



R F



ORANGE COUNTY AMATEUR RADIO CLUB

VOL. XXVII No. 12

P. O. BOX 3454, TUSTIN, CA, 92681

December 1986

C
ARC
WISHES YOU
AND
YOURS A VERY
MERRY

CHRISTMAS

1986 CLUB BOARD of DIRECTORS

President	Frank Smith	W6UKZ	492-7215
Vice President	Jim Talcott	N6JSV	838-5395
Secretary	Ken Konechy	W6HHC	541-6249
Treasurer	Jeanie Talcott	KB6E2S	838-5395
Activities Chairman	Kei Yamachika	W6NGO	538-8942
Membership Chairman	Jim Townsend	NS6W	551-5339
Public Relations O. T.V.I. Chairman	Mac MacInnes Al Watts	W6MIL W6IBR	594-8442 531-6245
Member At Large	Joe Partlow	KB6F2V	542-3122
Member At Large	Bob Eckweiler	AF6C	639-5074

CLUB APPOINTMENTS

Club Historian	Bob Evans	WB6IXN	543-9111
W6ZE Trustee	Bob Eckweiler	AF6C	639-5074
R.F. Editor	Bob Evans	WB6IXN	543-9111
Teen Representative	<open>		

CLUB FUNCTIONS

MONTHLY MEETING: 3rd Friday of each month, 7:30PM at:
MERCURY SAVINGS & LOAN
1095 Irvine Blvd. (4th St becomes Irvine)
Tustin, Ca. Talk-in on 146.55 MHz

(Take the 4th St. exit to the 55 FREEWAY
and head east. Continue about two blocks
past Newport Blvd. on the left.)

CLUB BREAKFAST: 1st Saturday of each month, 8:00AM at:
MIMI'S CAFE
17231 17th Street
Tustin, Ca. (714) 544-5522

(55 FREEWAY at 17th Street east.)

CLUB NETS

BAND	MODE	DAY OF WEEK	LOCAL TIME	FREQ MHZ
2 Meters	FM	Wednesday	2100 hrs.	146.550
15 Meters	SSB	Wednesday	2000 hrs.	21.375
15 Meters	CW	Sunday	2000 hrs.	21.175

(Listen for W6ZE, net control)

*** ON THE NETS ***

11/2 15m CW net- No response to IXN's call for check-ins!...11/5 15m phone net- AF6C did not call for check-ins...11/9 15m CW net- IXN checks in Karl, IEH. IXN's dad has the flu, and we discuss the airline runway mishap in Florida...11/12 15m phone net- Wid much power line noise in the background, AF6C checks in RE, NG7D, IXN, & XO. John comments on Xmas shopping..nothing new in Commodore computer line! Will CD discs replace floppy discs? Not so, says AF6C, as he states reasons why! LJA, Ted, goes into hospital Friday for a survey to see how successful chemotherapy treatments have been. And Wil Galusha will have prostate surgery next Tuesday. RE reports that are now on the back side of the sun, thus, propogation is way down! NG7D wants a copy of the Nov. Newsletter for 20m beacon times, etc. XO needs a color monitor for Nov. meeting. He will be showing tapes of Apollo 17, Space Shuttles 8,9, & 10, etc. XO also informs us of a meeting of amateurs wid Red Cross officials in Westminster to discuss formation of a Red Cross preparadness group. XO also had nice words for his inoperative Regency keyboard!...11/16 15m CW net- IXN checks in Karl, IEH. C'mon guys! CW is fun! Join us on Sun. eves. at 8:00 pm when you're bored wid the 'boob-tube'!! Karl says that "WX man speaks wid forked tongue" becuz it hadn't rained yet. IXN must finish cutting down a plum tree while IEH 'drops' 2 mulberry trees and a pine tree. Halloween hooligans broke some cement blocks out of Karls wall, and, Karl didn't know abt OCARC's 2m net!...11/19 15m phone net- AF6C checks in IXN & XO. AF6C becomes a school teacher at work. IXN (Pitt) and AF6C (Penn State) discuss the upcoming clash between Pitt & Penn State. If Penn State wins, they are in line for a bid to the Fiesta Bowl. XO had the day off and was watching a program, joining us when he heard the net come on the air. Bob mentioned his B.P. as 130/92. Still isn't too bad, XO! XO asks for a color monitor for this Friday's meeting. AF6C will get info. on 'tilt sensor' for IXN. AF6C Great Idea!!!..FREE RAFFLE TICKETS FOR 'RF' ARTICLES!!!...11/23 15m CW net- IXN checks in Karl, IEH. Jim, JSV, listens in, but IXN can't break thru the noise level at JSV's QTH!! We will have to look into that problem! IEH & IXN talked abt quad antennas. IEH lost his in the Santa Ana wind. But he doesn't talk wid the SSB group at 4 am anymore, so he doesn't need the 'quad' now, even though it was a great performer...11/27 15m phone net- AF6C was busy, no net...11/30 15m CW net- IXN checks in IEH. Karl put a new radiator in his truck over Thanksgiving. Karl will be putting up a new 40m ant, folded dipole or maybe a loop antenna.

*** AT LAST MEETING ***

Wid Frank, VKZ, presiding, a roll call of officers produced Jim, JSV, Jeannie, EZS, Kei, NGO, and Al, IBR. Yours truly, IXN, took the minutes. The Club unanimously approved \$200 seed money for the '88 ARRL Southwestern Division Convention to be held in late Aug. or early Sept., and to provide help with security and the drawings for prizes. The 'Good of the Club' award will be presented at the Christmas banquet. Remember! The Club gets a \$5.00 return on your ARRL membership when you renew through the Club!!! What a painless way to add money to our beleaguered treasury! IBR needed help to take down his vertical antenna between the 8th & 13th of Dec.

The Club unanimously approved a motion by IXN to award 6 free tickets to the raffle for writing an article for 'RF'.

Who will be first?! Send articles to Bob Evans, WB6IXN, 701 S. Kilson Dr., Santa Ana, CA. 92701. Typing the article, while nice, is not necessary. Computer articles are also acceptable. Don't hesitate, you Shakespeares & Einsteins! Compose now!

Enough can ever be said for those brave souls who contribute their time and talents on the Board! We appreciate ya, Guys & Gals!! The Club unanimously approved the following Board for 1987:

President: Jim Talcott ,JSV
Vice Pres: vacant
Secretary: Jeanie Talcott (acting), EZS
Treasurer: Ken Konechy, HHC

Membership: Bob Eckweiler, AF6C
Activities : Ron Toering, EZP
Public Rel : Mac McInnis, MIL
TVI : Frank Smith, VKZ

MAL: Kei Yamachika, NGO

LJA's cancer is in remission, and GDZ has had prostate surgery & is home. Wyatt, BPX, is recovering from cataract surgery. And may tnx to Wyatt for his \$20 donation to the generator fund.

For the program, Bob Tegel, XO, showed laser discs of the Mars Viking Landers, Space Shuttles, and Space Labs...with lively discussion. The raffle was held and the meeting adjourned at 9:14 pm.

*** ROSTER CHANGE ***

Frank Smith, VKZ's new telephone number is: 492-3218. Change your rosters NOW!!

*** DUES ARE DUE ***

Since there is no regular meeting in December, your first chance to pay dues will be January meeting. Please do not forget to pay your dues as soon as possible!

*** OUR MERRY CHRISTMAS PARTY - 1986 ***

The excellent Chinese restaurant, found by Kei & Ida provided 'mounds' of delicious Chinese cuisine, much to the delight of all! And what a party! Using his 'soap-on-a-rope', Jim, JSV, easily slid into the Presidency, picking up the gavel as he passed VKZ!

Party members NGO & Ida, BPX & Blanche, JSV & EZS, VKZ & harmonic Susie, ETK, IMP & Jane (new call NØNE, properly read NONE), AF6C, HHC & Dianne + harmonics: Sandi, Tony & Michelle, IBR & IBP, all witnessed the event. JSV then gave the Club a Christmas present... he donated \$30.29 to pay off the GENERATOR!! Thus, Wyatt & Jim have wiped the slate clean! The Club is free of debt! And we Club members appreciate the gifts and your generosity, OMs! Dotty livened up the party wid a unique gift exchange:

1. When you received your gift, you had to open it for all to see.
2. Your gift could then be claimed by another!
3. The 'gift' could exchange hands 3 times!

With these rules in mind, BPX opens his 'almond rocca' only to have it claimed by HHC harmonic, Tony. JSV then claims the 'AR' from Tony, only to lose it to victorious HHC! Tony finally ends up with a 'steering wheel cover'. Comments NGO's XYL, Ida (to HHC & Dianne), "Now Tony will need a 'Ram Charger' to go with the cover"!

IBR opened his gift and displayed a rolling tape measure. But his plans for its use in the new QTH were suddenly dashed when IMP, getting even for the auction, promptly claims AI's tape measure. But IBR was not to be foiled! His next gift was a bar-b-que charcoal starter, which he immediately used to light his cigarettes!

Here we go agn! Jane Watts unwraps a can of Almond Rocca, but the Konechy 'steamroller' moves in and harmonic Sandie claims it! You guessed it! The Konechy family claims all of the Almond Rocca! But once again, Jane, undaunted, unwraps a beautiful apple-shaped candy dish filled wid jelly beans! (Look out, Ronny Reagan!)

AF6C was so happy about having his trip to France postponed for a week that he 'giggled' when he received the 'Good-of-the-Club' award for 1986.

And Frank, VKZ, will certainly remain wide awake as he zips along the freeways with his new

auto coffee cup carrier, and we take this opportunity to thank Frank & the Board for guiding us through another successful year!

IMP leaves, in early January, for a 6 months cruise. We all wish Chris a safe voyage on his journey to the Aleutians, Thailand, Korea and other ports of call. Al, IBR, and Dotty, IBP, move away this month. However, they will drop in on us at Club meetings now & then.

Many thanks to Jeanie, EZS, for her excellent notes on the Christmas Party. 73s and Merry Christmas to all, and to all a good night!!

*** CONTINUOUS WAVE ***

IXN, your editor, has challenged Jane Watts to get her TECH license! Will our excellent cook at Field Days accept the challenge?! Will Jane plunge into the mysterious CW world to wrestle with those difficult P's, Q's, L's, J's, X's, etc.?! Will she eventually break the 5 wpm barrier? Watch 'RF' for future episodes of 'Continuous Wave', and follow Jane's adventures as she glides over the sine waves of destiny!!!

*** GIVE THIS PUZZLE A TRY ***

REPEATER TECHNICAL EDITORIALS LOCAL SWAPSHOP NEWSLETTER TOUCH
 TONE PAD DIAGNOSTIC TEST CONTROLLED SQUELCH PROGRAMMING
 SYNTHESIZER REMOTE CONTROL EVOLUTION SINCE ORGANIZATION WORD
 PROCESSING COMPUTER AIDED DESIGN AMATEUR ADVANCE GENERAL
 ACTIVITY RECOGNITION ANTENNA DEDICATION TOWER IMPROVE
 COVERAGE MOTORISTS EMERGENCY AUTOPATCH BIRD WATTMETER

E V O L U T I O N U C V P C R N K C O I K R E T E M T T A W P S L U F I O F
 E I I H H W D L K D O Y R N S S R S Q R E Z I S E H T N Y S I D S B Q C Z C
 H F I M P R O V E O A I O N U P B T D E D I C A T I O N J N H R O G O I K M
 P V D A U T O P A T C H C T G J P N M X Y A Y B L K O D C W J I V R E Y C L
 H D C O M V A K V X S Y E V U M Q H V G U S B G W O X E E F K B A H Q N Q C
 V Z A C T I V I T Y O U S I Z V E C N Z P O H S P A W S H O Y Z Q W K S G M
 R E C O G N I T I O N X S H M L O A I S H H P R O G R A M M I N G P L X P A
 T H A L F Z U C H H B D I T U N A I C I H C E T A I C L M L G A H A P D S W
 Q B I Q F I R I V C G Z N T T P N J D V K F S C F D R O W F J F I F N W J O
 R A N J P E Z E F U K V G R P W T L C O M P U T E R G J X S N R W L A B A P
 J R E W O T Q Z T O F L O L X N I E M E G A R E V O C O M K O I D X I D F J
 Y O H F K V D T V T A L E O L R B K D G A N N E T N A E H T R E M O T E L Z
 X R I K R S G Q M C E D O J H V E Q L R H D A B L Q L O I T E K Q W E Z A Q
 D G T D L A Z O I J I L E B G I B H V E L O C A L S P D I Z X X T A C H Y M
 X A Z Z N H T N V P A J S L B X P W S T I D J K N P E R F A A T G O D K L M
 D N U M I O H H S D Y S X W L Y J K N A H X A Q C W X X A B G Y V X N S A F
 K I S A R C O K V H Z R V P E O N E Z E H A K L O O O Y Z T B N Q D D E R E
 W Z R I E S J A O L U Y I N C N R X C P J C D F P S C Z I S Q B O Y F T E R
 Q A S T M W N Q N E P M V O G A H T X E M V L D N T F Z C E E Q G S F L N G
 H T V F S C A W T J N V F U D I R G N R B V Y E X D U S N T J S I D T G E B
 S I W M E W K A Z L L X X F E V S A D O X P R U U P Y Q M X K L A E V I G O
 X O Y A B T M H Y O Y C N D W O E E X H C A X I F Q Q Y U P U R J O V N C L
 G N R Q E A E G O Y C N E G R E M E D I F D Q T U E S R C Y M C I P Q U E L

(frm Ft. Venango Mike & Key Club 'KEY CLICKS')

Grounding Techniques to Reduce RFI Susceptibility

'RF' Ed. note: In a recent discussion with Jim, JSV, on RFI, etc., the importance of proper grounding techniques could not be overlooked. This article is the first of two which will appear in 'RF' concerning grounding techniques.

By Gary A. Breed
Technical Editor

It is a safe wager that everyone has experienced radio frequency interference (RFI) of one form or another. It may have been an FM radio overloaded by a police radio as the squad car passed by, a personal computer causing an AM radio to hear only bleeps and whistles, or a CB operator being picked up on a hi-fi system. These are certainly nuisances, but there are much more serious forms of RFI, too. Computer systems might have outside interference alter data, emergency communications can be disrupted, or laboratory research can be severely hampered.

These are not hypothetical situations; all of the problems noted have been personally witnessed by the author in 15 years as a broadcast engineer and 24 years as an amateur radio operator. What is an inconvenience to a private individual can be costly and dangerous to public or commercial facilities. Protection of these facilities from RFI starts with a properly designed and constructed master ground system.

A review of electromagnetic field theory reminds us of Gauss' Law and its derivative principles. The fundamental principle of shielding was proven by Gauss, who showed that a field will not penetrate a volume enclosed by a conducting surface. However, since no conductor is perfect, and since there are usually gaps which prevent the shield from being a continuous enclosure, leakage of external fields into any practical shielded enclosure will always exist to some degree.

A partial remedy to imperfect shielding is a reduction of the field intensity surrounding the circuitry by reducing the potential induced on the outer surface of the shielded enclosure. This can be done through grounding. Grounding can be defined as: *Reducing to zero the potential difference between objects in proximity to one another.* In practice, there are two components of a ground system: an

"infinite" current sink (earth ground), and a low impedance path from equipment to the sink (ground connections).

Earth Grounds

The configuration of a good earth ground is a subject of some controversy among proponents of "deep" grounds and "wide" grounds. Deep grounding methods usually suggest a system of ground rods which are long enough to penetrate into soil that is permanently moist, and provide a low impedance path to this relatively high conductivity region. This concept has been well-established, and has survived for some time as the best method. The use of well casings, water supply pipes, and other underground utilities as all or part of a "deep" ground system has been recommended often for commercial or home earth grounds.

A development of recent research into lightning behavior is the "wide" ground system, which relies on a large number of ground connections over a very large area, with little concern over the depth. The principle of this technique is that localized current densities in lightning discharge situations are too high in "deep" grounds that do not have a large area over which to distribute the charge. Spreading the charge over a wide area reduces the concentrated current densities, reducing the possibility of damage.

For RFI protection, there appears to be no distinct advantage of either earth ground method. Practical considerations of available space, soil conditions, and installation convenience may dictate the type of system used at a given location.

Equipment Grounding Connections

There is only one rule to follow in connecting equipment to the earth ground: *Minimize the inductance (and impedance)*

of the connection. As an example of this rule, consider a ground connection requiring 30 feet of #6 copper wire. DC resistance of the wire is .012 ohms, but it has an inductance of 10 μ H, which results in 63 ohms reactance at 1 MHz. At 100 MHz, the connection might as well be an open circuit, or worse, could act as an antenna to increase RFI in the "grounded" unit!

Keeping in mind that inductance per unit length is approximately in inverse proportion to surface area, here is a list of some conductors that might be used in a ground connection, and their surface areas:

#6 Copper wire = 0.51 in²/in
#12 Copper wire = 0.25 in²/in
RG58A/U shield = 0.38 in²/in
1" Copper strap = 2.0 in²/in
2" Copper strap = 4.0 in²/in
4" Copper strap = 8.0 in²/in

From this list, it is clear that flat copper strap will provide lower reactance ground connections than even large-gauge wire.

The broadcast industry has long known of the low inductance properties of strap, with 2", 4" and even 6" wide strap used to interconnect equipment which must operate in the vicinity of multi-kilowatt transmitters. With the spread of many urban areas, it is not unusual for homes, offices and factories to be located adjacent to radio and television transmitter facilities which were once in rural areas. These facilities will experience the same severe RFI problems as exist within those broadcast stations, and will have to solve the RFI problems in a similar manner.

We hope this note will encourage those who experience troublesome RFI problems to attack the problem with some fundamental understanding of grounding techniques. Readers are encouraged to share their experiences and analysis of RFI difficulties by contacting the author at *RF Design*.

SIX

METER

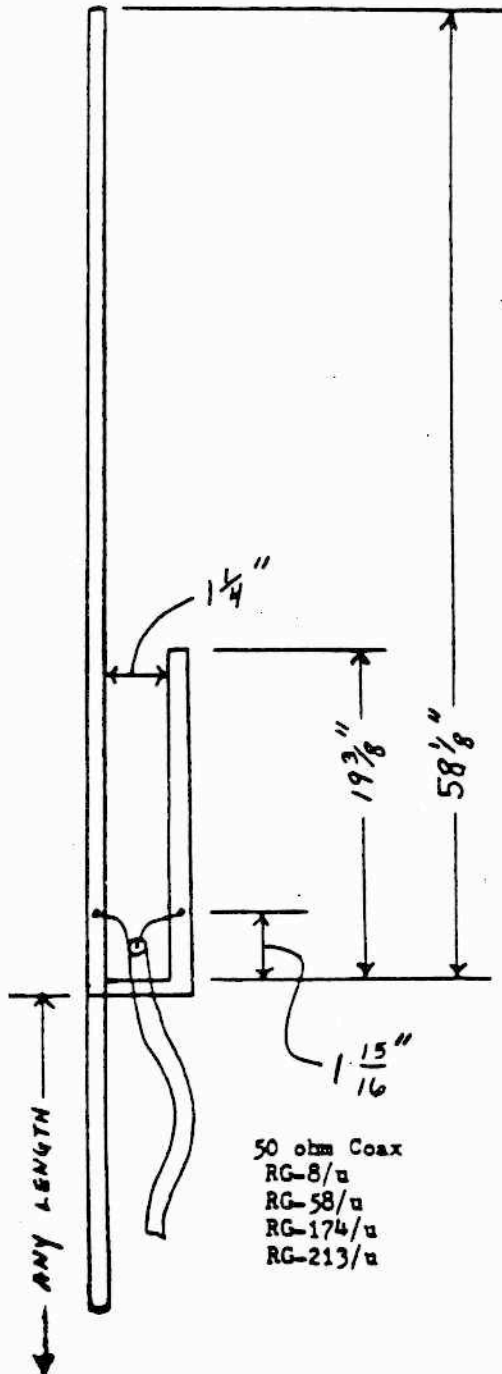
CLUB

OF CHICAGO

Here is a design for a 2-meter vertical antenna that has been in use at WA3KPT since October 1982. We had had very good success with it and it is still in use. From our Aston location we have no trouble hitting the various 2-meter repeaters in the area as well as simplex operation. We have also used it during the January VHF contests for the past two years.

The antenna is made of $\frac{1}{4}$ inch copper water pipe, one elbow and one tee fitting.

The dimensions shown are actual and not theoretical or calculated.



If you care to make any changes to the length of the antenna, you will find that the long element is three times as long as the matching short stub.

The stub is one quarter wavelength and the long piece is three quarters of a wavelength. The sizes shown are for 145 MHz but all the magazine and other printed materials found on the antenna say that it is good over a 5 MHz band width.

There are two gain figures that I have found for this antenna and the larger one depends on the particular arrangement of the mounting that you use. You will get better gain if this antenna is mounted on the top of a metal pole as apposed to mounting on brackets just below the bottom of the stub connection.

The lowest gain compared to a quarter wave ground plane is 2 db. If mounted on the end of a pole, you get 3.27 db. To translate this into terms of power gain, use this table:

2 db = 1.58 times power

3.27 db = 2.12 times power

This means that if your HT has an output of one watt, the antenna makes it look like a transmitter with an output power between 1.58 watts and 2.12 watts. Not bad for just a little bit of copper pipe.

For further reading on this 2-meter antenna, see the following references:

1. Air Force MARS Communicator, April 1982
2. QST, April 1977, page 35
3. Ham Radio Horizons, July 1980, page 44
4. FM & Repeaters by ARRL, First Edition, pages 94 through 96
5. VHF Manual by ARRL, First Edition, pages 195 through 196

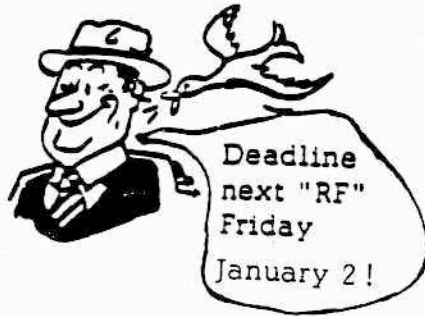
John Dyckman, WA6ALF

from **The HALO** (tnx AFMARS Communicator)

SIX METER CLUB OF CHICAGO

*** A GREAT BUY ***

ICOM 271A 2 meter Transceiver, FM, upper/lower sideband, 32 memories, power 1 to 25 Watts, 12 VDC in, MINT Condition!!! Call Alex, W6RE at 544-1974 today!!!



page 8

ORANGE COUNTY AMATEUR RADIO CLUB

P. O. Box 3454

TUSTIN, CA 92681