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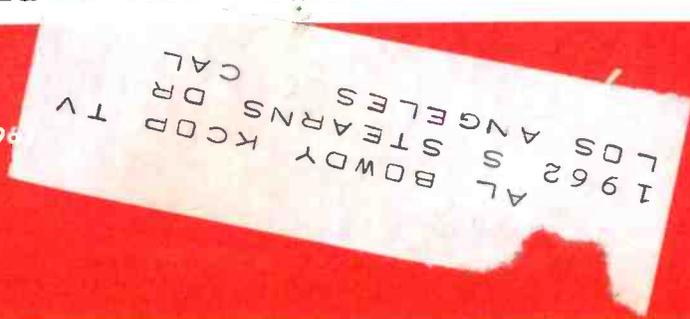
Video Communication Journal



Serving the Audio-Video Communications Industry

IN THIS ISSUE

- NCTA CONVENTION REPORT — Seattle 1963
- PAY-TV — Will it mix?
- COAXIAL CABLE — Losses and VSWR
- SECTION 605 — Part Two



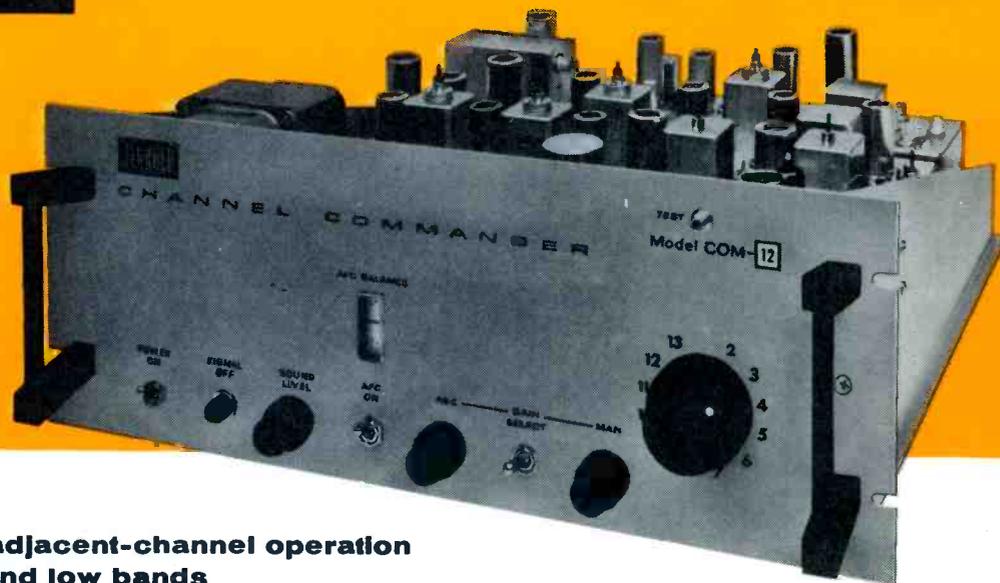
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WITH THE NEW

JERROLD[®]

CHANNEL COMMANDER



- Permits adjacent-channel operation on high and low bands
- Single unit processes, controls, and delivers antenna signal on any channel—including same channel

You can now offer CATV reception on all twelve VHF channels with no adjacent-channel interference! By adding a Jerrold Channel Commander to your head end for each adjacent channel desired, you achieve 12-channel operation with minimum equipment.

The Channel Commander is a complete, compact unit which processes, controls, and delivers clear, interference-free signals on any desired VHF channel, including direct operation on the received frequency in both the high and the low bands.

In conjunction with Jerrold microwave and all-band-system equipment, the Channel Commander gives you command of the entire VHF band, lets you offer CATV subscribers the widest choice of entertainment possible over their present TV sets.

Channel Commander's compact modular design and compatibility with your present head-end equipment lets you "go 12 channels" immediately or in channel-at-a-time stages. Call your Jerrold factory representative or write for complete technical data.

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Community Systems Division

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Channel

1

NOWACZEK NAMED TO NCTA R & D COUNCIL AS DIRECTOR

In a recent announcement, NCTA President William Dalton confirmed the appointment of Frank H. Nowaczek to the position of Director of Research for the newly organized Research and Development Council.

The R & D Council, a function of the NCTA, was conceived to provide technical and economic information to the CATV industry on services that could be performed in conjunction with a CATV system. Studies are currently progressing on various CATV public services such as weather information, emergency warning systems, and educational television.

In assuming the new position, Mr. Nowaczek brings with him the experience in these areas gained during his association, since 1959, with President Dalton where he served as Special Assistant.

Mr. Nowaczek is married, has two children, and resides at 5904 Bowie Drive, Springfield, Virginia.

SKIN DIVER PUTS HIS HOBBY TO WORK

Edward McGinty, one of the five McGintys operating the Atlantic Coast TV Cable Corporation in Atlantic City, New Jersey, is an expert skin diver. On vacations he goes adventuring underwater in far-away places. Most of the year you can find him probing under local waters for sport, and searching for whatever can be discovered in the depths.

This hobby has recently been turned to good use by the Atlantic City CATV system. The company has been granted a franchise in Brigantine, New Jersey, across a stretch of ocean. Ed McGinty has been donning his under-the-sea going clothes to lay down the cable on the ocean floor, so that Brigantine can be linked by wire to the Atlantic City system.

CANADIAN SYSTEM FEATURES TO-THI-POINT ADVERTISING

One of the very progressive Canadian CATV systems is using

CATV

MATV

2-WAY

UHF-TV

Microwave

a unique form of advertising. The system, Cable TV Ltd., Montreal, Quebec, Canada, has a standard postage meter with provision to insert an advertisement as part of the indicia. They have chosen as an advertisement a very simple phrase which reads as follows! Antennas Are For The Birds—Cable TV Is For People.

SACRAMENTO MAY HAVE PAY-TV TEST

Capitol Television Company, Inc., and Melco Pay TV Company have just recently requested FCC approval for a Pay-TV test to be conducted over Channel 40 facilities of KVUE. The telecasting station, KVUE, has been "off-the-air" since the first part of 1960.

Under the proposed system, developed by Mr. M. E. Lucas, normal video is transmitted but the sound is carried on a sub-carrier basis. In order for a subscriber to receive the aural portion of the program, a special adapter would be used (multiplex receiver).

The proposed test is slated for Sacramento, California and would raise the total of Pay-TV tests to three. Denver, Colorado is expected to have Pay-TV tests underway

this summer and Hartford, Connecticut has a test currently in progress.

AUSTIN SYSTEM WELL UNDERWAY

In a recent report concerning the construction progress in Austin, Texas, John G. Campbell of TV Cable of Austin said that more than 100,000 feet of coaxial cable has been installed as of May 2nd.

All the cable installation has so far been limited to South Austin, where the receiving site will be located. A survey and engineering report by Collins Radio Company shows that the city can be served completely with five microwave receiver and coaxial cable distribution points in South Austin, University Area, Northwest Austin, Northeast Austin and East Austin.

TV Cable of Austin expects to install a minimum of 35,000 to 40,000 feet of cable per week. "Currently," says John, "the residents of South Austin certainly should be aware of the white trucks with the 'Abel Cable' insignia moving about the large area."

Campbell added that he hopes to hear soon on the microwave application submitted to the FCC. "As soon as this permit is received," he said, "we will be able to move into the other four areas of the city with simultaneous installations."

TAGLIA NAMED TO NCTA STAFF

James J. Taglia has been named Executive Assistant for the National Community Television Association, it was announced today by NCTA President William Dalton.

Mr. Taglia will have major administrative and internal fiscal responsibilities at NCTA's Washington headquarters and will serve as secretary for NCTA's Standards, Safety and Membership committees.

"Mr. Taglia's appointment rounds out NCTA's administrative staff wherein increasing areas of responsibility have caused the need for additional experienced personnel to take over an increasing work load," Mr. Dalton said.

VIDEO-COMMUNICATION JOURNAL

Combining Television Horizons and Communication Horizons

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Editorial

We, like so many others, have only hours ago stepped down off an airplane ramp, stretched our legs on home soil, and blessed the jets for winging us home so quickly from the 12th NCTA Convention.

So in retro-spect, let's hit a few of the highlights.

Attendance was down. Some of the manufacturers felt that the traffic pattern could have been better. There were few wives in attendance.

But attendance was not down a great deal, and certainly the decision makers were on hand.

Without a doubt, this year's convention must go down in history as one of the most important this industry has experienced.

Where ever we strolled, we were deeply impressed with the soundness of thinking, the deliberate planning and the awareness of problems that propagated the entire meeting.

We listened with an open mind and sympathetic ear to engineers working for the industry's top manufacturers as they discussed the day in the not to distant future when we will have a universally accepted set of standards around which we can design a system utilizing any equipment.

We listened with some amazement to the many places this industry is finding financing, and concluded that by the very character of those who have studied our industry, and who are putting up expansion and building capital, that our industry is a sound one indeed.

Overall we liked everything we hear, and returned to our small niche in this industry confident that 1963 should be a banner year of opportunity for each and every one of us.

RBC

OUR COVER

Recipient of the Man of the Year Award, Loren B. Stone, of KCTS-TV, Seattle, receives a since congratulatory handshake from NCTA 1962-63 National Chairman Glenn Flinn, as new NCTA Vice-Chairman Archer Taylor looks on. Educational telecaster Stone received the honored award for his generous work in the area of educational television and CATV liason over many years, in the northwest.

CONTENTS

GENERAL—

12th Annual NCTA Convention Report

Staff Extra 9

Pay-TV, A CATV Catalyst

Ira Kamen, Teleglobe Pay-TV System, Inc. 13

Section 605 of the Communications Act — Part Two

Jeremiah Courtney, VCJ Contributing Editor 25

Two-Way Radio Speeds Fuel Oil Deliveries

R. A. Page, General Electric Company 33

TECHNICAL—

Understanding Coaxial Cable

Albert E. Hankinson, Oklahoma City, Oklahoma 16

Advantages of Back-Matching in Splitters and Tap-Offs

P. Freen, Benco Television Associates Ltd. 31

Channel One	1	Our Man in Washington	21
Editorial	2	New Product Horizons	29
FCC Horizons	4	Horizons Lab Report	36
System Horizons	6	Logbook	40
Our Man in Public Safety	20		

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OPERATE IT IN RAIN

OPERATE IT IN SNOW

OPERATE IT UNDERGROUND

OR EVEN UNDERWATER!

NOTHING, BUT NOTHING WILL
AFFECT THE INDUSTRY'S ONLY

HERMETICALLY SEALED AMPLIFIER

AMECO DOES IT AGAIN... TRANSISTORIZED TOO!

Talk about Telephone Company specifications!

Here is the CATV industry's first hermetically sealed amplifier. It incorporates the positive sealing of mil-spec "O" rings, and the rugged durability of hard anodic or plated epoxy coatings on all exposed surfaces, including the connectors on models for use with aluminum cable. The amplifier is completely resistant to any environment, even salt spray. Although light enough to be supported by the lashed cable alone, a support bracket which fits standard "C" or "D" lashing clamps is available as an accessory.

On models with aluminum cable fittings, the cable is inserted directly into the amplifier, eliminating the need for extra connectors. Though hermetically sealed, the amplifier chassis is easily reached by sliding cover back over cable. No tools needed!

SPECIFICATIONS

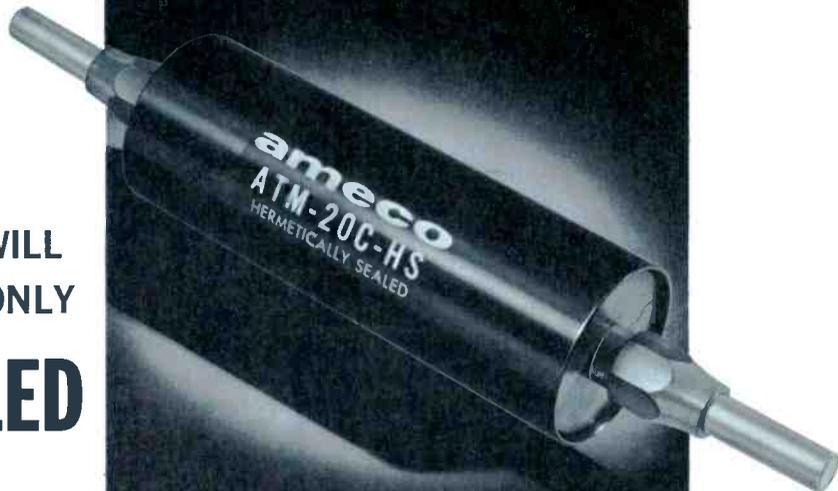
Response	Flat ± 1 db from 40-220 mc
Gain	20 db maximum at channel 13
Test points	-20 db on output, -15V DC supply
Gain-Tilt Control	External (except ATM-20C-HS)
VSWR	1.25 input
Pads	3 db step plug-in
Transistors	2 SM-1600
Size	tube — 2" dia., Length 5 $\frac{3}{4}$ "
Weight:	12 oz.
Recommended input	+10 db
Recommended output	+30 db

Available with connectors to fit .412 and $\frac{1}{2}$ " aluminum cables; "F" series; or "UHF" series. Specify connectors.

Also available painted in special heat-reflecting white paint for use in extremely hot climates.

Special neoprene boots to seal back of connector to polyethylene cable jacket available also. (Used with jacketed aluminum cable only).

ABSOLUTELY WATERPROOF!
YET INSTANTLY ACCESSIBLE
FOR INTERNAL ADJUSTMENTS!



ATM-20C-HS

ALL-BAND LINE EXTENDER AMPLIFIER
(LOW-BAND MODELS ALSO AVAILABLE)

Chassis easily accessible.
Merely slide cover back over
amplifier either way.
No tools needed!



Direct 115 VAC powered
model with sealed power cord. Also
shown is mounting of snap-on support bracket.

PRICE LIST

MODEL NO.	DESCRIPTION	PRICE
ATM-20C-HS	ALL-BAND CABLE POWERED	\$ 84.95
ATL-30C-HS	LOW-BAND CABLE POWERED	\$ 80.95
ATM-20-HS	ALL-BAND 115 VAC POWERED	\$104.50
ATL-20-HS	LOW-BAND 115 VAC POWERED	\$ 99.95
BRACKET	(LESS LASHING CLAMP)	\$.95
PAINTED REFLECTIVE WHITE		\$.75

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80%

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In an unmatched decade of experience the Daniels Team has successfully handled 80% of all CATV systems sold. D & A is the only major brokerage firm engaged exclusively in exchange of CATV properties. As the industry's established authority, D & A has proven time and again the ability to obtain top price for each system handled. Furthermore, only D & A offers complete listing with a wide range of ready, qualified buyers.

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INC.

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31 QUEBEC ST. — GUELPH, ONTARIO, CANADA

FCC HORIZONS

FCC actions, applications and public notices reported here are a representative sampling of actions which the Publishers of Video-Communication Journal feel will be of interest to our readers. The listing is by no means a complete report of all FCC actions in or out of these allied fields of communications.

GENERAL ACTIVITIES

By Public Notice, the Commission announced the adoption of a Report and Order establishing a schedule of fees for the filing of applications in most licensing activities. The new fee schedule contains some modifications of the original proposal (February 16, 1962 — Docket 14507).

Under the new schedule, one exemption has been made in broadcast fees. This exemption was extended to non-commercial educational applications by tax exempt organizations. In other broadcast areas, the filing fees for new commercial stations, major changes, renewals, assignments of license and transfers of control in the AM and FM services has been lowered from the original fee of \$150 to \$50. In the same area, commercial television application fees have been reduced from \$250 to \$100. For other broadcast applications (including television translators) a \$30 fee has been affixed.

Concerning the safety and special radio services, exemptions have been extended to government entities, police, fire, forestry-conservation, highway maintenance, local government, state guard; operational fixed-microwave applications filed for closed-circuit educational television service; also special emergency operations of hospitals, disaster relief organizations, beach patrols, school buses, non-profit ambulance services and rescue organizations; novice class amateur, RACES and disaster services; and compulsory ship inspections. An exemption has also been allowed for applicants to the experimental radio service.

The filing fees for common carrier services are \$100 for domestic public land-mobile service (including base stations and associated mobile units); \$30 for point-to-point microwave service; \$10 for rural radio service; \$50 for local television transmission service; \$5 for domestic public land-mobile radio service individual user mobile unit; \$10 for other common carrier services.

Renewal fees in the common carrier services are as follows: \$25 for domestic public land mobile radio service (including base station and associated mobile units); \$5 for point-to-point microwave radio service; \$5 for local television transmission service; \$5 for rural radio service and domestic public land mobile radio service individual user units; \$5 for other common carrier services.

The prescribed fees for applications filed in the safety and special radio services have been set at \$10 with the exception of applications in the amateur radio service and citizens radio service. Also, applications for radio station

authorizations for operational fixed microwave radio stations have been given a fee of \$30 (no fee required for applications for license to cover construction permit) and renewals for this service have been set at \$4.

Fees paid to the Federal Communications Commission are expected to recoup yearly revenues of about \$3,843,000 for the Government. Under the law, they must be turned over to the U.S. Treasury. Before the January 1, 1964 effective date, the Commission will announce procedures for submitting fees.

The Commission is inviting comments by July 1, 1963 regarding proposed rules which would put a ceiling on the amount of time used for commercial advertising by AM, FM and TV broadcast stations. In the proposal, the Commission is seeking to determine whether the advertising time limitations now contained in the Radio and Television Codes of the NAB, or some alternative, should be adopted.

CATV MICROWAVE ACTIVITIES

Southwest Texas Transmission Company, Del Rio, Texas has been granted a construction permit for 1 fixed facility to operate on 5295, 6355 and 6415 Mc from a location 1.5 miles West of the town of Burnet, Texas. A construction permit was also granted for a fixed facility at Beeler Farm, 14 miles North of Fredericksburg, Texas to operate on the frequencies of 6055, 6115, and 6175 Mc. The new microwave stations will be used to bring the signal of KENS-TV, KONO-TV and WOAR-TV, San Antonio, Texas into Llano, Texas for service to the Llano TV Cable Company, into Marble Falls, Texas for service to the Marble Falls TV Cable Company, and into Lampasas, Texas for service to the Lampasas Cable TV Company. Service to Llano, Marble Falls and Burnet will be via power-split at Beeler Farm. Service to Lampasas, Texas will be via relay at Burnet, Texas.

Mesa Microwave, Inc., Oklahoma City, Oklahoma was granted a modified construction permit to replace transmitting equipment which will result in a power increase from 0.1 to 1.2 watts at its Pledger, Texas fixed video radio station. In the same action a new point of communication was added at Point Comfort, Texas. Mesa proposes to bring the signals of KPRC-TV, KTRK-TV and KHOU-TV, Houston, Texas into Point Comfort, Texas for service to Vumore Company, a CATV system in that community. This will be accomplished by an interception of the signal transmitted from Station KLU25 to Port Lavaca, Texas at Point Comfort with no change in the direction of radiation now authorized to Port Lavaca, Texas.

Teleprompter Transmission of New Mexico, Farmington, New Mexico through its attorney, requested that applications for microwave facilities to have been located at Bayshire, California and Mt. Loma Prieta, California be dismissed. On 5-10-63 the Commission consequently dismissed without prejudice the subject applications.

Autry-Sigmon Communications, Los Angeles, California received construction permit grants for microwave stations at Fremont Peak, California

and Loma Prieta Peak, California. The new stations will be used to provide 5-channel video service to Salinas, Watsonville, Pacific Grove and Capitola, California. The signals carried will be KTVU-TV, KRON-TV, KPIX, KGO-TV and KQED of San Francisco, California and are slated for Central California Communications Corp., operators of CATV systems at the four receiving locations. Signals are picked up off-the-air at Loma Prieta Peak and delivered to Fremont Peak where they are relayed to the four receiving sites by a 4-way power split.

Mesa Microwave, Inc., Oklahoma City, Oklahoma, in a separate Commission action, received special temporary authority to operate microwave facilities at Woodward and May, Oklahoma through August 8, 1963 pending final action on the subject applications.

New York Penn Microwave Corporation, Corning, New York received a construction permit for an additional point of communications at Elmira, New York. Elmira Video, operators of a CATV system serving Elmira, New York will be the recipients of the new service which brings WPIX-TV, New York City, to that community. Service is to be effected through interception of the microwave beam presently directed toward Connecticut Hill, New York.

TWO-WAY ACTIVITIES

Waco Communications, Inc., Waco, Texas has requested a modification of license to change frequencies at its Long Mountain site and to change authorized control point.

J & J Radio Dispatch Service, San Antonio, Texas applied for a construction permit change to reflect the relocation of the base station and authorized control point. J & J also requested that they be allowed to make changes in antenna structure at their 2-way radio station in San Antonio.

Industrial Communications Systems, Inc., Los Angeles, California has requested a C.P. to install an additional base station transmitter and 60 mobile units to operate on 454.25 and 459.25 Mc at existing locations No. 1 and No. 3.

COMMERCIAL TELECASTING ACTIONS

Shenandoah Valley Broadcasting, Inc., licensee of station WSVN-TV, Harrisonburg, Virginia has requested that the Commission amend the television allocations table to assign UHF channel 74 to Charlottesville, Virginia.

It is expected that if the Commission grants the request, WSVN-TV will apply for the channel to operate a satellite television station.

Honorable Alvin E. O'Konski, Member of Congress, has requested that television channel number 4 be allocated to Merrill, Wisconsin. It is expected that if the grant is made, the Congressman will file an application to operate a television station there.

South Carolina Educational Television Commission has been granted a construction permit for a new non-commercial educational television station to operate on channel 7 at Charleston. Antenna height will be 180 feet, visual ERP 29.4 kw.

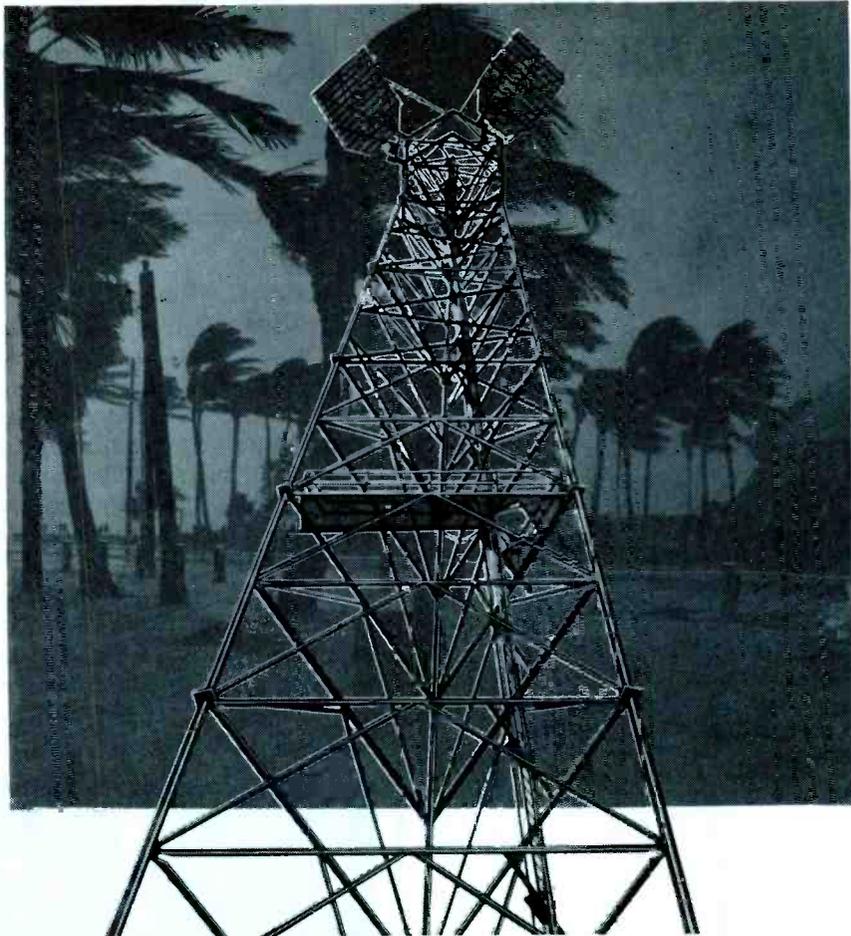
An application for UHF television channel 19 has been filed in Victoria, Texas by **Victoria Television, Inc.** The applicant would serve the region with 18.75 kw visual power from a 433 foot tower.

An application for UHF television channel 44 has been filled in Boston, Massachusetts by a firm called **Integrated Communications Systems, Inc.**

The **Indiana State College Board** has filed an application to operate a non-commercial educational television station on channel 57 at Terre Haute, Indiana. The station would have a 457 foot tower and operate with 520 kw visual power.

Television station KTVB, Boise, Idaho has filed an application to build a 12.9 kw, Channel 13, satellite station at La Grande, Oregon. The applicant requests waiver of section 3.613 (b) of the Commission's rules.

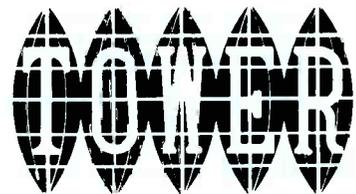
RIGID IN WINDS OVER 140 M.P.H.



ENGINEERED AND BUILT BY TOWER

RIGIDITY—TOUGHNESS—PERFORMANCE . . . these qualities your towers must have. Towers engineered and erected by Tower Communications Co. (like the tower above) are engineered and built to withstand hurricane force winds, blizzards, ice, nature's toughest tests. In short, they're built with engineering know-how acquired by being in the tower business for more than 20 years. As a matter of fact, towers by Tower have for years faced up to these rugged elements in every corner of the globe. Accept no less than the performance proved best . . . specify Tower . . . the world's largest fabricator and erector of Microwave Towers, Reflectors and Buildings.

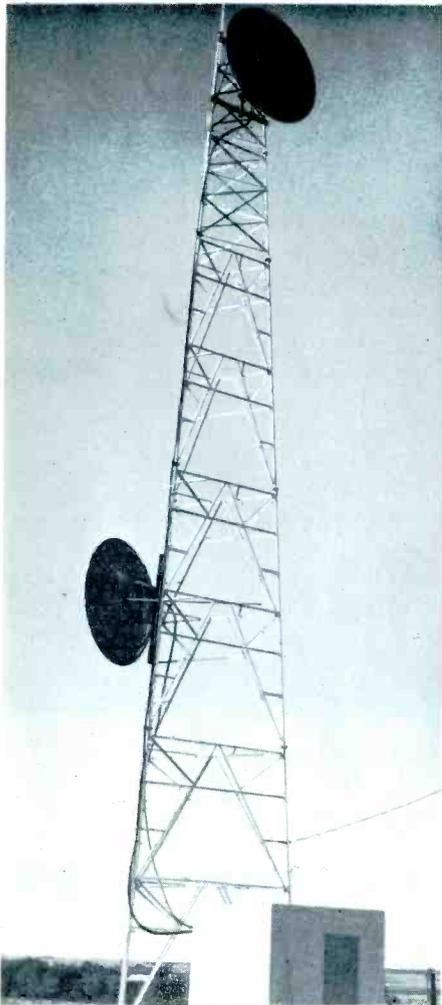
WRITE TODAY
FOR
COMPLETE CATALOG



COMMUNICATIONS CO.

DEPARTMENT 6-A — 2700 HAWKEYE DRIVE — SIOUX CITY, IOWA

CHECK ROHN FOR YOUR TOWER NEEDS FIRST!



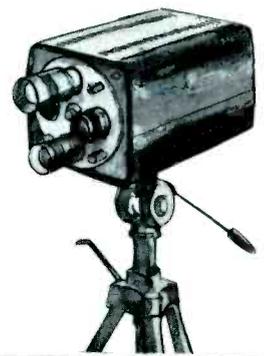
- ★ Full line of proved communication towers to fit every need . . . includes heavy duty broadcast, CATV, and microwave.
- ★ Tower design and engineering is tested by thousands of ROHN tower installations.
- ★ Complete installation service available to take care of the entire job—professionally and to save you money.
- ★ Complete line of microwave reflectors and tower lighting equipment available.
- ★ Deal with one of the oldest and largest tower manufacturers in the U.S.—representatives world-wide.

Write—Call—Wire for Immediate Service.

ROHN Manufacturing Co.

P. O. Box 2000
Peoria, Illinois
Phone AC 309-637-8416

SYSTEM HORIZONS



PEOPLE . . .

David C. Pinkerton has been named manager of engineering for G.E.'s Communications Products Dept., Lynchburg, Va. In his new position, he will have design and development responsibility for mobile radio, microwave, carrier current devices, tropospheric scatter equipment and tiny pocket transmitters and receivers. Mr. Pinkerton succeeds Richard P. Gifford.

Simon Pomerantz is now Corporation Treasurer and Assistant Secretary for the Jerrold Corp. Mr. Pomerantz was promoted to this position just recently. Starting as



head of Jerrold Electronics' Accounting Dept., thirteen years ago, Mr. Pomerantz has held the executive posts of controller, secretary and treasurer.

Frank A. Gunther, president of Radio Engineering Laboratories, Inc., has been appointed by the FCC to the National Industry Advisory Committee. As a member of the Amateur Radio Services Subcommittee of NIAC, Mr. Gunther joins that organization in assisting and advising the FCC on means

of ensuring a continuity of communications in time of war or emergency. Mr. Gunther is a Senior Member of the IEEE.

Dan O'Connell has been promoted to the position of Marketing Administrator, Distributor Sales Division, Jerrold Electronics Corporation. As Marketing Administrator, Mr. O'Connell's duties include market analysis, product analysis, product forecast, budget control, field sales analysis and preparation of both Jerrold reception aid and Jerrold-TACO antenna line sales plans.

Raymond V. Schneider has been named as vice-president in charge of the CATV Division and Jay J. Merkle as vice-president of the Programs and Productions Division of the TelePrompter Corporation it was learned recently. Mr. Schneider, who joined TPT in 1961, previously was vice-president and general manager for 10-years of the Williamsport, Pa. Cable Co., and supervisor of the CATV Division of National Theaters and Television, Inc. Mr. Merkle was pro-

Continued on Page 30

Presenting a star performer from the INTEC-WESTBURY Line

BRIDGING AMPLIFIER for LOW and HIGH BAND DISTRIBUTION

*Best buy for a
LOW BAND SYSTEM!*

*Unbeatable
economy for an ALL
BAND SYSTEM!*

*Leaves you
prepared for expansion
to HIGH BAND SYSTEM
at no extra cost!*



Volume production brings you the Intec-Westbury Model AB-4 Bridging Distribution Amplifier with individual low and high band sections at a **PRICE YOU EXPECT TO PAY FOR LOW BAND CAPABILITIES ALONE!**

If you missed us in Seattle, write for data today!

- Four separate isolated outputs
- Plug-in pads
- Built-in cable powering circuitry
- Minimum main line loss
- High & Low Band — separate gain controls
- High & Low Band — separate slope controls

Manufacturers of the **INTEC WESTBURY** LINE of CATV Equipment.

westbury catv corp.

4 Tecumseh Ave., Mt. Vernon, N. Y. 914 OWens 9-5225

WESTBURY CATV. CORP.
4 Tecumseh Ave., Mt. Vernon, N. Y.

Gentlemen:

Please send data on Model AB-4

Please send complete catalog

You can help us with the following "problems" or quotations on

We are Reps System Installers Operators

Name

Address

• PRE-AMPLIFIERS • LINE AMPLIFIERS • CHAIN AMPLIFIERS • DISTRIBUTION AMPLIFIERS • BRIDGING AMPLIFIERS • LINE EXTENDERS...SPLITTERS • TAPS • TRAPS • MATCHING NETWORKS ... Vacuum Tubes Transistorized

VIKING

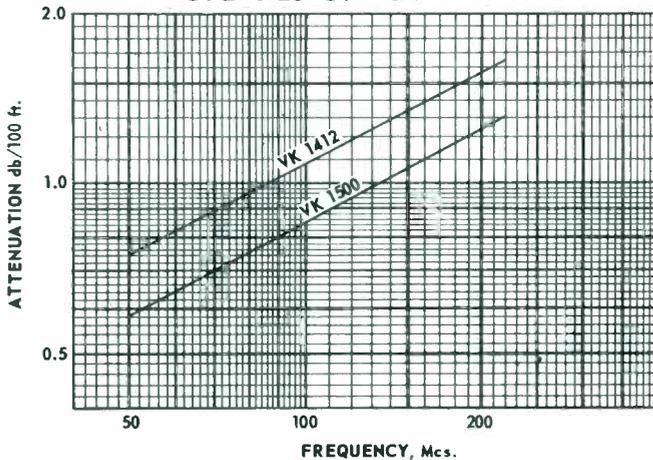
PROUDLY INTRODUCES

“VIKAL”



SEAMLESS SOLID SHEATH ALUMINUM CABLES

PROPERTIES OF VIKAL CABLES



LOWEST PRICES ON THE MARKET
Plus a complete line of E-Z lock fittings and connectors for aluminum jacketed cables.

LOWEST LOSS LOWEST RADIATION CHARACTERISTICS

- SEMI FLEXIBLE CABLES TO COMPETE WITH ALL FLEXIBLE TYPES.
- MADE TO RIGID STANDARDS.
- STRICT ADHERENCE TO PUBLISHED SPECIFICATIONS.
- PROMPT DEPENDABLE SERVICE AND DELIVERY.
- GUARANTEED DEPENDABILITY.

AVERAGE LOSS CHARACTERISTICS

TYPE	Nom. Outside Diameter (in.)				Attenuation (max.) (db/100 ft.)		Ship. Wt. (incl. reel) (lb./ 1,000 ft.)
	Conductor	Dielectric	O. D.	Jacketed	Channel 6	Channel 13	
VK1500	0.098	0.450	0.500		0.84	1.40	130
VK1500J*	0.098	0.450	0.500	0.580	0.84	1.40	160
VK1412	0.075	0.362	0.412		1.05	1.65	100
VK1412J*	0.075	0.362	0.412	0.480	1.05	1.65	120

* J - With extra long life non-contaminating polyethylene jacket.

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Report 1963

The NCTA Convention



A busy industry held its annual convention and trade show in Seattle, Washington during the week of June 10 to 14. That industry was **our industry**, Community Antenna Television.

In spite of a far-corner of the USA locale, an early June meeting and a number of other none to complimentary features, the 12th Annual National Community Television Association Convention was undoubtedly one of the most productive ever held.

A growing awareness of pending federal regulation and an ever mounting judiciary bill set the stage for serious private and public sessions.

As one wag put it, "we accomplished more this year than most recent years that I can recall simply because everyone came prepared to sit down and discuss out our problems to their logical solution."

And logical solutions there were. Many in fact, a large percentage of which will be announced through the offices of the NCTA in the coming months.

There was ample evidence of ever increasing large system investors becoming larger, and additional evidence that the public service aspect of CATV is in for many varied changes in the year ahead.

A specific sign of the times was the industry's considerable interest displayed in the new Research and Development Council. The R & D arm, while not an official operation of the NCTA, is headed up by former NCTA devotee rank Nowaczek. Nowaczek's R and D Council, financed by contributions from a number of manufacturers and large system owners, is seeking to find answers to the questions concerning auxiliary services that can be provided by master antenna systems.

The R & D Council was approximately one year old at this year's meeting. As an operation financed not by NCTA funds but more specifically by contributions from NCTA full and associate members, the ground work was laid for the eventual adoption of the R & D program into the NCTA's overall operation at some future date.

Nowaczek, in a morning meeting, reported to the members on his Council's progress to date in areas of collecting and deciphering material in the region of educational television, civil defense alarm systems and other closed circuit public service or auxiliary services that the cable systems of the future may include in their sales bag of tricks.

In the area of stock complexities and multiple-system single-ownership growth, evidence was everywhere that the big intend to get bigger.

One relatively recent entry into the multiple system field told interested parties that their management has set a goal of 100,000 subscribers on all systems they now own, plus new systems they are negotiating for, by the end of 1963. The firm now operates systems serving approximately 30,000 subscribers:

In an unverified announcement, it was reported that the first and second "largest" CATV system multiple owner groups may soon merge. It was reported that a recent stock transfer amounting to 11 percent of one firm plus the purchase of approximately \$1,000,000 in outstanding securities of the same firm, by the second firm, has paved the way for the expected merger of the two firms. If the report is accurate, a new single owner comprising approximately 105,000 system subscribers stretching



Daniel Mezzalingua, Craftsman Electronic Products, Inc., Manlius, New York (left) was quick to point out one of his firm's many cable accessory items on display at the show.

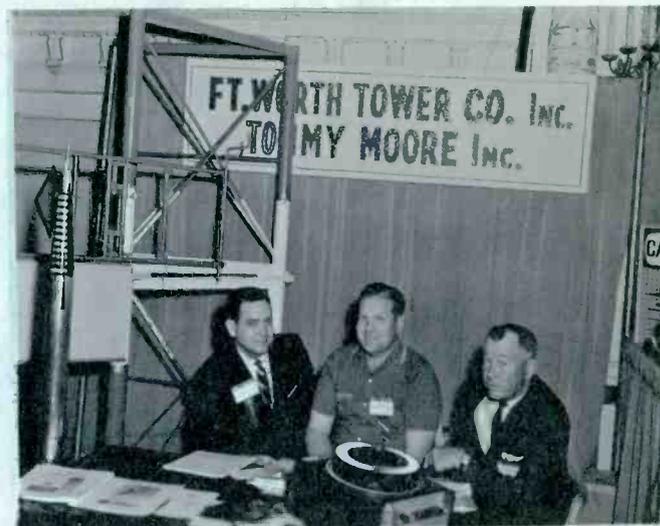
from eastern Canada to California may soon be under a single roof.

In a similar vein, Irving B. Kahn, chairman and president of Tele-Prompt Corporation has announced that he had agreed to sell 40,000 shares of his own personal holdings in TPT to BFS Company. The purchase, at \$6.00 per share, carries the provision that Mr. Kahn may re-purchase the stock or any portion thereof in a five year period for an amount somewhat greater than the sale price.

TPT owns and operates 14 community systems in the United States and is one of the major suppliers of CCTV facilities.

The system owners, large, small and multiple, found a wealth of new and much improved equipment on display at the show portion of the convention. All leading manufacturers, as well as most of the principal suppliers, were on hand.

Three firms on the floor plus one which hung out on the second floor has operating weather chan-

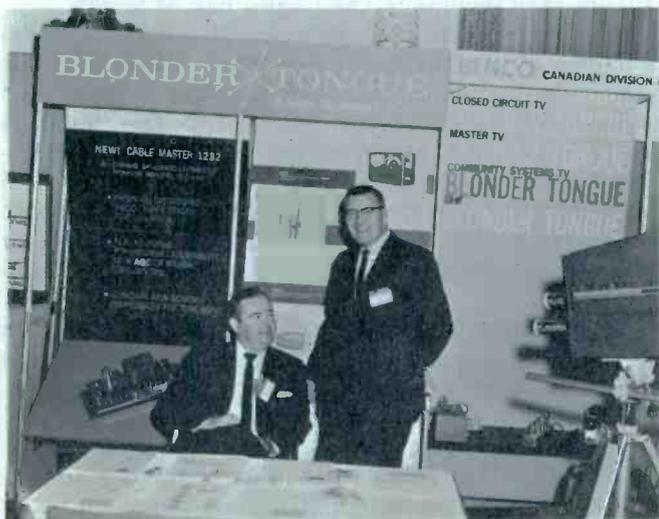


Fort Worth Tower Company, Inc. was the sole tower constructor present at the show, a fact that President Tommy Moore (center) probably won't complain about! Visiting in Tommy's booth were Ben Conroy, Uvalde, Texas (left) and John Monroe, Video Vumore.

nels. Two of these (CAS, Eero-Test Equipment, Co.) had their weather systems feeding the closed circuit television channels in the master distribution system at the Olympic Hotel, where the convention was quartered. You needed to but switch to either channel 2 or 3 (not used on the hotel system) to get the sales message, time, weather data and so on.

The weather systems displayed ran the gamut from CAS's relatively inexpensive weather-board unit to the more elaborate and system compatible unit of Weather Channel offered by Telemation, Inc.

Telemation's system provides for the optional addition, through the basic system, of slides, 16 MM films, separate audio or local origination video. To many of the larger operators, this made good sense if they were contemplating an eventual switch into a full or part time local origination channel at some future date.



Jim Mackey, left, and old friend of VCJ Les Farey, right, tended the Blonder Tongue booth which featured closed circuit TV and community systems equipment. Also on hand were Ike Blonder and wife Lois.



From Newark, N.J. came Arthur Baum (left) and Donald Dworkin (right) of Viking Cable Company. Viking featured their new seamless sold sheath aluminum cable at the show.



Electroline of Montreal, Quebec was represented by Mitchell Clfman, left and Maurice Olfman, right. The firm displayed a new line of transistorized equipment from Great Britain, and a series of high level amplifiers utilizing the new 7788 high mU pentodes.

Transistor equipment was all the rage. Proven in the field now, for nearly two years in some areas, weatherproof sealed cylindrical line amplifiers, and the associated components, were on display at practically every turn.

AMECO, to answer rumors that transistor equipment couldn't be cascaded, didn't work in moisture, and was subject to various other problems, ran an 18 amplifier 8 channel system including one amplifier that operated in a fish bowl (under water!) as their proof that transistors were here to stay.

Not to outdone, Jerrold displayed a series of new amplifiers featuring elaborate and finely tooled outer housings that the manufacturer claimed were indestructible, not subject to the elements and easy to service.

The entire trend of the show (and our singling out these manufacturers in no way indicates any-



A highly successful program of adding taped background music to CATV systems has put Tape-Athon into the foreground as a leading auxiliary supplier to the industry. On left is George Anthony, on right Tom Aye.

thing more than the direction the industry is taking) was to equipment that has maximum reliability, lower upkeep and maintenance, and maximum compatibility with the future direction of the industry.

There were many new faces at the show, made up for the most part of people representing interested parties who themselves are just getting into CATV. There was much discussion over ways and means of financing complete systems, with the trend of discussion (if not action, at this point) leaning towards long term lease programs. One firm on hand offered leasing programs that ran 9 years in the initial contract and up to and beyond 15 years through renewable clauses. Following the 1962 Tax Law revision on the subject of depreciation of system equipment, there was considerable indication that leasing will play a more and more important part in system operation in the future.



Ed Shaeffer, left, expounds on the virtues of Entron's high output broadband distribution amplifier, while Entron's Heinz Blum, right, ensures that Ed keeps his mind on the specs!



TELCO of Lewistown, Pennsylvania, a leading supplier of CATV parts, equipment and systems, represented a number of principals at the show. Here Jerry Conn points up the features of the Sadelco field strength meter, one of the lines carried by the firm.



Hank Shapiro, Westbury CATV Company, found his location in front of the main exhibit hall door a bit hectic at times. But Hank's a good natured sort and preferred to laugh the entire matter off, as he is doing here.

And there were talks of exotic systems. You know this when you corner someone like Tommy Moore of Fort Worth Towers (a major supplier of towers to the industry) and listen as he describes towers he is bidding on. A 1,100 foot tower, designed solely for the reception of distant television signals, has got to feed an exotic system!

Not all of the progress in the industry is being confined to activity in the United States. One heard talk of a system that is being planned to feed a Caribbean island with signals from South Florida stations. A 1,000 foot plus tower is planned and the principal stumbling block appeared to be "how do we anchor such a tower in the sand of the island? Drill down to the coral?"

The Canadian operators were in particular attendance. Western Canada has an excellent CATV operator's group, and most of these fellows were on hand. Here one heard talk of financing UHF translators in the states, to operate on or near the border, to serve pockets of U.S. population and to provide the necessary relay to bring usable signals to above border Canadian systems, from U.S. stations. One operator described a new 900 foot tower, complete with ten foot UHF parabolic dish, which he was outfitting with a \$5,000 parametric amplifier to capture the signals of a UHF translator some 70 miles distant.

The lack of man power, trained man power, was everywhere evident. The growing pace of the industry have not necessarily been kept at an even keel with the trained personnel capable of managing and operating systems. More than one system owner complained that his key people were literally being pirated out from his employe by other operators who were willing to offer more advantages. There was general discussion of offering system managers and key operating personnel a stock equity in their respective operations as an added inducement to stay with their employers and grow. This trend, especially as larger multiple operators



themselves continue to grow, has already cut deep into the trained personnel that come out of the manufacturing plants around the country.

ELECTIONS

The frame work for the new year was pretty well drawn up around the new officers of the NCTA, who were elected at the convention.

Fred J. Stevenson, president of Rogers TV Cable, Inc., Rogers, Arkansas, and a former NCTA Board Member, has been named NCTA National Chairman, succeeding Glenn Flinn of Tyler, Texas.

Also elected to 1 year terms as officers of the NCTA were: Archer Taylor, Northwest Video, Inc., Kalispell, Montana, who was elected as National Vice-Chairman; Jack R. Crosby, Waxtex Cable Corporation, Del Rio, Texas, who was elected Secretary of the NCTA; R. 'Lee' Stoner, Eastern Oregon Television, Inc., La Grange, Oregon, named to the post of Treasurer.

Elected to three year terms to the NCTA Board of Directors were: George J. Barco, Meadville, Pennsylvania; Benjamin J. Conroy, Jr., Uvalde, Texas; Douglas B. Danser, Naples, Florida; Bruce Merrill, Phoenix, Arizona; J. Lenord Reinsch, Atlanta, Georgia; Franklin R. Valentine, Jr., Dallas, Texas and Ralph L. 'Bud' Weir, Junction City, Kansas.

Elected to a two year term was Harold Harkins, Webster Springs, W. Va..

Elected to one year terms were Charles W. Fribley, Jr., Corning, New York and William R. Maginnis, Yreka, California.

PHOTO PARADE

Video-Communications Journal's Russ Miller, managing editor of this publication, returned to our Oklahoma City editorial offices with the finest collection of photos we have ever seen of an NCTA convention. In the August issue, we will present a wide variety of this photos in a photo montage. Those photos appearing as a part of this report were those processed and available for publication as we went to press just days after the convention wound up in Seattle.

VCJ

A New Approach to —

Pay-TV, a CATV Catalyst

By Ira Kamen
Teleglobe Pay-TV Systems, Inc.

Pay-TV may become the catalyst for joining the theatre exhibitors to the CATV operators. As predicted by the **Gallagher Report** of December 10, 1962: "Pay-TV is the biggest potential growth industry since electronics and space." The theatre owners enlightened to these Pay-TV growth opportunities are now taking positions with the Pay-TV proponents and have more than a foothold in new CATV activities. To understand why the theatre owner, CATV operator marriage is on the horizon, we must understand the problem of the entertainment industry.

The Theatre Market

The motion picture theatre business, according to local exhibitors, is a weekend operation with minimum volume realized during week days that are not associated with holiday periods.

The cost of evening entertainment at the movies is expensive even for those in the upper middle income group due to the plus cost of traveling to and from the theatre, baby sitter problems, and the tendency to incur the costly expenditure of pre-or post theatre dining at a local restaurant — and every member of the family must pay for a ticket. Inclement weather and rigorous climate in many areas wrecks the drive-in business even on weekends and some drive-in operators in northernly climates suspend entertainment operations during the winter.

Why Pay-TV in the Home

There are, of course, those who

would like to enjoy the better films several evenings a week; however, they prefer the comfort of the armchair in the home to the effort of driving or walking after a day's work to the local theatre. If the theatre owner could expand the number of seats in his theatre via connection to a Pay-TV system integrated with a Community Antenna Television distribution system connected to homes with television sets, he would unquestionably expand the number of viewers per picture as well as build up the attendance during slow week day periods — his extension theatre audience would also not incur the additional expenditure of an evening out — only the price of a single ticket to the movie. Actually, the Pay-TV system tests in Hartford have proved that Pay-TV is a lower cost form of entertainment as the subscriber pays for only one ticket although the whole family

views the entertainment, and there are no baby sitter, parental worries. To the tired businessman, the fact that he does not have to dress and the refrigerator is handy, adds to his enjoyment of the Pay-TV program. Broadway plays ("Show-girl," "The Consul," "Second City Revue."), Bolshoi Ballet, operas, and specialized nightclub material broadcast free of annoying commercials, supplementing good movies, further assures public acceptance of Pay-TV as a plus service for the American home.

Wiring the Television Homes

Taking for example the soon-to-be conducted Pay-TV tests in Denver, Colorado, the system that will be used, developed by Teleglobe Pay-TV System, Inc., requires that only a single telephone pair and associated speaker be installed. Here, the advantages are obvious inasmuch as no physical connection to the television set is necessary, a point well taken by subscribers. But, more meaningful is the fact that initial hook-ups are wholly uncomplicated.

Of the many systems devised to net the same end, most all are totally compatible to the CATV system and the subscriber. All require minimum time to install the Pay-TV equipment and all have certain advantages. In the Denver installation, during the times when there are no programs in process, the Teleglobe system will supply the subscriber with good music as well as inform him of up-and-coming programming. This latter feature can and does aid in selling Pay-TV to the consumer.

Physically connecting the sub-

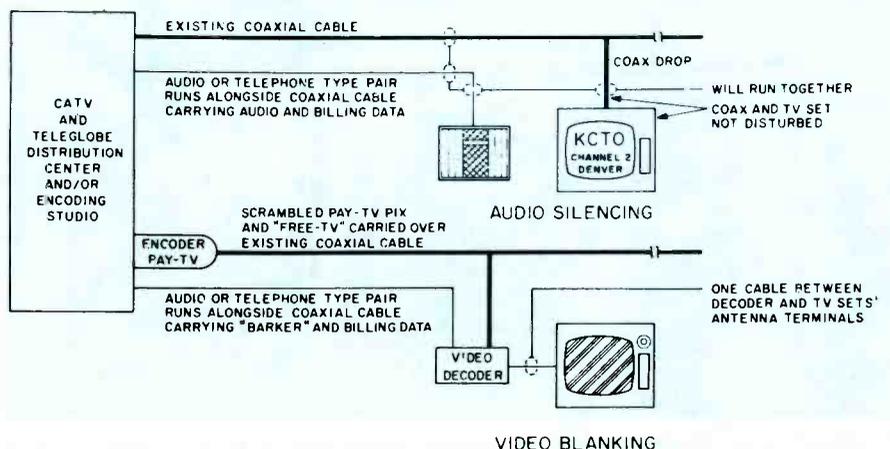


FIGURE 1

scriber to a Pay-TV system can be accomplished by a number of different means. Figure 1 shows two methods, both utilized by Teleglobe, to supply the Pay-TV material to the home. The upper part of Figure 1 shows the "separate audio" system where a normal picture is supplied via CATV and the aural portion is carried over a sepa-

rate line pair. The bottom drawing illustrates the scrambled Pay-TV system. This latter system requires a video decoder which is independent of the television receiver.

Potential

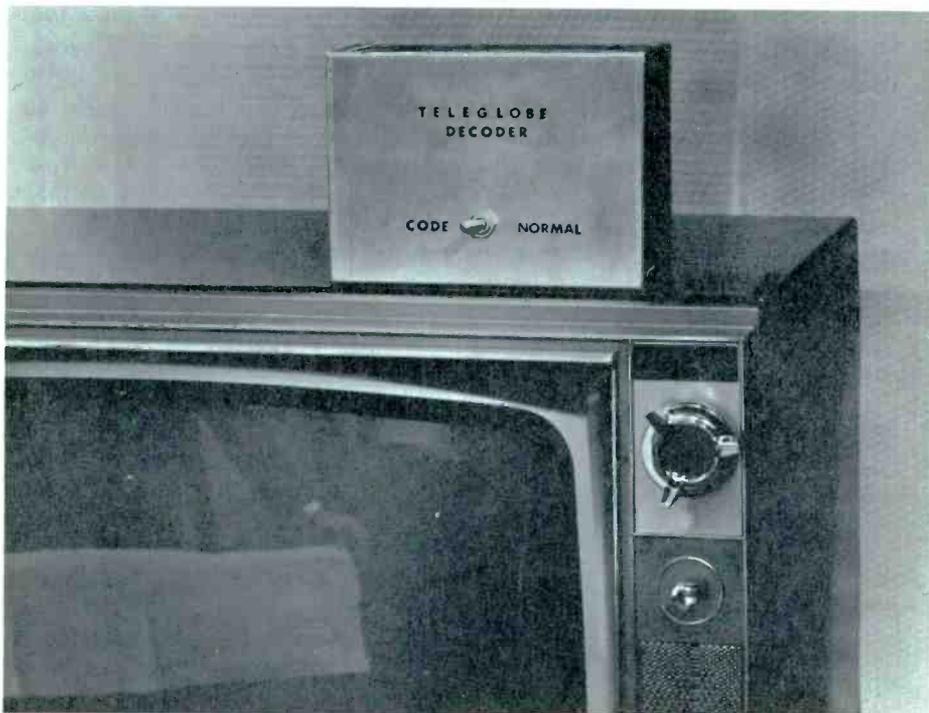
Pay-TV is of course in the wave of the entertainment future. Theatre operators could increase their

potential many-fold via entering the home using the closed circuit cable theatre principle. The closed circuit Pay-TV home theatre seat costs approximately 1/10 of the construction of the most modest theatre seats; i.e., \$45-\$60 per home theatre seat versus \$450 to \$600 per theatre seat.

As may be noted from the **Galagher Report** and Chairman Newton Minow's public statement, "lighting up 82 channels will make possible nationwide pay television," the UHF channels may be given the right to broadcast Pay-TV in order to best encourage UHF to develop and survive against the competitive network broadcasting operations. It will also make possible a huge purchasing power for producing and recording the best films and plays in a high quality format. While Pay-TV is still for the minority — it is an ever-increasing minority, as the intellectual standards of the nation improve and those who want something better than advertiser-sponsored TV fare increase in number. The CATV-Pay-TV system may give CATV operators a ground-floor position with their existing facility under the most favorable circumstances to theatre operators for expansion in areas where there are homes with TV sets, multiple dwellings, and housing developments. The unique Teleglobe Centralized Metered Pay-TV system will not require any modification to shift from cable to "over-the-air" UHF operation; therefore, it could not be obsolete by a local channel activation for Pay-TV. Most theatre operators missed being on the advertiser-sponsored TV bandwagon. CATV operators without major investment could give the theatre operator an opportunity in Pay-TV by working together on the installation of a compatible closed-circuit and over-the-air Pay-TV system which will increase the income from the CATV subscriber. In turn it is a good deal for CATV subscribers who pay only for what they want to see and by being subscribers in a Pay-TV network will open new vistas of entertainment and culture for the enrichment of their lives.



Pay-TV Centralized Metering Equipment. S. Sagall, President of Teleglobe inspecting tape which datalogs the billing information. Article author and Teleglobe's Technical Director — right of scanning mechanism.



"On channel" video decoder which installs between antenna and TV set and signals scanner in same manner as Speaker Control Unit so that Centralized Metering and Billing is possible with this version of the system.

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6AF4A	1.45	6AW8A	1.35	6CD6GA	2.10	6X4	.60
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Understanding Coaxial Cable

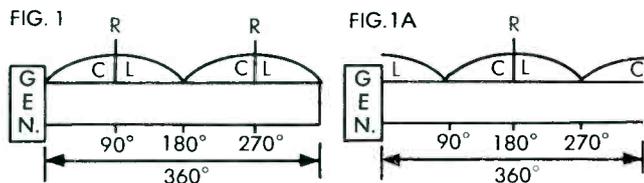
by Albert E. Hankinson
Oklahoma City, Oklahoma

“Behind the simplicity of coaxial cable lies a background of science and physics that has brought the state-of-the-art to what it is today.”

The Three Basic Terminations

In “Understanding Coaxial Cable — Part One,” we stated that the voltage waves, maximums and minimums, are the result of an improper load termination. In this category of terminations, we find there are really only 3 basic types. All line terminations are a form of one of these three which are: (1.) non-power consuming; (2.) partial power consuming; and (3.) total power consuming.

First, the non-power consuming load. Despite the fact that we usually strive to attain a matched condition and with this, the most efficient transfer of energy, we find that the worst possible conditions, the “open” and “shorted” terminations are extremely useful. For the moment we can neglect the purely capacitive or inductive loads. In Figure 1, we show the shorted condition. By simple logic, we know that the voltage across the short will be zero (a minimum) and the voltage vectors are shown in phase opposition. In Figure 1A, we have the open line, and the voltage at the end of the line sees an extremely high impedance (infinite) and therefore a maximum voltage exists.



One slightly dubious technical analogy which is often used is to point out that on an open line, the two open ends are like the plates of a capacitor and that the “C” formed by the voltage wave screams that the reactive component in the first 90° section is capacitive, then since a short is the opposite of an open, the first 90° of line terminated in a short must be inductive. As I said, a crude, dubious but highly effectual statement when trying to drive home termination concepts. In both the open and the short, no power is consumed hence “non-power consuming load.”

Second, Partial power consuming loads contain some resistance and some reactance, the reactance being either inductive or capacitive. If we take an example of each and apply vector analogy, we find that with R&C, as we move back on the line toward the source, we first arrive at a voltage minimum and at any point prior to that minimum, the impedance we would see if we cut into the line would be resistive and capacitive. Conversely, with a R&L termination, we would arrive at a voltage maximum and the impedance prior to the maximum we would see would be resistive and inductive. While these may seem like abstract points at this time, later they assume a definite importance.

Third, Total power consuming indicates that all the energy arriving at the load is consumed and that if we cut into the line at any point, we would find a purely resistive impedance equal to the characteristic (Z_0) of the coaxial line.

Up to this point we have established the basic voltage waveforms that exist on a transmission line as a result of the various classifications of terminations or “loads.” These voltage waveforms can be very useful in explaining the results obtained when various and sundry “gimmicks” are employed in connection with transmission line problems. Too often, these so-called “gimmicks” are used without the realization that they are merely an application of some basic concept of line behavior rather than some mysterious and unexplainable phenomena!

Students in transmission line courses often complain about the length of time devoted to relatively dull portions of basic line theory. This is readily understandable as anyone with any interest whatsoever in electronics and particularly with that portion dealing with the reception or transmission of energy has encountered transmission lines either in the open wire or coaxial form. This causes some students with a practical background to look with disdain on the theoretical considerations, that is, until someone rocks the boat by asking for an explanation as to “how it works.”

So, if you have the time to review the past issue, we can move on to more interesting portions of transmission line theory. This brings us to Standing Wave Ratio.

Voltage Standing Wave Ratio

Since we dealt strictly with voltage in our first analysis, and since the usage of voltage is most commonly employed, we will remain on that path and

state that Standing Wave Ratio as used here will be the Voltage Standing Wave Ratio. This VSWR is a much sought after item. If we can measure it, we can use it as a major tool in line analysis. First though, we must understand just what this elusive VSWR is. With reference to any one of the voltage waveforms developed by the different loads initially analyzed, we see a pattern of voltage maximums and voltage minimums. For quick reference, examine Figure 2, where we show a 50 ohm coaxial line with a half-wave dipole as the termination. Since this setup is one which is in common usage, we will base our analysis on the data given in Figure 2.

"LUMPED" EQUIVALENT OF TRANSMISSION LINE

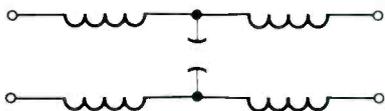


FIGURE 3

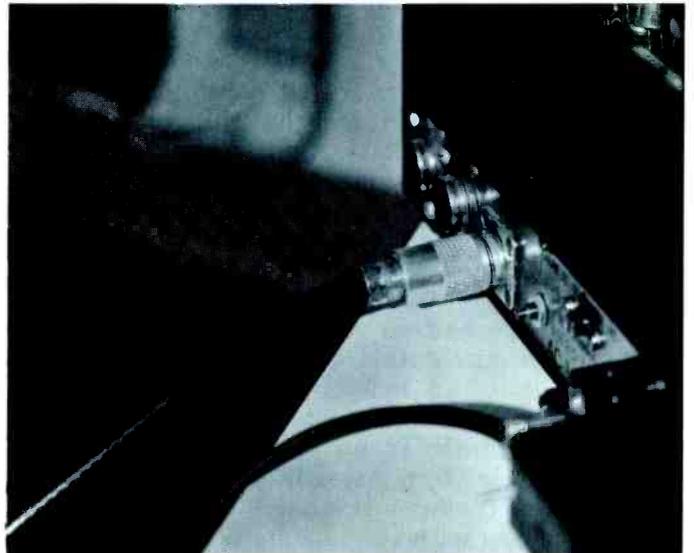
Applying the formula for Coefficient of Reflection (Gamma), we can determine the attitude of the incident and reflected vectors at the load. (Remember, a halfwave dipole exhibits an impedance of approximately 72 ohms).

$$\text{Gamma} = \frac{Z_r - Z_o}{Z_r + Z_o} = \frac{72 - 50}{72 + 50} = \frac{22}{122} = .18 \angle 0^\circ$$

So much for Gamma . . . Now, let us examine the accepted definition of Voltage Standing Wave Ratio. It is defined as the RATIO of the Voltage Maximum to the Voltage Minimum. Basic concepts say, the Voltage at a maximum point is the vector sum of the incident and reflected voltages, and likewise for the Voltage Minimum. Now if we pick up the information we obtained in solving for Gamma, we find we can solve for our VSWR using the ratio formula. In this case, the Voltage Maximum is 1.18 and the Voltage Minimum is .82. If we set it up as 1.18/.82, we arrive at a VSWR of 1.439 to 1. This VSWR is in reality, a measure of the efficiency of energy transfer. With reference to the basic loads previously discussed, we pointed out that when the termination or load is equal to the characteristic impedance (Z_o) of the transmission line, there will be a complete transfer of power to the load. If we were to continue to think in terms of the theoretical or "lossless" line, this means that if the generator delivered 10 watts to the input end of a correctly terminated line, there would be a transfer of 10 watts to the load. In the case of the actual or practical line, we would find that even if the line were correctly terminated and we delivered 10 watts to the line, that unless the line was extremely short, we would find that there would be a loss of power in the line between the generator and the load. This is due to the resistance, inductance, and capacity between the conductors and is stated for certain frequencies in many reference publications. (More on this a bit later).

Now if we accept the fact that some loss is inevitable in the cable itself, then we can examine the additional loss incurred by not having a proper termi-

nation. This is not something we have to guess about but instead is something we can readily calculate (using very simple math). For example, in Figure 2, if we were concerned about the additional loss with this relatively minor mis-match, we can use the available information and determine the loss in terms of percentage. The free and easy way of doing it is to take the value of magnitude of Gamma, which in



Coaxial cable has played an ever-increasing part in the development of our modern communications systems. What it may contribute tomorrow will ultimately be governed by man's ingenuity.

this case is .18 and square it. .18 squared = .0324, expressed as a percent, this says that this arrangement of a 50 ohm line feeding a 72 ohm load will result in an additional 3 percent loss of power. Using this method, we find that a 2 to 1 VSWR results in an additional loss of approximately 10 percent. Continuing in this line, we find a VSWR of 3 to 1 results in 25% loss, 5 to 1, 43% and 10 to 1, 81%, all these losses remember, are in addition to the normal losses of the cable.

Line Loss

But hold on a minute, I have spouted off some figures regarding percent of loss without showing just where they came from. They are obtainable with fairly simple equipment, the like of which should be available to anyone doing any serious work on transmission lines. Any good Wattmeter which can be inserted in the line can be used to determine the VSWR. Once we know the VSWR, we can use the following formula. Gamma (magnitude

$$\text{only}) = \frac{\text{VSWR} - 1}{\text{VSWR} + 1}, \text{ then square this magnitude.}$$

This represents the percentage of loss. One small point, to determine the loss due to the mismatch and not due to the cables losses, the wattmeter must be placed in the line as close as possible to the load.

Now for more on VSWR under other conditions. In order to get the most benefit from knowledge of VSWR, it is necessary to examine the best and the worst conditions and the resultant VSWR. Keeping in mind that VSWR is the ratio of the Voltage Maximum to the voltage minimum, we can now

examine what goes on when we terminate a line in a short circuit. Sounds rather foolish at first, but we find that in doing this we set up certain conditions and open an entire new source of information which can be applied in a very practical way later on. With a short for a termination, we find a voltage minimum at the end of the line. If we went through our vector analysis, we would see the vectors were equal in magnitude (the magnitude of the incident vector and the magnitude of the reflected vector would be identical since a short is a non-power consuming load and therefore all power or energy is returned to the source), and that the vectors shown would be opposite in phase. A quarter-wave length or 90 degrees from the short, we would find a voltage maximum. Just for kicks, assume that the voltage at the maximum were 100 volts, while we know the voltage across the short is zero. Using the VSWR formula (ratio of voltage max to voltage min), we would find we had an equation of 100 divided by zero. The result of this equation according to accepted math is an indeterminate number or "infinity." So we find in the case of a shorted line, our VSWR is infinity. If we ran through the same analysis of a line terminated in an "open," we would wind up with the same results.

We have now set up certain limits in our examples. Restated, these are as follows: If we have a coaxial line which is terminated in its own characteristic impedance, then we will have a maximum transfer of energy to the load. Since we have a matched condition, all the energy will be absorbed by the load and there will be no reflected energy. Therefore, our Coefficient of Reflection will be Zero, and our Voltage Standing Wave Ratio will be ideal, that is, 1 to 1. Under these conditions, it is only necessary to know the attenuation factor of the cable in use at the frequency being used to determine just how much of the energy being supplied to the cable will appear as useful energy at the load.

Then we have the extreme of the "open" or "shorted" load. Here we find that the load absorbs none of the energy supplied by the generator and that all or 100% of the energy arriving at the load is reflected. The Coefficient of Reflection is 1 and the VSWR is Infinity.

In actual practice, we try to obtain conditions that will put us at the lower end of the VSWR scale, and generally are willing to accept any VSWR of 3 or less.

Now we can dwell for a few moments on a set of conditions which unless understood, can throw the uninitiated in transmission lines for a flying loop. Sooner or later, an individual will run into a condition where the load somehow becomes disconnected from the line. Now if the line is of any length, say 50 feet or more, and a wattmeter that indicates forward and reflected power is inserted in the line at the generator or source, it will be noted that the reflected power will be substantially less than the forward power, particularly if the frequency in use is above 50 Megacycles. This seems to go against what has been previously mentioned regarding the happenings on an open line. However now we are

dealing with a practical line where the cable losses must be taken into account. As an example, consider the "old standard," RG-8/U, which according to Manufacturers data, exhibits the following characteristics. At a frequency of 100 Mcs, which happens to be a nice round figure which is most commonly used to describe coaxial lines, we find that 100 feet of RG-8/U will have an attenuation factor of 2 decibels. It will also be noted that one foot of RG-8/U exhibits 29.5 uufd of capacity. This last item may seem superfluous but in the next of this series, we will show how this item is put to very good use.

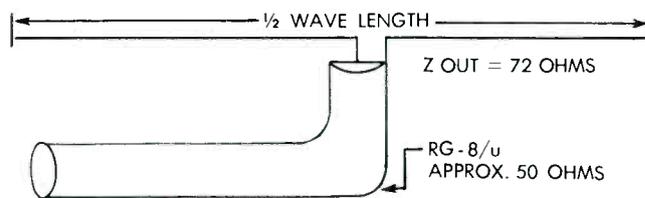


FIGURE 2

In the preceding, we pointed out that the most commonly found data is given at a frequency of 100 Mcs. Anyone using coaxial lines must keep in mind that as the frequency of operation is increased, the losses in the coaxial line will also increase. This is primarily due to the capacitive effect between conductors: If we examine Figure 3, we see it is a representation of the "lumped" characteristics of a transmission line. If we consider only the capacitance between the two conductors and then examine the formula for Capacitive Reactance,

$$X_c = \frac{1}{2\pi fC}$$

we see that as the frequency goes up, the capacitive reactance goes down, and in going down, effectively works toward a short-circuiting effect on the energy supplied to the line.

A bit of research into available tables regarding coaxial lines turns up the following; RG-8/U at 400 Mcs, the attenuation in db per hundred feet is 5.5 db and at 1000 Mcs is 8 db. If that sounds bad, try RG-59 which turns up these figures, attenuation per hundred feet at 100 Mcs is 3.8 db, at 400 Mcs is 9 db, and at 1000 Mcs is 14 db.

Things are really not as bad as they may seem in the foregoing when one has to deal with frequencies above 100 Mcs, provided one is ready to pay the price. By that we mean that cables designed with comparatively low loss at UHF are available. Of course, if it is not desired to use the higher priced lower loss cables, and one still has the problem of moving RF energy from one point to another, then it becomes necessary to use every means available and also economically feasible to minimize any losses other than the cable losses we must put up with. In this respect, we are able using relatively simple devices to compensate for improper matching at the load end.

In the next of this series, we will explore the most practical method of reducing losses due to high Standing Wave Ratio by use of quarter-wave transformers, open and shorted stubs, using simple formulas and a bit of common sense.

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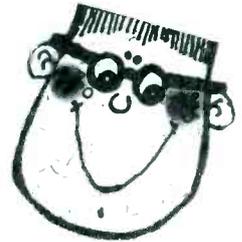
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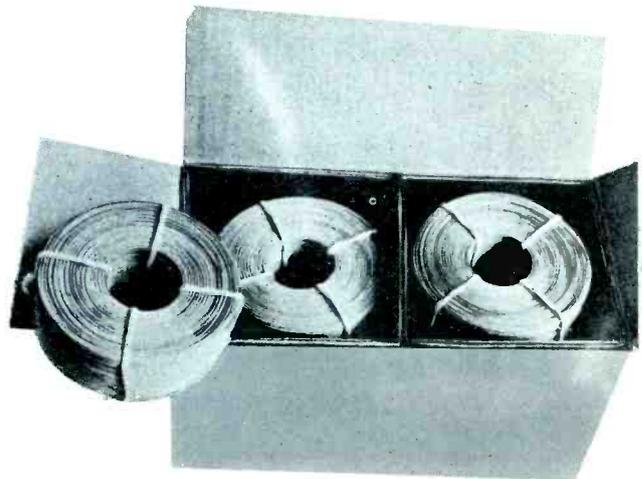
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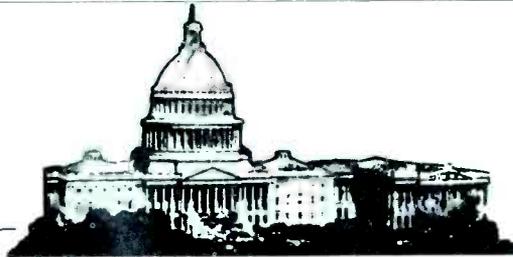
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Special Industrial Rulemaking Completed: The FCC has completed special industrial radio service rule changes which permit two categories of licensee in that service to use their radio facilities "for certain types of communications that are collateral, or incidental, to those activities upon which prime eligibility within the service was initially established."

The rule changes, which became effective May 20, permit: (1) farmers and ranchers to use their already-licensed special industrial radio facilities to communicate with their vehicles which are engaged in gathering and processing agricultural products that were grown for them by others, and (2) deliverers of fuel and ice to consumers to use their already-licensed radio facilities in connection with the servicing of their customers' equipment that uses the products delivered.

Strong Astronomy Support For TV Channel 37: The nation's scientific community has strongly questioned the proposition that the United States actually needs, for television broadcasting, all of the spectrum space the FCC currently is holding in reserve for it while other worthy needs of the country for frequencies — in their case radio astronomy — are hurting for lack of relatively minor segments. This position has been submitted to the FCC in comments in connection with radio astronomy's plea for reservation of TV channel 37 (608-614 megacycles) for a quiet zone for basic space research.

The comments specifically, are on rule proposals issued in March which would bar television broadcasting use of channel 37 within a 600-mile radius of Danville, Ill., the site of the University of Illinois's radio astronomy observatory, at least until Jan. 1, 1968. Support for radio astronomy position has reached the Commission from virtually all scientific associations or other types of organizations interested at all in that science, with a number of the filings suggesting that the FCC

proposals are not enough — that there is a possibility of international agreement to make the band a quiet zone, of much greater value than the 600-mile circle proposed by the Commission, and that the astronomy needs will certainly go beyond 1968.

To be considered in opposition to astronomy's position are four commercial television applications for use of channel 37 at Paterson, N.J., just outside of New York City. The matter was brought to the floor of the Senate by Colorado Republican Gordon L. Allott, who pointed out that he has asked several Senate committees to make recommendations to the FCC that the space be marked for astronomy, and urged his Senate colleagues also to call for such action by the Commission.

Special Industrial Proposals Supported:

Support for FCC special industrial radio service rule proposals which would permit licensees in that service to use 152 megacycle channels allocated primarily to the forest products, petroleum, and manufacturers radio services on a secondary basis at several points outside the continental United States has been submitted to the Commission by a number of organizations.

The rule proposals would permit such special industrial use in Alaska, Hawaii, Puerto Rico, and the Virgin Islands. Rule amendments had been asked by Alexander & Baldwin, Inc., a Honolulu, Hawaii, special industrial licensee. The Special Industrial Radio Service Association has supported the licensee in the case, and Forest Industries Radio Communications has agreed with the rule proposals except with respect to Alaska, where it indicated use of the frequencies by the services to which they are primarily allocated can be expected on a large scale.

The American Petroleum Institute's Central Committee on Communication Facilities went along with the proposals on the same basis as had FIRC, generally — that if the three services to

which the frequencies are primarily allocated require such a move from a frequency congestion standpoint, the special industrial licensees will be required to relinquish the frequencies, as proposed by the FCC.

The petroleum group took the opportunity in its comments to call attention of the FCC again to the "chronic frequency congestion" in the safety and special radio services.

The geographical sharing plan as contemplated in the instant special industrial rulemaking, the API committee said, "is entirely consistent with the maximum use of these frequencies in the areas concerned. To do otherwise," it said, "would be to allow such frequencies to be withdrawn from use and to lie fallow for an unknown period of time. This would be both wasteful and unjustifiable."

It went on that "In light of the Commission's proposal and the Central Committee's endorsement of it, the Central Committee again would like to direct the Commission's attention to the fact that this type of geographical sharing is an example of the type of allocation recommended by the Central Committee . . . in the testimony which was submitted in the Commission's proceeding in docket 11997 several years ago."

The group urged the agency "to review the geographical allocation plan" suggested in the 25-890 mc hearings "and seriously consider the adoption of the principles of this plan," which has been referred to frequently "as a partial solution to the problem of chronic congestion in the Commission's safety and special radio services."

At the same time, Radiotelephone Communicators of Puerto Rico, Inc., and Crumley Radio Corp., who have "long had on file" petitions for allocation of unused frequencies to the business radio service in Puerto Rico, submitted their "unqualified support" for the proposals as issued by the Commission, but contended that the rule action "will not relieve frequency

shortages where they exist outside of the continental limits of the United States," and asked the agency to take action on their pending petitions.

The companies declared that "What is really needed is a much bolder and broader action to relieve the acute channel crowding in Puerto Rico — a condition which is completely unnecessary and incomprehensible to those users who know of the many vacant frequencies on the Island."

Data On Tone Squelch Asked By Trucking Group: A request to all two-way radio equipment suppliers to licensees in the "property carrier" section of the FCC's motor carrier radio service to make a "serious" effort to aid in the collection of information necessary to the coordination of tone squelch frequencies in that service has been made by Secretary William E. Elder of the American Trucking Associations' Frequency Coordinating Committee.

Mr. Elder, pointing to the increasing use of tone squelch, asked the equipment suppliers' "cooperation in gathering information about systems that are now using tone squelch or new systems that propose to use it. If adequate information can be compiled and used in the frequency coordinating process," he said, "it would appear that considerable benefit might be derived from it, to both the user and the supplier."

Barr Says FCC Has To Face Frequency Problem: Operations of the FCC Safety & Special Radio Services Bureau are, to a newcomer who thought he had some prior idea of the scope of the field, "quite interesting and in some respects astonishing," Bureau Chief James E. Barr commented in a brief informal address to the Federal Communications Bar Association.

Mr. Barr emphasized that in the backbone 25-890 megacycles part of the spectrum, about 65% of the total is available for civilian uses — after eliminating about 25% devoted to government uses and another 10% available on a shared basis between the two — and that of the total civilian portion, somewhere between 80% and 90% is allocated to broadcast uses. This, he declared, is the "crux of the problem" which both the FCC and non-government groups interested in radio will have to face up in the "not-too-distant future."

Running through the various major groupings in the safety-special field, he referred at several points to the "terribly crowded" frequency situation affecting the radio services. Explosive public safety radio growth is a parti-

cular problem in connection with frequency shortages, he said. He added that there are 14 services in the industrial field, and that he is "concerned" about the speed of application processing in that area, since it is running about 60 days between receipt of application and action.

Users Apprised of Need For Action: The "answer" to the need for relief by the land mobile land radio services to the present severe overloading of their two-way radio communication channels "can come only from more frequency space and a better coordination procedure by the FCC in the allocation of all frequencies in the spectrum," Motorola Vice President William J. Weisz declared in an address to the joint meeting of the Petroleum Industry Electrical Association and the Petroleum Equipment Supply Association in Houston.

Mr. Weisz, speaking in his capacity as Chairman of the Electronic Industries Association's Land Mobile Communications Section, laid before the petroleum communications officials a description of recent attempts to solve some of the frequency problems of the land mobile radio field, and stressed the "major importance" of the problem to the country.

"A solution to the land mobile problem" he declared, "may mean more geographical sharing among existing land mobile users. It may mean geographical sharing between land mobile users and VHF or UHF TV stations and FM broadcast stations. In simple terms, it means better utilization of all the spectrum between 25 and 890 megacycles, and only the FCC can do something about it." He urged mobile radio users as a whole "to formulate a major program . . . aimed at telling the story to, and getting action from, your Senators and Congressmen and the FCC Commissioners."

Similarly at the PIEA-PESA meeting, Washington communications attorney Joseph E. Keller described as "of overriding importance" the "need for a basic and fundamental reexamination of the way frequencies are allocated, a review of the capabilities of the FCC, and a harkening to the increasing cry of reform, occasioned particularly by what many agree is a basic neglect at the Commission level of the importance of the role played by the Commission's safety and special radio services licensees."

Irvin Stewart Resigns OEP Post: Dr. Irvin Stewart has resigned his post as Director of Telecommunications Management in the Office of Emergency Planning, a post in which he oversaw,

through the Interdepartment Radio Advisory Committee, the government's use of radio frequencies. Announcement of his successor was not expected immediately.

Jiminez, of Vulcan Materials, Elected SIRSA President: The "desperate situation" which the special industrial radio service is currently facing, as a result of frequency shortages, was stressed by Special Industrial Radio Service Association General Counsel Jerome H. Heckman during the SIRSA Board of Directors' meeting in Washington. His address set the stage for the appointment of a special "task force" to search for additional frequency living space for the special industrial service.

During the SIRSA meeting, Victor P. Jiminez, of the Vulcan Materials Co., Birmingham, Ala., was elected SIRSA President to succeed Claude McDoulett, of the Halliburton Co. Also newly elected at the meeting were First Vice President J. L. (Roy) Cox, of International Minerals Co., Bartow, Fla.; Second Vice President Hugo E. Johnson, American Iron Ore Association, Cleveland, O.; Treasurer Anthony Lizzio, of the Associated General Contractors of America, Washington, D.C., and Assistant Treasurer J. Goodwin Moore, of Moore, Kelly & Reddish, Inc., Orange, Va.

Motor Carrier Frequency Shift Asked: The American Trucking Associations, Inc., has petitioned the FCC for motor carrier radio service rule changes which would shift the status of ten of the frequencies in that service from "duplex" to "simplex", in a revision of an action taken by the Commission three years ago. Frequencies involved are the present "base only" assignments of 44.36, 44.38, 44.40, 44.42, and 44.44 megacycles, and the "mobile only" assignments of 43.86, 43.88, 43.90, 43.92 and 43.94 mc, which were "paired" by the Commission for duplex operation in 1960.

Gulf Tow Boats Ask Use of 2292, 2398 and 4637.5 Kc: A group of about 40 Gulf of Mexico tow boat companies has petitioned the FCC for special industrial rulemaking which would permit them to use the frequencies 2292, 2398 and 4637.5 kilocycles in their operations. Several of the companies are now licensed for two megacycle frequencies in the special industrial service, but under grandfather provisions which terminated on June 15. The three frequencies are the only ones available to the industrial services which can meet the companies' long range communications requirements, they pointed out.

SECTION 605 AND YOU - PART II

by Jeremiah Courtney

(Editorial note: The first of this series of articles on Section 605 of the Communications Act dealt with wire-tapping. A few years after its enactment, the Supreme Court held that Section 605 outlawed wire-tapping because that practice was "inconsistent with (our) ethical standards and destructive of personal liberty." *Nardone v. United States*, 308 U.S. 338. But this meant only that evidence obtained by wire-tapping by Federal agents could not be used in Federal Courts. Later this principle was extended to bar such evidence in Federal Courts whether obtained by State or Federal agents. Because of the delicate State-Federal balance in our judicial system, the majority of the Supreme Court has to date held that evidence obtained by wire-tapping by State agents is admissible in a State Court. Some states, however, have their own statute which prohibits wire-tapping. Also, early in the history of Section 605, the Supreme Court has made it clear that the prohibition on unauthorized interceptions and disclosures applies to both interstate and intrastate communications, thus banning wire-tapping of all telephone calls.)

This second article will concentrate on the effect of Section 605 on the practice of recording telephone conversations. According to a survey of the House Committee on Government Operations (reported in the *Washington Post*, June 24, 1962), there were 202 recording devices used regularly by the Government. A total of 135 of these were attached to telephones in the Department of Defense. Some of the devices sound a beep when a conversation is being recorded; others do not. The latter type recorder has been used by the Atomic Energy Commission but was reported discontinued in April 1962. The Committee reported that 10 percent of the recording machines used by the Government have been removed; and that 39 agencies adopted regulations concerning monitoring of telephone calls after the Committee reported that this practice "is the indication of a dangerous drift toward a huge bureaucracy peering over the shoulder of the citizen."

Consent of Both Parties Not Necessary

The decided court cases have dealt extensively with the question whether the recording and subsequent use of a telephone conversation with the consent of one of the parties to it nevertheless constitutes a violation of Section 605. Until the Supreme Court settled the question in 1957 in *Rathbun v. United States*, 355 U.S. 107, there was a split between the various Federal courts on this important question. One line of cases, following a decision by one of the most respected Federal jurists, Judge Learned Hand, held that the consent of both parties

was necessary. *United States v. Polakoff*, 112 F. 2nd 288, where the Court states:

"Every telephone talk, like any other talk, is antiphonal; each party is alternatively sender and receiver, and it would deny all significance to the privilege created by Section 605 to hold that because one party originated the call he has power to surrender the other's privilege."

In this case, A through a telephone in the office of the F.B.I. talked to the defendant and the F.B.I. recorded the conversation on a machine attached to an extension. The conversation was the basis for defendant's conviction, which the Court reversed. Judge Hand conceded that the receiver of the message may himself broadcast it as he pleases, and that the sender will often give consent, express or implied, to the interposition of a listener. Party lines, Judge Hand said, are a good illustration of such implied consent. But obviously such consent could not be implied where the listener was a prosecuting agent bent upon trapping the sender criminally.

The second line of cases followed the decision of a District Court in Pennsylvania (which Judge Hand rejected) in *United States v. Yee Ping Jong*, 26 F. Supp. 69. This line of cases held that one party to the conversation may, without the consent of the other party, have someone else listen on an extension and record the conversation for subsequent use, without violating Section 605. The Supreme Court in the *Rathbun* case, cited above, sided with the latter view, but based its ultimate holding not solely on consent but also on the absence of interception.

The *Rathbun* case raised the issue whether the contents of a communication overheard on a regularly used telephone extension with the consent of one party to the conversation was admissible in Federal Courts. In this case, the defendant Rathbun threatened the life of one Sparks who was holding a stock certificate as collateral for a loan, in an attempt to compel the return of the stock. Sparks expected another call and, when it came, had the local police at his home, listening in on the conversation on an extension telephone. Rathbun was tried for making a threatening interstate call and objected to the introduction of the police evidence, which resulted in his conviction, on the ground that he had not consented to the eavesdropping. Did this constitute an unauthorized interception? The Supreme Court said: No — there was no "interception" as Congress intended that the word be used. Thus, the Supreme Court scotched the theory that the consent of each party to a conversation must be obtained before a communication may be divulged, observing:

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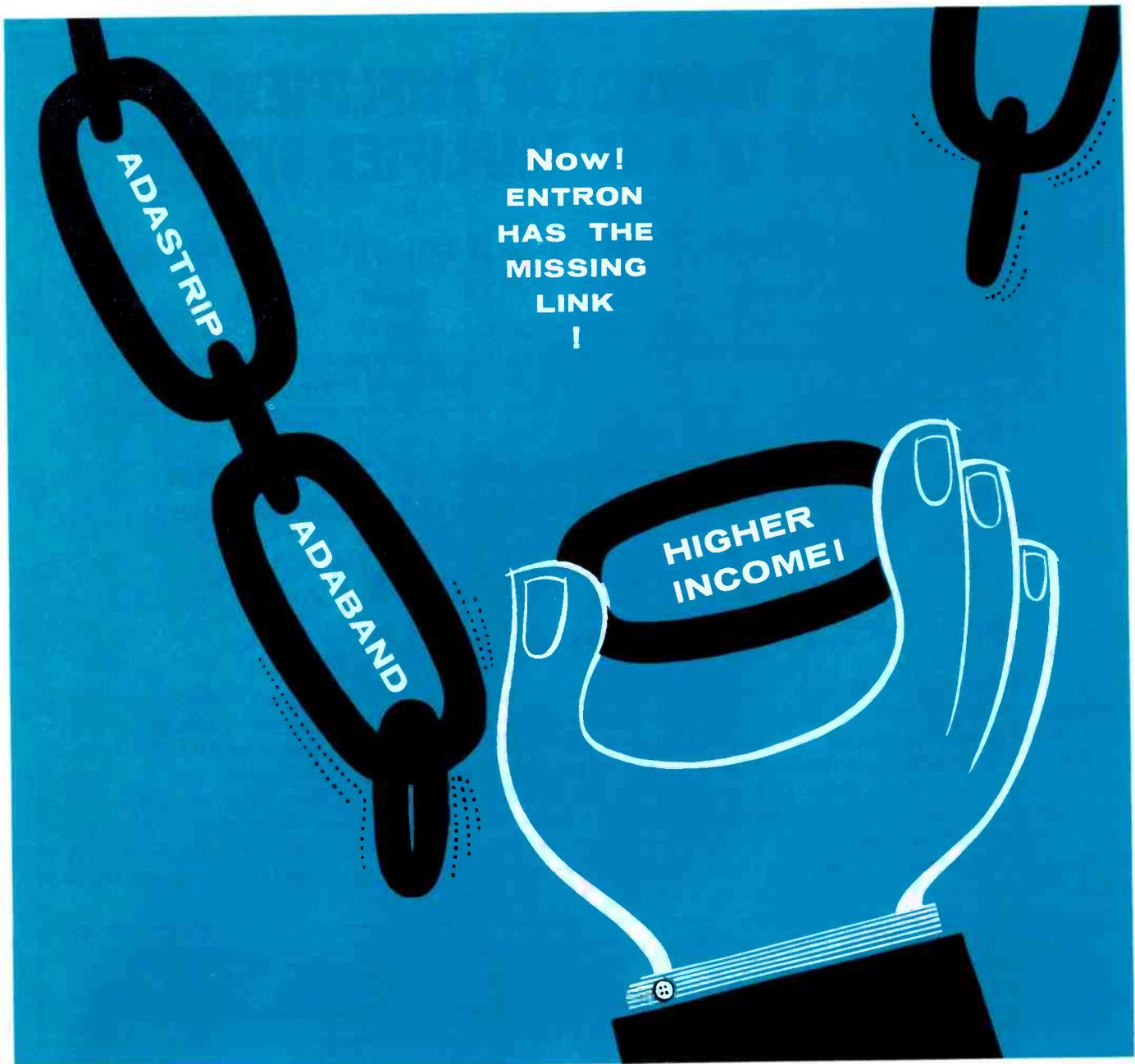
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Left to right, RA22 all transistor repeater amplifier; RC200 series Equalizer unit; RB21 Automatic Level Control unit. A complete trunk-line master station.



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"The clear inference is that one entitled to receive the communication may use it for his own benefit or have another use it for him. The communication itself is not privileged, and one party may not force the other to secrecy merely by using the telephone. It has been conceded by those who believe the conduct here violates Section 605 that either party may record the conversation and publish it. The conduct of the party will differ in no way if instead of repeating the message he held out his handset so that another could hear out of it. We see no distinction between that sort of action and permitting an outsider to use an extension telephone for the same purpose."

Our highest Court summed up the state of the law in this area thusly:

"Each party to a telephone conversation takes the risk that the other party may have an extension telephone and may allow another to overhear the conversation."

Then, in disposing of the issue, the Court did not rely on the consent theory alone. Said the Chief Justice:

"Since there was a divulgence of the contents of a communication, the only issue on the facts before us is whether there has been an unauthorized interception within the meaning of Section 605. The federal courts have split in their determination of this question. Some courts have held that the statute prescribes the use of an extension telephone to allow someone to overhear a conversation without the consent of both parties. Others have concluded that the statute is inapplicable where one party has consented."

And concluded:

"We hold that Section 605 was not violated in the case before us because there has been no 'interception' as Congress intended that word to be used."

Thus, the Supreme Court's conclusion that Section 605 was not violated on the facts of the **Rathbun** case, seems to rest on two premises: (1) that the consent of one party was given to hear and disclose his part of the conversation; and (2) that there was no interception of what the other party to the conversation said because this portion of the conversation had been recorded only after it had reached the intended receiver.

An important caveat is required here. We have been discussing what is legal, as opposed to, ethical. Common business decency requires a disclosure that a presumably private telephone conversation is being heard by a third party, and perhaps is even being recorded. We use the telephone daily to advise our clients located throughout the country, simply because written advice would take too long or prove too costly to formulate precisely. Not that the substantive advice would vary. But notwithstanding, if our spoken views are to be recorded by any client, we most certainly would appreciate the privilege of phrasing the advice in suitable record form. We believe most businessmen feel the same way, and probably more emphatically.

The Meaning of Interception

In order better to understand the effect of the **Rathbun** case on this very practical question, however, it is necessary to elaborate on the meaning of the word "intercept." The dictionary defines it as:

"To take or seize by the way, or before arriv-

al at destination; to interrupt the course of; as to intercept a letter."

The line of cases approved by the Supreme Court in the **Rathbun** case, as opposed to the decision in the **Polakoff** case, based their holding that the consent of one party is sufficient to let the contents of the conversation be used, on this very definition of the word "intercept." Thus, these Courts held that the word "intercept" indicates the taking or seizure by the way or before arrival at the destined place. Said the Supreme Court: "It does not ordinarily connote the obtaining of what is to be sent before, or at the moment, it leaves the possession of the intended receiver." **Goldman v. United States**, 316 U.S. 129, 134. Based on this view of the meaning of the word "intercept," the Court concluded in the **Rathbun** case that there was no violation of Section 605 where police officers were allowed to listen on an extension line to a telephone conversation in which the defendant threatened the life of the man he had called, and later testified to the conversation in court, because there was no interception within the meaning of Section 605.

It is clear, therefore, that the **Rathbun** case gives an affirmative answer to the question: Can you let your secretary listen to and record a telephone call without the other party's knowledge, without violating Section 605? If you can authorize a police officer to listen on an extension to a telephone conversation without the knowledge of the other party to the conversation, you certainly can, without violating Section 605, authorize your secretary to do the same thing and to take notes of the conversation to be used for any purpose, including testimony in court by your secretary. Sam Benedict's TV practices to the contrary notwithstanding, it is only good business form to advise the other party to your conversation that your secretary is on the line and making notes of the conversation.

Questions Left Unresolved

The Supreme Court in the **Rathbun** case, however, left at least one question unresolved: Is listening in by any other means than an extension telephone, if consented to by one party, beyond the reach of Section 605? For example, is listening to a radio conversation with the consent of one party protected under the **Rathbun** case? We think that it would be.

Another question which may yet come up as a result of the **Rathbun** decision is whether listening in on an extension without the consent of either party is beyond the reach of Section 605. If listening to a conversation on an extension telephone does not constitute interception within the meaning of Section 605 because the conversation originated at the other end of the circuit had already reached the intended recipient, there would seem to be no violation of this prohibition whether or not there was consent of one of the parties, if the listener on the extension hears what is to be sent "at the moment it leaves the possession of the intended sender." (See the definition of "interception" in the **Goldman** case above.) Moreover, does not each party to a telephone conversation take the risk that the other

party may have an extension telephone, whether or not the other party allows another to overhear the conversation? If such a case arose, the Supreme Court might yet be forced to re-examine its view on what constitutes "interception" in this age of electronic marvels.

Status of Mechanically Recorded Conversations

Can you substitute a record for the secretary? Certainly. For one thing, there appears to be very little difference, in principle, in substituting a mechanical agency for the human agency. If there is no interception when the secretary records the conversation on an extension telephone because the conversation has already arrived at its destined place, there is no interception when the record is made by a mechanical device. The FCC regulations presuppose that either party may record a conversation. In fact, these regulations declare that tariff provisions of telephone companies which bar the use of recording devices are unjust and unreasonable and in violation of Section 201 of the Communications Act. Thus, the Commission's Orders (Docket 6786, March and November, 1947), adopted ten years before the **Rathbun** decision, authorized the use of recording devices in connection with interstate and foreign message toll telephone service, upon the condition that all parties to the telephone conversation be notified that telephone recording devices are being used:

"The Commission is of the opinion that the use of telephone recording devices should be permitted in

connection with interstate and foreign message toll telephone service. These devices have been clearly shown on the record here as having a useful and legitimate place in the conduct of governmental and private business. The Commission is, however, keenly appreciative of the importance and desirability of privacy in telephone conversations. Such conversations should be free from any listening-in by others that is not done with the knowledge and authorization of the parties to the call, whether this be done by recording devices, extension telephones, monitoring devices, or any other means, and the Commission is prepared to take all steps within its authority to accomplish this objective. Accordingly, the Commission is firmly of the opinion that the use of telephone recording devices should be permitted only when measures are in effect to assure notification to the parties that their conversation is being recorded."

This notification is accomplished by means of a "beep," usually recurring each 15 seconds. AT&T FCC Tariff No. 132 which applies to interstate toll message service contains this requirement for a "beep" signal included with all recorder-connector equipment supplied by the telephone company. It is understood that the Bell System intrastate tariffs, which are outside the jurisdiction of the FCC, contain a similar provision. The person hearing the "beep" may either know its meaning or, if not, inquire about it. In either event, it gives the other party an opportunity to object to his conversation being recorded, or implicitly to consent to it. This would satisfy the standard of fairness in advising the other party that his conversation is being re-

Continued on Page 38

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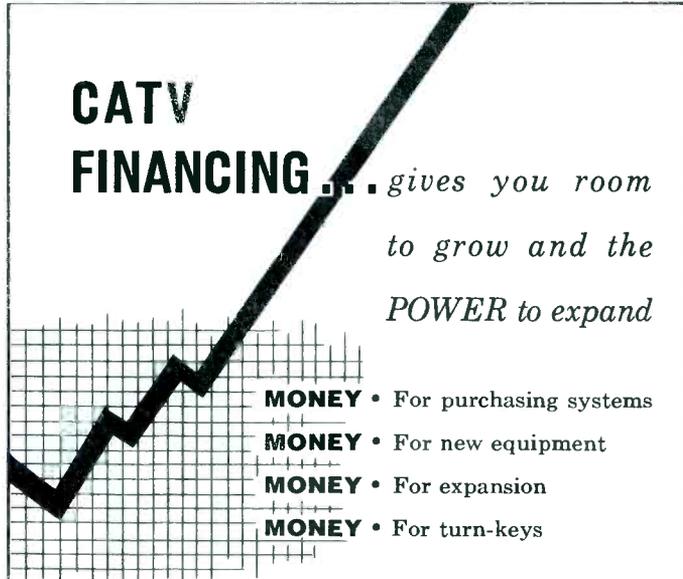
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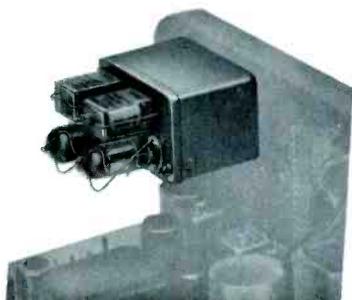
108 East Washington St., Indianapolis 4, Indiana

New Product Horizons



COMMUNICATIONS EQUIPMENT

Hammarlund Manufacturing Company, 53 West 23rd Street, New York 10, New York has just introduced a new alert tone decoder. In operation the decoder silences the radio receiver loudspeaker so unwanted radio transmissions are not heard. When a radio signal is intercepted which is modulated by a sustained audio tone of specific frequency and duration, the decoder energizes an indicator lamp and activates the loudspeaker. The decoder is 3" long, 2" wide and 7/8" high and weighs only 12 ounces. Additional data available from the manufacturer.



Polytronics Lab., Inc., Clifton, New Jersey has just announced the new Poly-Com "B" FM transceiver for Business Band communications service. The new transceiver features 18 watts plate power input with a power output to the antenna of at least 12 watts. Modulation is plus or minus 5 kc deviation for 100% at 1000 cps. An optional feature is a special crystal filter to eliminate adjacent channel interference. Selective listening is available by adding a plug-in Poly-Call Selective Ringer. Price of the Poly-Com "B" is \$299.95 (117 vac/12.6 vdc).

LEL, Inc., 75 Akron Street, Copiague, New York has added a single-sideband suppressed Carrier Modulator to its standard line of microwave components. Designated the MSS-1, the unit covers 925 to 5900 Mc in eleven models. Conversion loss is less than 10 db and the carrier and harmonic frequency suppression is greater than 20 db when used with I.F. frequencies up to 120 Mc. The MSS-1 modulators are useful for side-stepping RF frequencies in frequency agile radar systems and may be used in receivers as low noise, high rejection, image suppression mixers. Price of the units vary from \$525 to \$900.



LEL, Inc., has also announced a new line of high efficiency varactor frequency multipliers that operate at frequencies from 125 Mc to 10 kmc. Units may be used individually or cascaded to provide any multiplication to a desired frequency. Standard doublers and triplers with typical 60% efficiency are now available. Write for further details.

UTICA Communications Corporation, 2917 W. Irving Park Road, Chicago 18, Illinois now offers a Duo-Band FM receiver that covers 30 to 50 Mc and 152-174 Mc. The new receiver features a dual conversion super-heterodyne receiver, squelch, crystal-controlled second oscillator, and is temperature compensated for drift control. In addition the Duo-Band offers two crystal controlled positions for fixed frequency operation on the high and low bands. Price of the unit is \$164.95. Utica also has just released a new 30 watt FM transceiver designed for the 150 to 175 Mc range. The new transceiver features compactness and style, its physical size being only 5 1/2" high, 10 1/2" wide and 12" long. Receiver in the unit has a 0.5 uv rating for 20 db quieting and image and spurious response that is greater than 60 db down. Price of the Uti-Com transceiver is \$359.95. Further inquiries are invited.

Donne and Margolin, Inc., 29 New York Avenue, Westbury, New York have released a new High-Q Band Reject Filter for elimination of unwanted frequencies in the range of 100 to 500 Mc. A minimum insertion loss of 0.75 db below 0.98fr and above 1.02fr is featured in the single cavity model. Three cavity models increase the maximum rejection to greater than 50 db at plus or minus 0.1%fr with less increase in band-pass insertion loss than normally found in multi-cavity band-pass filters.

CATV-CCTV

Gavin Instruments, Inc., Depot Square and Division Street, Somerville, New Jersey announces a UHF converter featuring a grounded-cathode Nuistor circuit. The converter, Model G-4d, offers a 3 db improvement in gain characteristic plus improved noise factor. In addition, the 2-Nuistor unit has a vernier tuning dial and a convenience AC outlet. Price of the converter is \$39.95.



Blonder-Tongue Laboratories, Inc., 9 Alling Street, Newark 2, New Jersey now offers an all-channel UHF booster capable of bringing signals to scores of communities formerly out of range according to the manufacturer. The easy-to-install unit is styled to match Blonder-Tongue's line of UHF converters. Called the U-Boost, this new product is said to establish B-T as the only manufacturer with a complete line of UHF equipment and provides the distributor with a total approach to the profit potential in this fast-developing field of broadcasting and reception. Price of the U-Boost is \$39.95.

ANTENNAS-HARDWARE

Decibel Products, Inc., 3184 Quebec Street, Dallas 7, Texas has announced its entry into the microwave field with a completely new line of antennas. These new antennas utilize a ring focus feed in conjunction with a finite center paraboloidal reflecting surface to achieve a more uniform aperture illumination and thus greater efficiency, with correspondingly higher gains and front-to-back ratios. Mechanically, the new antennas use full-tempered aluminum in conjunction with a reinforced back structure to achieve a wind loading rating of 5-pounds per square foot. Attachment brackets for the antenna permit an adjustment range of plus or minus 15 degrees in all planes with ease and smoothness. The new design also includes a universal mounting bracket that converts readily from pipe mount to roof mount without additional components. The new antennas are available initially in sizes of 4' and 6' and in frequency components. The new antennas are available ranges of from 6 kmc through the 12 kmc bands.



8' and 10' versions will be offered soon along with a complete line of radomes, both heated and unheated.

Kreco Antennas, Cresco, Pennsylvania are now offering two all-grounded type Ground-Plane antennas. Model GP-41A mounts on 1 1/4" pipe threads and has a vertical radiator of 3/4" 6061-T6 aluminum tubing. Model GP-42A has a vertical element constructed of 3/4" aluminum pipe which extends two feet below the Ground-Plane for mounting to a tower or other vertical mounting arrangement. Both models are fed with RG-8/U and are factory cut and tuned to frequency required by the customer. Precise impedance match is obtained by the use of a capacitive gamma match which is completely enclosed and grounded. Claim is made of static and noise rejection and complete protection from lightning. Manufacturer invites inquiries.

GENERATING EQUIPMENT

Kato Engineering Company, Mankato, Minnesota has just come out with a new rotary converter delivering 115 vac, 60 cycles, incorporating a special governor to maintain the output frequency variation within 0.2 cycle. The converter is designed to operate between 25.5 and 29.5 vdc input to provide a continuous 750 watt, single phase, 115 vac output with a power factor of 0.8. Output voltage regulation is within less than 3%, no load to full load. The converter is available in several ratings other than those specified depending on the individual application requirements.

TEST EQUIPMENT

Loral Electronics Corporation, 825 Bronx Avenue, Bronx 72, New York has announced a new converter test set for semi-automatic, error-free calibration and troubleshooting of microwave receivers. The converter test set, Model 150792, enables complete checks and tests of sensitivity, selectivity and frequency accuracy in the maintenance of manual and servo-controlled super-heterodyne frequency converters. The unit is housed in a dual-cabinet console that incorporates oscilloscopes, frequency counters, detectors and marker generators. In each band, eleven pre-programmed frequencies are available on push-button controls for tuning both generator and converter. Manual tuning control is also provided.

gram production manager for the DuMont Television Network and was associated with Closed-Circuit Telecasting Systems, Inc., prior to joining TPT in 1958.

PLACES . . .

Andrew Corporation, Chicago,

Illinois, has announced the opening of a sales engineering office in Dallas, Texas. The new facility is intended to provide direct engineering and product assistance to the communication industry in southern and southwestern states. Mr. H. L. Woodbury will serve as district manager of the Dallas office. Mr. Woodbury is a Senior

Member of the IEEE.

CECO, State College, Pa., has appointed Lorber Instrument Division as Sales Engineering Representative for Ohio, Michigan, and Western Pennsylvania. Lorber Instruments, headed by Mr. Harold Lorber, has offices in Cincinnati (P.O. Box 37646), Cleveland (P.O. Box 7486), and Detroit (20111 James Couzens St.) CECO also appointed Truex Associates for the state of Florida. Truex is located at 3125 Onyx Court, Orlando, Florida.

THINGS . . .

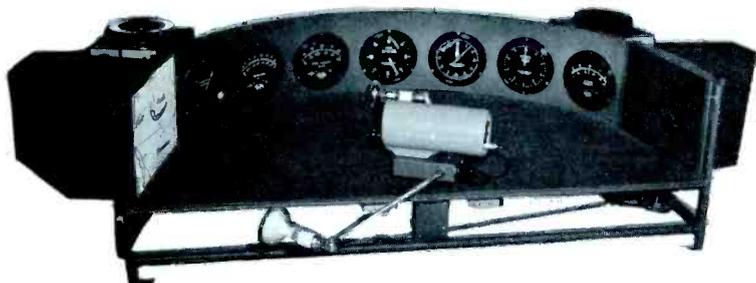
Great Northern Railway Company, Wenatchee, Washington, reports the theft of an equipment box, painted yellow, with the number 2248 on the lid. Contained within the box was one Motorola Handie-Talkie, Serial #C81337, EMTR Type 6C3502, Model H23-BAC-1101AH, top and one side have the orange figures "2248". If you have any information regarding this, contact: G. R. Roundy, GN Ry. Police, Wenatchee, Washington.

Communications Company, Inc., of Coral Gables, Florida has signed a contract with DuMont Laboratories to provide DuMont Communications Department with a complete line of VHF-UHF FM land-mobile communications equipment. The new contract, covering a part of DuMont's requirements for the next 12-months, will provide mobile, base and remote control units for operation in the 25-50, 150, and 450 Mc bands.

Cablevents, a subsidiary company of Daniels & Associates, has been named co-distributor of television rights through the facilities of CATV systems in the U.S. and Canada, to the World's Heavyweight Championship Bout between Sonny Liston and Floyd Patterson, scheduled to be held in Las Vegas on July 22nd. Bill Daniels, President of D & A, marked this event as the entry of his organization into the programming and distribution of special programs for community antenna television systems and stated that plans are underway for providing continuing events of an entertainment, sports, and cultural nature for CATV systems.

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TELEMATION INC.

Advantages of Back Matching in Splitters and Tap-Offs

by P. Freen
Benco Television Associates Limited

Past experience has taught us that reflections must be kept to an absolute minimum to insure maximum system quality. In actual practice, a reflected signal should be held to 18 db or more below the required signal on the high band and at least 24 db below the required signal on the low band. These particular figures were obtained from the results of a variety of tests conducted on the "annoyance value" of pictures degraded by echoes.

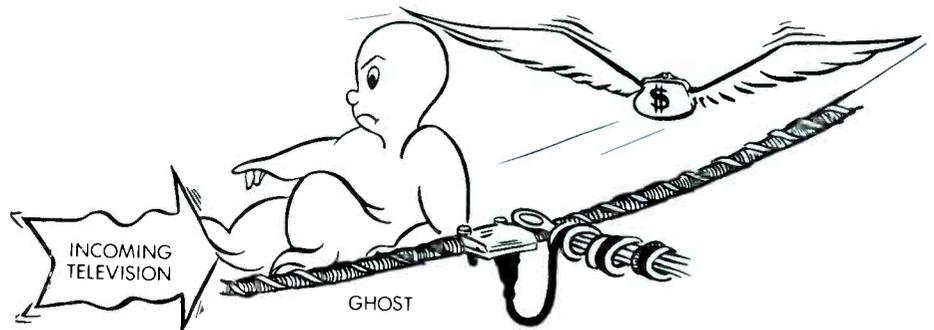
In considering echoes or reflections in a CATV system, it is easiest to divide the subject into two distinct categories. Group One should concern reflections caused by discontinuities on the distribution line and Group Two, the discontinuities on the drop line.

Following the categories in sequence, the cause of reflections on the distribution line is most generally attributable to line taps and splitters. However, splitters are usually well matched as far as the distribution line is concerned and, therefore, they will not be considered at this point. Now, let us look at the second item, the line tap

Line taps or "drops" are often made by use of capacitive tap-offs and it can be shown that the amount of reactance placed across the distribution line determines the reflection coefficient (ratio of reflected signal to incident signal). With a capacitive tap of a nominal 12 db tap-off loss at 200 Mc, the reactance of the capacitor shunted across the distribution line will be approximately 250 ohms. This implies a reflection coefficient of 18 db.

The other common type of tap-off is the transformer type which by virtue of its design can change

the reflection coefficient advantageously. Take a transformer tap of a nominal 12 db tap-off loss, the reactance placed across the distribution line is 75 x 16 or 1200 ohms. This is possible because the transformer is much more efficient in that it transforms the load imped-



ance (in this case the drop-line) up to a much higher impedance which is the one actually placed across the distribution line. In fact, 1200 ohms across the distribution line would give a reflection coefficient of better than 30 db, a considerable improvement over the 18 db given by the capacitive tap. A further improvement in the performance of the CATV system can be made by considering the discontinuities associated with the subscriber's drop-line (Group Two).

The subscriber's television set is nominally 300 ohms at its input terminals at the channel to which the set is tuned. At all other channels it can vary between what amounts to a complete short or a complete open circuit. In addition, drop-lines are often made with poorer quality cable and are also subject to disconnection, either in-

tentional or accidental.

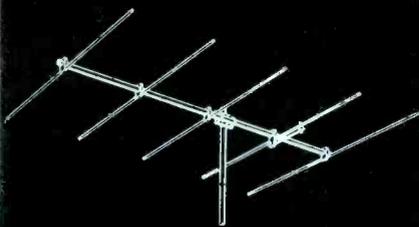
For example, if the subscriber's television set presented a complete open circuit or short at a certain frequency, energy in the drop-line would be reflected back into the main line via the tap. If the tap had a greater loss than 24 db, this would not be so important, but taps with lower values of attenuation than 24 db are often required on CATV systems.

Overcoming the problem presented by the subscriber's television set can be accomplished to a large extent by employing "back-matching" so that the energy reflected back from the subscriber's television set is absorbed in the match at the drop-line output of the tap. This will, of course, eliminate any echoes or "ghosts" showing up at any other subscriber's television set who wishes to look at the particular channel discussed above.

Basically, the foregoing is an attempt to show the reasons for the marked superiority of the back-matched transformer type tap-off in CATV systems. The same reasoning applies in cases where splitters are used to feed branch lines. It is desirable to absorb as far as possible the reflections in the branch line from the main distribution line for reasons discussed above. This can also be achieved by making sure all the **outputs** of the splitters are back-matched.

A brief summary of the ideal splitter or tap-off would be, that no matter which input or output is measured, if all the other inputs and outputs are correctly terminated by 75 ohms, it should "look like" 75 ohms. The closer this ideal is approached, the more suitable the tap or splitter for use in a CATV system.

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New Rulemaking Institute For Additional Communications: The FCC has completed special industrial radio service rule changes which permit two categories of licensees in that service to use their radio facilities "for certain types of communications that are colateral, or incidental, to those activities upon which prime eligibility within the service was initially established."

The rule changes, to become effective May 20, permit: (1) farmers and ranchers to use their already-licensed special industrial radio facilities to communicate with their vehicles which are engaged in gathering and processing agricultural product that were grown for them by others, and (2) deliverers of fuel and ice to consumers to use their already-licensed radio facilities in connection with the servicing of their customer's equipment that uses the products delivered.

The rule amendments went through without change from the form in which they were proposed by the Commission in December. The agency pointed out that the only comments filed on the proposals came from the Special Industrial Radio Service Association, which has petitioned for the changes in the first place.

ENTRON POSTS RECORD SALES AND EARNINGS

Entron, Inc., Silver Springs, Maryland, announced the completion of its most successful year. The firm has just completed its tenth year of operations as a leading manufacturer, designer and installer of Community Antenna Television Systems and is active in CATV system ownership and operation. Mr. J. L. Lahey, President, in his presentation to the Board of Directors, indicated that sales and earnings for the year ended February 28, 1963, were at an all time high.

Sales for the year totaled \$2,679,490 and represented an increase of ninety-seven percent over the previous year.

Net income for the year reached \$137,317 versus a loss of \$373,792 in the preceding year. Earnings were equivalent to fifty cents per share on the 272,135 shares outstanding compared with a loss of \$1.37 per share in the prior year.

In other business the Board of Directors elected Mr. W. T. Relyea as Secretary-Treasurer. Mr. Relyea replaces Mr. H. M. Kannee who recently announced his resignation.

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4. The Weather Station retains its static position for instrumentation and camera. Lead-in and lead-out cables are stationary, eliminating fatigue and ultimate failure on the cables. Four second time delay on instruments. Ten seconds or more on message display.
5. The Weather Station mechanism is easily adaptable to almost any industrial TV camera and signal modulator.



This is the complete "Weather-Tel" weather station (excluding sensors). It is compact, fitting easily into a 6 foot by 6 foot area including access space. Modulator, instruments, camera and lighting are within the enclosed package. Sensors may be placed on roof or other convenient outdoor location.



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Not one foot of these cables has had to be replaced or presented any problems due to increased attenuation or moisture seeping or developing within the interiors of these cables. Attenuations have remained consistent and the interiors of the cables are still "bone dry."

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How does PLASTOID "Flat Braid" pay you?

It pays you to use the "Flat Braid" cables that have been proven 100% perfect in every way. Why gamble with more expensive and unproven "new" types of cables? Remember, in many instances it costs twice as much to replace a defective section of "experimental" cable as it would have cost to have installed the "time proven" satisfactory Plastoid "Flat Braid" cables.

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Write, wire or phone for Plastoid's new low cost "Flat Braid" special pricings. Let our sales representative prove to you why you should consider using Plastoid "Flat Braid" cables for new construction or revampings.



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NOW AVAILABLE WITH MATCHED CONNECTORS

Specifically designed by the cable manufacturer to mate electrically and mechanically.



Better initial transmission quality
Better long term transmission stability

- UP TO 20% LOWER ATTENUATION THAN CONVENTIONAL SHIELDING
- SOLID TUBULAR SHIELD PROVIDES YEARS LONGER SERVICE WITH LESS DEGRADATION OF SHIELD EFFECTIVENESS
- IMPROVED RESISTANCE TO CRUSHING OR IMPACT STRESSES
- GREATER RADIATION PROTECTION
Solid shield eliminates radiation leakage apertures present in all braided coaxial types.
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Shield corrugations permit hand bending to acceptable limit of 20 times diameter. Special tools are not required or recommended.
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CATALOG NUMBER	ATTENUATION (Nom. db @ 100 ft.)		NOM. OVERALL O. D.
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4930	0.65	1.05	.652"



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Service was important to us because our own business is based on service."

As expected, radio has vastly improved Skillern's own service to its customers. In one particular case, the driver was able to make delivery within 3 minutes after the customer phoned because the truck operator was in the immediate neighborhood. Without radio, he would have had to drive to the bulk plant for the message and then return to the area.

"We are receiving favorable word-of-mouth advertising because our customers are telling their friends about our service. Customer relations are improved and our gallonage is increasing," Skillern adds.

Before radio, a truck operator seldom was able to make definite plans for the end of the day because he could never be sure when he would complete his rounds, due to unforeseen emergencies. Drivers now know that, upon returning to the bulk plant and completing their plant routine, they are through for the day. They have received all delivery instructions during the normal course of their route, not after its completion.

Late in 1962, Western Oregon was hit by an unprecedented wind storm, causing millions of dollars of damage to property, power lines and communications. Eugene was without power and telephone service for several days.

Says Anderson: "Our two-way radio equipment nearly paid for itself during that one storm. When we were without power and telephones, one radio-equipped truck was stationed at the bulk plant and kept in touch with our other units. We stayed in business and gained an edge over competition."

Increased truck efficiency has been accomplished with improved routing. Trucks are dispatched fully-loaded with the majority of the delivery points predetermined, but with a "cushion" for phone-ins in the normal delivery area. "Haulbacks" to the bulk plant are virtually eliminated.

The General Electric two-way radio also has been a time and money saver during occasional truck mechanical failures. A radio call to the main office brings as-

sistance, parts and service with a minimum of tie-up.

Skillern's radio equipment is mounted under the dash-board for easy operation. The G-E Progress Line units are on trucks having six volt electrical systems and the G-E Pacer sets are on 12-volt trucks.

Skillern plans to equip its fourth truck with two-way radio this summer. As Anderson puts it: "In a business rife with human factors, mobile communications provides a means of automating without lessening individual attention to each customer."



An informal meeting of CATV executives in the south-central portion of the United States was an opportunity for the camera man to put them "on camera."

Shown left to right at the DAVCO suite, New Orleans NCTA board meeting and South Central convention, are Carl Williams, (Daniels & Associates, Denver); Tom Garrett, Siloam Springs, Arkansas; Bob Wheeler, Harrison, Arkansas; Roy Holloway, DAVCO Electronics, J. D. Pierce, also of DAVCO; Mrs. Bob Wheeler, Harrison, Arkansas; Mr. and Mrs. Frank Valentine of Johnson City, Tennessee; Joe Davis of Poteau, Oklahoma; Bill Dalton, President of the NCTA; and Jim Davidson, DAVCO Electronics.

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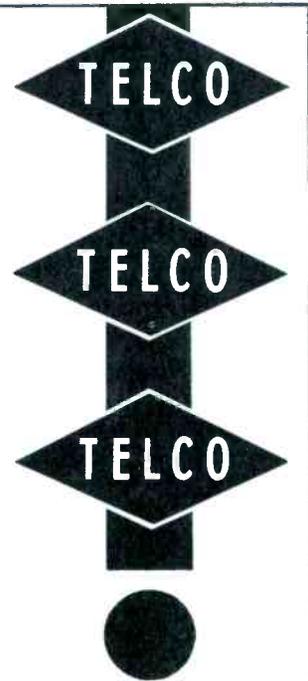
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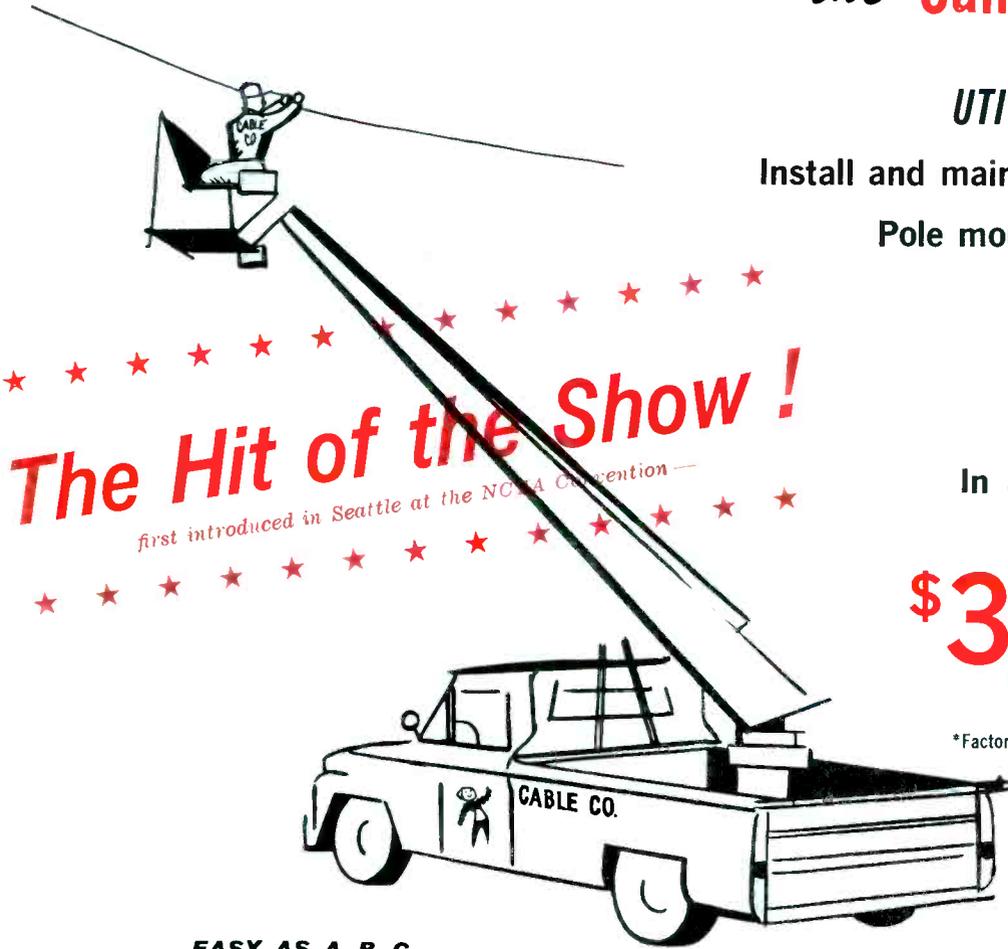
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C



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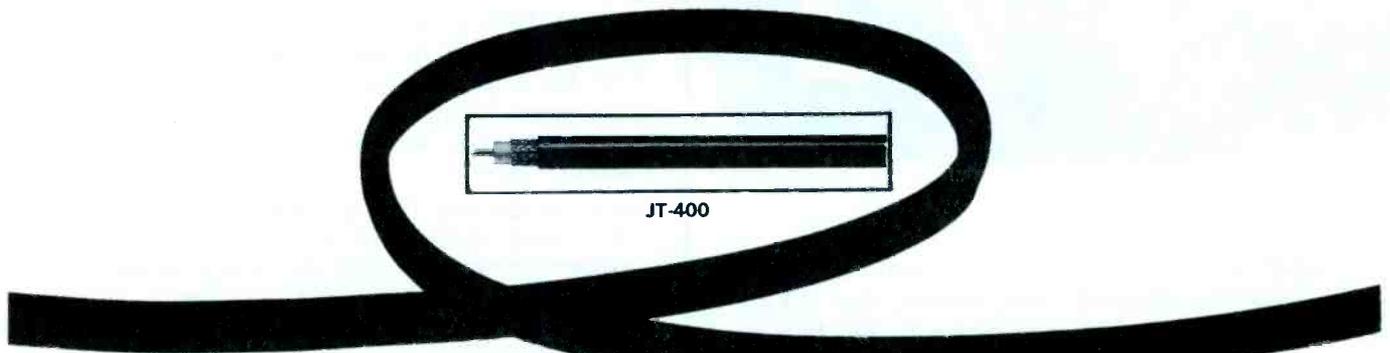
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JT-400

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JT-400 STRIP-BRAIDED FLEXIBLE COAXIAL CABLE

Type	Nom. Outside Diameter (in.)					Attenuation (Nom.) (db/100 ft)		Ship. Wt. (lb/1,000 ft)
	Conductor	Dielectric	Shield	2nd Shield	Jacket	Channel 6	Channel 13	
JT-400S	0.114	0.525	0.536		0.632	0.77	1.3	147
JT-400D	0.114	0.525	0.536	0.547	0.632	0.77	1.3	167
JT-404S	0.064	0.285	0.296		0.407	1.31	2.2	64
JT-404D	0.064	0.285	0.296	0.307	0.407	1.31	2.2	73
JT-408S	0.081	0.373	0.389		0.460	1.01	1.6	89
JT-408D	0.081	0.373	0.389	0.400	0.460	1.01	1.6	101

JT-1000 SOLID-SHEATH SEMIFLEXIBLE COAXIAL CABLE

Type	Nom. Outside Diameter (in.)				Attenuation (max.) (db/100 ft)		Ship. Wt. (incl. reel) (lb./1,000 ft)
	Conductor	Dielectric	Un-Jacketed	Jacketed	Channel 6	Channel 13	
JT-1750	0.1400	0.680	0.750		0.60	1.03	280
JT-1750J*	0.1400	0.680	0.750	0.850	0.60	1.03	330
JT-1500	0.0980	0.450	0.500		0.84	1.40	130
JT-1500J*	0.0980	0.450	0.500	0.580	0.84	1.40	160
JT-1412	0.0752	0.362	0.412		1.05	1.65	100
JT-1412J*	0.0752	0.362	0.412	0.480	1.05	1.65	120

*Cable overall jacketed with Xelon.



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Section 605 and You Continued from Page 28

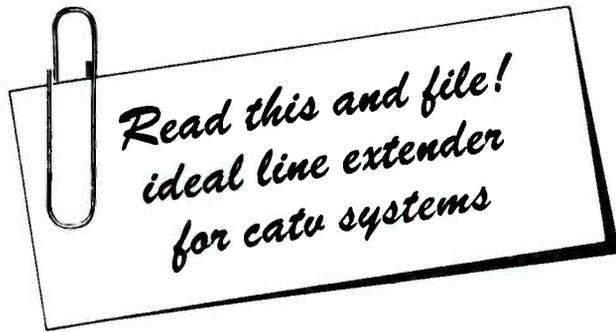
corded; and, insofar as Section 605 is concerned, the failure to object to the recording could be construed as consent.

The use of the "beep" to the extent that it is based on legal rather than ethical grounds underscores the uncertainty as to the status of such devices under Section 605. While the rationale of the **Rathbun** case would certainly appear to sanction such use, the factual situation in that case is distinguishable since it actually did not involve the use of a recorder. However, it seems to us that the use of the recorder would be sanctioned, even by those who maintain that the consent of both parties to a telephone conversation is necessary to avoid the prohibition of Section 605 on unauthorized disclosure. For it has been admitted by the proponents and opponents of the **Polakoff** case view (that the consent of both parties to a telephone conversation is necessary), that either party may record the conversation and publish it. Simply because the recording is done by a mechanical device would not make any difference. It appears, therefore, that the use of a recording device would be permitted even under the **Polakoff** view.

One-Sided Consent To Recording Radio Conversations

It would seem that as a practical matter the **Rathbun** principle should also apply when one of the parties to a radio conversation allows a third party to listen to it and record it, or use a mechanical device to make a record of the conversation. This would seem to be clear if A conducting a radio conversation with B, 100 miles away, allows C in his office but in an adjoining room to listen to the radio conversation through another receiver and to record the contents of the conversation. But suppose C is stationed at a point midway between A and B. Is he intercepting the conversation, i.e., receiving it before it reaches the destination at B's receiver? This presents a difficult problem. Since radio waves travel at the speed of light, the time difference between the transmission of a message and its reception is all but imperceptible to our senses. But scientists can measure it. Therefore, in our example, C who was stationed midway between A and B would receive the message a tiny fraction of a second before it arrived at its destination, even though to both listeners the reception would be, for all practical purposes, simultaneous. If a case of this kind were litigated, could a Court dispose of the issue involved by relying on the definition of the term "interception"? To do so might impose an extremely heavy and difficult burden of proving by expert technical testimony whether or not the radio conversation in question, was in fact, "intercepted." It would seem that the Court would then have to face squarely the view taken by Judge Learned Hand in the **Polakoff** case (both parties must consent) and either accept or reject it on grounds other than the dictionary meaning of the word "intercept."

(Part III of this three-part series
will appear in next month's issue)



BLONDER-TONGUE

BROADBAND TV/FM AMPLIFIER

(54-108 mc—174-216 mc)
model MLA-FM

DESCRIPTION

The newest broadband amplifier in the well-known MLA-series is designed to deliver uniform, high level gain to both TV and FM receivers in CATV and master TV installations. It has all the requisites for top performance as a line extender in a CATV system, or as the head end of an MATV system — high gain, high output, low noise, exact channel equalization and reliability.

The MLA-FM consists of two independent amplifying sections: one for TV channels 2 thru 6 plus FM (low band), and one for TV channels 7 thru 13 (high band). Each of these amplifier sections has an individual gain control, plus a control for tilting the bandpass. The MLA-FM is ready for installation in most systems without need of further alignment; it is factory pre-set with the response of both bands tilted to compensate for 400' of RG-59/U cable.

The MLA-FM has many advanced engineering features which contribute to superior performance. Its exclusive patented broadband neutralization circuit in the high band provides higher gain-bandwidth. It offers highest gain in the high band, where cable losses are greatest. The cascode input circuits utilize frame-grid tubes for best signal-to-noise ratio and long life.

Important in CATV system operation is long term trouble-free performance. To accomplish this, Blonder-Tongue has generously derated tubes and components, insuring long trouble free life under continuous duty operation. Further, an exclusive transient-protected full-wave silicon rectifier circuit eliminates silicon rectifier burn-out caused by power line transients.

RELATED EQUIPMENT

MIXER/SPLITTERS, ATTENUATORS — Blonder-Tongue MX filtered mixer/splitters, together with FA attenuators can be used to balance signals being fed into the MLA-FM.

SINGLE CHANNEL AMPLIFIERS — Blonder-Tongue CB and MCS amplifiers can be used to pre-amplify very weak channels.

TUNABLE TRAPS — Blonder-Tongue MWT-2 (54-108 mc); MWT-3 (174-216 mc) can be used to attenuate any undesired frequency in the entire VHF/FM band. Traps provide at least 60 db attenuation with virtually no loss to the desired frequencies.

SPECIFICATIONS

GAIN — 33.0 db min channels 2 thru 6 and FM
40.0 db min channels 7 thru 13

RESPONSE — 54 mc-108 mc ± 0.75 db (Factory preset at 4.5 db tilt) 174 mc-216 mc ± 0.75 db (Factory preset at 2.0 db tilt)

GAIN CONTROL RANGE — 15.0 db channels 2 through 6 and FM; 18.0 db channels 7 through 13.

TILT CONTROL RANGE — 0-8 db tilt 54 mc-108 mc, 0-4 db tilt 174 mc-216 mc.

MINIMUM INPUT — 230 μ v (across 75 ohms), each video carrier, for T.A.S.O. Grade 3 (passable) picture.

MAXIMUM INPUT — (Sum of all video and sound carriers): 0.65v total low band; 0.32v total high band.

MAXIMUM OUTPUT — (at full gain)
for 0.5% distortion:—0.32v per channel—3 channels low band, 4 channels high band.
for 1% distortion:—1.3v total low band, 1.9v high band.
for 3% distortion:—2.5v total low band, 2.8v high band.

MONITORS — 20 db down from input, 20 db down from output.

IMPEDANCE — 75 ohm input and output. "UHF" type SO-239 connectors.

TUBE COMPLEMENT* — (1) 6ES8/ECC189; (1) 6DJ8/ECC88; (1) 6EJ7/EF184 frame grid; (2) 6CB6A; (2) 12BY7A.

RECTIFIERS — Silicon, transient protected.

PILOT LIGHT — Neon, long life.

DIMENSIONS — 9" w x 6" d x 5" h — Shipping Weight: 9 lbs.

POWER REQUIREMENTS — 117 volts 60 cps 55VA (0.44A) 3 wire line cord

FUSE — 1 amp, 3AG UL approved.

*extra long-life tubes available on special request.

FEATURES

- SEPARATE LOW BAND AND HIGH BAND GAIN AND BANDPASS TILT CONTROLS for balancing signal levels of different TV channels.
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- PATENTED BROADBAND NEUTRALIZATION CIRCUIT in the high band — provides higher gain-bandwidth. (U. S. patent 2,761,023, Canadian Patent 535,392).
- IMPROVED BANDPASS FLATNESS at all gain control settings.
- LOW-NOISE FRAME-GRID TUBES used in cascode input circuits.
- SIGNAL MONITORING JACKS AT INPUT AND OUTPUT for routine maintenance checking and adjustment without interrupting service.



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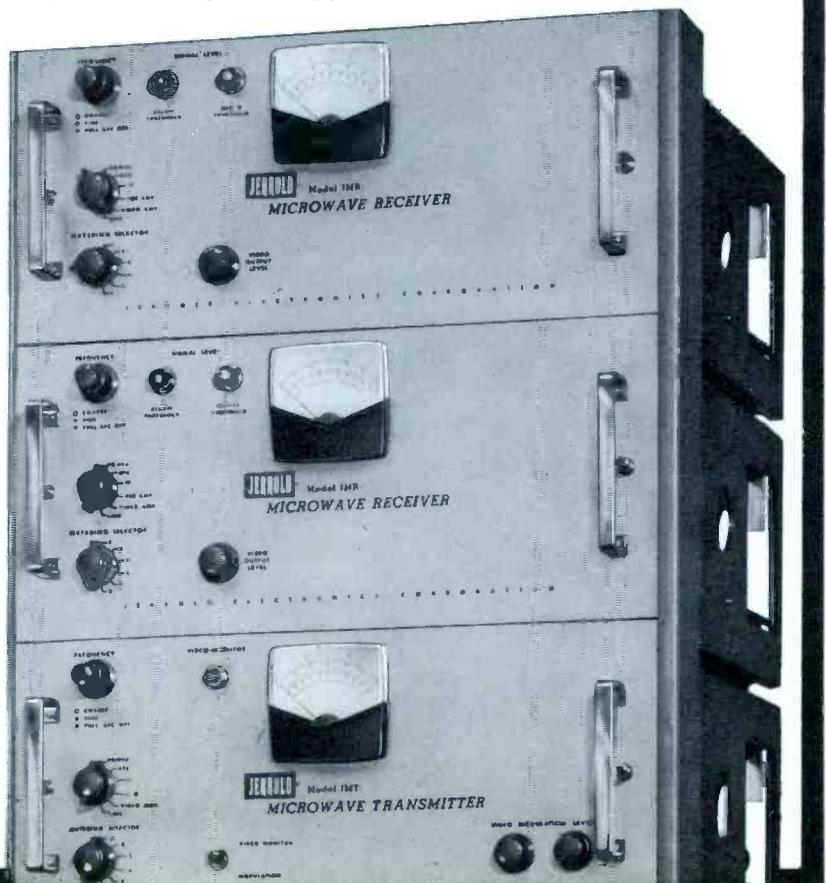
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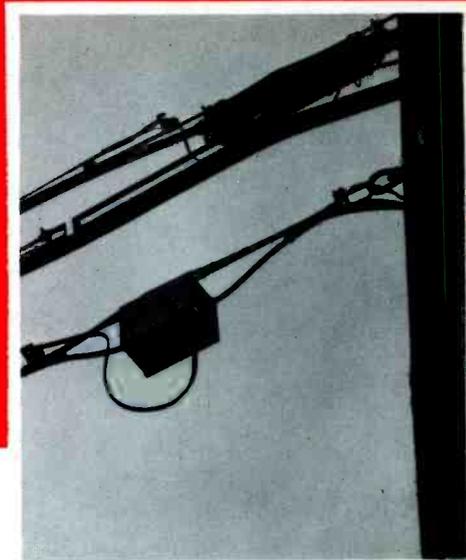
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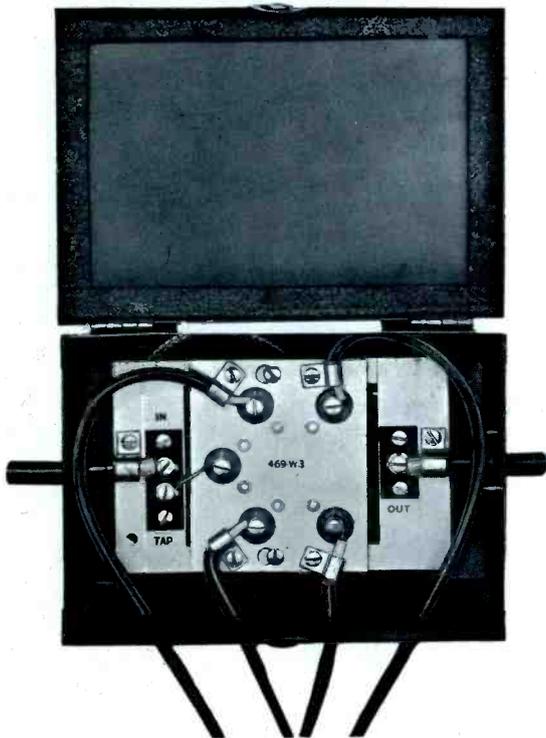
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