



**INDIAN  
RIVER ARC**

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

VOLUME XLVI, NUMBER 1

# SPURIOUS EMISSIONS

JANUARY, 2020

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N4VEP

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**ARMANDO DELGADO**  
KN4JN

## CLUB MINUTES

The meeting was called to order by the president, Viron Payne, N4VEP on January 3, 2020 at 7:30 PM followed by the Pledge of Allegiance.

16 Members and officers were present along with guests Benjamin Hosmer, N4BLH and John Moore, KN4TPA.

The minutes of the November meeting were in the last newsletter. A motion was made to accept the November minutes. Motion to accept, seconded, then voted on and accepted. Treasure Report: Larry out of town, report next month.

Technical report: All repeaters working ok but: Control on the 37 & 88 repeaters need to have a new software update which will be done in the next few weeks by Chris Durso, AA4CD. Also, the 94 repeater had an interment intermodulation distortion problem, Chris worked on the duplexer and now appears to work correctly. ARES report: Less Beecher, W9BCH is not here to give report.

Bears Report No Report.  
Red Cross Report (Red cross is

moving)

VP Report: Nothing this month.

President Report-

PO Box paid for the year  
DX Report: too early in the new year to make many dx contacts.

Insurance payment not due yet

Winter field day: Jan 25-26 for info only if you want to try.

Orlando Hamcation

Feb 7-9 \$20

Hurricane season June 1 - Nov 30

Dwain volunteered and is charged with making the two Go-kits based on the Go-kits that Dave, KUOR made and to be completed by March meeting. Meeting location not known!

New Business:

Red Cross is moving late FEB to where, we don't know, therefore where we are going is unknown.

Viron called for a study to find a HF Power Amp (500 to 800 Watts) that will run on 110Volts and a charge controller

The budget is tabled till next meeting.

Chris Durso was nominated to be our contact with the Rockledge Medical Center.

Chris also suggested that the club write a description of what we do to help the community and our needs to present to county organizations. Viron will take on this job.

A motion to increase dues to \$20 per year for individuals and \$30 for families was presented, voted on and approved. It will take effect in March 2020.

Chris mentioned that the FCC plans to take the 3.5 GHz band away from amateur radio. A letter to support the retention of the 3.5 GHz band in the amateur system to be sent to ARRL. The 50-50 drawing \$13.50 won by Danny  
Technical presentation on Solar Power by Viron  
Meeting over at 8:45 PM.  
Respectfully submitted,  
Ernest Hoffman, K1CPO  
Secretary

## HAPPENINGS

Interesting video on callsign piracy: <https://youtu.be/z6s58MI4EdA>

The Maine Bicentennial Special Event, an amateur radio activity celebrating the 200th anniversary of Maine statehood, will take place from March 16th to March 22nd, 2020.

Twelve special event call signs will be active, each representing

one of Maine's nine original counties, plus three special locations that have historical significance. These include the city of Boston (K1B), which was capital of the District of Maine while it was still part of Massachusetts, Jameson Tavern, in Freeport (K1J), where the papers were signed that separated Maine from Massachusetts, and the Town of Portland (K1P), which was Maine's first capital. The original nine counties will be

represented by the following call signs during the event: Cumberland (W1C), Hancock (W1H), Kennebec (W1K), Lincoln (W1L), Oxford (W1O), Penobscot (W1P), Somerset (W1S), Washington (W1W), and York (W1Y). For more information go to <https://maine200specialevent.com/>

"VHF/UHF propagation" is the topic of the new December 5

episode of the ARRL [The Doctor is In podcast](#).

The FCC is amending its Part 97 Amateur Service rules relating to RF exposure safety. In a [lengthy document](#) in ET Docket 19-226 released on December 4 that addresses a broad range of RF safety issues, the FCC said current amateur radio RF exposure

## HAPPENINGS

safety limits will remain unchanged, but that the amateur-specific exemption from having to conduct an RF exposure evaluation will be replaced by the FCC's general exemption criteria. Appropriate methodologies and guidance for evaluating Amateur Radio Service operation is described in the Office of Engineering and Technology (OET) [Bulletin 65, Supplement B](#), "the revised rule concludes

The NOAA/NASA-co-chaired international Solar Cycle Prediction Panel has released

its latest forecast for Solar Cycle 25. The panel's consensus calls for a peak in July 2025 ( $\pm 8$  months), with a smoothed sunspot number of 115. The panel agreed that Cycle 25 will be of average intensity and similar to Cycle 24. The panel additionally concurred that the solar minimum between Cycles 24 and 25 will occur in April 2020 ( $\pm 6$  months). If the solar minimum prediction is correct, this would make Solar Cycle 24 the seventh longest on record at 11.4 years. In its preliminary forecast released last April, the scientists on the panel forecast that Solar

Cycle 25 would likely be weak, much like the current Cycle 24.

**Earth at Night**, NASA's new 200-page ebook, is now available [online](#) and includes more than 150 images of our planet in darkness as captured from space by Earth-observing satellites and astronauts on the International Space Station over the past 25 years. For more information, visit:

<https://www.nasa.gov/earth>

The European Space Agency (ESA) is [challenging radio amateurs](#) (or anyone with appropri-

ate receiving equipment) to hear the first signals from ESA's OPS-SAT space software laboratory. The OPS-SAT flight control team has developed [open-source software](#) that allows anyone to receive and decode the UHF beacon on 437.2 MHz, 9.6 kB GMSK. A OPS-SAT UHF [beacon reception form](#) is available to report. The first three radio amateurs or listeners to receive at least five correctly decoded frames and submit them to ESA get an exclusive invite to the OPS-SAT Experimenter Day next March and a certificate. See the OPS-SAT [Amateur Radio Information Bulletin](#) page additional details.

## ON THE AIR

From 12 to 26 January 2020, special event call TM70TAAF will be activated by François F8DVD. The special call sign commemorates the 70th anniversary of the first Amateur Radio contacts with French Southern and Austral Territories (FSAT - TAAF). These took place in January 1950 during the building of scientific research stations on Saint Paul and Amsterdam island (FB8ZZ), Kerguelen island (FB8XX) and Adelie Land in Antarctica (FB8AX). Qsl OK via buro, direct with SASE and LOTW. For

more info : [www.grz.com/db/TM70TAAF](http://www.grz.com/db/TM70TAAF)

14th Annual Straight Key CW Event Jan 2-Jan 31, 0000Z-2359Z, K3Y, various cities. SKCC - Straight Key Century Club. 21.050 14.050 7.055 3.550. Certificate & QSL. SKCC c/o Jeremy Downard, KD8VSQ, 511 W. Pottawatamie St., Tecumseh, MI 49286. K3Y/O thru 9 plus KH6, KL7, KP4 and DX member stations in six WAC areas operating straight key, bug and cootie keys. QSL card confirms one QSO per area, up to 19 for all-area sweep.

See URL for schedule, map, stats, etc.

[www.skccgroup.com/k3y](http://www.skccgroup.com/k3y)

Russell, G5XW will be active as C5XW from Gambia, during 10 days, starting 28 January 2020. He will operate on 40 - 17m. QSL via home call buro.

E44RU Team will be active from Palestine, 5 - 14 January 2020. Team - R7AL, RA1ZZ, RW9JZ, R5EC. They will operate on 160 - 10m, CW, SSB, FT8.

QSL via R7AL, ClubLog OQRS, LOTW.

QTH - Near Jericho, Palestine.  
QTH Locator - KM71fm.

In Antarctica, Chris Cianflone, W2RTO, is on the air from KC4USV at McMurdo Station, mostly operating FT8 on 14.075 MHz. He will try to be on the air at 0000 UTC for about 30 minutes a day, Monday through Saturday, and at 0600 UTC. QSL via K7MT.

German special event station DL250BTHVN will be active between December 16, 2019, and December 17, 2020, to honor the 250th anniversary of the birth of famed composer Ludwig van Beethoven.

## Tropospheric Ducting by Armando Delgado, KN4JN

At HF frequencies radio signals usually propagate by refraction or reflection from the ionosphere. Since the ionosphere ranges from 50-200 miles above the ground, radio signals returning from this layer can reach very long distances. The ionosphere on the other hand is transparent to VHF signals, and these pass through it unimpeded to outer space. Due to this, VHF signals, especially those above 144 MHz, propagate by line of sight. Because of the earth curvature, the range of these signals depends on antenna

height.

However, there is another method of propagation for VHF signals that can allow long distance propagation. It is called tropospheric ducting, so named because it occurs in the troposphere, the lowest layer of the atmosphere where most of the atmospheric gases concentrate, and the signals propagate like in a duct, or radio wave guide (Figure 1).

For tropospheric ducting to occur, a phenomenon called a *temperature inversion* must happen in the atmosphere. In normal, stable air, the air temperature decreases gradually with altitude at a rate of about 3°C per 1000 feet. Under certain atmospheric conditions warm air superimposes on colder air, so that on reaching that altitude the air becomes warmer for the thickness of the warm air mass, and then cools again above that layer.

But just a temperature inversion will not trigger ducting. One other requirement is that the warm air layer has to be dry, or much drier than the air below it. Tropospheric ducting occurs because the radio signal is refracted back to earth in the warm air layer due to the index of refraction of this air mass being different from the colder underlying air. However, the difference in refractive indices between the air layers must reach a certain minimum

for the signals to be refracted enough to reach the ground. The signals will then continue to bounce up and be refracted down for the duration of the correct temperature inversion layer.

Temperature inversions happen when warm and cold air masses run into each other. High pressure air masses consist of subsiding cold, dense air. Whenever a high pressure system runs into a warm air area, the cold, dense air will slide under the warm, lighter air. If the warm air retains the correct humidity, tropospheric ducting can occur. Likewise, warm fronts moving into cold air will cause the warm air to rise above the colder, denser air with the same result. Some high pressure systems will last in some locations for long periods of time, like the Bermuda High off the east coast of the U.S. When the surrounding warm air is dry enough, these highs will produce ducting that may travel for very long distances. As a rule, ducting tends to develop on the west and south edges of these highs. In winter time, the Bermuda High provides excellent opportunities for ducting up and down the east coast and even into the Caribbean.

Because Florida is a narrow peninsula surrounded by water, the potential for the atmospheric conditions that lead to tropospheric ducting are more limited than in the US mainland. In the central US summertime sees many cold fronts colliding with warm, dry air and long distance tropospheric ducting is common. Unfortunately, in Florida summertime brings very unstable air from thunderstorms that disrupt the air layers and make the likelihood of ducting rare.

Fall, winter, and spring are another story. Cold, dry air masses move into Florida and the chances for ducting improve. In the central part of the United States, ducting commonly occurs in front and behind cold fronts, generally some distance from the front line. In Florida the air masses surrounding cold fronts are normally too humid to

permit the ducting conditions.

However, ducting will happen occasionally after the passage of a cold front with dry air. There are two situations when this may take place. One, called refractive heating, may develop about a day after a frontal passage, as the air stabilizes. When the sun goes down in the evening, the ground loses heat to the air just above it. This warmed air rises and cold surrounding air slides under it. If the warm air layer is dry enough, ducting could happen. Because most of Florida has many lakes, these cause uneven heat release patterns and thus the inversion layers may not be consistent for very long distances, but these conditions may produce ducting in varied directions for many miles, even if not long-sustained.

The other situation is the sea breeze front. In the evenings, the land cools faster than the ocean. The warm air over the water rises and colder air from land slides under it thus creating an inversion. Unfortunately, in Florida the likelihood that the sea air will be dry enough for ducting to happen is low. On the other hand, in the morning the opposite effect will happen. The land will warm faster than the ocean with the rising sun, and the warmed air will rise with a consequent cooler sea breeze moving under the rising air. In winter time, the land air may be dry enough to allow ducting. Actually, some of the best ducting episodes in this area in the past occurred in mornings after a cold front passed with signal being heard all along the east coast, and even into the Bahamas.

Most people associate tropospheric ducting with beam antennas, high power, and SSB or CW modulation, but ducting can happen with any form of modulation and even low

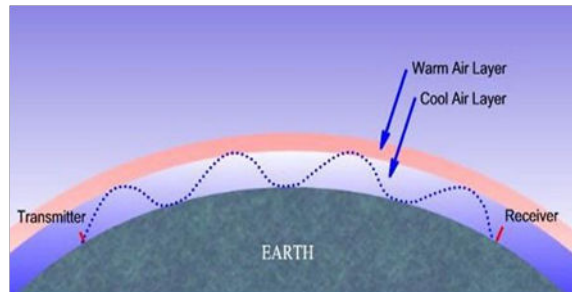


Figure 1.

power signals can travel long distances in a duct. Hams who engage in VHF dxing will monitor distant commercial FM stations to find out when a ducting opening happens.

So next time conditions are right for local tropospheric ducting, make a call on the FM calling frequency of 146.52 MHz. Many hams monitor this frequency, and who knows, some distant voice may answer your call.



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,  
50.350, 147.555



### Upcoming Contests

February 2019  
11-15 [School Club Roundup](#)  
16-17 [International DX - CW](#)  
March 2019  
2-3 [International DX - Phone](#)



Editor's Note:

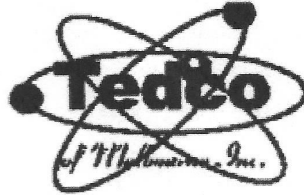
Send comments about the Newsletter or to contribute information or articles to the Editor's email address:

olardelga@aol.com.

ACTIVE REPEATERS INCLUDING DMR, PACKET & SIMPLEX							RACESBRE0008 REV B
Repeaters & Packet are open for all licensed amateur radio operators to use.							
OUTPUT FREQ.	STD. NAME	OFFSET	TONE/CC	CALL	LOCATION	OWNER	NOTES
<b>WBFM</b>							
145.130	130 VB	-600	107.2	AB4AZ	VERO BEACH, INDIAN RIVER	AB4AZ	
145.350	350 SC	-600	103.5	K4QSC	St. CLOUD, OSCEOLA	K1XC	Radio Science Club, FI Club
145.370	370 CO	-600	156.7	W2SDB	COCOA-BROADCAST CT.	IRARC	Yaesu Repeater replaced with Bridgecom FM
145.470	470 ME	-600	107.2	K4HRS	MELBOURNE- RIALTO PL.	HIRAC	
145.490	490 TI	-600	100.0	WN3DHI	TITUSVILLE SR405 & Fox 1k rd.	WN3DHI	
146.610	610 ME	-600	None/107.2	W4MLB	MELBOURNE- HOLMES HOSP	PCARS	Tone Downlink only
146.625	625 MM	-600	100.0	KE4NUZ	NW of MIMS NEAR HARRISON RD.	KE4NUZ	Limited coverage
146.775	775 MM	-600	100.0	K4KSC	NW of MIMS Hog Valley , W of I95	K4KSC	
146.850	850 ME	-600	None/107.2	W4MLB	PALM BAY- Port Malabar Rd.	PCARS	Tone Downlink Only
146.880	880 RO	-600	107.2	W4NXL	ROCKLEDGE- WUESTHOFF HOSP.	IRARC	FUSION Repeater replaced with Bridgecom F
146.895	895 PB	-600	107.2/107.2	K4EOC	PALM BAY- DeGroot Library	EOC	TSQL as of 5/2018
146.910	910 TI	-600	107.2	K4KSC	TITUSVILLE Water Tower on south st.	TARC	
146.940	940 RO	-600	None	K4GCC	ROCKLEDGE Carver Rd.WLRQ Tower	LISATS	
146.970	970 TI	-600	107.2	K4KSC	TITUSVILLE-T'VILLE TOWERS	TARC	
147.075	075 SC	+600	107.2/107.2	K4EOC	SCOTTSMOOR Near US1-Aurantia Rd	EOC	TSQL as of 5/2018 Relocated 4/2019
147.135	135 RO	+600	107.2/107.2	K4EOC	ROCKLEDGE-EOC	EOC	TSql as of 5/2018
147.240	240 DE	+600	123.0	KV4EOC	DELAND	VARES	
147.255	255 PB	+600	107.2	K4DCS	Near Babcock & Palm City S City limit	PBARC	
147.330	330 TI	+600	107.2	K4NBR	TITUSVILLE-PARRISH HOSP.	NBARC	
147.360	360 TI	+600	107.2	N4TDX	TITUSVILLE-PARRISH HOSP.	NBARC	DSTAR Gateway in work
442.850	850TI4	+5000	107.2/107.2	N4TDX	TITUSVILLE-PARRISH HOSP.	NBARC	TSql;FUSION/WBFM/WIRES-X
444.325	325ME4	+5000	107.2	K4DCS	MELBOURNE-TRINITY TWRS-E	PBARC	
444.375	CNLBRE	+5000	107.2		195 FDT Twr 1/2 Mile N of County Lin	SARNET	"SARNet Sebastian Repeater"
444.425	425ME4	+5000	107.2	W4MLB	MELBOURNE- RIALTO PL.	PCARS	
444.525	525RO4	+5000	103.5/103.5	K4EOC	ROCKLEDGE-EOC	EOC	TSql; VOICE/NBEMS
444.650	CNMBRE	+5000	107.2	W4NXL	COCOA-FHP SR520	IRARC	"SARNet Cocoa Repeater"
444.750	750TI4	+5000	156.7/156.7	N4TDX	TITUSVILLE- TGO WATERTOER 230 ft.	NBARC	TSql
444.875	875MI4	+5000	107.2	KC2UFO	MERRITT IS. COURTNEY SPRS.	K4UZM	
444.925	925KS4	+5000	131.8/131.8	N1KSC	KENNEDY SP. CTR.-VAB	KSCARC	FM Tsql ; P25 capable
224.120	120CO2	-1600	123.0	AA4CD	COCOA Broadcast Ct.	AA4CD	
<b>DMR</b>							
444.150	150TI4	+5000	CC1	K2JO	TITUSVILLE-PARRISH HOSP.	KC2CWT	DMR FL
444.575	575CO4	+5000	CC3	K4DJN	COCOA BROADCAST CT.	AA4CD	DMR Brandmeister
444.675	675TI4	+5000	CC3	K4DJN	TITUSVILLE-T'VILLE TOWERS	AA4CD	DMR Brandmeister
<b>ATV</b>							
427.250	250CO4			K4ATV	COCOA BROADCAST CT.	LISATS	NTSC INPUT 439.25 See www.lisats.org
<b>PACKET STATIONS:</b>							
145.090	W12KPB	WINLINK		W2PH-10	PALM BAY-W2PH QTH	PBARC	WINLINK GATEWAY
145.090	090 ME	PCARS		W4MLB-2	MELBOURNE-TRINITY TWRS-EAST	PCARS-K1YON	BBS W4MLB-4 EASTNET
145.770	770 PB	SEDAN		K4EOC-7	PALM BAY	N2DB	http://www.fla-sedan.com
145.770	770 TI	SEDAN		KD4MWO-4	TITUSVILLE	N2DB	INACTIVE NODE
<b>BREVARD RACES/ARES SIMPLEX</b>							
146.480	CENTX	SIMPLEX		N/A	CENTRAL REG	IRARC	CENTRAL NET SIMPLEX BACKUP
146.550	SOUTHX	SIMPLEX		N/A	SOUTH REGION	PBARC	SOUTH NET SIMPLEX BACKUP
146.580	MLBX	SIMPLEX		N/A	MELBOURNE REGION	PCARS	MELBOURNE REGION NET SIMPLEX BACKUP
146.595	NORTHX	SIMPLEX		N/A	NORTH REGION	TARC	NORTH NET SIMPLEX BACKUP
147.540	EOCROX	SIMPLEX		N/A	RACES Bay	EOC	EOC VOICE/NBEMS
<b>SIMPLEX</b>							
146.520	CALL52	SIMPLEX		N/A	Station to station, anywhere		VHF national simplex calling freq
146.490	TAC A	SIMPLEX		N/A	Station to station, anywhere		Standardized tactical option since 2006
146.560	NBRX	SIMPLEX		N/A	NBARC -Club/Parrish Hosptial Activities		
146.580	TAC B	SIMPLEX		N/A	Station to station, anywhere		Standardized tactical option since 2006
147.420	TAC C	SIMPLEX		N/A	Station to station, anywhere		Standardized tactical option since 2006
147.420	IRARCX	SIMPLEX		N/A	IRARC "FUN NET" and CLUB ACTIVIES		
147.450	TAC D	SIMPLEX		N/A	Station to station, anywhere		Standardized tactical option since 2006
147.570	TAC E	SIMPLEX		N/A	Station to station, anywhere		Standardized tactical option since 2006
446.000	CALL46	SIMPLEX		N/A	Station to station, anywhere		UHF national simplex calling freq
446.500	TAC A4	SIMPLEX		N/A	Station to station, anywhere		Standardized tactical option since 2006
446.600	TAC B4	SIMPLEX		N/A	Station to station, anywhere		Standardized tactical option since 2006
446.700	TAC C4	SIMPLEX		N/A	Station to station, anywhere		Standardized tactical option since 2006
2 Meter & 70 cm WBFM repeaters use CTCSS; if one frequency is listed it is for uplink (user Tx) , if two are listed the repeater is set for uplink and downlink (user Tx and user Rx)							
Repeater Call Signs in bold are owned by Brevard Emergency Management and are maintained by the county. Repeater Trustee: Ron K2RJ							
NOT ON AIR							
Standard Names in Bold are recommended for Emergency Radio in Brevard *							
PBARC= Palm Bay Amateur Radio Club (Replaces DCS for South Brevard) See Ed W2PH for more info							



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BUSSMAN FUSES  
BUD

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

DALBANI  
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DENNISON  
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ELECTROVOICE  
EVEREADY

FANON-INTERCOMS  
FLUKE (WAVETEK)

GC ELECTRONIC  
GALAXY  
GOLDLINE

HAM RADIO  
HARADA  
HITACHI  
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