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# tv horizons



**ADJACENT CHANNEL INTERFERENCE PROBLEMS?**

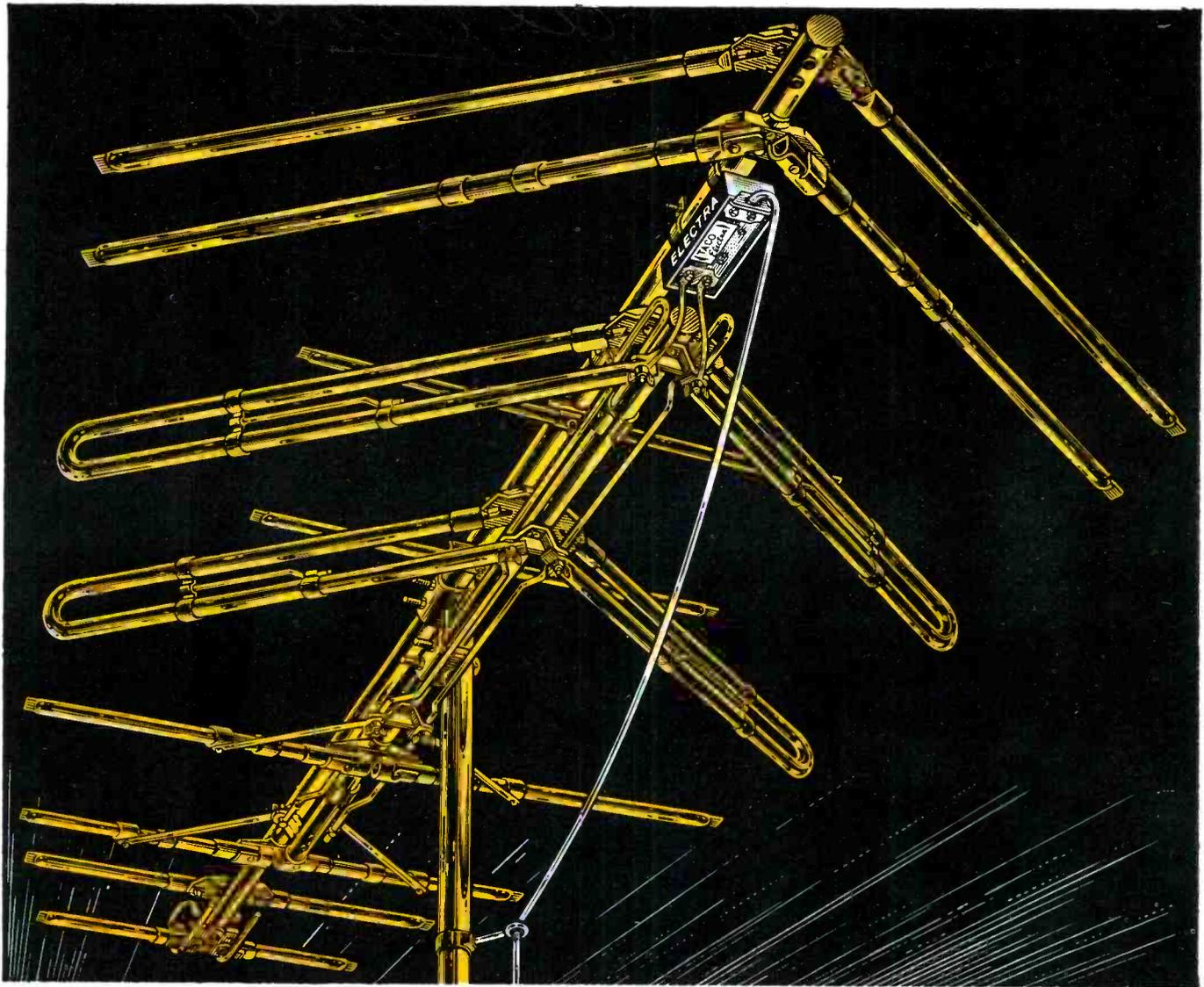
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**serving the television reception industry**

## IN THIS ISSUE

Re-Broadcast TV in Canada; "Do I Need Microwave?"

More About G-Lines • Intec Service Bench



# HOTTEST

Servicemen and distributors everywhere are talking about the hottest-performing electronic antenna around—the TACO T-BIRD ELECTRA.

And you know what started them talking ... color TV. Color reception is the ultimate test of an antenna today, and here the T-BIRD ELECTRA's superior design separates the men from the boys. No friction noise, no signal flutter, a rifle-sharp forward lobe, flat response on all channels—and the best transistor preamplifier in the business (Jerrold-designed) . . . a few of the reasons why T-BIRD ELECTRAS (model for model) are *the world's most powerful electronic antennas*. Every element is extra rugged and put there to *work*, not just look pretty.

Only TACO, of all leading TV antenna manufacturers, has deep experience in designing satellite-tracking and defense antennas, as well as the best electronic know-how in the business. It's this combination that's making T-BIRD ELECTRA the hottest antenna news today. Add to this the new promotional concept that TACO offers you, and you have a line that can't be beat. Hot tip: GO TACO.

Shown above: T-BIRD ELECTRA Model G-990-8, list price \$107.20. Other T-BIRD ELECTRAS as low as \$78.80. Unpowered T-BIRD antennas list from \$28.30 to \$65.05.



## TACO **T-BIRD** ELECTRA

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# Channel

# 1

## Jerrold Acquires Pilot Radio

Jerrold Electronics Corporation has purchased yet another firm in the electronics manufacturing field, with the announced acquisition of the Pilot Radio Company, New York. Pilot Radio, founded in 1919, and one of the pioneers in radio reception aides, currently produces a line of high fidelity components and consoles. Existing Pilot distributors will be continued, and the Pilot Radio line will undergo no drastic changes in the near future, according to Jerrold.

Jerrold has purchased three major firms in the past 12 months, including Pilot. Just one year ago Jerrold acquired Harmon-Kardon, and less than six months ago, Jerrold purchased Taco.

## Super Power FM

Melonas Broadcasting Company, Inc., Birmingham, Alabama, has filed an application with the FCC for a construction permit to install a 1,000 kilowatt (1,000,000) watt FM broadcasting station. The station currently operates with a "mere" 20 kilowatts at the present time.

## New Translator?

Middle Fork TV, Middle Fork, Idaho (8 miles due east of Kooskia) has filed an application to build a VHF TV translator station utilizing a "Huntley LHT-1" 1 watt VHF translator, and a Huntley model CR-13 antenna. Huntley is the first new "brand name" to appear on the translator horizon in more than a year. It was only a year ago that 8 firms were tooling to build units. Today only four are mentioned in FCC filings, and two of the original 8 have "pulled out."

## 1200 V Translators

Applications for VHF translators passed the 1200 mark during February and climbed slowly towards 1300. While the initial splurge is over in the field, concentrated sales efforts on the part of remaining manufacturers continues to stir up new leads and possible towns. Applicant number 1200 was Adel TV in Adel, Oregon.

- CATV
- MATV
- Fringe TV
- ETV
- UHF-TV
- Associated Industries' News

## New UHF Translator

A radical new approach to UHF transmitting circuitry will herald the arrival of the first *new* UHF translator unit to be brought into this field in nearly three years. Electronics, Missiles, and Communications (EMCEE), Mount Vernon, New York promises to break through their new 100 watt UHF unit at the NAB show April 1-4 in Chicago. The unit uses no cavity type amplifiers, is said to be exceedingly stable, and will sell complete for a reported price of \$5,000.00, or less.

## New CATV Microwave

The FCC is entertaining (so to speak) applications for new 6 Kmc microwave links for CATV systems in a number of states, this month. Among those recently filed with the Commission was an addition of two channels to a system now operating to Elk City, Oklahoma from the Oklahoma City area, and an extension of the service from Elk City to Erick, Oklahoma.

Northco Microwave, Inc., Laconia, New Hampshire is seeking 6 Kmc permits to link independent television station WPIX New York city with CATV systems in Mount Graylock, Massachusetts and La-

conia, New Hampshire.

V. L. Hutchison, Paducah, Texas proposes to microwave KROD and KTSM, both El Paso, into his proposed CATV system in Pecos, Texas.

The Dubuque, Iowa CATV system has filed through Microwave Service Company, Tupelo, Mississippi for permission to carry the signal of WGN-TV Chicago into Dubuque, via relays at Rockford and Waddams Grove, Illinois, from a pick-up point at Havard, Illinois.

W. A. Henley, Junction, Texas proposes a 6 Kmc unit to carry the signal of KONO-TV, San Antonio, Texas into Junction, via an existing intermediate station at Kerrville, Texas.

Eastern Shore Microwave Relay, Washington, D.C. proposes to microwave television signals from Durham-Raleigh, N.C.; Greenville, N.C.; and Washington, N.C. to CATV systems in Wilmington, N.C. and Wrightsville Beach - Harbor Island, N.C. The 6 Kmc proposed link would carry the signals as far as Wilmington, and cable will link the proposed systems in Wrightsville Beach and Harbor Island.

Television Microwave, Inc., Elko, Nevada was granted a modification of its C.P. so as to furnish additional service to the Lake Tahoe Unified School District. The five channel microwave system which crosses over the Sierra Nevada mountain range near Lake Tahoe now feeds a CATV system in Carson City, Nevada.

## NYC UHF Test

If you have been wondering about the progress of the New York City FCC conducted UHF testing program, you will probably have to wonder a little longer. The commission has put the lid on the last possible escape hatch for "early information" on test program results. *However*, Television Horizons will carry Part 1 of a special report in the April issue on how the testing program is being conducted, what types of measurements are being taken and what standards are in use.

# TELEVISION HORIZONS

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## EDITORIAL

A wise soul once remarked "nothing is so constant as change."

He was referring, of course, to the hard fact that evolution goes on constantly, and that the pattern of today's living will not be the pattern of tomorrow's life.

The television reception industry reflects this fact like few other industries in the world. While the home viewer has seen few changes in his television reception since the mid 50's, when television finally became of age, the changes within the industry that provides him with his major source of entertainment and enlightenment has seen many.

One cannot help but feel that a major evolution in television reception and transmission must be just around the corner. Things have been too quiet too long!

In the CATV industry, for example, the "big" are getting bigger and the small are rapidly disappearing. Multiple ownership, once a rarity, is now common place. And the industry is getting bolder. Two years ago no one would dream of marching into Wilmington, North Carolina and under the very nose of a local (single station) tele-casting tower bring in signals from distant multiple station markets for a town of 60,000 plus viewers!

And while a similar plan for Santa Barbara, California has failed to date, an identical plan for Monterey, California (also served by a single local station) has at last won the green light.

All of this points up the crying desire of the American public for (at the flick of a channel selector) a minimum of three programs ready for instant viewing.

These small successes in the field inspire one to imagine such grandiose projects as wiring Temple, Texas for Dallas-Fort Worth signals, wiring Erie, Pennsylvania for Cleveland or Buffalo signals, or even wiring all or a large part of Toronto for U.S.A. programs.

Two years ago no one would dream of such projects, and two years ago few if any supporters of CATV had the funds to undertake such installations. But today the industry is on very solid footing, and no progressive thinker dares scoff at such ventures.

And, while no one has yet suggested wiring downtown Chicago for New York independent station programs, the day may not be too far in the future when such a scheme will be proposed!

R.B.C.

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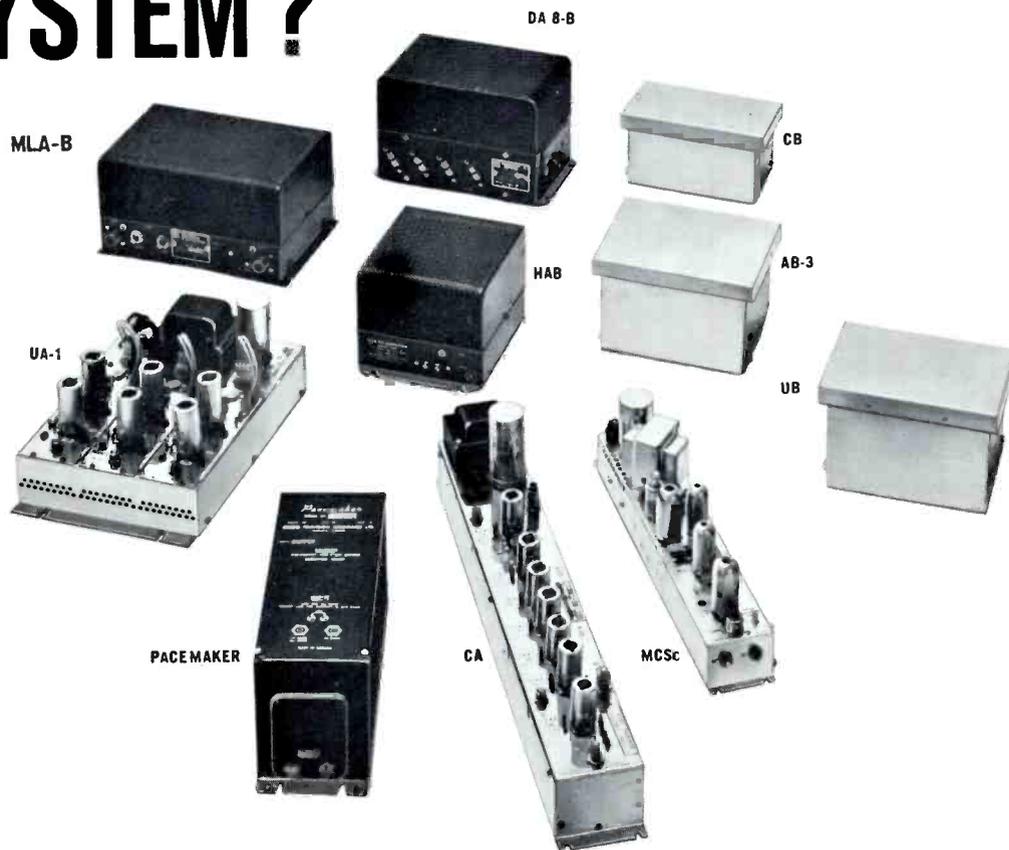
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	PACE-MAKER	75 ohms	75 ohms	VHF/FM	VHF, 35db FM, 30db	*2 v./band	Separate hi & lo band input.	99.50
	AB-3	300 ohms.	75/300	VHF/FM	25db	*0.9 v loband *0.5 v hiband **2.5 v loband **1 v hiband	Remote power supply. Weatherproof mast mounted.	104.95
	DA 8-B	75/300	75/300	VHF	10db per outlet	*0.2 v	8 outlets for distribution.	99.50
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	CAP (not illus.)	75 ohms	75 ohms	VHF/FM	60db	*5 volt	Agc. dual mixing out-put.,	295.00
	UA-1	75 ohms	75 ohms	VHF/FM (FM LIST 99.50)	35db	*1 volt	Requires external power supply.	59.25
UHF	UB	300 ohms	300 ohms	CH 70 thru 83	14db	*0.5 volt	Mast mounted with remote power supply.	84.50
	STRATO BOOSTER (not illus.)	300 ohms	300 ohms	CH 72 thru 76	20db	*0.5 volt	Mast mounted with remote power supply.	103.75



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# "am I ready for microwave?"

By **PAUL B. McADAM**  
Western Microwave  
Livingston, Montana

Microwave has become an integral part of CATV in some instances, and provides the only means of successfully operating CATV Systems in many areas. However, nothing can be more costly and provide more mental anguish than microwave! Therefore, some rough yardsticks or "Rules of the Game" could be of value to CATV operators.

Basically, the first problem in determining if you want microwave, is cost! Do the benefits warrant an average cost of \$400 to \$600 per channel per month microwave expense? Can you raise your rates or secure additional subscribers to cover this additional cost? Perhaps our experience as a CATV and microwave operator can help you.

## Need For Microwave

Do you need microwave? Will it help you improve or enlarge your system? Is the cost justified? Let's first examine the need for microwave.

**1. ADDITIONAL SIGNALS:** Microwave is the only economical way to bring television signals over ten miles distant to a CATV system. Signals should be different to those carried on the CATV system, or the expense of microwave is not warranted.

**2. IMPROVED SIGNALS:** Improved quality, elimination of fading and co-channel or icing problems at a distant pick-up site, would certainly justify the use of microwave.

**3. BOOSTER COMPETITION:** Microwave could provide high quality as well as otherwise non-obtainable signals through one or several hops, and improve your competitive position against boosters. If boosters or other signals are a real threat to your operation, microwave may be necessary regardless of cost.

## Cost of Microwave

**4. COST PER LINK:** The first transmitter-receiver link is the most costly, as it requires housing, road, power, pick-up antennas, standby power, legal and license expense, engineering and mainten-



Author Paul B. McAdam is a partner in Western Microwave, Livingston, Montana; Eastern Microwave, Ontario, New York; and a part owner of seven Montana CATV systems.

ance equipment including possibly snow vehicles, highly trained personnel, plus costly expensive "learning"! Roughly, it could be as follows:

### Estimated Costs

- (a) Legal, license and organizational expense .....\$1,000
- (b) Pick-up site development, housing, tower, etc. 6,000
- (c) Additional standby power, receivers, test equipment, etc. .... 5,000
- (d) Microwave transmitter-receiver equipment ..... 7,500
- (e) Terminal modulators, building, power, misc..... 3,000
- (f) Test equipment, minimum required (average) 4,000
- (g) Two 8-foot dishes, waveguide, plumbing etc..... 1,900

### Approximate

Total Costs.....\$28,400

**5. COST SECOND LINK, OTHERS:** The second channel would cost about \$9,000, using the same dishes diplexed together. Other hops or additional channels would have similar costs as to items needed.

**6. MAINTENANCE COSTS:** Including tubes, personnel, repairs, insurance, taxes, legal protection, power, truck cost and upkeep, etc., lumping all of this together, the maintenance cost after the first link would be about \$300 per month. The maintenance cost of the first link would probably be about \$500 per month.

**7. TOTAL COSTS:** Assuming you have two channels over one hop (the most economical) and a total investment of \$37,000 spread over five years (which has been O.K.'d by the Internal Revenue Bureau), and this cost was financed at 7% simple interest with payments of \$22.20 per month per \$1,000 borrowed or invested, your cost is:

60 month financed payments on investment....	\$ 814.00
Maintenance costs for 2 channels per month....	800.00
<b>TOTAL COST PER MONTH</b> .....	<b>\$1,614.00</b>

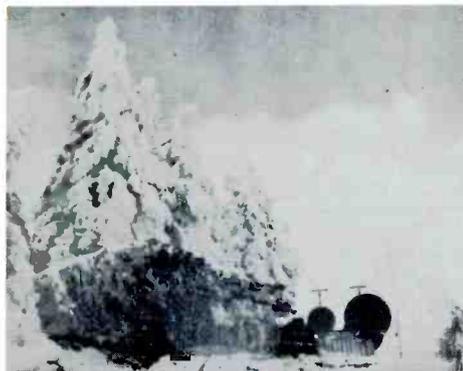
Obviously, this is expensive, and at \$800.00 per month per channel, the cost is probably prohibitive for the average CATV operator. One solution is for two CATV systems in neighboring towns to receive the same signals. This requires only two additional receivers with the same transmitters "squirting" in two directions, bringing the cost down to about \$450 per month per channel for each operator. The other solution is to buy service from another private microwave company who can operate many links at lower cost. As a common carrier, their rates are adjusted by the FCC to allow only a small profit.

**8. USE OF CABLE UP TO TEN MILES:** With the new low loss cable and super power amplifiers, cable runs up to ten miles are more economical than microwave because they provide several channels for the cost of one microwave link. Additionally, there would be no expensive headaches from FCC regulations. Antenna cable runs usually cost \$800 to \$1,200 per mile, or an average of \$10,000 for a 10-mile run.

## Using Microwave in CATV

9. RAISING RATES: Because of the cost of microwave, the only possible way for a presently operating CATV system to assume the added cost is to raise rates to their subscribers. If this is your decision, then we suggest the following strategy:

(a) Proceed quietly without public announcement of a definite date until you are ready to go, as you may have months of delay through the FCC.



Storm clouds on the horizon should be warning enough! This high mountain microwave installation near Bozeman Pass, Montana uses "T" tongue bars on 4 inch pipe with guys to prevent twist and misalignment of dishes.

(b) Consider at least two channels of microwave service for a price raise. Select signals with different programs or some other features that you can sell to the public. Don't dribble away your golden opportunity for a price raise by adding only one channel. Some systems now have 9 channels without having had a price raise, and they will never have an opportunity now to raise prices without stiff customer resistance.



Power lines coated with ice to the thickness of a man's arm, snow four feet deep on the level at Monida Pass location near Montana-Idaho border. Snow weasels bring in men and supplies. Note 10 foot dishes, painted black, to resist frosting conditions.

- (c) Most systems can stand a 90c per month or 3c per day price raise without trouble. Have no fear of people who say they will disconnect. If your product is good and sold right, you will have no trouble. We lost one out of 1800 subscribers! When the new clear pictures by microwave come on their sets, all opposition to the 3c per day raise will fade away!
- (d) With City franchises, watch out for politics with a price raise. Never announce a price raise before a City election. Quietly sell council members and the mayor in advance. Don't let your TV price raise become a political football!
- (e) Make your public announcement with great fanfare at least two weeks after you have cooked out the "bugs" in your equipment. Use direct letter to subscribers about new shows, etc. for "only 3c per day"!



Waveguide plumbing goes on a 10 foot dish at the Little Belt site near Lewistown, Montana. Despite the rugged appearance of the installation (and it is!) wind later tore the dish from the mounting tower and sailed it 200 yards through the air doing \$1500 damage.

### Legal Angles of Microwave

10. COMMON CARRIER STATUS: At the moment, it is best for CATV operators in microwave to assume a Common Carrier status because of FCC Rules and Regulations. This requires that you serve at least one customer other than yourself in which you do not have any financial interest; otherwise,

you are not classed as a Common Carrier. Therefore, the solution is that you must have at least one other willing customer to be classed as a Common Carrier in the eyes of the FCC, or buy service from another Common Carrier and let him worry!

A Washington legal counsel is a necessity to help guide you, prepare licenses, amendments, and present your story to the Federal Communications Commission.



Paul McAdam (right) and his partner in Eastern Microwave Bill Calsam of Oneonta Video (left) stand on a spot on Graham Mountain in the Catskills where all New York City stations are snow free on rabbit ear antennas. This spot forms the nucleus of the Eastern Microwave CATV complex which is now building in central-upper New York state.

### Conclusion

11. THE RIGHT DECISION: Only you can make the right decision, as each and every case is different. Please consider carefully the "pros and cons", even writing them out on paper and balancing them up, along with detailed cost estimates. Then, make your decision! Either plan to serve yourself and one other customer, or plunge in like we did with Western Microwave, now operating 64 links and soon to have 108 links of gear. So far, our microwave operations have not been very profitable, but we anticipate this major drawback will be eventually overcome with the addition of more customers. There's one thing for sure—it has been a real challenge!

### CATV OPERATORS

Had enough of microwave material, or do you want more? Drop TVH a line with your comments.

# MORE G-LINES

## PART TWO

Prepared from material submitted by  
Engineering Department  
Ameco-Antennavision  
Phoenix, Arizona

(Editor's Note: The February issue, *Television Horizons* carried a report on experimental data produced from the work of engineer's George Frese and Archer S. Taylor, both well known in CATV circles.

This month's report concludes this series with comments on the general adaptability of G-Lines to large installations, as found in the Antennavision complex in Arizona and California.)

A G-Line System is an economical method of signal transmission in situations where long cable runs are necessary in sparsely populated areas. Amplification characteristics of the system are exceptional when properly designed antenna type basket frame horns are correctly installed.

General transmission characteristics of G-Line are the same as those of coaxial cable. There is no mismatch and ghosting is limited. Since there is a healthy radiation signal around and near the G-Line, the system is limited to use in areas where few service drops will be made\*.

For maximum amplifier spacing, G-Line should be routed in as

straight a line as possible. Changes in direction should be gradual and sweeping, not more than ten degrees to twenty degrees per change, or poor transmission and high losses will result.

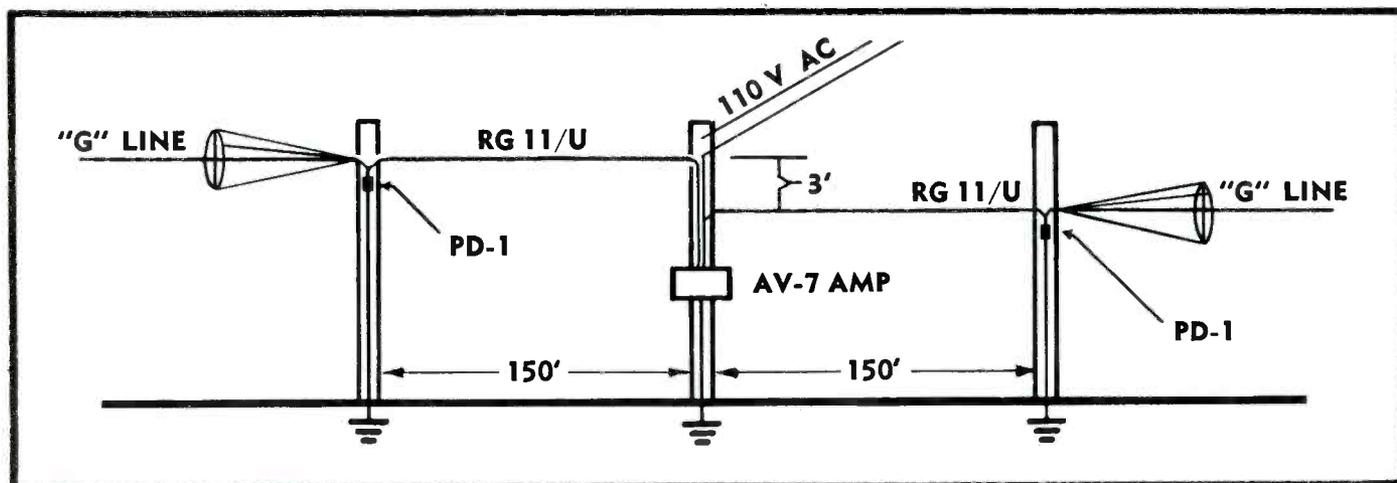
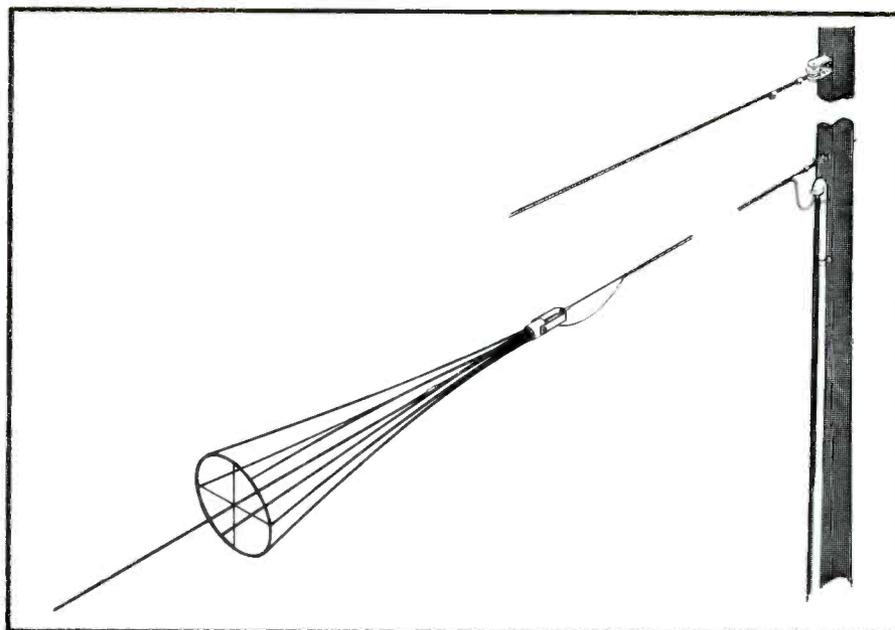
G-Line should not be installed above fences, or on poles parallel to power or telephone lines. Such installations raise the signal attenuation and cause signal feed back at amplifier locations. As a passing note, G-Line should not be installed closer than two (2) feet to any solid object.

A typical G-Line system is one installed by Antennavision, Inc. of Phoenix, Arizona in extending its Winslow, Arizona system to serve an Air Force Radar Base located eight (8) miles from the end of Winslow system. Using techniques perfected by its subsidiary manufacturing company, Ameco, Antennavision set 25 foot class seven poles 500 feet apart. Number 8 copperweld wire with a 3/64th poly

jacket was suspended three feet below a four foot cross arm with 3/8 inch nylon rope. The line uses four Ameco AV-7A amplifiers, locations of which were primarily dictated by the availability of power. The spacing worked out to approximately 30 db between amplifiers.

At each amplifier's location it is necessary to install a receiving horn and a launching horn. The receiving horn, installed on a pole 150 feet from the amplifier position feeds the signal into RG 11/U double shielded coaxial cable directly to the input of the amplifier. After amplification, the signal leaves the output of the amplifier over RG 11/U and is fed into the launching horn which is mounted on a pole 150 feet on the other side of the amplifier position (see drawing).\*\*

As a precaution against feedback the messenger supporting the RG 11/U cable on the output side of the amplifier location is installed



three feet lower than the input side. To bleed off induced voltages, an Ameco PD-1 power duplexer was installed at both the receiving horn and the launching horn with AC cabled to ground.

At the termination of the system, the signals are fed into the receiving horn and then distributed via conventional coaxial cable to the drops and splits. G-line can be tapped\* using a dipole antenna and typical house drop arrangement from the antenna to the customers set. The launching and receiving horns are identical in construction. The horn base plate is supported by a yoke which in turn is bolted to the pole. From the base plate six 3/8 inch aluminum rods twelve feet long project, and are connected to, a face ring which is 36 inches in diameter. Two plastic spacers, one 2 3/8 inches in diameter and the other seven inches in diameter are placed between the base plate and the face ring, to hold the tubing rigid and to shape. A UHF fitting is located on the back of the face plate for connection to the coaxial cable.

The Winslow G Line system has been in operation for over a year now, and has provided stable and maintenance free operation while delivering excellent quality pictures.

Equipment and materials for a G Line System include: Ameco Model GLH receiving and launching horns (one at the beginning and end of the system), and two at each amplifier location; Ameco AV-6 or AV-7 low band amplifiers; number eight (8) copperclad space wire with 3/64 poly jacket (loss approximately 3 db per 1,000 feet); half cross arms (one per pole) and the usual arm mounting hardware; nylon rope (1,000 pound breaking strength), 40 feet required for each antenna horn, and four feet for each pole attachment location.

\*Despite Ameco's comment concerning line radiation, Engineer Taylor reported in February that his radiation was less than 1.5 uV per meter at a distance 9 feet from the line, immediately following 45 db amplifier.

\*\*Apparently Ameco does experience radiation problems that Taylor did not experience in Montana (see February, Part 1). Ameco found it necessary to space receiving and sending launchers 300 feet apart to prevent feedback at 30 db amplifiers, while Taylor used much closer spacing and found only one installation where he was forced to space launchers at 240 feet, with 53 db of amplification. It may be that Taylor's Goubou horns are less prone to radiation than Ameco's open spire version

of the launching horn, and therefore less of a feedback problem.

### Texas CATV Sets May 18-19

The Board of Directors of the Texas CATV Association, meeting in Dallas January 28-29, set May 18-19 for a Spring session meeting in Dallas. With 65 CATV systems now operating in Texas, the state association represents one of the strongest in the nation with 53 of these signed up.

The Marriot Motel Hotel will be the site of the May meet. Broadcasters in Texas and adjoining states are to be invited to attend the session, with a reception and luncheon or dinner in their honor. Southwestern Bell will also attend to discuss pole line attachment matters.

It is hoped that auxiliary services, such as Stereo FM, Weatherboards, etc. can be worked into the agenda.

An open invitation to CATV operators in neighboring states to "sit in" has been issued and the session promises to be highly informative.

### FM Stereo On CATV

Considerable interest on the part of CATV-MATV operators-installers in stereo FM distribution over existing CATV-MATV systems has prompted TV Horizons to prepare a series of technical articles on the subject. The first of these reports will appear in the April issue of TVH, prepared under the guide of John Campbell, operator of the Mineral Wells, Texas CATV system and a principal in CAS Manufacturing Company, Mineral Wells. CAS has already made delivery on a number of FM stereo head ends, and the novel CAS method of double conversion without demodulation deserves special note on the part of any CATV system operator planning to add stereo FM broadcasts to his distribution system.

### Largest CATV Sale Ever

In a joint statement, Bruce Merrill, president of Antennavision, Inc., Phoenix, Arizona; and Larry Boggs, president of Vumore Company, Oklahoma City, Oklahoma, announced that Vumore has purchased seven of Antennavision's 17 community antenna systems.

Located in Arizona, the 7 systems provide television reception to 7,600 subscribers in the communities of Winslow, Cottonwood, Holbrook, Page, Snowflake, Lakeside, Pine-top, McNary, Safford, Clifton and Morenci.

Merrill, in announcing the sale, commented that Antennavision's future plans include operating the remaining ten company owned systems, serving 15,000 subscribers in California and Arizona towns. Future plans also call for expanded CATV ownership by Antennavision, in "other areas of the country".

Vumore Company, majority owned by RKO General, owns and operates community systems in 20 towns in Texas, Oklahoma, Kansas and Mississippi. Industry figures indicate that with the purchase, Vumore may now be the largest single entity in the CATV owning and operating field.

Although the single-lot sale price was not disclosed, Bill Daniels, of Daniels & Associates, Denver, reports that Vumore paid more for the seven systems than any single purchase ever involved in the four year history of his company.

## FCC BRIEFS

### GRANTS

Granted CPs for the following new VHF TV translator stations: Kenneth O. Ray (BPTTV-997) on Channel 4, Tierral-debmar and Sandlake, Oreg., to translate programs of KOIN-TV, Channel 6, Portland, Oreg.; Jicarilla Apache Tribe (BPTTV-1034) on Channel 9, Dulce, N. Mex. (KOB-TV, Channel 4, Albuquerque, N. Mex.). Parker Television Translators Parker, Ariz.

Granted CP for a new UHF TV translator station on Channel 74 to translate programs of KOOL-TV (Channel 10), Phoenix, (BPTT-633).

Coalville Area TV Assn. Coalville, Utah

Granted CPs for new UHF TV translator stations on Channels 9, 11, and 13 to translate programs of KUTV (Channel 2), KCPX-TV (Channel 4), and KSL-TV (Channel 5), all Salt Lake City (BPTT-1068-70).

BMPTTV-47 San Miguel Power K04AS Association, Inc. Naturita, Colorado

Mod. of CP (BPTTV-470, which authorized a new VHF TV Translator station) to change primary TV station to KREY-TV, CH. 10, Montrose, Colorado, via K06BF, Ch. 6, Norwood, Colorado, via K08AV, Ch. 8, Nucla, Colorado.

BLTTV-109 Caribou County TV K07BK Assn. Grace, Bancroft and Soda Springs, Idaho

License to cover CP (BPTTV-405) which authorized a new VHF Television Translator Station.

BLTTV-110 SAME AS ABOVE K11BC

License to cover CP (BPTTV-406) which authorized a new VHF Television Translator station.

BLTTV-111 SAME AS ABOVE K13AY

License to cover CP (BPTTV-407) which authorized a new VHF Television Translator station.

# RE - BROADCAST TELEVISION IN CANADA

## — A TVH 1962 STATUS REPORT —

The Canadian Board of Broadcast Governors has taken a positive step towards formulating a policy to facilitate the orderly growth of re-broadcast (translator) television. The BBG format might well serve as an example to the FCC and the equally pressing problem in the same area in the United States.

In the opinion of the Board, rebroadcasting stations in certain situations can contribute to the development of broadcasting service in Canada. However, many rebroadcasting stations provide for restricted use of scarce channels and make no provision for local service. Consequently, applications for low power rebroadcasting stations must be examined carefully to ensure that their approval does not result in inefficient use of channels or prevent the development of local service.

### Television Rebroadcasting Stations

A television rebroadcasting station is a station for retransmitting the signals of a television broadcasting station or another television rebroadcasting station for the purpose of providing reception to the general public. It receives substantially all of the signals for retransmittal by means of an off-the-air pick-up receiver which may or may not be separated some distance from the rebroadcasting transmitter. The output of the off-the-air pick-up receiver may be fed directly to the rebroadcasting transmitter or it may be relayed to the transmitter via a radio relay circuit or coaxial cable.

Applications for television rebroadcasting stations must be reviewed by the Board within the framework of the general policy for the development and extension of television service.

### Type of Service Available

Under the "one station" policy, television service expanded to cover a considerable proportion of the population. The "one station" policy was lifted in 1959. Since 1959, the development of service has proceeded on two fronts. First, there has been further extension of service, largely by rebroadcasting stations, into previously unserved areas. Where a broadcasting station is not in prospect, and the licensing of a rebroadcasting or network repeater station will not impede further expansion of service, this is a valuable contribution to the development of broadcasting service. The important, and increasingly difficult task of extending service into fringe areas

is not yet completed. Second, "second stations" have been approved in the major centres and alternative Canadian viewing is now available to a substantial portion of the population. The further extension of alternative service by broadcasting stations should proceed as circumstances permit. However, although they are operating in relatively favorable locations, the second stations now licensed are experiencing some difficulty in meeting their obligations. Consequently, although the Board is prepared to hear applications for further "second" broadcasting stations as they come forward, it is the view of the Board that alternative service beyond the major centres will proceed slowly. In the meantime, the long-run orderly development of "second" broadcasting stations should not be impeded or disrupted by diversion of pockets of population through the licensing of rebroadcasting or network repeater stations. The Board must also consider the effect on the position of the existing stations. Even in the most favourable situations, the Board does not believe that the conditions justify the provision of "third" service, by rebroadcasting stations or otherwise, at the present time.

### Relation of Television Stations to Rebroadcasting Stations

The need for rebroadcasting stations is related to the adequacy of the coverage provided by broadcasting stations. Applicants for broadcasting stations should clearly define the market area, and the principal community they intend to serve and in which they propose to locate the studio. They then have the responsibility to lay down an adequate signal level, so far as possible, over the entire market area, with special attention being given to the principal community.

Applicants for broadcasting stations must be prepared to outline plans, and to make commitments as to any pockets in their predicted B coverage area they are prepared to fill, if it is later found that the laid down signal is unsatisfactory. They may also be expected to make commitments to extend coverage into areas which could not, in the foreseeable future, support a television station.

The Board considers the proper functions of a VHF rebroadcasting station to be those of filling in gaps within the A and B contours of the primary broadcasting station, and of extending coverage into areas which neither receive adequate Canadian television service nor, in the foreseeable future, will be able to support a television station. The Board does not consider that it is a function of a VHF rebroadcasting or a network repeater station to extend its A or B contour area into the A or B contour area of another

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## VHF TRANSLATOR

AND THE

## MARS MARK-4

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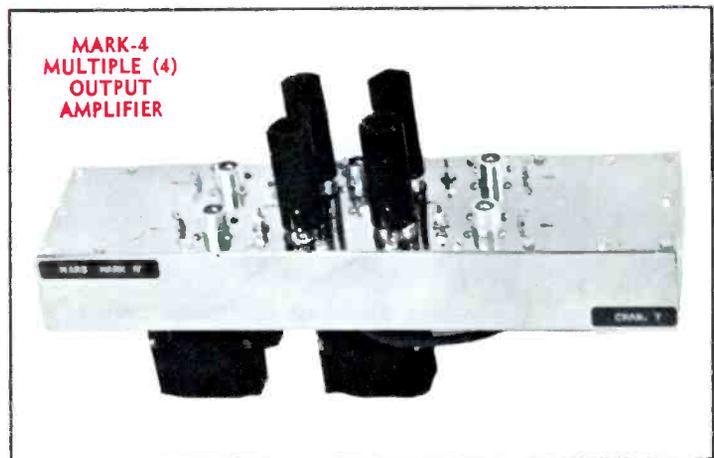
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- ★ MULTIPLY EXISTING COVERAGE AREA BY FOUR
- ★ DESIGNED TO SUPPLY ONE WATT IN FOUR DIRECTIONS TO ANTENNA SYSTEMS SERVING FOUR DISTINCTLY SEPARATE COMMUNITIES.
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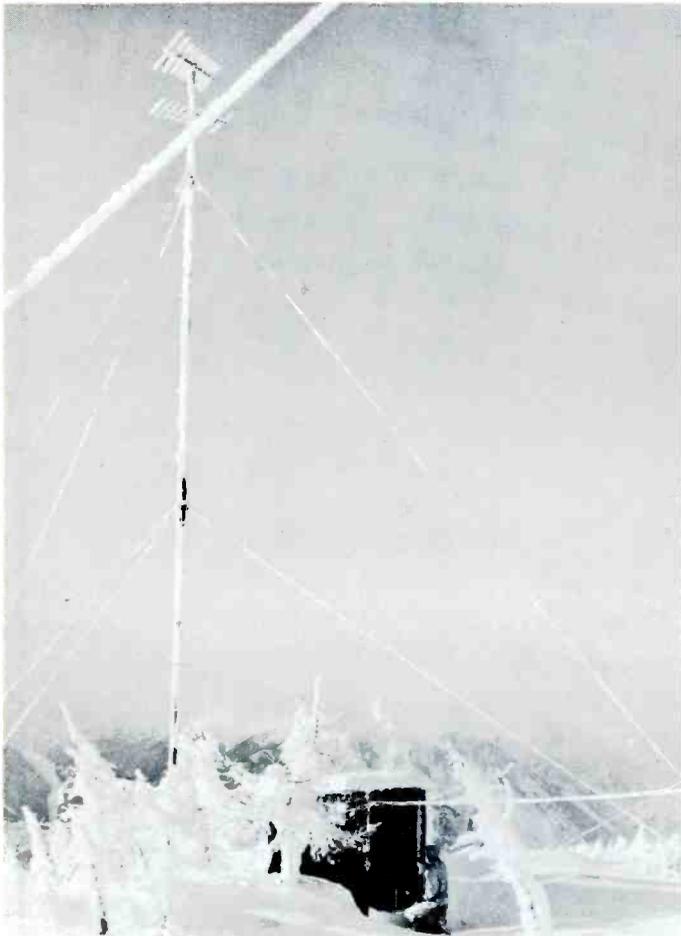
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existing television station or a station which has been recommended for licensing by the Board except under special circumstances. Exceptions to this principle will be:

- (a) when the language of the programmes to be rebroadcast is different from the language of the existing or projected station;
- (b) where the service being supplied by the existing station is located in a different province from the station which feeds the rebroadcasting or network repeater station;
- (c) where the standard of service being provided within the A or B contour area of the existing station is clearly inadequate, and the existing station is unwilling or unable to correct the deficiencies.



Directly in the path of Canadian storms off the Pacific coast, British Columbia translators are subjected to snow and ice for longer periods of the year than U.S. translators. Here transmitting yagis show snow-ice coating after storm near Lytton, B.C.

#### Where Repeaters Will Be Licensed

The Board is not prepared to recommend favourably on applications for rebroadcasting stations which will be duplicating any significant part of an adequately served A or B contour area of another rebroadcasting station which carries the same network programme.

Wherever possible, a channel should be selected for the rebroadcasting station which will not cause interference to fringe area reception of existing stations operating on the same or adjacent channels.

The Board, in considering an application for such a station, will weigh the increased service resulting from the proposed station against any loss of service which may be caused as a result of co-channel or adjacent channel interference to existing stations.

First priority on channels will be given to a station with a local studio in the principal community to be served, provided in the opinion of the Board it is economically feasible. If, in the opinion of the Board, it is not economically feasible for such a local station to operate in the area, second priority on channels will be given to a rebroadcasting station or network repeater station carrying the national service. Third priority on channels will be given to a rebroadcasting station which is not carrying the national service. If satisfactory applications for the use of the channels in the area are not received, these priorities will not be maintained beyond some reasonable time period.

In extending television to areas not now receiving service, top priority will be given to facilities which will extend the national service of the Canadian Broadcasting Corporation. Where the availability of channels permits, this policy will not prevent a successful application for a rebroadcasting station by a licensee not affiliated with the Corporation, but, in the opinion of the Board, the national service should be extended as soon as a satisfactory application is received from the Corporation or a station affiliated with the Corporation.



A trick borrowed from Idaho CATV systems, this shed houses receiving antennas on Botani Mountain near Lytton, B.C. at the 7,000 foot level. One side of the housing is fibreglass to let the R.F. in, and keep the snow and weather out. Snow frequently covers the shed with 14-20 feet on level areas during a heavy winter.

#### Local Live Programs Via Translators

The Board considers that the programming of a television station should reflect the community interests and needs, and it therefore wishes to encourage applicants for rebroadcasting stations to have a local satellite studio in the area to be served for part time use if it is economically feasible. In due course, as the growth and development of the local community increases, it may be expected that programming time from the satellite studio will be increased and, when it becomes economically feasible, the larger rebroadcasting stations and network repeater stations will be converted to the usual form of television stations.

Apparently the majority of the Canadian re-broadcast TV market is being captured by Canadian firms. For example, Benco Television Associates, Toronto, has supplied several dozen units to Canadian buyers,

(Continued — Page 22)

## DEPARTMENT JJ

Television Horizons serves the CATV-MATV industries by offering free-no charge advertising space to individuals and firms seeking employment opportunities or personnel. All readers are welcome to use this service. If you wish to place a listing in the next "DEPT. JJ," merely address your material to Dept. JJ, Television Horizons, P.O. Box 1557, Oklahoma City 1, Oklahoma.

The following listings represent employment opportunities. Address your reply to the box number given. All correspondence is forwarded directly to the box holder by TVH.

**WANTED**—Experienced CATV technician to head technical section of new system in the northeast. Should be capable of handling all phases of maintenance, construction, etc. System will eventually have 2,000 subscribers. **Reply to Box 6.**

**ADVANCEMENT**—I am a Chief Technician for a MATV company in a large eastern area. 13 years of experience. Present salary is \$10,000 per year plus expenses. MATV experience includes 3 CATV installations along east coast. Graduate of a radio-TV institute, and have completed an electronics course at New York University. Eager to get ahead, will consider relocating depending on salary offer and location. Age 32, married, 2 children. **Reply to Box 7.**

**MATV TECH WANTED**—Continued expansion of this medium sized Northern New Jersey manufacturer of commercial electronics equipment has created a new growth position for a technician experienced in the engineering layout and/or installation of MATV systems. We prefer a man with additional background experience in the CCTV field. Good starting salary and liberal company benefits, including college tuition payment plan. **Write in confidence to Box 1.**

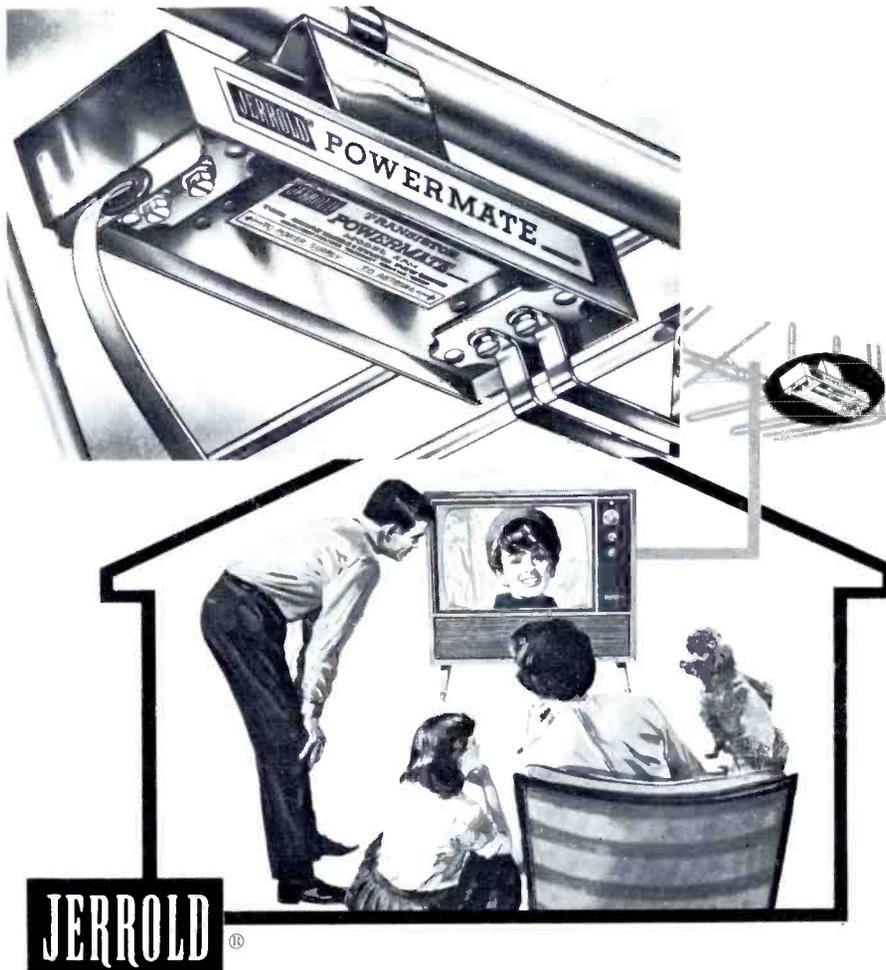
### BENCO ALIGNMENT SHEETS AVAILABLE

Benco Television Associates, Ltd., 27 Taber Road, Rexdale, Ontario, Canada, offers a new packet of alignment instructions covering a number of Benco units. You may request the alignment instructions (dandy for service shop types, or day in-day out users of Benco equipment) in single sheets or the entire packet at once.

Below, readers will find a complete list of the instruction sheets available, and the Benco unit which they cover.

AL001	Hi-Q-75
AL002	BPF
AL003	CO-3
AL004	CA-hi
AL005	HRA
AL006	PA-Hi
AL007	CO-2
AL009	PA-lo
AL010	CAT-Hi
AL012	HTA
AL013	UCT
AL014	Univerter
AL022	Iu-1

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# OUR MAN IN EUROPE

**GORDON J. KING**  
Assoc. Brit. I.R.E.  
Brixham, Devon, England

The Oxford system called for the laying of several virgin cables from the hill-sited aerial station to the first area distribution point—a distance of about one and a half miles. Overhead routing was not permitted, and the underground cable laying exercise was made even more exciting by a major motorway and a minor river traversing at right-angles the line of cable route.

It was decided to “mole-plough” the cables into the ground up to the river (about one mile), anchor them into the river bed, “thrust-bore” beneath the surface of the motorway and then continue the remainder of the route (about 500 yards) underground.

This happened almost to plan, but in practice the problem was eased somewhat by the presence of a water culvert beneath the motorway corresponding ideally to the point where it was required to route the cables!

## The Mole-Ploughing Session

Mole ploughs are regularly used in Great Britain for agriculture activities and for field draining applications. Various authorities concerned with the public services—like water, electricity and telephone—have adapted such ploughs for the speedy laying of underground cables and pipes and, as would be expected, relay contractors soon caught on to the idea themselves.

There are two ways of doing it. One requires the cable drums to be secured to the plough while free to rotate, and with the other the cables are first laid along the route on the surface of the ground. Towing power is provided by a substantial tractor and the blade of the plough cuts fairly deeply into the ground while delivering the cables through a guide so that they fall neatly into the groove of the cut.

The latter method was employed because over large tracts this puts less load on the cables. Four cables were thus buried, and lots of fun and games were had by all, the exercise taking place during the damp and dismal days of November. To check on cable breakage, a short-circuit was applied to one end of the cable and the other end was checked for continuity. The operator observing the continuity meter was in telephonic communication with the mole-plough chief, so that operations could immediately be suspended in the event of a break.

There was only one break and this was when something got jammed and the cables (over 1,000

yards or so) behaved like elastic! At this stage the operation was halted to check on possible damage. After joining the cable, an on-the-spot attenuation test was performed over the entire length, and this together with standing-wave tests for impedance continuity, revealed, much to our relief, that the damage was only superficial.

Apart from rock trouble and a few breakages of the tractor towing wire, the whole project was finished within a week, and during the subsequent week the cables were energized and signal was passing from the aerial station to the first area distribution point.



Getting set for a mole-ploughing exercise. This picture clearly shows the cable laying mole-plough, and the operation is under the direction of George Henry (Relay) Limited, Relay Contractors, of Eynsham, Oxford.

Our mole-plough was able to handle the four cables simultaneously, and after a month or so the cut in the soil had healed and, indeed, a while later one of the fields through which the cables passed was cultivated. There is now no telling that MATV cables are routed beneath the land.

Special precautions were taken to ensure that the cable covering (ordinary PVC) had a good “pin-hole” specification, but apart from that no additional protective precautions were taken. Pipes were used, however, to convey the cables through the stream and culvert.

Periodic attenuation tests are performed on the primary cables, and after several years' operation there is no alarming increase in attenuation, in spite of the fact that almost half the cable is submerged in water for at least four months each year.

Two of the "primary" cables are utilized for "main" and "standby" signal transmission, while the remaining two are "spares". One spare is presently used as a telephone link between the aerial station and the distribution point, but later both will probably be employed to carry closed-circuit programme material.



The route of the primary cable at the point where it enters the stream.

Three line-powered repeaters (40-70 Mc/s) complete the primary circuit, and at each repeater point there is a co-sited "standby" working on the "standby" cable.

#### Transmission Levels

Signal transmission levels vary somewhat between systems in the UK, and the signal level finally adopted by an operator is influenced by two chief factors—signal radiation from the cables and intermodulation.

The new cables which have recently been introduced (some which represent a hybrid of solid tape and braid) have remarkably good "radiation factors", and signal fields as low as 2 microvolts at a distance of 10 feet from a correctly matched cable carrying 200 millivolts of signal are now commonplace.

Unfortunately, in our line of business, it is impossible to retain a high degree of cable matching throughout a network, and as a consequence the cable radiation (due to standing waves) tends to rise above (sometimes well above) the desirable minimum. This is of little concern in areas of normally high off-air signal field, but a "relay" is usually launched in areas where the signal field is below average, and then those types who prefer poor off-air reception free rather than good relay reception (we get them here, anyway!) kick up a fuss about "ghosting" and patterning. One needs to be more than a relay engineer to "kill" interference when the off-air signal field is barely 20 microvolts/metre.

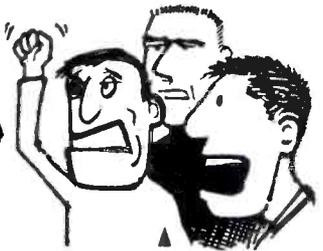
In such locations, therefore, the relay boys may well use, say, 50-100 millivolts of launching signal per vision carrier plus an extra special cable (and take extra care over the matching!). We generally launch the sound carriers 6dB down on vision.

Cross-talk between the modulations of the various carriers handled on a common network, resulting from intermodulation, is the next big headache, particularly now that cable improvements permit a higher network signal level for a given level of

(Continued — Page 23)

## ARE YOUR CATV-MATV CUSTOMERS

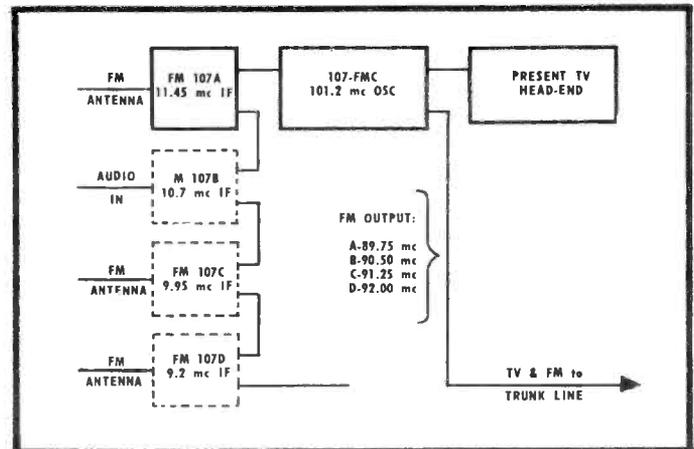
# DEMANDING STEREO?



### NOW—ADD STEREO FM CHANNELS WITHOUT COSTLY DE-MODULATION AND RE-MODULATION PROCESSES WITH EXCLUSIVE CAS METHOD.

CAS provides the only complete system of Stereo FM & Tape head-end equipment designed for the utmost in flexibility and add-on features. A combination of two or more of the units can add to your system any desired number of taped music or Stereo FM stations on the FM band, TV Channels or between TV channels 4 and 5. A unique system of double conversion for the FM station is utilized, eliminating the need for the de-modulation and re-modulation process. CAS permits economical addition of 1, 2, 3, or more FM stations or taped music once the basic system is in.

USE ON MICROWAVE, TOO. CAS Systems now in operation at the CATV microwave station in Brownwood, Texas, as well as several installations in Wyoming.



The CAS CATV/HEAD-end system is a method of providing several FM signals from standard FM or any audio source, with one basic system.

As an example of operation, follow the Diagram. An FM-107-A is used as a crystal controlled FM tuner to pick up a 96.3 mc FM signal off the air. This unit converts the FM carrier to 11.45 mc (does not demodulate). A limiter stage provides a clean constant output at this IF frequency which is fed to the 107-FMC for second conversion to 89.75 mc, Channel A.

To program background music a tape machine feeds an audio signal to the M-107-B which modulates an FM carrier at 10.7 mc. This 10.7 mc is assured by an AFC circuit. The audio input is adjusted for proper FM deviation shown on the meter. This 10.7 mc IF frequency is fed to the 107-FMC and converted to 90.5 mc Channel B.

The next two units, FM-107-C and FM-107-D each pick up an FM station. The output of the FM-107-C is 9.95 mc, while the FM-107-D has an 9.2 mc output. These IF frequencies are fed to the same 107-FMC and simultaneously converted to 91.25 and 92.0 mc Channels C and D.

CAS recommends a standard of frequencies to be used for FM on a cable system. FM channels are listed A, B, C, etc., with a frequency assigned to each, separated by .75 mc.

**CAS FEATURES:** Standard 19" rack mounting . . . Critical voltage regulated . . . Designed for continuing operation with lowered filament voltages for longer tube life and low maintenance . . . Each strip is fused with self contained power supply . . . All conversions are crystal controlled . . . Basic system has only one output to the cable system, eliminating multiple harmonics . . . Approximately 50% less conversions, and possible frequency shifts as in other systems . . . CAS recommended frequencies are compatible with our FM-90 and FM-75 Music System Receiver.

# CAS MFG. CO.

P.O. Drawer B — Mineral Wells, Texas — FA 5-5124  
TELEVISION HORIZONS—THE PROFESSIONAL TELEVISION JOURNAL 13

## Western NCATA Convention Set

The (Western) National Community Television Association of Canada *Convention* unfolds in Vancouver, British Columbia on the 5-7th of April, with more than 100 Canadian CATV enthusiasts expected to attend. In addition to the usual technical and business sessions, the last day of the meet will include a trip on a chartered yacht cruising the Canadian Coast . . . and all of the "necessities" will be supplied. Interested parties should contact B. J. (Bud) Shepard, NCATA Director, at 733 Beatty Street, Vancouver 3, B.C.

## General NCATA Convention Promises Good

Although a date "ready for releasing" has not been made available to Television Horizons at press time, Quebec City has been picked as the location for an early May National Convention of the Canadian CATV operators. One of the most interesting talks on the program promises to be a feature by Mr. I. Switzer of Co-Ax Television Ltd, Estevan, Saskatchewan. Switzer will caption his 50 minute discourse "*Looking Ahead in CATV*", and will deal with the economic, political and technical future of CATV in Canada. Site for the convention will be the famous Chateau Frontenac, and Television Horizons heartily recommends that you attend if at all possible, whether Canadian or U.S. reader, if for no other reason than to enjoy the scenery and be stimulated by CATV operator Switzer's unusual approach to cable TV.

## Congratulations

One of the hardest fought CATV franchise battles in the history of the industry came out in favor of CATV on February 5 in Monterey, California. Harold Bruggeman's Alarm Corporation fought tooth and nail with the local channel 8 (three network) television station, KSBW-TV, as the station sought to force reversal of a Monterey City Council nod towards Alarm Corporation.

KSBW-TV argued for a referendum vote when Alarm Corporation proposed to extend its CATV service to a substantial portion of the scenic Monterey region. KSBW, which enjoys a captive market of the area's viewers, attempted to show the City that it was earnest about opening translator operations into the City to bring in television reception from out of town (San



Francisco) stations. Alarm Corporation was successful in showing the City that even if KSBW was sincere about bringing in "competition to itself", the translator signals would not cover sufficient areas of the town to serve the population as the cable could, and would.

Because of the extent of this battle, and the end result which favored CATV, Television Horizons feels there is valuable information to be learned by the industry from this example. Perhaps Harold Bruggeman or one of his associates can be talked into preparing a report for publication?

## H & B Now All CATV

H & B American Corporation, Beverly Hills, California, has divested itself of its last holding outside of the CATV field, by disposing of Big Boy Barbeque Division to Big Boy Manufacturing Company, Inc.

At the same time H & B announced the purchase of the huge Reno, Nevada CATV system, Community Antenna Company, Inc. A cash payment for the system, which serves Nevada viewers in Reno and Sparks, totaled more than \$1,000,000, according to reports. This makes the purchase one of the largest in the history of the CATV industry. Purchase was from the Siegler Corporation.

With the new acquisition, H & B owns 18 CATV systems stretching from coast to coast, and into Canada, totaling more than \$10,500,000 in investment property.

## Daniels Buys TV Station

Apparently of the opinion that "everything good starts at the broadcasting station," CATV giant Bill Daniels (President of Daniels & Associates, and President of Tele-

vents, Inc., which operates 7 CATV systems) has acquired KTVR-2 in Denver, Daniels' home town. KTVR is the only independently owned and non-network programmed station serving the Denver market. It was one of the earliest stations to come on the air after the lift of the '48 freeze in TV applications. For considerable time, it was the only station in Denver and carried network programming from all three networks. Since losing network affiliation it has lost money on a fairly regular basis.

Daniels said his plans call for a "definite upgrading" in channel 2's programming, both in locally produced content and in filmed and other entertainment. "More locally produced television will be the prime goal and KTVR will have complete programming freedom" Daniels noted.

## Chippewa Cable Drops TV Application

Chippewa Cable Company, Inc., Eau Claire, Wisconsin, has returned its application for a construction permit for a 4.7 kw channel 25 station. The original filing was made in 1961. No reason was given the FCC for dropping of the application.

## Two System Sales

CATV systems on Bonham, Texas and Aztec, New Mexico have sold during the past 60 days. Both sales were negotiated by Daniels & Associates, brokers, Denver, Colorado.

The Aztec Community TV system was sold to Televents of New Mexico for a reported sale price of \$136,000 cash. The system serves approximately 1,000 subscribers and will be managed by Systems Management Company, a Daniels subsidiary.

The Bonham, Texas CATV system sold to Vumore Company, Oklahoma City, Oklahoma, a wholly owned subsidiary of RKO-General.

## NCTA Protests Commission Action

In a statement filed with the FCC, the National Community Television Association protested the FCC's newly assumed authority to adopt Rules restricting the viewing of broadcast signals via a CATV system located in the same community as a television broadcast station.

The CATV association noted the Commission has previously ac-

(Continued — Page 16)

# Introducing . . .

## VIKINGS ALL NEW STRIP COPPER SHIELD

"FOR THE HIGHEST ACHIEVEMENT IN QUALITY"

- IMPROVED RADIATION CHARACTERISTICS
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- VKD11 DOUBLE SHIELDED & SINGLE JACKETED
- VK108 SINGLE SHIELDED & SINGLE JACKETED
- VKD108 DOUBLE SHIELDED & SINGLE JACKETED
- VK100 SINGLE SHIELDED & SINGLE JACKETED
- VKD100 DOUBLE SHIELDED & SINGLE JACKETED

TYPE	O. D. (NOM.) Inner Cond.	O. D. (NOM.) Dielectric	O. D. (NOM.) Shield	O. D. (NOM.) 2nd Shield	O. D. (NOM.) Jacket	Attenuation Channel 6 (db/100 ft.)	Attenuation Channel 13 (db/100 ft.)	Shipping Weight Lbs./M. Feet
VK11	.064	.285	.296	—	.407	1.31	2.2	64
VKD11	.064	.285	.296	.307	.407	1.31	2.2	73
VK108	.081	.373	.389	—	.460	1.01	1.6	89
VKD108	.081	.373	.389	.400	.460	1.01	1.6	101
VK100	.114	.525	.536	—	.632	0.77	1.3	147
VKD100	.114	.525	.536	.547	.632	0.77	1.3	167

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knowledge that it does not have the required authority and has stated publicly that regulation of CATV systems is for Congress to decide. Congress has not been willing (to date) to grant power to the FCC to regulate CATV systems beyond authority to limit radiation strength from cables.

Specifically, the NCTA statement opposes a Petition for a Rulemaking filed with the FCC December 8 by television station WSTV, licensee of television station WBOY in Clarksburg, West Virginia. A

CATV system has been in operation in Clarksburg since 1953.

The WSTV petition requested the FCC adopt either or both of two proposed rules:

(1) To prevent viewing by the public, through the medium of CATV systems, of a television program which is simultaneously broadcast by a local station in the same community as the CATV system—or

(2) To prevent the viewing via CATV within one week of local broadcast.

At press time the Commission had not chosen to comment on the Petition.

### Carter Mountain, Wyoming

#### 'All But Final'

By decision on February 14, the Commission granted a protest by Joseph P. and Mildred V. Ernst of KWRB-TV, Riverton, Wyoming, and denied the application of Carter Mountain Transmission Corporation for additional microwave TV facilities to serve CATV systems in Thermopolis, Riverton and Lander, Wyoming. The decision, backed by the Commission en banc, noted that Carter Mountain "might" refile the application for CATV microwave to the Wyoming communities if a showing can be made which indicates that duplication of programming is adequately avoided and a satisfactory arrangement is arrived at whereby the CATV system will carry the KWRB service (see page 13, February TVH).

The official Commission announcement on the case reported, "The Commission weighed the showings that KWRB-TV is the only local TV outlet for the community against the fact that an increase in Carter's facilities would permit the rendition of better and more efficient service to the CATV serving the community.

"If the Riverton pattern is permitted to be altered and the substantial return from Riverton in particular is reduced, KWRB-TV, despite the fact that it would strive harder, would find it more difficult to sell its advertising in face of the split audience, and this situation together with facts or record, results in our judgment that the demise of this local operation would result."

The Commission added: "True, a grant of the instant application

would permit the rendition of better service by the CATV, but at the expense of destroying the local station and its rural coverage. The CATV would permit the urban areas a choice of coverage, but the local station, especially in this case of a single station market, serves a wider area. A grant of this application will not contemplate an extension of coverage for the entire area included in KWRB-TV's contours since it is too costly for CATV to enter the rural areas. Thus the rural people would be left with nothing at all. This is not a true competitive situation where one or the other applicants would render the service. In this instance, if KWRB-TV, the local outlet, should be forced to cease operation, the rural people would be left without any service. We do not agree that we are powerless to prevent the demise of the local television station, and the eventual loss of service to a substantial population; nor do we agree that the Commission's expertise may not be invoked in this instance to predict this ultimate situation. Thus, after weighing the public interest involved in Carter Mountain's improved facility, against the loss of the local station, it must be concluded beyond peradventure of a doubt, the need for the local outlet and the service which it would provide to outlying areas, outweighs the need for the improved service which Carter would furnish under the terms of the instant application."

#### What It Means

Basically, Television Horizons could agree with the FCC in its decision IF the facts as stated in the foregoing were irrefutably true. However, as we pointed out here in February, the real question is not so much one of Carter Mountain's application to provide improved and additional CATV service through microwave, as it is one of the Commission apparently only seeing what it wants to see. The Commission makes no attempt to produce concrete figures of the number of homes which might lose all television service should KWRB-TV leave the air. Presumably these would be rural homes only, in which case the Commission should check its applications, CP's and licensees for VHF and UHF translators in the Grade A and B coverage area of KWRB. And while the Commission is at it, they might check into the actual coverage of KWRB

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as opposed to its engineering statements made in its application for a CP and finally its actual license application. Finally, the Commission should check into the programming quality and quantity on the KWRB carrier (what there is of that).

The complete story has not been told the Commission. We reviewed part of it last month . . . you might read it over once again.

## AND

As feared within the industry, the unfavorable decision by the FCC in the Carter Mountain Wyoming case has prompted other broadcasters to climb aboard the CATV microwave opposition bandwagon. Latest to file a protest against a CATV microwave application is Frontier Broadcasting Corporation (licensee of TV stations KSTF, Scottsbluff, Nebraska and KFBC-TV, Cheyenne, Wyoming). The Commission granted Frontier's protest to the extent that *it will* now enlarge the issues in proceeding upon the applications of Collier Electric Company, and allow Frontier to become a party to the proceedings. Frontier claims that the renewal licensing of Colliers KAS41 license in Bridgeport, Nebraska will have adverse financial affects on KSTF-Scottsbluff.

KSTF is operated as a repeater-satellite of KFBC and originates none of its own programming. KFBC-KSTF, like KWRB in Lander, had informally threatened to oppose the Commission's licensing of VHF translators within their service areas one year ago. When the Commission acted non-interested about the entire matter, KFBC-KSTF dropped the issue. KFBC enjoys a large CATV audience (14,440) in Wyoming, Colorado and Nebraska.

## FCC Steps Into 'Local Level' CATV Franchise Bids

As reported on page 14 (see *Cable Drop*) of this issue of *Television Horizons*, Harold Bruggeman's Alarm Corporation has won a franchise in Monterey, California for an extension of the Alarm CATV service into additional portions of that city.

On February 7, City Manager Thomas G. Dunne, Salinas, California, apparently acting as a result of the Monterey City Council decision, addressed a letter to the FCC. Salinas is the home of Salinas-Mon-

terey television station KSBW, and "just down the road" from Monterey.

The FCC, on February 23, released the text of a letter it addressed back to City Manager Dunne. Dunne's original letter was not made available to the press.

As can be seen in the text of the following letter, the FCC is apparently injecting itself into local CATV franchise matters; something it has not done in the past.

Careful reading of the reply, which follows, may give you valuable insight into future paths of action on the part of the Commission in the CATV industry.

"This will acknowledge receipt of your letter of February 7, 1962 with regard to the pendency before your City Council of applications for a franchise for a community antenna television (CATV) system to serve Salinas.

"The Federal Communications Commission has been concerned for a number of years over problems posed for our system of free television by the expansion of cable television systems. Originally CATV systems were installed only in remote areas lacking any local television service of their own, and in such circumstances provided a needed public service and presented no problems for the Commission. However, in more recent years there has been a marked extension of CATV service into areas, such as yours, having one or two stations of their own. This has been of concern to the Commission because of the very real danger that operations of the cable system may force the local television station or stations off the air.

"This may occur for a number of reasons. In some cases, the CATV operator has refused to carry the signal of the local station on his system, and since it seems to be common practice in installing cable connections to disconnect the set from the outdoor antenna, this may prevent the set owner from receiving the local station directly off the air. In other cases, the Commission has received complaints that although the CATV system carries the local station's programs, it degrades its signal to such an extent that viewers turn to other stations on the system. Even where the cable system carries the local station in a satisfactory way, however, there is still a serious competitive

impact on the station if the system duplicates its programs on other channels of the system. For example, if a cable system in Salinas were to carry one of the network affiliated stations in San Francisco which was broadcasting the same network program being broadcast at the same time by either of the two stations serving the area, this would not provide residents in your area with any additional choice of service, but could cause your stations to lose programs.

"There are instances in which local stations have left the air and have charged that the principal reason was the competition of cable systems in their coverage areas.

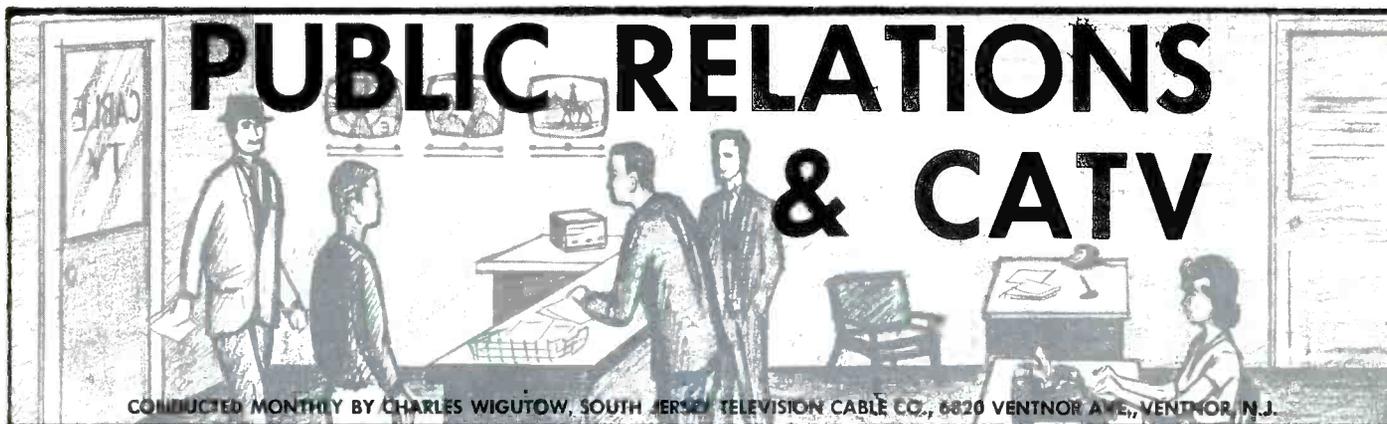
"Because of its concern over these matters, the Commission has requested that Congress grant it authority to regulate community antenna systems. In the light of the considerations which I have mentioned above, the Commission is seeking authority to make rules with respect to the following:

- (1) some requirement that a CATV system carry the signal of a local station if the latter desires this,
- (2) some requirement that if the local signal is carried, it is carried on the cable system without any degradation of quality, and
- (3) some protection of the local station or stations against duplication of other channels on the cable system of programs being carried simultaneously by the local station or stations.

"The Salinas City Council, in disposing of the pending franchise applications, may wish to use these guideposts pending Congressional action on our request. This would assure protection of the public interest in your community in the areas which the Commission has found to be most critical.

"It is an admitted fact that cable systems cannot serve people living outside the heavily built-up urban areas. As a consequence, if cable competition forces a local station off the air, the rural population in the area are denied any television service at all. Similarly, people living in the city who cannot afford the monthly cable charges are likewise denied service, and all the residents in the area are deprived of the benefits of a truly local service.

(Continued — Page 24)



Democracy is understood by the variety of forms and origins of information available to all citizens.

In a scant dozen years television has become a quick and vivid source of national and international news for most of the ninety percent of our population who own television sets.

In dictatorship countries where tv set ownership is not wide spread, the practice is made of placing sets at the disposal of controlled organizations, and viewing is done in groups. Here, our tv habits are exercised in the privacy of our homes.

In providing this multiplicity of news, information and entertainment outlets to towns which ordinarily could not afford to maintain their own television station, cable television fills a most important place in the democratic process.

Communities located hundreds of miles from metropolitan centers are served with more television by cable than are residents of the largest cities. Compare Prescott, Arizona, a city of about 15,000 population and its five channel reception by cable with Philadelphia. The Pennsylvania metropolis provides only three VHF channels and one UHF channel for its population of more than two and a half million.

These are valid talking points for a community minded cable system. The cost of cable television is not as important as what cable makes possible. What a loss it would be to the resident of the smaller community if he did not enjoy acquaintance by television with all the television personalities simultaneously with his big city counterpart. Only multiple channel television by cable makes this possible.

Sometimes in the allurements of the content that we make available on television, we forget the fascination of the electronic science that makes possible the transmission of moving, vocal pictures between a studio and the subscriber's home.

The electronic industries stand at a peak of scientific creativity, and young people are drawn to its magic.

Organizing an electronics youth group with your operation as its center would make an effective public relations gesture. The system's chief technician could be the guiding spirit. Radio hams are usually willingly enlisted; and even the school with meeting room space, and a high school science teacher can become interested parties.

Such a radio club came about in an unplanned manner as a result of a break down in cable service in a western town.

While the cable technicians were tracing the break to the antenna run, leading from the mountain

top to town, a Forest Service watchman on the peak shared with the system, reported to the sheriff that two youths were tampering with the antenna.

The sheriff caught the youngsters at the same time the technicians reached the site. A few words established that no malicious destruction had been intended, but that the boys had built a transmitter, and in their desire to reach a listening friend some hundred miles away, they had conceived the idea of coupling their home made transmitter to the cable system antenna.

The chief technician being a friendly fellow and naturally interested in everything working with electrons, asked, "Why didn't you come to us first?" We could have helped you get your rig on an antenna under the control of a licensed ham."

The sheriff was highly pleased when the manager and the chief technician offered to form a teen age ham club to help young would-be experimenters. The cable company had spare parts which had cluttered the shop for too long. Additional vital equipment was also furnished so that the boys were able to enjoy the fruits of their work that much sooner. Additional sponsors were found among "ham" personnel in the local utility companies.

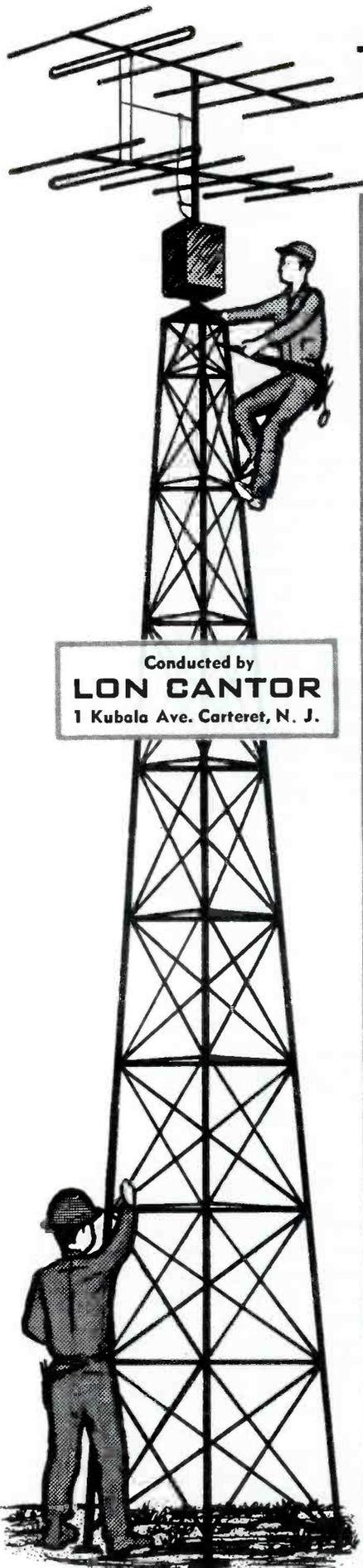
The pleasing results were: what might have been an ugly juvenile delinquency episode was turned into an interesting activity, carrying the blessings of the high school and city officials. The cable company gained prestige among those who knew the story of the ham club's origins. In a town of this size who didn't know?

There is no need to wait for an incident to build up a cable advantage. Being a conspicuous practitioner in the fascinating field of electronics, become a leader in teaching and guiding the young. Why not start such a club?

#### TRANSLATOR MAINTENANCE IS DANGEROUS

A Lakeview, Oregon television translator installation man, Dale Allen Ashby, 36, died during a heavy snowstorm which lashed Northern California during late February.

According to authorities, Ashby had climbed the 8,000 foot likely mountain near Alturas, California to repair the translator. When he did not return authorities set out with a search party. Ashby was found three miles down the mountain from his car, which had become stuck in drifts up to 10 feet in height. He apparently became exhausted and collapsed in the snow.



## FILTERS AND TRAPS

It was a beautiful day for a drive. The sky was piled high with white cotton candy cumulus clouds and the sun was bright. The air smelled clean, still cool enough to be invigorating but with a hint of the warm weather to come. A perfect Spring day. Hank and Bob were heading south on Route 37.

"Boy!" said Bob at the wheel, "I just feel like keeping on driving to the promised land. This is too nice a day for working. How about a round of golf?"

"That's only your spring fever talking," replied Hank in amusement, "besides, my wife thinks golf takes too much time away from the kids."

"And you say you're not henpecked," expostulated Bob. "You're the guy who keeps telling me how great married life is. It's times like this that make me glad I'm single. Are you going to let your wife get away with it?"

"I never question my wife's judgment," explained Hank with a glint in his eye. "After all, look whom she married. And the fact that you are still single is an eloquent testimony to the good judgment of our current generation of girls."

Bob tried to get in a topper but Hank stopped him. "There's the Motel Moderne right on the left," he pointed. "Pull in."

The Motel Moderne was an impressive, sprawling new edifice, with a huge electric sign, multi-colored balcony and a large, oddly shaped swimming pool. Bob swung the panel truck into the driveway, where they were greeted by the suave-looking motel manager, Charles Osgood.

"This antenna system is no good," he complained. "You can't watch Channel 6 at all—on any of the sets. It's full of lines."

"Interference," nodded Bob sagely. "When did you first start to notice it?"

"Notice it!" Osgood bristled with indignation. "Notice it! The thing never worked in the first place. I tell you, you can't watch Channel 6 at all. We paid good money for this

system. It was supposed to last for years. Why, if I'd known - - -"

Bob cut him off. "Don't worry about it, Mr. Osgood," he soothed. "We'll have this system working in a jiffy. All we have to do is install a filter and - - -"

This time it was Bob who was interrupted. Hank laid a heavy hand on his shoulder and said loudly, "We can't tell anything from here, Mr. Osgood. Let us take a look at the system."

As they lugged their equipment toward the Head-End of the system, Bob's look was pained and bewildered. "I was just trying to do a little public relations work there," he said. "You know, discuss the problem with him and explain how we're going to fix it."

"One of these days you're going to explain yourself right into a headache," said Hank testily. "What makes you think a filter is going to clear the trouble up? How do you know we can fix this trouble at all?"

In chagrined silence, Bob set down the portable TV they used for a test set. They looked the Head-End over carefully (see figure 1).

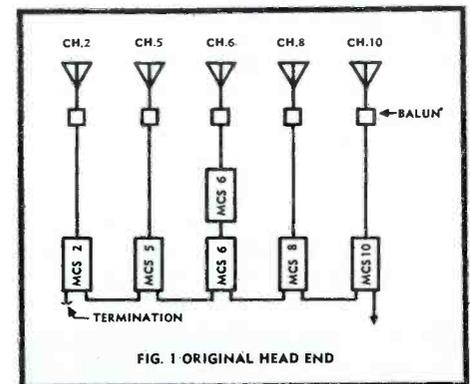


FIG. 1 ORIGINAL HEAD END

Hank grunted in approval. "Nice job," he commented as he hooked up the portable TV to the monitor output of the channel 6 MCS amplifier. "Let's see what the picture looks like."

The motel manager's description seemed to be pretty accurate. The somewhat wavy lines in the picture formed sort of a herringbone pattern (see figure 2).

Hank looked relieved. "Adjacent channel interference," he comment-

ed. "We shouldn't have any trouble with that."

"What is adjacent channel interference?" asked Bob.

"I'll explain," offered Hank. "What's the frequency of the sound carrier of channel 5?"

"I don't know," replied Bob. "You think I have all those frequencies memorized?"

"You don't have to memorize very much," declared Hank. "It's a cinch. You know channel 2 starts at 54 mc and each channel takes 6 mc. So channel 2 is 54 to 60, channel 3 is 60 to 66, and channel 4 is 66 to 72, there's a 4 mc guardband between 4 and 5, channel 5 is 76-82 and channel 6 is 82-88."

"Yeah," protested Bob, "but that only tells you the frequency range. It doesn't give you the sound and picture carrier frequencies."

"True," agreed Hank. "But that's not so tough either. Every channel is the same. Just remember that the picture carrier is 1.25 mc away from the low edge of the band and the sound carrier is .25 mc away from the high edge of the band. In other words, there are only a few facts you have to memorize to enable you to figure out every frequency in the VHF spectrum."

"Let's see," speculated Bob. "Channel 5 is from 76 to 82. And you asked me what the sound carrier is. If it's .25 mc away from the top edge, it's 81.75 mc."

"Now you're thinking," approved Hank. "And what is the picture carrier of channel 6?"

Bob figured it out. "1.25 mc away from 82 is 83.75 mc, right?"

Hank nodded agreement. "In other words, the sound carrier of channel 5 is only 1.5 mc away from the picture carrier of channel 6. The input circuits of the TV set are not selective enough to eliminate the channel 5 sound carrier. It slops over into the video portion of channel 6 and we see interference."



FIGURE 2

"Wait a minute," demanded Bob. "I just remember from my TV serv-

icing days that there are adjacent channel traps in practically every TV receiver. How come they don't get rid of this kind of interference?"

"Good question," conceded Hank. "In fact, they do, to a great extent. However, in this case, channel 5 is a lot stronger than channel 6. Channel 5 is local and channel 6 is pretty far away. That's why the installer used a pre-amplifier for channel 6."

"Now I am really confused," admitted Bob. "Those MCS strips are AGC controlled, aren't they? So the output from the channel 5 MCS shouldn't be any stronger than the output of channel 6. You were telling me a while ago about signal balancing (January Field Engineer). It seems to me that the installer has already balanced these signals pretty well."

"Think about it for a minute," commanded Hank. "You have an antenna cut to channel 6. Does that mean it won't pick up any of channel 5 at all?"

"No - - -" admitted Bob slowly. "But what about the amplifier. That's only supposed to pass channel 6, isn't it?"

"The input of a single channel amplifier is not very selective," said Hank. "Remember, the sound carrier of 5 is only a quarter of a mc away from the edge of channel 6. Even if it's not amplified quite as much as channel 6, the 5 sound carrier starts out a lot stronger, so of course it winds up a lot stronger at the output of the second MCS."

"You're right," agreed Bob. "I should have thought of that. So what do we do—put a filter in front of the first MCS—6?"

"A filter!" snorted Hank impatiently. "I go through this whole song and dance on how close 5 sound is to 6 picture and he wants to give me a filter! Did you ever hear of a trap? What's the difference between a filter and a trap?"

"I don't know . . . let's see," hazarded Bob. "A trap goes in parallel and a filter goes in series?"

"Let's get this straight, once and for all. A filter is made to pass a certain range of frequencies. A trap is made to attenuate one specific frequency. Suppose we had a channel 6 filter. Its response would look something like this." He drew a curve (see figure 3). "You don't want to attenuate any of channel 6, which is between 82 and 88 mc. However, the edges of the filter aren't sharp. This is pretty typical. The attenuation 9 MC away from the center frequency, in this case

76 MC, is attenuated by about six or seven db. Now, 76 MC is the lower edge of channel 5. The picture carrier is up here, only a quarter of a megacycle away from 82MC. There's very little attenuation at that point.

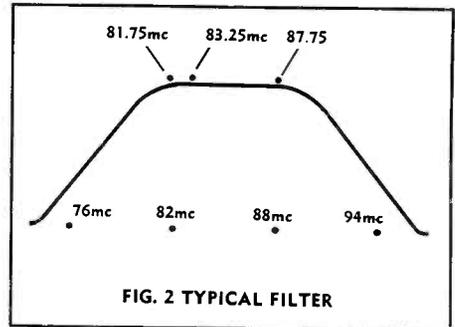


FIG. 2 TYPICAL FILTER

"Now, let's look at a trap. Let's suppose we have the same range of frequencies and put in a trap tuned to 81.75 MC. The trap doesn't worry about the other frequencies. Its only job is to take out 81.75 MC. The response would look like this" (see Figure 4). "You see, we have a big dip at the channel 5 sound carrier frequency. It's a very narrow band of frequencies, so that it doesn't attenuate the channel 6 picture carrier. What we need is a trap. Go out to the truck and get an MWT-2 trap."

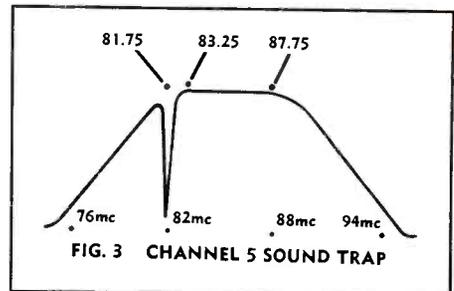


FIG. 3 CHANNEL 5 SOUND TRAP

When Bob returned with the MWT-2 trap, he asked, "Do these traps come pre-tuned?"

"Some of them do. But we have to tune this one ourselves. The advantage of a pre-tuned trap is that it's quicker to install. But I like the MWT because I only have to carry two traps, the MWT-2 for the low band and the MWT-3 for the high band, to cover the whole VHF range. All I do is tune it to the frequency I want. Otherwise, I'd have to stock 24 traps."

"How do you tune a trap?"

"The best way," replied Hank, "is with a sweep generator and an oscilloscope. Lots of installers just watch a TV set. They diddle with the adjustment until the interference goes away. When I'm in the field, I use a field strength meter with the off-the-air signal. Maybe I

don't get the full 60db that the MWT trap is capable of, but I get a deep enough notch to take care of the interference."

"Show me how it's done," asked Bob.

"Okay," agreed Hank. "We'll hook the trap up to the output of the first MCSc-6. We could go right off the antenna, but as long as we've got some amplification, we might as well use it. It will give us a strong indication. The output of the trap we'll connect to the field strength meter.

"This is a typical trap—what you call a phase cancellation type. It actually consists of two separate traps, about 8db each. These two traps are 180° out of phase. So if you tune them to the same frequency, the 180° out of phase signals cancel each other out. These are the main tuning adjustments." He pointed to the two slugs (see Figure 5). "Set the field strength meter to channel 5 sound and turn either of the main tuning screws till you see a dip on the meter."

Bob did so.

"Now turn the other main tuning screw till you see a dip on the meter." You'll have to keep switching out attenuation so you can keep the dip on the meter. The idea is to go back and forth from one trap to the other. Each time, you go just a fraction of a turn past the minimum point, because the two traps interact. Keep adjusting the traps until you get as low a signal level on channel 5 sound as you can."

After a few minutes, Bob announced that the signal was as low as he could get it.

"All right," said Hank, "now we use the fine tuning adjustment." (see Figure 5). "That's one nice thing about this particular trap. It's easy to align it right on the money. Go back and forth between the fine tuning adjustments the same way you did with the others and see if you can't get a sharper dip."

Bob complied, and after a few moments was able to improve the rejection of the channel 5 sound carrier frequency considerably.

"What do we do now?" he asked. "Does it make any difference where we put the trap?"

"Not a heck of a lot. The manufacturers generally recommend that the trap be installed after the amplifier, because there's less chance of deteriorating the signal-to-noise ratio in case the wanted channel picture carrier is attenu-

ated a little too. On the other hand, if there is a chance that the signal may be so strong it will overload the amplifier, the trap should be installed before the MCS. There's no danger of that in this case, so let's connect the MWT-2 between the two MCSc-6 strips. Another nice thing about the MWT traps is that they pass the whole VHF Band — so they can be used in broadband systems, too."

They quickly unhooked the output of the MWT-2 from the field strength meter and connected it to the second MCSc-6. In a moment the portable TV receiver was connected to the monitor output of this amplifier.

"A perfect picture," exclaimed Bob in delight. "Say, if traps work so well, why do we bother with filters at all?"

"Don't sell filters short, Ace," said Hank dryly. "They have their advantages. They're much more stable than traps. Traps tend to drift a little, especially with temperature changes. That means you sometimes have to go back and touch them up. That's something you never have to do with filters. The point here, though, is that filters are just not sharp enough for adjacent channel interference."

"Anyhow, we sure had this trouble pegged. Couldn't ask for a better picture on channel 6. Is that all there is to it?"

"It looks pretty good," conceded Hank. "Remember, though, that we didn't cut down the output of the channel 5 MCS strip. The TV receivers are still getting as much channel 5 sound as they are channel 6 picture, so there is still a chance of interference. We're depending now on the TV receiver's adjacent channel traps. Most of the modern sets today are pretty well trapped. However, we could cut down the channel 5 sound output and make it about 6 db weaker than channel 6 picture. That would make it easier for the TV receivers in the system."

"Wouldn't that also give us trouble on channel 5 sound? I mean, we want to get good audio when we're watching channel 5, don't we?"

Hank agreed. "Of course. But you don't need as much sound signal as you do picture. It's perfectly safe to make the sound carrier 6 db weaker than the picture. It's done all the time in CATV systems."

"How do you do it?" asked Bob. "Easy. Just stick in another MWT trap. Instead of tuning both traps

to channel 5 sound, only tune one of them. That will give you 6 to 8 db of attenuation and your worries will be over."

"Shall I go out and get another MWT-2?"

"No. Let's see how the system works as it is. No use putting in another trap unless we need it."

They demonstrated to Mr. Osgood that several sets in the motel were receiving channel 6 with no difficulty. The set in room 1C did give them a little trouble when they found that channels 8 and 10 were snowy, but after Bob replaced one of the tuner tubes and restored it to working order, it was easy to convince the motel manager that the trouble was not caused by the Master TV system.

"Well, Mr. Osgood," said Bob heartily, "good sound and good picture on all channels, right?"

Mr. Osgood agreed heartily. "Maybe I was a little hard to get along with, but you fellows don't realize how important TV is in a motel like this. We try to impress our guests with the fact that they are getting only the best — from bedding, to bathing facilities to TV. And you know, it's always the channel that doesn't work that they want to watch. Bad reception like that is a reflection on the motel."

"Believe me, Mr. Osgood, I understand," said Hank smoothly. "That's why we came over here first thing in the morning. It's the little extras that count in a motel like this. Those are the things your guests remember you for, the things that they mention to their friends, the things they come back for. That's why I think you ought to add a closed circuit channel to your master TV system."

"What's that?" asked the motel manager.

"Closed circuit TV," explained Hank. "You know, with a regular TV camera so you could originate your own TV programs."

"Do I look like Jack Paar?" Mr. Osgood laughed at his own mot. "What kind of programs could I originate?"

Hank smiled. "You'd be surprised how many modern motels are doing it. I don't mean you're going to put on a Broadway show or anything. I mean you might want to show your menu on TV. Or focus it on the swimming pool so your guests could watch the pretty girls from their rooms. On any other activities

(Continued — Page 24)

## REBROADCAST TV IN CANADA

(Continued from page 10)

while it has never been shown on D.O.T. records that more than a handful of American built translators are in use north of the border.

Canadian re-broadcast TV falls into two categories; the very low power, and the higher power. The very low power, takes the form of the conventional translator. 5 watts of peak visual power input to the final stage of the unit is allowed. D.O.T. approval of the equipment is a must, as is FCC approval required in the United States. Antennas may be stacked, phased and otherwise combined to effect strange gain and patterns, once the 5 watts final stage power is adhered to.

The biggest single seller is the Benco T-1, a \$1,500 package which is housed in its own weatherproof pole or shed mounting box, operating from 115 vac. Because remote mountain top antenna and translator sites are even more of a problem in the majority of Canadian areas than in the United States, the units are often supplied with a complete switch-over standby translator for installation in areas where snow and elevation combine to keep would be repair crews out of the highlands for up to six months per year.

The higher power re-broadcast stations are actually slave repeaters, many operating with powers up to and above 5,000 watts ERP with everything but origination equipment involved and not unlike their counterpart broadcast telecasters which they repeat. Such high power repeaters are common in Quebec, the far north areas of the Plains provinces, and in British Columbia.

As in the United States, the low power translator stations are normally financed by "television cooperatives" headed up by public spirited citizens bent on bringing the outside world *in* to the small valleys and hide-aways of even the remotest portions of Canada.

Strangely enough, unlike the United States, the D.O.T. maintains that until the translator service was established, not a single "illegal booster" unit was in operation. In other words, the Canadian Government decided that translators were a needed arm of broadcasting on their own accord, not after an irate citizenry had installed several hundred illegal units and forced the issue.

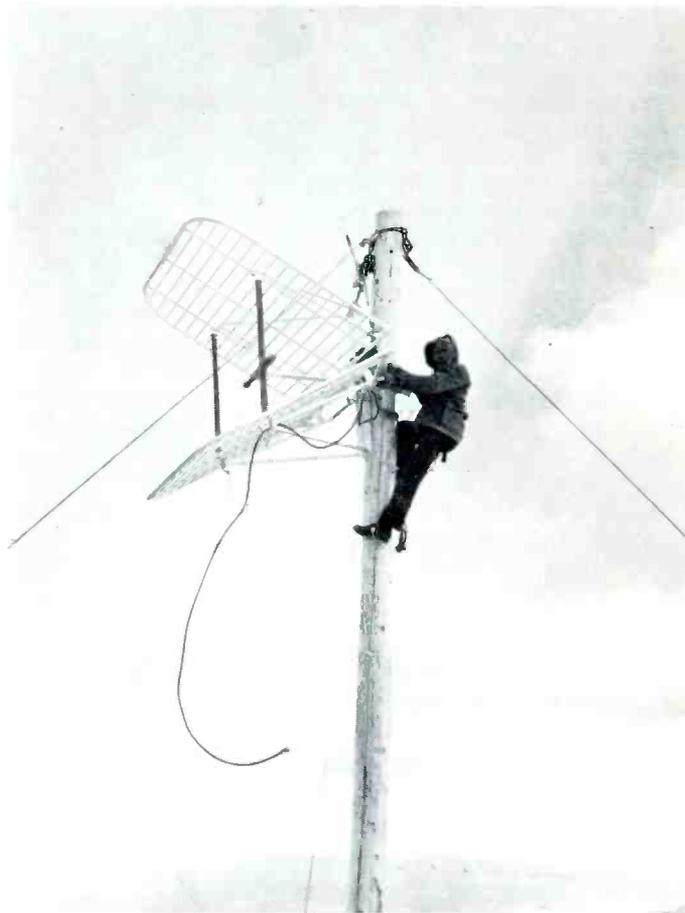
One Canadian CATV system operator noted to TVH, when interviewed about his feelings on Canadian translators, "*An illegal translator wouldn't last one day in Canada. Look at the mess that existed and still exists today in the U.S.A. What can you expect from a country born in revolution and which has never had any respect for law and order!*"

But the translator is legal in Canada, and civic groups, and broadcasters are making good use of it. An average of 8 new applications have been filed every month for nearly a year in the service, and the number of translators in operation is fast approaching the number of origination stations.

One shining example of how translators are being put to work in Canada can be found in the records of Twin Cities Television Ltd, or CFCR-TV (channel 4) Kamloops, British Columbia. CFCR-TV Chief Engineer Kurt Reichenek has placed seven of the re-broadcasting stations to work at distances 40 to 150

miles from the CFCR transmitter. The seven units, installed at an estimated average cost of \$4,500-\$5,500 American dollars each, represent an increase in coverage area more than triple that covered by the CFCR primary signal (see map). Prior to installing the seven translators, the CFCR signal penetrated approximately, 9,000 homes, according to the Canadian Census. With the translators perking, the total number of homes within the CFCR service area has been upped to 16,000-18,000; A considerable increase!

Engineer Reichenek points out many of the things CATV and translator operators in the U.S. learned



**Jampro Antenna Products Corner Reflector installed at Clinton, B.C. contains de-icer element to keep the ice from coating over the array. The antenna, an important investment with any translator, cost nearly twice as much as the translator itself, but is considered worthwhile in view of the particularly bad weather conditions it will experience. Four to six months per year, the antenna and site will be inaccessible.**

long ago. From their mountain top transmitter site three miles out of Kamloops, the CFCR signal reached the mountain peaks *above* many of the valley towns and villages the station had originally hoped to cover. Additional power didn't seem to be the answer an CFCR, but translators did.

At one of the seven sites a two mile power line was run for the translator. The 68 power poles for the run had to be flown in by helicopter. At another site no AC power was available for a 20 miles distance. So a 10,000 foot power line was laid down the side of the mountain of which the inaccessible translator was installed, and propane driven generators were installed as a power plant.

Even though the translators were engineered and supported with CFR backing, most of the units were installed with funds raised in the communities served. All told, in the seven installations, approximately half of the total cost was fund money coming from the eager would be viewers of the new units.



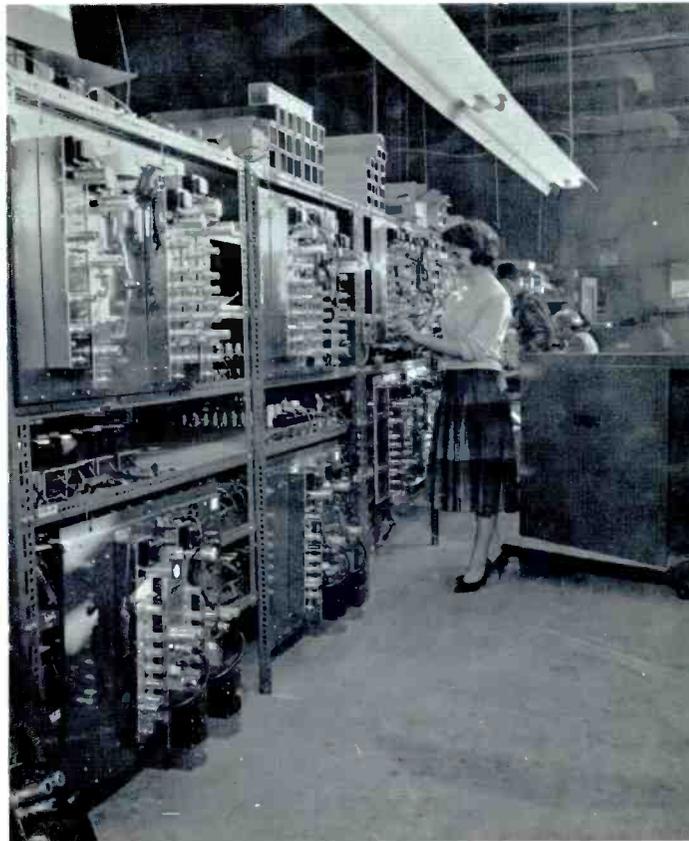
Pechlond, B.C. T-5 translator installation consists of a telephone pole, and two yagi antennas—one for receiving, one for re-broadcasting. In a land where trees outnumber people 10,000 to 1, every microvolt of signal counts here!

Many of the new TV receiver dealers allowed the individuals who pledged \$25.00 and up towards the translator to bring in their pledge certificate, and receive \$25.00 or more off on the purchase of their receiver. In this way the people, new set dealers and station combined their talents to form an unofficial alliance that expedited the whole process in the quickest possible time.

What is the future of the re-broadcast TV device in Canada? For one thing, the D.O.T. and the Board of Broadcast Governors is not going to allow Canadian translators to carry U.S. programs, except in very rare cases where no possible Canadian signal can be found. Thus the possibility that border communities receiving borderline viewing from American channels and passable reception from Canadian channels will be allowed to pipe in American TV, is remote. However as the second Canadian home network spreads across the continent with more and more primary stations, the demand for a second channel by Canadian fringe viewers will grow. As long as that second channel is Canadian in content, the BBG should be quick to recommend a translator.

One Canadian engineer with considerable TV engineering under his belt feels the Canadian translator market is immediately good for 250 units, especially as western Canada grows and new villages turn into towns of considerable size.

Thus born out of "lawful decent" and not out of



Home of the vast majority of Canadian installed translators, this breeding grounds is a product of Benco Television Associates Ltd. near decade of experience in weak signal tv work in Canada. Here a number of T units are about to be shipped to serve Canadians who for the most part have never seen a television picture!

public demand, the Canadian re-broadcast TV device continues to grow. Perhaps it did get off to a later start than its American counterpart, but it appears to be wasting precious little time in catching up!

#### MAN IN EUROPE . . . Continued from page 13

radiation. Most equipment provides intermodulation-free amplification of three channels (six carriers) at vision levels of 200 millivolts and sound levels of 100 millivolts. This is the straight, three-stage cascade-type amplifier. Distributed amplifiers, engaging a dozen valves (tubes), do better than this, and the EMI specification for their wideband (20-220 Mc/s) repeaters is 100 millivolts on 24 separate carriers. The former type of amplifier mentioned responds from 40-70 Mc/s or from 35-100 Mc/s, the latter embracing Bands I and II. The wideband units get in Band III as well as a bit below Band I.

We like to think that the intermodulation is some 60dB down on systems over here, but in some cases this is wishful thinking! That may well be the figure when a system is first launched, but after a while extra carriers may be added within the pass-band and, unless the levels of the existing and new

(Please turn page)

carriers are decreased or there was plenty of tolerance to start with, the repeaters are bound to go towards nonlinearity with consequent impairment of the intermodulation performance.

One of the reasons why we like to break up a system into distribution zones, as was explained last month, is that each section then becomes easier to handle intermodulation-wise. If, for example, the signal levels in one distribution zone are lifted to combat, say, extra network loading (to cater for new subscribers), the possibility of intermodulation will be confined to that zone's repeaters. Intermodulation will not get out of that zone (usually) because the a.g.c. of the subsequent distribution point will maintain outgoing signals at intermodulation-free levels.

#### Manual Control On All Carriers

We have found that the various carriers carried tend to fall out of balance over an extended network and, unless something is done to correct the trouble, at the end of several miles of network the situation becomes intolerable. In some systems over here we ship all the carriers into a "splitter" and then apply them individually to narrow-band amplifiers which respond only to the appropriate carrier frequency.

These amplifiers serve to correct both the response and level of each sound and vision signal, while also applying a.g.c. They also feature manual level controls. After correction, the signals are re-combined in a filter and sent on their way again into subsequent network. Some of the ways in which we derive a.g.c. and response correction are rather interesting, and will be discussed in the next reports from the UK.

**FIELD ENGINEER** —cont. from Pg. 21 you have in the motel. You'll be surprised how many uses you'll find for it. You can even make announcements, if you like."

"Isn't it expensive?" asked Osgood.

"It would be if you had to start from scratch," said Hank. "But you have most of the system already in. All you'd have to buy would be a camera or a PORTA-STUDIO and you could hook it right into the master TV system. The guests would watch it on channel 4. Believe me, this is the kind of thing they remember."

Mr. Osgood was impressed. "Give me an idea of exactly what it would cost and I might be interested," he said.

"I'll do better than that, Mr. Osgood," Hank's voice was persuasive. "I'll figure out a system for you and get the installer to come over here and give you a written estimate. That way you'll know exactly what you're going to get and just what it will cost."

Charles Osgood was agreeable. After a round of friendly goodbyes, Hank and Bob drove away.

"Aren't you the guy who keeps

telling me not to talk too much to the customers?" asked Bob.

"There are times to keep your mouth shut, and there are times to talk," said Hank smugly. "When you've just fixed something for a man, you're an expert in his eyes. That's the time to talk. That's the time to figure out what he needs or could use and make a pitch on it. That's the time for creative selling. There's more to this business than just being a good technician."

#### CABLE DROP

(Continued from page 17)

In other words, if the local station is forced off the air through cable competition, this eliminates the only means of providing the people in the area with local news, local weather, programs of particular local importance, and the support of local projects.

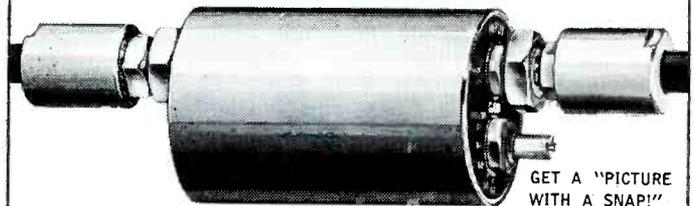
"In the opinion of the Commission, while multiple choice of program service is a worthy objective, it should not overbalance the very important services which can only be made available by a truly local station.

"I trust that the above will be of assistance to you and the Salinas

## Three years ago **BENCO** pioneered the First TRANSISTORIZED CATV SYSTEM

### Now **BENCO** Presents the Advanced "Model 3" Transistorized CATV System

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City Council. If you have any further questions with regard to this matter, please do not hesitate to write me."

The FCC release did not identify who "me" is.

## FCC BRIEFS

### BROADCAST ACTIONS

The Commission en banc, by Commissioners Minow (Chairman), Hyde, Lee, Craven, Ford and Cross, took the following actions.  
BINGHAMTON, N.Y., UHF CHANNEL CHANGES

By Report and Order, the Commission finalized rule making in Docket 14274 and amended the TV table of assignments by substituting Channel 34 for Channel 56 in Binghamton, N. Y., and deleting unused Channel 34 from Wilkes-Barre, Pa., and Channel 20 from Ithaca, N. Y. At the same time, the Commission modified the authorization of WBJA-TV, Inc. (formerly Alfred E. Anscombe, who petitioned for the change), to specify operation of WBJA-TV on Channel 34 instead of Channel 56 in Binghamton, upon submission of necessary information.

### CHANNEL 12 SHIFTED FROM BRAINERD TO WALKER, MINN.

By Report and Order, the Commission finalized rule making in Docket 14271 and amended the TV table of assignments by deleting Channel 12 from Brainerd and assigning it to Walker, Minn. Central Minnesota Television Co. had petitioned for the shift. No application had been filed for Brainerd.



## WHY JERROLD BUILDS MORE CATV SYSTEMS on a "turn-key"\* basis than all other manufacturing-contractors combined!

There's ample reason: Jerrald simply gives the owner more—takes every bit of responsibility along the way:

Check this typical Jerrald CATV "turn-key" package:

1. Antenna-site signal survey.
2. Pole-line survey (and assistance in dealing with utilities).
3. Complete systems engineering.
4. All equipment and materials, both construction and electronic—from the "antenna shack" to the "house drop".
5. Construction by the largest, most highly skilled force in the industry.
6. Activation of the new system.
7. *Thorough* checkout.
8. Training of your personnel in system operation and management.
9. Delivery of the fully operating system—on schedule.
10. COMPLETE FINANCING—*on terms to meet your needs.*

Small wonder, then, that system owners have found it simpler, faster—and cheaper—to rely on Jerrald from beginning to end rather than attempt to pull all the elements together themselves. Small wonder that Jerrald start-to-finish installations in 1960 alone added facilities to service over a quarter million new CATV subscribers in twelve states (see list below).

If you want the peace of mind that comes of dealing with a thoroughly integrated organization that knows your needs—leave it to Jerrald.

**"turn-key":** *You order the system built—we turn the key over to you when it's running full-tilt.*

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**EMCEE** ...THE

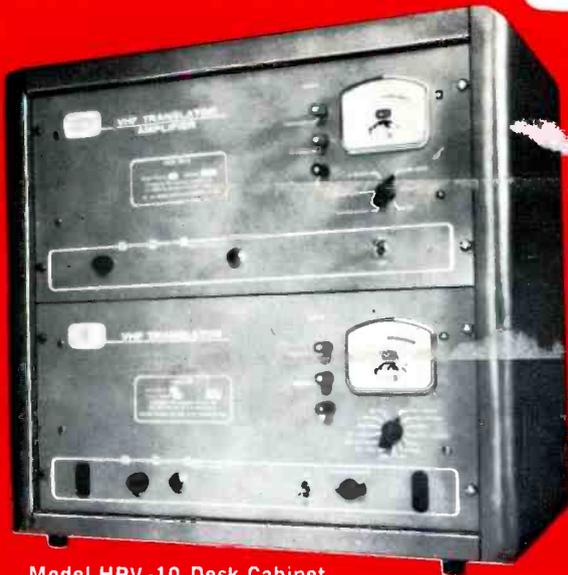
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Model HRV-10 Desk Cabinet



Model TOA-10

# D.O.T.

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### FEATURES

- Reserve capability, reserve sensitivity, reserve output power to ensure long trouble-free service.
- Full metering of principal circuits including forward and reverse output power; check translator and antenna performance without taking the translator off the air.
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- Widest AGC range holds output constant even with fading; prevents overload and loss of sync on up fades.

- Remote control circuit built-in for wire line or radio link.
- Operates completely unattended. Output shuts off automatically when originating station goes off the air.

### HRV

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### HRV-10

– Five watt pedestal level output. Consists of Model HRV and Model TOA Amplifier

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