metal camera bracket, and 50 feet of coaxial cable with BNC quick connectors. The setup is suitable for surveillance of offices, warehouses, auditoriums, parking areas, etc.

□ For more information write 525 on the inquiry card. Or write: Audiotronics, 7428 Bellaire Ave., N. Hollywood, CA 91605.

DC VOLTAGE CONVERTERS



12-volt DC negative ground equipment can now be run in non-standard voltage vehicles. Any stan-

dard negative ground 12-volt item, such as stereo, CB radio, fan, lights, radar detector, or tools, can be operated by simply wiring in this unit in both marine and land vehicles. Two models convert both voltage and polarity. The 3-amp unit changes +12 to -6 or to -12, and -12 to -24. The 15 amp unit changes -6 to +6, +6 to -6, -12 to +12, and +12 to -12. This unit also operates on 8 amps to change -6 to +12, +6 to -12, -12 to +24, and +12 to -24. Both models are compact and weigh as little as one pound.

□ For more information write 526 on the inquiry card. Or write: Tripp-Lite, 500 N. Orleans St., Chicago, IL 60610.

EQUALIZER

The Model 4520 One-Third Octave, Passive Equalizer features 27 single-tuned, L-C filters on I.S.O., one-third octave frequency centers from 40 Hz through 16 kHz.



These filters are individually tuned to a tolerance of $\pm 3\%$ of center frequency and continuously adjustable to a maximum insertion of 10 dB. All controls are mil-spec, conductive plastic, rotary potentiometers. The equalizer features two outputs and an accessory, octal socket into which optional, low level crossover networks may be installed for bi-amp operation. An EQ in/out switch is located on the front panel, to bypass the filters, but not the crossover network. The unit weighs only six pounds and requires only three and one-half inches of rack space. Finish is brushed, black aluminum with white nomenclature. A matching security cover is furnished.

□ For more information write 527 on the inquiry card. Or write: White Instruments, Inc., P.O. Box 698, Austin, TX 78767.

TEST INSTRUMENT

The Model 105 Multifunction Tester combines many functions useful for exercising low-frequency systems. The unit consists of two different type function generators, a pulse generator, a frequency counter, and an AC voltmeter. In its simplest form, the unit can be thought of as several pieces of independent equipment in a common cabinet. They are all basically familiar test equipment and can be used in the normal manner. In addition, when the various sections are properly connected to each other and to an X-Y plotter or scope, the system will generate a frequency response plot. When connected to a scope, it will provide a response plot for breadboard work on amps and filters. When connected to a plotter, it provides hard copy certification of equipment response. The first function generator is called the time base. Its primary task is to provide sweep voltage for the sweep generator and trigger voltage for the pulse generator. It generates a ramp with independently controlled leading and trailing sides. The time base also produces sine and square waves, has amplitude and DC offset controls, and has an externally triggered FSK mode. There is a decade frequency range switch which selects one of seven ranges from .001 hertz to 1K hertz and variable controls which multiply these ranges by a factor of 1 to 100. Output impedance is 600 ohms. The second function generator is called the sweep generator. It can be swept internally with the time base section, with an external signal, or manually with coarse and fine front panel controls. There are log and linear sweep modes. Maximum linear sweep range is 20 hertz to 20K hertz. Maximum log sweep range is 10 hertz to 1M hertz. The unit can be set to sweep any portion of those ranges. There is also a switch which will scale-down those ranges by a factor of 100 for servo and vibration testing, and a burst mode which produces counted integral waveforms, in bursts of 1 to 9, or a burst which is on during the leading side of the time base. The output is sine, square or triangle. In addition to the variable amplitude control, there is a switched times 10 and times 100 attenuator. Output impedance is 50

ohms. The pulse generator has a decade range switch and a variable control to produce pulse widths from 30n seconds to 3 seconds. It can be triggered by the time base or the sweep generator. If the pulse generator is triggered by the sweep generator, which is in turn controlled by the time base, the pulse generator can produce pulse bursts with independently controlled pulse width, pulse spacing, number of pulses per burst, and burst spacing.



Pulse generator outputs are complimentary TTL. The frequency counter is seven digit and updates every half second. It can be triggered by either the sweep generator or the voltmeter. The frequency counter replaces the customary printed front panel frequency scale for increased accuracy. When the counter is triggered by the sweep generator, the signal is picked up prior to the output section and hence is unaffected by the output attenuator. When triggered by the voltmeter, stable triggering is produced by any signal which yields a 10-percent or greater meter deflection. The AC voltmeter measures true RMS, has linear and log modes, and has fast and slow damping select. The meter will measure the signal at the time base, sweep generator outputs, or an external input. There is a nine-position range switch covering ± 40 dB or 10m volts to 100 volts. Zero dB is .775 volts. There is a DC output proportional to the meter deflection. Output impedance is 600 ohms. The tester also has a power amplifier which can amplify either the time base or sweep generator outputs. It has a voltage gain of three and an output impedance of less than one ohm.

For more information write 528 on the inquiry card. Or write: FSI, P.O. Box 1423, Victorville, CA 92392.

SIGNALING/PAGING

The Alarm Monitoring & Alerting System, ASAP (Automatic Signaling & Paging), is a microprocessor-controlled device that can monitor up to five alarm inputs and sequentially dial up to 12 seven-digit phone numbers. Each alarm closure is identified with solid state human voice, for clarity and reliability. The system can be called from any tone telephone and provides a voice status report on the stations it is monitoring. A maximum of 32 separate ASAP 45 units can be installed, each with its own voice identification that the user programs. The setup is equipped with a battery backup system, maintained in constant readiness, with a trickle charger. Each of the five alarm monitoring inputs is activated by a dry closure switch that instantly activates the calling sequence. The sequence is stopped only when a call is answered and acknowledged.



If the system is not reset within 30 or 60 minutes, depending upon the interval the user selects, the sequence calling will resume where the paging stopped. Momentary closures may be reset remotely. With a capacity of 100 keyboard depressions, the ASAP 45 can be programmed to dial a numeric code of any length. For example, it can be programmed to call through various paging systems, some of which use a multitude of numbers. When dialing to display pagers, each location is identified by its individual telephone number or numeric code. The system can verbally transmit its location over voice pagers. It is available in an attractive desk top model, or in a metal, lockable case. The system is FCC registered.

For more information write 529 on the inquiry card. Or write: Command Communications Inc., 8000 E. Girard Ave., Denver, CO 80231.

Now from Eventide... the almost invisible delay line.



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Sound reinforcement, for multiple speakers or clusters (tamper-proof panels available); signal "doubling", pre-echo delay, realistic echo effects.

Specifications

CD254 Delay Line - 1 input, 2 outputs, 254 msec of delay, set by internal switches.

JJ193 Delay Line - 1 input, 4 outputs, 510 msec, 1.022 sec, or 2.046 sec of delay, set in 2 msec steps by front-panel DIP switches.

Frequency response 12 kHz.

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Distortion less than 0.2% at 1 kHz.

Size: 19" rack mount, 1-3/4" high, 9" deep. Weight: 4.4 lbs. Power consumption 10 watts maximum, in any delay configuration.

Pricing

CD254	-----	\$895.00
JJ193	510 ms	\$1195.00
"	1.022 sec	\$1295.00
"	2.046 sec	\$1495.00

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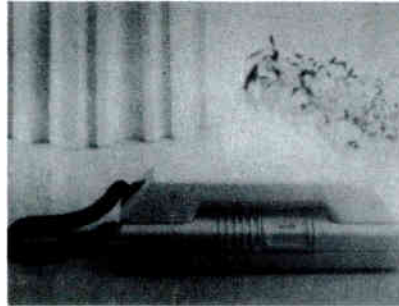
PLENUM CABLE

EC plenum cable is fire-protective signal cable for use in environmental air conduits. They are manufactured with a special compound which meets National Electric Code requirements for installation in air plenums without the use of conduit—thus the name EC (Eliminates Conduit). The cable features FEP teflon insulation and jackets. Conductors are paired and are available as solid or stranded, in either tinned or bare copper. Core wrap of glass-reinforced teflon tape (.003) is available upon request. Marker tape is required for identification. Aluminylar shield, providing 100% coverage with tinned copper drain wire, braided tinned copper shield, or braided bare copper shield, is available. The cable offers a temperature range of 200°C and has a voltage rating of 300 volts.



□ For more information write 530 on the inquiry card. Or write: American Electronic Wire Co., 1015 Sesame St., Bensenville, IL 60106.

APARTMENT INTERCOM



A two-wire apartment intercom system for duplex communication, chime and door release is made of high-impact Makrolon. The apartment unit requires only two 22-gauge wires, up to 600 feet, for all functions. The system uses one common wire and one home-run wire. A 12-volt transformer supplies

all the necessary power. Modular construction of the lobby unit allows any number of apartments in any configurations or finishes, bronze, brass, silver, champagne, white and various other colors. Apartment units are available in matte, white, black, beige, chocolate brown, and tabasco red. Each lobby unit has a tamper-proof keylock, no external screws, separate volume controls for speaking and listening, a self-contained amplifier and a heated moisture-proof condenser microphone for clarity. Units can be surface-mounted, flush-mounted or pedestal-mounted.

□ For more information write 531 on the inquiry card. Or write: Siedle Intercom/USA, 1 Wynnewood Rd., Wynnewood, PA 19096.

CEILING MOUNT

The Model CM-16 Light Duty Mount is styled to blend unobtrusively with the interior decor of offices, banks, or similar installations. It can support light-duty cameras up to 20 lbs. (9kg), and features an adjustable ball/swivel head, which allows for unlimited 360° pan rotation and 180° tilt adjustment. The ball/swivel assembly is locked securely into position with easy allen-wrench adjustments for tamper-resistant installation.



□ For more information write 532 on the inquiry card. Or write: Pelco Sales, Inc., 4790 W. Jacquelyn Ave., Fresno, CA 93711.

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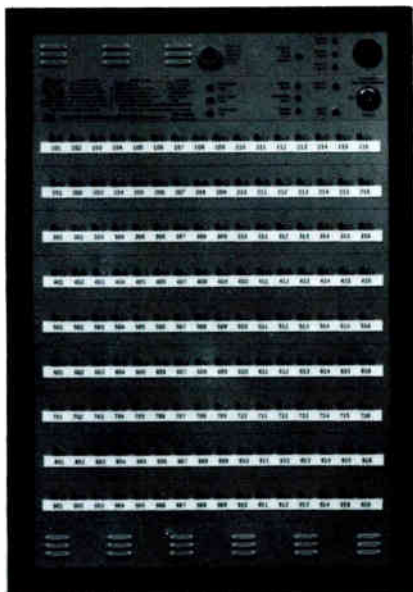
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FIRE WARNING

Model FSC is a fire warning system which provides a smoke detector for each guest room in a hotel, along with a central annunciator that powers all the detectors and indicates when one of them is in the alarm condition. This system is the first to be UL-listed under the new category, Fire Detector Annunciator. The system provides a choice of ionization or photoelectric-type smoke detectors, and can also operate with thermostat or rate-of-rise heat detectors. Standard battery back-up will power all smoke detectors as well as the central equipment for 24 hours in case of power failure.



Besides the primary listing, Underwriters has also listed the system for use with a host fire alarm panel, so that an alarm is automatically entered if the attendant does not respond to the fire condition within a specified length of time. In addition to the hotel industry, the system can find application in apartments, retirement centers, dormitories, and any place where multiple smoke detectors are used.

For more information write 533 on the inquiry card. Or write: Tel-Tron Div., Radio Manufacturers Inc., 220 Fentress Blvd., Daytona Beach, FL 32014.

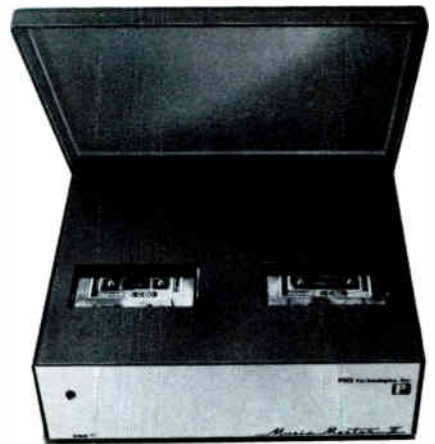
DC/DC CONVERTERS

The PKA series of miniaturized DC/DC converters provides 30 watts of output power. The compact, lightweight devices have nominal input voltage of +24 VDC or -48 VDC, with output voltage of ± 5 or ± 12 VDC. Using special monolithic ICs, as well as magnetic components, the converters promise outstanding reliability. There are eight versions, all available for PCB or chassis mounting, usable in signal or parallel configurations.



For more information write 534 on the inquiry card. Or write: RIFA Inc., Greenwich Office Park 3, Greenwich, CT 06830.

MUSIC SYSTEM



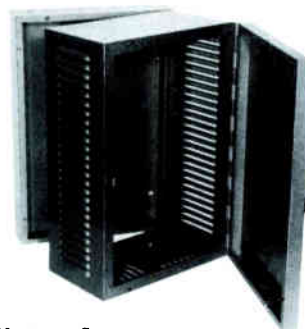
The Music Master II background music system uses standard cassettes for up to 16 hours of continuous, non-repeated music. The heavy-duty unit can randomly intermix two separate programs for a varying music pattern; messages may be inserted into the music program. Dozens of basic music formats, as well as ethnic and special programming, are available.

For more information write 535 on the inquiry card. Or write: PHI Technologies, Inc., 4605 N. Stiles, Oklahoma City, OK 73105.

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Telecom '83

During TELECOM '83, the quadrennial international telecommunications products/systems exhibition and conference, (October 26 through November 1) Geneva was Baghdad on the Rhone... a bazaar of telecommunications hardware and software of bizarre proportions.

All of it—presentations from most western European countries, the United States, Israel and Japan—for the edification of the executives and administrators of the Postal Telephone & Telegraph operations (PTTs) of the nations of the Eastern Hemisphere, Africa and Asia! Yet, a covetous eye was cast on the American market, viewed by many exhibitors as a big pie awaiting portioning, now that divestiture of some aspects of AT&T's monopoly is at hand.

Although not intended for interconnect distributors, the proliferation of bizarre product was the very essence of seven-layer cake, ele-

vated to the next power!

For example: a voice-controlled telephone dialer was on display. A voice recognition unit containing signal processor components compares the spoken word with previously entered reference patterns and assigns it to a particular pattern. When the acoustic pattern has been verified, it is converted into a series of numbers which generate the dialing signals.

A new key telephone system, microprocessor-controlled, offers such operating features as call repetition, collective call, charge meter, brokering between exchange and internal lines, and a digital clock.

A videophone system utilizes a broadband integrated optical fiber telecommunications network. It's a German system and appears to have unified both narrow and broadband services, including TV and radio broadcasting over a single optical

fiber.

A 450/900 MHz mobile radio system is designed for cellular network applications. By continuous radio checks on presence and accessibility, fully automatic switching to any radio telephone subscriber in the entire coverage area is possible, regardless of his whereabouts. The radio network is linked to the public telephone network via an exchange employing the digital electronic switching system.

Telephone dialers with upgraded capacities, but with the adjunctive feature of being able to accept a plastic card with additional subscriber numbers, read it, and complete the call.

Telecom '83 housed 650 exhibitors from 72 countries, organized by the International Telecommunication Union, and such an expanse of product begged for time.

The communality of the products offered—PBX, keyphones, videoconferencing and teleconferencing systems, along with videotex and teletex systems—was evidence that invention of product, creation of design, and color of equipment to work within the PTT exchange, housed within the subscriber's premise—proved that no country has a patent on exclusivity!

One "stand" occupier observed: "Some companies won't be in Geneva. Space reservations began four years ago, a number of smaller U.S. firms can't afford the minimum \$150,000 price tag!"

Obviously, the competition among producers and countries vying for PTT business is a thrust-and-parry proposition. One company will enter a neighboring country's telecommunications market, thrusting its product upon the PTT, believing it has that "edge" in features or price. That thrust is parried by the "native" producer, who reminds the PTT administrator that he generally works with a tightly knit group of "domestic manufacturers and suppliers." What we have at Telecom '83 then, is nothing but a courtship dance!

PTTs are truly governmental monolithic bodies who dictate their telecommunications services, regulate them, own and operate most of

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Customers love it because it eliminates blaring speakers and offers "soft" paging over each phone. You'll both like it because there are no expensive speakers to install.

But Voicepac actually adds a whole host of appealing features to any PBX or key system: individual station paging; group paging; all-call paging; handsfree intercom; privacy tone; station add-on. And it's so simple. No modifying phones. Voicepac's transducer fits

inside any telephone base and connects to a spare pair.

Choose Voicepac in systems for up to 15, 25, 50 or 75 stations. (You can even use it as a stand-alone intercom for clinics, etc.) And it comes with a 1-year limited warranty.

Give yourself a big edge in the bidding. Get details on Voicepac by writing Xtel, 1301 Cornell Parkway, Oklahoma City, OK 73108. Or call toll free 1-800-654-XTEL; within Oklahoma (405) 946-1200.

Xtel

the national networks. There is no move toward deregulation, and there appears to be no move toward a liberalized telecommunications policy.

However, critics of telecommunications monopolies do have a point, one PTT middle-management officer noted. A monopoly's strengths are paradoxically its weaknesses. Their protection policies regarding product and specification for product hinders the infusion of new capital. But the PTT's grip stymies competition, seems to restrict technological advances and limit the market size, because captive markets do not encourage export.

Thus, only about 30 percent of the world's telecommunications market is open to true competition—and about half of that is the United States. Because it is a large, relatively open market, most foreign companies have an eye on the U.S., (despite the "buy American" lobbying efforts of American telecommunications products suppliers). What is drawing off-shore makers to the American market is the soon-to-be divestiture by AT&T of some of its operations, creating seven new customers for product.

A Northern Telecom vice chairman remarked: "Our penetration of the U.S. market will accelerate and we are well positioned because of our past participation and broad product line."

"You cannot be in communications without being in the United States," observed an official of the Italian SGS-ATES Componenti Elettronica, Milan.

In clear evidence was the move by many exhibiting companies to concentrate on specific market niches, creating a comprehensive product range that can provide an integrated solution to a diverse number of communication requirements. With the convergence of technologies, many companies are said to be undergoing organizational changes and determining which value-added service will differentiate them from competition. Ericsson, for example, expects that by 1990 its product distribution will be one-third public communications, one-third information systems, and one-third radio, defense, cable, components, network engineering and construction.

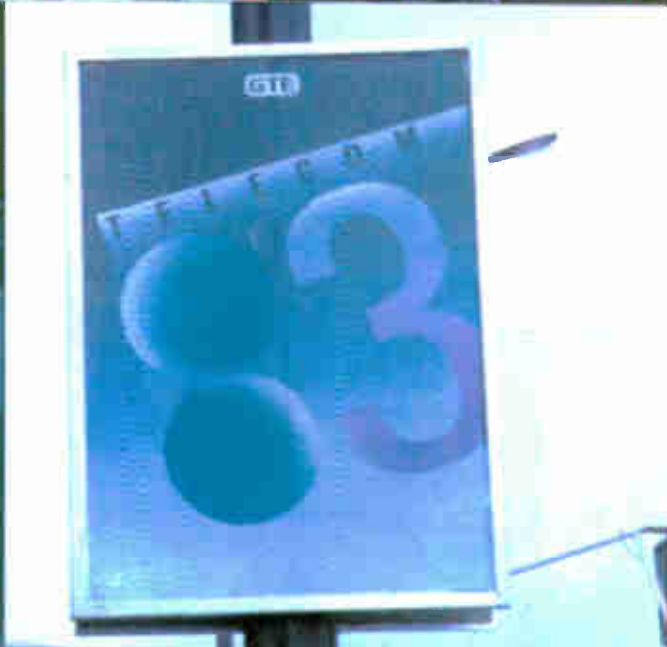
Telecom '83 conferences and

seminars ranged over a worldwide scan of subjects, analyzing new and enhanced communication services, the impact of the electronic revolution and the wireless society. The rising impact of technology on economic and societal problems was dissected for an audience of thousands.

On balance, then, Telecom '83 could be viewed as the dipstick into the telecommunications products world of technological advances, its depth and character and potential for worldwide customer acceptance, now or in the not too distant future!

Exhibitors in the USA Pavilion at TELECOM '83

Acoustics Development Corp.	Northern Telecom Inc.
Advanced Communications, Inc.	North Wind Power Co. Inc.
Alston Div. of Conrac Corp.	Ormat Systems Inc.
The Antenna Specialists Co.	Paradyne Corp.
AT&T International	Phelps Dodge Overseas
Automation Products Co. (APC)	Marketing Corp.
Aydin Microwave Div.	Plantronics/Frederick Electronics
Badger/TTI	Porta Systems Corp.
BBL Industries	PSI Telecommunications, Inc.
Benner-Nawmann Inc.	Power Group International
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Midwest Telephone Supply	U.S. Department of Commerce
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Group	Varian AG
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Trade	Warren Communications



NEW PRODUCTS

KEYPHONE

The Paragon 616 is a handsome key telephone system that offers small businesses and professionals many of the features usually found only in large systems. These include line queueing, flexible toll restriction, speed dialing, paging, message waiting, camp on/call back, and private line assignments. There are six intercom paths and multiple busy lamp fields, along with executive set with built-in speakerphone and display, call monitoring, call forwarding, executive "barge-in" and door and monitor boxes. The user can tailor the programmable system capabilities to his own needs, using any combination of up to 16 executive and standard telephone stations.



□ For more information write 536 on the inquiry card. Or write: Technicom International, Inc., 23 Old Kings Highway, S. Darien, CT 06820.

COMPUTER SECURITY

Lineguard 3000 intercepts all incoming computer access calls and—communicating via the caller's VDT—executes 60-second sequence: The caller is asked to enter his assigned code number. Lineguard then searches its memory to verify the code. If verified, the caller is told to hang-up and wait for callback. Lineguard then dials the phone number assigned to the caller's code number and connects the caller with the computer. An invalid entry code will be denied access to the modem. All failed entry attempts are permanently recorded for management evalua-

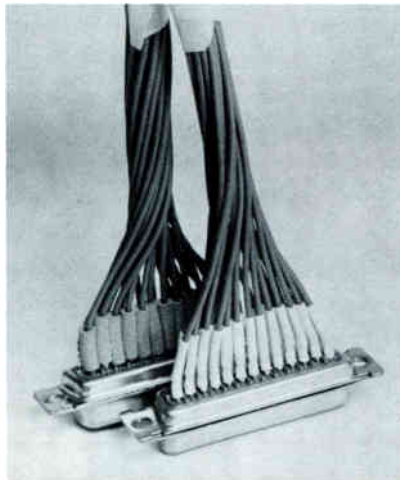
tion. Repeated attempts may be interpreted as a potential danger and warrant additional security measures. Each unit scans two incoming lines and is compatible with all asynchronous dialup modems and computer protocols in use today.



□ For more information write 537 on the inquiry card. Or write: Western DataCom Co., 5083 Market St., Youngstown, OH 44512.

SHRINKABLE TUBING

Highly flexible, flame-retardant, heat-shrinkable tubing, Tekfit CFR-TW, will shrink in less time and at lower temperatures than most similar products. Installation time is reduced and problems solved in such applications as wire wrap post insulation, strain relief in dense packaging and low-profile wire markers. Recognized under UL 224 (VW-1), the tubing comes in black, white, red and yellow, with other colors available on special order. Diameter sizes range from 3/64" to 1".



□ For more information write 538 on the inquiry card. Or write: Remtek Corp., 2021 N. Capitol Ave., San Jose, CA 95132.

SECURITY BY PHONE

The Listener is a highly sensitive instrument which allows the user to telephone from virtually any location in the world and listen in to what is happening at another location, such as his home or business. He can hear the faintest of sounds ranging from hushed conversations to a water faucet left running...all with excellent clarity. Uses range from checking the status of one's home when away on vacation, to monitoring unattended factory or data processing operations. Timely verification of emergency situations at remote industrial and commercial sites may be accomplished on a large scale using the capabilities of this device. It is installed by simply plugging it into the familiar modular telephone jack. No other connections are necessary, since it derives its power from the telephone line. The unit is adjustable to answer after as many as twenty rings, so that normal use of the remote telephone is unaffected. Operation is extremely simple. The user dials the telephone number where the Listener is located in the usual way.



After the device "answers," the caller has 10 seconds in which to turn on the listening function by means of a hand-held beeper. If the security coded beep signal is not received, the device will simply "hang up." The compact, solid-state device measures only 3" x 4" and weighs only a few ounces. It comes complete with external microphone, hand-held beeper, and an instruction book; it is FCC-registered for direct connection to single-party telephone lines.

□ For more information write 539 on the inquiry card. Or write: Mountain West, Inc., 4215 N. 16th St., Phoenix, AZ 85016.

KEY SYSTEM PANEL

The MP-610 allows the user to provide an economical 8-line key system which performs most basic key system functions. Up to eight 400-type line cards, a 10, 19, or 37-station intercom, and an inter-rupter, can be conveniently mounted with the MP-610. Music-on-hold, paging, and other features may be easily added to the system. The intercom provides fully selective station ringing, which may be repeated without on-hook/off-hook operation. Either tone or rotary dialing tele-phones, or a combination of both, may be used. The panel is easily installed and requires only 9" x 21" of space.

□ For more information write 540 on the inquiry card. Or write: Melco Labs, Inc., 14408 N.E. 20th St., Bellevue, WA 98007.

WIRE STRIPPER

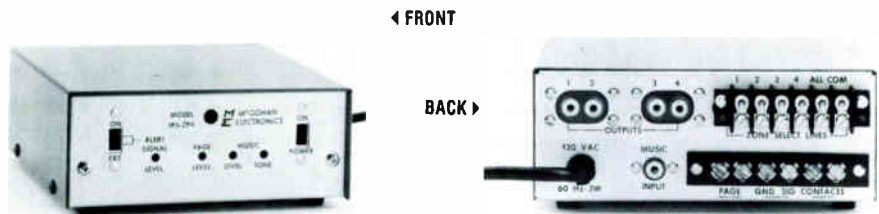
Wire stripping which must be performed in confined spaces may now be accomplished quickly and easily with the 90° T-Stripper.



Designed with the stripping blades at a right angle to the handles, the tool gets at hard to reach wires by permitting a straight pull-back stripping action. It has precision ground, knife-type stripping blades and a built-in cutter for clean, accurate work. Looping holes in the blades help produce professional looking loops with the twist of the wrist. Weighing three ounces, it has cushioned handle grips for user comfort, and is spring-loaded for automatic opening. The black oxide finish guards against corrosion. Three models are offered: Model T-91 for 10-14 AWG solid wire, Model T-92 for 14-18 AWG solid wire, and Model T-93 for 20-26 AWG solid wire.

□ For more information write 541 on the inquiry card. Or write: Ideal Industries, Inc., Becker Pl., Sycamore, IL 60178.

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A totally new concept in P.A. zone paging applications. This system combines individual pre-amplifier channels with some unique solid state circuitry that performs all the necessary switching functions in one small package, without expensive and troublesome relays. The outputs are followed by individual booster amplifiers of the required power for each separate zone in the P.A. system. This design greatly simplifies installation, and is virtually maintenance-free. Other features included are too difficult to achieve in a conventional system. Some of the features are:

- Solid State Reliability—9 integrated circuits
- Four zones with all-call (expandable with additional units)
- Transformer-balanced line-level input
- Background music High-Z input
- Zone-programmable music output
- Automatic precedence on selected zones
- Built-in signal generator for page alert
- Input for optional external signal generator
- Dry-circuit control for external generator
- Level controls for each input
- Tone control for background music
- Screw driver adjustment on all controls
- Adaptable to microphone paging with McGohan Zone Paging Microphone Accessory (available soon)

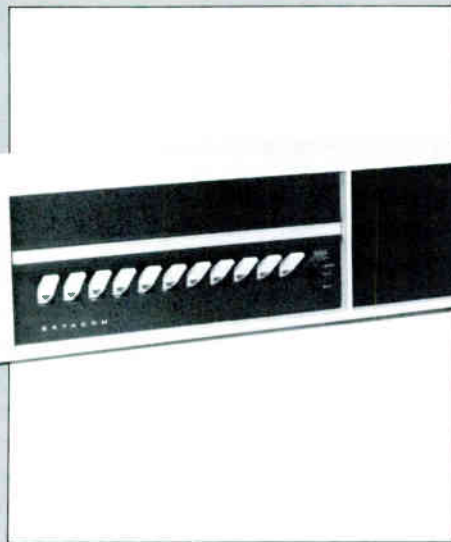
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McGohan Electronics, Inc.



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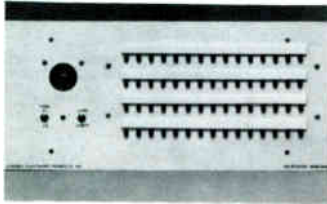
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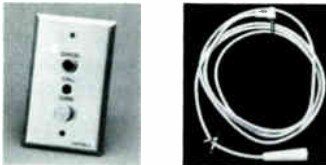
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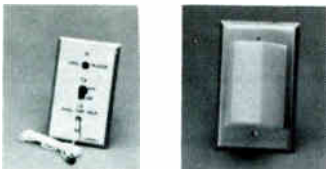
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A microprocessor-driven business communications system, with stored programs containing all routines needed for a complete range of electronic key system features, the EKS-801, can be site-programmed on a system-wide basis, and each station can be further user-programmed to meet individual requirements. The system is designed for small to medium companies. It expands from a minimum

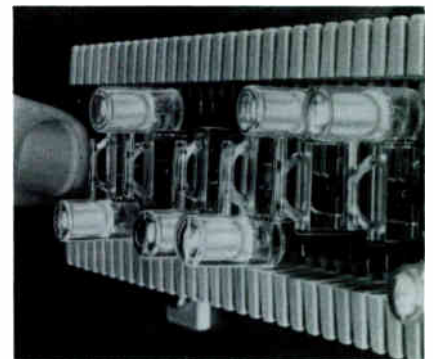


of 2 trunks and 4 stations to a maximum of 12 trunks and 32 stations, and can be installed as a stand-alone system or behind a PBX. System modularity translates into low installed cost, simple maintenance, and ease of expansion or changes in feature options. Station instruments are multi-button electronic telephones or talkback door monitor units, in cocoa brown or light ash. One DSS/BLF unit may be installed adjacent to the first station, to serve as an optional attendant's console. A choice of three multi-button telephones is also available. The Basic Telephone has 10 or 20 feature-access buttons, a pushbutton keypad, and 4-position ringer volume control. The keypad may have either Tel-Touch or Tel-Pulse dialing, with automatic speed dialing and last number re-dial. The Executive I Telephone has all features of the basic model, plus call announcer and call monitor. A built-in speaker permits handsfree answerback, on-hook dialing, paging and background music. The Executive II Telephone has all features of basic and Executive I models, plus a handsfree speakerphone. Call handling features of the system include one-button access to all features; conferencing and call transferring in privacy; toll restriction; automatic recall of held calls;

and maintenance of service during a power failure. Installation requires only 3-pair cable. Maximum run is 1000 feet (303M) of 24 AWG cable. For more information write 542 on the inquiry card. Or write: ITT Telecom, 3128 Smoketree Ct., Raleigh, NC 27604.

LINE STATUS INDICATOR

A bi-polar line status indicator slips easily over adjacent terminals on 66-type terminal blocks. The indicator, which can be installed in either direction, signals polarity as well as line status without intruding on a subscriber. The indicator is installed in series on tip or ring and provides a fast, easy cross-connection between adjacent terminals. The line status indicator is available in various color configurations that may be used to identify priority lines, e.g., computers, alarms, etc.



A red/green configuration is currently available to indicate polarity as well as line status. When this indicator is used, it can be installed with the "chimney" in one direction to indicate priority lines, and the "chimney" in the other direction to indicate general purpose lines. Both installation and service are greatly simplified. For more information write 543 on the inquiry card. Or write: ITW LINX Installer Products, 195 Algonquin Rd., Des Plaines, IL 60016.

AUTOMATIC DIALER

Especially useful to long-distance resellers, the CCA-1 (Common Carrier Access 1) is an automatic speed dialer for operation with dial-up long-distance networks, such as MCI, Sprint, etc. The line dedicated single-trunk unit is activated by the detection of dial tone when a user goes off hook. The unit can then be programmed to wait a predetermined period (switch selectable, 0 sec - 4.0 seconds) before dialing the OCC. The device is self contained, wall or rack-mountable and has a non-volatile memory. It has been certified by the FCC, registration #DD77D5-70589-DI-E.



□ For more information write 544 on the inquiry card. Or write: SMT Corp., 2929 Eskridge Rd., Fairfax, VA 22031.

PHONE FEATURE ACCESS

The Asset 1200 allows businesses to fully exploit the multiple convenience features of their advanced PBX systems, by making typically complex operations available at the touch of a single button. Easily installed by the user—via a standard modular telephone connector—the unit permits businesses to select up to 12 of the PBX features most valuable to them for one-button operation, using the system's 12-digit keypads. The system can be easily reprogrammed—without special tools or skills—to change the features available. Where less than 12 features are needed, the system's remaining locations can be used for automatic dialing of frequently called numbers. It can accommodate an average of 12 digits per location, or any number of digits in any number of locations to a 150-digit total. Built-in battery backup provides memory



protection up to five years in the case of AC power loss, and the system is transparent to telephones during power failure. Available with an optional 220-VAC, 50-Hz power supply, the Asset 1200 meets appropriate FCC specifications.

□ For more information write 545 on the inquiry card. Or write: Mobius Communications Corp., 3333 Soquel Dr., Soquel, CA 95073.

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Profile: Telephony's Fireman

Back in the days of their greatness, the New York Yankees enjoyed the services of Johnny Murphy, one of baseball's finest relief pitchers. Nicknamed "The Fireman," Murphy's experience and pitching skill turned many a seventh inning crisis into a ninth inning victory.

Ring Group of North America, the American subsidiary of the Norwegian company Scanvest-Ring A/S, which combines extraordinary technical sophistication with a worldwide distribution network, recently found their "fireman" in the person of Ron Stone. Stone, a former teacher, baseball coach, marketing executive and, most recently, president of ITT/DESD, has been able to halt a decline, revitalize operations and turn the company around—all in less than a year.

He achieved this feat without a huge budget or staff of consultants. Drawing on his own experience, marketing skill and customer insight, he is aided by a talented staff who fully support his approach to the communication marketplace.

Probably the most accurate assessment of Stone's performance comes from Harald Nordstrand, managing director of the former Gustav A. Ring Systems Company, Norway, now Scanvest-Ring A/S.

Writing in a memo to Ring's North American dealer network, Nordstrand stated that "...1983 has been a year of new beginnings for the Ring Group, due in part to new systems, new training workshops, and in general, a new attitude toward our position in the North American communications market. We now feel that the last step in our

rebuilding has been taken with the appointment of our new president, Mr. Ron Stone."

What Stone accomplished can be described as a minor miracle. He arrived at Ring in May 1983. By mid-summer, Stone had exceeded the entire 1982 sales total and was even far ahead of the 1983 objectives. Ring delivered the first 600-line Model 903 system sold in North America. Ring sold four 100-Plus-line systems in May and June and introduced a new, digital ACD to the North American market. Add to this a weeding and reshaping of the entire distribution network.

In addition, he instituted a volume discount program for Ring dealers that has helped trigger this impressive sales performance. And, according to Stone, "All of this is just the beginning."

"Our first step was to halt a downward trend in sales and the shrinkage of our share of market," Stone reported. "Now, we are getting out there and recapturing a major share of the market. We have the products and the people, but until now there was no driving force. My job is, essentially, to supply that force."

Stone's approach to marketing is similar to Murphy's approach to pitching, a superlative blend of knowing how and where to pitch to each "batter." Stone's philosophy of marketing rests on three elements:

First, there has to be a mutual respect between customer and supplier. This respect is based upon the

fast follow-through of a promise to deliver made by the supplier and a promise to complete the transaction made by the dealer.

Second, the supplier must provide the very best product possible, make it available when needed, be ready to support the product with service, and guarantee the customer against technical and business problems.

Third, the supplier must be sensitive to the needs of the dealer. The key here is TLC—tender loving care. No company can afford to present an impersonal, monolithic face to dealers or customers. For those who know Ron Stone, this was the least of the problems. In fact, using baseball jargon, Stone has a great fast ball and a variety of curves, but he never throws at anyone's head.

Stone brought to his assignment the qualities which had made him one of today's creative sales executives. First, there must be a basic respect for the dealers and customers. Second, there must be a keen awareness of their problems and the methods you use to solve them. Finally, you must exercise the art of combining learning with the drive for personal achievement, not to mention a sense of humor.

For Stone, being a science teacher provided intangible rewards but, unfortunately, comparatively little in the way of tangible ones—enough money to maintain his family.

A way out of the dilemma was offered by a sales opening with a

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In 1964, Stone went to work for an intercom company as New York City branch manager. Within a year, he had brought his branch to the number one slot. It was Stone who was picked to field test the 411 duplex intercom for the first time in the United States.

The company, Terryphone, then became part of the ITT family, expanded into Canada and Ron

Stone was sent to Toronto to open the first "offshore" office, train personnel and introduce Canada to the ITT Terryphone and vice versa.

One of Terryphone's competitors was Executone. Stone's performance for their rival convinced Executone that he was the man they needed to handle their marketing. They were right.

Returning to New York with Executone, Stone took over the market that was to shape his career. He created both the image and the book that was to become the sales bible for thousands who have since trained under him.

Again Stone racked up sales volumes which led to his promotion to vice president, commercial and industrial product sales, worldwide. From 1969 to 1976, Ron Stone was with Executone, both in the U.S. and Canada, becoming vice president/general manager of Executone Canada as well as a member of their Board of Directors.

Stone has been credited for developing the successful sales strategy which highlighted the dual-track flexibility plus the handsfree operation of the 411 system. Stone's work with the 411 concept at Executone, and the later 511 system with ITT (who approached him in 1976 to reorganize their duplex intercom marketing division), eventually earned him the presidency of the ITT/DESD Division. Stone helped build the division's sales to the multi-million-dollar level from a near standing start.

In 1983, Ring Communications came to Stone. What they needed was an innovative, experienced marketing executive who would operate in two communications areas—fully electronic duplex intercom and ACD, stand-alone automatic call distribution including 9-1-1 enhancement.

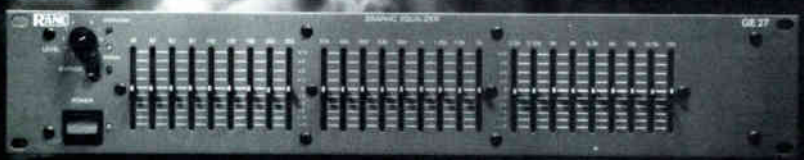
The market potential seemed to be virtually unlimited and for Stone this became a whole new ball game.

As Stone sees it, "We will be concentrating on the growing re-awareness of the need for efficient, flexible internal communications systems in business, and we're taking a vertical approach to these many marketing opportunities. It may be a harder sell and take longer to close, but with the sales tripling in both line size and dollars, the return will be greater.

"Of course there is competition. That doesn't worry us. Competition brings out all your skill and experience, your inventiveness. We have the products, the people and the distribution. I know we'll wind up winners.

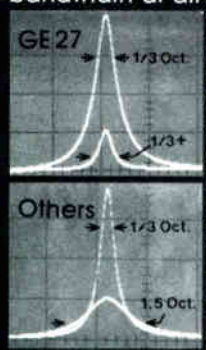
"The Scanvest-Ring communications products are highly sophisticated. With their marriage of internal systems to the enhanced ACD technologies, I feel we will expand marketing potential dramatically." □

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UPCOMING

January 17-19: Supermarket of Tele-Technology, USTA/USTSA Midwestern Telecommunications Showcase, Roe Bartle Convention Center, Kansas City, MO. (United States Telecommunications Suppliers Assoc., 333 N. Michigan Ave., Chicago, IL 60601. 312 782-8597)

January 17-19: Southcon/84 High Technology Electronics Exhibition and Convention, Orange County Civic Center, Orlando, FL. (Electronic Conventions, Inc., 8110 Airport Blvd., Los Angeles, CA 90045. 213 772-2965)

January 31-February 2: Communications Networks Conference & Exposition, Washington Convention Center, Washington, DC. (CN '84, Box 880, Framingham, MA 01701. 617 879-0700)

February 20-22: 1984 Office Automation Conference Los Angeles Convention Center. (American Federation of Information Processing Societies, Inc. 1815 N. Lynn St., Arlington, VA 22209. 703 558-3613)

April 4-11: 1984 Electrical/Electronics Hanover Fair, Fair Grounds, Hanover, West Germany. (Hanover Fairs Information Center, P.O. Box 338, Whitehouse, NJ 08888. 800 526-5978; in NJ, 201 534-9044)

April 25-27: Electronic Distribution Show & Conference '84, Hilton Hotel, Las Vegas. (Electronic Industry Show Corp., 222 S. Riverside Plaza, Chicago, IL 60606. 1 312 648-1140)

April 24-26: 1984 Contractor Conference & Expo, Sahara Hotel, Las Vegas. (National Sound and Communications Assoc., 5105 Tollview Dr., Rolling Meadows, IL 60008. 312 577-8350)

May 14-17: International Conference on Communications, RAI Conference Center, Amsterdam. (Dr. T.A.C.M. Claasen, Philips Research Laboratories, 5600 MD Eindhoven, Netherlands. 31 40-742131)

May 15-17: Electro/84 High Technology Electronics Exhibition and Convention, Bayside Exposition Center, Boston. (Electronic Conventions, Inc. Address above)

May 15-17: Mini/Micro Northeast-84 Computer Conference and Exhibition, Hynes Auditorium, Boston. (Electronic Conventions, Inc. Address above)

June 12-14: Ohmcon/84 High Technology Electronics Exhibition and Convention, Franklin County Veterans' Memorial Auditorium, Columbus, OH. (Electronic Conventions, Inc. address above)

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Municipal Data Link via Cable

by George Leon

A small town will usually have one building that houses the city hall and its municipal administrative buildings. Even if it is not all in one building, the communications that link the city government

will not have far to go. Telephone lines—most of the time voice only—will be short, and the cost of operation remains a relatively small item on the city's budget.

This is not true of large metropolitan centers. They usually have their muni-

cipality's edifices scattered over a wide area; New York City is no exception. The Manhattan Municipal Building, which is the administrative nerve center of the city, is separated from its computer center—the city's data communications headquarters—by about five miles.

That's only part of it; there are approximately 50 buildings in Manhattan, plus others scattered throughout the remaining four boroughs, that depend on data communications for their daily work. In all there are 13 separate data networks. These include: Financial, Police, Fire, Educational, Higher Education, Computer Services Center (CSC) and Traffic Signals. Of these lines, 30 percent are interborough. The need for dependable and continually reliable service is obvious.

In the past, the networks were served by New York Bell through leased telephone lines. As even the private subscriber with only one telephone knows all too well, phone costs have risen steadily. In the case of New York City, the increased cost of the circuits was not the only cause for a re-examination of the communications network.

"Some of the networks were very poor," said Joseph A. Giannotti, deputy commissioner of the Division of Computer Services. He added, "Down time was long, and there were mixed results from a reliability viewpoint." The Computer Service

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Call or Write for More Information



The Computer Center.

Center provides computer services to the city's agencies for such tasks as personnel, parking violations, Workers' Compensation, street light complaints and the Employees' Retirement System.

As a result of combining these four factors, the powers-that-be came to

one decision: to take their business elsewhere. While the average telephone subscriber can't do that, the city could—and did. First, CSC looked into the feasibility of using a microwave system. "Too expensive to build, and maintenance would be a problem." Other alternatives were looked

into. The ultimate choice was Manhattan Cable Television (MCTV)—in upper Manhattan—with a cable down to lower Broadway. This meant the cable snaked down not too far from City Hall and the Municipal building.

Why MCTV? That company could offer good service and a better price. "How much better was the price?" was the question. Giannotti's answer, "One-third below that of N.Y. Bell at the time the cable service went into effect." Furthermore, MCTV agreed to finance the costs of the cable construction as well as the pilot. MCTV also agreed to furnish installations at cost.

The pilot project consisted of nine out of about 67 of CSC's data transmission lines in Manhattan. There was a certain amount of caution exhibited at the time the pilot was begun. Saving money was a prime motivator, but the change to cable could not be at the expense of reduced circuit availability or reliability. MCTV showed that they were prepared not only to install the circuits but also to provide the required service. By franchise,

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MCTV must provide service to the city government at two-thirds their commercial rate.

What was the saving? According to James F. Capalino, commissioner of the City's Department of General Services (DGS), "By transferring these nine lines originally leased from Bell to MCTV's coaxial cable, the city cut its data transmission costs from about \$30,000 annually to less than \$20,000, while assuring improved service and increased reliability." He went on to say that the city's total annual data transmission costs are estimated at \$10 million. So from that it can be seen that while the original savings were not huge in absolute terms, there was a large potential savings in making the change.

There was no down time, in spite of the fact that it took three months for the work to be completed. This was accomplished by using the telephone lines and the coaxial cable during the first few weeks of the test. The generators were IBM 3081 and 3033. Giannotti said, "It takes less than 80 percent of the space of its predecessor—the 370-158—only 40 percent of the power and less than 40 percent of the cooling requirements. It also operates five times faster and because of this we can provide additional computing power at a reduced cost. We can now do more work for less money in less time." What all this comes down to is that while costs must go down, or at least not rise significantly, this must not be at the price of reduced reliability.

The pilot went into operation in October of 1981. The kicker from a savings point of view is that while Bell's rates continued to increase during the two years the cable has been operating, MCTV's rates have remained the same. So the present estimate is that the savings are closer to 50 percent of what it would have cost the city if it had remained with Bell. Savings are believed to amount to about \$100,000 a year. Payback on the system took only nine months.

There are 13 lines in operation as of this date; about 20 more are being planned. Giannotti went on to say, "MCTV is quick to respond for service and for new work. MCTV takes about one month to do new work. Bell would usually take three months."

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4800*	380	173	207	55
9600*	450	213	237	52
56 KB	630	475	155	25

*Bulk of DCS line usage

Table 1

Table 1 shows the relative cost and the savings:

Plans are to go to 60, or even 100 circuits, with an estimated savings of about \$50,000 per year. Other plans are to use electronic mail between the Computer Service Center and the Municipal Building. They—as most of us—suffer from poor mail service. At present some 70 terminals—word processors by Wang—are installed to allow direct access into the computer network for data transmission.

Manhattan Cable is currently the nation's only cable system providing data transmission services. As a result of a survey conducted during the first year of use, a great deal of interest was generated among the city's agencies in the use of cable for transmission and other institutional purposes. The computer network is also used to track information on over 3000 pieces of city-owned and/or managed properties. The computer program stores key information on the building, the lease holder and the tenants. Also included is the name of the lease holder, the length and type of lease, payment history and a number of other indicators. This means that in minutes any wanted information about a specific piece of property is available. The estimate is that the turn-around time has been reduced by about 70 percent.

What may be an unpleasant note to some is that the same computer network is accessed when someone wants to claim a towed-away car. The owner can't get the car unless all of the past parking violations are paid.

At the Law Department, the computer provides a case tracking system which monitors court assignments and appointments for staff and attorneys. The same network helps the Department of Health's Vital Records Division to furnish the public with official copies of birth and death certificates. Time saved? According to a Health Department

official, the time to obtain this information has been cut from 20 to 30 minutes down to two to five minutes. The computer monitors itself and keeps track of its failures and tells the engineers where the problem exists.

As with any large and complex installation, not everything came up roses. The installation was a lengthy one due to the construction involved. It was also found that communication regarding planning could have been better; this was balanced by excellent communication regarding repair. As to failure, over a three-month period there were only eight, a total of 2.5 hours or 1250 minutes.

What are the future plans for the network? For the time being it will be limited to southern Manhattan. Beyond that? Potential installations include the possibility of CSC occupying two locations with 14 lines. Giannotti added, "The cable project has been a major success, financially as well as service-wise. For this reason we are seeking to expand into all buildings in the cable area with four or more circuits." (A minimum of four circuits is necessary to justify construction costs.) He went on to say, "This could mean the replacement of another 60 circuits within the next year. As a companion effort, the viability of a local area network in the City Hall area is being analyzed."

The long-term plan is to install cable service to all five boroughs. CSC has 500 terminals in various locations throughout the city. The IBM 3081 is capable of accommodating many more terminals as the need arises.

The moral to this story is that there is a potential market virtually untapped by interconnect companies who have not thought of municipalities as customers. But in this, the Computer Age, they must be willing to sell data as well as voice-only links. □

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TIP & RING

TIE/COMMUNICATIONS, INC., SHELTON, CT, HAS ACQUIRED CERTAIN ASSETS AND THE BUSINESS OF THE OFFICE EQUIPMENT LEASING DIVISION OF HERTZ CORPORATION. This acquisition was completed by HCL Leasing Corporation, a newly-formed wholly-owned subsidiary of TIE. Alan Quinn and Hudson Hatcher have been named president and executive vice president, respectively, of HCL Leasing. Quinn has been associated with Hertz Commercial Leasing for the past 18 years, while Hatcher has had a long history with the leasing industry, including 14 years with Hertz Commercial Leasing. Howard Perrill, vice president, finance of TIE, will serve as chairman of the board of HCL Leasing Corporation.

U.S. TRANSMISSION SYSTEMS (USTS), A DIVISION OF ITT, HAS A NEW LONG-DISTANCE PHONE SERVICE DESIGNED EXCLUSIVELY FOR THE LODGING INDUSTRY. Called ITT Hotelnet™, it offers a lower priced alternative to conventional long distance services (WATS), a reduction by as much as 40%. Hotelnet can be integrated with almost any telephone system and hotel call accounting system, USTS said. The Hotelnet weekday calling rates range from 19 cents to 36 cents per minute. The weekday rates are discounted by 25% from 5 p.m. to 11 p.m., and 40% from 11 p.m. to 8 a.m. and all day weekends and holidays.

EXECUTIVE INDUSTRIES, INC., SAN DIEGO, CA, HAS SOLD ITS MANUFACTURING FACILITIES HERE TO AMERICAN MANUFACTURING TECHNOLOGIES, INC. in a leveraged buy-out of undisclosed value. The purchaser was formed to acquire the

assets and operate the leased 32,000-square-foot plant—one of four plants owned by Executone in San Diego.

AMTI was founded by Anthony J. Thomas, Jr., president and chief executive, who was formerly general manager of Executone Industries. Thomas has been joined by several private investors in AMTI.

EASTERN MANAGEMENT GROUP, MORRIS PLAINS, NJ, HAS PRODUCED A NEW REPORT, "IBM: A STRATEGIC ASSESSMENT," DETAILING IBM'S SIGHTING OF THE PBX INDUSTRY. IBM is expanding upon a communications product line that already boasts the Audio Distribution System and is shooting for a share of the \$3-billion PBX marketplace. Believing that it can no longer generate the desired revenues by restricting itself to data processing boundaries, it is moving up its massive marketing machine for what could be a protracted assault on the PBX arena.

Eastern Management Group's report states that approximately 200 "dataswitches," IBM's version of a PBX, will be shipped into the marketplace annually by 1987. Although representing a modest .5 percent of the PBX industry, IBM's performance indicates a keen awareness of the importance attached to penetrating the communications industry. But John Malone, president/Eastern Management Group, warns, "Don't expect IBM to go head to head with AT&T in an AT&T game. By creating a strategy that is unlike any currently employed by a communications corporation, IBM believes it can build its own private PBX arena. At the same time, it would insulate itself from what could be prohibitive losses due to direct competition with AT&T, the ROCs and the established interconnect industry."

IBM will be targeting the Fortune 500 corporations, precisely the same organizations that already tap IBM's mainframe line and subscribe to the SNA solution. Targets would include major accounts and, perhaps, Bell Regional Operating Companies for resale to end-users.

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MITEL CORPORATION/KANATA, ONTARIO, HAS CREATED TRILLIUM TELEPHONE SYSTEMS INC. TO DESIGN, MANUFACTURE AND MARKET ELECTRONIC TELEPHONES AND SWITCHING SYSTEMS FOR RESIDENTIAL AND SMALL BUSINESS USE.

Trillium's products, termed the TalkTo Series, are fully featured, low cost telephone systems, handling one or two outside telephone lines. Mitel has transferred to Trillium assets and technology used in its SX-2 system, now known as the TalkTo 109. It has also appointed Trillium as distributor of the SX-5 system, now known as the TalkTo 206, and the Superset 2 electronic telephone set.

Trillium is headquartered in Kanata, with facilities planned in the United States and Hong Kong. Staffing for the new company is largely being met by people who formerly worked at Mitel. Graham A. Neathway, the firm's president, was formerly vice president, Small Systems Division. Paul S. Wilker, executive vice president of Trillium, was formerly vice president, product marketing, of the Small Systems Division.

MITEL'S BOARD OF DIRECTORS HAS REORGANIZED THE SENIOR EXECUTIVE LEVEL OF THE COMPANY.

Terence Matthews, formerly chairman of the board, is now president and chief executive officer. Dr. Michael Cowpland, previously president and chief executive officer, assumes the role of chairman of the board. Dr. Cowpland and Matthews, together with Donald R. Gibbs, who remains executive vice president and chief operating officer, will form an Executive Committee of the Board of Directors, the senior policy and decision-making body of Mitel.

MCI COMMUNICATIONS CORP./ WASHINGTON, DC, HAS FILED A BRIEF WITH THE U.S. COURT OF APPEALS/ DISTRICT OF COLUMBIA CIRCUIT, CHARGING THAT THE FCC HAS VIOLATED THE COMMUNICATIONS ACT OF 1934 in establishing charges the company pays for access to local telephone exchanges. The filing involves an appeal of an order entered by the FCC in its docket 78-72, establishing the rate structure paid by long-distance carriers

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for access to local exchanges.

In its brief, MCI said that the FCC had "unlawfully discriminated" against MCI when it established a lower cost of access for companies which provide identical services, such as domestic and international record carriers, enhanced service providers, shares and the federal telephone system.

MCI made a similar argument before the court in 1983, in a related proceeding, but at that time the FCC told the court it had eliminated the discrimination in rates in an order on docket 78-72. However, after the court denied MCI's appeal, the FCC entered a further order which left most of the discrimination in effect.

In the current filing, MCI asks the court to reverse the FCC's access charge decision and to "remand to the Commission (the order) with instructions to prescribe rules or require tariff filings by the exchange carriers which ensure that all interstate users of local exchange services are charged the same for the same use..."

AT&T HAS COMMENCED MARKETING "MERLIN" FOR THE SMALL BUSINESS EQUIPMENT AREA, competing with Technicom International Inc., ITT Corp. and Comdial. However, industry analysts see Japanese makers, including NEC and Iwatsu, as the primary competitive threats to AT&T in the small business equipment preserve.

AT&T went through a test marketing period in Philadelphia and Colorado during the latter half of 1983, promoting Merlin as "easy to use, easy to install and easy to buy." Among Merlin's main features is that it's designed for installation by the customer without the help of the local telephone company; this approach is also being used by competitors to cut installation and selling costs.

The smallest Merlin system operates with two outside lines and as many as six extensions. In AT&T's market testing, that basic system sold for \$2742. A second model will include four outside line and ten extensions.

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CELLULAR RADIO

METROMEDIA, INC. HAS SIGNED AN AGREEMENT TO ACQUIRE 100% OF AMERICAN TELESERVICES STOCK.

The deal includes its subsidiaries. Since December 1981, American TeleServices has been operating an experimental cellular network—one of only two in the nation—throughout the Baltimore/Washington area. In June 1982, the FCC solicited applications from companies seeking to obtain commercial licenses for cellular transmission in Baltimore and Washington, D.C. The eventual applicants were American TeleServices and four competitors. On September 30/83, the competitive applicants, along with American TeleServices, signed a joint venture agreement to provide cellular service for both cities. The joint venturers are: American TeleServices, with 40% ownership; The Washington Post, with 20% ownership; Graphic Scanning, with 10% ownership; and Metro Cellular Telecommunications (consisting of Metromedia, MetroCall and Metropolitan Radio Telephone Systems), with 30% ownership.

Metromedia said it is expected that because of the developmental license in Baltimore and Washington, commercial cellular services will be offered to the public in either late 1983 or early 1984, conditional upon various regulatory approvals at FCC and the local Public Service Commission.

AN INTERNATIONAL RESOURCE DEVELOPMENT INC. STUDY REPORTS THAT FCC REGULATORY DECISIONS MAY GIVE THE NATION'S TELEPHONE COMPANIES A WINDFALL BONANZA OF \$5 BILLION IN THE IMPLEMENTATION OF CELLULAR RADIOTELEPHONES. The FCC, according to the report, has authorized two cellular systems per city. One system has been given to the regular "wireline" telephone company, while the second is open to any qualified "non-wireline" bidder, principally the RCCs who now supply mobile radio services.

Unless the FCC rulings are overturned by the courts, however, the IRD report predicts that the wireline

carriers, mainly the giant Bell Operating Telephone Companies, will have a 1 or 2-year lead time in implementing service in most major cities. The wireline carriers, says the report, have cut deals to divide the licenses in each city, because there are so few wireline applicants (less than two per city) and are ready to implement the service now.

The non-wireline carriers, however, according to the report, are likely to undergo lengthy comparative hearings in most cities, because there are 5-10 applicants per city. Since the FCC is likely to let the wireline companies begin service as soon as possible, the report says that it will result in a lead of 700,000 users, worth \$5 billion in revenues to the telcos during the next decade, before the non-wireline carriers can catch up in the market.

NEWVECTOR COMMUNICATIONS, INC. IS THE NEW CORPORATE NAME FOR THE NORTHWEST REGIONS OF ADVANCED MOBILE PHONE SERVICE, WHICH WILL PROVIDE CELLULAR SERVICES IN 14 WESTERN STATES. When operational, NewVector Communications, Inc. will be offering cellular services to thousands of customers in a given geographic area.

The company plans to introduce its cellular services in markets including Seattle, Phoenix, Minneapolis/St. Paul and Denver, with the first market entry beginning in the second quarter of next year. The company has also filed with the FCC to serve Salt Lake City, Albuquerque, Tucson, Tacoma and Omaha. Other markets will follow, ultimately expanding coverage in 14 western states.

Concurrently, NewVector is part of the restructuring of the national Advanced Mobile Phone Service organization of AT&T. At divestiture on Jan. 1/84, NewVector will become a wholly-owned subsidiary of US West, one of the seven regional operating companies to be



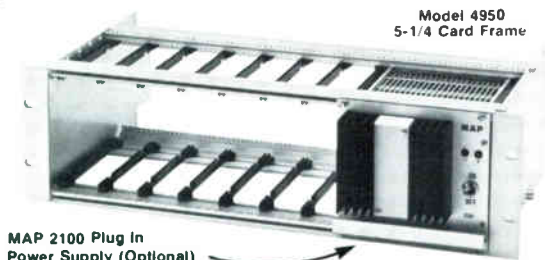
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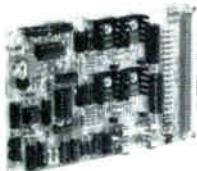
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established through AT&T reorganization. Headquarters for US West is Denver.

TAFT BROADCASTING COMPANY HAS ACQUIRED A MINORITY INTEREST IN MIDWEST MOBILEPHONE CORPORATION, an Indianapolis-based company formed to apply for and operate a cellular system in the area. Midwest Mobilephone is a one-third partner in Indianapolis Telephone Company, which recently won permission from the FCC to construct the cellular system. Construction is underway, and it is expected to be in operation by March 1984. Midwest has also applied for licenses for: Columbus, Cincinnati, Dayton, Louisville, Canton, Flint, Grand Rapids, Lansing, Omaha, Youngstown and Toledo. Midwest and other applicants for the Toledo cellular license have reached an agreement for the joint ownership of that system; that license is awaiting FCC approval.

Heritage Venture Group has joined with Taft with an investment in Midwest Mobilephone.

CELLULAR TECHNOLOGY, INC., NEW YORK/NY, ANNOUNCES THAT ITS SUBSIDIARY, HIGH TECH COMMUNICATIONS, HAS BEEN AWARDED FCC LICENSES TO OPERATE RADIO PAGING SYSTEMS in Austin, Houston and San Antonio, TX; Cedar Rapids and Waterloo, IA; and East Moline, IL.

Additionally, the company revealed the appointment of Richard J. Giacchi as vice president of Cellular Technology. He had been affiliated earlier with PageAmerica Group, Inc. as director of radio common carrier engineering.

LOCAL TELEPHONE COMPANIES CAN OFFER CELLULAR RADIO SERVICE THAT EXTENDS BEYOND LOCAL CALLING BOUNDARIES IN NINE METROPOLITAN AREAS, by approval of Federal Judge Harold Greene. The ruling affects these metropolitan areas: New York; Philadelphia; Boston and Worcester, MA., and Providence, RI; Baltimore and Washington; Milwaukee, Racine and Kenosha; Memphis, TN; Cincinnati, Columbus and Dayton, OH; Detroit, MI, and Toledo, OH; Omaha, NE and western Iowa.



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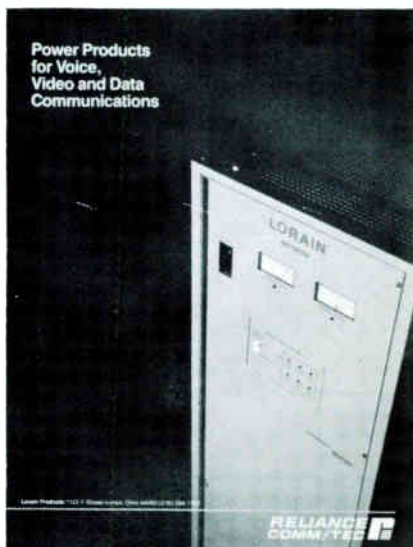
NEW LITERATURE

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INTERCOM: Ranging from 2 to 100 stations, a line of intercom systems is the topic of a catalog from Talk-A-Phone Co., Chicago. Easy to install and operate, the systems offer a range of options. Consulting service is offered to aid in specifying the best setups for specific applications.

POWER PRODUCTS: A brochure from Lorain Products, Lorain, OH, describes power products for voice, video and data communication systems. The equipment shown includes Uninterruptible Power Systems, DC Power Systems, DC to DC Converters/Plants, Single-Phase Inverters, Battery Charger/Rectifiers, and Ringing/Signaling Equipment.



The Power Products Selector included is a convenient chart which identifies such user categories as Telcos, cellular radio, specialized common carriers, interconnects, answering services, cable TV systems and data processing operations.

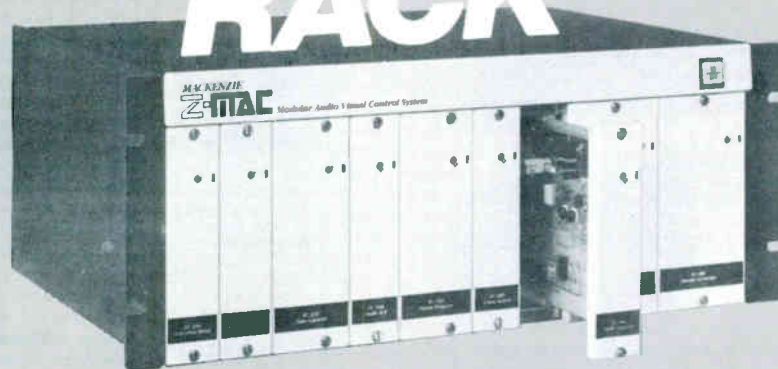
ries as Telcos, cellular radio, specialized common carriers, interconnects, answering services, cable TV systems and data processing operations.

AMPLIFIER: The Delta Omega 2000, a power amplifier that significantly reduces effective radiated distortion in speaker circuits (cable, crossover, voice coil) is illustrated in a folder from Crown International, Elkhart, IN. The Amp incorporates a velocity-control system at the amp/speaker interface, in which the speaker velocity informs the amp, while the amp controls the velocity. This information "loop" ensures a constant monitoring and balance of speaker output.

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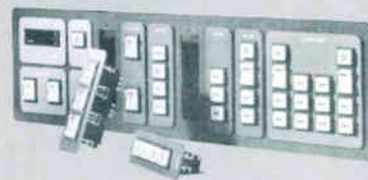
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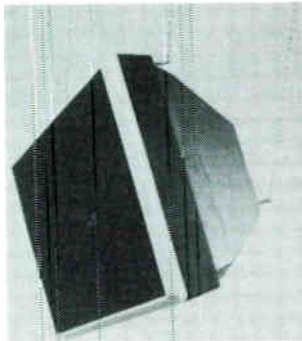
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For complete information and specifications on the entire Series 9000 line, call or write Switchcraft for New Product Bulletin NPB-365a. You'll realize just how sweet our impedance matching transformers can make your life.

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He's too busy to appreciate the clarity, sensitivity and design of this Shure microphone, but you will. The SM59.

Installing the Shure SM59 Cardioid Dynamic Microphone is one step toward a clean, natural sound for all of those who speak for a living. Its wide-range, ultra-flat frequency response prevents unwanted boominess or uncomfortable shrillness that complicates room acoustics and hampers intelligibility. And Shure's patented internal mechano-pneumatic shock mount virtually eliminates table rumble and hand-held noises.

To focus on the sound of the speaker, the SM59 features a classic cardioid polar pattern that remains symmetrical over a wide frequency range. This pattern also helps reduce feedback and other extraneous noises.

An internal humbucking coil minimizes hum problems associated with closed-circuit TV and lighting equipment, while a sophisticated internal windscreen

substantially reduces pop.

A champagne finish and distinctive appearance make this microphone a natural for permanent installation.

All of this makes the Shure SM59 the perfect choice for legislative chambers, court houses, large meeting rooms, pulpits and other public address applications.

In fact, wherever people are busy talking, they'll sound better through the SM59.

For more information on the complete line of Shure microphones, call or write Shure Brothers Inc., 222 Hartrey Ave., Evanston, IL 60204, (312) 866-2553.

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