

# VHF-UHF DIGEST

the official publication of the Worldwide TV-FM DX Association

JANUARY 1978

## TENTH ANNIVERSARY ISSUE



# From The Staff :

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AN EXTRA-SPECIAL VUD ISSUE FOR AN EXTRAORDINARY OCCASION...

Eleven years ago this month, WTFDA was nothing more than an inspiration in the minds of club founders Morrie S. Goldman and Gary A. Olson. Its predecessor, the World Monitors Radio Club, was as yet a failing all-band club; and a more direct parent club--the AIPA, which had functioned as a TV DX club only for ten years with great success--had folded four years earlier. It would not be until the fall of 1967 that Morrie would convince the publisher of the ill-fated WMRC to orient his club towards TV and FM enthusiasts--and not until January 1968 that the first edition of "WTFDXA's" VHF-UHF DIGEST would be printed.

This edition of our Digest marks WTFDA's tenth anniversary, an occasion which can only be described as momentous for our club. The intervening years between the first VUD and this special issue have seen TV and FM DXing grow from what Ferdinand Dombrowski once called "a small, underrated part of the DX hobby" to an outstanding and respected position in the Association of North American Radio Clubs (ANARC) as well as in other DX circles. Since the creation of WTFDA, two DX Man of the Year Awards and an ANARC Merit Award have been given to prominent TV-FM DXers, in a hobby which has often been primarily shortwave-oriented. For these awards, and for the support given to our organization over the past ten years, we thank all in the ranks of the DXing hobby.

Others more directly involved in our club also deserve our thanks, such as founders Morrie and Gary for their unending work; Ferdinand Dombrowski, Bill Heusmann, and others who were active in our club's early days; Bob Cooper and Dave Janowiak, for their many technical articles; the countless VUD and column editors; and all those who have contributed to our Digest over the years. This writer also thanks the current Board of Directors for their support during my time as Digest editor, which concludes with this issue.

The 50 pages following span the many years of WTFDA, with articles ranging from humorous to technical. I believe we all agree that it has been an issue well worth waiting for.

CLARKE INGRAM

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# HISTORY OF WTFDA



by John Zondlo

The roots of our Worldwide TV-FM DX Association go back many years, nearly to the inception of commercial television.

In the 1950s, current member Bob Cooper and several friends in New York state began corresponding about TV DX. When Cooper moved to California, a club was set up to keep the group together. This club, named the American Ionospheric Propagation Association, remained active for more than ten years, until 1963. In that year a new bulletin editor took over, ceasing publication without any prior notice. No explanation was ever received for this action.

Many of the former AIPAers moved on to other clubs, notably the now-defunct Canadian DX Club. CDXC at the time had an excellent TV DX column edited by Wayne Plunkett. Two other clubs, the Newark News Radio Club and the Canadian International DX Club, also offered TV-FM columns; but many lamented the lack of a club devoted solely to VHF-UHF DX enthusiasts.

In 1965, club founders Morrie Goldman and Gary Olson began efforts to start a TV-FM club. Morrie and Gary dug up names from electronics magazines and many other sources of those expressing an interest in TV-FM DX. Their efforts began to pay off two years later, when at the 1967 Chicago ANARC convention, Morrie approached the publisher of the World Monitors Radio Club (WMRC) and suggested he convert it to a TV-FM format. WMRC, created seven years earlier, was floundering with only 27 members and an all-band format. The change was made--and WTFDA was born.

The first bulletin, termed a sample issue, was dated September-October 1967 and mailed from Philadelphia. The new club, then called WTFDXA, sent this issue to old WMRCers and to many of the people who had been contacted about forming a TV-FM DX club. Several features were included in the first issue, such as an introduction to TV-FM DX, Western TV and FM DX by Dennis Smith, and Eastern TV DX and Products by Morrie Goldman.

## THE MILWAUKEE YEARS

1968 began with the move of WTFDA headquarters from Philadelphia to Milwaukee. Ferdinand Dombrowski took over as VUD editor and publisher and self-appointed club president.

The Digest was published by mimeograph during the Milwaukee era. Dues went from \$3 to \$3.50 to \$4.50 per year for first-class delivery in 1968, along with the establishment of a third-class mailing rate.

Many of the current VUD columns got their start in 1968. FCC TV and GCI were begun by Gary Olson in April. Other new columns included FCC FM by Dennis Smith, VHF Radio by Ferdie Dombrowski, Techni-Corner by Dave Janowiak, and Statistics by Glenn Hauser. Roger Winsor took over as FM DX column editor, a section now split into Northern and Southern FM DX.

WTFDA's first membership list came out in August 1968, totalling 67 members. At that time Bob Cooper, then in the Virgin Islands, became editor of the VHF Radio column. The September issue was the last sent to former WMRC members.

November 1968 saw a classic report by a California member claiming reception of channel 2 in Seoul, Korea, channel 3 in Cebu City, Philippines, and other "unusual" loggings. The report was roundly criticized in subsequent VUDs and prompted a classic Bob Cooper article titled "What Is Normal For TV-FM DX?"

WTFDA's second year, 1969, began with a report by President Dombrowski that club finances were in good shape and WTFDA was about to embark on a campaign of advertising in magazines such as CQ. The club's 1969 membership list had 113 names shown. By the end of the year, dues were up to \$6.50 per year for first-class mail.

The WTFDA TV Station List came out in 1969. It sold to members for 50¢ and to non-members for 75¢. Glenn Hauser set down club standards for counting TV stations, and also wrote a TV DX article for TV Guide which netted around 110 requests for information on the club.

WTFDA's first convention was held May 30, 31 and June 1, 1969. It was hosted by Bill Heusmann and staged at Dettmering's Tavern in Steger IL. 14 people paid a \$7.50 registration fee and were in attendance for such talks as "Using VTVM as S-Meter," "Photographing Your DX," and "Get That ID."

1970 brought Ferdie Dombrowski's first "President's Message" and the split of Eastern TV DX into Eastern and Central columns, which have since re-combined. Pat Dyer took over the VHF Radio column, retitled VHF Utility DX, and Morrie Goldman's Video Lines column introduced the VAFI signal code, which has since fallen from prominence.

The WTFDA tradition of great technical articles continued in 1970. During the year, Glenn Hauser penned an article titled "VHF Harmonics," Roderick Luoma discussed rhombic antennas, and Morrie Goldman explained the technique of TV offset identification. Many of the articles in the early years have been rewritten for recent Digests.

Super TV DXer Bob Seybold hosted the 1970 WTFDA convention in Dunkirk NY. The second annual gathering was held August 7-9. Although membership reached 163 in late 1970, the year was termed a bad one both in terms of membership and finances by president Dombrowski.

Outstanding FM DXer Bruce Elving featured prominently in WTFDA's fourth year, 1971. In that year he heard his 1000th FM station (WKVI Knox IN), published his first "FM Atlas and Station Directory," and headed the FCC FM News column. Early 1971 also brought into our club Andy Bolin, who has since stolen the FM lead in stations heard from Bruce.

Dues were increased to \$7.50 for first-class delivery in mid-year as a course in TV-FM DX for beginners, called the "New Member Package," was introduced. East Lansing MI was the site of the third annual WTFDA convention, where it was announced that club publishing would shift to Chicago at the end of the year. Roger Brown hosted the gathering over the weekend of August 13-15.

In November 1971, WTFDA reached a crisis point. A meeting held November 26th voted on the question: "Will HQ and publishing be moved to Illinois, or will the club cease to exist?". The HQ staff decided to transfer the publishing and headquarters to Illinois, over the objections of Ferdie Dombrowski, who wrote an editorial denouncing the changeover. His last Milwaukee issue was January 1972.

#### DOWN IN DEERFIELD

Morrie Goldman and Gary Olson took over the reins of WTFDA as its HQ moved to Deerfield IL. Both, along with Bill Heusmann, Bruce Elving and Dave Janowiak, had been visiting Milwaukee regularly for publishing sessions.

It was decided early in the Deerfield years to switch to an offset-printed VUD. This decision was announced in March 1972, and the change from mimeo to offset came with the May 1972 Digest.

WTFDA membership quickly soared past the 300 mark in 1972. New club supplies such as VUD boxers and DX log sheets were introduced, while the New Member Package and the TV Station List went out of print. The FM DX column was split, with Roger Winsor taking FM North, Richard Wood FM South, and Mike Dorner FM West (which has since been phased out).

The club's annual convention was held August 3-6, 1972 in Marrero LA with Ron LeBlanc hosting talks on FM DX techniques by Glenn Hauser and Mike Dorner Jr. and on TV antennas by Dave Janowiak. The get-together was summarized in the September 1972 VUD, with convention photos appearing for the first time.

1973 began with Don Ruland taking over the FCC TV column and several detailed reports on Mexican television from Glenn Hauser. Bruce Elving, for his work on behalf of DXers through his FCC FM column and FM Atlas, was chosen as the 1973 DX Man of the Year by the Association of North American Radio Clubs. It was the first such ANARC award given to a TV-FM oriented DX club.

Dunkirk NY was again the site of the WTFDA convention as Bob Seybold hosted the club's fifth annual gathering over August 2-5. Conventioneers voted to

eliminate third-class mailing for the Digest, and debated whether DX reports in the VUD should be edited or printed verbatim. In a yearend report, Morrie Goldman stated that 1973 was a bad year for WTFDA: membership had leveled off at around 330, and the club was losing money.

WTFDA had a busy year in 1974. Early in the year, two new club publications were released: Beyond Shortwave (an introduction to VHF-UHF DX) and the UHF Translator DX Guide. In addition, Bill Thompson took over the Eastern TV DX column, Jim Alexander began Photo-News, Bill Draeb headed Central TV DX, and Clarke Ingram wrote his first VUD feature--"The Haunting DX."

Results of a WTFDA membership survey, published in the June 1974 VUD, rated Bob Cooper's "Tek-Notes" the most popular column in the Digest, indicated the need for an article reprint service (which most other DX clubs had then), and discussed the question of DX reporting format. It also indicated a great deal of member apathy, which showed itself in the total of nine votes received for the WTFDA convention site. Dave Pomeroy hosted the gathering in Topeka KS on August 2-4, which was highlighted by a live TV program on KTWU, channel 11, featuring a TV DX discussion by Glenn Hauser, Morrie Goldman and Mark Lewis.

Morrie Goldman relinquished the VUD editorship to Don Ruland in the summer of 1974, staying on as publisher. Throughout the year, membership had declined until it hit 288 in November. In the Digest, Morrie editorialized on WTFDA's problems (including a lack of technical articles, inconsistent columns and editors, late VUDs and bad club publicity) and urged members to ride out the temporary slowdown.

1975 began with an announcement that Bob Cooper would be taking over the VUD editorial and publishing duties within a few months. Bob later reconsidered his offer, and decided against assuming those tasks. Early in the year, dues were raised to their current level of \$11 per year.

In June the WTFDA TV Station Guide was released, a publication which had been in the works for several years. Frank Aden took over the CCI column in 1975, John Zondlo headed the Mailbox column, and Dave Pomeroy became FCC TV editor. Two new columns were introduced: PS Spectrum by Terry Colgan, and TV CCI Aids by Steve West (both since phased out).

Fort Lauderdale, defeated in the 1974 convention voting by Topeka, became the WTFDA 1975 convention site. Ken Simon hosted the August 1-3 gathering, which featured a "portable" illegal FM station and E-skip into Mexico City on FM. Some members complained that none of the WTFDA Board members had attended. At that same time, member Glenn Hauser experienced a historic E-skip opening up to channel 13.

WTFDA reached another crisis point in late 1975, this one more serious than the one four years earlier. In September, Morrie Goldman began the search for a new publishing staff, without much success. The December VUD carried an "Important Notice" which was sent to about a quarter of the club members. It read, in part: "Publication of all VUD issues beyond January 1976 has been suspended. This condition will remain in effect until qualified volunteers step forward." Current publisher Pete Oprisko enlisted the help of Indiana members John Zondlo and Mike Hogan and the Northwest Indiana publishing team was born.

At that same time, Don Ruland indicated his desire to be relieved of the VUD editorship. Clarke Ingram, who had been editing the DX Scoreboard section of the Statistics column, stepped forward and volunteered his services, and took the helm with the February 1976 issue.

#### THE CHANGE

The new and revitalized Digest underwent many changes during 1976. The front cover design was altered in July to its present format. Bob's Tek-Notes and Techni-Corner returned to the VUD pages as editor Ingram put the emphasis on technical articles. April's "Special FM Issue," featuring articles by many prominent WTFDA members, was hailed by some as the best VUD of all time. Club membership, which had fallen as low as 260, began to edge its way back up, hitting 273 in mid-year.

The VUD became more attractive as Ingram stressed layout and graphics, while publisher Oprisko introduced many new cover colors. Fred Nordquist took the

FM North column and Dave Cox headed FM South as the VUD's editorial vacancies were filled. July's Bicentennial Issue featured a chronological history of WTFDA by John Zondlo, and August brought the largest Digest ever--72 pages.

Clarke Ingram created WTFDA's Reprint Service in the summer of 1976, making past technical articles available to members at a nominal cost. Over 1500 pages of material were handled within the first year before Ingram turned the operation over to club distribution manager Mike Hogan.

WTFDA's largest convention ever was hosted by Morrie Goldman in Chicago over August 6-8. Nearly 60 members assembled to hear talks on polarization and DX by Dave Janowiak, FM-SCA by Bruce Elving, and a Panasonic videocassette demo by Gary Olson. The current Board of Directors was also appointed at the 1976 convention.

November 1976 brought an announcement that WTFDA's membership had topped 300 for the first time in more than two years. The current HQ address in Whiting IN was also introduced. At this time, the popular UHF Translator Guide went out of print.

1977 ushered in a new club policy requiring that ten percent of each Digest be devoted to technical material. Editor Ingram began to streamline the VUD, combining some sections to reduce the overall number of columns from 25 to 15, and the number of DX columns from 7 to the present 5. A detailed summary of WTFDA's third membership survey appearing in mid-year rated Bruce Elving's FCC FM column the most popular in the Digest, and showed that a wide majority of members thought the work of the new editor-in-chief and publishers to be outstanding.

WTFDA's Board of Directors presented a very well received discussion on the preparation of the VUD at the 1977 ANARC convention in Schaumburg IL during July. Those present were given a first-hand look at preparing a VUD, as the July issue was prepared for mailing in the back of the meeting room as guest speakers lectured. WTFDA member Glenn Hauser was selected as ANARC's DX Man of the Year, a position for which Clarke Ingram had also been nominated.

Our club's own convention was held on the West Coast for the first time in 1977. Frank Aden, Bill Block, and Pat Martin staged the successful gathering in Portland OR over the weekend of August 5-7.

Heavy recruiting efforts brought WTFDA's membership up to an all-time high of 342 in October 1977. A mass mailing of information brochures to over 700 BCB DXers, conducted by John Zondlo and Mike Hogan, highlighted the recruiting.

Facing time problems due to conflicts with college work and his chosen career in broadcasting, Clarke Ingram decided to relinquish the VUD editorship in late 1977. He retired to a less demanding position as FCC TV column editor, while CCI editor Frank Aden was unanimously appointed as his successor.

#### THE FUTURE

This issue of the VHF-UHF Digest marks WTFDA's Tenth Anniversary. Our club's future looks bright, with our membership at one of its highest points ever and finances in excellent shape. Frank Aden assumes the VUD editorship with next month's issue.

More membership recruiting efforts are planned for 1978, with a goal of 400 members by the end of the year. A new edition of the WTFDA TV Station Guide is nearly complete, and a revised UHF Translator DX Guide will appear later in the year.

The real future of WTFDA is up to its members. With your support, we will continue to grow!

January, 1978

John Zondlo



*10th Anniversary*



# WHAT IS NORMAL FOR TV-FM DX?

by Robert Cooper, Jr.

This is intended to serve as a guide, or quick reference, to the types of reception and those distances that can reasonably be expected during TV-FM DX openings. This information is the result of this individual's own DXing experiences (beginning in July 1950); the cumulative results of hundreds of other DXers during that span of time; the statistical channel-by-channel DX tabulations by Glenn Hauser; and, as a cross-check, results obtained by amateur radio operators from 1946 to the present time, using the amateur 50, 144, 220 and 432 MHz bands. The correlations between the various amateur bands noted and our VHF-UHF TV channel groupings is explained in the text.

Please bear in mind that the data presented here is based on past experience, encompassing untold thousands of hours of DX observations by probably 1000-plus TV-FM DX enthusiasts (as they have come and gone through the years) and the many VHF-UHF minded amateur radio enthusiasts. The facts and figures that follow do not mean that loggings in excess of those distances or by propagation modes yet unknown will not one day occur. It does suggest, however, that we should always examine with a most critical eye any loggings reported which tend to exceed these basic "norms"--which we ourselves have established throughout the years.

## Correlation with Amateur Radio Work

The amateur six meter band (50-54 MHz) has propagation, or DX possibilities, roughly comparable to TV channels 2 and 3. However, F2 layer skip will occur on a ratio of approximately 500 to 1 when you compare the amateur six meter band with channels 2 and 3. For all other forms of propagation, the correlation between six meters and TV 2 and 3 is basically 1 to 1. F2 skip reaches as high as six meters only on rare occasions--and the F2 TV DX loggings can be counted on one hand. No valid F2 loggings have ever been reported on channel 3 or higher.

The amateur two meter band (144-148 MHz) compares roughly with channels 7 to 13 for tropo (extended ground wave) reception, with channels 7 to 13 for the extremely rare high band E-skip reception (although favoring channels 7 and 8), and with channels 12 and 13 for the unusual high band meteor scatter (MS).

The amateur 1½ meter band (220-225 MHz) compares favorably with channels 11 to 13 for tropo; the amateur 432 MHz band compares favorably with the lower UHF channels (14 to 40) for tropo.

## Basic Propagation

TROPOSPHERIC BENDING (TROPO) is so named because from the radiation point at the transmitting antenna to the receiving antenna site, the signal is trapped close to the ground (within the troposphere layer of the atmosphere) by weather fronts and other weather-related phenomena (temperature, humidity, and the like). Extended tropo (i.e. reception beyond the normal service area of a station) improves with frequency. The higher the TV channel number, up to and including channel 83, the more efficient the propagation agent. To illustrate:

Given six test transmitters, all transmitting with the same power, same antenna height and gain, same tower location--and given a single receiving location, 400 miles distant--place between the test transmitter location and the test receiver location the proper type of weather conditions to produce "tropo." NOW (and this is where theory separates from practice), install exactly equivalent receiving antennas, transmission lines, and receivers. Measure the received signal strength from each of the six test transmitters, on channels 2, 6, 7, 13, 14, and 83, at the receiver location. What will you find? That channel 2 will be the weakest, 6 slightly stronger, 7 quite a bit stronger, 13 stronger yet, 14 considerably stronger than 13, and channel 83 the strongest of all!

This is theory. In practice, the high band TV channels (7 to 13) have in the past often been the best for producing tropo reception, although the slowly improving quality of UHF receivers and antennas has resulted in plenty of

exceptional UHF tropo loggings. When and if manufacturers turn out a UHF TV receiver that has the same type of relatively low-noise, high-gain tuner as VHF receivers now do, and with completely equivalent gain stage for stage through the set, then we'll see greater numbers of really exciting UHF tropo catches.

SPORADIC-E SKIP (Es) has physical mechanics which are well known. A patch of ionized gaseous material forms in the E layer of the atmosphere, and either stays stationary (in which case it may quickly dissipate), begins to move (in which case it will usually follow well-established patterns of movement), or grows larger in size and area affected (in which case it may link up with other Es patches).

Eventually, the Es patch will dissipate (cease to exist). However, it may only cease to exist as far as TV DX is concerned, continuing to be active propagating DX signals down in the 30 to 50 MHz region. If an Es cloud goes "dormant" like this, chances are it will revive later in the day or the next day, bringing TV DX anew.

Es can and does occur at any time of the day or night. Over the years it has probably hit every date on the calendar (including February 29th as I recall). It is, however, most likely to occur between April 1 and August 15, and also between December 1 and January 15; between 7 a.m. and 10 a.m. local time, around noon local time, after 4 p.m. and before 10 p.m. local time.

Meticulous long-term study programs have studied the Es mechanism, most of these studies sponsored by one U.S. Government agency or another, or by recognized college and university research programs, the latter usually under federal grants. From these studies we know that an Es patch is in truth a storm within our ionosphere, occurring within the E layer. This layer extends as close to earth as 50 miles and as high as 80 miles, but usually is located about 55 to 60 miles up. The length of the skip path propagated by Es (i.e. the distance from transmitter to receiver) is determined by the elevation above ground of the Es cloud (the most important consideration); the elevation above mean sea level of the transmitting antenna (which is important enough to extend the maximum distance possible by up to 10 percent in the case of 10,000-foot-high channel 2 in Denver, ideally situated for Es to the east); and the elevation above mean sea level at the receiving site.

When "double-hop" Es occurs, you have two separate Es patches forming. One cloud provides the first skip or hop, and the second cloud provides the second hop. When the signal returns to earth from the first hop, it strikes the ground and rebounds off again, traveling on in a straight line away from the transmitter, eventually entering the E layer once again. If the E layer is ionized at the point of the second entrance of the signal, the signal is again reflected, or refracted, back to earth. Typically, each hop may cover 900 to 1200 miles.

Multiple-hop Es is rare because when the signal strikes the earth upon returning from the first reflection in the E layer, much of the energy is lost when the signal encounters and is reflected back from the ground. Thus, the amount of signal that heads off for the second hop is only a fraction of the total energy that entered the E layer from the transmitter on the first hop. Further, identifying double-hop Es through single-hop interference is difficult. For example, WCBD-2 in Charleston, South Carolina, frequently single-hops into southern Oklahoma. The signal arriving at the ground in southern Oklahoma always strikes the earth and heads on west. If another Es cloud exists between Oklahoma and California at the right point, the ground-reflected signal from the first hop is reflected back to earth once again, and shows up in California as double-hop Es. The signal is relatively weak, however, because of the loss of signal at the ground reflection point in Oklahoma. And if KTEW-2 in Tulsa is on the air at the time, it will be much stronger on single-hop Es in California than WCBD. End result: WCBD is lost due to co-channel interference from the single-hop KTEW signal.

A third Es hop is possible--but even more rare. Three isolated Es patches must line up from transmitter to receiver in a straight line, and so spaced that they effect a reflection point at the midpoint (or halfway mark) of each of the three individual skip points or hops, almost perfectly.

Most double-hop Es is in the 1800 to 2500 mile range. The most common paths are across the United States, which conveniently is just about "two Es hops



wide" at most points. On amateur six meters, for stations on the east or west coasts, double-hop Es occurs approximately 30 percent of the time that single-hop Es does; amateurs do not have to contend with the co-channel QRM (interference) problems that TV DXers do. The longest pure Es TV hauls known are 3500 to 3800 miles; the longest pure Es six-meter hauls range from 3800 to 3900 miles.

METEOR SCATTER (MS) is simply short-lived Es, caused by the entry of minute particles known as meteorites into the E layer. Distances tend to be a bit less than regular Es due to the fact that most dust particles do not ignite until they enter the lower levels of the E layer (usually 40 to 55 miles up), where the friction between meteorites and the rarefied gases is higher than at a point further up in the E layer.

### Channels 2 to 6

TROPO: In practice, channel 2 to 6 tropo loggings are usually in the 200 to 500 mile range. There have been some in excess of this, but these usually have occurred over such excellent tropo regions as the Gulf Coast, the middle to northern Atlantic Seaboard, and the upper midwest line from eastern Nebraska into western New York state. Any loggings over 500 miles via tropo on low band are exceptional.

E-SKIP: The maximum possible single-hop Es distance on channels 2 to 6 is 1500 miles, if both transmitter and receiver are roughly at sea level, and the Es cloud is right at the top of the E layer zone, or 80 miles up, right at the midway point between receiver and transmitter. In actuality, the Es patch is seldom about 70 to 72 miles; thus, the maximum distance usually found on Es is less than 1500 miles. It is theoretically possible that if tropo conditions existed at one or both ends of the path, the distance could be extended past 1500 miles, but this is an uncommon occurrence.

METEOR: Low band distances on meteor scatter tend to be in the 600 to 1000 mile range, though catches out to 1500 miles are theoretically possible. The number of MS "bursts" visible to the TV DXer decrease with high channels; for example, there are far more noticeable bursts on channel 2 than channel 6. Annual meteor showers provide the best opportunities for MS viewing.

### The FM Band (88-108 MHz)

TROPO: Distances are more like high band VHF TV than low band, stretching out to 1000 or so miles. This greater distance is primarily due to the greater number of FM channels (affording more clear channels in your locale on which to identify weak, distant stations) and the much greater sensitivity of FM receivers as compared to TV receivers.

E-SKIP: For every occurrence of Es on channel 2, there is statistically a six percent chance of your hearing Es on the FM band. In other words, for every 15 Es openings that affect channel 2, you will have one FM opening, from your receiving location to the same transmitting location. Double-hop Es is not quite as rare on FM as on TV for the reasons noted under "tropo" above. Es and double-hop Es distances are comparable with those on TV channels 2 to 6.

METEOR: Because of the extreme sensitivity of FM receivers as opposed to TV receivers, the number of meteor "bursts" will be greater; however, FM DXers do not have clearly visible "test patterns" with call letters displayed, and must listen for the much more elusive audio ID. MS distances on FM are very similar to those on TV channels 2 to 6.

### Channels 7 to 13

TROPO: Fertile ground for high band TV watchers. Distances up to 1200 miles (and a few just beyond that) have occurred. 1000 mile hauls on high band are not exceptional (although you will think so the first time you get one!), except in and west of the Rockies where 300 miles is considered pretty fair. Like low band, the best areas are across the Gulf Coast, up and down the eastern seaboard from North Carolina to Nova Scotia, and from western New York state west into east Nebraska.

The big problem, again, is with co-channel interference from other stations closer by. High band tropo is frequently selective in the way it works, and

# THE STRANGEST DX OF ALL TIME

## by Clarke Ingram

An interesting story bears retelling well--but over the years, scientists and casual observers alike have often come to view the KLEE "DX mystery" as more than just an absorbing tale. Some have seen it as a strange twist in the hand of Fate, or simply as a hoax; others view it as mankind's first contact with alien intelligence ("Close Encounters of the FOURTH Kind?"). Whatever its origin, I'll wager that even the legendary Bedford Brown would agree that it must go down in the books as the strangest DX of all time...

Most DXers are familiar with F2 skip, which has sent shortwave signals to all parts of the world since the origination of radio. This propagation mode has brought many foreign stations to our shores--and, conversely, has sent many of our signals to other nations. This seemed to be the case on September 14, 1953, when many television viewers across the United Kingdom saw on their TV screens the identification of station KLEE-TV, in Houston, Texas. For three days, the KLEE signal overrode the local station to which the sets were tuned, much as a strong E-skip opening may obliterate local signals here in North America. Finally, on the 17th, the signals from KLEE completely disappeared, never to return.

KLEE-TV operated on channel 2, which F2 skip has been known to reach, and it so happens that (despite polarity reversal and some other complications) the video carrier frequency of British channel E-3 coincides with that of channel 2 in our American standards--55.25 MHz. Hence, reception of the KLEE video was feasible; and as the Air Force later put it, "...under freak conditions such long-range reception of commercial television does occur." (This we TV DXers know well!) When several of the viewers, however, attempted to contact KLEE for confirmation of their unique experience, they were confronted by a mystifying situation: KLEE-TV had been sold and had changed call letters--three years earlier!

KPRC, the successor to KLEE, agreed that the reception itself was technically possible, but informed the viewers that no card or slide bearing the KLEE-TV call letters had been aired since the sale of KLEE in 1950.

Armed with photographic evidence of their DX (which would later appear in TV GUIDE), several viewers took their story to British newsmen, who in turn took it to the BBC. There they were told by a spokesman for the network that any hoax on such a grand scale would have involved expenditures of near \$100,000 as well as knowledge and equipment which "transcended contemporary technology and standards." The BBC could only conclude that the reception was genuine, if unexplained. Both American and British authorities ruled out any chance of a hoax in the case, which had attracted international attention.

As officials muddled over a possible explanation for the incident, the public interest first shown in the case gradually began to wane. Two years later, an "explanation" was offered by the U.S. "Project Ozma," which had been set up in 1959 to detect unusual signals from space. In a public statement, project spokesmen claimed that the strange occurrence was caused by nothing more than an unknown "mad scientist" perpetrating a hoax!

For what some considered obvious reasons, this "scientist" was never located, let alone charged or brought to trial for such a large-scale violation of the British broadcasting regulations. And it was never explained how he managed to blanket the British Isles with one television station--which is well nigh impossible.

Since that time, others have tried to explain this mysterious DX occurrence. The discussions have ranged from the possibility of signals being reflected from a heavenly body, to having been deliberately transmitted to us by aliens wishing to contact our planet. Today, this DX remains unsolved.

What really happened on the evenings of September 14-17, 1953? Was it a hoax? Were the signals reflected from some planet, or did they circle the earth for up to six years before returning to surprise the residents of Great Britain? Or did these viewers experience, perhaps, the greatest DX opening in history? We may never know the answer.

July, 1974

Clarke Ingram

# BOB COOPER'S DX HISTORY

by Robert Cooper, Jr.

Stumbling about in my garage one day in July 1969, I happened upon a musty old cardboard box loaded with equally musty folders and papers. The box had apparently followed me about the United States during the previous 19 years or so, gathering additional bits and pieces of information as the early years went by, and then finally relegated to non-existence around 1954. Buried deep in the box was a tattered and torn blue school notebook folder: my first TV DX Log and Record Book!

I was barely 12 years of age when the first entry was made. The date was May 27, 1950, and between approximately 2 and 4 in the afternoon I'd "intercepted a transmission" from old WMBR, channel 4, in Jacksonville, Florida. I'll never forget the nearly 90 minutes of test pattern with "news ticker tape" (stations at one time ran news tapes through their test patterns!), followed by a LIVE beauty contest that I never did learn the ending for!

Further into this first TV DX Logbook, I discovered a priceless copy of Volume One, Number One of the American Ionospheric Propagation Association (AIPA) bulletin. Printed in the fall of 1953, this was the first attempt at organizing a national group of long distance television enthusiasts. But this is getting ahead of my story.

As noted, I was 12 years old in 1950. My father, an engineer, had built an eighty-foot steel mast from three-inch pipe, and an electrical engineering friend had fashioned a pair of four-element channel 6 yagis for the closest station to our Ithaca, New York home: WHAM in Rochester, some 90 miles to the northwest. We built our own 300-ohm ladder line, and the EE designed a two-piece amplifier: the first section to mount on the tower at the antenna (the pre-amplifier), and the second to mount at the set (post-amplifier). I can still picture the gray hand-wrought post-amplifier box with its four controls. If you adjusted the controls just properly, you had fantastic gain. But if you went too far, the whole thing oscillated, probably throwing terrible radiation for a mile in all directions on channel 6! But we didn't worry about bothering other people's reception...we had the only TV in the county!

When you are 12 years old, the world seems pretty white to you. I recall a strong desire to have a television station of my own, and the logical place to start seemed to be a camera. So I sat down and wrote letters to NBC, CBS, and DuMont (these were pre-ABC days). "Will you," I asked, "send me your old worn-out TV cameras rather than junk them?" Some kind soul at NBC actually answered my inquiry, suggesting that I find a copy of QST (the amateur radio monthly), which had carried a series on building your own camera.

I did find QST, and soon was bitten also by the ham radio bug. But I didn't build a camera, nor did I acquire one until 1961.

I did have to have a television set of my own. My father suggested that I earn money and buy one. I already had a paper route (more about that later) but its earnings were already earmarked for such essentials as wire and tubing for my antenna systems I was constantly building and re-building (my first TV DX antenna was a 6-wavelength-per-leg rhombic, suspended among four well-placed trees).

Summer of 1961 was upon me, and caddying at the local golf course seemed like a good way to earn the money for the TV set. Now just any set wouldn't do. I had found an advertisement in Radio-Electronics Magazine offering an "end of production run" of Mattison 12-inch 4 i.f. stage receivers, without wood cabinets, for \$75.00 each. The advertisement suggested this was the most sensitive TV chassis ever built. This, obviously, was the one I needed!

Late in the summer, one Sunday, I arrived home bushed after caddying for two 18-hole players. For the fiftieth time, I sat down at the kitchen table and counted out my savings, plus the \$8.00 I had earned that long, hot day. I had \$76.50--and hurried to show my father the total. He counted it, and then calmly picked it all up and asked me to follow him downstairs into his shop. There, under a carefully arranged cloth cover, was a Mattison 12-inch 4 i.f. stage receiver, complete with a custom birch cabinet that he had built for it!

I'm not sure what would have happened to the receiver if I had given up on the project before I had the full amount earned. He had become concerned that perhaps by the time I had earned the money, the supply would be gone, and had gone ahead and ordered the set to hold for me. Woodworking was a hobby, and the cabinet resulted.

It's things like this you appreciate most only after you too have a family! I was then and there in the TV DX business (I learned early that TV DX and family viewing don't mix).

A friend, Ron de Neuf, was similarly fascinated with TV DX. In looking back, it was probably in self-defense! Ron and I lived within a mile of each other and were each other's closest playmates. We went through SWLing, TV DXing and our novice ham tickets together; and when the AIPA was born in the fall of 1953, Ron agreed to serve as "eastern TV DX editor."

As exciting as the May 27, 1950 logging of WMBR was (I don't remember many other loggings in such detail, so it did stick!), it was the coincidental receipt of the July 1952 issue of Popular Science (by subscription) and the TV DX reception of channels 4 and 6 from Havana, Cuba that really tied the DX knot for me. The July 1952 issue of the magazine carried an article on TV DX (the first I had found in print) entitled "Kansas TV Fan Gets Both Coasts," and it told about a fellow in Great Bend, Kansas who had logged, via E-skip, stations from both coasts plus Mexico and Cuba. The article, as I recall, featured photographs he had taken of TV DX station breaks and test patterns (everyone ran hours of test patterns in those days!) and included one or two from Cuba.

I was, first of all, fascinated by his reception. I was secondly amazed to find that someone else (anyone other than Ron de Neuf and I) actually chased long distance TV reception! Imagine that there might even be more TV DX enthusiasts around the country!

I read the article for over an hour, over and over, and missed my lunch. I decided then and there that I would check channels 2 through 6 many times each day, and went to the TV receiver to start the checking series. And I swear, there was a program coming through on channel 4 from CMUR in Havana. And on channel 6 was CMQ...just as the Kansan had logged!

I was once and for all hooked. My life would never be quite the same. Never again could I go by a television receiver without running through all of the channels to see what was coming in. I became a big problem at the neighbors' while visiting, insisting that the channels be checked every half hour or so. I even hooked three junior high school playmates on the hobby.

I couldn't travel about the country with my father without craning my neck constantly to look at rooftop TV antennas, to see what was in use and to try to figure out what the people "were getting."

In the summer of 1953 my family moved to California. At 15, I was spending the summer at a boys' camp near Cooperstown, New York, where I was serving as an assistant counselor. I had smuggled, without my parents' knowledge, a 7-inch portable TV to camp with me, and once there had installed a rhombic antenna in the trees, so I could DX during the summer.

I was to follow my parents west in late August, but before leaving I had logged 52 of the 120 TV stations on the air in the USA at the time, including 14 stations on channel 4.

Arriving in Lafayette, California was a big disappointment. My family had settled here, 30 miles east of San Francisco, in one of the many California communities buried deeply in the coastal mountain range (Lafayette has one of the larger CATV systems in the state now). TV DX looked hopeless, as we were ringed by hills 1000 feet or higher in all directions but the southeast. So to the southeast I put up my ever-present rhombic, and added a 10-element yagi at 30 feet with rotator. Topping things off were locals on 4, 5, and 7.

To keep in touch with de Neuf and a few others I had worked into a mailing list, I conceived the idea of a bulletin, to be printed quarterly initially and circulated free of charge to all interested parties. My mother, a school teacher, agreed to print the bulletin on the school mimeo machine.

Don't ask me how the name, the American Ionospheric Propagation Association, was born. I don't remember. I was carrying on regular correspondence with propagation expert George Jacobs, who then prepared professional forecasts for Radio Free Europe and VOA. We had been exchanging views on what caused E-skip (we never did resolve that question...hi!). Anyhow, it was named, whatever the source!

To the best of my recollection, the bulletin did go monthly in the summer of 1954, perhaps earlier. I do recall that a fellow in Indiana (Fred something or other) took over the mailing and printing at some point in time, and while he did it, the bulletin was quite handsome in appearance.

My own log for 1954 from California reveals what I was about, however. With no local on 2 (although I thought having even 4, 5 and 7 as locals was a curse, since in Ithaca I had none!), I concentrated on that channel. A few notable occurrences took place in Lafayette, and my log shows clearly what type of Es season 1954 was.

For example, my old California standby, KMID in Midland, was first seen on April 8. I then proceeded to log it for periods that varied from only three minutes to six hours, solid (!) on 2 days in April, 7 days in May, 17 days in June and 17 in July. Old KFEL in Denver came through on 3 dates in May, 9 in June and 5 in July.

Double-hop reception to the east was fascinating, since I had never seen any while in Ithaca (I did log channel 4 from Los Angeles once while visiting my grandmother in Middleport, New York in July 1952...they just couldn't keep me away from the dials!). CCI was virtually unknown in those days, and my 1953 records note "lines" right along with program material when it did occur on rare occasion. I probably thought the lines were due to some malfunction of the transmitter!

And then there was the reception from Brazil, a matter of record, which still mystifies me even to this day.

Yes, the "good old days" will never return. For one thing, there are too many stations on the air now. And for me personally, over twenty years of TV DX observing has both dulled my sense of super-excitement when there is DX, along with honing my reaction timing to a few seconds flat. After several thousand hours of Es observing, for example, you are bound to learn something!

Before closing this out, I'd like to recount one incident that happened in December of 1952. It involves my paper route.

My route was 62 homes, six miles long. I would come home from school, change clothing, and do the route. On December 19, 1952, the band was open on Es when I got home. I was torn between the usual route-ritual, and TV DX; TV DX won. And I logged nine stations including WFMY-2 and WBTB-3, both in North Carolina; WKZO-3 in Michigan; WTMJ-3 (now 4) in Wisconsin; KMTV-3 in Nebraska; WBRC-4 (now 6) in Alabama; WTVJ-4 in Florida; WHBF-4 in Illinois; and WMCT-5 (now WMC) in Tennessee.

Finally, at nearly 6 p.m., with the band still open, my mother offered to run me around the route in the car! It was snowing heavily, and I gratefully accepted.

I remember the incident because I was shocked by the offer. In four years of handling the route, I had never done it except by my own power. So TV DX had some side benefits even for a fourteen-year-old!

October, 1969

Bob Cooper, Jr.



# 10th Anniversary



# PROPAGATION $D_x$ NOTES

## by Dennis Smith

SPORADIC-E SKIP has been the most popular summertime VHF DX propagation mode almost since the start of commercial television. (Sporadic-E is abbreviated Es.) Sometimes, a medium wave DXer will work with the standard AM broadcast band in winter, and with TV or FM in the summer months, for May, June and July are the peak months for Es. Those who check TV and FM through the year find that distant signals by Es can happen on any day of the year, although the most likely times are the summer months along with some in April and August, and a minor peak in winter (December, January, and February). Summer skip is a largely daylight occurrence, starting after sunup or mid-morning, possibly dipping down at sunset and returning at night for a while. At other times of the year, it is usually an early evening phenomenon. But, one never knows for sure when it will take place; we'll see why further below.

Sporadic E-skip is known as "short skip" among hams, and is noted on 20, 10, and 6 meters, especially in the summer season. It is in the upper shortwave areas that Es can be noted as it first develops on any particular day, on 20 meters (14 MHz), and, as it builds up, extends its frequency range upwards through the citizens band and 10 meters (27-30 MHz) and on into VHF, if it is intense enough, to 6 meters (50 MHz), the low VHF TV band (channels 2-6, 54-88 MHz in the Americas), and the FM band (88-108 MHz). This is the usual upper limit, but on rare occasions, hams have noted Es on 2 meters (144 MHz) and alert TV DXers have seen it on the high VHF TV band (174 MHz and above).

The usual distance range for Es is about 700 to 1500 miles, although it can be shorter. The highest frequency affected by a skip such as Es is called the Maximum Usable Frequency (MUF). If the MUF isn't much above 10 meters, the shortest distance may not be less than 700 miles (there is a larger angle of ionospheric reflection), but with television affected, 10 meters can have short distances of 400 miles (smaller angle). Similarly, if TV channel 2 is opening up to a 500 mile station (or is knee-deep in strong signals), it may mean that the MUF is very high with FM and higher bands affected. This is single-hop Es; double and multiple hops are possible at 2000 miles and more. This is not easy now in North America; with so many stations on the air, it is often difficult to obtain a clear signal from just one Es station on a channel, let alone for a clear midpoint for double-hop reception.

Strength of Es on TV and FM can be strong and snow- or noise-free, but is usually characterized by rough fading of varying intensity, although this is sometimes minimized with very strong signals (some DXers have also noted occasional steady Es with weak signals).

What is the nature and cause of Es, and why is it generally so unpredictable and irregular as compared to other ionospheric and tropospheric propagation modes? Es occurs when patches of very dense ionization (electrical charge) develop in the region of the E layer of the ionosphere, about 50 miles high. The reason or direct cause of this activity has not been discovered as yet. Sunspots seem to have some effect on Es, resulting in unusual "off-season" openings, and sometimes even adversely affecting the summer season! In North America, there seems to be some relation between Es and violent thunderstorms or tornado activity, as they are often coincidental. If we someday discover the basic cause of sporadic-E skip, we may be able to predict it with more than mere generalities.

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TROPOSPHERIC BENDING, as evidenced by its name, is a phenomenon of that layer of the atmosphere known as the troposphere, extending up to about 10 miles above the earth. It is in the troposphere that weather patterns take place, and it is these patterns and their changing developments that can bring on an extension of the usual "limited" service areas of TV and FM stations.

VHF and UHF signals are refracted along boundaries of air, such as along some layers of temperature inversions and along weather fronts. Wide temperature variations tend to produce these conditions in spring and fall quite often, so these are considered to be the tropospheric DX seasons. The heating and cooling of sunrise and sunset has effects on this form of DX; and, winter tropospheric openings can develop through unseasonal warming.

Tropospheric, or tropo, DX is not limited to any portion of the VHF or UHF spectrum; it affects all such frequencies, therefore all TV and FM broadcast bands are subject to tropo DX. It has no minimum distance and can be seen on near-fringe stations as loss of snow. There is no real definite upper limit, so that distances of well over 1000 miles are possible.

One of the usual characteristics of sporadic-E skip is its very rough fading action. Tropo is generally noted as being much more steady. It is by noting reception characteristics such as this, including noting what frequencies are affected, that one can determine the propagation mode of a signal. A channel 4 signal at 750 miles could be seen by more than one mode, for example, and would be somewhat more unusual by tropo than by Es.

Real tropo DX, as we know it in North America, which can develop up to many hundreds of miles, can take place nearly anywhere east of the Rocky Mountains. Weather can develop and change at any time of the year to bring on the proper propagation conditions, and the eastern mountains do not seem to be a total barrier to weather patterns and tropo development. In the mountainous areas of the west, however, climate characteristics are different and often divided into definite regions separated by high mountain ranges, which, combined with the mountains' heights, limit any tropo to these single regions, if a region is of enough extent to allow any existence of tropo at all. At the opposite extreme, over-water paths allow the best development of tropo DX, such as on and along the Gulf Coast.

A small antenna such as rabbit ears will produce good results with sporadic-E skip DX, but for tropo, a larger antenna is definitely more satisfactory, and height makes a contribution as well.

Of all the VHF and UHF broadcast bands, the UHF TV band (channels 14 to 83) is affected the most by tropo conditions. Hams have noted that in the VHF and UHF ranges, the higher the frequency, the better the results in a tropo opening over a given distance. The high VHF TV band (channels 7 to 13) made the best showing in tropo DX for many years, however, due to the many years of development of VHF tuners in TV receivers, often-low transmitting powers for early UHF stations, and relatively insensitive UHF tuners and receivers. The combined effects of genuine UHF tuner progress and high UHF transmitting powers is bound to bring even greater results in tropo on UHF as time goes on. We shall see.

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METEOR SCATTER is a mode which TV and FM DXers can pursue on VHF frequencies to supplement their Es and tropo coverage. DX by meteor scatter (MS) is not simple to work with because of its relatively weak, short-lived nature. The meteors which enter the atmosphere are burned up in the ionosphere, most at about 40 to 50 miles above the earth's surface, leaving an often visible ionized trail for a brief moment. This results in a form of skip with sudden "burst" reception of often a second or less. The distances involved may be slightly shorter than average Es--about 500 to 1200 miles.

Because of its generally weak and brief character, good receiving equipment is needed: a good receiver in top condition and a sensitive outdoor antenna. Along with this, a certain amount of skill and patience is required of the MS DXer. Because a burst comes and goes so quickly, a TV receiver should be fine-tuned for the best possible immediate reception on the channel, as there is little time to tune. The receiver should also be quite stable to lock in a video signal without excessive adjusting of vertical and horizontal hold controls. On the FM band, a different skill is necessary: of tuning across a clear portion of the band until a sudden signal burst is noted. Settle down on this signal as quickly as possible, or look for another signal just as quickly while the trail is still effective.

Since meteors enter the atmosphere at any time of day or night, DX by MS can occur at any time, although it can be more productive in the early morning, as that side of the earth is moving forward in its solar orbit at that time and meteors' velocities tend to be increased into the earth. This therefore is a good time to catch stations before the locals sign on the air (and most particularly to the east) and, for television, to catch test patterns. If a channel or group of frequencies is clear throughout the day at your location, there is always a chance for DX by MS.

The low portion of VHF is the most productive for MS DX, which means the low TV band and FM band are favorable. It is also possible in the high VHF areas, meaning that the high VHF TV band can have MS DX; but because many bursts are so very short in duration here, meteor activity must be at a high level (as would be seen on the low band), or ultra-sensitive receiving equipment must be used.

Not all MS activity is of such extremely short and isolated duration as noted. Larger meteors can cause a larger and longer ionized trail to result in burst reception of many seconds. And, there are a number of predictable meteor showers, which, for a period of a few hours or days, can increase the number of bursts noted in a given time segment. Some of the more intense showers can even result in overlapping bursts resembling a weak Es opening. Most of these showers occur once each year, many of them best at a particular time of day over a several day period. Some showers are only a few hours in length, and others can be noted only once every several years. The most productive yearly meteor shower has been the Perseids, occurring in mid-August.

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AURORAL SKIP was first discovered on the VHF bands by amateur (ham) operators in the early 1940s. They discovered that radio signals bounced from the aurora borealis (northern lights) whenever they were visible, and often when not visible because of daytime or low-visibility conditions. A very strong background "rush" would be heard across the spectrum generally, and their amplitude-modulated transmissions were often unintelligible, along with a broadening of signal width and instability of frequency. Code seemed to be the only good way to work DX by this means, and even this had to be done very slowly because of the generally mushy signal effects.

As the 1950s began, TV DXers found this type of DX, but attempts to identify signals by auroral skip were fruitless at first. Both video and audio were garbled beyond intelligibility by such characteristics as sliding jumbles of pictures that would not materialize and synchronize along with "hashy" sound. Television signals have been identified since then, however, since sunspot conditions and magnetic disturbances increased in the late 1950s and again in the late 1960s and made aurora DX somewhat stronger. There seems, then, to be more incidence of auroral skip during high sunspot years than otherwise, although there is some in low years as well.

It has been found, too, that auroral skip, like meteor scatter, seems to have no definite maximum usable frequency (MUF) as does sporadic-E and F2 skip (to be discussed shortly). On the VHF broadcast bands, the low TV band and FM respond best to auroral conditions; the high band does also although less strongly than the low bands.

The directions and distance of aurora DX are unique. The transmitting and receiving points may be separated by more than 2000 miles or as little as 200 miles (possibly even less). What matters is that the signal is being bounced from the aurora, and the direction for best reception is northerly, in the direction of the aurora, rather than toward the station.

Apparently frequency-modulated signals are somewhat less distorted in auroral skip than are amplitude-modulated signals. Probably for this reason, FM DX enthusiasts have done quite well whenever aurora conditions exist. Some have asked why the FM audio signal of TV stations is often or usually as garbled as the AM video. The intercarrier-sound construction of the modern receiver is the answer. This type of circuitry became popular with the manufacturers about the same time as TV DX by aurora was defined, in the early 1950s. It is a more stable set with the sound actually made a 4.5 MHz subcarrier of the video signal in the receiver, but it is not as desirable for DXing since the shortcomings of the video show up in the audio, too. The jumbled "buzz-saw" type sounds from the speaker in a big Es opening are results of AM TV video interference, while the FM audio may be a bit "shwisy" by itself but less distorted as would be obvious on an audio-only receiver. The effect with aurora DX is therefore multiplied; while a video signal can on occasion be identified, often the best way is to inject a video signal (using a signal generator or SW set radiation) and the audio will be less garbled.

Because the aurora borealis is the cause of this mode of VHF DX, the DXer in northern regions sees more such DX than one further south. In North America,



DXers in northern areas of the U.S. and in Canada have been treated to aurora DX relatively frequently while the more southern enthusiast may have never seen it, although lucky DXers have been known to observe it as far south as Oklahoma and Georgia. Presumably, the aurora australis (southern lights) may also be a cause of aurora DX in southern areas of our earth.

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F2 SKIP originates in the F2 layer of our atmosphere. This ionospheric layer is up to 150 miles above the earth's surface, while the E-region is about 50 miles high. So a single F2 hop is about 2000 to 3000 miles as compared to about 800 to 1500 miles for E reflections.

In contrast to sporadic-E, it is definitely known that the sun has a direct influence on the F-region. F2 skip is the mode responsible for much regular shortwave reception. Many of you know that winter is better for SW reception, especially on upper frequencies, because the earth is closer to the sun. The winter and early spring periods are particularly good in peak times of the 11 year sunspot cycle (another of which is almost upon us). This is F2 skip, a daytime condition, which can be noted above the usual 30 MHz limit of SW in these seasons and cycle times, opening up unusual areas of spectrum for DXing. The sunspot cycle peaked in 1957-8 and in 1969 and will peak again in 1980.

In the Americas, the low VHF region between 30 and 54 MHz has many kinds of specialized communications such as industrial two-way, police, paging, and amateur radio. TV channel 2 is 54-60 MHz. England's channel 1 and France's channel 2, however, start at about 41 MHz, and these lower frequencies will be the first to watch for TV DX by F2 skip.

How can one determine that F2 skip is on the move into areas of VHF? Perhaps the best way is to use a radio receiver tuning above 30 MHz, such as a 30-50 MHz radio. If the citizens and 10-meter band (27-30 MHz) are full of skip, listen for two-way and paging. Virtually all two-way radio on 30-50 MHz in the U.S. is FM, while paging is AM. If AM is heard on an FM receiver, tune to a sideband for intelligibility. Paging stations are on the air constantly on 35.22, 35.58, 43.22 and 43.58 MHz, so they are especially good indicators of improving F2 conditions. If 35 MHz paging shows long-range skip, 41 MHz TV DX may be just around the corner, particularly in the eastern half of our country and Canada. Listen for British channel 1 audio on 41.5 MHz and French channel 2 audio (41.25 MHz), both AM sound. If F2 improves further, you may hear British channel 1 video at 45 MHz, which will sound like a rough 50-Hz buzz. If you are already set up with modified video gear or a European TV receiver, you know what to expect and hope for. If conditions improve (and they may not) to the point where F2 reaches into the 6-meter ham band (50-54 MHz), other European channels may be noted, and you may then find some weird video signals on your TV receiver on channel 2 or slightly below, which may be evidenced by lack of synchronization and negative picture (reversal of polarity). It is then that TV may be seen in Europe from the Americas, too. European F2 may be noted by double-hop in western North America, and TV from Australia and New Zealand may also be a possibility there.

F2 skip can offer strong signals, as strong or stronger than Es, so even a dipole cut to 40 MHz will be useful. Multipath is very evident on F2 video signals, however, by much ghosting and smearing. Look to special reports and articles in the VUD for further details on the approaching F2 season.

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TRANSEQUATORIAL SCATTER, like F2 skip, was discovered by ham radio operators, this in the late 1940s around the time of the peak years of sunspot Cycle 18. In the late fall of 1947, hams found reliable contacts which didn't coincide with the usual VHF F2 skip--with paths between such areas as Argentina and Mexico, Australia and Hawaii, and Rhodesia and southern Europe, occurring after sunset with higher usable frequencies than by F2. F2 skip was good in daylight hours with maximum usable frequencies reaching up to 50 MHz in peak years in the winter months. But these contacts, with a north-south path characteristic, took place for about three hours after sunset with the MUFs exceeding F2 expectations, sometimes up to 75 MHz (well into TV frequencies), before the real VHF F2 season.

It was found that signals were quite reliable, with the path open night after night with fairly strong signals characterized by rapid flutter such as noted on many SW signals. Distances were in the range of 4000 miles, more or less,

with TV signals definitely heard, as from Europe to southern Africa. These conditions were reported in two excellent articles in the April 1963 issue of QST, detailing also the nature of transequatorial (TE) scatter as being a breakup of the F2 layer in the area over the magnetic equator (somewhat south of the geographic equator in the Western Hemisphere and north in the Eastern Hemisphere) into "clouds" of higher ionization and upward tilts in the layer which causes signals to come in contact with the layer at a smaller angle and to be bent back to earth more gradually, resulting in higher MUFs and greater distances than with regular F2. The scattering of the gradually bent signals across the ionized clouds produces the flutter-fading effect, although still reliable. It was found that distances by TE were sometimes increased by such as sporadic-E acting as an extension. Some of our Western Hemisphere TV DX distance records may be by TE scatter or by TE in combination with Es.

TE scatter was studied in the late 1960s by WTFDAer Bob Cooper in the Virgin Islands, and by other hams working with him to further clarify details of the mode. In the Americas, the magnetic equator is about 20 degrees south of the geographic equator. The radio path is best when the magnetic equator is the midpoint between the stations; the greatest distance is obtained on straight north-south paths (90 degrees to the equator), with shorter distances when the path is more east-west. It is best around 2000 to 2300 local time at the midpoint, and the MUF seems to be  $1\frac{1}{2}$  times greater than the daytime north-to-south F2. It occurs in equinoctial periods of the year; that is, September to November, and March to early May. Signal strengths are good, even by ham power uses, so that other VHF services such as television are certainly of sufficient transmitted power along with good receiving installations. And, since the MUF of TE is higher than F2, it is usable more often than just at sunspot peaks.

Why hasn't more TV DX by TE scatter been reported over the years? The 11-year sunspot cycle is itself a limitation; further, sunspot levels for the last peak in 1969 were not as high as the previous cycle, which may have affected it, and possibly TE has been overlooked by many since it doesn't occur in the active summer months or in mid-winter. The frequently jumbled, sliding TV pictures propagated by TE, often resembling auroral skip, may be difficult to identify. And perhaps there has been a lack of suitable high-gain receiver and antenna installations. Receivers for 6 meters and 30-50 MHz are helpful in warning when conditions are good for this interesting propagation mode.

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LIGHTNING SCATTER has been studied and reported in various articles starting in the 1950s. QST's column, "The World Above 50 Mc.," in October 1954 noted its discovery a few months before. An amateur radio operator in Indiana had contacted an Ohio ham 240 miles distant on August 2, 1954; signal strengths resembled meteor scatter bursts, but with stronger peaks. Analysis of other reports indicated its range as about 100-300 miles as compared to the meteor scatter distances of 400-1100 miles.

The British periodical NATURE in its May 28, 1955 issue noted thunderstorm signals at VHF-UHF frequencies on equipment monitoring signals at 200 miles on 49, 91, 173 and 492 MHz using 5-element yagis (and a 12-foot parabolic on 492 MHz) at the receiving end, all horizontal polarization. A thunderstorm in the region of the receivers on June 26, 1954 brought normally slow-fading signals up to a series of rapid impulses. This may have been the first wide spectrum observation of the propagation.

The December 1957 issue of IRE Proceedings reported analysis by two Midwest scientists of 400-mile 915 MHz transmissions with lightning-caused bursts up to 20-30 dB above median levels, when the storm was at the midpoint of the path. Evidence pointed to forward-scatter type ionized areas caused by cloud to cloud discharges. In the May 1958 issue, a TV enthusiast in San Antonio reported his reception via lightning scatter (LS) of channel 2 video and audio signals (55.25 and 59.75 MHz) from KPRC-TV Houston and KMID-TV Midland at 200 and 300 miles.

From the resources of our memory is a report in a 1960 AIPA bulletin from Charles Wood of Ashland, Oregon, who discussed lightning flashes causing increases of Portland VHF TV signals over 200 miles, as is recalled. Such lightning-induced scatter observation would be infrequent in these Western areas; there is much more electrical weather further east. One of the first WTFDA reports of lightning scatter was Roderick Luoma's reception of WFLD-32

from Chicago (578-584 MHz), about 250 miles from his Detroit location, on the evening of June 23, 1968 during a severe electrical storm to the west (the DX report was printed in the August, 1968 VUD). Rod noted that WFLD popped in for about a second during lightning flashes, apparently due to ionization of the air around the charge. There was no signal between lightning strokes. He adds that VHF was also affected.

QST's "World Above 50 Mc" of November 1968 reported the first amateur contact via lightning scatter on 432 MHz, between hams in Mississippi and Kansas on September 16, 1968. The stations directed their antennas at an intense storm over adjoining borders of Arkansas, Texas and Oklahoma. The Kansas ham noted that some bursts lasted 25 seconds, up to 40 dB above the noise level. The distances were not noted, but may have been around 500 miles.

Lightning scatter affects both VHF and UHF signals, with generally stronger signals on UHF. A storm may be anywhere between transmitter and receiver, not necessarily at the midpoint or in the station's true direction, and still provide good LS results. You can discover some interesting DX by checking the bands in the VHF-UHF spectrum--not only television, but FM and other ham and communication bands--whenever electrical storm activity is evident in your region. However, appropriate caution is urged if a storm is in your immediate area, as your antenna makes a pretty effective lightning rod.

October, 1968

Dennis Smith

What Is Normal For TV-FM DX? (continued from p.9)

TENTH ANNIVERSARY ISSUE

stations only 200 miles distant can be covered by others 400 miles away. The 300 to 500 mile distant stations are often the strongest in a tropo opening.

E-SKIP: Not impossible, just darn rare. Approximately 20 validated loggings in as many years. High band Es has reached channel 13, but the channels most likely to be affected (if any are) are channels 7 and 8. The 1500-mile maximum distance holds, but past experience indicates 800 to 1300 miles is most likely. Almost all validated loggings have occurred east of the Rockies, and most of these have been south of the Mason-Dixon line. The best times seem to be around noon local time and between 4 and 8 p.m. local time.

METEOR: Possible, if not frequent, with the proper equipment. The big problem with meteor scatter reception on high band is the relatively insensitive TV receivers and the almost totally ineffective antennas for meteor scatter work. This writer has had moderate success with a number of high band MS projects in the early 1970s.

#### Channels 14 to 83 (UHF)

Here is the real potential. So many channels, so much less co-channel QRM, and all of that beautiful, strong tropo!

E-SKIP: Never known, not likely. If it happens and you are there, consider it a once-in-a-lifetime experience because it will be!

METEOR: Seen once by this writer in 27 years of TV DXing. The rarity of the phenomenon does not rule out burst-like reception, however, which may happen in the troposphere during heavy weather (storms). Lightning scatter is a common example.

TROPO: The theoretical distance limit at UHF will be around 1500 miles when we have the equipment to see it. The most distant UHF catches to date come close to that mark, but will remain there until such time as manufacturers produce some truly acceptable TV receivers for UHF.

With new, more powerful UHF stations coming on the air, continual increases in power at present UHF stations, and the slow but gradual improvement in UHF receivers and tuners, the future is all in UHF.

The TV DXer of the future, at least east of the Rockies, will concentrate on the untapped potentials that UHF has to offer.

January, 1969

Bob Cooper, Jr.

# A DXING CONSTITUTION

## by Dr. Bruce Elving

The so-called freedom to approach DXing as one pleases has long precluded any written "rules" to be followed in practicing this hobby. Through the years, little attention has been given the problem of defining standards of DXing. Some years ago, however, Glenn Hauser presented a set of standards for counting stations that was primarily TV-oriented, which was a step in the right direction.

The following document is FM-oriented, but could be modified to include TV and other forms of DXing. It was drafted by myself, based upon a then 22-year history of FM DXing and extensive contact with others in the DXing fraternity, and was ratified by a fellow long-time Duluth, Minnesota FM DXer, Dick Gottschald, and myself January 2, 1971. It constitutes the basis upon which all of our DXing has been practiced and reported.

**ARTICLE 1: STANDARDS REQUIRED TO COUNT STATIONS.** This article defines the DX setting, the geographical area within which DXing can take place, and the standards necessary before a station that is heard can be counted.

**SEC. 1** All stations must be heard personally by the DXer (and not just by his wife, brother, etc.), although recordings may be employed to assist in identifying signals that may, upon first hearing, have been very difficult to copy. Automation may be employed; for example, as in the prior setting of a timing device to hear a station during the middle of the night, provided the requirements of Sec. 4 (below), pertaining to the timely logging of a station, are met.

**SEC. 2** All stations must be received within the general area of the DXer's residence at which DX reception over a period of time has taken place. Totals added to a DXing log must be confined to a 30-mile airline radius from the original location at which logs were maintained. Should a DXer move from such an area and desire to resume DXing, he must start at zero, and the same 30-mile limitation apply to the area surrounding the city of his new residence. At any time, however (such as on vacation trips), he may return and add to his totals from a previous location, provided such DXing takes place within the 30-mile radius and all other rules of this constitution are upheld.

**SEC. 3** The DXer must use his own receiver or radio, but may DX on another alternate or auxiliary receiver or receivers of his own. This will provide for the ability to DX when one's main receiver is in for repairs or, in the event of dual receiving locations, the use of two stationary receivers for the purposes of DXing. However, hearing DX at a friend's house, over his receiver, does not qualify as DX for you. The buying of new receivers or the retiring of old receivers does not alter the station total claimed, nor is the presence or absence of other equipment (antennae, boosters, etc.) meant to impose additional conditions, so far as the counting of stations is concerned. Indeed, the use of improved antenna and other equipment is encouraged in an effort to make the hobby of FM DXing more enjoyable and productive.

**SEC. 4** No station can be counted that is not listed or underlined in a radio log within 24 hours of receiving said station, and such radio logs or documents shall be saved from year to year. This rule is waived under the special circumstance listed in Sec. 5(e) below.

**SEC. 5** There is no arbitrary minimum amount of time stated that a DXer should listen to a new station before counting it. We believe, however, that definite standards of counting a station should be established with reference to the hearing of station identifications, under the following explicit conditions:

- (a) Four call letters and the name of the city, state, province or country, to count any six call-letter FM station. Example: WTMJ-FM Milwaukee.
- (b) Three call letters and the name of the city, state, province or country, to count any three, four, or five call-letter FM station. Examples: WRVB, WHA-FM Madison; KUT Austin, Texas.
- (c) Without the name of the city, state, or country, ALL call letters and positive program identification are required to count such a station.

(d) If no call letters, but the city, state or country are heard, the station shall not count, unless it is a foreign station other than Canadian that does not normally employ call letters in its identification.

(e) Stations that are broadcasting in a foreign language may be counted if any two of its call letters are heard and understood, along with a feeling by the DXer that the station was "positively heard." Helping in this process may be tape recordings which may be identified by a speaker of the language, with the requirement that such tapes be positively identified within four weeks of the time of their hearing in order to underline and count such stations.

#### SEC. 6 Definitions of types of transmissions that may be counted by an FM DXer:

(a) All commercial and educational FM radio stations licensed to operate, and those on the air with construction permits throughout the world on the 87.5 to 108 MHz band. Such stations need not be at any minimum distance from the DXer's place of DXing, with all FM stations, local and distant, qualifying.

(b) Translator FM stations may be counted if either (1) their call letters are received and understood, either by voice announcements or Morse Code, according to the standards of Sec. 5(a), or (2) the programming of the main station they rebroadcast is identified and their existence confirmed by the antenna bearing and an accurate log showing the locations or such translators. On-channel FM boosters may be counted only if positively identified (by main station programming or any identifying characteristics of the boosters) and separated by antenna bearing from the main station's signal.

(c) Auxiliary FM transmissions received, such as SCA, stereo, facsimile, or slow-scan television, may not be counted as separate stations, but note may be kept of such receptions for the DXer's own interest.

(d) Radiations from satellites, airplanes, ships, or from outer space, if broadcasting FM radio signals for general reception by the public within the FM band, will count.

(e) Unlicensed and illegal FM stations, broadcasting on the 87.5 to 108 MHz band, may be counted, provided such stations are apparently intending to broadcast to a general audience, and not used for such purposes as wireless microphones or intercoms. The DXer himself is not to set up such stations, either by himself or through others, as this practice may lead to his artificially "fattening" his totals.

(f) Radiations other than direct FM broadcasting, such as pickups from local community antenna systems (whether radiated through the air or directly connected to the user's receiver) do not count. Included in this prohibition are signals spuriously received on FM, such as AM, TV, shortwave, and point-to-point communications of various types.

#### SEC. 7 Changes in FM stations. Because of an unprecedented number of call letters and other changes affecting previously received stations, the following will determine whether such a station will count as a new "catch" and thereby qualify for counting anew in the DXer's "heard" or "verified" log.

(a) Change in call letters. Does not qualify as a new station in the heard log; it may in the verified log at the DXer's discretion. In any event, a record should be made in the DXer's own files that a previously heard station was subsequently heard under new call letters.

(b) Change in city of license. Normally, does not qualify for counting as a new catch, either in the heard or verified logs, even if the transmitter is moved, unless a change in the FCC allocations chart is involved, as well as a "substantial" geographical distance. An example of such a "portable" FM station that counts for two locations is KBMF 100.3 Pampa TX, which became KBMF 98.3 Spearman TX.

(c) Change in frequency. There is a considerable body of thought which maintains that the reception of a station on a new frequency involves new receiving conditions and such stations should count. We think not, however, and do not allow the mere change in frequency as a new catch.

(d) Change in transmitter location. Does not count, with the exception listed in (b) above. FM transmitter sites are not as well known as TV, and DXers are not expected to know the transmitting sites of the hundreds of stations that make up the log totals of leading FM DXers. For this reason, FM DXers go by the city of license (as determined by the FCC or other national licensing body, and announced in the legal station identification). In case of hyphenated cities of license for a station, the first such listed city shall be entered into the DXer's records.

(e) Deletion and return to the air by the same station at a later interval. In the case where a station returns on its original frequency, it does not

count, even if it returns with different call letters. If it returns on a different frequency with the original call letters, it may be counted at the discretion of the DXer. If it should return on a different frequency with different call letters, it may be counted (although the DXer should be aware of the possibility that the call letters will again be changed to those previous to the deletion.

(f) A station is not counted anew if it raises or lowers its power or antenna height, is received vertically as well as horizontally, received with both its main and auxiliary transmitters, changes ownership or programming format, or is received on more than one receiver used by the DXer.

ARTICLE II: VERIFICATIONS AND RECORDS. This article clarifies the difference and relationship between hearing a station and verifying it, and indicates the types of records that a conscientious DXer should maintain so that his accomplishments may be readily compared with those of other DXers.

SEC. 1 As a matter of interest, the DXer may obtain written verifications of the stations he has heard. However, only those stations meeting all of the standards for counting, as stated in Article I, can be written to for verification. This, therefore, rules out "tentative" loggings based upon the subsequent receipt of a verification. Reception reports soliciting such verifications should be sent out within 36 hours of hearing a station, and may or may not include return postage and a tape of the reception. Such letters should be friendly, well-written, accurately describe the programming and conditions of reception, and be suitable for persons not technically (DX) oriented.

SEC. 2 It is the obligation of the DXer to maintain complete and legible lists of all FM stations heard, and if he collects verifications, of those verified, as well as maintaining up-to-date totals of his heard and verified stations. The maintaining of a library of tape recordings of past years' DXing is encouraged.

ARTICLE III: AMENDMENT PROCEDURE. In a hobby dealing with a fast-changing technology, it is vital that room be provided for the orderly amendment of this constitution.

SEC. 1 Other DXers may subscribe to the conditions of this document without being signatories thereto, and the document may be amended upon the approval of either (a) both the original framers thereof or (b) two-thirds of all involved individuals, who may subsequently subscribe to this constitution.

There it is. Please feel free to send me a postcard, letting me know if you support this constitution either in your own DXing efforts or as a possible statement of club policy. If you have any questions about any part of the document, let me have them, and I'll gladly comment on any aspect of this constitution in future issues of the Digest.

April, 1971

Bruce F. Elving

FERDINAND DOMBROWSKI, former VUD editor/publisher and former WTFDA President, pens these comments on the state of WTFDA today:

"WTFDA's success has surprised a lot of people in the hobby, myself included. In 1967, after agreeing to take over this club of 27 members, I renewed my membership in the Canadian DX Club because I thought WTFDA would be dead in less than a year. When a club of only 27 members changes format, thereby alienating 25 of them, and has a deficit to start with, I certainly could not be chided for expecting the worst! But the support over the years was truly stupendous, and a lot of free publicity from other clubs and magazines helped to spread the word throughout the DXing hobby beyond our wildest expectations. So, within a few months, our success was assured. The past years have proved me wrong in my original evaluation. We still have a surprising number of our first-year members with us, so we must have done something right. Considering the appearance of the first few VUDs, it's a wonder that ANYONE stuck with us through the first year!"

# TV-FM DX BIBLIOGRAPHY

## compiled by Dennis Smith

In 1969, Gary Olson presented a list of magazine articles and publications of the past pertaining to TV and FM DXing. Shortly thereafter, thought was given to expand the listing, so effort was made to make it as complete as possible. This resulted in the assembly of some 550 entries on file cards which in turn were used to compile a "TV-FM DX Bibliography" appearing in the January 1970 VUD. Further research was conducted for an update which was printed in 1971. If you were a WTFDA member at that time, perhaps you have found some of these historical articles of our hobby in libraries and old book stores.

Sources include as many different publications as possible, though inclusion of appropriate articles from newspapers and smaller regional-area magazines could not be attempted. These articles were found by consulting the Readers Guide to Periodical Literature (an index to magazine articles found in most libraries), as well as by searching school and public library shelves and by leafing through used magazines in bookstores. Additional articles were found through the Wireless Engineer, a British periodical with a detailed index of electronics magazines, and The Engineering Index, covering many electronics publications around the world. These listings are responsible for the list which follows, from many North American as well as European sources.

Though the most complete of its subject ever attempted, this listing still is not considered complete. Some issues weren't accessible from above sources, and even if all books and magazines were located, there would be the matter of smaller magazines (such as radio-TV program publications), of which there are many, to say the least. Articles from 1970 on have not been catalogued, simply because there has been no one to take on the job. If you're interested in bringing this list up to date, please contact editor-elect Frank Aden.

There is one other area which is not included, perhaps altogether the richest source of historical information on TV and FM DXing, which I unfortunately could not consider: the DX club bulletins. There have been many which have come and gone over the years, covering all phases of DXing. They could not be considered because most of us do not have access to many DX clubs' bulletins beyond those of which we are members, unless we are club representatives or publishers, which gives those many such issues through ANARC or an exchange mailing program. But even this is only for current issues as printed. At any rate, for anyone who might have some interest or access, here is a little information on DX clubs:

The American Ionospheric Propagation Association (AIPA) was active from the fall of 1953 to the spring of 1963, a successful TV DX club for many years. It also included FM DX starting around 1959. The National Radio Club (NRC) had a TV-DX section for summer activity of its BCBers, but dropped it in 1955 with a note to join AIPA for further TV DXing. The general-coverage Newark News Radio Club (NNRC) had the best and most active FM DX column of any club at that time from 1955 to 1960, 4 to 8 pages a month of enthusiastic reporting edited by Bruce Elving. Before that, FM was handled in the Statistics column as early as 1953, and since has had a small corner (along with TV) of 2 to 4 pages, or in connection with the Statistics column. From 1964 to 1968, the Canadian DX Club (CDXC) had a very active TV-FM section compiled by Wayne Plunkett, with FM separately from 1968 by Dennis Smith. In Europe, the Europa DX TV Club was active for about a year from 1963-64. Our Worldwide TV-FM DX Association has been active in both TV and FM and other VHF-UHF DX since late 1967, reaching for worldwide coverage. Also, there are many general-coverage (MW-SW-FM-TV) clubs, large and small, past and present, with TV-FM columns that are usually very small compared to the MW and SW sections. Many thanks to Bruce Elving for providing some of this data. There are still many clubs and columns that may have been active in FM and TV fields, but as yet we are unaware of them. If you know of or are a member of any such clubs, we would appreciate hearing from you.

Now following, for your academic research or enjoyment, somewhat in the style of an annotated bibliography, is our TV-FM DX Bibliography: the list of known book and magazine articles pertaining to DXing of FM and TV broadcast.

## NORTH AMERICAN PUBLICATIONS

General and Non-Electronic

## BUSINESS WEEK

- 13 Mar 1954 Local Business: "KLEE Lingers On" The KLEE-TV mystery  
 02 Apr 1955 Production: "TV Relay Leaps 200 Miles" UHF tropo scatter

## THE NEW YORKER

- 24 Jun 1967 Notes and Comment: Impression of patterns on in-between VHF TV channels in NYC. Not really DXing, but somewhat related.

## TIME

- 02 Jan 1956 Science: "Sunspot Programs" High sunspots, TV F2 predicted  
 24 Feb 1958 TV and Radio: "On the Bounce" TV DXer George Cole, Rhodesia

## TV GUIDE

- 22 Jan 1955 "Why Freak Reception" These four articles are on the  
 23 Jul 1955 "Hey Ump, Throw the Bull Out" general nature of TV DXing and  
 10 Nov 1956 "The DX Bug" by Bob Cooper its propagations.  
 11 Jul 1959 "The Strange Language of the Television DXers" by King Schafer  
 05 Oct 1968 "Taking Color Pictures from a TV Screen" TV color photos  
 02 Aug 1969 "Tune Your Set Carefully, and You May Even Get Holland," by  
 Glenn Hauser. Mentions WTFDA.

Scientific Review

## ELECTRONICS

- Nov 1944 "RTPB on FM" FCC VHF study burst propagation, 42-50 MHz  
 Dec 1944 "A Report on the FCC Frequency Allocation Hearing" FM & TV prop  
 Jan 1945 "Measurement of VHF Bursts" Observation of bursts, 42-50 & TV  
 Dec 1948 "Airliner Television" Tests of TV reception on airline  
 Dec 1948 "Train Television" Tests of TV reception aboard passenger train  
 Mar 1949 "Train Television" More details of above  
 Aug 1950 "Mobile FM Broadcast Reception" Tests of car FM reception  
 Oct 1951 "Horn Antenna for Television" Tests & construction details  
 01 Apr 1957 Electrons at Work: "Anomalous Propagation" Trans-Atlantic F2

## PHYSICAL REVIEW

- 01 Nov 1946 "On the Detection of Meteors by Radio" SW-VHF MS study  
 15 Jan 1947 "Ionization by Meteoric Bombardment" SW & VHF-FM MS

## SCIENCE

- 30 Sep 1938 Science News: "Radio Wave-Lengths" Explanation of VHF (TV) Es

## SCIENCE DIGEST

- May 1955 "Watch Out for Foreign 'Ghosts' on TV" Sunspots, TV F2 skip  
 Sep 1955 "200-Mile TV Transmission" UHF tropo scatter experiment  
 Jan 1956 "Next Five Years: Watch Out for TV Ghosts" Sunspots, TV F2 skip  
 Dec 1956 "Round-the-World TV" VHF & UHF scatter explanation  
 Apr 1957 "The Sun Gets Spottier" Radio blackouts, BBC TV London F2 skip

## SCIENCE NEWS LETTER

- 01 Oct 1938 "Obtain 2500-Mile Reception on Television Wavelengths" E-skip  
 26 Feb 1955 "TV From Abroad?" Sunspots, F2 skip, probable TV interference  
 02 Apr 1955 "Direct TV Signals Sent Over Horizon" UHF tropo scatter  
 26 Nov 1955 "Global TV Possible Now" VHF & UHF scatter explanation  
 09 Mar 1957 "See Foreign Television" Sunspots, F2 skip, TV interference  
 13 Apr 1957 "Mountains Improve Television Reception" Signal diffraction

Electronic Hobby and Repair

## ELECTRON (Canada)

- Jun 1965 "SW Lingo" (regular column) TV DX nature & propagations  
 Jun 1967 "Other People's Mail" (letters) TV DX letter by Mark Lewis  
 Jun 1967 "SW Lingo" (regular column) TV-FM DXing of Wayne Plunkett

## ELECTRONICS ILLUSTRATED

- Aug 1959 "TV Over the Horizon" by Tom Hidley Humorous DXing account  
 Nov 1961 "Europe's Top TV DXer" TV DXer Jacques Herreman of Belgium

## POPULAR ELECTRONICS

- Jun 1956 "DX TV Reception Makes New Hobby" by Bob Cooper TV DX, DXers  
 Jan 1957 "London-New York TV in '57?" TV F2 skip, RCA looks for BBC TV  
 Jan 1958 "International TV DXing" Palmer, Australia & Tammet, Estonia  
 Apr 1959 "DXing with Your TV Set" DX in Cuba; editors mistake sunspots  
 Jun 1960 "DXing on TV" by King Schafer Discussion of DX prop, equipment



- Jul 1966 "Riding the TV DX Trail" by Gary Olson, who says eds butchered  
 Jul 1966 "Photographing TV Screen" Short filler following above article  
 POPULAR MECHANICS  
 Nov 1954 Radio-Television Electronics: "DX Television Station Receptions  
 Verified with Screen Photos" TV DX & photoing explanation  
 Jun 1955 "TV Crosses the Horizon" UHF scatter between Florida, Cuba  
 POPULAR SCIENCE  
 Jul 1952 "Kansas TV Fan Gets Both Coasts" TV DXer Gene Smith  
 RADIO-TV EXPERIMENTER (later SCIENCE AND ELECTRONICS)  
 Spring 1960 "Tune In on the World" DX history; DXing on MW-SW-FM-TV; clubs  
 Spring 1960 "Custom-Build Your TV and FM Aerials" TV-FM yagi measurements  
 Fall 1960 "The Hidden DX" Techniques for DXing FM subcarriers  
 Jun/Jul 1970 "A DXer's Open Sesame to Old Mexico" Jensen. AM-FM-TV-SW, lists  
 All issues of RADIO-TV EXPERIMENTER have "White's Radio Log," AM-FM-TV-SW  
 station lists, having taken it over from its independent days in the 1950s.

Ham and Broadcast Industry

- RADIO (changed to AUDIO in the mid-1940s and became a high-fidelity magazine)  
 Sep 1927 "Radio Television" Bell Labs experiments on MW  
 Mar 1928 "Radio Pictures" Still pictures transmitted on MW stations  
 Nov 1928 "Radio Picture Transmission and Reception" Stills from airplane  
 Dec 1928 "Radio Picture Transmission and Reception" Description of the  
 television reception methods of that day, includes station list  
 May 1929 "Radio Commission Issues Television Permits" Stations on new  
 experimental TV channels above MW band; also another article in  
 series on "Radio Picture Transmission and Reception" in issue  
 Aug 1929 "List of Visual Broadcasting Stations" U.S. television station  
 list; other television-activity articles in the same issue.  
 Oct 1929 Further television-activity articles and news.  
 1930-1935 No access to issues  
 Feb 1937 "28 & 56 Mc. Activity," also in Apr 1937 issue; Oct 1937 & Jan  
 Apr May 1938 & Jan 1939 "56 Mc," regular VHF ham column, these  
 issues with TV F2 skip news.  
 Dec 1940 "Commercial FM Receives FCC Approval" New radio service, list  
 Dec 1940 "Weak Signal FM Reception" Four detailed articles  
 Feb 1941 "Aurora UHF Propagation" describing DX prop and  
 Apr 1941 "The Coincidence of UHF Fading" reception 42-50 MHz FM  
 May 1942 "UHF" Tr, Es, Au, Ms, and F2  
 Dec 1945 "Irregularities in Radio Transmission" by O.P. Ferrell. Part 1  
 Jan 1946 As above, Part 2. These three parts give details of VHF  
 Feb 1946 As above, Part 3. prop on 42-50 MHz FM: Tr, Au, Es, MS.  
 Oct 1969 "An Empirical Study of FM Antennas" Error-ridden article. FM  
 DX noted but called rare; line-of-sight formulae "prove" ideas!  
 CQ (began in Jan 1945 with ham emphasis, replaced RADIO which turned hi-fi)  
 Aug 1953 "DX and the Sun" Detailed article on approaching sunspot peak  
 Mar 1956 "The Sunspot Story: Cycle 19" Detailed; F2 skip noted. Part 1  
 Jun 1956 As above, Part 2.  
 Nov 1956 "Propagation" (regular column) Detailed F2 skip discussion  
 Apr 1959 "Transatlantic Video DX" Europe video F2 in North America  
 Apr 1961 "The Sunspot Story, Cycle 19: The Declining Years" Detailed  
 article, continued in May and June 1961 issues  
 Jul 1963 "VHF" (regular column) TV DX mentioned  
 Mar 1964 "A Look at the Remainder of the Sunspot Cycle" Cycle 19 decline  
 Jan 1969 "The Sunspot Story--1969" Cycle 20 information  
 Nov 1969 Propagation Special Issue. Many articles on prop, SW, VHF, etc  
 "VHF-UHF" regular ham column has mentions of TV & FM DX in these issues:  
 1947- Feb Mar Apr May Dec 1952- Mar Nov  
 1948- Jul Sep 1958- Jan Mar  
 1949- Jan Feb Mar May Jun Jul Aug 1962- Aug  
 QST (ARRL ham magazine)  
 Aug 1945 "Strays" Item about Es on the 42-50 FM band  
 Jan 1948 "Any DX Today?" British article about trans-Atlantic F2  
 Feb 1958 "Using TV Signals in VHF Propagation Studies" Euro-NA-SA lists  
 Nov 1958 "Sporadic-E Skip on 200 Mc?" Bob Cooper High-MUF TV Es study  
 Dec 1959 "Transequatorial Propagation of VHF Signals" S. Africa-Europe  
 Apr 1963 "TE Propagation--VHF Discovery Extraordinary" and "How Does TE  
 Work?" Two articles. Ham and TV TE work; relation to F2 skip  
 "On the Ultra/Very Highs" regular ham column (named "The World Above 50 Mc.")

after the mid-1940s) has TV and FM DX mentions (F2, Es, Au, tropo, TE), often detailed, in countless issues from 1942 onward. Check the column every month!

## HAM RADIO

- Aug 1970 "High-Performance VHF Bandpass Amplifier" by Bob Cooper  
 FM (short-lived, retitled FM-TV, then FM-TV RADIO COMMUNICATIONS)  
 Jul/Aug 1942 "Long Distance FM Reception" Summer 42-50 Es at Tulsa OK  
 Mar 1945 "Discussion of Proposed FM Frequencies" by E. Armstrong Props  
 May 1945 "Memorandum on Sporadic-E Interference" by above 42-50 & 100  
 Jul 1948 "FM-TV Controversies Continue" FM & TV prop & allocations  
 Nov 1948 "Directory of TV Markets" U.S. television station list  
 Mar 1951 "U.S. Educational Stations" List of AM & FM school stations  
 U.S. FM station lists: Dec 1941 (and possibly before), Feb 1942, May Oct 1943,  
 Mar May Aug 1944, Feb Oct 1947, Sep 1951.

- COMMUNICATIONS (also short-lived, before and after many mergers in the field)  
 Apr 1940 "Notes on FM Transmitters" Uses of new FM system, station list  
 Aug 1943 "FM and UHF" FM history and present status, FM station list  
 Jan 1949 "Airline TV Receiver Installation Tests" Reception between  
 Washington, Detroit, and Chicago, at 4000 feet altitude.

Extensive Listener Columns and Articles

- ALL-WAVE RADIO (short-lived; last magazine with listener emphasis until DXH)  
 Accessible issues were from Jan 1937 to Jun 1938, monthly. All issues have  
 "Short-Wave Broadcast Station List," covering 3040 kHz to 41 MHz. Regular VHF  
 DX listeners column, "Ultra-High," including lists of all xmtrs (except TV)  
 above 25 MHz: Feb Mar Apr May Jun 1938.  
 Dec 1937 "Ultra-High: When to Listen--What to Listen For" VHF station  
 information and DX listening possibilities above 25 MHz.  
 RADIO NEWS (became RADIO & TELEVISION/TV NEWS, then ELECTRONICS WORLD)  
 May 1928 "Seeing Across the Atlantic Ocean!" First such TV experiment  
 Nov 1928 "Successful DX Work Marks 'Radio-Movie' Transmissions" DC-MA TV  
 Jan 1929 "Television: The Latest Developments in the Field" Station list  
 Feb 1929 "What Is Happening in the Television Field?" TV list additions  
 Mar 1929 What's New in Radio: "Scanning Disc Is Adjustable to Four  
 Transmissions" Includes list of TV stations  
 Apr 1929 "Successful Television Experiments in the Home and Workshop"  
 List of stations; reception of DX in Chicago and Fond du Lac WI  
 "On Short Waves" (regular section) May Jun 1929, Mar 1930, TV DX notes  
 Jan 1930 "Where Television Is Today" Development and reception  
 Jun 1930 "SW Broadcasting Stations of the World" U.S. experimental TV  
 Feb 1931 "Visual Broadcasting Still an Experiment" U.S. TV station list  
 May 1931 "The Boston Television Party" Includes U.S. TV station list  
 Aug 1931 "Short Wave Station List, Broadcast-Phone Television" 1500+ kHz  
 Sep 1931 "Building a Radiovisor" Reception possibilities & locations  
 Nov 1931 "Television Goes to Sea" Receiver used on S.S. Leviathan  
 Oct 1932 "With the Experimenters" (regular section) TV recep. in England  
 Television station lists: Feb Dec 1933, Dec 1934, Sep 1935, May 1936  
 "Short Wave Station List" (includes experimental VHF) Jun Jul 1936, Jul 1937  
 "Broadcast Stations in the U.S." (experimental hi-fi) Dec 1936, Jan 1937  
 "The DX Corner for Broadcast Waves" (regular column) Hi-fi news May Aug 1935  
 "The DX Corner for Short Waves" (regular column) DX tips, experimental VHF:  
 1935- Jun Dec. 1936 - Feb through Nov. 1937- Jan Feb, May through Oct, Dec.  
 "The DX Corner for Broadcast Waves" News of VHF radio, TV-DX Jul Aug 1937  
 Jan 1937 "Britain Inaugurates Television for Public Use" BBC TV details  
 Feb 1937 "Change in Frequency Allocations" Important MW-FM TV changes  
 May 1937 "Television Now Ready But Kept Under Wraps" Allocation problems  
 Jul 1937 "Empire State Television Shows Marked Advance" RCA tests; tropo  
 Oct 1937 "Television Range Extended" TV field tests; distant GW  
 Feb 1938 "Firing the Open Guns of TV in the New York Area" NBC-BBC F2  
 Apr 1938 "Television Transmission Schedules" Schedules of some stations  
 Apr 1938 "Is Television Here?" Includes discussion of distant GW and F2  
 Jun 1939 "The Video Reporter" (regular column) BBC seen on Long Island  
 "Short Wave Flashes" (regular column) TV news, tropo Aug Sep Oct Nov Dec 1939  
 Jan 1940 "The Video Reporter" TV news; RCA TV reception in airplane  
 Mar 1940 "The Video Reporter" TV interference between Phila and New York  
 "For Immediate Release" (regular column) TV-FM news, tropo Sep Nov 1940  
 "Spot Radio News" (regular column) FM-TV alloc, Es, F2 Mar 1943, May Sep 1945  
 Nov 1944 "Recording FM Bursts for Observation" Burst study, Es mention  
 Jan 1945 "An Introduction to Television" TV activity, station list  
 Nov 1951 "Summary of TV Situation Round-the-World" Countries' TV plans

- Dec 1951 "No Television in Your City?" TV Es experience in Colorado  
 Dec 1952 "DX Television" TV Es results of Stan Johnson, Denver  
 "TV Stations on the Air" U.S. and Canada station lists Jan 1954, Mar 1955  
 Feb 1954 "TV on Mt. Fuji" TV reception atop Mt. Fujiyama, Japan, 12200'  
 Jan 1955 "Over-the-Horizon Transmission" UHF TV tropo scatter  
 Jun 1957 "Operation Smoke-Puff" Man-made E-region ionized cloud  
 Aug 1957 "Fringe-Area FM Reception" Consistent distant reception in BC  
 Aug 1957 "Sunspots Mar TV Reception" Infers Es, not F2; neither named  
 Nov 1957 "First Over-Horizon TV Bridge" UHF tropo scatter Florida-Cuba  
 Feb 1958 "Rhombic Antennas for TV" by Bob Cooper Experience in ON & CA
- RADIO-ELECTRONICS (RADIO-CRAFT before Oct 1948; began Jul 1929.) (Hundreds of appropriate articles; in your exploring, you may consider others useful too.)  
 "Short-Wave Stations of the World" (regular list) All broadcast stations from 1500 kHz to 60 MHz including exper. TV: Nov Dec 1929, Jan through May 1930 (There was no access to issues from July 1930 through September 1942.)  
 Dec 1943 "The Listening Post" (regular column) U.S. FM list  
 Apr 1944 "World-Wide Station List" (regular column) NYC area FM list  
 Sep 1944 "FM Expansion Rapid" U.S. FM activity; station list  
 Nov 1945 "United States FM Broadcast Stations on New Frequencies" List  
 Dec 1945 "New FM Bands" Includes discussion of propagation modes  
 "Transatlantic News" (regular column) F2, Es, Tr Aug Sep 1946, Feb May 1948  
 "Radio-Electronics Monthly Review" Atlan. & Austr. F2 Sep 1947, Feb Mar 1948  
 TV station lists: US-Jan 1948, Mar Jul Nov 1949, Jan 1950, Jul 1953, Jan 1954  
 Jan 1955. W. Hemisphere- Jan 1951, Feb 1954. U.S. changes Feb 1953. European activity- Oct 1953. Canada- Feb 1955. U.S. and Canada- Jun 1955, Jan 1956, Jan 1957. Latin America- Aug 1957. North America- Jan 1958, Jan 1959. Map of stations Jan 1948. Corrections Mar 1957.  
 FM station lists: US- Apr Jun Sep Dec 1948, Apr 1949. Canada- Jul 1950.  
 FM DX reports with station lists: Apr Jun Sep Dec 1948.  
 "Question Box" (regular column) Rhombic antenna construction: May Sep 1949  
 Jan 1949 "How to Get Television DX" Equipment for fringe-area reception  
 Sep 1949 "The Radio Month" (regular column) TV DX in New York City area  
 Feb 1951 "Rhombic Antennas for TV" Construction of four sizes  
 May 1951 "What's the Mystery Behind Television DX?" Explanation of prop  
 Jul 1951 "V Beam for DX" Construction of long-wire V antenna for fringe  
 Mar 1952 "Beyond the Fringes" Rhombics & yagis in Maine, distant TV  
 Apr 1953 "Transoceanic Television" 1928 history, future scatter work  
 Apr 1953 "DX Prospects for UHF TV" VHF DX history, recent UHF ham work  
 Apr 1953 "Long Distance FM Receiver" Construction of sensitive receiver  
 May 1953 "High-Gain Rhombic for TV" Construction (see "Question Box")  
 Jun 1953 "TV DXer" TV DX poem by Jeanne DeGood  
 Jun 1953 "The Effect of Sporadic-E on TV Reception" A detailed analysis  
 Jul 1953 "UHF Growing Pains Mark First Year of Unfreeze" U.S. TV list  
 Dec 1953 Question Box: "Rhombic for Channel 2" 6-wavelength antenna  
 Oct 1954 "The Radio Month" (regular column) Color TV Es  
 Oct 1954 TV Service Clinic: "Helical Antenna" Constructing UHF helical  
 Jan 1955 "The Waves of Wireless" Poem by Lee de Forest; propagations  
 Apr 1955 "Horn Antenna Construction" See also Correspondence Aug Oct '55  
 May 1955 "New Departure in TV Antennas" Discussion of magnetic antenna  
 May 1955 "The Planets and TV DX" Relationship theories  
 Aug 1955 "Antenna Beams TV Signals 188 Miles" UHF tropo experiments  
 Apr 1956 "Sunspots and Communications" Explanation, F2, ham-TV DX  
 Apr 1956 "Interference vs. Signal Strength" Microvolt & picture ratings  
 Jan 1957 "Thirty Years of Television" TV history, early DX mentions  
 Jan Feb 1957 "Tall Tower Techniques" Construction & maintenance of tower  
 Mar 1957 "Target for DXers" Description of Australian TV channels, F2  
 May 1957 "Rhomboids for TV Reception" Construction & results in New York  
 Jul 1957 "Transoceanic TV DX" History of F2 in Texas; potential  
 Aug 1957 "TV and Sunspots" Writer confuses Es & F2; neither named  
 Oct 1957 "News Briefs" (regular column) Completion of UHF scatter link  
 Nov 1957 "Tips from a TV DXer's Notebook" Bob Cooper. Equipment, props  
 Feb 1958 "Photographing C-R Tube Images" TV screen photo-taking details  
 Jul 1958 "Communications via Meteor Bursts" FM MS history, present use  
 Aug Nov 1958 "News Briefs" (regular column) 108 MHz moonbounce listening  
 Sep 1958 "Looking In on London" Converting TV sets for BBC F2 reception  
 Oct 1958 "News Briefs" (regular column) Navy balloon with UHF ch 14 xmtr  
 Dec 1959 "Photographing TV DX" TV photo principles  
 Mar Apr 1960 "News Briefs" (regular column) Ducts over oceans carry VHF-UHF  
 Regular TV DX column (also FM starting Sep 1958): Nov Dec 1949; 1950 all but  
 May Jul; 1951 all but Mar Apr May; 1952 all months; 1953 all but Mar; Jan Feb  
 Mar Apr Jul Oct 1954; Jan Feb Apr Jul Oct 1955; Jan Jul Aug Oct Dec 1956; Jan

Mar May Jul Sep Nov 1957; Jan Mar Jun Jul Sep Nov 1958; Jan Mar May Jul Sep Dec 1959; Jan Feb 1960. Yearly resumes in Jan issue 1952-1959 except in 1955 (Feb issue), and in Jan Feb 1960.

DXING HORIZONS (later TELEVISION HORIZONS, then VIDEO-COMMUNICATION JOURNAL) Started Jan 1960. TV DX reporting column Jan 1960 to Aug 1961. FM DX report column Jan to Dec 1960, combined with TV DX Feb to Aug 1961. Many interesting articles on long-range VHF-UHF reception, equipment, construction, UHF TV problems, and FCC news, along with translators and CATV. Last issue under Horizons Publications Dec 1963.

CB HORIZONS (Horizons Publications magazine starting June 1961)

Jun 1961 "CB and Sunspots: No More Skip--Interference?" Series on relation  
Jul 1961 "On CB - No Sunspots Can Mean More Skip" of spots/Es, TV-FM  
S9 (CB emphasis)  
Sep 1966 "The SWL Shack" (regular column) TV Es from Mississippi seen in NY  
May 1967 "DX on the Idiot Box" Article about TV DXing

### Technical Journals

- PROCEEDINGS OF THE I.R.E. (Since 1963, PROCEEDINGS OF THE I.E.E.E.)
- Nov 1928 "Radio Stations of the World on Frequencies Above 1500 Kilocycles" Station list, all xmtrs except amateurs between 1500 and 51360 kHz
- Mar 1933 "A Study of the Propagation of Wavelengths between 3 and 8 Meters" and "Notes on Propagation of Waves below 10 Meters in Length" Two articles: 44 and 61 MHz observations around New York City.
- Oct 1937 "Field Strength Observations of Transatlantic Signals, 40-45 MHz" BBC & Berlin TV F2 at Long Island and Indiana, Jan-Apr 1937.
- Jan 1939 "Observations on Sky-Wave Transmission on Frequencies Above 40 MHz" BBC-Berlin-Paris TV F2 at Long Island, Sep 1937- Mar 1938.
- Nov 1939 "Transatlantic Reception of London Television Signals" BBC TV F2 skip at Riverhead, Long Island, New York, Sep 1938-Mar 1939.
- Jul 1941 "Observations of Frequency-Modulation Propagation on 26 MHz" Study of 26.3 MHz FM broadcast signal by ionospheric skip.
- Jun 1944 "Timely Broadcast Matters" Frequency allocations and propagation
- Feb 1947 "Very-High-Frequency and Ultra-High-Frequency Signal Ranges as Limited by Noise and Co-Channel Interference" FM tests, prop
- Feb 1947 "Field Intensities Beyond Line of Sight at 45.5 and 91 Megacycles" FM monitoring project, groundwave and tropo.
- Jul 1947 "Propagation Studies on 45.1, 474, and 2800 Megacycles Within and Beyond the Horizon" Observations around New York City, FM xmtrs
- Dec 1947 "A Study of Tropospheric Reception at 42.8 MHz and Meteorological Conditions" FM monitoring project, tropo
- Mar 1948 "Reflections of Very-High-Frequency Radio Waves from Meteoric Ionization" Es & MS on FM and TV signals, 42 to 84 MHz
- Mar 1949 "Detection of Radio Signals Reflected from the Moon" FM moonbounce
- Jun 1949 "Tropospheric Effects in Ionospheric-Supported Radio Transmission" Combined ionospheric-tropospheric studies, using MW, SW and VHF-FM
- Dec 1950 "Comparison of Tropospheric Reception at 44.1 Mc With 92.1 Mc Over the 167-Mile Path of Alpine, New Jersey to Needham, Massachusetts" FM tests
- Jun 1951 "A Study of Tropospheric Scattering of Radio Waves" FM tests
- Dec 1952 "Field Strengths Recorded on Adjacent FM Channels at 93 Mc Over Distances from 40 to 150 Miles" 92.9 and 93.1 reception
- Jan 1953 "Radio Transmission Beyond the Horizon in the 40 to 4000 Mc Band" VHF and UHF (TV audio and other xmtrs) reception up to 325 miles
- Jan 1953 "Field Strength of KC2XAK, 534.75 Mc, Recorded at Riverhead, NY." UHF TV audio observations.
- Jan 1953 "Auroral Effects on Television" (in Correspondence section), Ithaca
- May 1953 "A Review of VHF Ionospheric Propagation" Includes TV-FM Es and F2
- Oct 1955 "Some Applications of the Monthly Median Refractivity Gradient in Tropospheric Propagation" Several-year VHF study, includes FM
- Oct 1955 "Obstacle Gain Measurements over Pikes Peak at 60 to 1046 Mc" 150-mile diffraction tests, included Denver TV signals
- Oct 1955 "The Use of Angular Distance in Estimating Transmission Loss and Fading Range for Propagation through a Turbulent Atmosphere over Irregular Terrain" Wheel! Anyway, includes VHF TV and FM signals
- Aug 1956 Correspondence: "VHF Diffraction by Mountains of the Alaska Range"
- May 1958 Correspondence: "Lightning Enhancement of a VHF Tropospheric Scatter Signal" TV lightning scatter monitoring
- TRANSACTIONS OF THE I.R.E.: ANTENNAS AND PROPAGATION (PGAP series)
- Dec 1952 "Meteorological Effects on VHF Propagation" Illinois FM-TV study

## RCA REVIEW (started July 1936)

- Jul 1936 "RCA Television Field Tests" RCA's TV equipment, 1931 to 1936  
 Jan 1937 "Equipment Used in the Current RCA Television Field Tests" 1936-37  
 Jan 1937 "Some Notes on Ultra-High-Frequency Propagation" VHF propagation discussion for proposed TV frequencies above 30 MHz (see also in this issue "Frequency Assignments for Television"). Says DX rare!  
 Oct 1937 "Field Strength Observations of Transatlantic Signals, 40-45 MHz" Reprint of Oct 1937 PROCEEDINGS OF THE I.R.E.  
 Jan 1939 "Observations on Skywave Transmission on Frequencies Above 40 MHz". Reprint of Jan 1939 PROCEEDINGS OF THE I.R.E.  
 Jan 1940 "Television Reception in an Airplane" Washington DC to New York  
 Apr 1940 "Mobile Field Strength Recordings of 49.5, 83.5, and 142 Mc from Empire State Building, NY--Horizontal and Vertical Polarization"  
 Oct 1940 "NBC Frequency-Modulation Field Test" NY 42.6 MHz AM-FM tests  
 Mar 1950 "Experimental Ultra-High-Frequency Television Station in the Bridgeport, Connecticut Area" Tests with KC2XAK, 529-535 MHz  
 Mar 1951 "Investigation of Ultra-High-Frequency Television Transmission and Reception in the Bridgeport, Connecticut Area" More tests, KC2XAK

## JOURNAL OF ATMOSPHERIC AND TERRESTRIAL PHYSICS

- #1, 1950 "Comparison of Tropospheric Reception at 44.1 Mc and at 92.1 Mc, Over the 167 Mile Path, Alpine, New Jersey-Needham, Massachusetts, 1947-1948"  
 Apr 1953 "Correlation of 100 Mc Radio Propagation with Certain Variables" Largely-tropospheric FM study in Texas.

- 1957 I.R.E. WESCON CONVENTION RECORD, Part 1 (Microwaves, Antennas, & Prop.)  
 "A Meteor-Burst System for Extended Range VHF Communications" Includes VHF TV COMMUNICATION AND ELECTRONICS (American Inst. of Electrical Engineers Trans.)  
 Mar 1958 "Wide-Band Ultra-High-Frequency Over-the-Horizon Equipment" and "The Miami-Havana Radio System and Its Integration in the Telephone Networks" Two articles, UHF TV & telephone scatter relay  
 JOURNAL OF THE S.M.P.T.E.  
 Feb 1960 "Troposcatter Communications for Intercontinental TV Transmission" Discussion of much then-recent testing and information.

Books, Pamphlets and Publications

WORLDWIDE OCCURRENCE OF SPORADIC-E, National Bureau of Standards Circular 582, available from Superintendent of Documents, U.S. Government Printing Office, Washington DC 20402. Extensive detailed research project about Es, including TV DX section; written by Ernest K. Smith. Info is also in larger book by Smith and S. Matshushita: IONOSPHERIC SPORADIC-E, Pergamon Press, 122 E. 55th St, New York NY 10022, but is extremely technical and complex overall.

COMMUNICATIONS HANDBOOK (yearly Popular Electronics publication). Ham-CB-SWL articles of usual general interest. Available from Gilfer Associates, Inc., Box 239, Park Ridge NJ 07656.

NORTH AMERICAN RADIO-TV STATION GUIDE, Howard W. Sams Co Inc, Indianapolis IN 46206. AM-FM-TV station listings compiled by WTFDA member Vane A. Jones. Is available from publisher and from Gilfer, and from some electronics dealers.  
 FM ATLAS AND STATION DIRECTORY by Dr. Bruce F. Elving, WTFDA member and "FCC FM News" column editor. Lists FM stations of North America on maps and in geographical and by-frequency directories, noting music formats, coverage, network affiliations, and stereo stations, plus much more, including a brief DX section which mentions WTFDA. 1978 edition to be released in mid-year; watch the Digest for details. Can be ordered from "FM Atlas," Adolph MN 55701.

BROADCASTING YEARBOOK, Broadcasting Publications Inc., 1735 DeSales St., NW, Washington DC 20036. 1978 edition \$37.50. Listing and facilities of US AM-FM-TV stations; condensed Canada-Mexico listings. Write publisher for info.

TELEVISION FACTBOOK, Television Digest Inc., 2025 Eye St. NW, Washington DC 20006. Most complete listing of U.S. and Canada TV stations (including coverage maps for each), plus translators. Write publisher for more info.

SPOT RADIO RATES AND DATA, Standard Rate and Data Service, Inc, Skokie IL 60076 (also SPOT TELEVISION RATES AND DATA, same publisher). Huge monthly listings of US AM and FM (or TV) commercial stations with detailed rates and program info. Expensive, and probably not as useful as the two above books.

TELEVISION, a series of books published by RCA REVIEW, Volumes 1 (1936), 2 (1937), 3 (1946), 4 (1947), 5 (1950), 6 (1950). Development of television, 1933-1950; collections of articles from RCA REVIEW and I.R.E. PROCEEDINGS.

## EUROPEAN PUBLICATIONS

Electronics Magazines

- WIRELESS WORLD (British; access to Jan-Jun 1928, Jul 1943 to 1944, & 1947 on)  
 15 Feb 1928 Current Topics: "Television to America" SW TV from England-NY  
 Apr 1944 "Frequencies for Television" Propagation, F2, Es, weather  
 Apr 1950 "Unusual Ionospheric Storm" Special report about 20 Feb storm  
 Nov 1950 "Long Range Television" BBC reception in S. Africa, 1949-1950  
 Jan 1952 "Propagation of VHF via Sporadic-E" Discussion of Es, effects  
 Jul 1954 "Long Distance VHF Reception" Lightning-burst TV experiments  
 Oct 1955 "Long Range Television Reception" TV DX in southern Sweden  
 Dec 1955 "Long Distance VHF Interference" Detailed Es-tropo discussion  
 Feb 1956 "Long Distance ITA Reception" VHF TV Band III GW-tropo  
 Mar 1959 "European Television Stations" List, map, card photos  
 Apr 1959 "Long Distance VHF Reception" VHF TV Band I propagation  
 Jun 1959 "Sporadic-E and the F2 Layer" Es-F2 relationship theories  
 Sep 1969 "Long Distance Television Reception" Euro list, card photos  
 Oct 1969 "Identifying Television Transmissions" Above, DX interests  
 "Ionospheric Review" Yearly propagation summary, including VHF TV F2  
 Mar 1947, Feb 1948-49-50, Mar 1957, Feb 1958-59-60.  
 TV-FM DX in "Letters to the Editor" section: Sep 1947, Feb Jun Sep Nov 1948,  
 Aug 1949, Dec 1956, Mar May Aug 1958, May Jun Sep Nov 1959, Nov 1961, Dec  
 1963, Jan 1964, Aug 1969.  
 TV-FM DX in "World of Wireless" section: Nov Dec 1947, Dec 1948, Aug 1952,  
 Dec 1956, May 1957.  
 TV-FM DX in "Random Radiations" section: Mar 1956, Feb 1958, Jun Jul Aug Sep  
 Oct 1960, Feb 1961.

## TELEVISION (previously PRACTICAL TELEVISION)

Roger Bunney writes "Long-Distance Television," a column in every monthly issue. Before that, starting in Sep 1963, Charles Rafarel wrote "DX-TV," a monthly column. Other occasional DX articles, station lists, and European TV news and articles. IPC Magazines Ltd., Lavington House, 25 Lavington Street, London SE1 0PF, England.

## TELEVISION (French or Belgian?)

- Mar/Apr 1956 "Long-Distance Television Reception in the USSR" Digest of TV DX reports from RADIO magazine, Moscow, Nov-Dec 1955.

## RADIO-REVUE TV (Belgian)

- Jun 1951 "Long-Distance Reception of Television" Belgian TV Es in 1951

## RADIO-SHAU (Austria?)

- Feb-Mar 1960 "VHF and Television Reception over Great Distances" 30-100 MHz

Scientific Review

## NATURE (London)

- 04 Apr 1953 "Multiple Bursts of Signal in Long-Distance Very-High-Frequency Propagation" TV burst reception, 40-60 MHz, MS & lightning  
 21 Nov 1953 "Non-Standard Radio Propagation" June TV Es seen in Ottawa  
 26 Apr 1958 "Long-Distance Radio Propagation above 30 MHz" VHF DX study, TV

Broadcast Industry

## BBC ENGINEERING MONOGRAPH (London)

- Mar 1966 "Sporadic E Ionization and Television Interference" Low band Es

## BBC QUARTERLY

- Jan 1948 "Radio Propagation in the Frequency Range 40-100 MHz" F2-Es-Tr  
 Autumn 1953 "Interference to Television via Sporadic-E on May 17, 1953"

## RSGB BULLETIN

- Mar 1957 "The Reception of Chrystal Palace Transmission in Australia" F2

## THE JOURNAL OF THE TELEVISION SOCIETY (London)

- Jan-Mar 1935 "Reception of the 30-Line Television Transmission in Madeira" MW mechanical TV reception on island off NW Africa since 1929  
 Dec 1938 "Some Aspects of the Propagation of Ultra-Short Waves" VHF TV propagations, tropospheric and ionospheric, are discussed.  
 Jul-Sep 1957 "Scatter Propagation and Its Application to Television" UHF  
 Feb-Sep 1958 "Reception of Australian Television in New Zealand" Es, Nov-Feb  
 Apr-Jun 1960 "Problems of UHF Television: Propagation" Tr in UK & North Sea

Technical Journals

- THE PROCEEDINGS OF THE INSTITUTION OF ELECTRICAL ENGINEERS (London)  
 Apr-May 1952 Part 3A "A Survey of British Research on Wave Propagation With Particular Reference to Television," "Ionospheric Influences In Television Reception," "Long-Distance Propagation in Relation to Television in the United Kingdom" Discusses F2, Es, tropo  
 May 1957 Part B "Long-Distance Propagation at 94.35 MHz over the North Sea" Study of tropo using FM xmtr in Holland, receivers in UK  
 Mar 1960 Part B "VHF Field Strength Measurement over Paths in the Irish Sea Involving Mountain Obstacles" TV signal diffraction
- THE JOURNAL OF THE BRITISH INSTITUTION OF RADIO ENGINEERS (London)  
 Jan 1961 "Reception of BBC Television Sound Transmissions on 41.5 Mcs at Halley Bay, Antarctica" F2 video and audio, Apr-Oct 1958
- THE MARCONI REVIEW (Chelmsford, Essex, England)  
 2nd Qtr 1963 Many articles, studies with VHF-UHF propagations, broadcasting
- POINT TO POINT TELECOMMUNICATIONS (Chelmsford)  
 Oct 1960 "A Tropospheric Scatter Link over a 200 Mile Path" UHF TV tropo
- PROCEEDINGS OF THE INSTITUTION OF RADIO ENGINEERS, AUSTRALIA (Sydney)  
 Jun 1960 "Tropospheric Propagation at VHF" Tests with Melbourne TV xmtrs
- ANNALES DE RADIOELECTRICITE (Paris)  
 Oct 1953 "Report of Propagation Tests on 45 and 66.6 MHz in the Central Mediterranean" Propagation across Mediterranean Sea
- ANNALES DES TELECOMMUNICATIONS (Paris)  
 Aug-Sep 1953 "Long-Distance Propagation of Metre Waves" FM tropo, Es study
- TIJDSCHR. NED. RADIOGENOOT, (Dutch?)  
 #3 1960 "Weather Conditions during Television Reception from E. Germany and Italy" Distant TV studies
- ARCHIV DER ELEKTRISCHEN UBERTRAGUNG (Germany)  
 Oct 1959 "Extraordinary Propagation Conditions for Ultra Short Waves" FM
- HOCHFREQUENZTECHNIK UND ELEKTROAKUSTIK (Leipzig)  
 Nov 1956 "Observations of Long-Distance Reception in the 3-Meter Band" FM tropo studies, central Europe
- NACHRICHTENTECHNIK (Berlin)  
 Jun 1954 "Long-Distance USW Reception" FM tropo studies
- TECH. MITT. SCHWEIZ. TELEGR.-TELEPH. VERW. (Swiss?)  
 01 May 1953 "Study of Ultra-Short-Wave Propagation over the Barrier of the Alps" FM tropo diffraction tests, Switzerland
- Z. MET. (German?)  
 Jul-Aug 1954 "Influence of Weather Conditions on the Characteristics of USW Long-Distance Reception" FM tropo tests

Books, Pamphlets and Publications

- HOW TO RECEIVE FOREIGN TELEVISION PROGRAMMES ON YOUR TELEVISION SET BY SIMPLE MODIFICATIONS, W.J. West. Bernards Radio Manual No. 183, presumed now out of print. Of use in European DX installations particularly, and has interesting collection of photo identifications.
- HOW TO IMPROVE YOUR TV RECEPTION, J. Vastenhou. World Publications, Hellerup Copenhagen, Denmark. Television principles, equipment, and DXing. Believed out of print; once carried by Gilfer.
- HOW TO BUILD TV ANTENNAS FOR ALL CHANNELS, O. Lund Johansen, World Pub. above Also apparently out of print (November 1964). Written by Europeans, useful worldwide, though somewhat dated (does not include log periodic antennas, for example). Worth locating in your library or used-book shop.
- WORLD RADIO-TV HANDBOOK, J.M. Frost, ed. 1977. 31st edition. Billboard Pubs. Inc., USA office: One Astor Plaza, New York NY 10036. Available in USA from Gilfer Associates Inc., Box 239, Park Ridge NJ 07656 (1978 edition soon to be released). Yearly worldwide listing of radio and television stations, MW-SW-FM-TV, though it almost completely omits North American FM and TV and ignores low-powered domestic MW stations. Includes a section on SW DX programs and a list of cooperating DX clubs which includes WTFDA. The 1977 edition includes a discussion of expected solar activity for the upcoming year. The WRTVH now incorporates HOW TO LISTEN TO THE WORLD, a largely SW-oriented section, which discusses antennas, Es-F2 propagation, and other DX topics. -END-

# MONTHLY DX PROPAGATION TABLE

by Robert Cooper, Jr.

What follows is intended as a year-round reference, to be kept where it can be checked on from time to time to remind you of just what types of DX you should be looking for each month of the year. This table is a composite of several sources, including reference texts on meteor showers and more than 25 years of TV and FM DXing. It is meant to be as all-inclusive as possible, but please keep in mind that all forms of tropo and Es DX are unusual and therefore may occur at any time of the year, month or day.

Even with elaborate monitoring equipment, it is seldom practical to "forecast" Es DX more than an hour or so ahead of time. Of all the DX forms we enjoy, Es is without a doubt the most unpredictable. Tropo, on the other hand, "telegraphs" its presence hours or days in advance, and this is especially true during the so-called off-season periods. During the "in-season" tropo periods (i.e. the warm months), the weather conditions that go hand-in-hand with tropo DX sessions are often only barely different (from our surface observation points) from similar weather that fails to produce tropo DX.

During the "off-season" periods, tropo DX occurs almost exclusively when there is unusual weather; i.e. sudden days of warm, spring-like conditions right in the middle of winter, for example. However, because the "normal" weather patterns in South Dakota are totally dissimilar to those in Texas or Florida, a blanket statement of what is unusual for one area cannot be applied to another. Each DXer in each locale will have to do his own studies to arrive at his own conclusions. Once this is done, he can easily spot off-season tropo DX coming a day or two in advance of the actual conditions.

TV and FM DX is a "one percent and down" type of thing. That is, we are dealing with abnormalities in the troposphere and ionosphere; we are counting on the unusual to bring us unusual reception. Predicting the unusual by specific dates, months in advance, is impossible. But we can go back into our DX history of 25 years or so and find trends, and normalize these trends into averages so that we can at least be aware of the potential DX for any period of the year, based upon the past reports of DX.

In the table that follows, each month begins with a general summary of the types of DX that period is noted for, and where (i.e. in what regions of North America) this DX is most likely to occur. A key is used under the meteor scatter (MS) listings, as follows: (A) means a peak (i.e. highest burst rate) in the 5 to 7 a.m. period; (B) means a peak in the 5 to 9 a.m. period; (C) means a 5 to 11 a.m. period peak; (D) means a peak in the 9 p.m. to midnight period; (E) means a midnight to 3 a.m. period peak. Some of the minor (not very productive) MS showers have been deleted from the listings.

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**JANUARY:** A mixed bag for DX. In spots, January can be flashy for Es and tropo. It is noted for neither, however, on a regular (i.e. annual) basis.

The winter Es season usually begins between December 5 and 15. By January, it is swinging pretty good but mostly south of the Mason-Dixon line (or an area south of an imaginary line drawn from San Francisco to Norfolk, VA). December to February Es, the so-called minor Es season, runs in much more clearly defined 27-28 day cycles than the summer (major) season. That is, a good Es opening of December 20th stands an excellent chance of repeating in some form on January 16-17 (27-28 days later) and even a fair chance of being repeated again after a fashion on February 12-13 (an additional 27-28 days). If you catch, or know of, Es openings in December, look for them to repeat and watch the 27-28 day cycle closely. This is especially true of openings down into Mexico from the southern and southwest USA.

Tropo is unpredictable in January. However, it has been known to produce excellent UHF in the upper midwest (usually associated with a slight warming trend and generally foggy conditions), ducting on VHF and UHF in the lower midwest and south (usually associated with a slow-moving, non-violent cold front pushing south over the top of unusually mild, warmer weather). Distances seldom exceed 700 miles in January tropo, but then there are still a few of us who have a few stations to log in the 700-mile-and-down region. One of the best annual meteor showers occurs in January, as we shall note.



**TROPO:** This is the big month for the Gulf Coast area. By the 10th of April, you had better have your tower and antennas in shape again! The annual Texas to Florida openings may last for days at a time, and seemingly drift from one to the next with only a few days between each. A good session from Texas-Louisiana north to Iowa-Illinois may also occur by mid-month. After the 15th or so, or when general warming really sticks with us, virtually all of the USA tropo paths regain their summertime levels and 300 mile reception becomes common again. By the end of the month, or very early in May, there should be one dandy tropo session that eventually includes everyone from the Texas-Louisiana area north to southern Minnesota and east to Ohio. This will start usually over the southwest and spread first to the north (Nebraska area) and then east, with general tropo and ducting combined.

**E-SKIP:** The summer Es pattern may get underway as early as April 10th, but that is only about 25 percent likely. On or after the 20th is more likely, and by the 30th everyone should have had at least one good Es session. Openings follow the general summer trends, prevalent in the 8 to 10 a.m., 12 to 1 p.m. and 4 to 8 p.m. periods. The latter is often the most productive.

**METEOR:** Not your bang-up MS month. The Lyrids shower runs April 19 to 24, but there are NO random dates worth mentioning.

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**MAY:** Now we are rolling into summer. Everything is back into swing, and there should be enough DX for everyone.

**TROPO:** The first week of May is traditionally the end of the spring tropo DX season. It lingers along the Gulf Coast a little longer, and may shoot north on a date or two into the midwest from Texas, usually in the early morning period. By mid-May we have the potential for ducting and general tropo conditions all over the USA and southern Canada. Large, extended tropo openings in May are rare, but ducts are very common, especially over the region between the high Rockies and the Smokies.

**E-SKIP:** If it began in April as we would hope, Es is in good form by May. If it started late, it may not get underway until around the 15th. In any case, the 1st to the 20th is usually concentrated in the 8-10 a.m., 12-1 p.m. and 4-8 p.m. periods, and then after the 20th we are into the June type of Es opening, with late evening openings quite common. Good periods, again based upon history only, are May 4-7, 10-14, 20-22 and 25-31. From May 1 to 15 is an excellent time of year to catch Caribbean area stations on Es if you DX from the upper midwest or the east. Es from your location south into the Gulf area should be watched closely for signs of SS (Spanish-speaking) double hop stations that are possibly not Cuba or Mexico. The best period for this type of thing is 3-5 p.m. and 4-7 p.m. local time.

**METEOR:** The Aquarids shower runs May 1-8. It is not a big shower as they go, but it is worthwhile. Random dates: the 11th (A), 12th (B), and 30th (B).

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**JUNE:** What can be said that hasn't been said already? June is a transition month. Both tropo and Es patterns change in June, and interestingly enough, about the same time: the 10th to the 20th of the month.

**TROPO:** There are usually several good periods of extended tropo in June for DXers in the east and midwest. The southeastern DXers fare badly as a rule. Good north-south (Texas to upper midwest) tropo is not uncommon between the 1st and 15th. Colorado-Wyoming may make it down to Texas, Arkansas and Louisiana between the 10th and 25th, usually during early morning. Oklahoma north and northeast is common from the 15th to the 30th, usually on ducting. The Atlantic coastal people have it good most of the month, as weather patterns drift back and forth, but DXers located in the region of the Eastern mountain chain (southern Pennsylvania to Tennessee) seldom do very well. Don't give up, though: there are always the exceptions! After the 15th of June, the Gulf Coast DXer finds tropo conditions slipping.

**E-SKIP:** The 1st to the 10th of June is usually quite good, with a slow tapering-off period from the 10th to 20th. If the Es season bounces back on schedule around the 20th, excellent openings are common through the end of the month. This is the best period of the year to see high-band Es, which

**TROPO:** This is the big month for the Gulf Coast area. By the 10th of April, you had better have your tower and antennas in shape again! The annual Texas to Florida openings may last for days at a time, and seemingly drift from one to the next with only a few days between each. A good session from Texas-Louisiana north to Iowa-Illinois may also occur by mid-month. After the 15th or so, or when general warming really sticks with us, virtually all of the USA tropo paths regain their summertime levels and 300 mile reception becomes common again. By the end of the month, or very early in May, there should be one dandy tropo session that eventually includes everyone from the Texas-Louisiana area north to southern Minnesota and east to Ohio. This will start usually over the southwest and spread first to the north (Nebraska area) and then east, with general tropo and ducting combined.

**E-SKIP:** The summer Es pattern may get underway as early as April 10th, but that is only about 25 percent likely. On or after the 20th is more likely, and by the 30th everyone should have had at least one good Es session. Openings follow the general summer trends, prevalent in the 8 to 10 a.m., 12 to 1 p.m. and 4 to 8 p.m. periods. The latter is often the most productive.

**METEOR:** Not your bang-up MS month. The Lyrids shower runs April 19 to 24, but there are NO random dates worth mentioning.

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usually occurs in the 4 to 8 p.m. period. Be especially wary of Es openings that seem to last on until past midnight; they may well not quit at all and still be productive the next morning!

**METEOR:** Two random dates worth noting: the 20th (B), and 23rd (B).

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**JULY:** Usually either the best all-around DX month or the second best DX month of the year. Between summertime Es and midsummer tropo, DXers north of the line from San Francisco to Norfolk often find that this is the peak period of the year, when more DX occurs than during any similar 30-31 day period. Typically, some form of DX is observed almost every day in July by northern DXers, and it isn't bad elsewhere either!

**TROPO:** Because tropo depends entirely upon weather conditions, and boundary lines in the weather fronts, the south and southwest seldom fare well in July after the 10th of the month. Typically, this is the hot and dry, or just plain hot; period of the year south of the Mason-Dixon line, and day after day of the stagnant weather does not produce tropo. Further north it is hot also, but cooler air masses from Canada are still sneaking down into the Great Lakes region; and when one of these overrides hotter air, tropo abounds. Virtually all areas of the country enjoy improved early morning tropo in the 200-300 mile range during July. However, if it turns "unseasonably cold" south of the Mason-Dixon line, watch out: extended tropo is much more likely!

**E-SKIP:** There is a gradual transition in Es during the first week in July, from the June type of suddenly developing, strong Es with violent heavy fading to the slow-building, slow-fading form of July opening, and this affects the entire continent. Late evening Es is more likely in July than in June as a rule. Between the 21st and 31st, there are usually one to three days of bang-up, first-class Es openings starting about 8 to 10 a.m. local time, typically the last of the good Es for the summer season. This type of opening, starting in mid-morning, may come and go all day and last long into the evening hours.

**METEOR:** Good July random dates: the 5th (B), 9th (B), 14th (B), 22nd (A-E), 24th-25th (A-E), and 26th through 31st (A-E).

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**AUGUST:** A quick transition for Es fans, from virtually daily openings of some type during much of June and July to catch-as-catch-can August openings. The first ten days of August will produce a combination of June and July openings most years, but not always. After the 10th, Es is limited to mid-morning and late-afternoon breaks, usually occurring over the southwestern USA and from the mid-south into Mexico. Early August is much like most of July for tropo, but spreads south by September. And MS peaks in August during the Perseids meteor shower.

**TROPO:** As the "storm track" out of Canada begins to dip further south in August (usually after the 15th), the hot and dry season south of the Mason-Dixon line begins to taper off. With the cooling comes much-improved tropo conditions for the area, and an opportunity for more southern DXers to get in on the July type of tropo that the more northern DXers have been enjoying. Traditionally, after the 20th of August, DXers in southern Kansas, Oklahoma, Arkansas, north Texas, north Louisiana, north Alabama and north Georgia begin to find breaks to the north and northeast directions in the early morning (5 to 8 a.m.) and early evening (6 to 9 p.m.) on an almost daily basis. Usually distances are under 500 miles, except when a major weather front is upsetting things. By late in August, the tropical storm tracks out of the Caribbean are also bringing heavy amounts of moist air north, and while they may make life miserable for Gulf Coast DXers, indirectly the further penetration north of these huge amounts of moist air often livens up tropo DX for many others. Unseasonable or unusual weather is the key to watch for, regardless of where you live.

**E-SKIP:** The first ten days of August tend to be like the month of July, and they may produce one or two very good Es sessions. If this happens, these are usually mid-morning openings that tend to peter out by noon or so. After the 10th or so of the month, Es is sparse, usually confined to mid- or late-afternoon sessions over the southwest and northern Mexico. But keep an eye out for the exceptions!

**METEOR:** The Perseids meteor shower, the biggest of the year, hits from August 9 to 14 and it is a dandy. Other good (random) dates: the 1st (B), 2nd (B), 4th (B), 8th (B), 17th (A), 22nd (B), and 27th (A).

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**SEPTEMBER:** Often tagged the biggest tropo month. When September is good, it is very good; when it is bad, it is usually very bad (i.e. Septembers are not always good). Some Es is still likely, and there are a couple of MS dates worth noting.

**TROPO:** By the 10th of September, we are out of the August storm tracks and what we start to look for is one of two things: either a large, slow-moving high pressure area that stagnates over the Indiana-Ohio-Kentucky region and extends west to the plains and east to the coast, or a wet, moist, unusually cool air mass that settles in about the same region or a bit further west and south. Whatever happens, it will be best for DXers located east of a line from Amarillo north to Bismarck, and north of a slanted line running from Dallas to the Virginia-North Carolina border. This is the type of tropo opening you can see coming, and it will be evident usually by 7 to 9 p.m. in your area, and continue through the wee hours of the morning into the next day, perhaps tapering off by 9 a.m. and then coming back the next evening.

**E-SKIP:** Don't write off Es in September. The first seven days almost always produce at least one good opening between 4 and 8 p.m. local time, although it may be centered so that only those in the south, southwest and west get in on it. After this first-week session, we usually must have pronounced auroral conditions before additional Es sessions will occur. Auroral-type Es is associated with magnetic storms occurring on the sun's surface, and usually occur only over the more northern USA and southern Canada, centered around 9 p.m. local time, east to west.

**METEOR:** Good random dates are the 11th (B), 16th (A), 21st-22nd (A), and the 27th (A).

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**OCTOBER:** Most noted for its tropo sessions, which can be brilliant in spots. October is not noted for its Es or MS, although "unseasonal" openings tend to be good...if they occur.

**TROPO:** October is a mixed-bag month for tropo. Through the 15th or so, tropo of the September variety may well occur. Weather front movement speed increases in October, so slow-moving, almost stagnant air masses are almost impossible after the 15th. So watch for September-type tropo during the first half of the month, and then watch for direct weather-front-associated ducting-type openings for the remainder of the month (these may occur at any time of the month or year, of course). A strong tropical storm moving north with gobs of moisture is sure to set off something, as is a sudden cold snap moving south over a warm, nearly stagnant air mass.

**E-SKIP:** October Es tends to concentrate south of the Mason-Dixon line, and over the southwest-Mexico region. These will be late-afternoon or early-evening openings. If you run into Es in mid-morning or early afternoon, stick around because it could turn out to be a dandy (again--unusual timing equals unusually good opening).

**METEOR:** There is a flurry of MS activity from the 19th to 23rd as the annual Orionids shower occurs. This is a fairly good shower, worthy of your time. Only one random date worth mentioning: the 27th (E).

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**NOVEMBER:** Known mainly for the unexpected DX. We don't expect good tropo, or much Es, or MS, during November. But virtually every November produces one or more totally unexpected DX openings, such as the legendary November 7-8, 1970 Es session. And consequently, November serves to remind us that DX of any form can happen at any time.

**TROPO:** Most November tropo depends upon "warmer than normal" weather building over a region of the country (which itself improves morning and evening tropo DX), followed by the inevitable return of cool weather, which will often trigger ducting-type DX along the cool front line. This can and does happen over virtually any portion of the country, and once again, the key weather

# E-SKIP IN DEPTH

by Mel Wilson

Q) "Is there any way to predict how long an E-skip opening will last?"

I don't know of any way to predict the duration of an intense Es occurrence. Until the true mechanism of the phenomenon is understood, trying to predict its behavior is at best a rather precarious exercise! However, there are indicators which can lead to an educated guess; that is, play the probability game. Such indicators would include the large-scale weather conditions, the temporal occurrence, and the general intense Es occurrences to date. If I am correct in the assumption that intense Es is the result of turbulence within a large sheet of Es, then conditions (like the wind shear theory) must exist, and a triggering mechanism must be present within the area of the Es sheet to cause the turbulence. A higher probability for a long duration of intense Es is present if large-scale weather conditions indicate widespread possible locations for "generators." The more generators that appear, the more intense Es is spread, and the longer the "band is open." If the generators are strong, they will shed some long-lived clouds which will drift for many hours. Often the more intense and strong generators will support quite high frequencies (FM and higher), and this is an indication that the conditions will probably last for a while. In some cases, it appears that a cloud can become more intense by passing through another turbulent area.

An understanding of propagation paths is a prerequisite to any attempt at predicting where, or how long, an opening might last. The more precisely one can observe existing conditions, and the manner in which they change, the better an educated guess becomes. Plotting of data when combined with basic knowledge of the possible wave propagation paths can often result in quite accurate assessments of actual conditions. If a model can be established in this manner, and the behavior watched carefully, predictions of duration and area coverage can be accomplished by a single observer. The radio amateurs on 50 MHz have a distinct advantage, since they can trade information and get two points of view. It is useful to TV-FM DXers to listen in on 50 MHz for such information. Recording devices, scanning devices, and spectrum displays are useful to the single observer, since such techniques add information.

Q) "Is most Es single hop, or is it a cloud-to-cloud condition?"

In any widespread opening, the probability of a two-cloud propagation path is high, especially as the higher frequencies are propagated. When the band at 50 MHz is just open, the chances are that all skip is single-cloud. The data I have shows that, with very few possible exceptions, ALL reported 144 MHz skip observed over the past 25 years has been cloud-to-cloud. By far the majority of FM propagation has been two-cloud, and many of the 50 MHz and low band TV paths have been cloud-to-cloud. When widespread intense Es is in progress, the lower frequencies usually have more than one path open at the same time, both single-cloud and cloud-to-cloud. This causes very strong stations to have very deep fades. Very complex wave paths can develop in such conditions.

Q) "Why does Es peak in spring and summer and re-peak in December-January?"

I don't believe anyone has yet figured this one out! I would think that the mechanism for triggering turbulence is present much of the time, at least on an annual basis, and therefore the difference between the solstice and the equinox occurrence of Es must be a result of the basic establishment and behavior of the basic sheet of ionization. This probably is a very complex phenomenon. Some feel that the basic ionization generation must be a result of the energy from the sun (excluding aurora and meteors) and thus the zenith angle of the sun relative to the coupling magnetic field lines between conjugate points between the hemispheres probably controls this formation. There is some evidence that the plasmapause controls the boundary of Es in the temperate zone ( $L=4$ , approximately 60 degrees magnetic latitude), and thus not too far out to give serious consideration to this form of coupling. When the sun is over the equator, its coupling to the midlatitudes is at a minimum, and this could account for the minimum Es occurrences at equinox. During our summer, the sun's angle is such as to directly couple with the northern hemisphere, and the effect should be greater than during our winter

solstice, when the proper zenith angle of the sun must be coupled through the magnetic lines from our conjugate point.

- Q) "About what percentage of the Es openings that reach TV channel 2 will reach channel 6? FM? channel 7?"

The general rule of thumb is that doubling frequency reduces the probability to one-tenth. Thus, if channel 2 is assumed 50 MHz, then 100 MHz will be propagated one-tenth the time that channel 2 is open, and 200 MHz only one-hundredth of the time. However, this assumes a single-cloud propagation path. Since most higher frequency propagation paths are multi-cloud the probability is higher than these figures. The MUF of a single cloud can be below the frequency propagated by a two-cloud path. In practice, it is difficult to know of a possible propagation path for the highest frequency because of the geometric restrictions imposed, and unless the DXer and the transmitter are in precise relative positions, it will go undetected. This seems to be the experience on the ham 2-meter band. I expect that this will change somewhat with the advent of many repeaters coming on the air and many more people listening, and many openings will be reported. In the case of channel 7 stations, the probability of receiving them is not very good, since there are relatively few of them, and the propagation paths very restrictive. But FM stations, on the other hand, are geographically well spread out, have a relatively high density, and transmit continuously--and openings are observed a high percentage of the time. It is interesting to note that since there are so many more FM stations than, say, channel 2 stations, that an observer may hear FM stations and not channel 2 stations. This doesn't mean the band is not open for channel 2, but that there is no channel 2 station for that particular wavepath. It is possible that no TV stations can be received and only FM stations can be received. (Such information is of great importance when plotting an opening.)

- Q) "What characteristics should be found in a good antenna system for Es DX?"

There is no single good antenna for Es DX. The serious DXer must have more than one antenna, and depending upon what he wishes to accomplish, must be able to change antennas rapidly (preferably scan). I would guess the minimum would be a good yagi, stacked as much as possible, and as high above ground as possible. Of course, it must be rotated. Lower should be a second DXing antenna, a small beam type with an excellent null. The high, sharp beam antenna is useful most of the time, because of its gain and its area coverage (low angle of radiation covers a larger geographical area). The lower and smaller antenna is useful for higher angles of radiation (when Es clouds are closer) and the deep null is useful for cutting down interference. The smaller beam should be independently rotated, and for local interference and also strong skip (if azimuthal angle is different), the smaller antenna can be electrically combined with the higher antenna to produce a null on the unwanted station. Beyond the minimum, there are all kinds of special types, with polarization changes being the most useful.

- Q) "How can a DXer recognize conditions favorable to double-hop E-skip?"

The probability of successfully recognizing the possibility of double-hop Es is directly related to one's understanding of transmission paths, and one's knowledge of conditions existing at the time. Plotting of conditions for propagation for an opening is most useful. This is the technique of drawing propagation paths as they are observed on a map, and trying to establish where the Es clouds started and where they are going. Listening to the radio amateurs on 50 MHz is most useful for finding the paths that are present but beyond one's own radio horizon. I believe that weather maps are very useful for guessing the direction and extent of possible intense Es. The place where skip starts is often along a front, very unstable air mass interfaces, and seem to favor low pressure areas. Once clouds are formed and drift off, they may well drift into high pressure areas. Intense Es does not seem to form in stable high pressure areas, although on double-hop skip remember that any ground reflection point can be in the high, so one can be received through the area as long as a cloud is not required in the area. Thus the probability of double skip is higher if low pressure cells dominate the country, or the fronts are spaced properly for the observer. Of course, when the band is wide open over a large area, there is no need to recognize the conditions for double-hop Es: it's already there!

Q) "Can meteor showers trigger an E-skip opening?"

Meteors can well be the chief supply of metallic ion debris so important to the duration of Es, but I doubt very much that meteors could trigger an Es opening. Meteors do heat the ionosphere in an extremely small volume, often causing "ping" type VHF propagation, and a dense shower can sustain that propagation (sometimes double skip) for a relatively short duration. Meteor trails often produce field aligned scatter signal propagation and are very aspect limited. Although the energy released by the transit of the meteor through the E layer is small, some of the "over dense" meteors can extend the duration of propagation for several minutes. This mode of propagation is quite different from intense Es.

Q) "What is your analysis of the large amount of off-season Es activity?"

I don't know why we seem to have so much activity. The variability of Es is what makes the study of the phenomenon so interesting! I will never forget November 8, 1970 when the intense Es extended a quarter of the way around the world, 144 MHz was open for two hours, and FM was reported out to 2000 miles! So we sure get some odd ones off-season.

Q) "Can you make any predictions about upcoming Es seasons?"

Sorry, I can't make any predictions! The variability of intense Es from year to year is far too great, and since the mechanism is not known, there is no way of predicting what may occur. If one takes 100 days from the first weeks of May until the middle of August, then almost every year 92 days will be reported open somewhere in the continental United States. However, duration and location of these openings vary tremendously from year to year, and this makes it very difficult to predict what will be reported. I guess if we really knew, it would take most of the fun and enjoyment out of our hobby!

May, 1975

Mel Wilson

Monthly DX Propagation Table (continued from p. 36) TENTH ANNIVERSARY ISSUE

phrase to watch for is "unseasonable," especially when it refers to warm and moist air masses. Along the Gulf Coast, this is a pretty good time for up to 500 mile tropo over east-west paths without any obvious weather boundaries present.

E-SKIP: Most November Es, of the regular garden variety, occurs about sundown over the southwest and northern Mexico. The non-garden variety (such as the November 7-8 binge of 1970) is closely correlated (if not related) to the occurrence of a major auroral display or magnetic disturbance. If you learn that a major aurora is occurring or is expected, watch closely for Es within the next 48 to 72 hours.

METEOR: The Leonids, a minor shower, peaks on the 15th. Good random dates: the 21st-22nd (E), and the 27th (E).

DECEMBER: Known sometimes as the winter sub-peak of the Es season. January has often been as good as, or better than, December. Tropo reminds us of November, and MS is good twice.

TROPO: A repeat of November, but seldom productive in the north. When it is, it's great!

E-SKIP: December can be good for up to a half-dozen openings between the 10th and the 31st. Dates between the 15th and the 25th are often best, and the best times are 8-10 a.m. and 4-8 p.m. Any place in the country may be in on it, but the south is favored.

METEOR: The second best month of the year. The Geminids (December 10 to 14) and the one-day Ursids (23rd) are often outstanding. Random dates worth your attention: the 3rd (A), 7th (A), 27th (A), and 30th (A).

January, 1972

Bob Cooper, Jr.

# DXING FRUSTRATIONS

by Robert Cooper, Jr.

All DXers have frustrations concerning DX activities. Chances are you may not be aware that others share these frustrations. So...let's get a few of the more unpleasant ones out into the open; perhaps we'll find that misery loves company, even in DXing!

Because DX is erratic at best, any DX opening is frustrating. The exception is the one that lasts "too long"; ask Bob Seybold how he feels after 72 hours at the dials during heavy fall tropo sessions, with only brief catnaps along the way!

ID TIMES: No matter how good reception has been for the 28 minutes leading up to ID time, sure enough...when the clock approaches the hour or half-hour...

- \* The signal fades
- \* The next-door neighbor starts his lawn mower
- \* Your smallest child bursts into the room shouting "Potty-potty, Daddy..."
- \* The intermittent tube in your TV receiver that you have been promising to replace picks this time to quit again
- \* A CBer down the street decides to key his transmitter
- \* You discover your camera is out of film
- \* The station you thought for sure was Es turns out to be weak tropo, and the one you were certain was weak tropo turns out to be Es; you aren't ready for the latter and have ten pictures already of the former
- \* The strong, clear signal you have been watching and have a meticulous log on for the past 28 minutes suddenly fades out, to be replaced by two more DX signals, neither of which you can get a log on through the mess of video CCI but both of which you get audio IDs on (which leads to the "I logged it but don't have anything for my log..." syndrome)
- \* You are all alone in the house and the phone rings, just as ID time comes. You resist the urge to answer it, finally dash for the telephone telling yourself you can be back before the ID slide is flashed, and hear the party at the other end proclaim: "Congratulations, sir, you have just been chosen as a winner in our free dance lesson contest..."

PICKING THE RIGHT TIME TO DX: We, of course, don't pick the times to DX; the DX picks its time to happen and we sort of luck into or out of being there at the right time. But nonetheless, after a few seasons of DXing, some of us begin to think we have it figured out--only to learn:

- \* You've missed four nights in a row of solid Es, having caught the tail end of each opening. Tonight, you work out your schedule to be at the dials for the entire evening. But a local thunderstorm comes up, knocking off the power (just on your block!) for the entire evening. And later you find out that this was the BIG Es night of the year!
- \* You have followed the weather maps and reports closely. It is mid-September and everything points to this coming weekend as THE big, long-awaited super tropo session. Friday morning everything out to 300 miles is great, and you spend most of the day dreaming about the great 800-mile tropo that you will have for the weekend. Friday afternoon at 5 your wife calls in a panic; her mother is suddenly ill, and she will be down to pick you up in an hour for a 200-mile drive to spend the weekend with her parents (who are part of the 3 percent of the population that doesn't own a television set!).
- \* For weeks you have prepared your family for the eventuality: you are going to climb out of bed at 4 a.m. on August 12th to DX the peak date of the Perseids meteor shower. They think you are nuts. Weeks of planning and you know which channels to watch, who runs test patterns, and so on. At 7:30 a.m. on the 12th, you wake up; the alarm clock didn't go off.
- \* Planning for the vacation has been going on all year. Early November. There is never any DX then; you can safely leave your tower, antenna and gear and sneak away for ten days of country touring. You won't even turn on a TV set. That evening you check into a motel 300 miles from home, eat a leisurely dinner, bed down the kids and play a couple of hands of cards with your wife. Finally, at 11 p.m., you decide to check in on the late TV news--and find all 12 channels so covered with CCI that you can't watch the news from a station right there in town!

EQUIPMENT TROUBLES: We all have them. Not all of us know we have them; most of us don't (or won't) admit that we have them. But they do exist:



- The channel selector knob that falls off while you are passing through a local channel, just ten seconds before ID time
- The rotor that hangs up due north during an opening to the east (or west)
- The rotor that suddenly goes out of calibration, and you spend all evening trying to figure out who the Spanish-speaking stations are from the north, only to discover later that the antenna was south at the time
- The fancy, elaborate antenna array you carefully put together, piece by piece, on the ground, test on a ladder for five days, and then hire two \$15-per-hour tower climbers to erect...only to find out after they leave that, sixty feet above your house, they have forgotten to attach the new transmission line to the antenna mixer. It's Friday evening, they don't work again until Monday, and the mixer is just out of reach even if you stand on your tiptoes on the top tower rung.
- The UHF tubular transmission line that you were so proud of because it was super low-loss and weather-tight; you notice a tiny drop of moisture coming out of its end at the converter input, and when you poke a small pin into the tubular line...two quarts of water drain out on your TV set.
- The big VHF antenna that you are so proud of, bringing in 200 mile stations under what you considered dead-band conditions. And then your wife comes in and complains that your "new TV antenna" is messing up her portable in the kitchen. And when you check, you find 400 mile tropo all over the dial on her portable...with the rabbit ears pushed all the way down.
- The hot new FM tuner you bought and are telling all of your neighbors about. You are demonstrating how loud and clear 200 mile reception is, just as the kid next door walks in with a 7-transistor AM/FM tucked to his ear. He is listening to the same 200 mile signal that you are demonstrating...and it is just as loud and clear.
- The 100-foot roll of large CATV 75-ohm cable you talked the CATV type into giving to you--free--knowing it will make an ideal UHF transmission line and give you 90 percent less power loss. Then you find out that only one company makes connectors for the cable...and they cost \$40 each.
- The hot new preamp you installed at the antenna, and when you turn it on, there are dozens of 200-300 mile stations all over the dial. For 3 days it is like this, and you think "Boy, wait until the band opens up!" Then you discover the band has been open with super tropo for three days...

**PEOPLE TROUBLES:** Whether it be our family, friends, or pure strangers, often we can't resist the urge to talk about or show off our DX reception. This is usually a mistake:

- "That's nice, all right...but I get the same program on channel 5..."
- "Can't you get rid of those funny lines?"
- "My cousin got Chicago once..." (and you live in Milwaukee...)
- "Can't you get the sound, too?"
- "If I had a big antenna like yours..."
- "That's pretty good for a little portable like that..."
- "Will it be better if I pull up on the rabbit ears?"
- "I didn't know you spoke Spanish..."
- "I've been thinking about getting one of those UHF things, too..."

**ID PHOTOS AND VERIE LETTERS:** Not all of us collect them, but those who do are rightfully proud of their collections. Pride is hardly what our friends and relatives see in them, however:

- "But you already showed me one for channel 2..."
- "I have a cousin who lives there..."
- "How big a flash bulb do you use?"
- "I used to collect butterflies when I was a kid..."
- "You call this a Q what?"
- "One night last winter I heard Cincinnati on my car radio..."
- "I don't see much excitement in sitting and staring at a test pattern..."
- "We were in Houston last year and I saw that station, too..."
- "You have HOW MANY MORE of these for me to look at??"

There are many more DX frustrations, to be sure. Let's hear some of yours!

October, 1971

Bob Cooper, Jr.



*10th Anniversary*



# ALLTIME TV-FM RECORDS

by Glenn Hauser, Andy Bolin and Clarke Ingram

ALLTIME TELEVISION DISTANCE RECORDS: "La creme de la creme." These DX records parallel our FM method, in picking out the one most distant DX catch by each propagation on each channel; Western Hemisphere and American standards only. Dennis Smith did most of the original research, including many dates. Only a handful of the VHF changes since original publication in May 1968 and later revision in April 1973 involve new DX; even in MS, which has been added, most records were set 10-20 years ago. But UHF is an entirely different DX story; channel 59 is the ONLY ONE still standing after 10 years of the "UHF DX era" (400 miles was once enough to capture a UHF DX record; now even 1000 miles is common.) By "Es," we mean that the TV DX catch is believed to have involved ionospheric propagation over at least part of the path. At this late date, it is impossible to determine exactly what combination of multiple Es, F2, tropo ducting, etc. may have produced the DX. Some of these catches may strain your credulity; there's a good chance some of them were in error or even falsified, but they have become part of TV DX lore. Let's try a bit harder to break some of them in the NEXT 5 years!

CH	PR	CALL	LOCATION	MILES	DXER, LOCATION
2	Es	PRG3	Rio de Janeiro, Brazil	6615	Robert Cooper, Lafayette CA
	Tr	CHCT	AB Calgary	1240	Edwin Shorey, Derby KS
	MS	KLRJ	NV Las Vegas	1385	Barney Rauch, Peoria IL
3	Es	PRF3	Sao Paulo, Brazil	5015	Bedford Brown, Hot Springs AR
	Tr	WRCV	PA Philadelphia	1045	Bedford Brown, Hot Springs AR
	MS	KDAL	MN Duluth	1465	Doris Johnson, Longview WA
4	Es	KULA	HI Honolulu	4230	Carl Lupton, Shelbyville IL
	Tr	WTVJ	FL Miami	1155	Pat Dyer, San Antonio TX
	MS	WOAI	TX San Antonio	1420	Richard & Wm Nieman, Buffalo NY
5	Es	LRL	Buenos Aires Argentina	5290	Bedford Brown, Hot Springs AR
	Tr	KENS	TX San Antonio	1120	Carlton Howington, Homestead FL
	MS	WHDH	MA Boston	1400	Edwin Shorey, Derby KS
6	Es	CMQ	Habana, Cuba	2430	Robert Cooper, Fresno CA
	Tr	KRIS	TX Corpus Christi	1075	Carlton Howington, Homestead FL
	MS	KTVG	KS Ensign	1635	Ghislain Girard, Arvida QB
7	Es	WBKB	IL Chicago	2480	UnID ARO, Thule AFB, Greenland
	Tr	WCKT	FL Miami	1155	Pat Dyer, San Antonio TX
	MS	WCKT	FL Miami	1210	Thomas Hidley, Crystal Lake IL
8	Es	KZTV	NV Reno	1490	Robert Cooper, Arcadia OK
	Tr	KSWs	NM Roswell	1510	Jerry Don Burch, Hot Springs AR
	MS	WMTW	NH Mount Washington	1325	Arnoldo Coro, Marianao, Cuba
9	Es	CMGQ	Matanzas, Cuba	1440	Bedford Brown, Hot Springs AR
	Tr	CMAB	Camaguey, Cuba	1105	Ed Sparks, Odessa TX
	MS	WSOC	NC Charlotte	1120	C. Rareshide, New Orleans LA
10	Es	CMTV	Habana, Cuba	1395	Glenn Hauser, Von Ormy TX
	Tr	KWTX	TX Waco	1365	Ed Sparks, Odessa TX
	MS	WCAU	PA Philadelphia	870	Richard Italiano, Binghamton NY
11	Es	KITV	CA Los Angeles	1610	William Hider, Binghamton NY
	Tr	KGUL	TX Galveston	1245	John Bettersworth, Starkville MS
	MS	WBAL	MD Baltimore	1140	Barney Rauch, Peoria IL
12	Es	NONE	NONE		Robert Seybold, Dunkirk NY
	Tr	KONO	TX San Antonio	1135	Robert Cooper, Arcadia OK
	MS	NONE	NONE		Carlton Howington, Homestead FL
13	Es	KLAC	CA Los Angeles	1785	Phil Rader, Indianapolis IN
	Tr	KERA	TX Dallas	1150	Robert Seybold, Dunkirk NY
	MS	WSPD	OH Toledo	715	Bedford Brown, Hot Springs AR
14	Tr	KMEG	IA Sioux City	1280	Christopher Hall, Salem MA
15	Tr	WDCC	GA Cochran	830	Robert Cooper, Oklahoma City OK
16	Tr	KEDD	KS Wichita	995	Robert Seybold, Dunkirk NY
17	Tr	WJKS	FL Jacksonville	1020	Glenn Hauser, Von Ormy TX
18	Tr	WDHN	AL Dothan	805	Glenn Hauser, Von Ormy TX
19	Tr	KXNC	NE Norfolk	930	Robert Seybold, Dunkirk NY
20	MS?	WICS	IL Springfield	560	Robert Seybold, Dunkirk NY
21	Tr	WBBH	FL Fort Myers	1070	Robert Cooper, Arcadia OK
21	Tr	WFMJ	OH Youngstown	975	Robert Cooper, Arcadia OK
22	Tr	WJCL	GA Savannah	1040	Glenn Hauser, Von Ormy TX

CH	PR	CALL	LOCATION	MILES	DXER, LOCATION
23	Tr	WLTW	FL Miami	1150	Pat Dyer, San Antonio TX
24	Tr	KVUE	TX Austin	1330	Robert Seybold, Dunkirk NY
25	Tr	WVIZ	OH Cleveland	915	Robert Cooper, Arcadia OK
26	Tr	KVRL	TX Houston	1245	Robert Seybold, Dunkirk NY
27	Tr	WKYT	KY Lexington	1105	Fred McCormack, Des Lacs ND
28	Tr	WJSP	GA Columbus	855	Glenn Hauser, Von Ormy TX
29	Tr	WMAA	MS Jackson	925	Robert Seybold, Dunkirk NY
30	Tr	WETV	GA Atlanta	895	Glenn Hauser, Von Ormy TX
31	Tr	WAAY	AL Huntsville	795	Glenn Hauser, Von Ormy TX
32	Tr	WLKY	KY Louisville	1040	Fred McCormack, Des Lacs ND
33	Tr	WRBT	LA Baton Rouge	990	William Draeb, Kewaunee WI
34	Tr	WBJA	NY Binghamton	1230	Robert Cooper, Oklahoma City OK
35	Tr	WWSW	FL Orlando	1040	Pat Dyer, San Antonio TX
36	Tr	KTUV	TX Austin	1110	Robert Frantz, Fort Lauderdale FL
	MS?	KSTM	MO St. Louis	830	R.J. Walker, Daytona Beach FL
37			Channel reserved for radio astronomy		
38	Tr	WBSK	MA Boston	1475	Robert Cooper, Oklahoma City OK
39	Tr	KHTV	TX Houston	1260	Robert Seybold, Dunkirk NY
40	Tr	WXLN	FL Sarasota	1060	Robert Cooper, Oklahoma City OK
41	Tr	KWEX	TX San Antonio	1035	John Combs, Orlando FL
42	Tr	WBMG	AL Birmingham	805	Mark Lewis, Downsview ON
		WPBO	OH Portsmouth	tie	J. Joel Rosenberg, Downsview ON
		WUAB	OH Lorain	tie	Robert Cooper, Arcadia OK
43	Tr	WUAB	OH Lorain	935	Robert Cooper, Oklahoma City OK
44	Tr	WTOG	FL St. Petersburg	1035	Robert Cooper, Oklahoma City OK
45	Tr	WTCL	TN Chattanooga	665	J. Joel Rosenberg, Downsview ON
		WBFF	MD Baltimore	tie	William Draeb, Kewaunee WI
46	Tr	KNCT	TX Belton	990	John Combs, Orlando FL
47	Tr	WSVN	VA Norton	825	Robert Cooper, Oklahoma City OK
48	Tr	WMSL	AL Huntsville	800	Glenn Hauser, Von Ormy TX
49	Tr	WLBC	IN Muncie	735	Robert Cooper, Oklahoma City OK
50	Tr	WKBD	MI Detroit	900	Robert Cooper, Oklahoma City OK
51	Tr	WKID	FL Fort Lauderdale	1150	Pat Dyer, San Antonio TX
52	Tr	WKON	KY Owenton	835	Glenn Hauser, Franklin TX
53	Tr	WKGB	KY Bowling Green	700	Glenn Hauser, Franklin TX
54	Tr	K54AC	MN St. James	515	Robert Cooper, Arcadia OK
55	Tr	K55AF	NE Cozad	380	Robert Cooper, Arcadia OK
56	Tr	WTVS	MI Detroit	900	Robert Cooper, Oklahoma City OK
57	Tr	WBGU	OH Bowling Green	800	Robert Cooper, Arcadia OK
58	Tr	WUNG	NC Concord	345	Thomas Yingling, Dundalk MD
59	Tr	WFAM	IN Lafayette	410	Robert Seybold, Dunkirk NY
60	Tr	WLXT	IL Aurora	455	Robert Seybold, Dunkirk NY
61	Tr	WKBF	OH Cleveland	930	Robert Cooper, Arcadia OK
62	Tr	WBLG	KY Lexington	720	Robert Cooper, Arcadia OK
63	Tr	W63AB	PA Mansfield	475	James Gould, Kokomo IN
64	Tr	K64AA	TX Perryton	195	Robert Cooper, Arcadia OK
65	Tr	WEDY	CT New Haven	335	Robert Seybold, Dunkirk NY
66	Tr	W66AB	PA Lake Ariel	430	Roger Brown, East Lansing MI
67	Tr	WMPP	MD Baltimore	610	Donald Ruland, Kenosha WI
68	Tr	WKMJ	KY Louisville	650	Robert Cooper, Arcadia OK
69	Tr	W69AB	WI Darlington	180	William Draeb, Kewaunee WI
70	Tr	K70CL	IA Fort Dodge	530	Fred McCormack, Des Lacs ND
71	Tr	W71AE	IL La Salle	605	Robert Cooper, Oklahoma City OK
72	Tr	K72DJ	MN Olivia	395	Fred McCormack, Des Lacs ND
73	Tr	K73BU	TX Big Lake	300	Glen Neal, Sayre OK
74	Tr	W74AS	MI White Pine	580	Robert Seybold, Dunkirk NY
75	Tr	W75AJ	WI Fond du Lac	420	Robert Seybold, Dunkirk NY
76	Tr	K76BZ	IA Ottumwa	470	Robert Cooper, Oklahoma City OK
77	Tr	K77BO	NE Inman-O'Neill	425	Fred McCormack, Des Lacs ND
78	Tr	K78CR	IA Keosauqua	470	Robert Cooper, Oklahoma City OK
79	Tr	CITY	ON Toronto	410	William Draeb, Kewaunee WI
80	Tr	K80AW	IA Dubuque	605	Robert Cooper, Oklahoma City OK
81	Tr	K81AE	MN St. James	350	William Draeb, Kewaunee WI
82	Tr	K82AJ	MN International Falls	380	Fred McCormack, Des Lacs ND
83	Tr	W83AB	MI Detroit	200	Robert Seybold, Dunkirk NY

EDITOR'S NOTE: Some of these records were obtained by scanning TV DX reports in the VUD from 1973 on; for the editorship of the Statistics column has been vacant for some time. If you'd be interested in taking on the TV Statistics-Scoreboard column, write to editor-elect Frank Aden or to HQ. -CLARKE INGRAM

ALLTIME FM DISTANCE RECORDS: These listings have been gleaned from Statistics columns in the VUD as far back as 1974, from noteworthy FM DX reports in the Digest, and from updates provided by editor Andy Bolin during 1976-77. Andy's resignation from FM Statistics makes the need for a new editor for the column imperative. If you'd like to volunteer for either the FM or combined FM-TV Statistics column, or if you have a DX catch which exceeds one of those below (which is likely, due to the dated listings), please drop a line to the VUD's editor-elect, Frank Aden Jr., at 1535 NW Ithaca Avenue, Bend, Oregon 97701.

FREQ	PROP	CALL	LOCATION	MILES	DXER, LOCATION
88.1	Es	WAUP	OH Akron	1255	Glenn Hauser, Von Ormy TX
	Tr	----	Guatemala, Guat.	1125	Michael Dalton, Clearwater FL
	MS	KDPS	IA Des Moines	900	Glenn Hauser, Von Ormy TX
	Au	KSOZ	MO Point Lookout	565	John Ebeling, Bloomington MN
88.3	Es	KQED	CA San Francisco	1375	Robert Cooper, Oklahoma City OK
	Tr	KSUC	TX Keene	930	Michael Dalton, Clearwater FL
	MS	WHWC	WI Colfax	855	Larry Vogt, Springfield VA
	Au	WAER	NY Syracuse	675	Andy Bolin, Charleston IL
88.4	Es	TGRT	Guatemala, Guat	1130	Glenn Hauser, Von Ormy TX
88.5	Es	WFCR	MA Amherst	1405	Robert Cooper, Oklahoma City OK
	Tr	WRAS	GA Atlanta	890	Glenn Hauser, Von Ormy TX
	MS	WFDD	NC Winston-Salem	1160	Glenn Hauser, Von Ormy TX
	Au	WFCR	MA Amherst	705	Russ Brown, St. Joseph MI
88.7	Es	HRLP	Tegucigalpa, Hond.	1260	Glenn Hauser, Von Ormy TX
	Tr	HRLP	Tegucigalpa, Hond.	1035	Michael Dalton, Clearwater FL
	MS	WHA	WI Madison	1080	Glenn Hauser, Von Ormy TX
	Au	WHA	WI Madison	685	Fred McCormack, Des Lacs ND
88.8	Es	TGRT	Guatemala, Guat.	1130	Glenn Hauser, Von Ormy TX
	Tr	TGRT	Guatemala, Guat.	1125	Michael Dalton, Clearwater FL
88.9	Es	WEKU	KY Richmond	2000	Jim Pizzi, Santa Maria CA
	Tr	XHM	DF Mexico City	1300	Michael Dalton, Clearwater FL
	MS	WKES	TN Chattanooga	875	Glenn Hauser, Von Ormy TX
	Au	WEKU	KY Richmond	675	John Ebeling, Bloomington MN
89.0	Es	YSR1	ES San Salvador	1215	Pat Dyer, San Antonio TX
89.1	Es	ZBM	Hamilton, Bermuda	1385	Andy Bolin, Charleston IL
	Tr	XHRA	Guadalajara, Jal.	1480	Michael Dalton, Clearwater FL
	MS		NONE		
	Au	KMUW	KS Wichita	640	Russ Brown, St. Joseph MI
89.2	Es	XEJT	Tampico, Tams.	990	Glenn Hauser, Enid OK
89.3	Es	WPCS	FL Pensacola	1420	Fred McCormack, Des Lacs ND
	Tr	WPCS	FL Pensacola	800	Russ Brown, St. Joseph MI
	MS	WHKW	WI Chilton	tie	Carlton Howington, Uniontown OH
	Au	WCAL	MN Northfield	1165	Glenn Hauser, Von Ormy TX
89.4	Es	TGD	Quetzaltenango, Guat	1095	Frank Merrill, Milan MI
89.5	Es	WPKN	CT Bridgeport	1365	Glenn Hauser, Von Ormy TX
	Tr	WMOT	TN Murfreesboro	840	Robert Cooper, Oklahoma City OK
	MS	WNIU	IL DeKalb	1035	Glenn Hauser, Von Ormy TX
	Au	WPKN	CT Bridgeport	790	Andy Bolin, Charleston IL
89.6	Es	TGDX	Guatemala, Guat.	1130	Glenn Hauser, Von Ormy TX
89.7	Es	WMCU	FL Miami	1510	John Ebeling, Bloomington MN
	Tr	WMCU	FL Miami	1155	Glenn Hauser, Von Ormy TX
	MS	KGCC	TX Denison	1120	Larry Vogt, Springfield VA
	Au	WGBH	MA Boston	905	Andy Bolin, Charleston IL
89.9	Es	WJCT	FL Jacksonville	1625	Fred McCormack, Des Lacs ND
	Tr	WJCT	FL Jacksonville	1020	Glenn Hauser, Von Ormy TX
	MS	WHSa	WI Brule	905	Larry Vogt, Springfield VA
	Au	WHSa	WI Brule	505	Frank Merrill, Milan MI
90.0	Es	YSU	ES San Salvador	1205	Glenn Hauser, Von Ormy TX
90.1	Es	WOI	IA Ames	1425	Gil Morgan, Santa Ana CA
	Tr	KPFT	TX Houston	785	Andy Bolin, Charleston IL
	MS	WMBI	IL Chicago	1065	Glenn Hauser, Von Ormy TX
	Au	WMBI	IL Chicago	545	Al Kopec, Himrod NY
90.3	Es	WAFR	NC Durham	1425	Fred McCormack, Des Lacs ND
	Tr	WHLA	WI Holmen	800	Larry Vogt, Springfield VA
	MS	WHLA	WI Holmen	1085	Glenn Hauser, Von Ormy TX
	Au	WPLN	TN Nashville	685	John Ebeling, Bloomington MN
90.5	Es	CMQ	Habana, Cuba	1415	Fred Nordquist, N. Syracuse NY
	Tr	WKAR	MI East Lansing	930	Richard Wood, Baton Rouge LA
	MS	KXCV	MO Marysville	790	Glenn Hauser, Von Ormy TX
	Au	KXCV	MO Marysville	935	Larry Vogt, Springfield VA

FREQ	PR	CALL	LOCATION	MILES	DXER, LOCATION
90.7	Es	WFUV	NY New York	1445	Fred McCormack, Des Lacs ND
	Tr	WSMC	TN Collegedale	885	Glenn Hauser, Von Ormy TX
	MS	WHAD	WI Delafield	885	Waldo Bishop, Tallahassee FL
	Au	WFUV	NY New York	650	Russ Brown, St. Joseph MI
90.9	Es	WETA	DC Washington	1385	Glenn Hauser, Von Ormy TX
	Tr	WILL	IL Urbana	720	Ron LeBlanc, Marrero LA
	MS	KCMW	MO Warrensburg	885	Larry Vogt, Springfield VA
	Au	KCMW	MO Warrensburg	420	John Ebeling, Bloomington MN
91.1	Es	WGGL	MI Houghton	1350	Glenn Hauser, Von Ormy TX
	Tr	WFAM	FL Jacksonville	1020	Glenn Hauser, Von Ormy TX
	MS	KSJN	MN New Brighton	1130	Glenn Hauser, Von Ormy TX
	Au	KCCM	MN Moorhead	605	Russ Brown, St. Joseph MI
91.3	Es	WIPR	PR San Juan	1820	Carlton Howington, Uniontown OH
	Tr	WTHS	FL Miami	1155	Glenn Hauser, Von Ormy TX
	MS	WHHI	WI Highland	740	Larry Vogt, Springfield VA
	Au	WCNY	NY Syracuse	525	Russ Brown, St. Joseph MI
91.5	Es	WBJC	MD Baltimore	1425	Glenn Hauser, Von Ormy TX
	Tr	KANU	KS Lawrence	740	Carlton Howington, Uniontown OH
	MS	WHMD	WI Suring	1220	Glenn Hauser, Von Ormy TX
	Au	WRPI	NY Troy	505	Frank Merrill, Milan MI
		KANU	KS Lawrence	tie	Russ Brown, St. Joseph MI
91.7	Es	KOSU	OK Stillwater	1335	Shelby Remington, New Haven CT
	Tr	KOSU	OK Stillwater	790	Bruce Elving, Adolph MN
	MS	KOSU	OK Stillwater	790	Bruce Elving, Adolph MN
	Au	KOSU	OK Stillwater	700	Russ Brown, St. Joseph MI
91.9	Es	WSIU	IL Carbondale	1725	Jim Pizzi, Santa Maria CA
	Tr	WSIU	IL Carbondale	810	Glenn Hauser, Von Ormy TX
	MS	WHRM	WI Rib Mountain	1005	Richard Wood, Baton Rouge LA
	Au	WSIU	IL Carbondale	505	John Ebeling, Bloomington MN
92.0	Es	XEBJ	Cd Victoria, Tams.	895	Glenn Hauser, Enid OK
92.1	Es	CKY	MB Winnipeg	1435	Ron LeBlanc, Marrero LA
	Tr	WRLS	WI Hayward	790	Robert Cooper, Oklahoma City OK
	MS	WFNY	WI Racine	715	Robert Cooper, Oklahoma City OK
	Au		NONE		
92.15	Es	CMBC	Habana, Cuba	1330	Glenn Hauser, Enid OK
92.3	Es	WDBO	FL Orlando	1740	Fred McCormack, Des Lacs ND
	Tr	WDBO	FL Orlando	1065	Glenn Hauser, Von Ormy TX
	MS	WCOV	AL Montgomery	955	Shelby Remington, New Haven CT
	Au	WTTV	IN Bloomington	520	John Ebeling, Bloomington MN
92.5	Es	WPAP	FL Panama City	1505	Fred McCormack, Des Lacs ND
	Tr	KYND	TX Pasadena	985	Russ Brown, St. Joseph MI
	MS	WIFI	PA Philadelphia	1105	Richard Wood, Baton Rouge LA
	Au	CFQR	QB Montreal	680	Russ Brown, St. Joseph MI
92.7	Es	WMCF	FL Stuart	1500	Bruce Elving, Adolph MN
	Tr	CKSO	ON Sudbury	610	Dennis Moe, St. Ansgar IA
	MS	WDUX	WI Waupaca	430	Peter Sawatzky, Waterloo ON
	Au		NONE		
92.9	Es	KFYR	ND Bismarck	1435	Waldo Bishop, Tallahassee FL
	Tr	WZGC	GA Atlanta	890	Glenn Hauser, Von Ormy TX
	MS	KITY	TX San Antonio	1235	Carlton Howington, Uniontown OH
	Au	WVNY	VT Burlington	855	Andy Bolin, Charleston IL
93.1	Es	WPAT	NJ Paterson	1435	Fred McCormack, Des Lacs ND
	Tr	WDDS	NY Syracuse	820	Bruce Elving, Adolph MN
	MS	KBHB	SD Sturgis	1175	Richard Wood, Baton Rouge LA
	Au		NONE		
93.2	Es	XHQQ	NL Monterrey	1375	Russ Brown, St. Joseph MI
	Tr	XHQQ	NL Monterrey	265	Glenn Hauser, Von Ormy TX
93.3	Es	KTEN	OK Ada	1435	Richard Steinberger, Hudson MA
	Tr	WFLA	FL Tampa	995	Glenn Hauser, Von Ormy TX
	MS	KTEN	OK Ada	1040	Peter Sawatzky, Waterloo ON
	Au	WBBW	OH Youngstown	680	John Ebeling, Bloomington MN
93.5	Es	WCFA	PA Clearfield	1385	Glenn Hauser, Von Ormy TX
	Tr	WMPL	MI Hancock	610	Fred McCormack, Des Lacs ND
	MS	KCHF	SD Sioux Falls	515	Andy Bolin, Charleston IL
	Au		NONE		
93.7	Es	WJIT	PR San Juan	2275	Robert Cooper, Oklahoma City OK
	Tr	KBNO	TX Houston	1090	Carlton Howington, Uniontown OH
	MS	WCCM	MA Lawrence	1475	Robert Cooper, Oklahoma City OK
	Au	KWYR	SD Winner	655	Andy Bolin, Charleston IL

FREQ	PR	CALL	LOCATION	MILES	DXER, LOCATION
93.9	Es	KSIX	TX Corpus Christi	1430	Fred McCormack, Des Lacs ND
	Tr	WBUS	FL Miami Beach	1155	Glenn Hauser, Von Ormy TX
	MS	WBAG	NC Burlington	1005	Robert Cooper, Oklahoma City OK
94.0	Au	KKLS	SD Rapid City	830	Andy Bolin, Charleston IL
	Es	XET	NL Monterrey	1375	John Ebeling, Bloomington MN
	Es	WYSP	PA Philadelphia	1515	Glenn Hauser, Von Ormy TX
94.1	Tr	WVFM	FL Lakeland	1015	Glenn Hauser, Von Ormy TX
	MS	KBPO	TX Beaumont	935	Russ Brown, St. Joseph MI
	Au	WQXI	GA Smyrna	585	Russ Brown, St. Joseph MI
94.3	Es	KVFM	CA San Fernando	1495	Dennis Moe, St. Ansgar IA
	Tr	WGMW	FL Riviera Beach	1155	Glenn Hauser, Von Ormy TX
	MS	WUUU	TN Oak Ridge	1220	Fred McCormack, Des Lacs ND
94.5	Au	CFRW	MB Winnipeg	745	Russ Brown, St. Joseph MI
	Es	KELT	TX Harlingen	1530	Peter Sawatzky, Waterloo ON
	Tr	KSMB	LA Lafayette	875	Russ Brown, St. Joseph MI
94.7	MS	KROK	LA Shreveport	1045	Peter Sawatzky, Waterloo ON
	Au	WRVQ	VA Richmond	570	Russ Brown, St. Joseph MI
	Es	WDSO	DE Dover	1475	Glenn Hauser, Von Ormy TX
94.8	Tr	KTTS	MO Springfield	670	Bruce Elving, Duluth MN
	MS	WPTF	NC Raleigh	1065	Glenn Hauser, Enid OK
	Au	WXXI	MS Jackson	tie	Fred Nordquist, N. Syracuse NY
94.9	Es	TGDX	Guatemala, Guat.	1130	Frank Merrill, Milan MI
	Es	CKQS	ON Oshawa	1480	Glenn Hauser, Von Ormy TX
	Tr	WOCN	FL Miami Beach	1160	Glenn Hauser, Von Ormy TX
95.0	MS	WDBJ	VA Roanoke	1205	Glenn Hauser, Von Ormy TX
	Au	KFMG	IA Des Moines	600	Fred McCormack, Des Lacs ND
	Es	ZFB	Hamilton, Bermuda	1375	Russ Brown, St. Joseph MI
95.1	Es	KRDO	CO Colorado Springs	1470	Larry Vogt, Springfield VA
	Tr	WJAX	FL Jacksonville	1020	Glenn Hauser, Von Ormy TX
	MS	WTMA	SC Charleston	1130	Glenn Hauser, Von Ormy TX
95.3	Au	KICT	KS Wichita	645	Russ Brown, St. Joseph MI
	Es	CKDS	ON Hamilton	1415	Glenn Hauser, Von Ormy TX
	Tr	WTLN	FL Apopka	1035	Glenn Hauser, Von Ormy TX
95.4	MS	NONE	NONE		
	Au	CKDS	ON Hamilton	375	Shelby Remington, New Haven CT
	Tr	XHOX	Tampico, Tams.	495	Glenn Hauser, Von Ormy TX
95.5	Es	WTVY	AL Dothan	1445	Fred McCormack, Des Lacs ND
	Tr	WTVY	AL Dothan	800	Glenn Hauser, Von Ormy TX
	MS	KOKE	TX Austin	tie	Waldo Bishop, Tallahassee FL
95.7	MS	KRFM	AZ Phoenix	820	Glenn Hauser, Enid OK
	Au	KBCM	IA Sioux City	465	Fred McCormack, Des Lacs ND
	Es	KHOW	CO Denver	1495	Fred Nordquist, N. Syracuse NY
95.9	Tr	WBYU	LA New Orleans	865	Russ Brown, St. Joseph MI
	MS	WHDL	NY Olean	1105	Glenn Hauser, Enid OK
	Au	WTAR	VA Norfolk	430	Fred Nordquist, N. Syracuse NY
96.1	Es	KLBS	CA Los Banos	1380	Glenn Hauser, Von Ormy TX
	Tr	KRSL	KS Russell	665	Glenn Hauser, Von Ormy TX
	MS	CJFM	QB Montreal	845	Andy Bolin, Charleston IL
96.3	Au	KDHL	MN Faribault	480	Fred McCormack, Des Lacs ND
	Es	WKTZ	FL Jacksonville	1465	Fred Nordquist, White Sands NM
	Tr	WKTZ	FL Jacksonville	1020	Glenn Hauser, Von Ormy TX
96.5	MS	KFMC	UT Provo	1050	Glenn Hauser, Von Ormy TX
	Au	WKLS	GA Atlanta	590	Russ Brown, St. Joseph MI
	Es	WJIZ	GA Albany	1470	Fred McCormack, Des Lacs ND
96.7	Tr	KLLL	TX Lubbock	1190	Michael Dalton, Clearwater FL
	MS	WMYQ	FL Miami	1050	Andy Bolin, Charleston IL
	Au	NONE	NONE		
96.9	Es	WHOO	FL Orlando	1390	Bruce Elving, Duluth MN
	Tr	KIOU	TX Corpus Christi	965	Andy Bolin, Charleston IL
	MS	KIOU	TX Corpus Christi	1160	Russ Brown, St. Joseph MI
96.9	Au	WTIC	CT Hartford	555	Frank Merrill, Milan MI
	Es	KDLR	ND Devils Lake	1340	Ron LeBlanc, Marrero LA
	Tr	WSTC	CT Stamford	tie	Robert Cooper, Oklahoma City OK
96.9	Tr	WFOB	OH Fostoria	580	Bruce Elving, Duluth MN
	MS	NONE	NONE		
	Au	WJOL	IL Joliet	345	John Ebeling, Bloomington MN
96.9	Es	KVMV	TX McAllen	1465	Bruce Elving, Duluth MN
	Tr	WINK	FL Fort Myers	1045	Glenn Hauser, Von Ormy TX

FREQ	PR	CALL	LOCATION	MILES	DXER, LOCATION
96.9	MS	WLAV	MI Grand Rapids	790	Glenn Hauser, Enid OK
	Au	WLAV	MI Grand Rapids	400	John Ebeling, Bloomington MN
97.1	Es	KWXI	TX Fort Worth	1375	Richard Wood, Medicine Hat AB
	Tr	WEZB	LA New Orleans	865	Russ Brown, St. Joseph MI
	MS	WALT	MS Meridian	885	Peter Sawatzky, Waterloo ON
	Au	WCOW	WI Sparta	595	Fred McCormack, Des Lacs ND
97.3	Es	WIOD	FL Miami	1585	Bruce Elving, Duluth MN
	Tr	KEEZ	TX San Antonio	1100	Russ Brown, St. Joseph MI
	MS	WKBC	NC North Wilkesboro	915	Robert Cooper, Oklahoma City OK
	Au	WKWK	WV Wheeling	410	Shelby Remington, New Haven CT
97.5	Es	KINT	TX El Paso	1645	Robert Seybold, Dunkirk NY
	Tr	WPCV	FL Winter Haven	1025	Pat Dyer, San Antonio TX
	MS	KINT	TX El Paso	1140	Andy Bolin, Charleston IL
	Au	WNCQ	NY Watertown	700	Andy Bolin, Charleston IL
97.7	Es	KPUP	TX Kingsville	1460	Peter Sawatzky, Waterloo ON
	Tr	XHGL	Merida, Yucatan	720	Waldo Bishop, Tallahassee FL
	MS		NONE		
	Au	CHOM	QB Montreal	680	Russ Brown, St. Joseph MI
97.9	Es	XETIA	Guadalajara, Jal.	2020	Robert Seybold, Dunkirk NY
	Tr	WJNO	FL Palm Beach	1155	Glenn Hauser, Von Ormy TX
	MS	WNCI	OH Columbus	1080	Fred McCormack, Des Lacs ND
	Au	KDVR	IA Sioux City	220	John Ebeling, Bloomington MN
98.1	Es	KABL	CA San Francisco	1475	Glenn Hauser, Von Ormy TX
	Tr	WAFB	LA Baton Rouge	850	Russ Brown, St. Joseph MI
	MS	WLEX	KY Lexington	1105	Fred McCormack, Des Lacs ND
	Au	CHFI	ON Toronto	535	Andy Bolin, Charleston IL
98.3	Es	WSUX	DE Seaford	1460	Glenn Hauser, Von Ormy TX
	Tr	CBW	MB Winnipeg	849	Andy Bolin, Charleston IL
	MS		NONE		
	Au	WZMF	WI Menomonee Falls	250	Andy Bolin, Charleston IL
98.5	Es	KPAC	TX Port Arthur	1635	Richard Wood, Medicine Hat AB
	Tr	KQXX	TX McAllen	955	Michael Dalton, Clearwater FL
	MS	WROR	MA Boston	905	Andy Bolin, Charleston IL
	Au	WSB	GA Atlanta	590	Russ Brown, St. Joseph MI
98.6	Es	TGHR	Guatemala, Guat.	1135	Pat Dyer, San Antonio TX
98.7	Es	KBBC	AZ Phoenix	1765	Michael Dalton, Clearwater FL
	Tr	KNUS	TX Dallas	900	Michael Dalton, Clearwater FL
	MS	WMDE	NC Greensboro	1000	Glenn Hauser, Enid OK
	Au	KLOH	MN Pipestone	385	Fred McCormack, Des Lacs ND
98.9	Es	KRNY	NE Kearney	1350	Shelby Remington, New Haven CT
	Tr	KBOA	MO Kennett	740	Bruce Elving, Duluth MN
	MS	WSPA	SC Spartanburg	895	Glenn Hauser, Enid OK
	Au	WSPA	SC Spartanburg	555	Russ Brown, St. Joseph MI
99.1	Es	KSCO	CA Santa Cruz	1440	Glenn Hauser, Von Ormy TX
	Tr	KODA	TX Houston	1095	Carlton Howington, Uniontown OH
	MS	WFMK	MI East Lansing	905	Fred McCormack, Des Lacs ND
	Au	KGVM	ID Idaho Falls	595	Fred McCormack, Des Lacs ND
99.3	Es	WEZY	FL Cocoa	1420	Bruce Elving, Duluth MN
	Tr	WEZY	FL Cocoa	1080	Glenn Hauser, Von Ormy TX
	MS		NONE		
	Au		NONE		
99.5	Es	WTCX	FL St. Petersburg	1415	Bruce Elving, Duluth MN
	Tr	WQYX	FL St. Petersburg	975	Glenn Hauser, Von Ormy TX
	MS	WGAY	DC Washington	1380	Fred McCormack, Des Lacs ND
	Au	WDCX	NY Buffalo	535	Andy Bolin, Charleston IL
99.7	Es	WOOF	GA Dothan	1450	Fred McCormack, Des Lacs ND
	Tr	WLTA	GA Atlanta	890	Glenn Hauser, Von Ormy TX
	MS	WMNI	OH Columbus	1080	Fred McCormack, Des Lacs ND
	Au	WMC	TN Memphis	590	Frank Merrill, Milan MI
99.9	Es	KTSM	TX El Paso	1645	Robert Seybold, Dunkirk NY
	Tr	KROB	TX Robstown	1170	Russ Brown, St. Joseph MI
	MS	WVAF	WV Charleston	895	Glenn Hauser, Enid OK
	Au	KFAB	NE Omaha	550	Fred McCormack, Des Lacs ND
100.1	Es	WIVE	VA Ashland	1420	Fred McCormack, Des Lacs ND
	Tr	KMHL	MN Marshall	565	Glenn Hauser, Enid OK
	MS		NONE		
	Au	WIVE	VA Ashland	555	Russ Brown, St. Joseph MI
100.3	Es	KIQQ	CA Los Angeles	2150	Michael Dalton, Clearwater FL
	Tr	KBER	TX San Antonio	955	Michael Dalton, Clearwater FL

## Alltime TV-FM DX Records

TENTH ANNIVERSARY ISSUE

FREQ	PR	CALL	LOCATION	MILES	DXER, LOCATION
100.3	MS	KBOX	TX Dallas	1100	Fred McCormack, Des Lacs ND
	Au	KLIR	CO Denver	700	John Ebeling, Bloomington MN
100.5	Es	WCMS	VA Norfolk	1505	Fred McCormack, Des Lacs ND
	Tr	WEAI	IL Jacksonville	810	Fred McCormack, Des Lacs ND
	MS	WKEE	WV Huntington	355	Glenn Hauser, Enid OK
	Au	WCMS	VA Norfolk	655	Russ Brown, St. Joseph MI
100.7	Es	WDAE	FL Tampa	1750	Fred McCormack, Des Lacs ND
	Tr	WTJS	TN Jackson	790	Bruce Elving, Adolph MN
	MS	WMJR	FL Fort Lauderdale	1260	Glenn Hauser, Enid OK
	Au	KGBI	NE Omaha	550	Fred McCormack, Des Lacs ND
100.9	Es	KSRT	CA Tracy	1420	Glenn Hauser, Von Ormy TX
	Tr	WRCO	WI Richland Center	660	Robert Cooper, Oklahoma City OK
	MS		NONE		
	Au	KQAD	MN Luverne	420	Fred McCormack, Des Lacs ND
101.1	Es	CFMI	BC New Westminster	1815	Russ Brown, St. Joseph MI
	Tr	KLLOL	TX Houston	980	Russ Brown, St. Joseph MI
	MS	WRED	OH Youngstown	975	Glenn Hauser, Enid OK
	Au	WBAV	WI Green Bay	695	Fred McCormack, Des Lacs ND
101.3	Es	WDM	SC Sumter	1480	Fred McCormack, Des Lacs ND
	Tr	KMIO	TX Sinton	900	Michael Dalton, Clearwater FL
	MS	KQTY	KS Wichita	540	Glenn Hauser, Albuquerque NM
	Au	WEZO	NY Rochester	1210	Fred McCormack, Des Lacs ND
101.5	Es	CJBR	QB Rimouski	1480	Fred McCormack, Des Lacs ND
	Tr	WLYF	FL Miami	1155	Glenn Hauser, Von Ormy TX
	MS		NONE		
	Au	WBIE	GA Marietta	580	Russ Brown, St. Joseph MI
101.7	Es	WJJS	VA Lynchburg	1365	Fred McCormack, Des Lacs ND
	Tr	WTGR	SC Myrtle Beach	620	Shelby Remington, New Haven CT
	MS		NONE		
	Au	WILS	MI Lansing	295	Andy Bolin, Charleston IL
101.9	Es	WCIB	MA Falmouth	1580	Fred McCormack, Des Lacs ND
	Tr	WWL	LA New Orleans	905	Carlton Howington, Uniontown OH
	MS	KFNB	OK Oklahoma City	680	John Ebeling, Bloomington MN
	Au	WRIG	WI Wausau	625	Fred McCormack, Des Lacs ND
102.1	Es	KLYX	TX Houston	1415	Fred Nordquist, N. Syracuse NY
	Tr	KLYX	TX Houston	980	Russ Brown, St. Joseph MI
	MS	WRNL	VA Richmond	980	Bruce Elving, Duluth MN
	Au	KFWD	TX Fort Worth	680	Andy Bolin, Charleston IL
102.3	Es	WWSR	VT Saint Albans	1380	Fred McCormack, Des Lacs ND
	Tr	KBIC	TX Alice	970	Michael Dalton, Clearwater FL
	MS		NONE		
	Au	WWSR	VT Saint Albans	695	Russ Brown, St. Joseph MI
102.5	Es	WTSP	FL St. Petersburg	1415	Bruce Elving, Duluth MN
	Tr	WBEN	NY Buffalo	1085	Richard Wood, Baton Rouge LA
	MS	KQV	PA Pittsburgh	740	John Ebeling, Bloomington MN
	Au	WBEN	NY Buffalo	740	John Ebeling, Bloomington MN
102.7	Es	KTFM	TX San Antonio	1390	Peter Sawatzky, Waterloo ON
	Tr	KTFM	TX San Antonio	970	Michael Dalton, Clearwater FL
	MS	KCYS	WA Richland	1015	Glenn Hauser, Albuquerque NM
	Au	KORD	WA Richland	850	Fred McCormack, Des Lacs ND
102.9	Es	KPSE	CA San Diego	1345	Fred McCormack, Des Lacs ND
		WHKY	NC Hickory	tie	Fred McCormack, Des Lacs ND
	Tr	KQUE	TX Houston	1095	Carlton Howington, Uniontown OH
	MS	WRBL	GA Columbus	975	John Ebeling, Bloomington MN
	Au	WCCO	MN Minneapolis	460	Fred McCormack, Des Lacs ND
103.1	Es	KWXY	CA Cathedral City	1205	Glenn Hauser, Calgary AB
	Tr	WZZW	GA Augusta	540	Ron LeBlanc, Marrero LA
	MS		NONE		
	Au	KJAM	SD Madison	360	Fred McCormack, Des Lacs ND
103.3	Es	WESR	VA Tasley	1485	Fred McCormack, Des Lacs ND
	Tr	KEEE	TX Nacogdoches	975	Carlton Howington, Uniontown OH
	MS	KNTD	TX Wichita Falls	1345	John Jefferson, Concord CA
	Au	WYSL	NY Buffalo	540	Andy Bolin, Charleston IL
103.5	Es	KOA	CO Denver	1345	Robert Seybold, Dunkirk NY
	Tr	WSHE	FL Fort Lauderdale	1155	Glenn Hauser, Von Ormy TX
	MS	KOA	CO Denver	895	Andy Bolin, Charleston IL
	Au	KOA	CO Denver	695	John Ebeling, Bloomington MN
103.7	Es	WEZS	VA Richmond	1425	Fred McCormack, Des Lacs ND
	Tr	KRMH	TX San Marcos	940	Michael Dalton, Clearwater FL



FREQ	PR	CALL	LOCATION	MILES	DXER, LOCATION
103.7	MS	KVIL	TX Dallas	1165	Peter Sawatzky, Waterloo ON
	Au	KJAN	IA Atlantic	570	Fred McCormack, Des Lacs ND
103.9	Es	KGRD	NM Las Cruces	1265	Bruce Elving, Duluth MN
	Tr	WCLD	MS Cleveland	620	Michael Dalton, Clearwater FL
	MS		NONE		
	Au		NONE		
104.1	Es	KRBE	TX Houston	1400	Fred Nordquist, N. Syracuse NY
	Tr	KRBE	TX Houston	980	Russ Brown, St. Joseph MI
	MS	WLAG	GA La Grange	1025	Bruce Elving, Duluth MN
	Au	WIKY	IN Evansville	560	John Ebeling, Bloomington MN
104.3	Es	WBBQ	GA Augusta	1440	Fred McCormack, Des Lacs ND
	Tr	KBEY	MO Kansas City	630	Richard Wood, Baton Rouge LA
	MS	WOMC	MI Detroit	885	Glenn Hauser, Enid OK
	Au	KBEY	MO Kansas City	470	Russ Brown, St. Joseph MI
104.5	Es	WEAT	FL West Palm Beach	1880	Fred McCormack, Des Lacs ND
	Tr	KEXL	TX San Antonio	970	Michael Dalton, Clearwater FL
	MS	KEXL	TX San Antonio	1100	Russ Brown, St. Joseph MI
	Au	WWST	OH Wooster	635	John Ebeling, Bloomington MN
104.7	Es	WDOL	GA Athens	1865	Bill Frahm, Boise ID
	Tr	WJLN	AL Birmingham	960	Bruce Elving, Duluth MN
	MS	KRES	MO Moberly	825	Glenn Hauser, Albuquerque NM
	Au	KIOV	SD Sioux Falls	520	Andy Bolin, Charleston IL
104.9	Es	KSMI	LA Donaldsonville	1370	Fred McCormack, Des Lacs ND
	Tr	WNRE	OH Circleville	680	Bruce Elving, Duluth MN
	MS		NONE		
	Au		NONE		
105.1	Es	WAVA	VA Arlington	1390	Glenn Hauser, Von Ormy TX
	Tr	WWQS	FL Orlando	1045	Glenn Hauser, Von Ormy TX
	MS	WYOR	FL Coral Gables	1050	Carlton Howington, Uniontown OH
	Au	WSOM	OH Salem	680	John Ebeling, Bloomington MN
105.3	Es	WAGI	SC Gaffney	1370	Fred McCormack, Des Lacs ND
	Tr	WVSL	LA Slidell	840	Russ Brown, St. Joseph MI
	MS	KXXK	TX Dallas	1100	Fred McCormack, Des Lacs ND
	Au	WDAS	PA Philadelphia	605	Russ Brown, St. Joseph MI
105.5	Es	WRAR	VA Tappahannock	1435	Fred McCormack, Des Lacs ND
	Tr	WGUL	FL New Port Richey	965	Glenn Hauser, Von Ormy TX
	MS		NONE		
	Au	WXEZ	OH Sylvania	280	Andy Bolin, Charleston IL
105.7	Es	CHSC	ON St. Catherines	1440	Glenn Hauser, Von Ormy TX
	Tr	WOOD	MI Grand Rapids	915	Richard Wood, Baton Rouge LA
	MS	WOOD	MI Grand Rapids	790	Glenn Hauser, Enid OK
	Au	KXEL	IA Waterloo	600	Fred McCormack, Des Lacs ND
105.9	Es	WXRA	VA Woodbridge	1380	Glenn Hauser, Von Ormy TX
	Tr	WAXY	FL Fort Lauderdale	1155	Glenn Hauser, Von Ormy TX
	MS	WLAC	TN Nashville	1120	Fred McCormack, Des Lacs ND
	Au	KBPI	CO Denver	685	John Ebeling, Bloomington MN
106.1	Es	CJOY	ON Guelph	1415	Glenn Hauser, Von Ormy TX
	Tr	KDNT	TX Denton	935	Michael Dalton, Clearwater FL
	MS		NONE		
	Au	KDNT	TX Denton	655	Andy Bolin, Charleston IL
106.3	Es	WVIP	NY Mount Kisco	1335	Glenn Hauser, Enid OK
	Tr	KPAN	TX Hereford	1250	Michael Dalton, Clearwater FL
	MS		NONE		
	Au	KVWO	WY Cheyenne	940	Russ Brown, St. Joseph MI
106.5	Es	WADV	NY Buffalo	1440	Glenn Hauser, Von Ormy TX
	Tr	WFML	IN Washington	975	Fred McCormack, Des Lacs ND
	MS	WSTP	NC Salisbury	965	Glenn Hauser, Enid OK
	Au	WKBV	IN Richmond	545	John Ebeling, Bloomington MN
106.7	Es	WPDC	PA Elizabethtown	1350	Fred McCormack, Des Lacs ND
	Tr	WYEN	IL Des Plaines	790	Fred McCormack, Des Lacs ND
	MS	WWWW	MI Detroit	885	Glenn Hauser, Enid OK
	Au	WDTM	MI Detroit	535	John Ebeling, Bloomington MN
106.9	Es	KMPX	CA San Francisco	1340	Glenn Hauser, Enid OK
	Tr	KNRO	TX Conroe	1070	Carlton Howington, Uniontown OH
	MS		NONE		
	Au	KROC	MN Rochester	525	Fred McCormack, Des Lacs ND
107.1	Es	WGRP	PA Greenville	1320	Glenn Hauser, Von Ormy TX
	Tr	KASI	IA Ames	630	Carlton Howington, Uniontown OH
	MS	KDUZ	MN Hutchinson	620	Glenn Hauser, Stillwater OK
	Au		NONE		

FREQ	PR	CALL	LOCATION	MILES	DXER, LOCATION
107.3	Es	WHYD	GA Columbus	1395	Fred McCormack, Des Lacs ND
	Tr	WANS	SC Anderson	1000	Glenn Hauser, Von Ormy TX
	MS	WBWA	FL St. Petersburg	1085	Peter Sawatzky, Waterloo ON
107.5	Au	WEOL	OH Elyria	610	John Ebeling, Bloomington MN
	Es	WBOW	PA Boyertown	1500	Glenn Hauser, Von Ormy TX
	Tr	WBOW	IN Terre Haute	660	Richard Wood, Baton Rouge LA
107.7	MS	WTRF	WV Wheeling	915	Glenn Hauser, Stillwater OK
	Au	WCCN	WI Neillsville	580	Fred McCormack, Des Lacs ND
	Es	BVIV	NY Wethersfield	1450	Pat Dyer, San Antonio TX
107.9	Tr	WNCT	NC Greenville	835	Ron LeBlanc, Marrero LA
	MS	KWIC	TX Beaumont	1185	Peter Sawatzky, Waterloo ON
	Au	KICD	IA Spencer	470	Fred McCormack, Des Lacs ND
	Es	CBJE	QB Chicoutimi	1415	Fred McCormack, Des Lacs ND
	Tr	WIRK	FL West Palm Beach	1150	Glenn Hauser, Von Ormy TX
	MS	WBT	NC Charlotte	950	Glenn Hauser, Enid OK
	Au	WOBT	WI Rhinelander	600	Fred McCormack, Des Lacs ND

## WTFDA'S GUIDELINES FOR COMPUTING TV-FM DISTANCE RECORDS AND SCOREBOARD TOTALS

1. A TV station received on more than one channel (when it changes channels, but retains its identity) may be counted once for each channel, excluding changes in offset on the same channel. Simultaneous reception of the same station on more than one channel is usually a receiver problem only, though you may present evidence to the contrary. An FM station may be counted again when it deliberately changes frequencies, or varies more than 100 kHz from its normal frequency. The DXer should be certain he is not counting receiver images or mixing products.
2. Stations operating successively on the same channel in a single city that are clearly unrelated (i.e. with different call letters and a hiatus in occupation of the channel, or non-renewal of the first station's license, such as WHDH and WCVB) are counted as separate stations.
3. A move in a station's transmitter location does not allow it to count as a new station unless the city of license also changes. Thus, a station starting in a small city and later moving both transmitter and identity to a larger city, if received during both phases of operation, will count twice. Stations moving antenna from downtown to suburbs, for example, with no change in the city of license, count only once.
4. A change in call letters per se is not sufficient reason to count that station as new, whether or not a change of ownership is involved in a continuously operating station. Power level or changes in power alone shall have no bearing on these guidelines.
5. Sharetime stations (e.g. WPBT and WTHS) count as one if they share their transmitter; individually if they have separate transmitter sites.
6. DX received via CATV may be counted if the station was received off the air on its original frequency at the CATV headend, from which distances must be measured. Totals including CATV should be so specified.
7. The precise location of the transmitting antenna of the station shall be the determining factor in computing the DX path distance and tallying the number of political units received.
8. Verification is not required; however, contributors must be reasonably certain that all stations claimed were received. Those totals limited to verified only should be labeled as such.
9. DX obtained by recording only, and not witnessed at the actual time of reception, is eligible--so long as the contributor himself chose the frequency and prepared the recording apparatus. When more than one DXer is present at a DX reception, even as a visitor to another DXer's shack, only those having an active part in the reception may claim the DX.
10. Any station licensed to broadcast on the FM or TV bands is eligible, but transmissions outside the 54-108, 174-216 and 470-890 MHz bands is beyond our scope. Translators and experimental stations, as well as unlicensed outlets such as pirates and clandestines, are eligible. Harmonics of TV video signals are eligible if they fall within another TV band, and those of FM stations are eligible if the harmonics fall within the FM band. But utility stations monitored on FM or TV, and CATV radiation, do not count.
11. Any DX received within a 50-mile radius of a DXer's primary location may be included in scoreboard totals; but if more than two locations are used, all must be within an equilateral triangle 50 miles on each side. Include all stations eligible and monitored in scoreboard totals, whether "local" or actual DX.

-END-

# AN EDITOR'S FAREWELL

by Clarke Ingram

When I became editor-in-chief of our Digest in early 1977, I must admit I had only a dim view of what would ensue, though I knew at the outset that my plan for reviving the magazine would be one of action. Relegating club problems to committees or to membership vote had only left them unsolved; I had therefore confirmed my intent to take charge and make changes as no VUD editor or Board member had done before. Even so, such problems as sparse technical material and falling membership were not eliminated for many months. Others, such as inconsistent columns and oversized DX reports, were more easily resolved. But it would not be until mid-1977 that the improvements would be complete.

I am therefore pleased to be able to rest on my laurels after 24 busy issues, this one the busiest of all, and view WTFDA as a dynamic, rapidly growing DX organization: its membership and bank balance higher than ever, a capable HQ crew in Indiana and an able editorial successor--Frank Aden--on the sidelines. It is, thankfully, on these happy notes that I conclude my Digest editorship.

During my two years in this post, much unneeded controversy was raised on the matter of late issues. Since this will be my last opportunity to tackle this subject, I will not rehash old arguments which are now quite moot, but shall simply note that if delays in issuing a magazine are the only problem facing a DX organization, then that club is a lucky one indeed, and in better shape than most. I take pride in stating that ALL other problems which confronted WTFDA at the start of my term in office--slim issues and the need for a club reprint service, among others, plus those mentioned earlier--were eradicated; our club and its Digest, in all respects, are in finer shape than ever before. And the VUD has traditionally been late; even in the lean 1974-75 era, Morrie Goldman and Don Ruland could be seen more often than not apologizing for late issues on Digest pages. The debate, however, becomes purely academic; let me only note for the record that VUD delays played only an indirect, minor role in my resignation, despite what some members are trying to suggest.

There are far better things upon which I reflect: the warm, genuine accolade I received at the 1976 WTFDA convention; my nomination and near-win for "DX Man of the Year" at last year's ANARC gathering; the creation of our Reprint Service; and the gradual transformation of the VHF-UHF Digest into a tightly organized, technically oriented, streamlined, professional magazine. Of this I am most proud. I have never been ashamed of the product I produce, which is more than can be said of some DX magazines and editors (and even some past VUD personnel). There are those who maintain that a DX "bulletin" should be exactly that and nothing more; I disagree with such attitudes, and feel quite fortunate that no one of such viewpoints has yet handled the VUD! For these, there will always be clubs such as IRCA which do not profess to be issuing a professional publication--and other, smaller groups which haven't yet tried.

Unlike some past Digest editors who seem to have slipped into oblivion and do not contribute much to our club or magazine, I plan to remain active in WTFDA. For several months, I have considered a retirement option, and am now pleased to be able to announce it: Beginning shortly, I'll be heading the FCC TV NEWS column, which I plan to expand to include more useful data on television not only in North America, but worldwide as well. The first edition of the column under my direction will most likely appear in either March or April, and your contributions are most welcome!

Even had time problems not forced my choice between a career in broadcasting and DX magazine editing, this still might be my last issue. After a full two years at the helm, which have seen WTFDA back on its feet again, I strongly feel that the time has come to turn the reins of the Digest to someone else. It is interesting, though coincidental, that the resignations of many column editors were closely timed with mine. Perhaps this Tenth Anniversary edition of our VUD marks not only the end of WTFDA's first decade, but the end of an era in Digest editorial appearance and familiarity as well.

And as the era concludes, I am grateful to all those members past and present who have participated in our club since its creation. Many thanks to all for a marvelous two-year term as Digest editor. It will be always remembered.

January, 1978

Clarke Ingram, Editor-In-Chief

# WTFDA



## WTFDA's Board of Directors

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