THE BULLSHEET

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Texas DX Society

An ARRL Affiliated Club

founded 1970

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The Texas DX Society, P. O. Box 540291, Houston, TX 77254-0291

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Announcements

Meeting Notice - The Texas DX Society meets on the second Friday of each month, except when the date is changed by the Board of Directors. This month the July meeting of the TDXS will take place the evening of **Friday, July 9, 1993.**
This meeting will be held at **Moose's Restaurant at 5423 Bellaire Blvd**. The restaurant is located on the south side of Bellaire just east of its intersection with Chimney Rock. It is in the middle of a small strip shopping center. There is ample parking along the front of the center. We will be using a room which can be closed off from the main restaurant dining area.
Our reservations start at 6:00 P.M. Members are encouraged to plan on dining with the group so that we can properly respond to restaurant owner's hospitality. Menu prices are modest with a traditional chicken-fried-steak at $4.80. There is a salad bar. Beer is available but only with the meal. The meeting should get underway around 7:30 P.M.

N6RJ Silent Key - Noted DXer **Jim Rafferty N6RJ**, passed away on June 13 after a long illness. Rafferty, 44, was best known in DX circles for his work as a member of the ARRL's DX Advisory Committee, his development of the popular "N6RJ 2nd Op" DX operating aid, his numerous DXpedition operations, contest operations from the Cayman Islands and other Caribbean islands and the countless forums he has moderated over the years.
Rafferty was employed by Ham Radio Outlet Inc. where he served as the corporations Vice President and as manager of the chain's Anaheim California store.
N6RJ was recently honored as the first recipient of the newly created "Spirit of DXing" award created by the Southern California DX Club and presented to him on April 17 by his longtime friend Chip Margelli K7JA at the 1993 International DX Convention in Visalia, California. Services were scheduled Friday June 18th at St. Martins Church in Yorba Linda, California. (Taken from the Amateur Radio Newsline..ed)

TDXS Weekly DX and Contest Net - Each Tuesday night at **2100 CST**, the Texas DX Society sponsors a **DX and Contest net** on **147.96/36 MHz**. The purpose of this net is to exchange information of interest to DXers and contesters. The agenda includes general and club announcements, DX information, contest information, QSL routings, propagation forecasts and various related topics. It should be noted that participation is not limited to members of the TDXS, but is open to all and everyone is encouraged to join in.

DX PacketClusters - The TDXS Contest and DX PacketCluster operates on 144.970 MHz with the call **K5DX**. This cluster node is operated by Rich, K5WA from his home in southwest Houston, and is sponsored by the Texas DX Society. It is regularly linked to the Texas PacketCluster DX network. K5DX may be accessed directly, or using the TDXS97 packet node by first connecting to the TDXS97 node and then connecting to K5DX, i.e. **C TDXS97**, then **C K5DX**, all running on 144.970 MHz. K5DX is also accessible using the TDXS digipeater option, e.g. "C K5DX via TDXS")
The Brazos Valley Contest and DX PacketCluster Bulletin Board is located in Hempstead, Texas and operates on 144.990 MHz with the call **KE5IV**. This node is accessible either directly or by connecting through any of several local packet nodes, e.g. IAH, HOU, etc. The Galveston County DX PacketCluster, located in La Marque, is active under the call **KC5SC** and operates on 144.930 MHz. It is usually connected with K5DX and KE5IV via the 446.100 MHz backbone link.

Bullsheet Articles - Articles or other newsworthy items are hereby solicited by the editor. Articles should be submitted in the form of either ASCII files or as word processor files. Files may be uploaded to the TDXS area on **KB5NFN's Bulletin Board** at **713-777-0821**, or sent to the Editor. If necessary, text may be sent to via FAX to the editor by prior arrangement. Files or other messages may be sent to the editor via CompuServe or Internet to 71045.2632@compuserve.com. For those with VHF Packet ASCII text can be sent directly to the Editor. Contact W5ASP at 713-974-3455 to arrange for either fax or packet transfers. Publication deadline is the first Friday of the month.

Upcoming Events

July 09.....**Texas DX Society Monthly Meeting**
July 10.....IARU HF World Championship
July 10.....CQ WW WPX VHF Contest
August 07.....North American QSO Party CW
August 13.....Texas DX Society Monthly Meeting
August 14.....WAE European DX Contest CW
August 21.....North American QSO Party SSB
August 27.....New Orleans DX Convention

(The following article appeared in the Northern California DX Club's DXER Newsletter for June 1993..ed)

What Antenna Height is Best?

by David M. Barton, AF6S

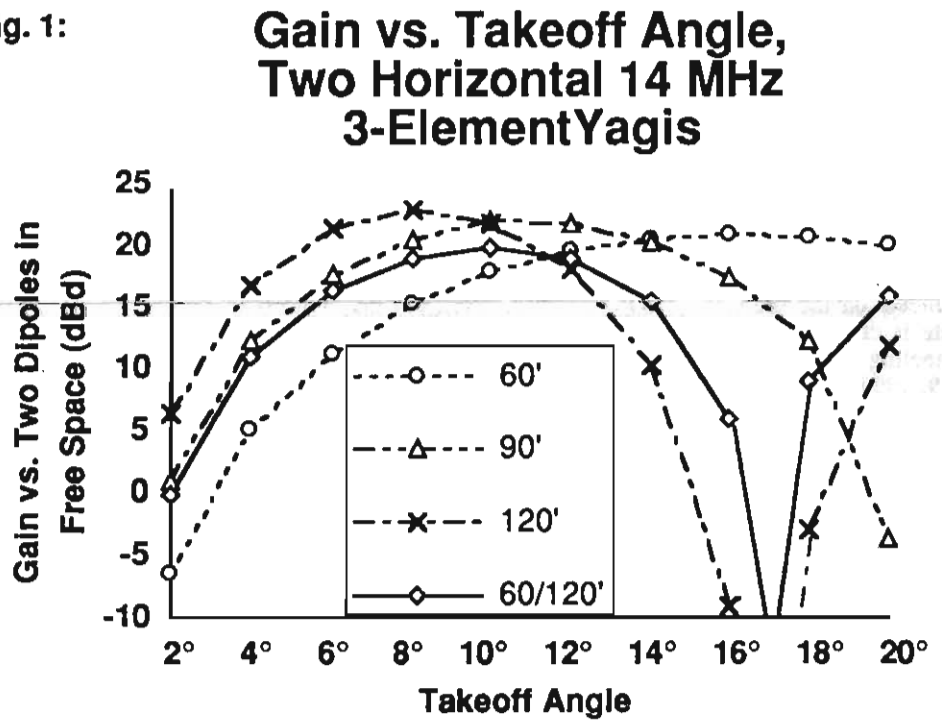
Jean Harlow said, "You can never be too thin or too rich." Likewise, a DXer might say, "An antenna can never be too big or too high." The former proposition would be difficult for most of us to test, but the latter is amenable to "virtual testing"—by way of computer modeling.

The salient factor in antenna height is its effect on the elevation pattern. For a horizontally polarized antenna over average ground, very little radiation occurs right on the horizon. But at increasing takeoff angles signal strength rises, reaching a peak at an angle that depends on antenna height. At higher-yet angles the signal falls, reaching a null at about twice the angle of that first peak. Antennas many wavelengths high produce multiple peaks and nulls. Also, the higher the antenna, the lower the angle at which the first peak occurs—the so-called "radiation angle." It's best to avoid this term; it implies radiation concentrated at one particular angle rather than spread over a continuum of angles as actually happens.

Antennas

Figure 1 graphs the gains of two antennas in combination, one transmitting and the other receiving—the case for all radio paths. Three of the curves are for equal-height 3-element yagis at 60, 90, and 120 feet on 20 meters. A fourth curve is for one 60-foot yagi and another at 120 feet. In each case, the values plotted are the sums of the gains of both antennas, including the "ground gain" over standard ground (dielectric constant: 13, conductivity: 5 mS), relative to dipoles in free space. Runs of Brian (K6STI) Beezley's MN4.5 version of Mininec, using a lossless dipole model, provided the values. I added 12 dB to simulate the 6-dB gains of 3-element yagis at both ends of a path.

Fig. 1:



Notice the variation of the first-peak elevation angle with height: 8 degrees for 120 feet, 11 degrees for 90 feet, and 16 degrees for 60 feet. The pattern null of the 120-foot antenna (and of the 60- and 120-foot yagi combination) are prominent too.

The curve for one yagi at 60 feet and one at 120 answers the old question: Does a high antenna give an advantage over a low one when the antenna on the other end is low?

Compare the curve for both antennas at 60 feet with that for one at 60 feet the other at 120 feet. Below 12 degrees, the high antenna produces a better signal—by as much as 5 dB in the 4–8 degree range—but above 12 degrees the 60-footer works better. Curiously, the crossover occurs at the same elevation angle when the other guy's antenna is up 120 feet. (diamonds vs. X-marks)

Propagation:

More than one high-frequency propagation "mode" can coexist along a single path. Over a distance of 6,000 miles, for example, a mode with three F-layer hops of 2,000 miles can coexist with a mode with four 1500-mile F-hops. On forty or eighty meters, E-layer may appear; a 6,000-mile mode could even mix two E-layer hops of 1,000 miles and two 2,000-mile F-hops.

When more than one mode exists, each will have a distinct takeoff angle. If you could measure signal strength for each mode, each would vary uniquely, because each mode's signal experiences different "difficulties" along the way.

The lowest-angle mode usually produces the strongest signal, since fewer hops mean fewer passes through absorbing D- and E-layers, and fewer earth reflections—which can scatter signals.

But low-angle signals travel farther within the D-layer, making D-layer absorbtion higher at low angles. So on the low-frequency bands, when one end of a path is in sunlight (so significant D-layer absorbtion occurs), the strongest signal can be a high-angle one.

Figure 2 shows predicted signal strengths for every mode present on 14 MHz between San Jose, California and Novosibirsk, Siberia on May 3, with solar flux of 110. (This 5437-mile path reaches 79 degrees north latitude.) I used Sheldon (W6EL) Shallon's Miniprop Plus to model the path. The values are in dB relative to Miniprop's standard default settings.

Fig. 2:

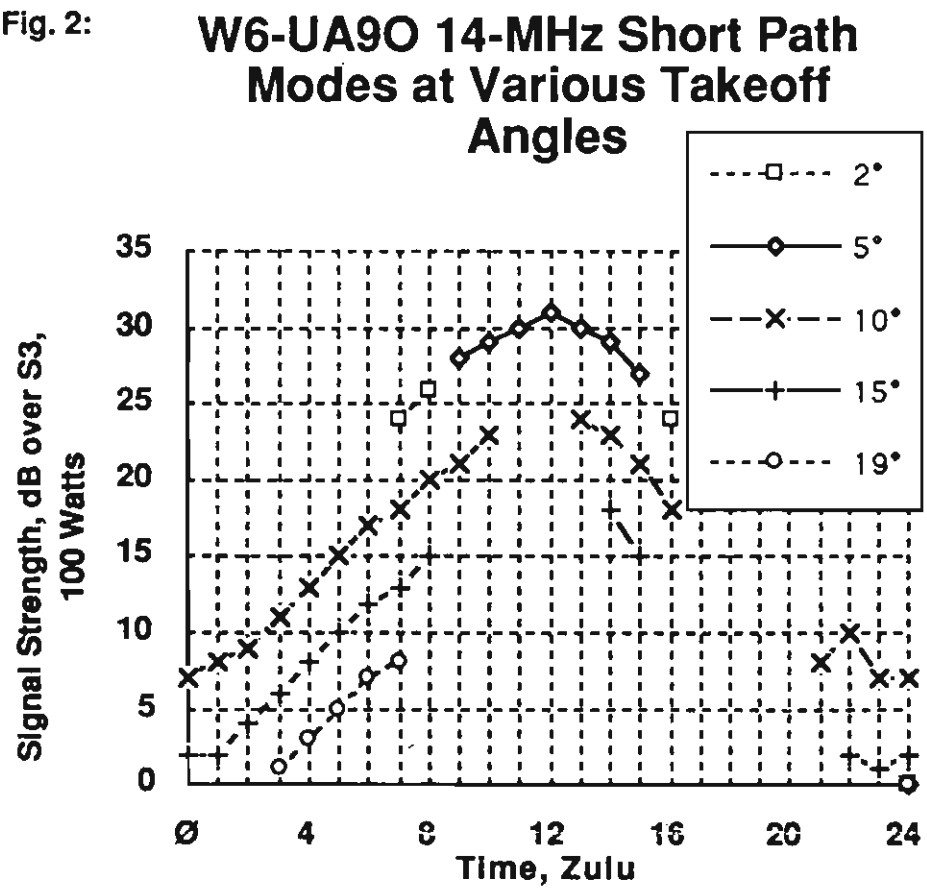
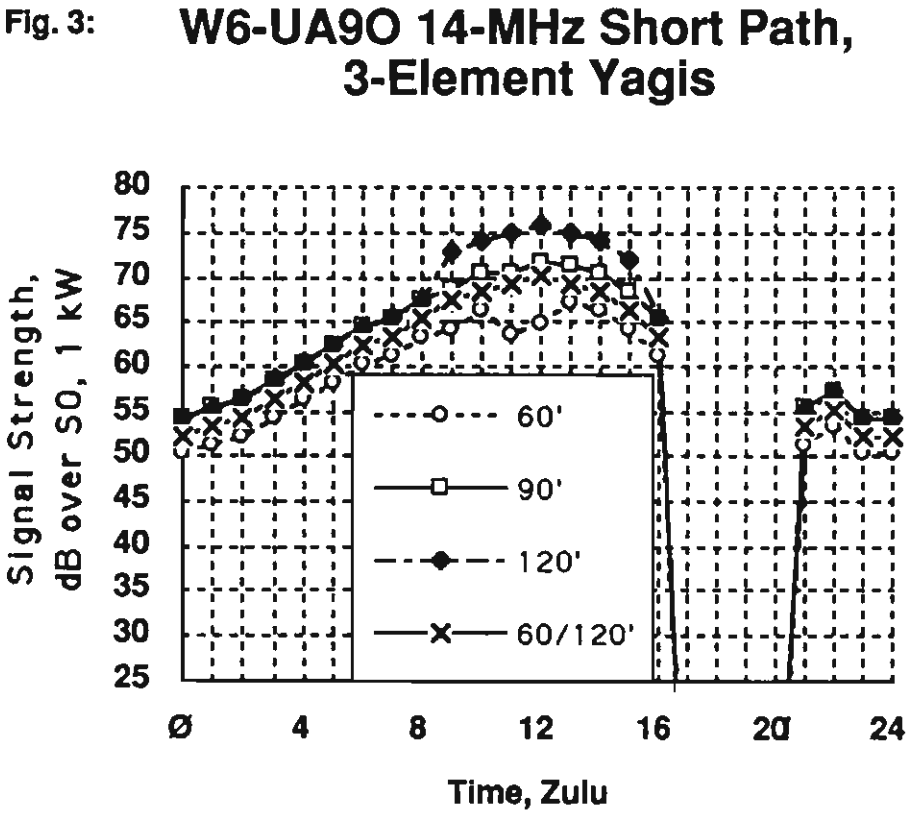


Fig. 3:



Combining Results:

If we could combine the elevation-angle variation of antenna gain with the path mode signal strength data, we could directly compare the performance of various antennas over a path. That would be difficult with real antennas, but the "virtual experiment" is easy.

With Excel (a spreadsheet), I added Miniprop path/mode signal strengths to the MN-predicted antenna-pair gains at various elevation angles, giving a signal strength for each mode. To produce familiar numbers, I increased transmit power to 1 kW and changed the 0-dB reference from S3 to S0. Assuming 5 dB per S-unit, that puts S9 at 45 dB on the graphs.

W6-UA9O SP: Figure 3 shows results for W6-UA9O on May 3, with solar flux at 110. Twenty meters remains open for nineteen hours, from 21 to 16 hours Zulu, with signal strength climbing almost the whole time. The signal peaks just before the gray-line nearly connects San Jose and Novosibirsk at around 13 Zulu.

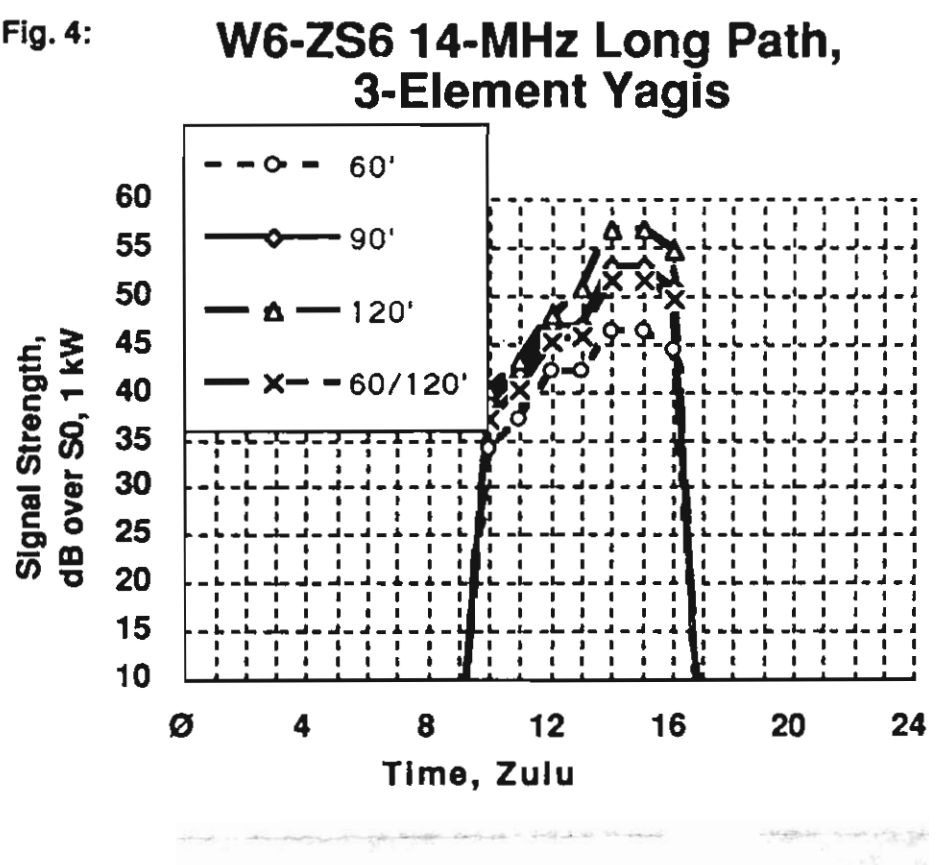
Notice the effect of antenna height. Two 120-foot antennas produce the best signals, but a *strong* 120-foot advantage exists only during the peak hours of the opening. Amazingly, the 60-foot pair is worse by only 5 dB most of the time, though in the peak hours the high antennas' advantage increases to 10 dB. The combination of a 60- and 120-footer produces signals that neatly split the difference—at all times.

W6-ZS6 via LP: Figure 4 shows results for the long path from San Jose to Johannesburg, Republic of South Africa on the same date, with solar flux of 110. Signal strength rises during most of this opening—from 10 to 16 Zulu, then falls abruptly at the end, as on the W6-UA9O path.

The long path to Joburg is weaker than the short path to Novosibirsk by almost 20 dB. The much greater distance (14,438 miles), with more hops, has more loss. Yet the signals between two 120-foot antennas are better than between 60-footers by no more than on UA9O path.

The sudden "turn-on" and "turn-off" charactarizing both of these paths indicate that MUF (maximum usable frequency) is

Fig. 4:



Notice that from 2 to 11 Zulu the low- and high-antenna signals differ by 22 dB! The high-angle modes lack sufficient MUF during the night, so they disappear. Then the low antennas must use the FF mode at 5 degrees, where their performance is poor.

When high-angle modes open, the difference is only about 6 dB. Contrary to the old canard, the 60-foot antenna is never better than the 120-foot one, whether the antenna on the other end is low or at 120 feet. DX paths always seem to favor height.

When rising MUF opens a path, or falling MUF closes it, the signal strengh changes abruptly. The lowest-angle mode always has higher MUF than high-angle modes, so the lowest-angle mode always opens first and closes last. Someone with a low antenna may observe gradual openings on paths in total darkness—where absorbtion isn't a major factor. That's usually a result of the antenna's poor low-angle performance. When higher modes open, the antenna "hears" better, so strength increases.

So heed Jean Harlow's words—well, a DXer's paraphrase of them, anyway—and "hang those 'tennas high!"

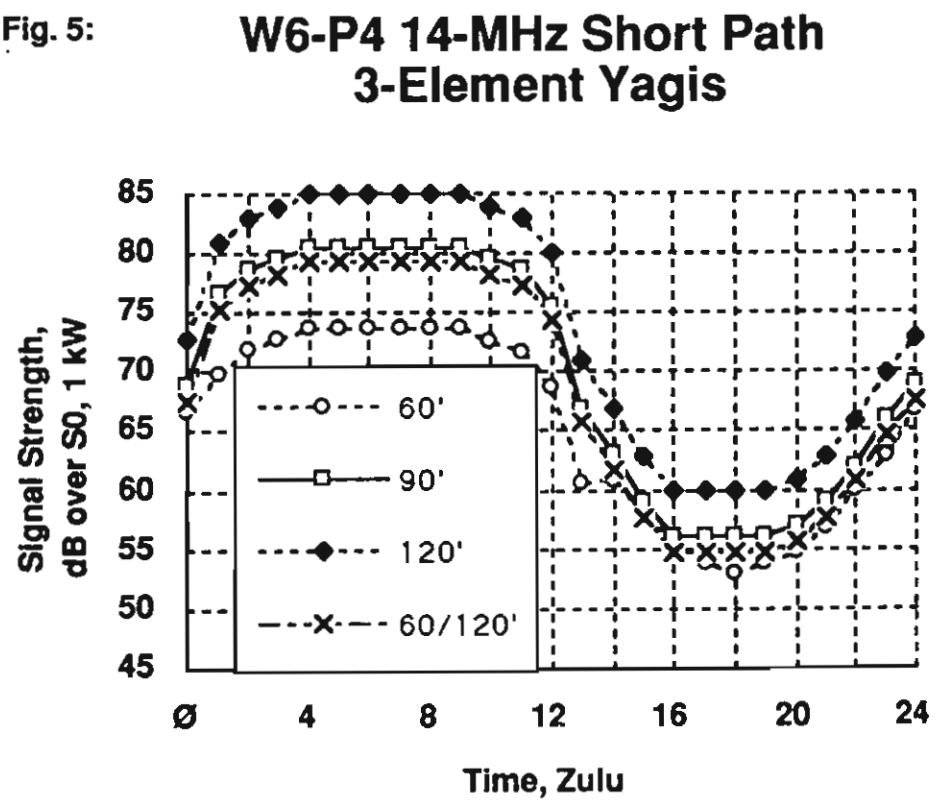
the limiting factor. Changes in D-layer absorbtion, as the amount and zenith angle of sunlight on the paths varies, cause the more gradual variations that occur during the openings.

Of course the signals could be far weaker. Miniprop cannot account for excess absorbtion caused by high-energy solar storm particles. The path to Novosibirsk is far more sensitive to these effects than that (long or short) to "Joberg," because the UA9O path reaches as far as 79 north; the highest latitudes the Joberg paths reach are 40 degrees north and 40 degrees south, for short and long path respectively.

W6-P4 via SP: Figure 5 shows the 20-meter path to Curacao, a distance of only 3639 miles, on May 3 again with solar flux of 110. The path has four modes: two F-hops (FF) at 5 degrees, 3F at 13 degrees, 4F at 19 degrees, and 5F at 24 degrees.

Signal strength is best when the whole path is in darkness, from 3 to 10 Zulu, and weakest when sun is high above the middle of the path between 16 and 20 Zulu, because D-layer absorbtion peaks then.

Fig. 5:



W3XU OPERATORS' MANUAL

By Bill Remington, W3XU

Reprinted from the April 1993 issue of *The Frankford Radio Club Newsletter*

Objective of the Contest.

With fear of being trite, the objective is to score as high as possible and to leaven the effort with some fun and humor, but the paramount objective is the score. Though this objective is obvious, keeping it in mind at all times can improve your results. Every action, every word, and every motion that does not add to the score or which doesn't spark humor is at best unproductive and, because it competes with results oriented action, etc., is probably harmful.

How do I Achieve this Objective?

You achieve the objective of ending the contest feeling like you really succeeded given the limitations of the station and your own experience and knowledge by striving to make as many valid contacts in as many countries as you possibly can.

How Do I Maximize the Number of Valid Contacts?

There is a finite number of techniques that, if practiced, will put you in the top 5% of contest operators. This is because in contesting, as in all phases of life, 85% of the people are undisciplined and/or are satisfied with mediocrity.

1. Think about how to get the job done speaking as few syllables as possible.

a. MOST IMPORTANT: Discipline yourself to copy his call right the first time. A repeat will cut your speed for that QSO at LEAST IN HALF unless the other station is located in certain Mediterranean countries, in which case pop a top 'cause you're about to settle in for awhile! Think about it!

b. Cut the extraneous chatter. Responding to an answer to your CQ:

DX: W3XU, this is Delta Juliet Nine Fox Oscar X-Ray.

YOU: Delta Juliet Nine Fox Oscar X-Ray, You're 5 by 9 in Delaware. Over, Over. WRONG!

Were there any extraneous syllables? Identify them! Improved Version:

YOU: D J 9 F 0 X 5 9 Delaware

He already knows his call; no need to phoneticize it. He knows the contest script. When you say your state, he knows you're done. No need to tell him so. The word 'in' adds nothing except time. Saying his call fast without the phonetics is not as easy as it seems. The easiest response is to repeat his call EXACTLY as he said it -- with phonetics. To de-phoneticize his call quickly takes discipline and practice.

What if the answer to the CQ goes something like this: Garble Garble Static Foxtrot Garble Splatter Splatter.

You have a decision to make: Do you respond "Foxtrot, 59 Delaware," or do you say, "QRZed Foxtrot"? The first is much faster, as your side of the QSO will be over if it works out OK. But you have a decision to make. ANSWER: Choose the faster first alternative if you believe you will eventually have a QSO with this guy, and chose the second if you believe you might not be able to conclude a complete QSO.

Confirming his Information and Seeking New Callers.

DX: W3XU, you're 5 9 200.

YOU: Thank you, sir, for the 59200. See you after the contest. Whisky Three X-Ray United standing by for contest QSO'S. Besides everything, what else is wrong with this exchange? Contrast with an improved version:

YOU: Roger. QRZed W3XU.

Alternative versions:

YOU: Thanks. QRZed W3 X-Ray United.
YOU: Thanks. QRZed

Let me list the problems with the "before" example: "Thank you" has 2 syllables when one would do. What's with the "sir"? Why repeat his report; he already knows what it is. There is typically no reason to phoneticize the call. None of the letters

has a sound close to any other letter. Besides, as often as not the stations that will pick up on the QRZed answered your CQ with the other guy that you just worked. They already have your callsign figured out. If you had a small pileup before your last QSO, there maybe isn't even a reason to give your callsign.

2. Keep in mind you are maximizing valid contacts. If you are not absolutely sure of his callsign, do NOT put him in the log! How do you know if you are sure or not? If you have even the slightest doubt that even one little old letter could even remotely be ambiguous, you NEED to get it clarified before logging the QSO. It is very useful to keep the screen on Shift F8 while you are running. My experience is that 80+ % of the callsigns you work will be in the database. If you work someone who isn't there, your eyebrows should show a discernable elevation, and the callsign bears a second thought.

Get his power(or whatever the exchange is), and get it right! If you have your screen set to F9 or F10, and you see you received a different power on another band, ask him about which is right. Keep in mind it is quite possible that he sends different powers on different bands or at different times.

3. Avoid other wasteful and foolish practices. Where to begin? Directional CQ's: CQ Japan, CQ Japan, CQ Japan. Are you telling the BY, 9V1, or even the UA0 who's tuning the band that you don't want him to call? Getting in foolish fights over frequencies... but what distinguishes a foolish fight from a prudent holding of your own?

Rule 1: Don't fight with somebody who is either bigger than you (W3LPL) or who has no receiver, ears, or brains, and who, for that reason, no matter what you do or say won't realize he is on your frequency or that it's not to his advantage to be on your frequency. If he is in the latter category, he won't even notice or care that he hasn't gotten a call on the frequency in the last ten minutes. But YOU should!

Rule 2: Don't fight with a club member. If he or she says it's not your frequency, don't argue; chances are they operate by Rule 2 also and wouldn't say it if it wasn't true or if they didn't think it was true. Some members fit both Rule 1 and Rule 2. These are guys you REALLY don't want to argue with.

How Do I Decide When to Run and When to Chase Multipliers?

There is one rule for the operator that is not experienced at operating at a competitive station. (Almost) Always Run! The inexperienced operator is not accustomed to the notion that a stateside station can dominate a frequency and have the DX come to him. This station should be able to hold a frequency on 10, 15, and 20 when propagation is advantageous to our being on that respective band. You need to use judgement to determine when you should give up a run frequency to grab a multiplier -- or when you can grab it fast enough that you won't likely need to give up the frequency. (The latter is often accomplished by leaving one VFO on your run frequency and slipping onto the multiplier frequency with the other VFO.) A feel for this comes with experience. A couple of statements of the obvious: Don't, for example, lose a frequency on 10 meters during a European run to go grab NP4Z, P40V, or 8P9DX. These guys will be there all weekend and will be begging for QSO's on Sunday afternoon. Work them when Europe is gone. On the other hand, if UI8ZAA is called out on 10m during a European run, better go get him as our opening to UI is quite short, and he won't be coming in very long.

Generally, in ARRL multi single, you should only leave the run frequency to chase specific guys on known frequencies and then, when you have sopped up all the multipliers as quickly as possible, return to running. If you can't run in any case, as is often true late in the evening, you probably have no choice but to tune for multipliers.

What Band Should I Be on?

The answer follows from the previous discussion ... 90 % of the time you should be on the band that you can run on. Do NOT pay any attention to guys on packet that say, "9N1XX called me on 14213.4. Come close and he might call you." In almost 25 years of contesting, I have seen this "come close" theory work maybe once or twice. It is almost entirely a siren song; a complete waste of time. If 9N1XX is going to call you, he is going to call you. Do you think the entire Frankford Radio Club is going to find a good frequency for calling CQ around 14213.4? If you leave a clear frequency to go there, you are being foolish and probably giving up some other multiplier that would have called you on your clear run frequency. [ ]

The 1993
MELLISH REEF DX-PEDITION

This small uninhabited reef 4 to 5 days by boat off the coast of Australia will be activated soon. Mellish Reef ranks in the top 20 most needed countries among surveyed DX-ers. It will be an exciting and fun time for all----we need everyone's help in telling others. Please pass along the following information to others. We look forward to working you.

VK9M
SEPTEMBER 19 - 28, 1993

OPERATION: **160 - 6 Meters plus WARC Bands**
SSB, CW, RTTY
Five HF stations-Around clock operation

OPERATORS: **VK4CRR, VK2BJL, VK2BEX, P29DX, V73C, WA4DAN, K5VT, G3WGV**

FINANCIAL ASSISTANCE:

While each participant is contributing personally to the costs of the DX-Pedition, it will be necessary to acquire additional assistance. Your consideration in making a donation will be very helpful and appreciated. All donations returned if for some reason the DX-Pedition should be cancelled. All licensing, boat, and landing permits have been obtained.

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