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THE BULLSHEET



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Texas DX Society
An ARRL Affiliated Club

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THE OTHER FELLOW'S SHACK (de Bill, K2TNO)

Nature, (London) 328:367 (1987):

"India builds big radiotelescope." Perhaps by 1992 you'll be able to QSO a VUZ on 144 MHz EME while running an HT. In the July 30 issue of Nature, a new radiotelescope is described called the "Giant Metric Wavelength Radio Telescope" (GMRT) to be built at a cost of \$20 million 200 miles east of Bombay.

This antenna farm just may outshine even W5UN's or K2UYG's EME setups. It "will consist of 34 identical, steerable, 150-foot diameter parabolic dish antennas forming a Y-shape configuration spread over an area of 25 square kilometers...(it) will operate at frequencies of 38-150 MHz and 325-610 MHz."

This location and frequency range were chosen because in the Western world, that portion of the spectrum is blotted out by man-made radio interference. No gain figures were available from the article, but you can bet it's a lot: "GMRT will be capable of resolving radio sources up to a few arc-seconds."

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USES OF THE MEASURED LINES: As an example, let me describe a situation that took place at NR5M during Radiosport 1987. We decided to replace two old 80M slopers, and cut both dipoles to 66'6" on a side. Both were fed through random length RG 213 coax. Once installed (center-conductor side at 90 ft. level, tied to a tower leg, lower ends each about 15 ft. off the ground) we measured the SWR curves at the shack. The NE sloper SWR minimum was at about 3450, with a value of about 2:1. Then NW sloper showed an SWR minimum of about 1.6:1, but at about 3700. Moving the lower ends around, raising, lowering, etc. had no significant effect. Because the coax lines were of unknown length, WE HAD NO WAY TO KNOW WHAT NEEDED TO BE CHANGED !

Many readers might have jumped to the concluding that the NE antenna was too long, and the NW antenna was too short. Not necessarily, Beldon-breath ! Remember that if an antenna's impedance is not equal to the transmission line impedance, this mismatch results in an SWR greater than 1:1. At any point on the line, the voltage and current will be out of phase with each other except at the half-wavelength points. So, since we didn't know we were measuring at a half-wavelength multiple, the SWR measurement told us very little. Especially, the frequency of SWR minimum was not only not informative, it was downright misleading. So, since we didn't know we were measuring. If we had added another few feet of coax (say, but inserting a 5-foot coax jumper) between the feedline and the SWR meter, a new SWR minimum would have been seen -- and the frequency of that minimum would have been different. (We haven't even touched the antenna in this thought experiment, so its actual resonant frequency can't have changed. Don't believe me ? Go into the shack, choose an antenna whose SWR minimum is, say 1.8:1 at say, 7.080. Insert a 5-foot coax jumper and repeat your readings. See ?)

Now, what would have happened if the two feedlines on those slopers had been multiples of 1/2-wavelength ? If we had inserted any R-X noise bridge at the rig end and set the reactance dial to zero (recall that resonance means the antenna is purely resistive, and has no reactance), we could have tuned the receiver for a noise null, maximized the null depth with the resistance dial, and read the true resonant frequency on the receiver. The resistance reading (say, 70 Ohms) could then be compared to the coax impedance (50 Ohms) to compute SWR from the relationship.

$SWR = R_{ant}/R_{coax}$ (for $R_{ant} > R_{coax}$) or

$SWR = R_{coax}/R_{ant}$ (for $R_{ant} < R_{coax}$).

In the example given, SWR would be $70/50 = 1.4:1$. Suppose the antenna showed a resistance much different from 50 Ohms, like 25 Ohms or 100 Ohms. Then we would know that, although resonant as desired, the SWR would be 2:1 and could take steps to correct that problem using a matching network or transmatch.

Don't own a noise bride ? Well, even without one the 1/2-wavelength trick still makes life easier. If we assume that both slopers were measured accurately when the wire was cut, the antennas should be resonant very close to the design frequency, 3525 KHz (133 ft total length). With the antennas free of surrounding metal and reasonably high in the air, little detuning is expected, but the feed-point resistance will be unknown. Hence, we could have measured the frequency of SWR minimum with the SWR meter alone, and that frequency would have been a good approximation of the results obtainable with the noise bridge.

Let's say, for example, that the NE sloper had been fed with a 1/2-wavelength of line. The SWR minimum was t 3480, and the minimum SWR was 1.8:1. We could then have rightly concluded that the antenna was indeed a bit too long, and shortened it accordingly to bring the resonant frequency up to 3525. Since dipoles, inverted vees and slopers always (well, except at heights below 0.2 wavelengths) have a resistance greater than 50 Ohms, we could also correctly calculate the antenna feedpoint impedance from $SWR = R_{ant}/R_{coax}$. In this case ($SWR = 1.8:1$), $R_{ant} = 1.8 \times 50 = 90$ Ohms. Matching considerations could then be done if desired.

Finally, if you record and store information about an antenna's feedpoint impedance and resonant frequency you can return to these numbers in the future to see what the feedline is like. As coax ages and weathers, its dielectric properties deteriorate and it becomes lossy. This increased loss causes the observed SWR to DECREASE ! (Not increase, as you might have presumed). Let's take an example. Suppose we leave that NE sloper up at NR5M for five years. Assuming the wire hasn't stretched or been re-positioned, what would it mean if the SWR at resonance gradually declined until it was 1.4:1 ? The optimist says that's great -- the antenna's better than before ! But the antenna engineer says the coax has deteriorated. The longer the coax run, the quicker the SWR will drop over time. The treatment of these losses and determining how bad they are is covered in the ARRL Handbook and has been a subject covered by me some time ago in this rag.

So, here's the take-home lesson:

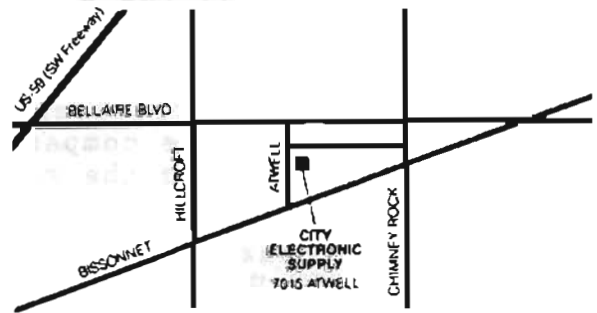
- 1) Use coax feedlines that are multiples of 1/2-wavelength.
- 2) Buy a noise bridge.
- 3) Record SWR and resonance data for each antenna.
- 4) Use a decline in SWR with time as a way of telling when the coax is shot.

Adolph

Alex-WA5UHT

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KEEPING IT UP IN THE DOG DAYS

(de Dave, K5GN)

NZ5I and I were talking on 2M the other day about how to get your fist into shape for the fall. Good question! If you don't do FD or IARU one's skills tend to get rusty--softball and pina coladas by the pool don't maintain your ability to copy the weak ones! There is nothing more frustrating than to pause at midnight on the first night of CQ WW, looking back on five hours of total confusion, and wishing you could do it all over again. So, how do you keep it up or get it back?

One answer may be the Doctor DX your wife made the mistake of buying you for Christmas two years ago and nothing got done around the house for months. But you know why it's sitting on the shelf now--no real static, no QRM, and no pileups. Not to mention that real live propagation hasn't sounded that good for years. The Doctor is good for your fist, though, and can help you get the hang of that new dupesheet for CQ WW.

The best answer, of course, is to do it on the air. But, when? Well, any weekend will do, but the XYL may not go for 18 holes and a contest every weekend. You have to pick the ones that will give you the most benefit. A look at page 86 of August CQ magazine reveals the contest calendar through October. Wow, look at that: A contest (no, two contests) every weekend! And what happens the last weekend of October? Yes, the start of the real season, CQ WW Phone. Here's my list of suggestions for sanity and practice between now and then...

Aug 8,9	European CW	Lots of activity Openings during waking hours. QTC's make you copy the code.
Aug 22,23	All Asian CW	Lots of JA's. Good for learning how it goes on 40.
Sep 12,13	European Phone	Chance to try the new antenna Learn the accents. Learn the their oper. habits.
Sep 13 Sep 20	NA Sprint CW NA Sprint SSB	If you like 'em, don't miss 'em. If not, try it anyway. They're good for the fist and the tongue.
Sep 19,20/26,27 Oct 3,4	Can-Am SSB, CW Cal QSO Party	Good practice for SS.
Oct 10-11	IRSA Championships	Not sure about this one, but it might be a good prep for SS if you miss the Can-Am.

Wait a minute, you say, that's a lot of contesting!

Well, not really. No one said you have to do the whole thing. Pick the ones you need and just do the good parts or whenever you can arrange to

be on the air. But do it long enough to feel it, and do it carefully, correctly, with the theme of preparation in mind.

Consciously work on at least these four talents:

1. clean fist/smooth talk.
2. keeping the dupesheet and other paperwork.
3. mixing CQing and hunting.
4. band-changing technique and strategy.

Note that you have to prepare a little bit to get the most out of it. In the process, you probably will check out most of your equipment and station arrangement. A contest like European Phone would also give the club a good chance to get the kinks out of that packet or 2M FM multiplier network before the real season starts.

There you have it, then: A training schedule of sorts. Pick your weekends, pick your times, and get them onto the XYL's calendar. (While you are at it, better get started on lobbying for November.) Take some time now in the preseason to brush up. Otherwise, the first few hours of WW Phone may leave you out of breath, hopelessly behind, and wishing for a second chance.

73, *Dave*
K5GN

P. S. If the lumberyard guys are willing, we may try to hold another contest clinic there during one of the preseason tests in Sept. or Oct. Details in next bullsheet.

CONTEST CORNER
Guest Editor: K5GN

Your contest chairman is on HONEYMOON in KH6. The info this month comes from the NCJ, CQ, and the repeater rumor mill.

RESULTS:

NA Sprint CW--another second place finish for the TDXS #1 team due to a late entry. The unnamed late entry has moved into the land of the first place team, so perhaps the problem has moved with him. Notable scores from the CW results:

K5LZO #1 in club, #2 overall, #3 in QSO total
(you're not getting older, just getting better)

K5GN #2 in club, #8 overall, #7 in QSO total

N5DU #3 in club

K2TNO/5 #4 in club, #9 in QSO total
(never enough mults, Bill)

followed by K5TU, KG5U, KN5H, K5WA, NT5D. Also submitting were N5JJ and W5WMU with K5GA at the key (would have been #3 in team score and now qualifies for #1 team status).

NA Sprint Phone--yes, second again. This time only seven entries and one of them really wasn't competitive. Maybe this September we can muster a full team and win it. Congratulations to NR5M who has won his first sprint! Notes:

NR5M #1 IN CLUB, #1 OVERALL, #2 in QSO total
(George had 4 more mults than anyone else, and nearly
as many Q's as the QSO leader)

HIGH CLAIMS:

ARRL DX '87 CW--very few W5 types in the listings, but some significant achievements:

NR5M--multi-double--holding a slim (1 mult or 5 QSOs) lead in first place ahead of N3RG.

N5RZ--our neighbor in NTX--is the only single op all-bander listed (13th of 22) west of the Mississippi.

W5VX--our neighbor in STX--#1 single-band 15M.

ARRL DX '87 SSB--Same story, different mode. Notable:

NR5M--Multi-Multi--in 2nd place, trailing KX4S by 200K, but ahead of W3LPL by 150K.

K5NA/2--Multi-Multi--4th, a long ways back, but his QTH may become the new N2AA location...

KE5FI--Single-band-10M (what else?)--1st place, by nearly double his competition.

W5WMU--single-band 75M--the man himself--1st place! Tough band!

No W5 S-O-A-B's listed over 1Meg.

CQ WW WPX SSB '87--you remember...conditions were terrible.

KE5FI--S-O-A-B--9th in U.S.A., but WS4Q/5 beat him (#7)

KG5U--S-O-A-B--11th in U.S.A.

W5WMU--S-O, 75M--3rd in U.S.A.

K5NA/2--S-O, 16OM--2nd in U.S.A., to K5UR.

NR5M--M-O-S-T--Not listed (?) but would be 4th in U.S.A.

IARU HF Championship--more lousy conditions, but the best sporadic E in years, with 10M open nearly all day to Europe!

KE5FI--S-O-SSB--1000 X 110 ?

KG5U--S-O-CW-- 713 X 100

NR5M--M-O-S-T--1380 X 147

N5EA--M-O-S-T--(lumberyard/QRN city) 900 X 100 ?

8/8-9 WAEDC CW The European DX contest. Rules are complex so get out your QST or CQ and figure it out.

8/22-23 AA CW The Asian DX contest. Conditions may be good.

9/5-6 73 MAG NAT'L CHAMPS (Not recommended)

9/12-13 WAEDC SSB

9/13 (Saturday night 9/12) NA SPRINT CW *** TEAM COMPETITION ***

9/20 (Saturday night 9/19) NA SPRINT PH *** TEAM COMPETITION ***

9/19-20 CAN-AM SSB; SAC CW

9/26-27 CAN-AM CW; SAC SSB; CQ WW DX RTTY

10/3-4 CAL QSO PARTY; VK-ZL SSB

10/10-11 VK-ZL CW; IRSA SSB/CW CHAMPS

10/24-25 CQ WW DX PHONE ***** THE BIG ONE.

11/7-8 SS CW *** TEAM COMPETITION ***

11/21-22 SS PHONE *** TEAM COMPETITION ***

11/28-29 CQ WW DX CW ***** THE OTHER BIG ONE.

Preliminary discussion on team line-up for September Sprints will be held at the meeting. See K2TNO.

Sweepstakes is not far off. ARE WE READY TO BRING THE GAVEL BACK??

ALMOST TOTALLY WORTHLESS -- THE 73 MAG NATIONAL CHAMPIONSHIPS

I say "almost" because the inventors of this contest tried to achieve a noble goal: To give credit or parity to the guy with a modest station. I say "worthless" because the inventors of this contest have dreamed up a set of rules that negate many of the strategies that a good operator learns for maximizing his score, regardless of his station's capability. Also, the antenna multiplier rules are not clear or precise enough to prevent confusion and loop-holing.

First, the antenna-mult loop-holes. "Wire" antennas have the largest mult (three). Rhombics, with up to 12 dB gain, seem to be in this category, but quads are not considered wire antennas. I'm not sure if a single quad or delta loop is a wire or not. Duo-, tri-, and four-band antennas with a single feedline get a multiplier of two. Does this mean less for a trap dipole than for a full-size dipole? My 40M single delta loop works on 40, 20, 15 and 10. I wonder if this means I could claim six? The way the antenna mult works in the score is confusing to me, too. The rules say you get so many antenna mults for each band worked with a certain type of antenna. It seems you could use a dipole for one contact on 20, then switch to the stacked yagis for the rest and claim a mult of 4.

Lost strategy #1: Band-changing to maximize rate. The rules set up fixed time-frames of three hours each, beginning at the start of the 24-hour test (0000-0300, 0300-0600, etc.). You operate on one band only during each time frame AND you must change bands for the next frame.

Lost strategy #2: Band-changing to maximize multiplier. Obviously, you can't be very successful moving mults to other bands when you can't move yourself (see L.S. #1, above). Plus, they have come up with another ignorant rule: The multiplier average. In calculating your score you multiply NOT by the simple sum of band-mults, BUT INSTEAD by the average number of mults per band you operate on. So, why bother going to 10 meters for 10 or 15 states when you can instead go back to 20 to increase the average? Why bother going to 160 when you can increase the average on 40? And so what if you've got a superior antenna on these bands? If everyone else stays away for these reasons, you won't have enough people to work. The rulemakers saw this coming and doubled the QSO and mult points for 160/10. But in noisy S. Texas and with 10M dependent on unpredictable sporadic E, it still seems there is no reason to try.

It takes WORK to put up a decent 160M antenna. It takes WORK to get a few mults out of a noisy or dead band. It takes WORK to turn a suburban ham station into a decent contest setup. It takes WORK to keep track of multipliers and WORK to maximize the total. It takes WORK to set up your station for rapid band-changes. It takes WORK to bounce from band to band to maximize your rate.

Evidently it is all this WORK that Wayne Green and the fellows at 73 want to avoid in their "championship". But it is precisely all this WORK that makes the difference between winners and losers in all the real contests in amateur radio. So, if you want to avoid WORK and operate in what I see as the lazy man's "championship", go ahead and put your dipole on the air in this worthless contest. Me? On Labor Day weekend? I'll be out camping in central Texas. See you in CQ WW (the real championship).

73,
K5GN

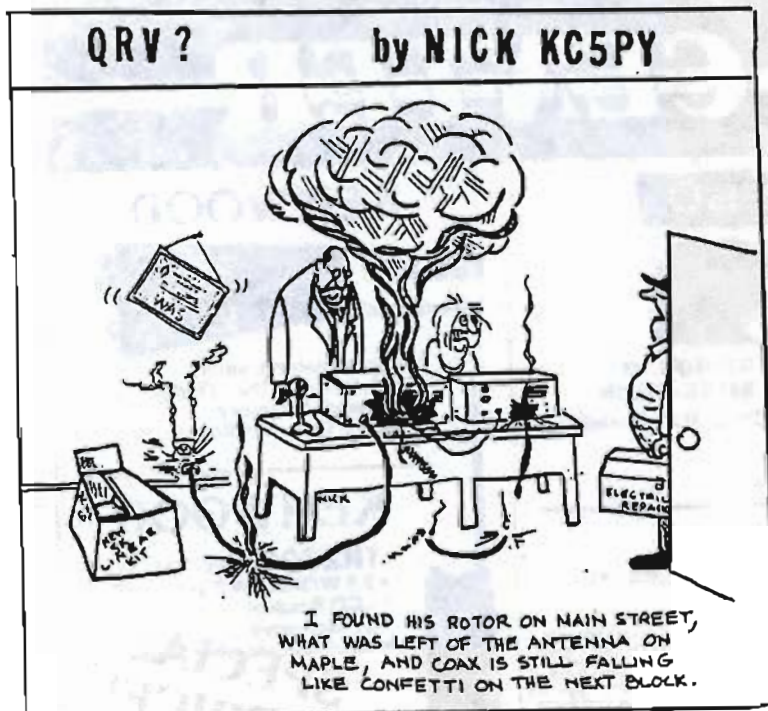
ANNOUNCEMENTS

MEETING NOTICE - The Texas DX Society meets the second Friday of each month at De Montrond Motorhomes, 6015 Hillcroft, just South of the Southwest Freeway at 7:30 P.M.

BULLSHEET MAILING LIST - The Club provides the Bullsheet free of charge to all amateurs with an interest and DX and Contests. To subscribe, send your name and address to TDXS, P. O. Box 540291, Houston, Texas 77254-0291.

BULLSHEET ARTICLES - Articles and other newsworthy items are hereby solicited by the editor. Please send them to Chuck Dietz, KE5FI, P. O. Box 348, Highlands, Texas 77562.

WEEKLY DX AND CONTEST NET - TDXS sponsors a weekly DX and Contest net on our 147.36/147.96 repeater each Thursday night at 9:00 P.M. The purpose of the net is to exchange DX, contest and club information. Participation is welcomed from non-members as well as members. Your active support of this net is welcomed.



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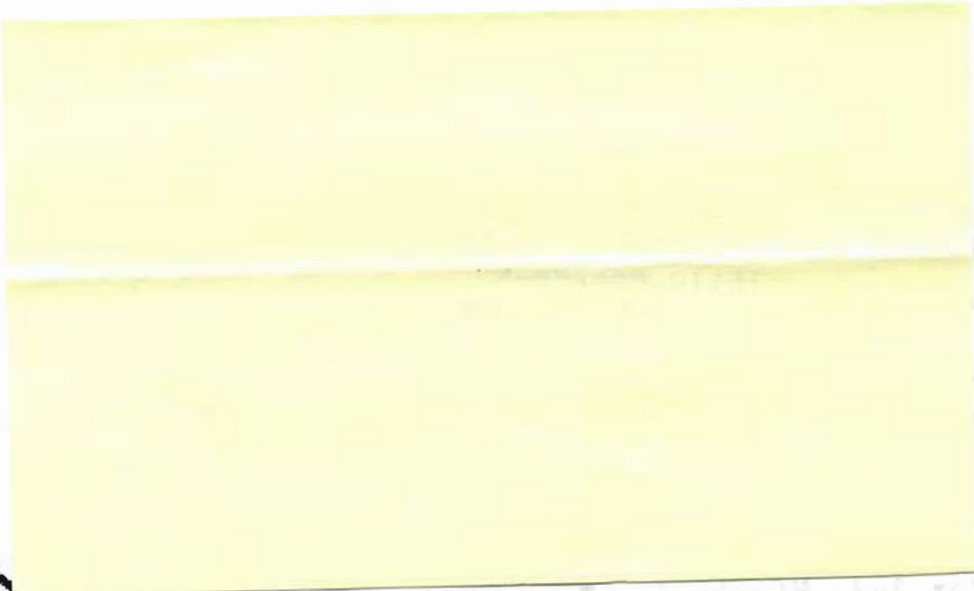
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