VOLUME XLII, NUMBER 8

SPURIOUS EMISSIONS

AUGUST, 2016

INDIAN RIVER ARC

P.O. BOX 237285, COCOA
FLORIDA 32923-7285

OFFICERS

PRESIDENT
DAVID LERRET
KU0R

VICE-PRESIDENT
VIRON PAYNE
N4VEP

SECRETARY
STEVE LUCHUCK
N4UTQ

TREASURER
LARRY HENDERSIN
KK4WDD

DIRECTOR
LARRY JASMANN
WD5CKN

NEWSLETTER EDITOR
ARMANDO DELGADO
KN4JN

CLUB MINUTES

IRARC General Meeting August 4, 2016

The meeting began at 7:31 PM with the pledge of allegiance. Vice President Viron N4VEP led the meeting in the absence of President, Dave KU0R, who is out of town on business.

An old power point was selected to guide the agenda. No guests or visitors were present. Viron called for a report on Ray.

Dave K4UZM reported for Ray's condition and said Ray woke up a month following the anesthesia for the operation and remembers nothing. He is home now doing better but undergoing renal dialysis several times a week.

A motion was made and approved for John Wallace KW4VR for membership into the club. John recently passed all exams, Technician through Extra, in one sitting.

Viron called for the approval of the July meeting minutes, which were published in the newsletter, and a motion was made, seconded and approved.

Larry KK4WDD, our Treasurer, reported that we have $1311.23 in the checking account and $1276.90 in the equipment fund.

A motion was made to approve the Treasurer's report and was moved and approved.

Dave K4UZM reported for the technical committee that the 37 machine is working very well.

Old Business: None

New Business: None

A call for HF contacts produced a nice showing of hands.

A short video was then presented about CB radio in the United Kingdom, where they operate with enthusiasm and courtesy.

A motion to adjourn occurred at 8:19 PM; it was seconded and approved.

Respectfully Submitted

Steve N4UTQ

Secretary

HAPPENINGS

The Doctor Will See You Now!

"Grounding" is the topic of the (June 16) installment of the "ARRL The Doctor is In" podcast, “Are Linear Amplifiers Really Worthwhile?” the later one(June 30) and ”Propagation" is the topic of the latest (July 14) episode.

Ham Radio Outlet (HRO) has announced plans to hire an unspecified number of Amateur Electronic Supply (AES) employees when AES shuts down its four locations in late July. In addition, the current AES Headquarters store in Milwaukee will become HRO's newest location later this summer, following renovation. On July 1, AES announced that it was going out of business and ending retail operations at its Milwaukee, Las Vegas, Cleveland, and Orlando locations. With the approval of AES management, HRO senior managers visited each AES location to interview staffers in hopes of "acquiring some of the Amateur Radio retail employee talent in each of the current AES locations," an HRO news release said.

The North American QRP CW Club has posted a video about their organization, which is free to join. The club sponsors novelty challenges during the year, involving working stations, and then combining the letters of the worked calls to complete various phrases. (Paul, N8XMS) https://www.youtube.com/watch?v=WPRPJEgpw9w

HAPPENINGS

From the ARRL

Traps

A popular way of multibanding antennas is to install parallel tuned circuits, or traps. There are two different techniques used. One technique is to resonate each trap in the middle of the ham bands, while the other is to resonate the traps between ham bands. The latter, while less intuitive, can offer more bands with fewer traps, if properly designed.

Articles:

Coaxial cable Antenna Traps

QST May 1981, pp. 15-17

Both the coil and capacitor of a parallel-resonant antenna trap can be made from the same length of coaxial cable. Sound intriguing? Here's how.

Build a Space-Efficient dipole Antenna for 40, 80, and 160 Meters

QST July 1992, pp. 35-36. Construction details in the September 1992 QST p. 88.

A new trap design, using only RG-58 and PVC pipe, yields better space efficiency than conventional coaxial traps.

Two New Multiband Trap Dipoles

QST August 1994, pp. 26-29

W8NX details a new coax trap design used in two multiband antennas; one covering 80, 40, 20, 15, and 10 meters, and the other covering 80, 40, 17, and 12 meters.

An Improved Multiband Trap Dipole Antenna

QST July 1996, pp. 32-34

You need this - traps with lower loss, higher Q, increased power -handling capability and four-band coverage. Also build a multiband dipole for 80-, 40-, 17-, and 10-meters only 84 feet long.

Taming the Trap Dipole

QST March 2002, pp. 28-30

A trapped dipole for 10/15/17 meters.

Presentations from the 2016 Dayton Antenna Forum are now available on the K3LR website. Included are presentations on (intentionally) bent-element Yagi antennas, the future of the ARRL Antenna Book, low band antennas at W3LPL, and wideband techniques used in OWA antennas.

http://www.k3lr.com/Dayton/

ON THE AIR

FEDERAL REPUBLIC OF GERMANY, DA. Special event station DR777RI is QRV until the end of 2016 to mark the 777th anniversary of the town of Rinteln. QSL via DL8OBQ.

JAPAN, JA. The special event station 8J7START will be active between July 16 and August 31, drawing attention to disaster management and the reconstruction after the earthquake. Operators are members of the Sendai Tuning DX Club (JH7YES). QSL via bureau.

The Mitsubishi Electric Amateur Radio Club celebrates its 50th anniversary on the air with the call 8J3ME between July 16 and December 24. QSL via bureau.

International Lighthouse Lightship weekend, August 20-21.For more info, visit http://www.illw.net/

TUVALU, T2. Thomas, KC0W is QRV as T2C0W until August 18. QSL direct to home call.

ROMANIA, YO. Special event call YP700CJ is QRV until the end of 2016 to celebrates the 700th anniversary of the city of Cluj-Napocaon.

Nob JF2MBF and Ken JA2FJP will be active from Pitcairn Island, IOTA OC - 044, 25 August - 3 September 2016 as VP6J.

They will operate on 160 - 10m CW, SSB, RTTY.

QSL via JF2MBF direct, OQRS, LOTW.

W1AW CW PRACTICE TRANSMISSIONS

7 PM EST Slow CW : 5-15 WPM Mon, Wed, Fri

7 PM EST Fast CW: 35-10 WPM Tue, Thu

FREQUENCIES:
1.8025, 3.5815, 7.0475, 14.0475, 18.0975, 21.0675, 28.0675, 147.555

Radiation Safety by Armando Delgado, KN4JN

Back in the 1990's an Australian study suggested that in a local community children living close to electric power lines had a high incidence of leukemia. The media picked up on this report and a panic ensued. That study later was found to have some errors that invalidated its conclusions, and subsequent studies in Australia and other countries failed to replicate the initial findings or suggest a correlation between radio frequency emissions or high voltage power lines and cancer. Yet, the media and public outcry led politicians to set radiation guidelines to appease the public.

Since there is no evidence of a *pathological* effect from radio frequency emissions, the regulators needed some sort of scientific criterion to set the standards. They decided on *biological* effect of radiation as the best proxy to implement regulations. Experiments with monkeys suggested that at a specific absorption rate of radiofrequency radiation, or SAR, of 4W/Kg a biological effect appeared in the form of changes in feeding pattern of the animals. In humans, exposure to this level of radio frequency radiation would produce a feeling of warmth, like stepping from the

Editor's Note:

Send comments about the Newsletter or to contribute information or articles to the Editor's email address:

olardelga@aol.com.

Radiation Safety

shadow into sunlight. To be extra safe, the guidelines recommended a 10 fold safety margin, setting the SAR at 0.4 W/Kg for a "controlled" environment; that is, where the person is aware of the exposure and can take precautions. For those in "uncontrolled" environments, or who are not aware of the exposure, the limit is 1/5 that of the "controlled" environment, or 0.08 W/Kg. It is important to understand that this is the amount of radiation received by the individual not the radiation emitted.

To complicate the issue is the fact that biological response to radio waves is frequency dependent, since the shorter wavelengths carry more energy, and in humans there is a range of frequencies in which the average human size exhibits a certain resonance and increased absorption. These frequencies are between 80-100 MHz. For this reason, the guidelines set the strictest limits between 30- 300MHz.

The SAR is tissue effect. The next step is to figure the emission intensity that would produce the limiting SAR. This is the power density of the emission expressed in milliwatts/cm^2 (mW/cm^2) and is dependent on frequency, distance from the emitter, and duration of exposure. In setting the limits, the duration of exposure is calculated on a 6 minutes basis for the controlled environment and 30 minutes for the uncontrolled. There are further corrections for near-field and far-field distances from the antenna; that is, distances less than one wavelength and those over one wavelength from the antenna, because of changes in the energy distribution of the radio waves in the different planes at different distances. For amateur stations the power emissions that define the need for routine station evaluation are listed in Table 1 . These also are the power levels below which most amateur antennas would be within the emission guidelines.

Another option is to use the formula for far-field power density:

$S=PG/4\pi R^2$

where

S = power density (in appropriate units, e.g. mW/cm2). P = power input to the antenna (in appropriate units, e.g., mW). G = power gain of the antenna in the direction of interest relative to an isotropic radiator. R = distance to the center of radiation of the antenna (appropriate units, e.g., cm).

Table 4a further shows distances from antenna at different frequencies and power levels for both controlled and uncontrolled settings at which emissions exceed limiting levels. Most amateur stations operating HF at 100 W into wire dipoles raised to the usual heights will be within the guidelines. However, those using amplifiers at the higher HF frequencies need to take care as the safe antenna distances grow exponentially in these ranges.

For more information on this topic review the articles in the references.

———————

References:

FCC OET Bulletin 65.

FCC OET Bulletin 65B.

QST January, 1998 pp50-55.

TABLE 1. Power thresholds for routine evaluation of amateur radio stations.

Wavelength Band	Transmitter Power (watts)
MF	
160 m	500
HF	
80 m	500
75 m	500
40 m	500
30 m	425
20 m	225
17 m	125
15 m	100
12 m	75
10 m	50
VHF (all bands)	50
UHF	
70 cm	70
33 cm	150
23 cm	200
13 cm	250
SHF (all bands)	250
EHF (all bands)	250

TABLE 4a. (MF/HF Bands)
(Developed by Fred Maia, W5YI Group, working in cooperation with the ARRL.)

Estimated distances in meters from transmitting antennas necessary to meet FCC power density limits for Maximum Permissible Exposure (MPE) for either occupational/ controlled exposures ("Con") or general population/uncontrolled exposures ("Unc") using typical antenna gains for the amateur service and assuming 100% duty cycle and maximum surface reflection. Chart represents worst case scenario.

Freq. (MF/HF) (MHz/Band)	Antenna Gain (dBi)	Peak Envelope Power (watts) 100 watts Con.	100 watts Unc.	500 watts Con.	500 watts Unc	1000 watts Con.	1000 watts Unc.	1500 watts Con.	1500 watts Unc.
2.0 (160m)	0	0.1	0.2	0.3	0.5	0.5	0.7	0.6	0.8
2.0 (160m)	3	0.2	0.3	0.5	0.7	0.6	1.06	0.8	1.2
4.0 (75/80m)	0	0.2	0.4	0.4	1.0	0.6	1.3	0.7	1.6
4.0 (75/80m)	3	0.3	0.6	0.6	1.3	0.9	1.9	1.0	2.3
7.3 (40m)	0	0.3	0.8	0.8	1.7	1.1	2.5	1.3	3.0
7.3 (40m)	3	0.5	1.1	1.1	2.5	1.6	3.5	1.9	4.2
7.3 (40m)	6	0.7	1.5	1.5	3.5	2.2	4.9	2.7	6.0
10.15 (30m)	0	0.5	1.1	1.1	2.4	1.5	3.4	1.9	4.2
10.15 (30m)	3	0.7	1.5	1.5	3.4	2.2	4.8	2.6	5.9
10.15 (30m)	6	1.0	2.2	2.2	4.8	3.0	6.8	3.7	8.3
14.35 (20m)	0	0.7	1.5	1.5	3.4	2.2	4.8	2.6	5.9
14.35 (20m)	3	1.0	2.2	2.2	4.8	3.0	6.8	3.7	8.4
14.35 (20m)	6	1.4	3.0	3.0	6.8	4.3	9.6	5.3	11.8
14.35 (20m)	9	1.9	4.3	4.3	9.6	6.1	13.6	7.5	16.7
18.168 (17m)	0	0.9	1.9	1.9	4.3	2.7	6.1	3.3	7.5
18.168 (17m)	3	1.2	2.7	2.7	6.1	3.9	8.6	4.7	10.6
18.168 (17m)	6	1.7	3.9	3.9	8.6	5.5	12.2	6.7	14.9
18.168 (17m)	9	2.4	5.4	5.4	12.2	7.7	17.2	9.4	21.1
21.145 (15m)	0	1.0	2.3	2.3	5.1	3.2	7.2	4.0	8.8
21.145 (15m)	3	1.4	3.2	3.2	7.2	4.6	10.2	5.6	12.5
21.145 (15m)	6	2.0	4.6	4.6	10.2	6.4	14.4	7.9	17.6
21.145 (15m)	9	2.9	6.4	6.4	14.4	9.1	20.3	11.1	24.9
24.99 (12m)	0	1.2	2.7	2.7	5.9	3.8	8.4	4.6	10.3
24.99 (12m)	3	1.7	3.8	3.8	8.4	5.3	11.9	6.5	14.5
24.99 (12m)	6	2.4	5.3	5.3	11.9	7.5	16.8	9.2	20.5
24.99 (12m)	9	3.4	7.5	7.5	16.8	10.6	23.7	13.0	29.0
29.7 (10m)	0	1.4	3.2	3.2	7.1	4.5	10.0	5.5	12.2
29.7 (10m)	3	2.0	4.5	4.5	10.0	6.3	14.1	7.7	17.3
29.7 (10m)	6	2.8	6.3	6.3	14.1	8.9	19.9	10.9	24.4
29.7 (10m)	9	4.0	8.9	8.9	19.9	12.6	28.2	15.4	34.5

Note: Multiply above distances by 0.707 if duty cycle is 50% - such as during a typical back and forth communications exchange. To convert from meters to feet multiply meters by 3.28. Distance indicated is shortest line-of-sight distance to point where MPE limit for appropriate exposure tier is predicted to occur.

437 S. BABCOCK ST.
MELBOURNE, FL 32901
Ph) 321-727-2311
Fax) 321-727-2312

DISCOUNT ELECTRONICS

HAM&CB EQUIPMENT
SECURITY SYSTEMS
BATTERIES(ALL TYPES)
REPAIRS(ALL TYPES)
ANTENNAS – TOWERS
2-WAY RADIO EQUIPMENT

"SALES AND SERVICE"
TELEPHONE SERVICE
COMPUTER REPAIR
STEREOEQUIPMENT
POWER SUPPLIES
TUBE EQUIPMENT

2013 LINE LISTINGS ** THE ONLY REAL PARTS STORE LEFT IN SOUTH BREVARD **

AIM
ALINCO
ANTENNACRAFT
ANTENNA SPECIALISTS
ARRL
ASTATIC
ASTI

BEARCAT
BECKMAN (WAVETEK)
BUSSMAN FUSES
BUD

C.B.RADIO
CALRAD
CORNELL DUBILIER
CELLPHONE AMPS
CHICAGO MINIATURE
CINCH JONES
CLOVER
COBRA
CUSHCRAFT

DALBANI
DECIBEL PRODUCTS
DENNISON
DURACELL
DANTONA IND.

ECG (SEE NTE)
ELECTRONIC RESOURCES
ELECTROVOICE
EVEREADY

FANON-INTERCOMS
FLUKE (WAVETEK)

GC ELECTRONIC
GALAXY
GOLDLINE

HAM RADIO
HARADA
HITACHI
HYGAIN

ICOM RADIO

JSC WIRE
JW DAVIS SOUND
JVC PARTS

KENWOOD RADIO
KOSS
KESTER

LITTELFUSE
LOWELL

M & G
MALLORY
MACOM
MAXON
MIDLAND
MOTOROLA

NTE TRANSISTORS
NELLO TOWERS
NTE ELECTRONICS
NORMAN LAMPS

PANASONIC
PANAVISE
PHILIPS ECG (SEE NTE)
PHILMORE
PIONEER
POMONA
POWERSONIC
PRB
PROAM ANTENNAS

QUAM
QUEST

RANGER RADIO
RAYOVAC BATTERIES

RUSSELL IND.

SR COMPONENTS
SANYO BATTERIES
SHURE BROTHERS
SONY PARTS

SPECO
SWITCHCRAFT

TEI
TNR BATTERIES
TELEX – HYGAIN
TRIPPLITE
TUBES – ALL TYPES
TV ANTENNA'S

UNIDEN
UNIDILLA
UNION CARBIDE

VARCO
VALOR
VECTOR
VIDEO EQUIPMENT

W2AU BALUNS
WALDOM – MOLEX
WAHL-CLIPPER
WAVETEK (BECKMAN)
WILSON ANTENNAS
WILSON ELECTRONICS

YAESU

WEB PAGE:
www.tedcoelectronics.com

EMAIL:
tedco@bellsouth.net

Hours:
MON – FRI 9 AM – 5 PM
SATURDAY 9AM-3PM

TED – W4LR - GENERAL MGR.

DOTTIE – OFFICE MANAGER