Squelch Tales

A Publication of The San Diego Repeater Association, Inc.

Winter 2013

Ahead in Squelch Tales

SANDRA maintains repeaters on several San Diego County mountaintops and on Kearney Mesa in San Diego City. Being on a mountaintop allows for better coverage but just how good is the coverage from each repeater. Longley-Rice (L-R) modeling can help supply an answer. In this issue we look at L-R modeling packages. Future issues will provide modeling results.

T-hunting is a popular amateur radio activity but it also has real world use. *SQ* details a recent search for a stuck transmitter which was causing interference to SANDRA's Sharp Hospital repeater.

Announcements - ARES needs volunteers for the November 21st hospital drill. SANDRA's holiday party is around the corner on December 5th.

2014 SANDRA officers were unopposed and will be installed at the December meeting.

The usual features of SANDRA Board of Directors meeting minutes and errata are also included.

Modeling Repeater Coverage

The Longley-Rice Model

SANDRA maintains repeaters on three mountaintops, two sites on Kearney Mesa and on a semi-mountaintop at the former stage coach station of High Pass. Having repeaters on mountaintops dramatically increases coverage, at least as far as range goes because the elevation of the antenna sees further over the horizon and over the tops of closer-in obstructions. But, actually how good is the real coverage across San Diego County? The author has marginal access to the SANDRA Laguna repeater although access to neighboring Monument Peak is exceptional - this is undoubtedly a function of a lower level obstruction.

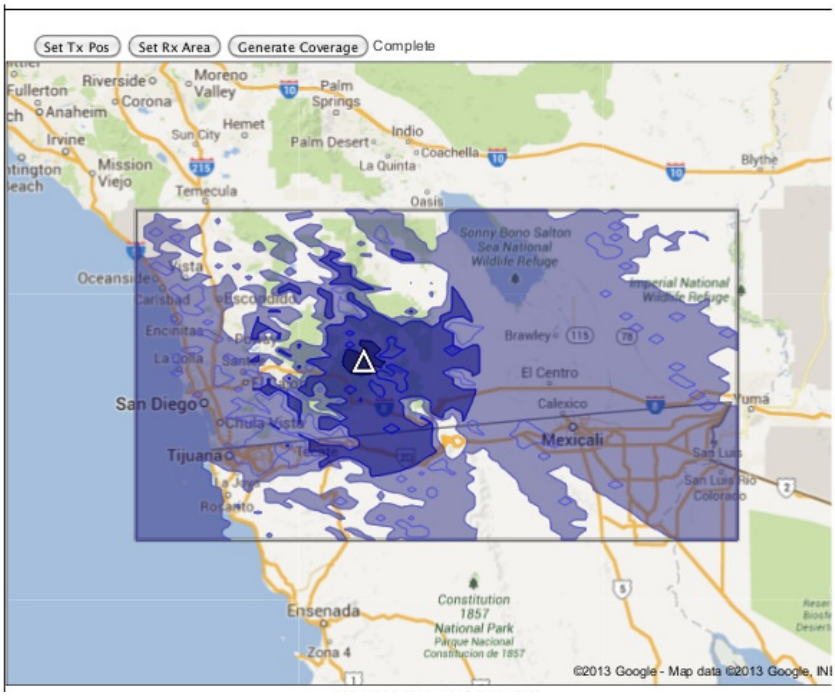
Radio engineering was an early adopter of the use of computer models to solve complex problems of signal propagation, signal loss and many other multi-factor problems. Examples are the Numeric Electromagnetics Code (NEC) which is the antenna modeling software that hams have learned to love and use. NEC was written by Gerald Burke and Andrew Poggio at the Lawrence Livermore National Laboratory in Fortran and punched onto Hollerith cards for use on the computers of the day. There are many more radio propagation programs, i.e., Voacap and Voaprop, that come from the early computer era of the 1960's. The proliferation of early computer models may be because they were problems that the government needed to solve and the programs were paid for by the government. Longley-Rice Irregular Terrain modeling is another example of the early use of computers. First published as *"Prediction of tropospheric transmission loss over irregular terrain. A computer method-1968"* [i] The method was developed for frequencies between 20 MHz and 20 GHz and was used by the FCC as an aid to determine broadcast areas for FM radio and television licenses.

The Longely-Rice (L-R) model is a statistical model which incorporates the expected variability in the model factors, the resulting models can be considered the mean of the expected signal along any path but minimum and maximum performance can also be generated. The factors that go into the models include; transmitter power delivered to the antenna, antenna gain and height above the ground, terrain between the transmitter site and the reception site or area, path loss due to absorption considering variability in path conditions, coverage changes due to refraction over the terrain, reflection losses, path loss due to clutter (another terrain effect) and receiver antenna height above terrain.

Continued on Page 2

Longely-Rice continued.

As is the case with other mature software, there are a number of L-R modeling packages available to the interested ham. Communications Research Center Canada has a web site with an online L-R application [ii]. The application is available for free but requires the user to sign up. The illustrated model of the Laguna two meter repeater to the right was prepared using this application. The application is somewhat abbreviated and doesn't have all of the options that are available from other full L-R applications. Pathloss 5 is a very sophisticated program available for pay[iii]. The author has not enquired as to the price. SPLAT! is also a sophisticated software package available from KD2BD[iv]. The software is delivered as source code that compiles directly under Linux and Mac OSX. Since the software is delivered as source code it can be easily modified for other operating systems. SPLAT! is supplied under the GNU General Public License and is fully redistributable. QRadioPredict is available from YO8RZZ compiled for Windows and Linux[v]. Source code is also available for compilation under other OS's. The product produces very detailed output plots. Radio Mobile[vi] is available from VE2DBE for Windows and Wine running on Linux or OSX. Radio Mobile is free but requests donations.



Example of the output of a L-R model, this one prepared by using Communications Research Center Canada's web application.

The included imagewas obtained for the Laguna two meter repeater using the Communications Research Center Canada online application. The model is simple and the transmitter antenna height had to be adjusted to achieve a reasonable result. This is an example of the expected output from a model. The author lives in one of the shadows shown on the plot and has marginal access to the repeater.

In the next few issues of *SQ* the results of L-R models for SANDRA repeater coverage will be presented using several of these packages. The goal of the project is to predict SANDRA repeater coverage throughout Southern California and to report the ease of use for each of the packages. There will also be an attempt to validate the models by measuring signal strengths in various areas around the county and comparing the measurements to the model predictions. Stay tuned. {*SQ*}.

i. *Prediction of tropospheric radio transmission loss over irregular terrain. A computer method-1968,* A.G.Longley and P.L. Rice, ESSA Tech. Rep. ERL 79-ITS 67, U.S. Government Printing Office, Washington, DC. July 1968.

ii. http://lrcov.crc.ca/main/

iii. http://www.pathloss.com/pwiki/indes.php?title=Pathloss_5_-_Basic_Program_information

iv. http://www.qsl.net/kd2bd/splat.html

v. http://qradiopredict.sourceforge.net

vi. http://www.cplus.org/rmw/english1.html

Interference at Sharp Hospital
By
Chuck Wood WD6APP

One popular ham radio activity is Transmitter Hunting or T-hunting. T-hunting usually involves transmitters of various power levels hidden somewhere in the county which are tracked down using mostly portable radios with highly directional antennas. The August 2012 issue of *Squelch Tales* contains a T-hunting talk given by Joe Corones, N6SZO, on the very active San Diego T-hunters which hold T-hunts every few weeks. Like all of our ham radio activities, T-hunting has an important real world use. A number of times in the past several years there have been loose transmitters in the wild that needed to be found and shut down. We have all read about the unattended transmitter activated by a house pet (usually a cat) that resulted in interference and a T-hunt to find it. This is an example of a real life T-hunt to find a stuck transmitter causing interference to a SANDRA repeater which went unnoticed by the transmitters owner.

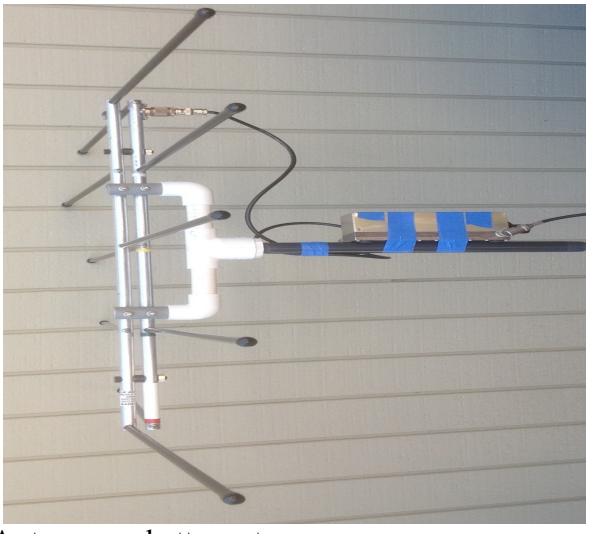
Early In September the 147.885/147.285 repeater on Sharp hospital suddenly began experiencing extreme interference. This was in the form of a steady carrier that appeared as constant "white noise". This continued for several days, completely disabling the repeater. As a result, the repeater had to be shut down to prevent additional interference on the two meter band. The SANDRA Technical Committee assigned me to make an evaluation of the problem. After gathering what information I could, I began checking the area north of highway 8 using a handheld transceiver. I finally narrowed the area down to about a one square mile area north of Poway and within the city limits of San Diego.

I returned the following day with a simple direction finding set-up which consisted of a five element ELK brand antenna, which is a vhf/uhf satellite beam of the log periodic type, a 120 db step attenuator and a small Vertex transceiver which had a very effective digital "s" meter. I then went to a high and clear area and with about 40 db of attenuation in line between the antenna and the transceiver, I got a significant peak in signal strength.

At that point I was able to get a peak on the signal and I began tracking the signal in increments. Finally I arrived at a cul-de-sac of seven houses. At that point the signal was so strong I couldn't isolate it any further. I knocked on every door except one and was told that the occupant either was in the hospital and/or knew nothing about ham radio. At this point I could go no further.

The following day K6VCR Tom and WB6DTR Alex went to that location and isolated the signal to a garage in the one house that I had not checked. The lady there was cooperative and allowed Tom and Alex to look in the garage. Lo and behold, there was a cross band repeater a friend of the occupant had placed there a week earlier.

The cross band repeater had somehow "locked up" for one solid week and the owner was unaware of it. The repeater was turned off and the owner notified. This was unintentional interference and no further action was taken.



Antenna and attenuator.

This is a solid example of ham radio skills being put to use in the real world. As you consider your ham activities, T-hunting should be considered as one more valuable skills to be practiced along with other ham activities. - {Chuck Wood}

Announcements
ARES needs volunteers for the November 21, 2013 Countywide Hospital Drill

ARES is a key ham radio activity and one of the main reasons the federal governments allows hams to keep their spectrum allocations. Public service may be considered **THE** key reason that spectrum has been maintained. Public service is what the ARRL and other support organizations carry to congress and the administration as ham radios main contribution to the country. You can support your county, city and ham radio by volunteering to be part of the ARES drill on November 21, 2013.

Please Contact – Bruce Kripton KG6IYN kg6iyn@arrl.net

OR

David Kaltenborn n8kbc@cox.net

The objective of ARES is to provide trained communicators when and where they are requested. ARES is a volunteer organization but they function at the request of hospital and public safety agencies, they do not show up uninvited. The key is to have well trained operators functioning in a professional manner.

San Diego ARES has a client group of hospitals that they service. The upcoming countywide drill is a state requirement.

ARES members spend the largest part of their volunteer time training for communication emergencies, planning for training and assembling the appropriate equipment to provide the communications service.

Please Volunteer – you are needed!

Annual Holiday Party and Potluck

Join SANDRA and Filamars

Thursday December 5, 2013

AT

San Diego County Office of Education

6401 Linda Vista Road, San Diego CA 92111

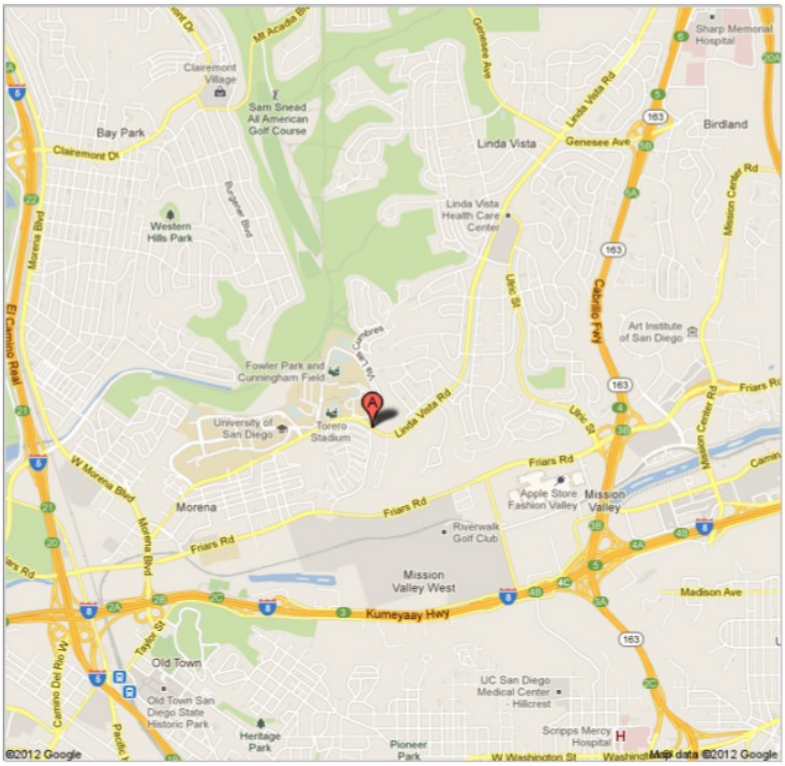
Rooms 401 & 402

Fabulous Prizes Great Food Great Company

Win a new Kenwood TM 281A

Prizes include Transceivers, Test equipment, Books and More

Bring a favorite Holiday dish to share with others



San Diego Repeater Association, Inc.

Board of Directors Meeting Minutes October 3, 2013 (Thursday) 7:00 PM
San Diego County Office of Education
6401 Linda Vista Road San Diego, CA 92111

Director	Present	Excused
President Barbie Flinn, WA6URS	X	
Vice President Stogie Panger, AJ6AX	X	
Treasurer Ken Decker, WA6OSB	X	
Secretary Alex Groza, WB6DTR	X	
Membership Chair Bob Boehme, W2IRI	X	
Meeting Chair Ben Concepcion, N6VVY	X	
MAL-1 Year Tom Myrick, N6JOJ	X	
MAL-2 Year Bayard Rehkopf, K6GAO	X	
MAL-3 Year Chuck Wood, WD6APP	X	

Call to Order: The meeting convened at 7:00 PM, President Barbie Flinn, WA6URS, presiding.
Members in attendance: Attendance Roster attached. (Sixteen attendees)
Approval of Minutes: Approval of September 2013 Minutes by unanimous consent
Board Reports / Presentations / Comments:

President:

Requested input regarding speakers / presentations for upcoming Membership Meetings. Amateur Radio operations demonstration at Fry's Electronics in Murphy Canyon and North County on November 24th.

Treasurer:

July, August, September 2013 monthly reports presented / submitted

Membership Chair:

218 members. Most memberships are coming in via SANDRA website. Other

Board Members: No reports

Committee Reports:

Tech:

Written report submitted by K6RLV. Kearny Mesa UHF repeater appears to have a problem with it keying up (kerchunking) on its own. Ed (WA6YVX) will monitor the problem.

SANDARC:

Report by WD6APP, W2IRI and AJ6AX. 2014 ARRL Convention update by Chuck an Bob. SANDARC Convention flyers were distributed. Flyers will also be distributed vi SANDRA email distribution list. Stogie stated SANDARC Convention website should online near the end of October. SANDARC bylaws update discussed.

Squelch Tales:

Report by KF6ROX. Working on current edition. Seeking articles for upcoming edition. WD6APP to supply article information regarding Sharp repeater interference issue / Hunt.

Unfinished Business:

WA6OSB: Policy Manual is in need of several updates. Informal meeting set for Nov. 2nd.

WA6URS: $300.00 allocation at this time for December pot-luck

N6VVY: FILAMARS to join with SANDRA at pot-luck meeting

New Business:

WA6OSB: Regarding Otay expenses, SDGE summer rate increase was 7%. Winter rates are slightly less. He will calculate an annual rate increase.

WA6URS: Last Call for nominations for 2014 SANDRA Board. N6JOJ stepping down from Member At Large position. David Andreoli (KI6VIA) was nominated and accepted Member at Large-3 position. No other nominations, all positions are unopposed. President closed nominations, thanked and dismissed the 2014 Nominations Committee. Since all positions are unopposed, no vote will be necessary at the November meeting.

SANDRA Repeater Usage Requests / online submissions discussed. Motion by WD6APP

Second by N6JOJ to assign Secretary the collateral duty of coordinating repeater requests with the SANDRA webmaster. Motion passed by unanimous vote.

Correspondence / Member Comments:

Bruce (KG6IYN) discussed the October 19th ARES Field Day.

Next Meeting Date:

November 7, 2013, Combined Annual Meeting of the Association and Board Meeting.

Adjournment: The meeting was adjourned at 7:45 PM by Unanimous Consent

Errata, Corrections, Amplification and Shorts: This section acknowledges errors and omissions or allows additions to previous articles. We rely on reader feedback – please write.

SQ has had a dearth of input over the last several months, which either means that we are generally doing things right or the membership has completely tuned out – hope it is not the latter and it is at least a little of the former. However, one way or the other we would like to hear from the membership.

Repeater Status – Otay, Lyons, Hi-Pass, and Sharp Hospital all have no changes to operational status.

Laguna- The 440 antenna has been damaged in past winters and is suffering from high SWR. The duplexer for the 220 repeater will need to be retuned on our next trip to the site.

Kearney Mesa – The repeater is currently down. The technical committee has scheduled a maintenance trip to address the problems.

Callsign	Location	Input	Output	Callsign	Location	Input	Output
WB6WLV	Mt. Otay	146.040	146.640	WB6WLV	Mt.Laguna	444.500	449.500
WB6WLV	Mt. Otay	222.460	224.060	K6GAO	Hi-Pass	144.680	145.280
WB6WLV	Mt. Otay	444.200	449.200	W6SS	Lyon's Peak	146.865	146.265
WB6WLV	Mt. Otay	1270.300	1282.300	K6AIL	Sharp Hospital	147.285	147.885
WB6WLV	Mt. Laguna	147.750	147.150	WB6WLV	San Diego	442.320	447.320
WB6WLV	Mt. Laguna	222.600	224.200				

All SANDRA repeaters use PL 107.2

SANDRA NETS

Sunday 8:00 P.M. Mt. Otay Repeater

Wednesday 7:30 P.M. Mt. Laguna Repeater

GUIDELINES SUMMARY

SANDRA, Inc. operates their repeaters for service in the San Diego area. The policy of the organization is that the repeaters are available for all licensed amateur radio operators to use so long as applicable rules and regulation are observed, whether members of SANDRA or not.

SQUELCH TALES

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The SANDRA membership meets the first Thursday in the Months of March, June, September and December. Meetings start at 7:00 P.M. and are located at the San Diego County Education Center, 6401 Linda Vista Road, San Diego. Board meetings take place on the first Thursday of January, February, April, May, July, October and November. All SANDRA members are encouraged to attend.

SANDRA, Inc.
San DiegoRepeaterAssociation
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