Lanierland ARC Newsletter
W4ABP www.lanierlandarc.org

April 2007

President's Corner

By Doyle Gantt, W4DJG, LARC President

Spring has sprung resulting in the yellow stuff getting all over our vehicles and in our lungs.
For those that suffer from pollen allergies there is not a lot you can do but try to stay indoors as much as possible. I think we all agree we need more rain.

As the weather warms up, so will our activities. Spring/Summer events will include learning about fox hunts and equipment needed for same then begin with simple hunts and advance to more challenging ones. Field Day on July 23 and 24, our annual hamfest, summer picnic, and other fun and interesting events are in the planning stage.

Shifting gears a bit, the last few club meetings we have had problems with scheduling and some issues that led me to seek other places for our meetings. It is very difficult to find such places that meet our needs. Hall County lacks any type of community center so we have to rely on local businesses to provide meeting space. There are only a select few restaurants in the area that have any type meeting room. With all that said, we have made arrangements with a new local bank on Mundy Mill Road that has agreed to let us use their meeting room for our club meeting. The great thing about this is they waived fees since we are a non-profit organization and provide an important community service. The April meeting will be held 7pm April 24 at the United Community Bank
located where Sidney's used to be, across the road from Gainesville College. There are a variety of restaurants and fast food establishments near by if you wish to eat before coming to the meeting. More information will be forthcoming as the April meeting nears.

Membership has dropped off this year as compared to the last few years. It is up to us all to promote our club. In your travels each day, please make a point to let at least one person know about our hobby and club. You never know who's interest may be ignited from your comments.

Congratulations to the following folks for earning their Tech ticket at the April VE session:

Randy Cates, KI4UVT, Gainesville
Patricia A. Hulsey, KI4UVU, Gainesville (wife of David Hulsey W4PSL)
Sam Wright, KI4UVV, Roswell

Congratulations are also in order to the following upgrades:
Fred Murphy, KG4VTF, Buford upgraded to General
Dorothy Guest, KI4NLR, Lakemont upgraded to Amateur Extra

Well done to you all. I would also like to thank Alfred KT4VP and his VE team for conducting the session. We sincerely appreciate you guys for your tireless efforts.

Hope to see each of you at meetings and other activities. Until then, take care. 73's Doyle, W4DJG

Your 2007 Officers and Committee Members

Vice President	Alfred Westbrook, KT4VP
Treasurer	John Brandon, KE4PCF
Secretary	Bob Aldrich, N9RLA
Activities Manager	Phil Loggins, K4PDL
3 Year Director	Larry Tyson, W4WLT
2 Year Director	Terry Jones, W4TL
1 Year Director	Philip Loggins, K4PDL
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	Fred Ariail. KD4T
	David Hulsey, W4PSL
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Field Day Committee	Terry Jones, W4TL
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	Gary Morgan, K4GRM
Web Site Editors	Doyle Gantt, W4DJG
	Bob Aldrich, N9RLA
Nominating Committee	TBA
	TBA
	TBA

Electronic Trivia

By Clyde Thomason, N4FCL

"GETTER"

It is inside an electronic device.

1. In what device is it located?

2. What is its function?

3. What activates it?

There is at least one in every house.

The Purpose of the Propagation Beacon

Submitted by: Bob Aldrich, N9RLA, LARC Secretary

The purpose of the listening to and identifying of radio beacons is to know the propagation quality of radio waves, and thus, to determine which continent can be joined or favored at a given moment. There are radio beacons on most ham radio wavebands and even on certain frequencies outside ham radio bands.

CW mode is recommended for being easier to copy when signals are weak. The message passed on with beacons is generally the call sign, QTH, as well as the power and the antenna used.

The prediction of wave propagation is by way of the always vague being ionosphere being often unreliable, the only way of making sure that a band is opened or adequate to support radio contacts is by listening to radio beacons. The six and ten meters bands are especially unpredictable, being subject to several kinds of different propagations, and also often on the edge of the MUF, or highest useful frequency.

On the band of ten meters (28 Mhz), there are about 180 propagation beacons in operation between 28.175 Mhz and 28.300 Mhz, while there are two hundred more of them on the six meter band, mainly between 50.000 Mhz and 50.100 Mhz. These radio beacons are spread worldwide.

By the listening to these, one sometimes can deduct the distance and the number of hop made by the wave, as well as the area of the ionosphere able to reflect our transmissions. One will frequently be able to deduct even the kind of propagation, according to the QTH of the station heard, the time and the season. Wave propagation of this kind of transmission is made by reflection on various layers of the ionosphere with a one-hop distance which can reach 4400 kilometers in the best conditions, or at least some hundred kilometers by tropospheric dispersal of the signal, or still more than 500 km by reflection on sporadic E layer.

A good listening report

The listening reports are the only rewards of a beacon operator. Indeed, these reports tell the operator which were the favorable periods of propagation from his QTH. This information is highly interesting for the beacon operators. By these observations and exchange with other

people interested in propagation, they can contribute to a better understanding of phenomena inherent to radio propagations.

The minimal information of a listening report should be:

- Universal time (UTC), and date at which the signal was heard
- The QTH, or the location where the signal were copied
- Signal according to the code RST convention
- Frequency
- Mention if the signal underwent some fading (QSB)

You can complete with your conditions of operation, such as, what kind of antenna and used receiver you use. Any other comment concerning the state of the propagation, quality of the audio, or presence of interfering signals is always welcome. The operator of a propagation beacon will always be pleased to receive your comments and to answer your questions concerning propagation and his beacon.

The wave propagation for 6 and 10 meters band

My interest towards the bands of 6 and 10 meter bands (50 and 28 Mhz) rest mainly in the similarity of these two bands, regarding waves propagation. Indeed, it is now more than 50 years ago that 30 Mhz was chosen as the separation point between HF and VHF. At this time, the properties and characteristics of these ranges of radio frequencies radio were not yet perfectly known. So, it is not so surprising to notice that even separated by more than 20 Mhz, these two bands are subject to several types of identical waves propagation. The ten meter band (28 Mhz) is a HF frequency, but it behaves in several aspects like a VHF band.

Here are some kinds of wave propagation which make possible communications beyond the horizon line with the six and ten meter bands.

The F layer propagation

The ionosphere's F layer is the highest in altitude, being situated between 150 and 500 kilometers, it is the layer which gives the most distant contacts and one of best quality of transmission. Possibilities will be especially appreciated in the daytime during winter, with contacts exceeding 20,000 km. The ten meters band is the one that benefits most of this kind

of propagation, because good conditions will be more frequent and lasting on 10 meter than on 6 meter, even if low power is used. However the solar flux has to reach a value of 110 in the solar flux intensity on ten meter for the signal to be reflected, in about six of the eleven years of solar cycle, this band can provide good propagation. As for 6 meter band, only when the solar flux is at its maximum will contacts be possible by way of the F layer. A minimum solar flux intensity of at least 200 will be generally be necessary in winter period to make possible contacts by way of F1 and F2 layers. Single hop distance should be of the order of 3500 to 4400 kilometers.

The E layer propagation

Propagation by way of E layer is very interesting because it is practically unpredictable. This ionized layer is situated at about 105 km in altitude and it's effects are felt mostly in the daytime and more rarely at night.

E layer can support contacts on the HF bands and up to the 2 meter band in VHF. As regards the frequencies of 28 and 50 Mhz which are our main concern here, they are probably the most favorable by the reflection of the waves by E layer.

In HF, when there is propagation by way of E layer, one says short skip propagation, because the stations contacted can be distant from only some hundred kilometers. This phenomenon indicates that the "MUF" or maximum usable frequency is superior to the frequency used and that the signal is reflected with an angle of incidence much higher than normal, which reduce the skip distance. It is also presumable that communications can be established on higher frequencies.

The maximum single hop distance by way of E layer, independent of the frequency is about 2200 kilometers. There can be more than one hop by way of E layer, or another skip combination between E and F layers, so that communications over distances of more than 6000 kilometers are possible.

The main peculiarity of E layer remains however made that it can produce a strongly ionized limited area called E cloud sporadic. This ionized area then allows contacts between well defined regions, because these clouds ionized dimensions are only between 80 and 160 kilometers in diameters and have a speed of movement from 240 to 400 kilometers per hour, in a west or north-west heading. In these ionized clouds of the E layer, MUF can increase from 28 to 50 Mhz in a matter of minutes. Due to all these factors, the length of time when contacts by way of sporadic E layer are possible can be of very short duration, which explains the frantic short exchanges between ham radio stations during these openings on the 6 meter band.

These openings are less spectacular on the 10 meter band. Indeed, contacts can last much longer because at lower frequencies, the MUF frequency will be able to support contacts over a longer period. It is mainly the distance limited to about 2200 kilometers, the strong signals, and the fact that contacted stations are from the same geographic area that will indicate to the radio operator that these contacts are due to sporadic E layer propagation.

In the northern hemisphere, it is between May and August that sporadic clouds in E layer happen. The most favorable hours are between 9 and 12 o'clock, and 17 and 20 o'clock local time. It is to note that there is still no established correlation between solar activity and the frequency of openings radio by way of sporadic E clouds.

Backscatter and side scatter propagation

This kind of propagation occurs when the maximum usable frequency « MUF » is higher than the frequency in use. The most part of the radio wave is reflected forwards, but a small part of its energy is returned back for backscatter or aside for side scatter. The ionization of E and F layers is then intense enough to return part of the wave towards the site of emission, or sideways, rather than only forwards towards the ground. It can also happen that when the wave strikes the ground after a first hop, a part of its energy return back to the ionosphere and in the direction of the origin of emission or aside from it. Signals by way of these types of propagation are generally stable but weaker than normal and little affected by fading QSB. Modulation in phone mode is easily and gives the impression of hearing somebody talking in a pipe with a faint echo. What is much more remarkable it is that the contacted station can be located some hundreds of kilometers away, a distance usually too short for contact and within the silent zone. This kind of propagation can also reach 2000 km. It is to be noted that improvement in the sensitivity of modern receivers and more efficient antennas have helped making use of this kind of propagation. Frequencies of 50 Mhz and of 28 Mhz are both subject to this type of wave propagation.

Trans-Equatorial propagation

Trans-equatorial propagation favors the regions located at most in about 2500 km on both side of the magnetic equator. It is necessary however to keep in mind that magnetic equator is not the same as the geographic equator which one knows from maps, in the same way as the magnetic north is not located where the geographic north is.

The northern half of the United States, as well as Canada, is little subject to this kind of propagation, while the most part of Europe is within 2500 km from the magnetic equator. Trans-equatorial propagation appears from July till October in the maximum of solar cycle activity and can also happen in September during the minimum of the same cycle. It is after sunset, between 8 and 11 o'clock, local time, that possibilities of contacts are best. It is a wrinkling in the ionosphere above the magnetic equator and encircling it, which would bring

about a double deviation of the wave on both sides of this wrinkling over the magnetic equator. Contacts from 14 Mhz up to 430 Mhz in the UHF, can take advantage of this type of propagation. Stations communicating by trans-equatorial propagation are located on each side of the magnetic equator at similar distances from it. However stations can be situated on very different meridians, such as contacts connecting India and South America. Contacts from 2500 to 8000 km can be made.

Tropospheric scatter propagation

Generally, tropospheric scatter appears during a temperature inversion, when propagation by dispersal tropospheric finds the meteorological elements necessary for this phenomenon.

The troposphere is the space of air included between the ground and 5 kilometers of altitude at the poles, and 18 kilometers of altitude at the equator. As for us, it is between the ground and ±10 kilometers in altitude that the air masses produce this type of radio waves propagations.

During a temperature inversion there is a superposing of a warmer and damper air mass over another colder and dryer one. It is then between these two layers of air of different densities that radio wave remains trapped and can travel some hundred of kilometers. The VHF and UHF bands are generally favored by this propagation mode. As for the effects of this kind of propagation on 28 Mhz, there is little information on the subject. Personally I believe that it there may be certain positive effects and maybe also negative effects, caused by tropospheric scatter. We may be able to observe this phenomenon during the next solar minimum.

Meteor scatter propagation

This kind of propagation is highly appreciated by numerous of radio amateurs operating the VHF band. Frequencies of 28 and 50 Mhz are favored with propagation by way of reflections on ionized tracks left by the entrance of micro-meteorites in the atmosphere.

Reflection or dispersal of waves happens on air which was ionized by the passage of meteors. Indeed, by passing through the atmosphere at high speed, they reach a very high temperature and melt away, leaving a trail of ionized air between 80 and 150 kilometers in altitude lasting a few seconds. These ionized trails can then reflect frequencies from 28 to 432 Mhz. When there is a significant shooting stars shower of plentiful and constantly falling micro-meteorites, it is possible to make short contacts. The Perseids meteor shower of August 12 offered the best chances of contacts. When a radio signal intercepts the ionized trail left by a micro-meteorite, it is possible to experience a return of signal of the order of 40 db and a shift in frequency (Doppler Effect). Such a shift of up to 2 Khz has been observed, due to the very fast movement of the source of the reflection. For these reasons, digital modes passing information quickly are best adapted.

During the most intense shooting stars showers, a few watts and a simple directional antenna are sufficient to make contacts on frequencies of the 28 and 50 Mhz, stations distant from 200 to 2300 kilometers can be contacted.

Auroral propagation

For stations located in middle latitudes, it is possible to make contacts by reflection on auroras borealis or northern lights for the northern hemisphere, or auroras australis for the southern hemisphere. Contacts will then be limited to a zone circling each hemisphere and, at most, at 1100 kilometers from the aurora. However, the more one is situated near the poles the better will be the opportunities to establish contacts by reflection on auroras.

Auroras are caused by particles ejected from the sun which are captured by the earths magnetic field and attracted towards the polar regions. These particles react with oxygen and nitrogen atoms present in the atmosphere, by forming a sort of brilliant curtain in movement, which is the aurora. It is during the magnetic disturbance when there is an abundance of material thrown by the sun towards the earth that aurora occurs with an intensity sufficient to support reflection of radio waves. For this kind of communication, direct the antenna northward and adjust it for the strongest signal reception signal. One recognizes easily a signal reflected by an aurora because of a jerky audio with a certain tremor. The QSB or frequent fading in this type of contact is caused by the irregular shape and constant movement of the aurora. QSB results also from multiple reflections on the front of the aurora causing a fast change in the phase of the signal. Due to the characteristics stated above, cw is the preferred mode, even though phone contacts are generally possible, with more or less ease, depending on the intensity of the aurora. Radio signals reflected by auroras are generally of weak to moderately strong levels, and these conditions can last from some minutes to few hour. Contacts between 400 and 2000 kilometers can be established, the wave can then be reflected then more or less towards the transmitting station for back scatter, or aside for side scatter. The best periods are in spring and in autumn between 22 and 3 o'clock, local time. Contacts on frequencies between 28 and 432 Mhz are possible even though it is the 50 Mhz which is most favored. The frequency of 28 Mhz should normally be reflected easily by auroras, needing a less intense ionization to be reflected. The HF operators seem little interested in this mode of propagation, probably out of misunderstanding the phenomenon on the HF bands, or believing that it is rather reserved only for VHF frequencies. In HF, auroras are rather considered as a nuisance by causing an audio quality called arctic flutter, when radio signals passes near the poles and are affected by auroras.

Thanks go to Marc Gagnon, VA2MGL for permission for the reprint.

Radio Amateur Civil Emergency Service (RACES)

Submitted by: Bob Aldrich, N9RLA, LARC Secretary

Courtesy of http://www.races.net/

The Radio Amateur Civil Emergency Service (RACES), is a public service provided by a reserve (volunteer) group of Amateur Radio (Ham Radio) Operators that is administered by local, county and state emergency management agencies, and supported by the Federal Emergency Management Agency (FEMA) of the United States government. As a part of the Amateur Radio Service, it provides radio communications for civil-preparedness purposes only, during periods of local, regional or national civil emergencies. These emergencies are not limited to war-related activities, but can include natural disasters such as earthquakes, hurricanes, wildfires, power outages, floods, victim searches, air crashes, and many others.

Originally for wartime use, RACES has evolved over the years, as has the meaning of civil defense (which is also called civil preparedness), to encompass all types of emergencies. While operating in a RACES capacity, RACES stations and amateurs registered in the local RACES organization may not communicate with amateurs not operating in a RACES capacity. (Of course, such restrictions do not apply when such stations are operating in a non-RACES--such as ARES--amateur capacity.) Only civil-preparedness communications can be transmitted. Test and drills are permitted only for a maximum of one hour per week. All test and drill messages must be clearly so identified.

Although RACES and ARES are separate entities, the ARRL advocates dual membership and cooperative efforts between both groups whenever possible for an ARES group whose members are all enrolled in and certified by RACES to operate in an emergency with great flexibility.

Georgia ARRL Events

27-28 Apr 2007* Southeastern VHF Society Conference
Southeastern VHF Society
http://www.svhfs.org
Contact: Robin Cutshaw, AA4RC
773 Cumberland Road
Atlanta, GA 30306
Phone: 404-713-4000

Email: aa4rc@amsat.org
Atlanta, GA
Mariott Hotel Century Center
2000 Century Center Blvd.
Div: Southeastern
Sect: Georgia

28 Apr 2007+ Calhoun Hamfest
Cherokee Capital Amateur Radio Society
http://www.qsl.net/k4woc
Talk-In: 443.675+; 146.745-; 146.805+
Contact: Felton Floyd, AF4DN
1054 Mountain Loop Road NW
Sugar Valley, GA 30746
Phone: 706-629-0369
Email: af4dn@iwispr.net
Sugar Valley, GA
Sugar Valley Community Center
3295 Sugar Valley Road NW
Div: Southeastern
Sect: Georgia

5 May 2007+ Heart of Georgia Hamfest
5 Central Georgia Amateur Radio Clubs
http://members.cox.net/cgarc/
Talk-In: 146.850 (- 600)
Contact: Charles Armstrong, AE4VA
172 Old Hickory Road
Byron, Georgia 31008
Phone: 478-956-5030
Email: jejecha@aol.com
Byron, GA
Peach Shops at Byron
311 N Highway 49, Byron, Georgia 31008
Div: Southeastern
Sect: Georgia

2 Jun 2007* Georgia State Convention (Atlanta Hamfest)
Atlanta Radio Club
http://www.atlantahamfest.com
Talk-In: 146.820 (-) (PL 146.2)
Contact: Johh Talipsky, N3ACK

385 Madison Chase Drive
Lawrenceville, GA 30045
Phone: 678-618-2190
Fax: 678-985-2906
Email: johnn3ack@comcast.net

Marietta, GA
Jim Miller Park
2245 Callaway Road
Div: Southeastern
Sect: Georgia

11 Aug 2007+ Ellijay Ham Fest
Ellijay Amateur Radio Society
http://www.qsl.net/w4hhh/
Talk-In: 145.170 (-600) PL 100 Hz
Contact: Sam Underhill, K4SWU
446 SUTTON RD
ELLIJAY GA 30540
Phone: 706-276-4877
Email: k4swu@ellijay.com

Ellijay, GA
Ellijay Lions Club
1729 S. Main St (Old Hwy 5 South) , Ellijay, GA
Div: Southeastern
Sect: Georgia

15 Sep 2007+ Paulding Amateur Radio Club
http://www.pauldingarc.com
Talk-In: 146.895+ (PL 77)
Contact: AL Martin, KF4RPQ
409 Sleepy Hollow Road
Powder Springs, GA 30127-6751
Phone: 770-920-1309 (Home) or 404-281-6859 (Cell)
Email: KF4RPQ@yahoo.com

Dallas, GA
Paulding Meadows Park
Highway 61
Div: Southeastern
Sect: Georgia

Monthly newsletter inputs from our members are getting scarce but we need them every month. Please do your part and contribute.

Send newsletter inputs to Bob Aldrich, N9RLA, LARC Secretary and Newsletter Editor

For those of you that contribute, Thanks. Your work is appreciated and keeps this newsletter going!