

LINCOLN LOG

2017

August

Lincoln Amateur Radio Club



AUGUST MEETING

19:30, WEDNESDAY, AUGUST 9

NORTHERN LIGHTHOUSE CHURCH, 6131 NORTH 14TH STREET, LINCOLN, NEBRASKA

AUGUST CLUB MEETING

TOTALITY: WELCOME TO THE DARK SIDE AND THE ECLIPSE OF A LIFETIME
 What causes eclipses and makes total solar eclipses so rare? What can we expect August 21 in Lincoln and how can an eclipse be viewed safely?

Our presenter will be Daniel Claes, Ph.D., professor and chair of the department of Physics and Astronomy at UNL. Dr. Claes was involved in the discovery of the top quark, the heaviest-known subatomic particle, and

"AUGUST CLUB MEETING" CONTINUED ON PAGE 4

EVENT CALENDAR

August

Th	08/03	18:30	VE Exams	Northside Café	2701 N 48th St
Th	08/03		County Fair begins	Lancaster Event Center	
W	08/09	12:00	QCWA Luncheon	The Eatery	2548 S 48th
W	08/09	19:30	LARC Meeting	Northern Lighthouse Church	6131 N 14th St
Sa	08/12	11:00	HPQRP Homebrewers	Bredeaux Pizza	1425 Silver St, Ashland
Sa	08/12	11:59	County Fair ends		
W	08/16	19:00	LARC Board Meeting	Red Cross	220 Oakcreek Dr
Th	08/17	19:30	SATERN Meeting	Salvation Army	2625 Potter St
Tu	08/22	23:59	LOG Deadline	Email articles & ads to	log@k0kkv.org
Sa	06/26		Mud Run		
Su	08/27		Heat Stroke 100		
M	08/28	19:00	LOG Folding	Red Cross	220 Oakcreek Dr

September

Th	09/07	18:30	VE Exams	Northside Café	2701 N 48th St
Sa	09/09	11:00	HPQRP Homebrewers	Bredeaux Pizza	1425 Silver St, Ashland
W	09/13	12:00	QCWA Luncheon	The Eatery	2548 S 48th
W	09/13	19:30	LARC Meeting	*** LI-COR ***	4647 Superior St
Su	09/17		Last Blast Y-Tri Triathlon	Branched Oak Lake	
W	09/20	19:00	LARC Board Meeting	Red Cross	220 Oakcreek Dr
Th	09/21	19:30	SATERN Meeting	Salvation Army	2625 Potter St
Tu	09/26	23:59	LOG Deadline	Email articles & ads to	log@k0kkv.org
Su	09/30		Market to Market Relay		

Lincoln Amateur Radio Club, Inc.
 PO Box 5006
 Lincoln, NE 68505

Club Repeater KØKKV 146.760 (-)
Packet APRS KØKKV 144.390
DX Packet Cluster telnet://cluster.k0gnd.net

LARC Web Site k0kkv.org
Facebook www.facebook.com/LARCLincoln

2017 BOARD OF DIRECTORS

President	Ed Holloway	KØRPT	402/326-1139	k0rpt@arrl.net
Vice President	Bryan Leavitt	WØBCL	402/310-1686	w0bcl@arrl.net
Secretary	Heather Chestnut	KDØBXA		secretary@k0kkv.org
Treasurer	Marlene McLaughlin	KDØHYM		kd0hym@gmail.com
	Greg Brown	KTØK	402/937-3540	gwbrownx@inebraska.com
	Mike Arter	W9LG	402/770-6460	w9lg@yahoo.com
	Randy King	KØNC		randyking1958@gmail.com
	Mike Long	KØSHC	402/770-2427	k0shc13@yahoo.com
Executive Director and Club Station Trustee	Reynolds Davis	KØGND	402/488-3706	reynoldsd1@aol.com

2017 COMMITTEE CHAIRS

COMMITTEE	LIAISON	CHAIR/CO-CHAIR
Activities	KDØHYM	Bruce Wood, WAØRIM
Bylaws	KØRPT	Jeff Bennett, WØWKP
Christmas Party	KØRPT	Heather Chesnut, KDØBXA
Club Awards	KØRPT	Heather Chesnut, KDØBXA
Club Station		Bruce Steyer, KBØKA
Convention	KDØHYM	Marlene McLaughlin, KDØHYM
Education	WØBCL	Aaron Rogge, NØADR Richard Mulder, ACØLN
Emergency Cord. ARRL	KØRPT	Ed Holloway, KØRPT
Estate Assistance	KTØK	Gordon Trout, WØKBS
Facebook		Dale Douglas, KDØWVD
Field Day		John Mardock, KRØP Mike Walsh, KBØQH Larry Frisch, KDØRTK
LOG Editors		Aaron Rogge, NØADR Jeri Lyn Rogge, NØJLR
Merchandise	W9LG	
Nets	WØBCL	Connie Zehr, NØGMA
Public Relations	KØRPT	Bob Mitchell, WBØRJJ
Public Service	KØSHC	Mike Long, KØSHC
QSL Cards	KTØK	Greg Brown, KTØK
Repeater	KØRPT	Ed Holloway, KØRPT
Transmitter Hunts		
Web Site	KØRPT	Aaron Rogge, NØADR
Equipment Inventory	W9LG	Larry Frisch, KDØRTK



PRESIDENT'S COLUMN



Thank you to all who came to the July club meeting. Congratulations to Reynolds Davis, KØGND, appointed as Admiral in the Great Navy of Nebraska and recognized for his many years of service by way of [Nebraska Legislative Resolution 128](#). Many special thanks to Nebraska's Lieutenant Governor, Mike Foley, for presenting these awards. Thank you to Charles Davis, NØCKD, for bringing the family together in Lincoln to see the presentation and to Barb Dorn, KEØKWV, for her work in making it happen.

Many thanks to Jim Davidsaver; Lonnie Rech, WDØAOP; Cathy Rech, KCØVET; Matt Anderson, KAØBOJ; Bob Mitchell, WBØRJJ; Aaron Rogge, NØADR; and Greg Brown, KTØK, for being on hand to show an ARES and ARRL presence.

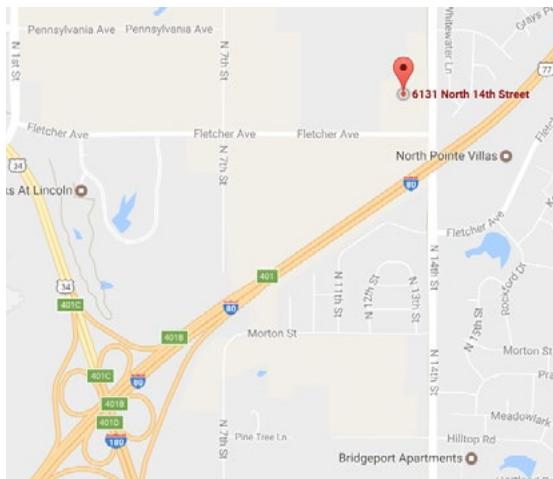
"PRESIDENT" CONTINUED ON PAGE 4

CLUB MEETING LOCATION

MEETING LOCATION THROUGH AUGUST
Northern Lighthouse Church
6131 N 14th St
Lincoln, NE 68521

GOOGLE MAPS

<https://goo.gl/maps/J6jkhghyNq>



—Ed Holloway, KØRPT

LARC PROGRAMS

AUGUST – TOTAL SOLAR ECLIPSE 2017

SEPTEMBER – GLENN JOHNSTON, WØGJ

OCTOBER – 6 METERS PRESENTATION

FUN ON 6 METERS

For those of you who enjoy a little DX or 6 meter operation, it has been open every day since May. I have made 128 contacts since May 30, not counting the 59 contacts I made during the CQ WW contest last weekend.

Do you want to know more about operating on 6 meters? Keep your eyes on the LOG for my upcoming presentation at a club meeting near you!

—Ed Holloway, KØRPT

"AUGUST CLUB MEETING" CONTINUED

currently is a principal investigator on the Cosmic Ray Observatory Project (CROP).

The eclipse occurs on August 21 and Lincoln is in the path of totality. The last total eclipse occurred in the 1600s.

Eclipse glasses will be available for purchase at the August club meeting for \$2.00 each, with proceeds going to LARC. The glasses are made in the United States and are ISO and CE certified for safe eclipse viewing.

—Bryan Leavitt, WØBCL

"PRESIDENT" CONTINUED

As club president, my focus has been to recognize folks who have given back to the community in so many ways. Reynolds has truly done this. Thank you so much for all you have done, Reynolds. LARC is a great club because of you!

Thank you to LES and their team of linemen, who gave an outstanding presentation on electrical safety. The crowd outside was attentive, and I believe everybody had a great time. I thought it was great that the lieutenant governor enjoyed the program and had some questions afterward. Unfortunately, Mother Nature insisted on dropping moisture on us. Regardless, a great time was had by all.

Next month, join us at Northern Lighthouse Church for a presentation on the upcoming eclipse. Look for Bryan's, WØBCL, program notes in this LOG. See you at the club meeting!

—Ed Holloway, KØRPT

THE LARC BOARD NEEDS YOU!

Have you ever served on a board of directors? Have you ever thought about helping LARC move forward? Do you have that special something you believe is missing from the Board?

Well, don't wait to be nominated! Please call any Board member and let us know you would like to be on the ballot in December. We would love to have you and would enjoy some fresh new ideas. You are always welcome to call me at (402) 326-1139.

—Ed Holloway, KØRPT

VE EXAM SESSIONS



**ARRL
VEC**

This month we had our regular session at the Northside Café on Thursday, July 6. We had one candidate who passed for an upgraded license listed below.

GENERAL

- ◆ Daniel Norstrom, KEØNWP, Omaha

Volunteer Examiners (VEs) who participated this month are NØADR, WØBCL, NØJWS, KØKTZ, NØLNK, KCØPJR, KBØQH, and KØSIL.



Upcoming exams are August 3, and September 7, and October 5 at the Northside Café. For testing details, please visit

<http://k0kkv.org>.

—Chris Evens, KCØPJR

JULY LOG ASSEMBLY CREW



Each month a great crew prepares the LOG for mailing to approximately 800 addresses. Thank you to WØBCL, KCØDHM, KDØDIU, KEØEQY, NØJLR, KØKPH, KEØNOQ, KØRPT, KDØRTK, and NØVMT for your help prepping the July 2017 LOG!

We could use some help with LOG folding each month. Use of our own resources is what helps keep the cost at a minimum to print and mail the LOG each month.

Here is the process: Aaron Rogge, NØADR, and Jeri Lyn Rogge, NØJLR, proofread all submissions and lay out the LOG. Aaron sends the document to the printer. Bryan Leavitt, WØBCL, picks up the copies. He delivers them to the Red Cross, where we have eager volunteers waiting to fold and put them into envelopes. Lastly, I deliver the trays of prepared LOGs to the post office the next day.

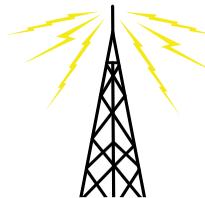
The spot where we could really use some help is folding and packaging. With your help, we could cut this prep time from an hour and 45 minutes to about an hour.

We always enjoy a laugh or two and great conversation during the folding and packaging process.

Thanks in advance!

—Ed Holloway, KØRPT

LINCOLN REPEATER CLUB



146.850 — KØLNE/R

2017 is a great year for Amateur Radio. The FCC authorized and approved two new bands, 630 and 2200 MHz; however, the bands are not yet available. It should be interesting as manufacturers start production on radios for these frequencies.

We are going to raffle off two radios this year. One will be a new BaoFeng UV-5R dual band handheld two-way radio (black), and the other will be a new Yaesu FT-2900 VHF mobile radio. Raffle tickets are \$2.00 each or three for \$5.00. The drawing will be held this fall. Good luck!

Please see Chris, KCØAOO, at the LARC meeting to start or renew your 2017 LRC membership. Membership cost is \$10.00/year.

We encourage you to use our repeater as much as you like. It is an open repeater. If your part of the hobby would like to hold nets on the repeater, please contact Lonnie, WDØAOP (wd0aop@arrl.net), and we will get your net reserved, advertised, and on the air.

Lincoln Repeater Club

C/O WØCHV

6705 W Mill Rd

Raymond, NE 68428-4308

Thank you, LARC members, for your support.

—Lonnie Rech, WDØAOP

2017 PUBLIC SERVICE CALENDAR

Month	Date	Event	Location
August	3 – 12	Lancaster County Fair	Lincoln
	26	Mud Run	Lincoln
	27	Heat Stroke 100 Bicycle Ride	SAC Museum
September	9	MS Bike Ride	Lancaster County
	17	Last Blast Y-Tri Triathlon	Branched Oak Lake
	30	Market to Market Relay	Cass Cnty/Lancaster Cnty
October	8	EYE RUN	Lincoln
	21	Oregon Trail Run	Hebron
	29	Good Life Halfsy	Lincoln

All dates are confirmed, so feel free to mark your calendar. Sign up sheets will be available at upcoming club meetings.

—Mike Long, KØSHC
Public Service Chair

FIELD DAY: THANK YOU!



Thank you to everybody who joined in the fun at Field Day 2017 and to John Mardock, KRØP; Mike Walsh, KBØQH; and Larry Frisch, KDØRTK, for building a great site and making things happen. I believe everything went well, and I had a great time overnight working a little 40 meter phone. I really enjoyed sitting outside Greg's, KTØK, camper and listening to the CW pouring out at about 30 to 40 wpm. I caught some of it and enjoyed catching a few states and call signs at that speed. Thank you to Bryan Leavitt, WØBCL, for keeping the generators going and for helping with the dinner.

I'm also grateful to Cory Campbell, KCØPOC, and troops of Grand Island for trekking to Lincoln to assist with event set up and tear down. I hope the youth were as thrilled to be there as we were in having them. Thank you to John Glass, NU6P, for making the annual trip from California. It was great to finally meet you! Bruce Steyer, KBØKA, set up a tent operating six meters and it was fun chatting while the band was dead. Many thanks to all the operators who came and had some fun.

I must send out a huge thank you to Chuck and Bev Bennett, KDØPTK and KDØPTR; Jeff Bennett, WØWKP; Dale and Kay Softley, KDØPTE and KDØTPP; Dale Douglas, KDØWVD; Bryan Leavitt, WØBCL; Dave Whitworth, NØVMT; The Salvation Army; Hy-Vee; Bob's Tavern; One More Bar, and Cheapest Damn Cigarettes. We were faced with a short notice "put

RADIO HUMOR

DEFINITIONS

Dummy Load: A measure of the stress exerted on a tower by a Ham who climbs the tower without a safety belt.

Long Path: The direction you are told to aim your antenna, to work a rare DX station, as suggested by the other fellows in the pileup.

Coax: (Usually mis-pronounced as two syllables). A term applied to the maneuvering of a piece of transmission line through the attic or walls of a house.

—Brett Coningham, AB5P

together" of sorts for the dinner and breakfast. With the help of contributors who brought dishes to share, we could make it all happen in a couple days' time-- and it was fantastic! These folks stepped up during a time of need and I can't thank you enough!

We can't forget those who are behind the scenes and make things happen. Bob Mitchell, WBØRJJ, made all the contacts with local governmental and media organizations. Thank you so much for all you do, Bob!

—Mike Long, KØSHC
Public Service Chair

LARC BOARD RESIGNATIONS AND NEW BOARD MEMBERS

I am very sorry to report that Dale Douglas, KDØWVD, recently resigned his Board position due to health concerns. We are truly sorry to lose you, Dale, and hope that you feel better soon.

Under the club's bylaws, Section 3.3.09, the task fell to me to appoint Dale's replacement. Heather Chesnut, KDØBXA, will be joining the Board at our July 26 meeting. Heather has expressed an interest in the secretary's position. The Board will select the new secretary at that meeting [KDØBXA appointed as secretary 7/26 ed.].

Due to his retirement and a recent out-of-state move, Mike Lauver, KØLVR, has resigned his Board position. Mike let me know earlier this year that his retirement was upcoming and that the potential of his Board resignation was high. Congratulations on your retirement and stay in touch!

Also joining us at our July 26 Board meeting and graciously accepting an appointment to fulfill the remainder of Mike's term is Randy King, KØNC. Randy brings a wealth of experience in business as the owner of King's Inspections. Randy has a degree in electrical engineering and is a longstanding member of LARC. Randy is one of a few who have known me longer than I have been licensed. In fact, he helped me to get my license.

Welcome, Heather and Randy!

—Ed Holloway, KØRPT

PROPOSED BYLAWS CHANGES

Bylaw changes are presented by the LARC Board for your review. They are to be voted upon at the August club meeting. [Changes are italicized. ~Editors]

CURRENT

2.01 Annual Business Meeting: The Club's Annual Business Meeting for the election of eligible Directors and other presented business transactions shall be held concurrently with the December regular meeting at a time and place designated by the President of the Board. In the event a quorum is not present, the Annual Business Meeting shall be held at successive regular Club meetings until a quorum is present.

REVISED

2.01 Annual Business Meeting: The Club's Annual Business Meeting for the election of eligible Directors and other presented business transactions, shall be held concurrently with the December *Club* meeting at a time and place designated by the President of the Board. In the event a quorum is not present, the Annual Business Meeting shall be held at successive regular *Club* meetings until a quorum is present.

CURRENT

3.04.01 Elected Directors' terms shall begin on January 1. The Director's term ends at the end of the day December 31 of the second calendar year. Four (4) Directors shall be elected each year and may serve unlimited terms. A Director, appointed to fill a vacancy, shall serve until the expiration of the term s/he was appointed to fill.

REVISED

3.04.01 Elected Directors' terms shall begin on January 1. The Director's term ends at the end of the day on December 31 of the second calendar year. Four (4) Directors shall be elected each year and may serve unlimited terms. A Director, appointed to fill a vacancy, shall serve until the expiration of the term s/he was appointed to fill.

ADDITION

3.04.02 *In the event a Director's term would end before the Annual Election can be held, said Director's term shall be extended until an election is held. Once the results of this election are final, said Director's term shall end and the elected successor shall immediately begin serving his/her term on the Board.*

CURRENT

3.05.01 - Committee: The President of the Board shall appoint a Nominating Committee to include at least two elected Directors, whose terms are not expiring, and at least two (2) members from the Club at large at the October Board Meeting. This committee shall present to the Members, at the November Club meeting, a slate of nominees at least long enough to

fill the Board vacancies created by the retiring elected Directors plus one (1).

REVISED

3.05.01 Committee: The President of the Board shall appoint a Nominating Committee to include at least two elected Directors, whose terms are not expiring, and at least two (2) members from the Club at large at the September Board Meeting. This committee shall present to the Members at the November Club meeting, a slate of nominees *sufficient* to fill the Board vacancies created by the retiring elected Directors plus one (1).

CURRENT

Nominations: Nominations from the floor by Members will be accepted only at the November Club meeting.

REVISED

3.05.02 Nominations: Nominations from the floor by Club Members shall be accepted only at the November Club meeting *except in the event there are fewer than Five (5) nominees prior to an election. Then nominations from the floor presented by Club Members shall be accepted prior to the election.*

—LARC Board

RADIO SPORT

AUGUST

- ◆ 5-6 222 MHz & Up Distance Contest
- ◆ 19-20 10 GHz & Up – Round 1
- ◆ 20 Rookie Roundup – RTTY

SEPTEMBER

- ◆ 9-10 EME - 2.3 GHz & Up
- ◆ 9-11 September VHF
- ◆ 16-17 10 GHz & Up - Round 2

OCTOBER

- ◆ 7-8 EME - 50 to 1296 MHz
- ◆ 16-20 School Club Roundup

November

- ◆ 4-5 EME - 50 to 1296 MHz
- ◆ 4-6 Nov. Sweepstakes - CW
- ◆ 18-20 Nov. Sweepstakes - Phone

—ARRL Contest Calendar

REVIEW TIME

Why is it best NOT to draw the DC power for a 100 watt HF transceiver from a vehicle's auxiliary power socket?

- A. The socket is not wired with an RF-shielded power cable.
- B. The socket's wiring may be inadequate for the current drawn by the transceiver.
- C. The DC polarity of the socket is reversed from the polarity of modern HF transceivers.
- D. Drawing more than 50 watts from this socket could cause the engine to overheat.

Answer on page 18.

LARC STRIKES DEAL WITH COUNTY

In April of this year, the Lancaster County Board of Commissioners unanimously approved a lease agreement, granting LARC use of a space in a county-owned building.

The one-year lease will allow LARC to store equipment in a 700 square foot stall with garage door, at the facility at 1440 West Burnham.

Most notable is that Lancaster County Emergency Management-owned equipment trailer (contents owned by LARC) will be stored at the facility, giving LARC 24-hour access to club-owned equipment. After Field Day, the trailer was moved to the Burnham facility. The generator/light tower (currently used as a portable antenna mast) has also been moved there.

John Mardock, KRØP, has moved the tube bank to Burnham, allowing easier LARC member access. There is a printed inventory list at the site as well as instructions on how to pick tubes without disturbing the inventory.



County-owned building at 1440 West Burnham. Two of the garage doors are 11 feet high and the third is 12 feet high. The county has leased LARC use of the stall behind the 12 foot door. Photo by Larry Frisch.

Since there is no physical separation between the county-owned equipment and LARC equipment, the county has insisted that until renovations are done to the building, access will be strictly limited



View of the stall that is being used by LARC for club storage. The building was constructed many years ago, with stone quarried nearby, and has significant historical value. Photo by Larry Frisch.

to a few individuals who have been given personal access codes.

Here is a list of LARC members with access codes:

- ◆ Ed Holloway, 402-326-1139
- ◆ Mike Arter, 402-770-6460
- ◆ Mike Walsh, 402-730-1786
- ◆ Dave Whitworth, 402-470-7059
- ◆ Larry Frisch, 402-560-4565
- ◆ Lancaster Co. Emergency Mgt., Jim Davidsaver / Mark Hoskins, 402-441-7441

If you are a club member and need access to the building, please contact one of the individuals listed above.

There is no fee attached to the lease agreement, and LARC will not be charged for electricity if usage is minimal.

—Larry Frisch, KDØRTK
LARC Inventory Committee

ON THE BANDS WITH NW7US: COMPARATIVE ANALYSIS WITH ACE-HF PRO

For the last two months, we looked at noise and how it impacts the reception of radio signals. But what if you just want to talk to a station in a new country in Europe and, for some reason, can't establish the circuit? Using software such as described last month, ACE-HF Pro, the software predicts no connectivity, but what then? Here's where ACE-HF comparative analysis comes in. Maybe your favored band, where that European station has been active, is closed, but will open later in the evening. Or perhaps you see that it would be better if your QSO was on a different band. Such simple comparisons are easy to see at a glance using HF prediction software.

In addition to optimizing your daily operation with propagation comparisons, ACE-HF can be used for more elaborate future planning. Will your favorite circuits improve when the sunspot number rises during the next solar cycle? Is it worth investing in a high-gain antenna array, or is it good enough to continue with your simple dipole? How about sending messages to your friend on a sailing ship, who might be anywhere in the Pacific Ocean? Such alternatives can be quickly evaluated with the ACE-HF charts and area coverage maps, where it's easy to switch between different cases and take advantage of the software's animation techniques. (ACE stands for Animated Communications Effectiveness.)

VOACAP: THE GOLD STANDARD

Accurate ACE-HF evaluations such as these are made possible by using the VOACAP computational engine, which has emerged as the gold standard of HF propagation models. Because of its decades of historical development and due to the many years of validation through VOA listener reports, VOACAP is used throughout the world by the government and Amateur Radio operators, as well as by international broadcasters. Under a U.S. Navy program, ACE-HF was funded to evaluate all available HF models, and selected VOACAP as the best, most accurate model available. ACE-HF continues to work with Institute for Telecommunication Sciences (ITS) personnel to develop new VOACAP capabilities, and funded ITS to implement the new reception area coverage predictions, so important to SWL enthusiasts.

LOW-FREQUENCY SIGNAL PREDICTIONS

One of the most complicated areas of the VOACAP model is the computation of signal power at the receiver, which involves a frequency-dependent signal absorption model. In 1999, VOACAP was changed to include a more conservative model of nighttime signal absorption for frequencies below about 4 MHz. The previous IONCAP absorption algorithm was replaced because it was feared to be in error since very little measured data supported the low-frequency predictions. Without a strong database, it was thought best to err toward the conservative, if at all.

Since then, however, anecdotal experiences by Hams and other HF operators have reported

nighttime signal reception where the VOACAP model computed no connectivity. Recently, Dick Buckner of ACE-HF, working with ITS personnel, conducted comparative tests of the IONCAP vs. the standard VOACAP absorption models and concluded that indeed, for some circuits, the IONCAP model results in significantly higher signal predictions.

ACE-HF now permits the original IONCAP absorption model to be invoked if the user wishes to experiment with this different computation. The model selection, shown in Figure 1, defaults to the NORMAL setting to emphasize that the standard VOACAP absorption model should always be used by those desiring more conservative predictions.

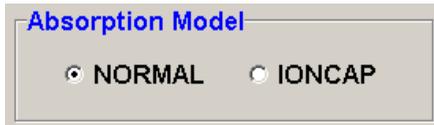


Figure 1: ACE-HF Absorption Model Control

COMPARATIVE TESTS OF THE ABSORPTION MODEL

To investigate this new capability, I decided to test a circuit from my friend's coastal station in Washington state, to Honolulu, Hawaii. This 4279-km circuit was long enough to test the effectiveness of 160-meter and other low-frequency transmissions, yet not so long as to stretch the accuracy of the VOACAP model. Although it is based on HF ray-trace theory, VOACAP actually is an Operations Research (OR) model. OR models are accurate only when they operate within their assigned ranges of system variables, called boundary conditions. VOACAP's boundary conditions are based on an extensive database of field measurements, so comparisons using extremely long circuits whose integrity might depend on short-term ionospheric effects that come and go would be ill advised.

For my trial circuit, I decided to use SSB signaling with a Required SNR (RSN) threshold of 48 dB-Hz and made the initial predictions for a Required Reliability of 50%. My transmit power was assumed to be 1000 watts, and I assumed isotropic antennas with +6 dBi gain at each end of the circuit. The manmade noise level in Hawaii was set for ACE-HF's Rural default of -155 dB-Hz at 3 MHz.

Figure 2 shows the SNR vs. Time-of-Day chart for 160 meters with the Absorption Model set for NORMAL, the VOACAP standard. In these tests, it was important

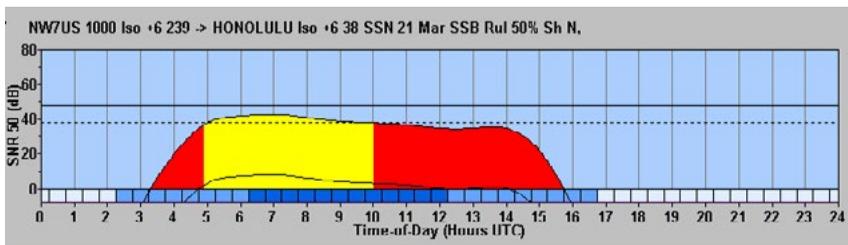


Figure 2: SNR50 vs TOD 160m Normal

to determine when the path was in an all-nighttime condition, so I purposely assumed the month of March in order to place the day-night terminator in a roughly North-South position as it swept through the path. For March 2018, I chose a Smoothed Sunspot Number (SSN) of 21. The ACE-HF chart has terminator bars below the graph, where the dark blue bars are for times when both path terminals are in nighttime, the white bars show daytime conditions

and the light blue bars are when one of the terminals is in the nighttime or twilight zones. The figure clearly shows that low-frequency transmissions are only effective during nighttime hours. It also shows that this circuit is marginal, even at 50% reliability.

Now I was ready to invoke the IONCAP Absorption Model. Figure 3 shows the same conditions with only the Absorption Model changed. The increase in signal strength is quite evident in the higher SNR levels, and the path is in the green during most of the nighttime hours.

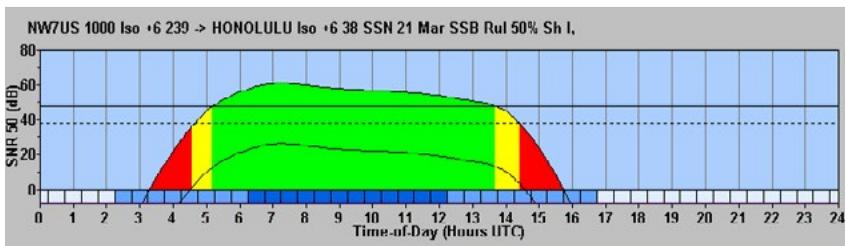


Figure 3: SNR50 vs TOD 160m IONCAP

ALL-BAND FREQUENCY EFFECTS

Now I wondered about the effect on other Ham bands. Would the IONCAP absorption model truly affect only the low-frequency bands? For this comparative test, I used my favorite tool, the ACE-HF Summary Chart, configured in this case to show Reliability predictions. Figures 4 and 5 show the comparisons.

Clearly, the IONCAP setting made a difference. The charts show that only the lower frequencies were affected and confirm that the effects apply only to the nighttime period, from roughly 04 to 16 UTC for this circuit.

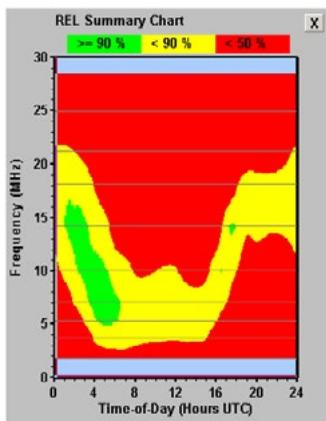


Figure 4

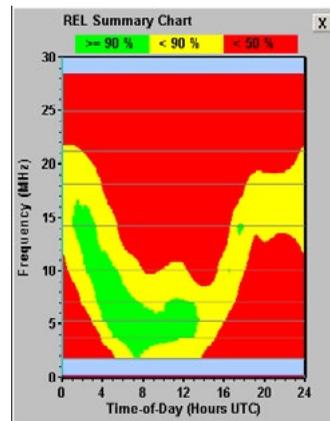


Figure 5

I chose the REL Summary Chart for this comparison because—mindful of boundary conditions—I wanted to use only very conservative system specifications and 90% reliability limits.

COMPARATIVE DATA

But just to be sure, I used the Outputs selection on the ACE-HF Circuit Analysis screen to look at the raw VOACAP data. Again, I concentrated on SNR data only, rather than signal predictions, in order to be sure all system factors such as atmospheric and man-made noise were included. And I used a 90% Required Reliability for this test—once again the concern

about staying well within the boundary conditions of the model. I then transferred the data to a spreadsheet and produced the curves of Figures 6 and 7.

Figure 6 plots the data for both the NORMAL and IONCAP Absorption Model settings as a function of frequency. The blue curve shows the difference between the two predictions. The curves clearly show that the increased signal gain produced by the IONCAP setting is a low-frequency effect. It also shows that the difference is rather spectacular, rising to about 10 dB at the 80 meter frequencies.

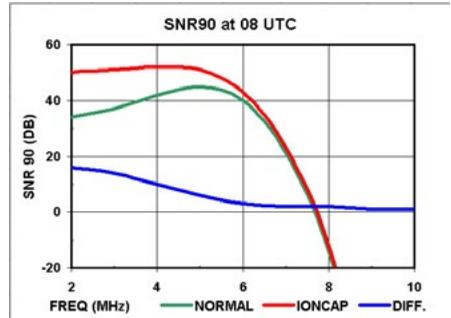


Figure 6: SNR90 vs Freq NORMAL and IONCAP

Now 10 dB is a bunch, equating to a transmitter power increase of from 1000 to 10,000 watts! I can see why the VOACAP scientists were so reluctant to continue using the IONCAP absorption model when there was so little data to support the resulting predictions.

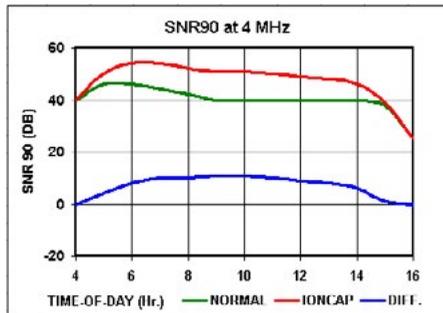


Figure 7: SNR90 vs TOD NORMAL and IONCAP

I also wanted to quantify the nighttime-only effect of the IONCAP model, and produced data for the curves of Figure 7. This graph, with data for 4 MHz only, clearly shows that the difference between the models is important only during nighttime hours. That is, when the ionospheric control points (the reflection points) are in the nighttime regions.

Area Coverage Comparisons. Recognizing that tests with one isolated circuit might not be representative, I decided to make ACE-HF area coverage maps using the

two absorption models. In this way, I could evaluate many different paths and be sure of my conclusions. (ACE-HF creates area maps by running many point-to-point circuit calculations to a grid of receive locations.) Figures 8 and 9 are the result.

The two cases are fun to show on the computer, where the two images can be quickly animated back and forth. Since I purposely chose 14 UTC so my station would be at the edge of the sunlit area, the daylight side of the coverage area never moves, but the nighttime part flicks back and forth, clearly showing the effect of the IONCAP Absorption Model's higher gain.

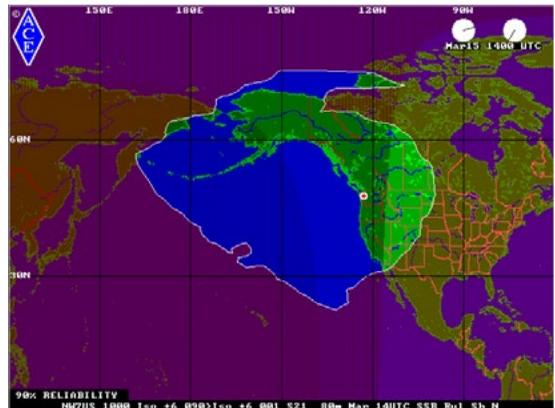


Figure8: Area Cov 80m 14UT 90% NORMAL

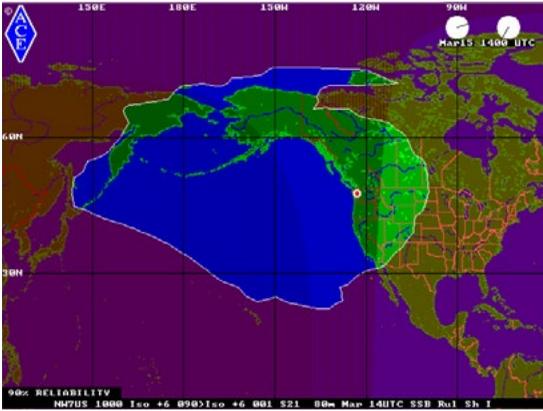


Figure 9: Area Cov 80m 14UT 90% IONCAP

WHICH MODEL TO USE?

What should the average Ham do? Use the NORMAL or the older IONCAP Absorption Model? Hams who have had experience with circuits that seem to connect, but which show poorly in the VOACAP predictions might want to leap at the "improvement" and always use the IONCAP model. But HF scientists and engineers would say "NO! You should always use the more conservative NORMAL model, because that's why VOACAP was changed in 1999!"

The fact is, there is very little data to support the higher signal gain of the IONCAP model, and until there is such, changes cannot be recommended for everyone. Here's what ACE-HF says:

FOR THE NORMAL ABSORPTION MODEL:

"The NORMAL selection uses the standard Absorption Model that was included in VOACAP in 1999 because of a perceived error in IONCAP. This selection results in higher nighttime signal attenuation below 4 MHz. Use of this NORMAL setting for more conservative predictions is recommended."

FOR THE IONCAP ABSORPTION MODEL:

"The IONCAP selection restores the VOACAP Absorption Model to the earlier IONCAP design. This selection will produce higher nighttime signal predictions below 4 MHz.

WARNING: This selection should be used experimentally, because there is little measured data to support the change. Use of the NORMAL setting for more conservative predictions is recommended."

But after all, we are Hams! And isn't it fun to experiment? That's what HF Ham operation is all about!

In fact, I would be delighted to accumulate a body of ACE-HF user reports, where the two absorption models are compared with your on-air experiences. Please don't hesitate to write and let me know what you find out about this interesting comparative analysis.

HF PROPAGATION FOR AUGUST

Late August and early September are a difficult time of year for which to make accurate band predictions because conditions can change drastically from day to day. On many days, typical summertime conditions will continue much as they were during June and July.

On the other days, conditions may sound typically fall-like, with somewhat higher daytime usable frequencies and somewhat lower nighttime usable frequencies. When you add equinoctial conditions that can begin as early as late August, we often experience optimum openings between the northern and southern hemispheres on the one hand, but periods of active to stormy conditions on the other.

Despite being near the end of Solar Cycle 24 with low solar activity, during the daylight hours good DX conditions should be possible on several bands: 17 and 20 meters. Expect signals on the 17 and 20 meter bands to peak approximately during the two-hour window immediately following sunrise and again during the late afternoon. These two bands, and to a lesser degree, the 15 meter band, will see openings for DX throughout the daylight hours. Fairly good DX openings should occur along an arc extending across central Africa, Latin America, and into the far Pacific area. Peak conditions should occur during the afternoon hours, but an increasing number of earlier openings should be possible by early September.

Between sundown and sunrise 20 meters is expected to be the best DX band. However, with lower solar activity, the band in general will suffer compared with the past few years. Openings might be possible to many areas of the world, some with surprisingly strong signal levels. Until midnight good DX conditions should be found for openings toward Latin America, the far Pacific, and into Asia. You might even catch some activity on 17 or even 15. Fairly good conditions are also expected on 30, 40, 60, and 80 meters despite the high static level at times. Openings should be possible before midnight along an arc extending from northern Europe, through Africa, and into Latin America, the far Pacific, and Asia after midnight.

By late August it should be possible to work some DX on 160 meters during the hours of darkness. Conditions on this band, as well as on 40, 60 and 80 meters, will tend to peak just as the sun begins to rise on the light, or easternmost, terminal of a path.

For short-skip openings during August and early September, try 80 meters during the day for distances less than 250 miles, with 60 and 40 meters also usable. During the hours of darkness both 80 and 160 meters should provide excellent communications over this distance. For openings between 250 and 750 miles use 30 and 40 meters during the day for distances up to 500 miles, and 20 and 17 meters between 500 and 750 miles. At night, 40 and 30 meters should be the best bands for this distance until midnight, with 80 meters optimum from midnight to sunrise—try 60 meters, as well. For openings between 750 and 1300 miles, try 20 and 17 meters, as they should provide optimum propagation during the hours of daylight. Optimum conditions should continue on these bands for this distance range after sundown and until midnight. Between midnight and sunrise the best band should be 40 meters, but check 60 meters, too. For openings between 1300 miles and the one-hop short-skip limit of approximately 2300 miles try 20 and 17 meters during the day, with 15 meters also usable. After sundown try 30, 40 and 60 meters, with 80 meters also

providing good propagation conditions for this distance range.

VHF CONDITIONS

Sporadic-E propagation usually begins to taper off during August, but may continue to occur fairly frequently. Some 6 meter sporadic-E openings are expected during the month over distances of approximately 750 to 1300 miles. During periods of intense and widespread sporadic-E ionization, two-hop openings may be possible considerably beyond this range. Also check the 2 meter band for an occasional sporadic-E short-skip opening between approximately 1200 to 1400 miles. While sporadic-E short-skip openings may occur at any time, there is a tendency for them to peak between 8 AM and noon, and again between 6 PM and 9 PM local daylight time.

THE NUMBERS, PLEASE

The Royal Observatory of Belgium, the world's official keeper of sunspot records, reports a monthly mean sunspot number of 11.6 for June 2017. The mean value for June results in a 12 month running smoothed sunspot number of 17.1 centered on December 2016. Following the curve of the 13 month running smoothed values, a smoothed sunspot level of 18 is expected for September 2017, plus or minus 14 points.

Canada's Dominion Radio Astrophysical Observatory at Penticton, British Columbia reports a 10.7 cm observed monthly mean solar flux of 74.8 for June 2017. The twelve-month smoothed 10.7 cm flux centered on December 2016 is 80.0. A smoothed 10.7 cm solar flux of about 78 is predicted for September 2017.

The geomagnetic activity as measured by the Planetary-A index (A_p) for June 2017 is 7. The twelve-month smoothed A_p index centered on December 2016 is 11.4. Geomagnetic activity this month should stay level at about the same activity as seen in August 2017. Refer to the Last-Minute Forecast for the outlook on what days we might witness degraded propagation (remember that you can get an up-to-the-day Last-Minute Forecast at SunSpotWatch.com on the main page).

Please check out my educational tweets on Twitter.com; you can follow @hfradiospacewx ([Twitter.com/hfradiospacewx](https://twitter.com/hfradiospacewx)) for hourly updates that include the K index numbers, as well as @NW7US ([Twitter.com/nw7us](https://twitter.com/nw7us)), which will provide the daily dose of educational tidbits about the Sun and propagation. You can also check SunSpotWatch.com for the latest numbers.

Your thoughts, questions, and experiences regarding this fascinating science of propagation are welcome. E-mail or write a letter; if you are on Facebook, check out www.facebook.com/spacewx.hfradio and www.facebook.com/NW7US.

Happy DX! 73

—Tomas Hood, NW7US

NEW CONTEST

NEW "222 MHZ AND UP DISTANCE CONTEST" TO KICK OFF AUGUST 5-6, 2017!

OBJECTIVE:

Work as many stations as possible on the 222 MHz through 241 GHz bands using any allowable mode. A station in a specific grid locator may be contacted from the same location only once on each band, regardless of mode.

DATE AND CONTEST PERIOD:

The contest is held on the first full weekend of August, beginning at 1800 UTC Saturday and ending at 1800 UTC Sunday (August 5-6, 2017).

For more details, see www.arrl.org/222-mhz-and-up-distance-contest.

—ARRL

ARRL CONTEST RULE CHANGES

CLARIFICATIONS REFLECT "BEST PRACTICES" IN RADIOSPORT

Just ahead of the 2017-2018 contest season, ARRL has announced rule changes and clarifications to League-sponsored contests. These include an improved process for submitting logs and reporting scores. Unless otherwise noted, these changes become effective starting with the September VHF Contest.

"These changes reflect current 'best practices' in the contest community and help us improve the quality of the competition and reporting of results," ARRL Contest Branch Manager Bart Jahnke, W9JJ, said. "For example, getting the log data into log checking more quickly will allow us to post preliminary results online for nearly all contests."

For more information, check out arrl.org/arrl-contests-changes-for-2017-2018.

—ARRL

BEST CHOICE UPC LABELS



Please bring UPC labels from Best Choice products purchased at Russ's or Super Saver to club meetings.

USED EYEGASSES NEEDED

The Lions Clubs International of Lincoln will have a used glasses collection box at our August 9 club meeting.

Please bring any broken or used glasses to the next meeting.

—Dale & Kay Softley, KDØPTE / KDØTPP

REVIEW TIME

Answer: B

The socket's wiring may be inadequate for the current drawn by the transceiver.

—General Exam Question Pool
2015–2019

FOR SALE



ICOM IC-2SAT HT: \$125

Pyramid Phase III Regulated Power Supply Mod. No. PS4 , output 13.8 VDC, OPC 254 power Cable 12 DC power, manual, Schematic Diagram, HM-46 Speaker Microphone, MB-30 Mounting Bracket, CP-12 Cigarette Lighter power cable w/noise filter, BC-74A Wall Charger, BP-90 Battery Case, and BA-11 Battery Bottom Cap.

Unit works with external power sources. The internal battery is dead; it will not charge.

Contact: Gene Nick, NØOSB,
genenick51@gmail.com.

ICOM IC-718: \$475

100 watt HF Transceiver, DSP upgrade, with hand mic. Never around smoker. Purchased from club one year ago, works perfectly. Contact Mike, W9LG, at (402) 770-6460 or W9LG@yahoo.com.

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The Lincoln Amateur Radio Club, Inc. (LARC), is a nonprofit organization devoted to the promotion of Amateur Radio. The club sponsors activities and programs to promote growth in Amateur Radio, as well as furthering the experience of those already licensed, and to create international good will.

The *Lincoln LOG* is mailed monthly to all paid members of LARC and to all Lancaster County, Nebraska, Hams.

If your label says, "COMPLIMENTARY," please consider joining the club and supporting its activities. Even if you are not currently active, your contribution will help to ensure the future of Amateur Radio. Annual dues are only \$20. For your convenience, please join by completing and mailing in the form below or visit k0kkv.org and use PayPal.

The *LOG* solicits your input. If you have an idea for an article, wish to contribute an article or photo, or want to place an ad in the *LOG*, contact the editors at log@k0kkv.org. The deadline for each issue is generally the last Tuesday of the previous month.



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LARC (\$20 / Calendar Year: Jan - Dec) Year: _____

ARRL: National Association of Amateur Radio (\$49 / year)

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Social activities \$: _____

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