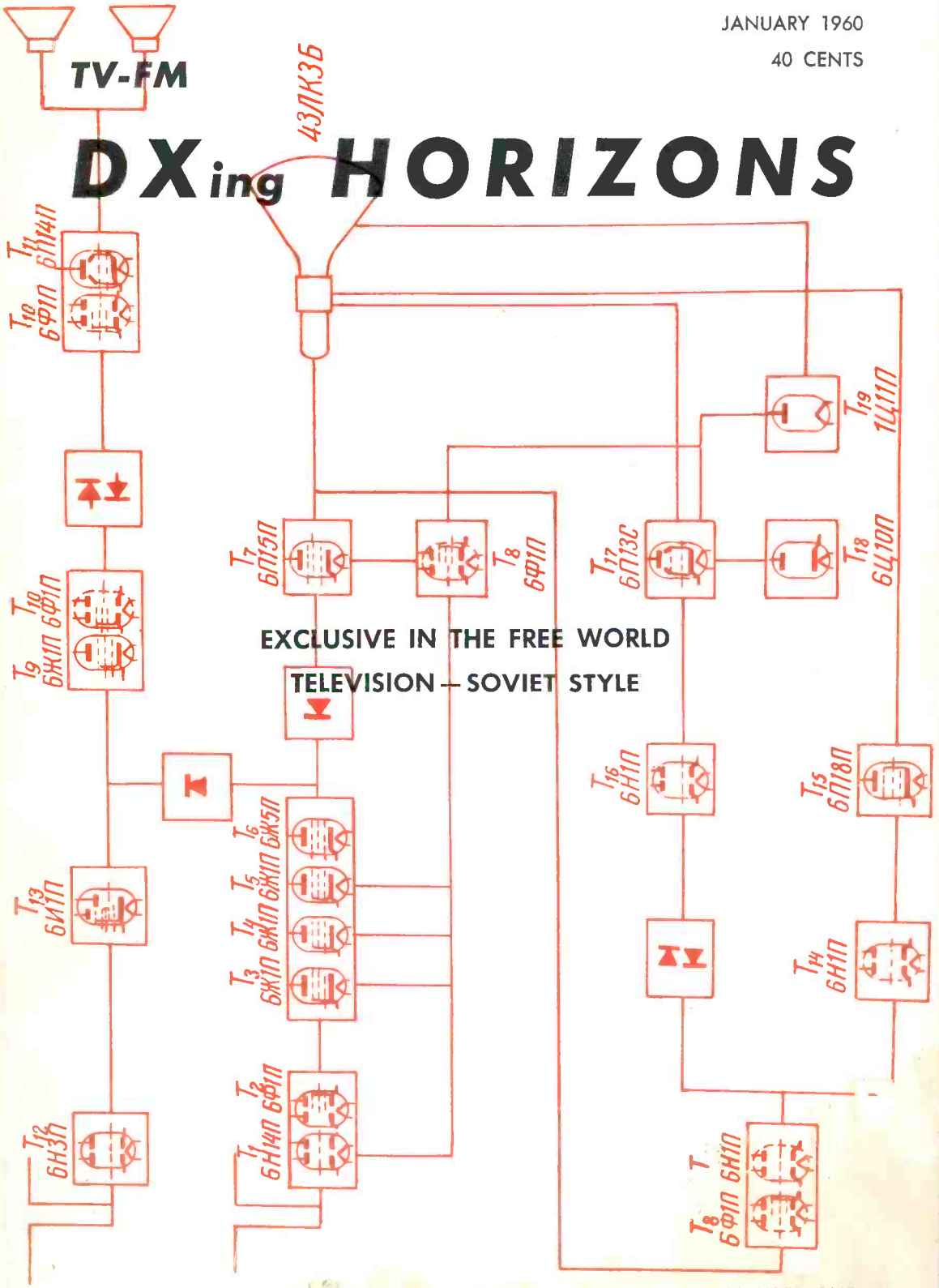
JANUARY 1960
40 CENTS

TV-FM

DXing HORIZONS



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VOLUME ONE

NUMBER ONE

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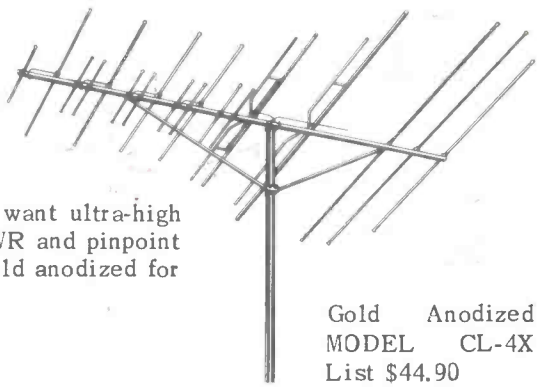

Gold Anodized
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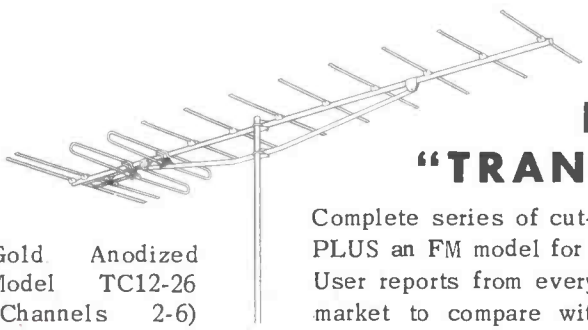

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TV-FM JANUARY 1960

DXing HORIZONS

"A monthly publication devoted to active long range Television-FM enthusiasts throughout the world. Published the second day of each month in Modesto, California, DXing HORIZONS is the copywritten title registered to Robert B. Cooper, Jr."

"DXing HORIZONS is aimed at the 25,000 long range TV and FM enthusiasts throughout the world, and the 3,000 operators of TV translators, on channel boosters, and master distribution systems throughout the world. Advertising rate card upon request. DXing HORIZONS accepts advertising ONLY from bona fide manufacturers and distributors of new electronic equipment, parts and assemblies. DXing HORIZONS is the only magazine in its field . . . advertising results guaranteed."

DXing HORIZONS
820 Tully Road
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(Amateur K6EDX)

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WATCH FOR MARCH ISSUE!

FEATURES

DEPARTMENTS

At Sign Off

FIRST ISSUE

As the first words in the first issue of a brand new publication I suddenly find it difficult, as editor-publisher to select the right words. And for a man who makes words his business this is indeed unusual. But then place yourself in my shoes for a moment. Here I am parked at the Modesto Post Office with 5,000 copies of DXing HORIZONS piled high in the back seat, front seat, sticking from the trunk, and poking from the glove compartment. "Mr. Postman," says I looking over a ten foot pile of magazines I have managed to carry into the lobby, "I am here to mail my magazine." And the mailman, usually a mild mannered sort, shows his true temperment by downing a large bottle of tranquilizers and uttering under his breath something which must be pretty profane because his face turns red. Not one to give up easily he makes a vain effort to talk me into taking my magazine to San Francisco for mailing but I show my true colors by telling him it would take four hours to drive to the city . . . and I have an obligation to my 5,000 readers who want their magazines on time. But Mr. Postman doesn't give up this easily . . . he comments under his breath that he has just let his Christmas staff off and he doesn't think Mr. Summerfield would approve of a sudden help increase in January.

But my inner radiance wins out . . . especially when the ten foot stack of magazines begins to topple and I run south as the stack tips north . . . and covers the friendly postman with photographs of Russian TV . . . clear to his double chin!

"Besides," says I, as he opens another bottle of tranquilizers, "the permit on the back cover says number 53, Modesto, California."

"Right" says he, suddenly fortified with renewed vigor . . . "and Mr. Summerfield wouldn't approve if it was mailed in San Francisco."

"I knew you would see it my way" says I, heading for the car and another load of magazines.

WELCOME

TV and FM DXers the world over will find in this magazine more material devoted to their hobby than has ever before gathered in one magazine. DXing HORIZONS has several purposes as far as the DXer is concerned. (a) To better inform with more up to date, detailed and accurate information than has ever before been possible to be gathered into one publiction, (b) To provide "thinking articles" accented with the experimental approach in hopes that DXers the world over will profit by technical and construction articles, and thereby improve their individual DXing rigs, these are but two (and very general at that) reasons for the existence of DXing HORIZONS in the TV-FM DXing fields.

Operators of community distribution systems, translators, and VHF boosters will find in DXing HORIZONS a wealth of information not available in any other publication. Look and ye shall see . . . and watch the future.

VHF TRANSLATORS

As we go to press, action is reaching a fever peak on question of what to do with the on channel VHF boosters, and the somewhat more elaborate VHF translators. The FCC has issued a set of rules in which it states it is considering the licensing of VHF booster-converters (translators) under certain conditions. Some of the more important; VHF translators would be limited to one watt output, rigid frequency selection, supervised installation and maintenance, etc. In future issues we will watch this story closely as it promises to be a real boom to the type of equipment advertised elsewhere in this issue, and as different as VHF and UHF, it could mean an early demise to the UHF translator. We shall see . . . and by February we may know more.

Meanwhile a new translator product for UHF is on the market. Currently Adler is the sole manufacturer of high quality UHF translating gear. The new firm, in Arizona, is awaiting FCC engineering approval of its equipment. The big surprise? This new piece of equipment sells for one-third the price of the "high priced spread!"

This is not an editorial department, and we know better than to take a stand at our tender young age, however we do wish to welcome the National Community Television Association and its public relations manager Frank H. Nowaczek to these pages. The NCTA will occupy a space in the "weak signal industry" pages in February.

TALL TOWER MANIA

Little by little TV and FM station owners are discovering that antenna height is synonymous with distance. As word of the 1,619 foot WGAN-TV tower (Portland, Me.) is still fresh we learn of a new 1,676 footer under construction at KFVS-TV, Cape Girearde au, Missouri. This will be THE tallest! Other mid continent stations are working on new tall towers . . . including WLBT-3, Jackson, Mississippi who's 1,529 foot tower (up nearly 900 feet from their present height) is expected to reach completion in January. WSPD-TV, 13, Toledo is now on their 1,049 footer, and KTBS-TV 3, Shreveport, is asking for permission to erect a 1,630 footer (currently at 1,153 feet).

TOPICS

New NBC basic in Sioux Falls, S.D., KSOO-TV, 13, has started construction, expected completion is set for June of '60.

ABC-TV announces they are helping finance new TV's in El Salvador, Guatamala, Nicaragua, Honduras and Costa Rica. This means more countries available on Skip. ABC will also program the stations with ABC's new Latin American Network (in Spanish).

The fight continues in Corpus Christi, Texas over Channel 3. ABC-TV wants an outlet there to compete with NBC and CBS, while the State of Texas wants 3 reserved for educational uses.

CANADA SIGN OFF

CKOS-TV, Yorktown, Sask., has been granted a new Channel 8 satellite for Baldy Mountain, Manitoba. Power will be 9.5 KW from the 1,032 foot tower.

CKX-TV, Brandon, Manitoba denied its petition for four northern Manitoba satellites.

For late FCC news always check FCC Analyzed, on page 18 this month.

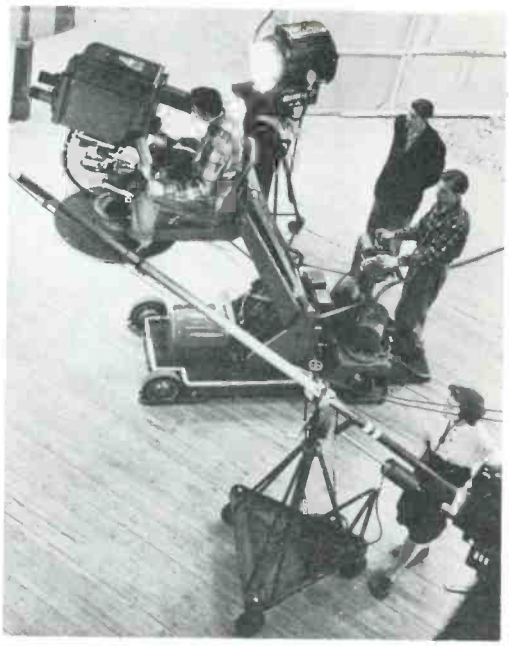
Television – Soviet Style

Information supplied by
A. GIRIKHOVSKY, *Radio Engineer*
and
A. KANAYEVA, *Director of the State Radio Trust, Ministry of Communciations of the USSR*

Today the USSR realizes the value of reaching its peoples with television programming. In a county which values so highly the forcefulness of propaganda, the advancements in the field of video engineering are rapid and not at all surprising. Russia first demonstrated its electronic ability to the world in the summer of 1957 at the Brussels World Fair. Today the big topic in the USSR is the way television is sweeping the nation's peoples . . . much as video swept the United States in the early 1950's.

In 1949 there were but five television stations operating in all of Europe and Asia. Russia had two of these . . . both removed from Germany at the close of World War Two. One of these units had been operating in Berlin since 1936 (constructed for Hitler's pleasure). The second came from one of the Slavic countries. Today Russia has 65 operating television stations, and 97 repeater-booster stations to extend the primary service of the base stations. The majority of the Russian television stations operate with two kilowatts input to the final amplifier (both audio and video). Tubes used in today's Soviet VHF transmitters are reminiscent of the early EIMAC High Power Glass Triodes (100th, 450TL. etc.). Our more recent high power ceramic air cooled tubes are still in the development stage for Russian television use (no doubt such tubes exist in Russian military communications). Today's 65 base stations plus the nearly 100 low power booster stations (operating ON THE CHANNEL of the base station) cover approximately one-quarter of the nation's population. 20 additional primary stations are due to come into service by mid 1960, according to the current five year plan.

12 channels are used for television in the USSR. Each channel is 8 megacycles wide (as compared with our six megacycle bandwith). Five video channels occupy the region 48-100 megacycles. This spectrum is shared with other radio services in some regions of the country. The region 66 to 73 megacycles is used by the Russian counterpart to our FM band (occupying 88 to 108 megacycles in the USA and Canada). Russian channels 6-12 ly in the space 174 to 230 megacycles, allocated exclusively for television.



The business end of a production at the Moscow TV center. Cameraman and dolly operator zero in on the scene of action as the microphone operator (a woman incidentally) keeps the carbon box above the "X" on the floor. With hands behind his back, the unit director keeps an eye on proceedings.

Equipment currently used by Russian television broadcasting centers is all Russian constructed. As most of the equipment has been developed from scratch since 1952 (television didn't get the green light in Russia until after Stalin's death), Russia still lags behind the U.S.A. in several more recent developments, but the quality of the equipment NOW PRODUCED is apparently as good as ours.

Studio Equipment

A great deal of the programming found on Moscow television any night is done live from the studios, or from remote locations. Two of the most popular programs are the opera and ballet broadcasts. Because the Soviets do not concentrate as heavily on filmed programming

as U.S.A. networks do, nor have they found kinescope to be acceptable, they have developed the art of live studio presentation to a high degree, even by our standards. Moscow is the center of Russia television productions. Moscow studios use four channel STUDIO equipment, with four camera chains and eight audio signals fed to the control room engineer. Studio crews (photo one) include a sound man for each microphone, lighting man, camera man, dolly operator, and "unit director," for each camera crew used in the broadcast. Each station has a "telecine room" which includes film cameras and still projectors. Selection of either a film, slide, studio or remote shot is possible in the television center control room, according to reports from tourists.

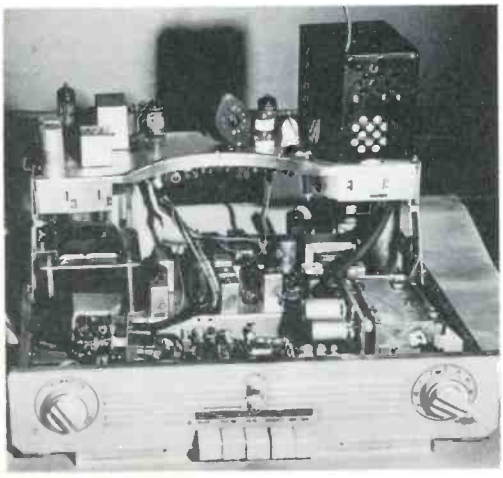
Small Towns and TV

Not all cities and towns have sufficient population to make installation of a large four camera chain and all that goes with it feasible. So just as we do in the U.S. and Canada, small "package stations" are available for smaller towns. Such "package stations" consist of a two camera chain (studio cameras use image orthicon tubes) and two film channels, using vidicon cameras. All film installations (large and small alike) use two projectors . . . one 35 MM, and another 16 MM, in addition to the slide projector.

Mobile Units

As previously noted, much of the Russian viewing fare is live production, from remote units, covering special events. Mobile vans are much like those used in North America, although each one is built to identical specifications by a single manufacturer. It is not known how many such units are in use in Russia, but as each is practically custom built, they probably number fewer than ten. The "PTS-3" mobile unit consists of two independent equipment rooms: one for the production staff and the second for the technicians who set up, operate, and dismantle the equipment. Each mobile unit is set up to handle three camera inputs (ie. three chains) and six microphone inputs. The STL (studio . . . in this case at a remote location . . . transmitter link) is by 2500 megacycle microwave. The video signal is on 2500 megs, the audio goes through at 2550 megs. Claimed range between the microwave unit (using dish type antennas mounted on top of the van) and the transmitter is 8.5 miles, over flat terrain.

The Rubin 102 Receiver, dressed up in cabinet.



The Rubin 102 Chassis.

Microwave Relays and Coaxial Cable

The large land area covered by the sprawling USSR, and the extreme distances between cities has made plans for coaxial cable unpractical, Russian sources say. In the U.S. and Canada intercity relays are split about half and half . . . between cable and microwave relay. In the Soviet Union, engineers say the expense and time (perhaps here is the real key . . . time) required to lay cable over the country has hastened the development of the microwave relay. Such relays, operating in the 2000-2500 megacycle region are identical in design to one another. Like the mobile units they are from a single manufacturing plant. (See photo four) The microwave relays, called "Radio Relay Lines," are capable of carrying 600 telephone conversations, or one television signal, in each TRUNK . . . and the Soviets say each relay station handles six such trunks. At the present time relays exchange programs between Leningrad and Tallin (on the Black Sea), and between Moscow and three surrounding centers of population, Ryazan, Smolensk, and Yaroslavi. The country's only long line cable system takes programs from Moscow to Kalinin, a distance of 100 miles.

New Moscow TV Center

Although the population of the USSR is scattered over a large area, there are many small towns and cities within a 100 mile radius of Moscow, which could be served with a viewable signal if a powerful transmitter (more powerful than their present two kilowatt units) radiating from a tall antenna was put into service. With this in mind, technicians and engineers are constructing a rather gigantic concrete and steel tower, when finished, "MAY represent the tallest man made structure in the world" 1651 feet tall (currently the tallest tower . . . or any man made structure . . . is the WGAN-TV tower, Portland, Maine . . . 1619 feet high. Watch for a story on the WGAN-TV tower in the February issue of DXing HORIZONS). Completion is scheduled for sometime in 1960. The tower is designed to be concrete in structure to the 1274 foot level, and steel above that point. On top of the tower itself antennas will be mounted for four television channels (looking to the future as Moscow has only two at this time) and two FM channels. The tower will also serve as the usual tourist attraction, with a restaurant built into its superficial structure.

FM Radio in the USSR

Ten percent of the estimated three million television receivers in use in the USSR on April 1, 1959 had FM receiving provisions. FM stations employ 50 KC deviation in Russia. Using a push button pre set tuner (such as is found on many american car radios) the video portion of the television set is turned off when FM goes on. The FM transmitters are, of course, being installed where television stations are already established.

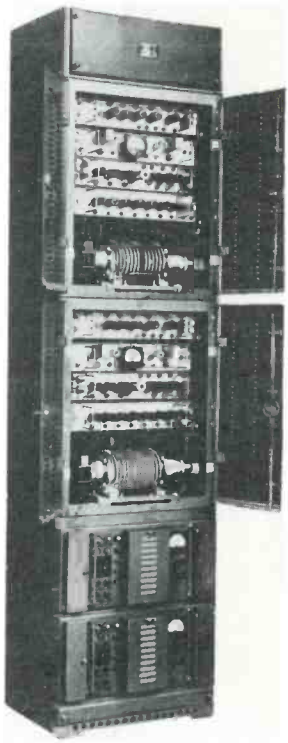
Television Receivers

One of the most popular receivers in Russia is the RUBIN 102. This receiver has a picture tube comparable to our 16 inch tubes, push button tone control, push button on-off, and following a recent american trend, four speakers! From an engineering standpoint the Rubin 102 has many of the features not found in american receivers since the 1952-55 era of expanding TV markets in this country. This is not to say that set design is necessarily behind ours, but merely that problems of modern day television in the USSR closely parallel those here five years ago. With many "fringe area" receivers in use, four stages of IF seems to be the rule, not the exception. And power supplies still maintain the faithful transformer (photo two).

Set Sensitivity and Antennas

According to Soviet provided data, 75 microvolts of signal is sufficient to produce snow-free images in a moderately noisy location, with the Rubin 102 Receiver. No information is available as to the minimum signal required to lock in a video signal.

Antennas in the USSR for some unexplained reason do not appear to have attained the popularity they have in this country. One sees many tall masts (many home constructed of wood and discarded plumbing pipe) but few antennas of more than three elements. The most common antenna is the Dipole with reflector, even in fringe areas. In large cities, community and master antenna systems are common because many landlords do not want more than one antenna on the roof line.



One rack of Microwave Receiving-Transmitting Equipment . . . a la Moscow! This rack holds two "Trunk Units," each capable of receiving and transmitting 600 telephone conversations, or one television channel. Power supply units are on the bottom.

From the outside looking in! TV Center in Baku, Azerbaijan, SSR. This is the only TV station located in the oil rich Caspian Sea area and this tower sends signals into northern Iran as well as over southern Russia.

MORE RUSSIAN TV IN THE FUTURE

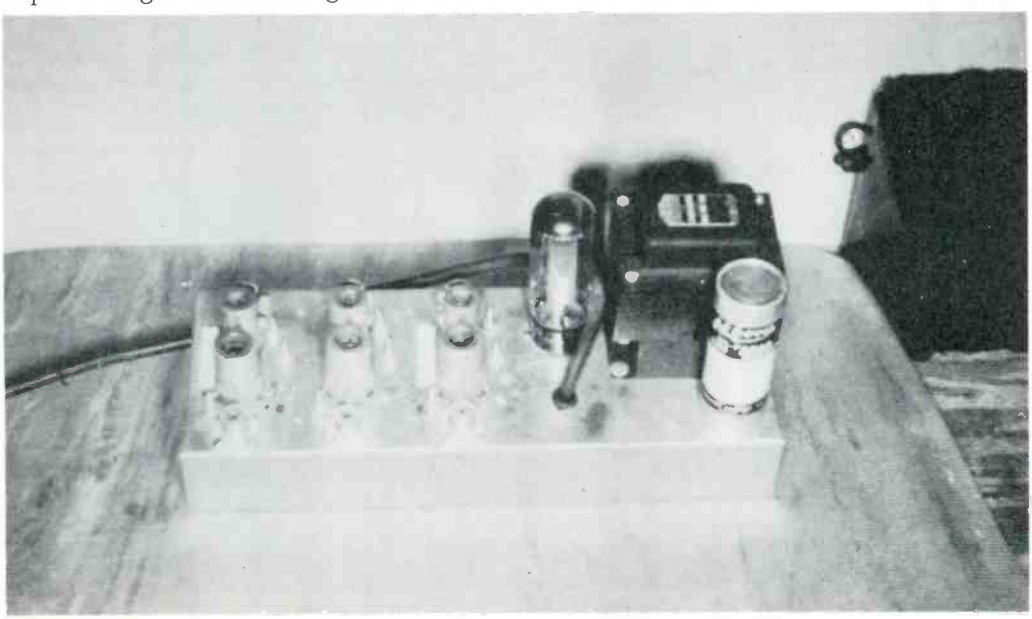
Low Noise TV Pre-Amplifiers

Designing and building a low noise pre-amplifier (or booster) stage to go ahead of modern day television receivers is not an easy chore. To understand why this statement is true, and what considerations must be analyzed, we must do a little studying of history, and of the basic laws of electronics which govern the usefulness of such a unit.

First understand, that the sensitivity of any receiver (whether it be AM, FM, short wave, TV, or whatever) is determined almost entirely by two factors . . . the band width of the receiver, and the receiver's noise figure. In television work the band width of the receiver is set by the width of the signal . . . six megacycles from sideband to sideband. Therefore in TV receiver design band width is not too important when considering sensitivity. Generally speaking you may improve the sensitivity of any receiver by narrowing the band width. By narrowing the band width of a TV receiver you begin to shut out certain portions of the signal and lose definition. When this happens the signal becomes blurred and lacks detail.

But noise figure is yet another story. In any receiver (from here on anything said can be applied to FM receivers as well) the receiver amplifier stages themselves generate noise. You recognize noise on a TV receiver by watching the dancing black and white snow dots on the screen. Check the noise figure in your receiver sometime by disconnecting the antenna on a clear channel and watch the snow on the screen. Chances are only the very heaviest black dots will disappear when you disconnect the antenna. The remaining snow on the screen (and a lot of the hiss in the speaker) is noise generated in your receiver. And it is this noise which the DX signal you are trying to see and hear must override. The noisier your receiver is . . . the harder it is for a DX signal to break through the snow barrier. Granted some noise comes from cars, power lines, and even cosmic space, but the greatest portion of the noise on your DXing receiver is SET MADE! Now, if you could reduce that noise in your receiver by one-half, the chances are you would add fifty percent more range to your receiving area! That is fact, not fantasy, as this article, and part two, to appear in the February issue, shall explain.

Like signal level (which is measured on field strength meters in microvolts) noise is also measured, in a unit called a decibel. The decibel (termed DB) is a logarithmic function which means mathematically speaking, four DBs is not twice two DBs, but actually nearly five DBs. The noise level (or amount of noise



417A AMP — NORTH BAY, ONTARIO VERSION — 3 CHANNEL

generated) in a receiver is measured in these units . . . DBs. It is necessary only that you remember that DBs are a relative standard of measurement.

As a DX or weak signal enthusiast you may recall the more popular television receivers were aided by boosters until 1953-54. Up until that period the television receiver on the market had a low band (channels 2-6) noise figure of 7-8 DB and a high band noise figure of 9-11 DB.

Although noise is generated in tube stages throughout a television receiver, the very first stage the signal goes through (the RF amplifier stage) is the one which determines the noise figure for the whole receiver to follow. Therefore in designing a sensitive receiver, the most important stage is the first stage . . . the RF amplifier stage. It was no wonder then receivers built prior to 1953 with a high band noise figure of 9-11 DB worked better when a well designed booster boasting a noise figure of 7-8 DB was added ahead of the receiver (remembering it is the first stage which the signal goes through which determines the sensitivity of the receiver). But the day of the booster had already begun to wane when in 1953 receiver manufacturers brought to the market a circuit called the "cascode or cascade" circuit. The chief feature of the cascode circuit was the new lower noise figures . . . 5-6 DB on the low band, 7-8 on the high band. Immediately receivers were more sensitive, and some manufacturers went so far as to reduce the number of IF stages (intermediate amplifiers) from four to three, and in some cases two! The day of the short cut to receivers had arrived.

In the six years that have passed from the beginning of the cascode circuit in TV work, no real improvements have been made to the receiver sensitivity scene. A new neutrode tuner promises to improve high band noise figures somewhat, but not as much as DXers would like.

But that does not mean the DXer must be satisfied with the mediocrity to be found in today's receivers. Not when there are tubes on the market, and circuits already developed and in use, which make use of noise figures as low as three DB on the high and low bands! It will be the purpose of this section next month to describe the building technique for the home construction of this unit, (or if you wish to have it done for you, the information will serve to give a local TV technician enough data to build such a unit for you) while the remainder of this month's article will describe the design of this super efficient booster unit.

417A TUBE

The heart of this unit is the first amplifier stage tube, the 417A/5842. The 417A was developed by Western Electric Telephone Company for use in the higher VHF and low UHF regioin. It was developed for one purpose . . . to out perform at a moderate cost anything else available. It is not a $2.95 tube . . . but when used in the circuit to be described and if used when DXing only, and not merely to overload your receiver with unbelievable signals from your local and semi-local stations. It will last a long time. If it is put into service as a master amplifier head on a mountain top, and if the voltages given by our design lab are followed, it will last as long as any premium quality tube now in service. It costs around $15.00, but this is nearly half the cost of the entire unit, if the parts are purchased at your local wholesale house. The tube may be purchased from most any mail order house, although they seldom list it in their catalogues. Be sure to do not order or buy the WL417A, as that is a UHF Klystron, completely useless in this application. And it costs only a few dollars. Check with your local Graybar dealer, if you have one. He can probably supply you locally.

The circuit we have developed for use in the "DXing Horizons Pre Amp" was initially developed by Stan Hosken, North Bay, Ontario. It has been modified somewhat by Cliff Price, our consulting engineer, for more practical tuning across the entire high band range. It is designed for use on channels 7-13, with the feeling being that after tests conducted by "D-H" we felt that for most DXing locations, the outside noise from power lines, cosmic noise, autos, etc. Would exceed five DB on the low band. Thus an amplifier with a three DB noise figure operating on these channels would be wasted because the outside noise is greater than the noise figure. On the high band however, manmade and cosmic noise is not nearly as strong, and a low noise booster such as this will really make DXing and reliable long haul work much more enjoyable. Our circuit tunes channels 7-13 with uniform results.

In the interest of those DXers who would like to build a single channel model, and for those rare low channel locations where outside noise is very low, we will also describe Hosken's working circuit he uses on channel four (which with suitable coil changes will work on channels 2, 3, 5, 6 or the FM band).

DXing HORIZONS presents . . .

DX PRODUCTS

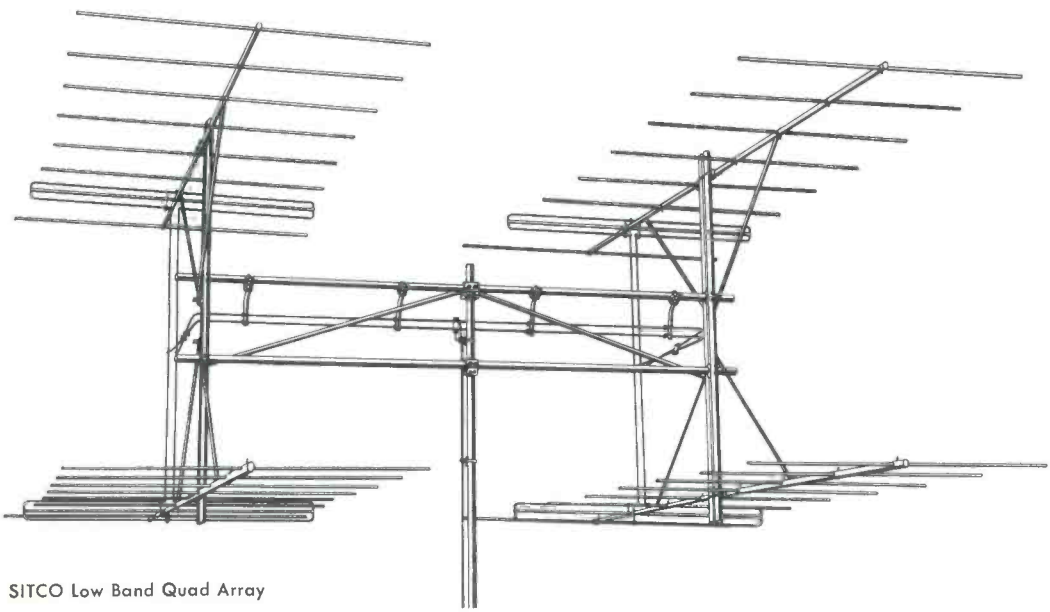
SITCO SOLID BAR YAGIS

In the long range TV and FM reception game there is an adage as old as the field itself . . . "The receiver is only as good as the antenna." Meaning . . . a receiver can only reproduce picture and sound when it receives a signal from the antenna . . . and if the antenna isn't scooping up those microvolts . . . no amount of receiver gain is going to help. In recent years, however, long range TV work (speaking of the DX enthusiast now, not the distribution system operator) trends have been away from super efficient single channel yagis, red hot boosters and 4 IF receivers. Away . . . in favor of 3 IF receivers, multi channel antennas of various designs, and the complacent feeling that comes with the POPULAR MISCONCEPTION "a Cascode Tuner is so good is doesn't need a booster (or pre-amp)."

In the midst of this chaos a firm in Portland, Oregon, the Simplicity Tool Company has risen above the devastation with a line of custom built antennas which work good . . . like an antenna should.

SITCO antennas are designed to do the very best job possible . . . built to cover a single channel, but available for any of the VHF-UHF channels. SITCO antennas are designed to ride out the winter of 10,000 foot Rocky Mountain peaks, buried under tens of feet of snow, or burdened with inches of ice. Antennas built with SOLID bar aluminum elements . . . for maximum strength under the severist of weather conditions . . . and SOLID to greatly reduce wind drag and thermal antenna noise. Antennas with the elements mounted through the boom, and fastened with 12 guage mast clamps for extra rigidity. Antennas designed for flat response across the six megacycle channel of the television signal. Antennas fabricated with both Delta Match and "3 Wire Folded Dipole (photo 1) driven elements. And antennas so matched that the manufacturer claims they provide a standing wave ratio better than 2:1 across the entire channel. (Antennas designed for more than one megacycle of work in the VHF spectrum seldom work with equal gain across the entire spectrum they are designed for. All broad band multi channel yagi arrays have varying gain figures from channel to channel. And, in MANY ELEMENT SINGLE CHANNEL YAGIS, the gain will often vary within the channel covered. Thus the antenna is working with more (or less) gain at one portion of the signal than at another portion. The result is loss of definition and a high SWR . . . standing wave ratio.)

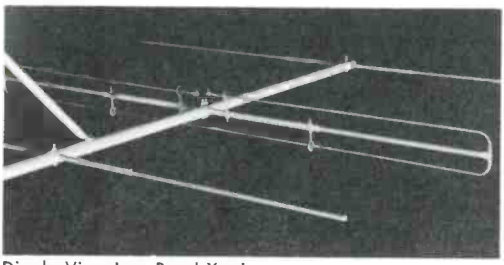
To quote information provided by SITCO, describing their model 848 low band (8 elements) "this antenna is ideally suited for super fringe, weak signal areas, where a sharp lobe "Hi Gain" antenna is necessary to provide sufficient signal strength at the receiver for



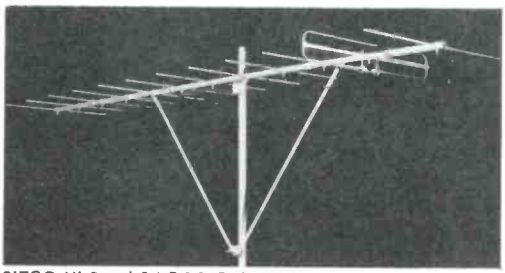
SITCO Low Band Quad Array

good picture reproduction." And if this 8 element job, with its 14.5 DB gain isn't enough to do your job, SITCO provides the same antenna with stacking harnesses, ready to go, with a guaranteed 20 DB forward gain . . . on any low band channel!

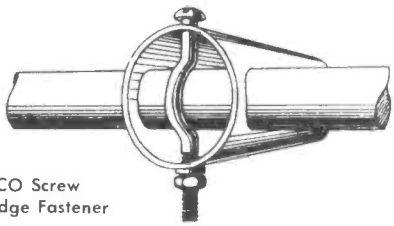
The SITCO antenna line is best summed up with the company's own phrase "It is a completely balanced system which reduces the noise pick up and greatly improves the signal to noise ratio." In other words anyone can build an antenna which picks up lots of signal . . . but to build an antenna which gathers in lots of signal, and very little else (i.e. external noise, antenna thermal noise, etc.) is quite another project.



Dipole View Low Band Yagi



SITCO Hi Band 14.5 DB Gain Yagi



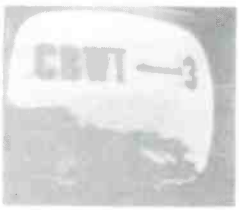
SITCO Screw
Wedge Fastener

USER FINDS SITCO ANTENNAS SATISFACTORY

The following is an excerpt from a letter addressed to Wilson Leeper, television communications engineers, Fort Collins, Colorado. The letter was written by Jack O'Brien, Evanston, Wyoming translator operator. "We installed a QUAD STACK SITCO antenna at La Barge and it seems to be giving us exceptionally good gain. This antenna is rated at 20 DB. Reflectors and directors are solid rod with machined ends, and the construction looks very good. I know of some that have been on mountain top locations for four years with no trouble."

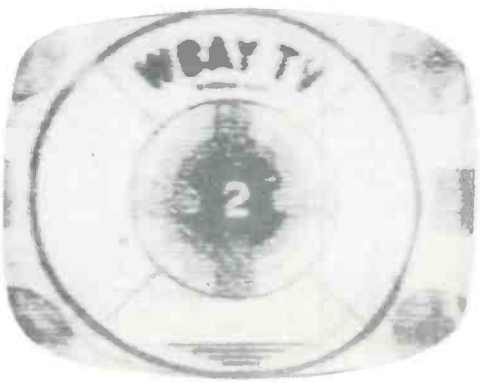
TV-DX-ID-CARDS

KARD-TV-3 **Wichita, Kansas**



CBW-TV **Winnipeg, Manitoba**

Now 3 . . . previously 4



WBAY-TV-2 **Green Bay, Wisconsin**

TV Reporting

(Material in this section prepared and edited by DXing HORIZON staff members, Modesto, Calif.)

Although this month's column is not a good tool for demonstration, close liason between the publisher and reports will allow DXing news to be in print in this section up to the 18th of each month (with DXing HORIZONS issued on the second of the following month). The deadline for news to the column will always be found at the close of each column.

Generally speaking, this fall was not an unusual one for TV DX in any quarter. Neither long haul ground wave nor unusual E Skip sessions marred the predictions for a fairly quiet change of season. However winter time E Skip may be blossoming forth as this is read, bringing reception from stations 700-1500 miles distant (see propagation review on page 18 for the latest predictions). This will perhaps give this section a chance to outline its purpose in DXing HORIZONS so there can be no mistake, as reports begin to flood this desk. DXers will find report forms enclosed with the magazines. You are requested to use these forms in reporting any distant reception which you consider UNUSUAL FOR YOUR LOCATION. There are no mileage limits, or other superficial barriers. The forms are self explanatory. There is a check section provided which you check when you need a new set of report forms. Additionally, you are asked to follow the instructions found at the top of each column heading. Try to remit your completed report forms at least once per month, in time to make the deadline at the end of this column.

Photographs of DX reception are invited, and except in rare cases they cannot be returned. Each should be marked with the name of the DXer, and address, call of the station, channel, and time and date seen.

Additionally DXers are asked to contribute any and all information of interest to them (unusual observations, etc.) so that it might be passed along to other enthusiasts. In the future, complete credit will be given to all DXers submitting information and photos, as they are used.

REPORTS

Stephen Tuura has the dubious honor of being the first reporter to this section. DXer Tuura lives in a Toronto, Ontario suburb which despite its name, he tells us it is in a valley (Mount Dennis). Tuura uses a 21 inch 55 Motorola and 8 element wide spaced all channel yagi for VHF, a corner reflector and BTC-99 converter for UHF. Despite the handicaps of many local stations, a poor location and little time to DX, Tuura has snagged 56 television stations. Some of his most interesting hauls have been via the auroral route, with WOC-TV, Davenport, Iowa (590 miles), WNBQ-5, Chicago, Illinois (410 miles), WTMJ-4, Milwaukee, 400 miles, WICS-3, Madison, Wisconsin (490 miles), and WBBM-2, Chicago all logged via "A."

Ed Prond, DXing from Dalton, Illinois spent one week without his antenna (a ten-element yagi) in late September as DX ground to a large style halt. Under temporary repairs Ed had his Motorola set perking during October to catch meteor scatter stations WOAI, WKY, and KRLD, all channel four, over 800 miles, between 0630 and 0730 on several mornings.

DXer Frank Wheeler put his Winegard CL-4-X to work for WMSB-TV-10, a new station in the upper Michigan Peninsula 236 miles north during October. This brought DXer Wheeler's totals to 132 video stations logged. Wheeler also noticed auroral lines on channels 2-6 October 3, from 2200-2330 EST.

John Dranchak, Bridgeport, Conn. has a strange logging to report on Channel 10. On the early morning of July 24, way back last summer, Dranchak logged KE-2J-KJ testing between 0130 and 0245 A.M. EST. Dranchak says the station ran an RTMA test pattern and once every hour would flash the strange call on the screen. It notes the station had rapid fading on the signal. The only likely suspect D-H could turn up is the experimental station KE2XZJ, north Greenbush, N.Y. KE2XZJ operates on Channel 10 with 250 watts in conjunction with WTEN-TV, Vail Mills, N.Y. We suggest you check with WTEN John.

There was a little E Skip activity in late October and November. For instance Donald Ruhland, Holly Hill, Florida, snagged CKVR for fifteen minutes on October 29th. This Channel 3, Barre, Ontario station is 1,070 miles north of Holly Hill.

DXer Frank Greene of Roswell, New Mexico reports some skip on December 4, 6, and 7 from his new Mexico location east into the Gulf Coast States, Georgia, North and South Carolina and Tennessee.

The power of a photo ID of a call slide was demonstrated to Ronald Boyd, Truro, Nova Scotia when he sent a photo of the word "presenta" taken from his screen at 1510 EST on August 1 to CMAB, Channel 2, Havana, Cuba. Back came a letter from the station thanking him for the report, identifying the slide as their own. Net result . . . a new station . . . and a new county for Boyd . . . and a 1,800 mile double hop logging! And talk about strange loggings for an August evening . . . DXer Boyd parlayed what appeared to be a normal late summer auroral opening into an auroral-E Skip session which netted CFRN-TV, Edmonton, Alberta, a Channel 3 haul of 2,350 miles for one hour! We hope to have more words of auroral ES, from the pen of Boyd himself, at an early date in the form of a special article.

Judging from the report of Jim Himes, Joes, Colorado, his location must be one of the hottest for DX in the U.S.A. Himes regularly logs MS burst DX from both coasts, as well as catching more than his share of ground wave openings into Texas, Louisiana, and the mid-west.

Send all TV DX reports to 820 Tully Road. Modesto, California. The deadline . . . All reports must arrive in Modesto by January 15 for the February issue.

FM Reporting

Edited and Prepared by
Bruce Elving
920 Laramie Street
Manhatten, Kansas

Just as the public's buying of FM receivers has risen sharply in the past few years in response to a demand for the better programs and high fidelity that FM radio offers, more and more people are discovering that the 88 to 108 megacycle FM band is a DXing paradise. All kinds of folks are enjoying the ever-changing thrills of long-distance reception of radio stations, or FM DX, as we prefer to call it.

The FM DX enthusiast may be the seasoned veteran of broadcast band or shortwave radio DXing. Or, he may have been attracted to FM radio through experiences with television DX reception, which enjoys similar reception characteristics to FM. Or, he may be one of the many persons who recently purchased his first high fidelity tuner or FM radio and, upon exploring the FM band, was fascinated by his set's ability to bring in distant stations. Whether old pros at the FM DX game, newcomers, or those who have yet to experience the thrills that this form of radio reception has to offer, all have a vital interest in this section of DXing HORIZONS, and can help it prosper. It's in response to a need we feel exists for a clearing-house of information on the activities of FM DXers scattered around the world that this column came into being.

In order to make this an interesting column for all, it is important that we learn of your DXing exploits by means of our reports, mailed to Manhattan, Kansas. If you have been fairly active in FM DX, you could start the column rolling by sending a summary of your 1959 FM DX accomplishments. Perhaps you have found a particular type of antenna, receiver or other piece of apparatus that has been a boon to the quality of YOUR long-distance FM reception.

Thus, in addition to providing listings of the distant stations that are heard by the readers of DXing HORIZONS, will give tips on equipment that has proven successful for some of the nation's top FM DXers, and have reports on new technical developments that hold promise for better DX.

As editor of this section, I feel uniquely qualified to give hints and tips on FM reception, for I have been an FM DXer since 1948. In those eleven years, I have received stations from 33 states, the District of Columbia and Quebec from my permanent DX location of Duluth, Minnesota. To date, I have heard 346 FM stations in Duluth and have some 240 of these verified. Although I have spent the greater portion of the last two years in the states of Iowa and Kansas (I am on the faculty of Kansas State University), I have found it possible to continue adding to my Duluth FM listings on my occasional return trips there, especially during the summer. Situated on the side of a hill affording a clear view across Lake Superior and vast areas of northern Wisconsin, the location has proven to be an excellent one for long-distance FM reception, with regular reception possible at distances of from 250 to 300 miles. My receivers for FM DX have included a Zenith FM-AM table radio and Harman

FM Department Editor Bruce Elving with hand poised on the Harmon Kardon THEME Tuner at his Duluth DX Den

Kardon "Theme" tuner, which has been in use since 1956. Additional equipment includes a Jerrold FM-TV signal booster. The antenna used in Duluth is a rotatable, ten-element FM yagi.

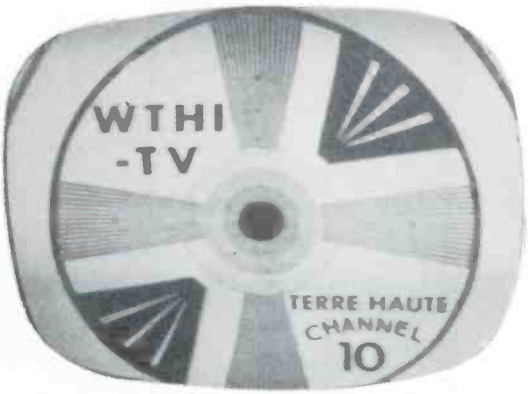
No longer are the words of the manufacturer's instruction booklet for a 1949 FM radio, "Do not expect to receive other than your local FM stations," taken literally. If you are a comparative veteran at FM DXing, or if you are a person yet to tune in an FM station for the first time, you can now see that FM DX is a practical reality. It remains for YOU to join, within this FM DX section, the ranks of FM DXers the world over — and add to the development of one of the fastest-growing DX fields.

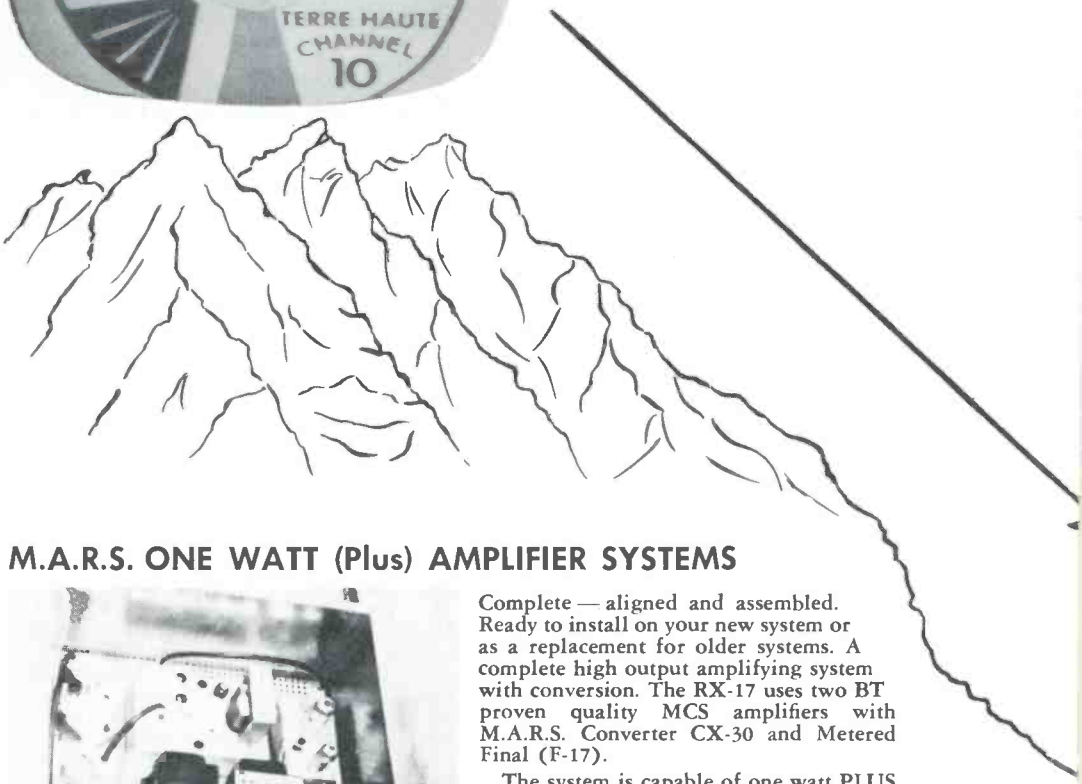
Several interesting FM DX reports on hand at the editorial office of DXing HORIZONS. Among these are reports from Dale Chote, Toronto, Ontario and Joseph Tibiletti, Victoria, Texas. FM DXer Chote is one of the rare few who got their start in FM DXing in FM itself . . . not TV or short wave. Dale uses a Sherwood Model S-3000 FM tuner, and tow five-element yagis . . . one cut for 98 megs, the second for 108 megs. His total number of stations was pushed to 80 at 0037 on November 9th when he was listening to a weak station on 94.5 megs . . .and a three second BURST over the weak fringe station brought the call letters WHDH-FM, Boston, 455 miles over the mountains of upstate New York. This was probably a strange phenomena known as trops bursting, which we hope to cover in a future issue of D-H.

Victor Tibiletti, a TV DXer from Victoria, Texas took a few spins on the FM dials June 28-29th and logged 46 FM DX stations from 200 to 1,400 miles distant. Stations in Florida, South Carolina, and up the coast to New York City and then west to Indiana, Illinois, Minnesota and Wisconsin and south to Kansas City were logged in the 24 hour period.

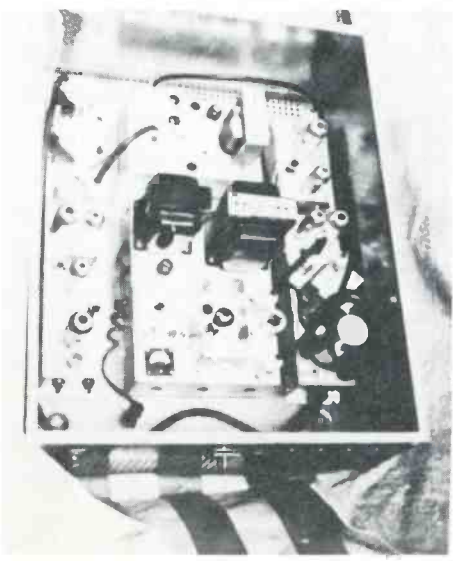
Deadline for FM DX reports for February issue is January 11 in Manhatten, Kansas.

BRING THIS SIGNAL





M.A.R.S. ONE WATT (Plus) AMPLIFIER SYSTEMS



Complete — aligned and assembled. Ready to install on your new system or as a replacement for older systems. A complete high output amplifying system with conversion. The RX-17 uses two BT proven quality MCS amplifiers with M.A.R.S. Converter CX-30 and Metered Final (F-17).

The system is capable of one watt PLUS output with as little as 50 microvolts input.

The unusual range of automatic gain control enables complete pre-adjustment to accomodate ANY useable signal level.

Metered output eliminates guesswork for fast — efficient operation.

AVERAGE VALUE SPECIFICATIONS:

Gain: 110-120 DB.
Conversion Accuracy: .005%
AGC: 40 DB.
Input Range: 50 Microvolts to 5000 Microvolts
Output: One Watt Plus
Power: 115 Volts AC 60 Cycle (140 Watts)
Cables: Low loss input and output cables and baluns to match 300 OHM line are included.
Installation: Can be done by anyone in a short hour.
Price: $957.00

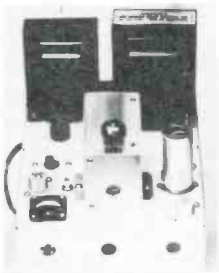
M.A.R.S. CRYSTAL CONTROLLED CONVERTER CX-30

RELIABILITY . . . The world's most reliable converter-amplifier units, with 10,000 hours tube life in premium quality Amperex 6922 Tubes. The CX-30 is the heart of any amplifier system which requires the highest accuracy in conversion, and maximum reliability. Input may vary from 1,000 MV to 100,000 MV at 75 OHMS. One-half of the second 6922 is reserved for possible use with a coding on-off system.

AVERAGE VALUE SPECIFICATIONS:

Gain: 15 DB on Low Channels
10 DB on High Channels
Conversion Accuracy: .005%
Power: 115 VAC, 60 Cycle — 17 Watts
Input: 1000 to 100,000 MV at 75 OHM.
Tubes: Premium Quality Amperex 10,000 Hour 6922's.

M.A.R.S. ONE WATT FINAL TV AMP. F-17



Mountain top locations require the very best in equipment . . . and when you need 10,000 hour reliability, high output, and broadcast quality amplification . . . M.A.R.S. equipment is for you. Maintenance calls are held at the lowest rate in the industry with M.A.R.S. equipment . . . and the F-17 amplifier.

AVERAGE VALUE SPECIFICATIONS:

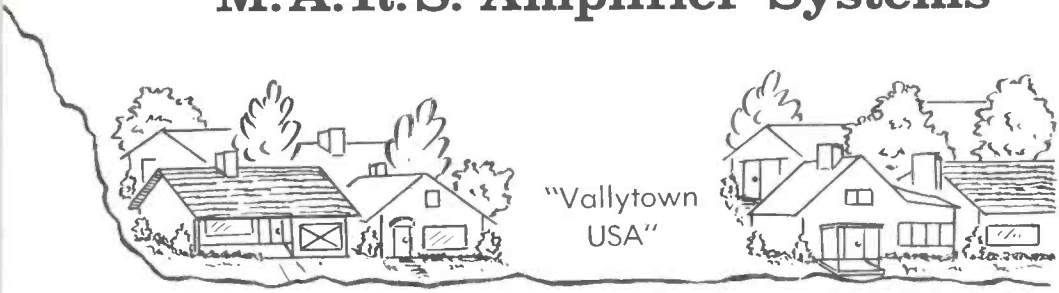
Gain: 26 DB over Each Input
Band Width: 6 MC (Plus-Minus) One DB.
Power Requirements: 115 VAC, 60 Cycles, 70 Watts.
Output: One Watt Plus
9 Volts at 75 OHM
13 Volts at 300 OHM (Through Balun)
80 DB above One Millivolt.
Meter: Switch and Meter to Monitor Plate Voltage and Relative RF Voltage.
Tubes: Premium quality Amperex 6922's and 6360's (10,000 Hour Rating)
Price: $395.00

IF AND WHEN VHF BOOSTERS BECOME LICENSED, THIS F-17 UNIT WILL PROVIDE A QUALITY PICTURE UP TO 40 MILES.

The following chart shows channel conversions available. The shaded areas should be avoided if possible.

CHANNELS	7	8	9	10	11	12	13
2		126	132	138	144	150	156
3	114				138	144	150
4	108	114	120	126			
5	98	104	110	116	122	128	134
6	92 Trap	98	104	110	116	122	128

HERE with M.A.R.S. Amplifier Systems



MID AMERICA RELAY SYSTEMS, INC.

601 Main Street **Rapid City, South Dakota**

STATION REPORT

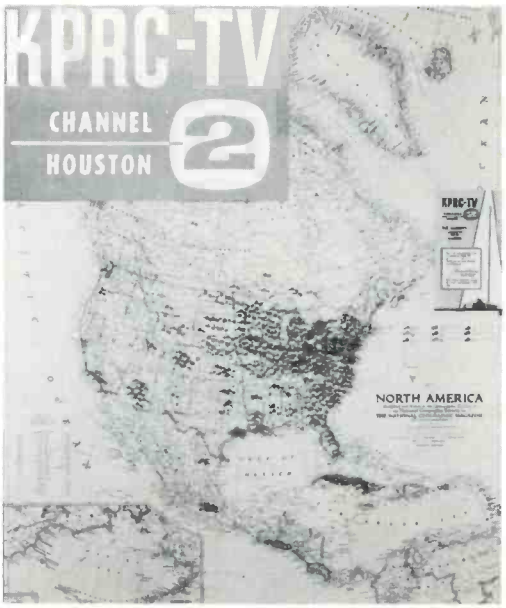
KPRC-TV — Houston, Texas

One of the most intriguing chronic appearing DX stories involves the reception in England of an american channel 2 station . . . several years after the station had left the air. Actually the station remains on the air today, under a differing set of call letters, and new owner. That station today is KPRC-TV . . . that station in 1949 was KLEE-TV.

The story began in the mid 50's when an english experimenter fooling with some equipment he had modified for U.S. standards (although heaven knows for what purpose) astonished the world with a report he was watching Television Station KLEE-TV, Houston, Texas, from his London shop. The world of electronics was doubly astonished when it discovered KLEE-TV had been off the air several years. Immediately scientists, and psuedo scientists began working with their slide rules, to calculate how far the KLEE-TV signal had traveled (at the speed of light) before it came bounding back to earth from some stellar body, to be received in England. The figures told them nothing and everyone promptly forgot about the whole matter assuming a hoax. Everyone except the English experimenter who continued his dial twisting until in 1955 he did it again . . . so he reported. This unusual DV report has never been explained . . . nor verified. Nevertheless the station responsible (KPRC) nicknamed itself the NATION'S DX STATION. . . a phrase aptly backed up by several hundred DX reports it receives every year. For several years running, RADIO-ELECTRONICS TV DX column tabulations revealed KPRC-TV was being received by more DXers at more DX locations, from Maine to California than any other station in the country.

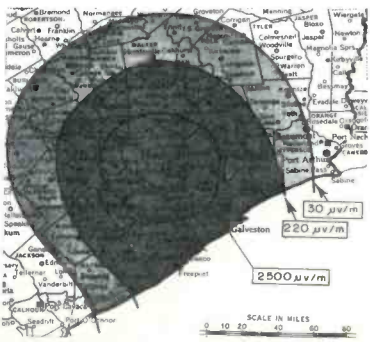
The engineering staff at KPRC-TV tabulated DX reports during each yearly period, 1951 to 1956. DXing HORIZONS has further tabulated this "Houston eye view of DX" for the years covered, and these are some of the highlights.

In the summer of 1951, KPRC was received 22 times in California, 106 times in Ohio, and 120 times in Pennsylvania! Whereas the next year, 1952, California did not report KPRC reception once, Ohio had but 20, and Pennsylvania a paltry 23 reports! Nor has Skip always favored the same areas for KPRC. Pennsylvania, Ohio and Michigan were hot spots for



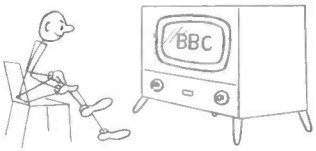
KPRC Engineering Department TV DX Reporting Map

KPRC in the summer of 51 . . . while the summer of 53 saw Iowa (47 reports of reception) and Minnesota (42 reports) leading Ohio's 35 and Pennsylvania's 28 reports. Nor was 1954 like any of the previously mentioned periods. In 54 Iowa was the top state with 59 reports, followed by New York with 56 and Indiana with 47! Florida also showed strongly in 1954 with 44 reports. 1955 must have been a very poor year for E Skip all over because the leading state, Iowa, had only 17 reports . . . and normal front runner Pennsylvania a mere 7 reports! 1956, the last year this particular group of KPRC engineering reports covers, was also a very poor year for E Skip action. Michigan was the leader that year with a handful of reports . . . 11! While Pennsylvania had but one DX report. Compare this poor showing with the 120 reports received from Pennsylvania in 1951!



KPRC-TV FCC Contour Coverage Map

DXer of the Month

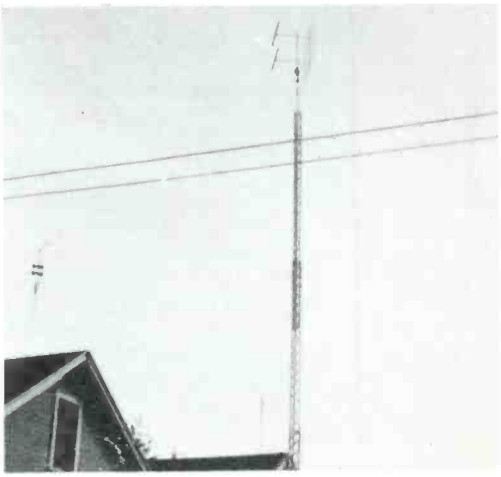


Art Collins — Buffalo, New York

Art Collins presents an outstanding example for the first in this series in DXing HORIZONS. DXer Collins has been the sole thread of continuity in many phases of organized DXing in the past half decade. In the American Ionospheric Propagation Association, Art Collins has served long and well. First as an informal DX test arranger, and more recently as an elected member in the organization body behind the AIPA, the world's first TV DX organization. In the first years when SPECIAL TV DX TESTS were popular Art Collins apparently had more talent and persistence than the rest, for Art was the only link between the station conducting the test and the DXers during many such tests. More recently Art has served the DXing field well with level headed thinking in the face of crisis after crisis, as AIPA president. Faced with internal verification arguments, AIPA bulletin problems, and the usual problems of keeping a shifting membership growing, Art has done an outstanding job. Art and the AIPA saw to it that articles describing TV DX (from perhaps a fanciful vantage point) were placed in the popular mass circulation TV GUIDE magazine, and Electronics Illustrated. Although Art did not write either of these mass appeal articles, he was instrumental in the planning of both, not to mention a lot of behind the scenes activity which comes with the presidential post of the AIPA.

As a personal DXer Art is perhaps without equal. DXing from a downtown Buffalo location, he is plagued with the usual problems encountered by any metropolitan area DXer . . . high traffic ignition noise, powerline noise, and noise from every conceivable electrical appliance his neighbors can plug into their 110 volt outlet. Plus . . . local stations with "maximum tower and power" on channels 2, 4 and 7. An excellent grade "B" service from Rochester on 5, Toronto on 6, Rochester on 10 and Erie on 12. Better than normal fringe area viewing is to be found on every channel in Buffalo. So Art of late has paid particular heed to the calling of the UHF region (less noise, less interference, and more room to stretch one's arms . . . notes Art), having logged nearly every UHF'er within 600 miles to the west along the Southern Great Lakes . . . and as far as the New England States to the east, and Pennsylvania to the south. But Art is not one to avoid the VHF channels, having logged VHF calls from Puerto Rico, Mexico, and west of the U.S. and Canadian Rockies to his credit. Several of these have been logged through his 20,000 MV locals!

Many hours of dial twisting per day, patient watching of weather maps and the changeable fringe area conditions . . . and the unbeatable DXing habit of watching the snow bound channels after his local's leave the air in the wee hours . . . these habits and many more have paid off for DXer Art Collins. Today Collins has 277 stations to his credit . . . an amazing total for a DXer with so many natural strikes against him before he steps to bat! A tip of the DXing HORIZONS hat to DXer Art Collins . . . a tribute to the hobby as he enters his second five years of active long range TV reception.



70 feet of Buffalo, New York TV DXing Antenna — a la Collins

WEAK SIGNAL INDUSTRY

Revelstoke, B.C.

Except in the very strongest of signal areas most operators of distribution and re-radiation devices will agree signal is where you find it. And in some locations finding that signal can be quite a problem! Take the headwater of the Columbia River Valley west of Revelstoke State Park in East Central British Columbia. the small town of Revelstoke, where until two years ago television was something they had "down south" (in Vancouver), but not one aluminum bird cage was to be found above the two story wood framehouses of this well to do mountain valley town. Revelstoke WAS isolated, quite effectively from television signals by both distance and the surrounding 9,000 foot mountain peaks.

WAS ISOLATED, until engineer C. E. Stephens read about KNIFE EDGE REFRACTION in Alaska, and began drawing lines on his topographical map. After several months of calculating and figuring, engineer Stephens decided that television reception was possible in Revelstoke, from the low power transmitter of CHBC-TV, Channel 2, 95 miles to the southwest in Kelowna. CHBC-TV runs but 3300 watts ERP, and to bring any useable signal over A FLAT LAND PATH of 95 miles would be quite a trick . . . but over a path which averages 4,500 feet ABOVE the receiving location would be a downright miracle. But Stephens didn't think so, and with a dipole cut for Channel 2 and a field strength meter he began probing the area on the outskirts of Revelstoke for signs of signal. And he found it! Very spotty, in areas less than 100 feet square, and in low signal levels (10 MV, or less). Re-calculating his figures and rechecking his map, he decided perhaps he had been looking in the wrong area, and began in another section . . . slightly further south. Here he discovered an area 200 feet long and 30 feet wide which boasted 20 MV of signal on the dipole–field strength meter combination. He was in business!

The secret of his reception? An 8,956 foot mountain. A mountain 15 miles SW of his receiving location, directly along the path between the transmitter and the receiver. The mountain was actually amplifying the television signal! By a peculiar process discovered as recently as 1953, the mountain was providing a "knife edge" or "wedge" which as a prism diffracts light, was diffracting the VHF television signal. The principal is as old as light itself, but its application to VHF radio and TV signals was brand new. Actually, to provide maximum diffraction and the highest possible signal strength the mountain should be visible from both the receiving and transmitting sites, and it should be half way be-

The arrow points out the 8,956 foot Diffracting Peak

Proof of the Pudding — CHBC Signal on Cabled Receiver

80 Element Snow Bound Coaxial Phased Array

(continued on page 24)

PRODUCT REVIEW

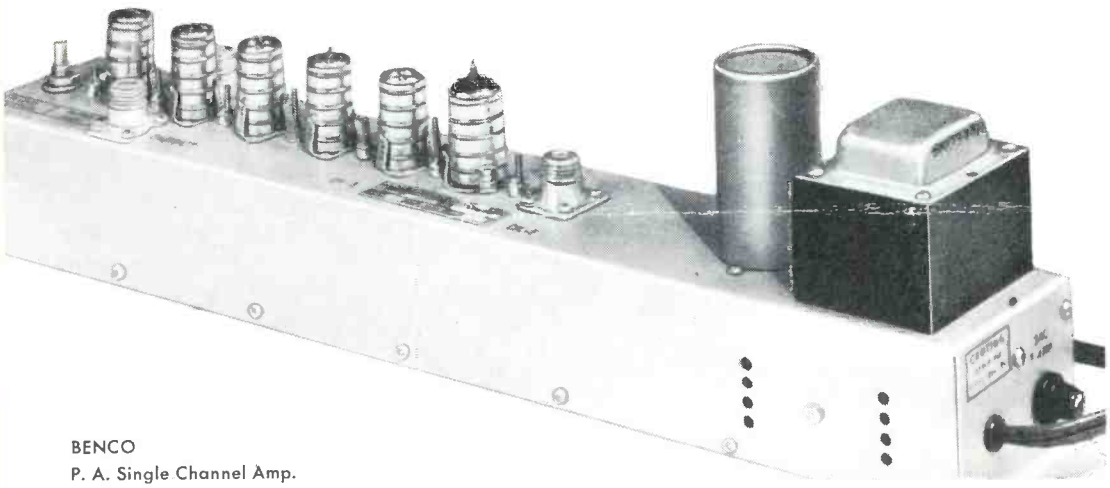
To the operators of a master distribution wired television system, or the installer of on channel and translator re-radiation devices, the use of a high gain–low noise booster amplifier is still accepted practice. And for good reason . . . the weak signal distributor knows the best way to take a 50 microvolt signal, and make it into a 500 microvolt signal is to run that signal through a series of back to back amplifiers. And the master distribution system OP also knows that by running the signal through a series of back to back amplifier stages he can inject an automatic gain control circuit (AGC) which will act as a leveler, or filler, to maintain the signal level at a constant output. Thus, cutting fading, as well as improving signal strength are both equally important functions of well designed pre-amplifier stages.

Pre-amplifiers on the market today fall into two categories. The good and the not so good. Or to be more exact, those which are of use to receivers built prior to 1953, and those of use to receivers constructed after 1955. Most DXing receivers take the latter place of honor. THE MOST IMPORTANT CHARACTERISTIC of any pre-amplifier (or call it booster . . . both words mean the same here) is the noise figure it generates. Noise is measured in an elusive logarithmic function called decibels, or DBS. As a DXer you need only understand (at this time) that the best amplifier in the world would have a zero (0) DB noise figure. Chart one indiciates the comparitive noise figures obtained by DXing HORIZONS using premium quality tubes in three randomly selected brand name 1959 television receivers and two older model boosters (commercially constructed, brand name). WITH THE GIVEN NOISE FIGURE IN ANY RECEIVER OR PRE-AMPLIFIER THE SENSITIVITY OF THAT UNIT IS DECIDED. A high noise figure in the unit means the weak TV signal must be that much stronger to override the noise generated in the receiver itself. A low noise figure in the receiver insures less receiver noise for the signal to fight in the receiver, and it also means the noise in the receiver will be amplified less in the IF stages (thereby producing a higher ratio between the noise and the received signal on the picture tube, and in the speaker). Thus the noise figure of a receiver, or pre-amplifier is important in two ways. It determines how strong the signal must be before it will ride over the receiver generated noise and trace a picture on the tube face, and it determines the signal to noise ratio which has much to do with the final quality of the signal on the screen and in the speaker.

FIRST AMPLIFIER STAGE

The noise figure of any receiver is determined in the very first stage; which is called the RF amplifier stage. If the noise figure in this stage is (as an example) 8 DB, that is the noise figure for the whole receiver. Like a chain, the receiver is only as sensitive as its weakest stage . . . and in the case of a receiver . . . the first amplifier is always the weakest link in the chain from the antenna to the picture tube. (Progressing from RF amplifier stage through the mixer, if amplifier stages, etc.). However, one can take a receiver with an 8 DB noise figure, add AHEAD OF IT a

(continued on page 24)



BENCO
P. A. Single Channel Amp.

Propagation Review

The long autumn DX drought was broken during the first week of December when E Skip hit through the south from Florida to Arizona on the 3rd, 4th, 6th and 7th for a very good start in the winter time E Skip season. Skip also moved into more northern areas on the 4th and the 6th with DX reported on north-south paths good on the 4th. Stanley Penc notes Texas, Louisiana and Florida stations were seen in his Utica, New York DXing location on the 4th.

It is interesting to note that a large class three solar flare shot from the sun's surface November 30th. This flare was preceded by several class two flares on November 27-28. The resulting aurora and general disturbance in the E and F layers lasted until December 2. Immediately following the break up of this disturbance, E Skip conditions set in for a five day run.

Ground wave reception usually grinds to a large halt for FM and TV DXers in the month of December although there may be a chance of good extended conditions as sudden warming spells move into your region. This is especially true of later in the month (of January) in the South and Gulf States.

F2 reception is also on its dying legs although it might spring back to life between the first of January and the 17th as you read this. Nonetheless this fall has been the poorest for cross the Atlantic reception since 1956 and perhaps even 1955. The MUF seldom was reported above 46-48 megacycles, with but one day of reception into the 52 megacycle region reported (see International DX, page 21). As the sun spot cycle continues to plummet to new depths, it is safe to say F2 has left us for all practical purposes until 1966-67.

As you read this you should be aware of the daytime meteor shower (the Quadrantids) which peaks on January 3-4 and has been known to provide excellent burst conditions on north-south paths (i.e. Chicago to New Orleans, etc.) from 0900-1400 local standard time. Other meteor activity will be in the one recession period of the year with the next major meteor display as far away as April.

Auroral backscatter (sometimes known as Aurora) and Auroral-ES should begin to become very frequent in late January. The chance for northern DXers to log a few rare calls of stations 200-800 miles away on channels 2-8 (sometimes 13) is never better. Aurora and Auroral ES peaks in March-April however and this section will deal with "Tuning in Aurora" in March. Hazy lines on the screen, sliding at a 45 degree angle, especially strong when your antenna is north, is Aurora.

PROPAGATION CALENDAR

January 2-15, 22-31 — Wintertime E Skip, peaking in the area south of a line between Norfolk and San Francisco, 1600 (4 P.M.) local time to 2000 (8 P.M.) LST.

January 3-4 — Quadrantids meteor shower, one of the best daytime showers, point your antenna NE or SW (depending on your location) and look for lowbanders in that direction. Burst count to 75 per hour. (0900-1400 LST)

Jan. 21-Feb. 2 — Trops (ground wave) improves over the Gulf and South with the approach of warm fronts.

E Skip Dates: Watch January 2, 3, 26, 27, 29, 30

FCC Analyzed

You should be familiar with the formal FCC announcement concerning the further proposed rule making and amendments of part four of the commission's rules and regulation to permit the operation of low power broadcast repeater stations for television. As it stands at this time this section deals only with the operation and legal licensing of UHF translators. However under direct and adverse pressure exerted on the FCC by a number of western senators and several large groups of influential western land owners, it would now appear the FCC is about to license VHF translator stations. The proposed rule making makes it clear such VHF translator stations must be of good engineering design, may not merely amplify the station (but must convert it to another channel and then amplify-radiate the signal), must be under direct operator control (which can include remote control facilities), and will be licensed to anyone who can prove he is financially able to install an operate such a unit. Additionally, there must be a need for the Unit. Each translator (VHF) unit will be processed separately by the FCC. Each unit will be assigned to a license and set of call letters. Only one channel may be broadcast by each unit. If there are two receivable channels which are to be TRANSLATED and relayed or rebroadcast, then two such units must be licensed and installed, with two separate call letters. All such units will have to conform to a rigid set of non-interference standards. Quoting Section 4.703 of the proposed rule making, "If interference develops between VHF translators the problem shall be resolved by mutual agreement between the licensees involved." And continuing, "It shall be the responsibility of the licensee of a VHF translator to correct at its expense ANY condition of interference to the direct reception of the signals of a television broadcast station operating on the same channel." Whether DIRECT pertains to wired TV antenna systems is not known by this office, but we intend to find out.

Interested parties have until January 11 to file comments with the FCC. The docket number is 12116, should you care to write.

FACTS AND FIGURES:

TV Applicattions:

Carbondale, Ill.— S. Illinois University, Channel 8 316 KW, Antenna 860 feet.

Wilmington, Del.— Metro. Broadcast., Channel 12 316 KW, Antenna 886 feet.

Tacoma, Washington — School District No. 10 Channel 62, 21 KW, 420 foot antenna.

Salem, Oregon — Oregon Faculties, Inc., 19.6 KW, 916 foot antenna, Channel 3.

Licenses (FCC Approval Granted):

Joliet, Ill. (FM) — 93.5 megs, 1.0 KW

Garden Grove, Calif. (FM) — 94.3 megs, 805 watts

Central Square, N.Y. (FM) — 89.3 megs

Farmington, N.M. (TV) — 12,15.5 KW, 386 feet (Farmington TV system here)

Iron Mt., Michigan (TV) — 8,120 KW, 1,312 feet

Translators (Approved by FCC):

Renville County TV Corp., Olivia, Minn. Channels 71, 79 to trans. KSTP, KMSP

Citizens TV, Inc., Milton-Freewater, Oregon Channel 79, to translate KREM-TV

DX by Dateline

Winter time scheduling of DX openings and happenings of interest to DX and distribution enthusiasts is hap hazard at best. Of all the winter time DX expected, E Skip reception bringing stations 700-1500 miles distant on channels 2-6 is most likely (see propagation review, page 18) to be caught by the casual observer. Additionally the DXer along the Gulf Coast, and through the mid west from Arkansas north to Minnesota should enjoy a few extended ground wave sessions to 350 miles, which will show on FM also. Operators of distribution systems making use of channel 2-6 stations can expect interference complaints from customers during E Skip sessions, most likely to occur between 4:00 P.M. and 8:00 P.M. local standard time.

SNOW ON SCREEN MAY BE SNOW!

RCA Victor, Ltd., Montreal has announced that company will soon begin construction of a 1250 mile microwave relay link to connect the U.S. proper with the 49th state, Alaska. Utilizing 50 relay towers, the U.S. Government will lease the relay line from the Canadian Government (who's land it crosses). Just when the line will be finished, has not been announced.

JANUARY 5th . . . BACK TO WORK

As our U.S. Congress gets back to work on the 5th it is the hope of representative Oren Harris that his bill (HR-8426) will receive early consideration. The Harris Bill provides for the establishment of a frequency allocations board which it is assumed would oversee government use of the radio spectrum. In the long run such a group would probably have a lot to say about the future of UHF television and the plans to eliminate UHF in favor of extending the VHF range above channel 13, giving us TV 18 channels, all VHF. Such a move would require a swap with the military which now owns frequencies above channel 13 in the higher VHF spectrum.

RCA SHIPS EQUIPMENT

Two new transmitters and a new antenna have been shipped by RCA manufacturing division to U.S. stations. A 25 kw. transmitter has gone to KSWO-TV, Lawton, Oklahoma, and a 10 kw. unit has been shipped to WTHS-TV, Miami. Additionally, a pylon style UHF antenna is in transit to WKST-TV, Channel 33, Youngstown, Ohio.

(continued on page 22)

DXing Horizons Previews

In the months to come many changes will take place on these pages. This is to be expected, and it is the natural product of evolution. Perhaps the most apparent change will be in the form of the special feature articles. Every effort is to be made to raise the general level of technical ability of the individual DX enthusiast. We hope to create in the DXer a sense of desire to improve his DXing set up through building an experimentation. For TV and FM DXing, fields devoted to the extending of everyday reception range as well as to sitting glued to the receiver when weather conditions favor DX, are ripe for home experimentation. From antennas to booster-amplifiers, super efficient receivers and any of the many varied products along the way, the DXer who learns to roll his own is the same DXer who will make twice as much hay when conditions favor DX reception.

DISTRIBUTION SYSTEM OPERATORS

With a series of articles devoted to construction and installation, we think the distribution operator will find a great wealth of information in DXing HORIZONS. Looking at weak signal reception from strictly the experimental approach, sections devoted to diversity reception, para-balanced selective amplifier-phasers, super efficient rhombic antennas, re-entrant cavity amplifiers with gold plated 416B tubes . . . and IF WE CAN SMUGGLE THE INFORMATION OUT OF CANADA, design data on what is undoubtedly the world's must efficient multi channel yagi design . . . 17 elements in line, designed for either low, or high band use.

And all weak signal enthusiasts will find the story of the 288 element channel four antenna in North Bay, Ontario, of prime interest. One man built this fantastic array of aluminum, which provides grade B service 290 miles from the receiving station!

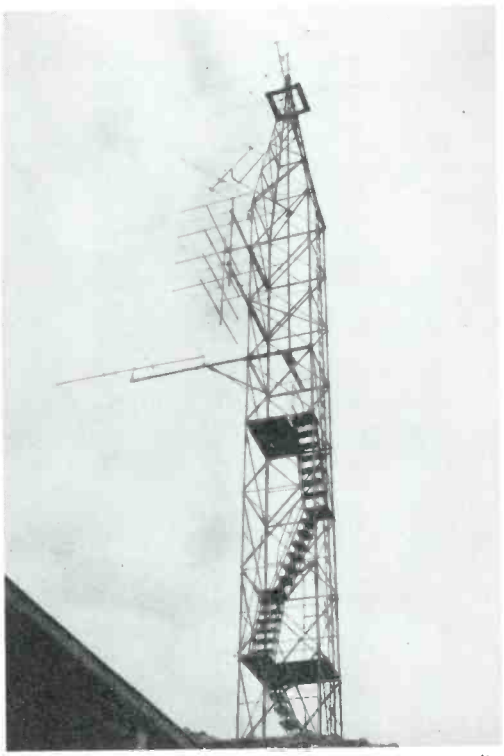
Scheduled for the February issue we have enlisted the aid of R. E. Smith, of the Radio and Electronics Department, Provincial Institute of Technology and Art, Calgary, Alberta. Mr. Smith put in 1440 hours this past summer pen recording the effects of E Skip reception on channels 3 and 4 in Alberta. His observations, while not earth shaking, are timely and his chart supported material will serve to acquaint many newcomers to the field with the strangest of all DX phenomina, E Skip reception.

International DXing Horizons

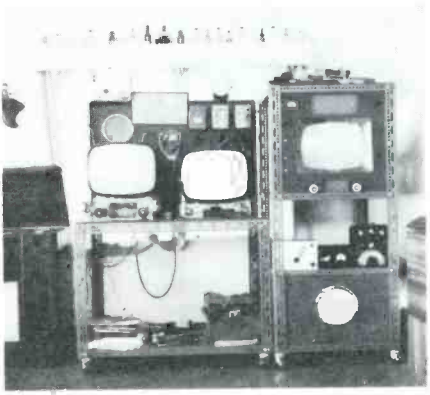
To the long range enthusiast in television, and FM reception, nothing is so stirring as the flashing of a foreign call slide on the screen, or the sound of a foreign language coming from the speaker cone. Nor is their any news so elusive . . . so indefinite, or so inaccurate as news from areas of the world outside the boundaries of the North American continent . . . when THAT NEWS deals with TV-FM station construction, and operation. In fact even news close to home is sketchy, and often unobtainable. Take Mexico for instance. In the early 1950's television stations were reported not only granted, but under construction in a score of cities. Yet not one of these stations has ever come on, to the best of any accurate reporter's knowledge. It is within the confines of "International DXing Horizons" that the reader will learn to find the most accurate, and up to date station information, DX reports, and DXer observations on the IDX SCENE.

DXers OF THE WORLD

Photo feature DXers in Australia and Southern Rhodesia, Africa occupy the limelight in this month's IDX Review. What is probably the most versatile DXing set up in the world, and from one of the world's most unusual DXing locations, belongs to George Cole, of Salisbury, S. Rhodesia. DXer Cole sits at the southern end of the Africa-Europe TE (Trans Equatorial Scatter) circuit. He enjoys almost nightly reception from stations in England, France, Italy, and throughout Southern Europe, at certain times of the year. If this fails to make you sit up and take notice, we suggest you take a gander at a map of that portion of the world . . . and measure off the miles from S. Rhodesia to England. This very unusual mode of DX reception, TE, is akin to the more familiar F2 reception, and shall be delt with in a subsequent article in "D-H." Cole's equipment consists of seven antennas, any one instantly selectable from the master panel above the two receivers on the left, booster pre amplifiers, and three receivers . . . each different. Starting at the left, an 819 line French standard receiver, A 605 European Standard Receiver, and to the right, his 405 line receiver . . . all 17 inchers.



TV DX Antenna Array—George Palmer, Victoria, Australia



TV DX Den — George Cole, S. Rhodesia, Africa

DXing from Williamstown, Victoria, Australia, George Palmer backs up the hard working Norm Burton of Revesby, N.S.W., Australia. At the present time these two fellows are the only known TV DX enthusiasts in Australia, although more will undoubtedly spring up as TV grows in the continent down under. This impressive tower array photo, taken in October, 1958, shows the extent Palmer has

(continued on next page)

International DXing Horizons
(continued)

gone for weak fluttery TV signals. At the very top, the BBC-TV 41 megacycle rotatable antenna. Below that an identical beam fixed on the short path (10,800 miles) to England. It was with this antenna DXer Palmer was able to snag bits of video in the fall of 1958 from BBC-TV, Channel One, England to establish the existing world's (non U.S. standards) TV DX record . . . 10,800 miles. On the bottom left is a four element channel two yagi (56 megacycles). The maze of aluminum in the center are FINCO antennas which Palmer hopes to bring TV signals from Hawaii, or the U.S.A. someday. The tower is self supporting 150 feet above ground!

International DX Topics

F2 DX IN DOLDRUMS

Nova Scotia F2 DXer Ronald Boyd reports the following activity this fall from European TV stations. "F2 from Europe has been much poorer this year than last. BBC (England) and RTF (France) audio on 41.5 megacycles have come in almost daily since October 17, but 45 MC/S. Video was only heard or seen on November 4, 8, 17 and 21st. On the 21st however I received a big surprise . . . audio on 41.5 MC/S as usual after 0851 AST, but nothing unusual was noted after that until 1111 AST when the 45 meg video began coming through. This was followed by these stations:

1156-48.25 MC/S audio and bits of positive video
1240-51.75 MC/S video
1305-52.4 MC/S video
1248-53.25 MC/S video
1253-53.75 MC/S audio (Danish or Flemish).

All signals were strong or very strong."

CHANGES APPARENT IN CANADA TV SCENE

Several new stations have taken to the airwaves in Canada, and as some are low banders they should make E Skip work into Canada from the states more interesting this winter and summer.

INVERNESS, NOVA SCOTIA

CJCB-6 (Satellite of CJCB-4) first noted November 13. Operation may be intermittent until mid January.

NEW CARLISLE, QUEBEC

CHAU-TV-5 uses indian head test pattern provided by Westinghouse. Call letters at top and "Westinghouse" at bottom. First noted November 6.

GRAND FALLS, NEWFOUNDLAND

A new Channel Four station has been issued a construction permit here, licensed to the Newfoundland BCST., Ltd. ERP-Video-7.3 KW, Audio-3.6 KW.

SECOND STATION POLICY

The board of broadcast governors has announced it will begin hearings of second TV stations for many Canadian cities this winter-spring. Until this date CBC has held a monopoly on TV licenses in Canada. Hearings are scheduled for Winnipeg, Vancouver, Montreal, Toronto, Edmonton, Calgary, Halifax and Ottawa before summer arrives.

Additionally, the Canadian government will now take applications for those CBC existing stations which wish to increase their grade A contours by increasing power.

ENGLAND FIRST WITH TRANS OCEAN TV?

Postmaster General J. R. Blevins has announced in London, his office is OKing plans to girdle the world with underwater coaxial cables which will eventually link all British commonwealth nations. The longest link planned for the immediate future will connect Australia and Canada (9000 miles) with telecast carrying cable.

NEXT MONTH

A special report on plans for future Caribbean TV expansion . . . PLUS . . . a listing of current TV stations operating there . . . with channels.

DX by Dateline *(continued)*

CALENDAR DATES FOR JANUARY, 1960

January 1-15, 25-31—E Skip season for winter time. 4 P.M. to 8 P.M. LST.

January 6-9 – High Fidelity Music Show, Shrine Exposition Hall, Los Angeles.

January 13 – Canadian Board of Broadcast Governors open Winnipeg second TV license hearings.

JANUARY 3 – Quadrantids meteor shower, watch low channels (2-6) 10 A.M. to 4 P.M. LST.

Reading Offset Interference

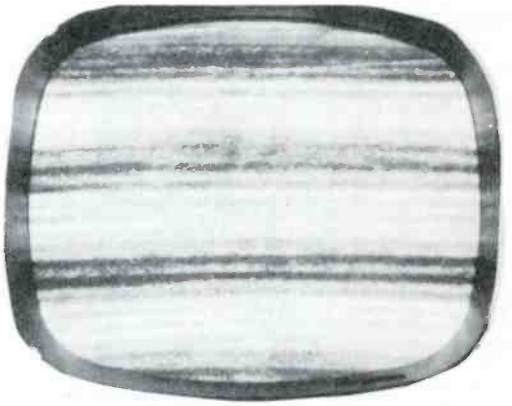
How many times have you been ALMOST ABLE to identify a DX station, only to have it drop behind a wall of intereference bars (any of the three photos to the right)? Or how often have you caught a couple of stations at a station break time, only to miss a third, or fourth because it somehow managed to be covered up by others from the same region on the same channel? What to do? Suppose you could look at the bars on the screen caused on the dominant station at any given moment, and from the number of these bars, and how wide they were deduce exactly what station is causing the interference . . . without even seeing a picture frame? Fantastic you say? Not so — say many experienced DXers. And all due (believe it or not) to the FCC and the freeze of the late 40's and early 50's.

NOT ALL THE SAME

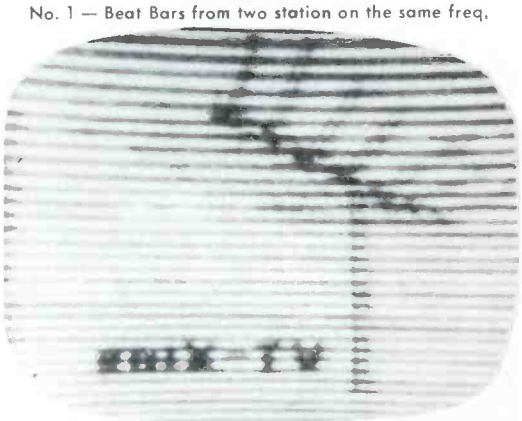
Using Channel 2 (54-60 megacycles) as our example . . . there are 42 stations operating on Channel 2 in the 50 states of the U.S.A. But not all of these stations operate on the same frequency. During the waning years of the allocation freeze the FCC engineering staff relayed information to the policy making staff concerning a means of reducing intereference between two stations operating on the same channel. In the fringe area near the mid way point between stations on the same channel, viewers with tall antennas were getting signals from both stations, and even though one station might be substantially stronger than the other at the mid way point, the interference caused to the stronger one by the weaker took the form of annoying bars (see photo one). With a weak signal, weak bars meant an unwatchable picture . . . and to the FCC . . . this meant several thousand people were deprived of TV reception. The engineering staff suggested that instead of insisting that all Channel 2 stations (or any other channel) operate on the exact same frequency, the stations operating frequency be staggered . . . plus 10 KC, and minus 10 KC . . . from the normal operating frequency. This means some Channel 2 stations are now required to operate "OFFSET" from the normally assigned Channel 2 frequency. And amazing things happen to the interference when a station goes offset. The two interefering stations, once on the same frequency, are now operating on slightly different frequencies. And the WIDE heavy bars on the video, caused by interference, turn into 30-40 varying bars (photo three). In each of the latter cases the video smear clears up to a viewable picture, which, WHEN TREATED with the proper antenna installation will usually become a viewable picture, where before it was not watchable.

DX AND OFFSET

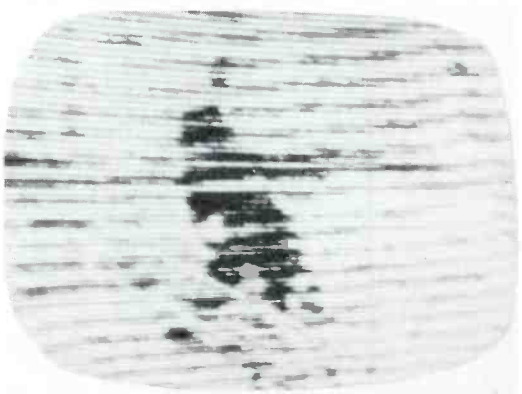
A DXer, armed with a list of stations on each channel, and whether they operate "on frequency," or minus 10 KC . . . or plus 10 KC . . . can compare the BEAT BARS (term applied to the alternating black and white video bars on the screen) between a station he knows and the interfering station. For instance . . . he has a fringe station on Channel 2 operating on Channel 2, minus 10 KC. When he logs interference on his fringe station from a station causing just a few bars . . . wide bars (see photo one) it is safe to assume the interfering station also is operating on two minus 10 KC. But suppose he identifies a station on Skip . . . a station which makes beat bars like photo two with his fringe station. Then a third station comes on the scene, causing bars like photo three with his local, and like photo two with his identified Skip station. The wise DXer, checking his list of stations for a station plus 10, will prabably pin point the new third station even if it never overrides the other two on channel. He knows it is plus 10 because it is causing the maximum number of beat bars (photo three) with his local, and 10 KC beat bars (photo two) with his "On Channel" Skip station.



No. 1 — Beat Bars from two station on the same freq.



No. 2 — Beat Bars from two stations . . . one offset 10 KC



No. 3 — Beat Bars from two stations . . . one 20 KC removed from other (i.e. one plus 10, the second minus 10)

Product Review *(continued)*

pre-amplifier with a 4 DB noise figure . . . and execute a tremendous improvement in sensitivity and signal to noise ratio.

Since 1955 higher station powers, antennas and the like have virtually removed fringe areas from the BIG BUSINESS CATEGORY . . . and few mass produced boosters have been introduced on the market since that time.

EXCEPTION

One firm does manufacture a series of units, aimed primarily at distribution system operators, but to the enterprising DX enthusiast, the cost might not seem too much out of line, especially with the results gained. The BENCO COMPANY, 278 BRIDGELAND AVENUE, DOWNSVIEW (TORONTO), CANADA, manufactures three booster amplifiers of interest to the DXer and distribution system OP alike. Only the most efficient of the three will be described here . . . the P. A. SINGLE CHANNEL PRE-AMPLIFIER. Two others, the SPA single channel pre-amp with 40 DB gain, and the super 40 broadband pre-amp (for all channels 2-13) with 38 DB gain, are also available. Brochures on all can be obtained from the manufacturer.

P. A. SINGLE CHANNEL AMP

Expressly designed for the head of a community or apartment house system, where the signal is very low, the unit will give an output as high as 50,000 microvolts with only 50 microvolts input. Five stages of RF amplification are incorporated into a circuit providing 60 DB GAIN over the six megacycle band width. The noise figure of the unit is 4 DB on the low band, 6 DB on the high band. On the low band outside noise (cosmic and man-made) is greater than 4 DB at most locations (next month—more on location noise). On the high band the addition of one of the 417A amplifier stages described in this month's construction article (page six) would truly make this unit the hottest possible with today's current TV technology. Of course the PA is a single channel booster, making it an expensive buy for any but the most enthusiastic DXer who is perhaps interested in bringing a useable signal over a 250-300 mile path. Or the use of such a unit (see table of specifications) with a huge capture area yagi array on one of the high band channels would make history overnight on meteor scatter and long range ground work for a DXer.

TECHNICAL SPECIFICATIONS — PA SINGLE CHANNEL PRE-AMP

Tubes: 1 6BZ7, 5 6AK5
Band width: Plus/minus 0.75 DB, 6 megacycles
Noise figure: Low band 4 DB, high band 6 DB
Gain: 60 DB minimum
Minimum input for snowfree signal: 50 microvolts
AGC tracking: 50 microvolts to 2000 microvolts
Maximum output: 0.5 volts

RECEIVER-BOOSTERS TESTED BY "D-H" (Noise Figures)

Receiver A	5.5 DB	7.0 DB
Receiver B	6.0 DB	7.0 DB
Receiver C	7.0 DB	7.5 DB
Booster D	7.0 DB	9.5 DB
Booster E	6.5 DB	8.5 DB

Weak Signal Industry *(continued)*

tween the two. Moving the mountain closer to the receiver decreases the overall signal level, and makes the area in which the signal can be received much smaller. (Actually tending to focus the signal as a magnifying glass focuses light.) Stephens had used his topographical map to line up the mountains between the receiver and the transmitter, and using simple geometry he spotted where the signal should be, IN THE REVELSTOKE AREA. Then it was merely a matter of probing with a field strength meter until he found the signal in his previously plotted area.

As Stephens notes, one tremendous advantage to "knife edge or obstacle gain" reception is the almost complete lack of signal fading. Because it is line of sight from the transmitter to the "diffracting mountain" and line of sight from there to the receiving site, the normal fading characteristics to be found with fringe area reception (subject to the whims of weather fronts, etc.) is missing. In line of sight propagation there is little if any fading which can be traced to weather phenomena. Therefore when his 20 MV of signal was amplified first by eight ten-element Channel 2 yagis (see photo one) to 75 MV, and then fed through an amplifier-AGC circuit Stephens had sufficient signal, with no fading, to distribute as "Central TV Systems Ltd." With a potential cable system of 500 subscribers, Stephens and his engineer George Henderson look forward to a bright future with similar systems throughout the mountainous areas of British Columbia. Stephens already has plans to probe for signal from CHCT, only 185 miles to the east on Channel 2, but over the 11,000 foot Canadian Rockies.

Television is truly where you find it and perhaps the secret in finding it is to not to give up merely because the job looks impossible.

Subscribe NOW

The pre-printing success of DXing HORIZONS is the talk of the industry. Never has a magazine been accepted so well and so readily by subscribers and advertisers alike. The explanation is simple enough however. To the reader, DXing HORIZONS brings every detail of information he has long searched for in a half dozen publications . . . all wrapped up in one package. Plus . . . exclusive features to be found only in DXing HORIZONS. And we are growing! From a first printing run of 5,000, circulation will grow the very next issue with a projected circulation of ten thousand (10,000) by July of this year! AND THE MARCH ISSUE . . . already due for a large page expansion because a new department is to be added, will grow even more with new features . . . more features . . . for the TV and FM enthusiast.

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You won't want to miss any feature packed issues! Submit your subscription now . . . add a whole new dimension to your hobby or business!

TELL YOUR FRIENDS ABOUT D-H!

While we consider our mailing lists the best in the industry for weak signal TV and FM enthusiasts and businessmen, it is still likely we are not aware of nearly anything like all of the potential enthusiasts in this field. If you know of any enthusiasts which you have reason to believe would be interested in receiving a free copy of "D-H," in February, why not send along those names (and addresses) with your subscription. There is more demand for the magazine than we can currently supply with our printing runs of 5,000 plus, but rest assured that every name submitted will receive a copy of "D-H" at an early date.

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