Ham RADIO News

Newsletter of the Amateur Radio Society of India (Indian Affiliate of IARU)

October 2018 Issue

Meet Pradeep and the family of hams:

VU2SLL/Saleel (nephew), VU3YGN/Yogen (brother-in-law), VU2RTE/Artee (XYL), VU2PCD/Pradeep (OM), and VU2DCD/Deepak (nephew)
Pradeep's brother VU2IOC/Ramesh not in photo

VU2PCD The station – and the antenna

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PRESIDENT'S MESSAGE

On 22nd July 2018, a new set of office bearers took charge of ARSI. Unfortunately I had to return to Chennai as my harmonic Sanjay VU2SJD met with a very serious motorbike accident in Chennai on the 21st July.

I once again request all ARSI members to sign up on the official ARSI e-group by sending a mail to < secretary.arsi@gmail.com > from your preferred e-mail address, and quote your call sign and membership number, so our records may be updated.

Unless you join, you will not get important mailers like AGM notices and nomination / ballot papers as ARSI will soon stop sending such notices by ordinary post as it has been found that many are not delivered and ARSI has been unnecessarily blamed for not sending them.

Our contest manager will be sending out information on the several contests planned. It was encouraging that many participated in our previous contests.

We are coming close to HFI 2018 that will take place in Bengaluru and over a 1000 registrations are expected. Let's meet there and have an enjoyable eye-ball

73 - Gopal Madhavan VU2GMN

FROM THE EDITOR'S DESK

Since the previous issue, we have decided to change the format of the Ham Radio News. I hope the members like the new format. Please let us know!

I had requested members to send photos of their shack and antenna for the front page of the HRN now that we have a full page format, but regrettably I received only one response - the result of which you are seeing. I hope I will receive some photos for the future issues.

Our secretary who was duly elected in the July 2018 AGM resigned from the post in September, for personal reasons. Govind 'Poru' Girimaji / VU2GGM has taken over as the Secretary with immediate effect. Let's welcome him and wish him all the best.

You all are aware of the disaster that struck Karnataka and Kerala in the form of a deluge during the last two months; as always, amateurs got into action and did a wonderful job of assisting the official rescue operations.

The solar minimum - the lowest point of the cycle #24 - officially expected in 2019-2020 - seems to have arrived already. As I am writing this, there were a total of 158 days of spotless sun this year, translating to 58% of the year already. Band conditions have not been good especially on the higher bands. Let's hope for the best in the future.

73 - Ganesh VU2TS

FLOODS IN KERALA AND KARNATAKA – AUGUST 2018

(by Ganesh - VU2TS)

My take on the recent *emergency* and the serious discussions that went on regarding the role of ARSI:

Natural disasters come in two flavours. Those that happen in a few seconds and those that happen over weeks.

Take an earthquake or a tsunami - for example. One moment everything is fine - the next moment you don't know what hit you. Nothing remains around you - *if you are still breathing,* that is. Within an hour, the rest of the world knows about this calamity. You see it flashed on all TV channels, people are talking about it everywhere, and you get messages from your cousin in the U.S.A asking about your welfare and so on.

On the other hand, a deluge due to excess rainfall is different. First there is rainfall in a certain area. People are happy. Oh! Cool - and so on. After a couple of days it starts to worry some when they find small ponds in their backyards - and when farmers find their land inundated. Even then, they might say "better rainfall than last year" and so on and carry on. The interesting part is, a couple of hundred kilometers out there may be "business as usual" – with sunshine and all.

And then the news begin trickling down the media - the water in a certain dam is reaching the maximum, or such-and-such-a river is flowing full. Even at this time, most everyone is happy. Good rainfall this year - and so on. That would be a week of a fortnight into the rains already.

At this time, only the area affected by excess rain feel the pain - but even then no one expects any major calamity - then the farmer growing vegetables says he has lost his crop; the family that lived in a very old house complaining that the roof is leaking and so on. Purely 'local'. I mean, really 'local'.

Take my own case, for instance. B R Hills is just about 120 km from Madikeri - and 100 km from Waynad - aerial distance - and even today I have no clue that there was a deluge in both these places that has caused so much destruction; I know about it only from the media reports and the messages I received from friends. Here it was drizzling off and on - no downpour at all - but has been cloudy weather for nearly two months. For about a 70 km radius everything was absolutely normal.

In the meantime, it continued to pour just a couple of hundred kilometers away. We (*the outside world*) start reading in the newspapers that there has been heavy rains in such-and-such-a district - and it exceeds the record held by the rainfall in

1992 and so on. We read the news and carry on with our routine - without giving it a second thought. No big deal, right? Routine stuff.

And then - a couple of days later - we start receiving messages - whattsapp, e-mail, phone calls and so on - we hear about landslides, road blocks, houses collapsing, etc. Remember, this is the third week after the rains started; and even now it is 'local' - but covering a larger area. Most people within Karnataka and Kerala know about it, but the neighbouring states like Tamil Nadu, Andhra Pradesh/Telangana have no clue about what's going on. Some of them read about the deluge in the newspapers and some may see it on TV - but even then it is just news.

I am sure you are wondering why I am recounting all this - well, this is just to let you realize that the deluge is not 'sudden' like the earthquake or tsunami. Consequently no one knows when exactly heavy rains turn into a calamity - *or a disaster* - needing external assistance. The first people to realize that 'it is something serious' are the people directly affected. At this time even the even government does not know the seriousness. It takes a couple of days for them to start moving the files as it were.

In this situation, I see messages on *Whattsapp* asking "who is in charge of disaster communications?" "Why he is not involved" or wor ds to that effect. It was not a 'query' - like asking *"who is in-charge? Let's contact him"* or anything polite like that; it was more like pointing fingers at someone. Radio Amateurs are not expected to behave like this. And then the question of whether Ramesh VU2LU is representing ARSI or BARC to assist in emergency communications?

What nonsense! How does it matter? Do you think hams hold a mike and pose for photos during an emergency like politicians do?

Firstly - Bengaluru came to know about the seriousness of the situation in Kodagu only two weeks or so after the rains started. The person in-charge of disaster communications is in Gwalior – 2000 kilometers away. How on Earth is he to know the seriousness of the situation? He might have seen in the news that there are floods in Kerala and Kodagu - but that happens every year somewhere or the other; does it not?

Secondly - what can he do - sitting that far away? How can he be directly involved? Someone from here needs to appraise him of the situation. Someone could have called him immediately! It is only then that he can find out more details and take notes and be clear of what is happening. Unless someone informs him, he does not know. He may have been on vacation with his family - when *families in Kodagu were wading in water.*

Halloa! If there is an emergency here, we do not wait for instructions from someone to start acting.

The unwritten convention is that hams always offer their services unconditionally - without expecting any personal gain or fame; it is understood that everything is done to bring up the good name of Ham Radio as a unique hobby and how useful it can be in times of emergency. Absolutely nothing 'personal'.

Hams jump into action whenever and wherever needed. We normally do not wait for the 'person in charge' to start the ball rolling. And no individual ever takes 'credit' for something that is done as a 'team'. If the 'person-in-charge' does not get involved for any reason, it can be discussed after the emergency is over. One cannot use the opportunity to 'settle-the-score' with someone else in such emergencies.

Halloa! If a member does not like the way an office bearer works, surely he needs to point it out, but without getting 'personal' about it. If members start making personal attacks on each other, there is no more society left, and we are no better than the lousy politicians.

The downside was, those who volunteered to QSY to Kodagu did not know where the 'Grab Kits' - kept aside for just such occasions - were available. This should not happen in future.

We need to learn from the armed forces. They were handling rescue operations during the floods, and I heard that when the TV anchors requested the army personnel for an interview, they just walked away – saying they were busy. They are just not interested in individual fame but the whole world knows that the armed forces are the saviours in times of need. Anytime, anywhere.

It is slightly different in our case - we want the world to know the usefulness of this wonderful hobby; given a chance any of us would be happy to appear on TV and explain to the public how hams assisted in the emergency and so on.

ARSI is the only National Society that is recognized by the IARU. It is therefore absolutely necessary that we always take the lead, act fast and make our presence felt in all emergencies. Mistakes made today are the stepping stones for a better organization tomorrow.

Now comes the punch-line. Who or what is ARSI? Don't you see that the 'members' constitute the ARSI? Consequently, it is the members who need to jump into action when there is an emergency instead of waiting for someone else to take action or point a finger at someone and say "he/she has not done anything". Surely, we need to grow up! If there is an emergency, if we are in a position to assist, then let's jump – go for it – without waiting for anyone's instructions.

The ARSI Annual Awards 2017

Each day we are excited by advancement of technology, competitive aspects of the hobby. Some hams do it not just for learning and fun, but also to push themselves to the edge. This year we had published guidelines in advance and called for nominations to improvise the processes. These processes also promote discipline of self-organization and deserving nominations for sure came up with data points as requested. Unfortunately, we did not get any valid nominations with data points from any Homebrewer or Youngsters. Therefore, the "VU2VWN Homebrewer of the Year" and "Young Contester of the year" will not be awarded for-this-year.

However, there were two entries for "VU2AJ Contester of the Year". And based on the qualification criteria rules and submitted scores, we are glad to announce VU2DED Ajaya Gupta as winner of "VU2AJ-Contester-of-the-Year-2017. Please join me in congratulating Ajaya on his achievement.

2017		VU2IBI				VU2DED		
Contest	***Weightage***	***QSO's***	***Contest Score***	***Weightage points***		***QSO's***	***Contest Score***	***Weightage points***
CQ-WPX-RTTY	0.4	79	16133	31.6		249	153282	99.6
CQ-WPX-SSB	0.4	103	20203	41.2		188	71958	75.2
CQ-WPX-CW	0.4	123	22950	49.2				0
AA-CW	0.4	34	504	13.6				0
AA-SSB	0.4	72	5440	28.8		120	8858	48
IARU-HF	1.0	80	6080	80.0		89	12048	89
CQ-WW-RTTY	0.6	49	3424	29.4		277	98418	166.2
CQ-WW-SSB	0.6	136	21535	81.6		245	83130	147
CQ-WW-CW	0.6	186	55322	111.6		149	36830	89.4
		862	*151591*	***467***		**1317**	464524	**714.4**

Consistent efforts and meticulous record keeping are obvious from the submitted score cards by them. VU2DED used all low power hooked to dipoles – *info for those who think contests are for stations with yagis and amplifiers!* Coming years will see improvements in criteria towards improving the benchmark. But, submission formalities will not be relaxed further for these awards as they form the finest tenet of the ham radio contester. So do take part in the next contest!

Ajaya/VU2DED

Contest Corner update:

WRTC2018 : Every four years, contesters all over the world get chance to prove their competency on a level field in pinnacle of radio sporting format called World Radio Team Championship (WRTC). This 24hour contest event happens during IARU HF Championship weekend. This year it took place in Germany during July14th weekend. To qualify for the contest is great challenge with scores monitored from various international contests over previous two year observation period. Then there are few sponsored teams (two contesters form a team) and wild card entry teams. There were totally 63 teams in competition this year from various parts of the world. There is a youth category for hams lesser than 25 years of age. This year youngest contester was 14 years old - Bryant Rascoll, KG5HVO!

Thousands of QSOs were made by each team within the 24 hour time span. Top 3 scores were as follows:

#	Call	Team lead	Team member	Final Score	QSO	CW	SSB
1	Y81N	LY9A	LY4L	5,690,685	5,139	3,617	1,522
2	Y81A	DJ5MW	DL1IAO	5,273,488	4,936	3,591	1,345
3	Y82V	N6MJ	KL9A	4,891,710	4,766	3,721	1,045

Worked All VU:

There is DX award mention this time as well. K0DEQ - Bill Morgan a DX Award chaser from USA was awarded with "Worked All VU" at Bronze level certificate. For a W land station to track VU states and work at least 10 of them is a huge challenge. Bill sent us well maintained log record and QSLs he received since 1970s shown below:

application for WORKED ALL VU AWARD - Bronze

STATE	CALL	DATE	TIME	BAND	MODE	QTH
AN	VU4AN/VU3RYJ	23-Apr-06	1311	20	RTTY	PORT BLAIR
DL	VU2CGS	16-Sep-81	121	20	CW	NEW DELHI
GA	VU2JAB	25-May-12	1535	15	CW	BENAULIM
GJ	VU2BOB	15-Apr-77	120	20	CW	AHMEDABAD
JK	VU2RNM	22-Jul-81	208	15	CW	SRINAGAR
KA	VU2JA	19 DEC 199(	238	20	CW	BANGALORE
KL	VKU2ATB	14-Mar-04	1822	20	CW	CALICUT
MH	VU2AJ	22-Mar-89	224	20	CW	BOMBAY
TN	VU2CP	15-Mar-78	1855	15	CW	COIMBATORE
TS	VU2SU	8-Apr-92	141	15	CW	HYDERABAD
WB	VU2KX	3-Dec-78	255	20	CW	VERHAMPORE

I certify that the above information is correctly extracted from QSL cards in my possession confirming QSO between K0DEQ and the specified Indian call signs. I certify that correct photocopies of those QSL cards are provided herewith.

What a systematic tracking!. Congrats to Bill for this Certificate.

IARU HF Contest 2018

This year ARSI member team could not participate due last minute additional documentation ask from WPC. As these additional clarifications were not asked in previous years, we did not expect such roadblocks. Hopefully, in future, we will be better equipped to handle such asks proactively.

Fall contest season has just started with Worked All Europe and All Asia Contests. CQWW is around the corner. We hope many new hams join contesting stream this year and enjoy operating. Who will be the next "BigCQ" winner?!

All the best!

Kiran - VU2XE

NEWS FROM CLUBS

PUNE, MAHARASHTRA

Sean Kelly W5SPK of Amphenol Fiber Systems, USA is a frequent visitor to Pune. Two special meetings with Pune Hams were held - at the office of the Development Education International Society (DEIS) on Sunday 12th August and the other at the club station VU2DYP (Engineering collage of D Y Patil University) near Pune Airport - on Monday 13th August.

OM Sean is a very keen amateur and a certified EMT associated with Lowry Crossing Fire Department. He shared invaluable insight on the work conducted during the search and rescue operation in the aftermath of a huge tornado in Canton (Texas).

He shared his experience also during Tornado rescue operations and covered some of the following points:

1) *The role of HAM radio in case of disaster management (the community with knowledge of both capability and capacity)*

2) *The importance of being well equipped, prepared and calm in the face of Tornado / storm and the chaos.*

3) *The value of working in harmony with different departments together to asses and assist everyone in need.*

Various departments like Fire departments, Law enforcement, Emergency Medical Care Dept along with the fast and sharp HAM radio community the people of Texas were left with only property damage and no lives were lost during this tornado.

He also shared valuable knowledge on RF connectors - their design, types, uses and also their importance. Different connectors having various applications in industries like RF, Medical and also the Military. He also shared the work of

Amphenol Corporation in fiber-optic connectors. Amphenol produces high grade Co-axial cables in their Chennai plant. *(Special thanks to YL Monica for taking notes)*

At ***Ajeenkya DY Patil University Ham Club station*** VU2DYP - a new batch of students from second year Engineering were introduced to Ham Radio by VU2VPR OM Vilas. Soon these students will appear for ASOC Exam and operate club station & carry out experiments for next two years during studies.

There is a VHF net on Repeater ***VU2ETD on*** *144.800 minus 600 KHz - mornings between 08:15 and 08:30 Hrs, and evenings between 20:30 and/ 21:30 Hrs. The antenna height was recently increased by 10 ft. for better coverage.* ***Thanks to VU2DYP Ham Club of ADYPU near Airport. for VHF Repeater support.***

The regular monthly meeting of PUNE HAMs & AMATEUR CLUB -VU2PHQ was held on August 18th at their CLUB STATION premises off MG Road, Pune Cantt. Pune 411001. The highlight was the session conducted by VU3YWK/Ajay Kashikar, on "Digital Logging and Digital Logbooks", The various features available on the logging platforms were described and compared, and also took the group through a virtual walkthrough.

The various features available on the logging platforms were described and compared, and also took the group through a virtual walkthrough. The session was not only useful for existing license holders but it helped SWLs to understand digital communication like how to receive FT8 signals on WSJT using their-commercial-receivers.

+

For more photos and updates about the CLUB's activities do visit our facebook page our PUNE HAMS Facebook page: http://m.facebook.com/punehams/

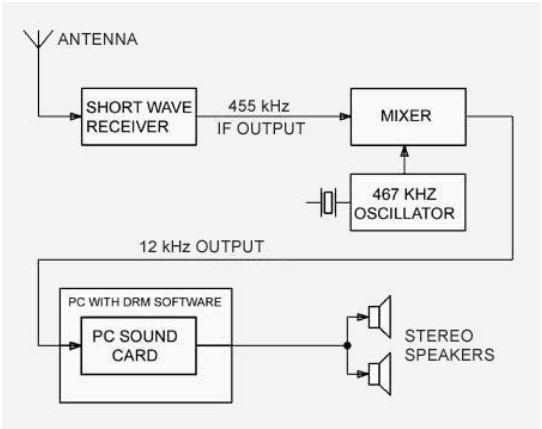
73

de Udaya Patil /VU2UPQ on behalf of The Pune Hams & Amateur Radio Club

Another meeting at Pune

Monthly Eyeball: Pune Hams met on Sunday 9th September DEIS office Hall, Film Institute Road, Pune at 10:30AM. There was a record attendance - *21 members attended the meeting.* **Mr Ashok Kale, (Asst Director-E, All India Radio) gave a presentation on Digital Audio Broadcasting Technologies – known as Digital Radio Mondiale (DRM).**

'Digitalization' is the buzzword. In the field of Radio Broadcasting, the Digitalization is happening in phases at various segments of production, distribution and transmission Worldwide. In many of the developed countries this is complete & traditional analogue transmission systems are switched off or are being phased out. Worldwide there are three Radio broadcast standards/technologies – DAB/HD/DRM - which have been adopted along with few proprietary implementations in some countries In our country we have adopted DRM Radio standards for MW & SW Broadcasts & is being implemented in a big way.



Features of various digital radio technologies with special focus on DRM, benefits to various stakeholders (Govt., Broadcasters, Listeners), it's implementation status in India, DRM Receiver availability/status and associated issues were discussed during the presentation. Here are links for those who are interested:

http://www.drm.org/

http://www.drm.org/drm-india-page/

All India Radio Pune has already commissioned DRM transmitter for it's MW Channel & is broadcasting regularly in simulcast mode (Analog+Digital). It also broadcasts in FULL DRM mode, as test transmission on its 792 KHz frequency with two stereo signals & data services like Journoline, EPG etc.

Vilas Rabde VU2VPR - Advisor, IL & FS CapSwap – Mobile: 9822502078

GANDHINAGAR, GUJERAT

To popularise Ham Radio in western India, two events were conducted back to back recently.

'Ham Radio for GenX' full day workshop with demo was conducted at LDRP College Gandhinagar on 12th July 2018. More than 70 EC students + faculty members participated. The Program was inaugurated with kind presence of dignitaries from GIAR, LDRP, IEEE, ISRO & AMSAT-INDIA.

From GIAR, Shri Pravinbhai Valera VU2CPV (Joint Secretary) & Shri Jagdishbhai Pandya VU2JGI (General Secretary) blessed us with their kind presence.

Presentation on 'Antennas for Space Application' was conducted by Dr. Ramesh Kumar Gupta (SAC-ISRO).

Ham Radio history & introductory session was conducted by Shri Jagdishbhai Pandya VU2JGI with several interesting examples.

Thereafter, Rajesh VU2EXP gave good overview on Satellite Communication, APRS, RDF, IOTA, SSTV & RTL-SDR etc. technology.

Live demo of SSTV was conducted which was very much enjoyed by the students & faculties. VHF demo with mock drill was simulated by VU2JGI Pandya, VU2EXP Rajesh, VU3IKI Ke Ke, VU3EXP Sakshi & team.

Ham Radio stuff were exhibited incl. VHF/UHF Rigs, PSU, Antennas, Digital Interfaces, Cables, SWR Meter, attenuator, FunCube satellite model, QSL Cards, Awards, etc stuff was displayed for the knowledge of the students.

We also got excellent support from fellow-hams including VU3DVA Deepakbhai, VU3GLY Priyesh, VU3DSJ Dipakbhai, and SWL Abhigna.

We had guest presence of Dr Narendra Chauhan (IPR) & Prof. N. N. Jani at the event.

The program concluded with the hope that a good number of students will take up this unique hobby.

---Day 2---

'Ham Radio Practical Insight' titled workshop was conducted at LD College Ahmedabad on 13th July 2018 in afternoon session. More than 65 EC students and faculty members participated.

Dignitaries from IEEE, ISRO, LD & AMSAT-INDIA inaugurated the workshop. It was our great pleasure to have chief guest presence of Shri Rajeev Jyoti Sir (Dy. Director SAC - ISRO) & Chair (IEEE) Gujarat chapter in this Ham Radio Workshop.

Rajesh VU2EXP explained the latest technology/modes ham world uses & gave quick practical Demos for chief guest. Demo includes CW, Text, Image & Voice transmission/reception with simple VHF Radio sets. The simple experiment techniques used were described. Students were surprised to learn the potential of Amateur Radio & experts appreciate such public demos.

We got nice support from team members VU3EXP Sakshi, VU2UTZ Dinyarji, VU3PMT Mahendrabhai, VU3GLY Priyesh, SWL Ketanbhai during demo & whole event. Thereafter detailed presentation was given on interesting ham events, digital communication, SatCom, ARISS program, ASOC licencing procedure, APRS, SSTV witth RTL-SSDR etc.

Session remained very interactive with lots of queries which were answered very well. Also mini Ham Radio exhibition was appreciated by the audience.

I am thankful to Prof. Usha (HOD - EC), Prof. Arun (EC), Nilesh (IEEE) who have coordinated & provided excellent support for the event.

A small spark of Ham Radio was ignited, I hope that inspires good number of students to take up this unique hobby!

Thanks & 73

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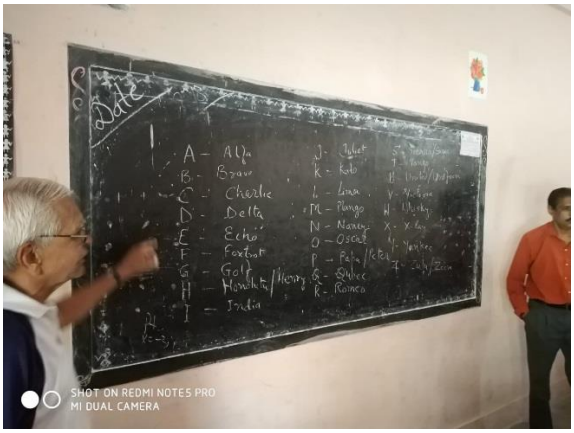
GWALIOR, M.P.

JOTA awareness program in RKVM Gwalior

On a special request of Respected Shri Swamiji, Rama Krishyna Vidya Mandir Gwalior, an awareness program was organized by OM Jayant S. Bhide VU2JAU on 20 September 2018. Students of IX to XI standard attended the program. The students were introduced to the common courtesies exchanged and the procedures followed by radio amateurs during a QSO on the air.



The Jamboree On The Air (JOTA) held during October every year gave the Scouts and Guides among the students an opportunity to talk to their counterparts around the world; so it was important that the students learnt how to communicate in an appropriate way. They were also told to respect others and to use polite language while communicating on the air. Other factors like how the accent differs from country to country, and so it was important that the words spoken needed to be

clear and precise. The students were introduced to the 'phonetics' of English alphabets to avoid any confusion in pronunciation of words.

Thanks to Respected Shri Swamiji, and the faculty of RKVM, Gwalior for providing this opportunity to interact with students.

FOX GOES TO GWALIOR

Fox Hunt in MITS Gwalior

A two days Antenna Workshop involving designing and construction of antennas was successfully completed on 22 and 23 September 2018 at Madhav Institute of Technology and Science, Gwalior. A total 150 candidates of different colleges took part in the event. Thirty antennas were constructed under the guidance of Jayant Bhide_ VU2JAU, Praveen Guptaji VU2PGZ, Kailash Agrawal VU3CTP.

Next day, a foxhunt was organized. It was an existing to everyone. Mr. V. K. Arya VU2VAB specially came all the way from Delhi and was very happy to see the success of the event. A big thanks for his presence to motivate the students. Mr. C. Makhija VU3UHT and Mr. Namit Agrawal VU3VFE along with SWLs enjoyed the event.

There were five teams chasing the fox, and on the basis of minimum time taken to catch the fox first 3 winners declared and prizes awarded to them. Thanks to all staff of M. I. T. S. and coordinators, and faculty for excellent coordination. Thanks also to Prof. Kanhere Singhji who gave his full support during the two days program.

73 – de VU2JAU / Jayu.

Skin depth: Part 2

(By Kiran VU2XE)

You may recall, I had written a brief article on Introduction to Skin effect in previous quarter's HRN edition. As I was wondering myself about its impact on PCB tracks, Antenna wires etc., I asked question to few experts I knew about what must be considered for wire antennas. Responses suggested that at the HF frequencies we need to take a note of physical strength of wire to support itself in mid-air more importantly than tiny impact of skin effect.

Yes, this is agreed. But curiosity of my mind wanted to do some more exploration as I had seen mention of thicker wires and usage of thicker copper tracks etc.

I went on to some web based calculators (circuitcalculator.com) to find out the skin depth at various bands. And as shown below, all dimensions were in minute micro meter levels. Just to get some more contrast, 1 Oz copper pour PCB (most common) has 34.8 µm thick copper tracks whereas 2 Oz has 70 µm.

Frequency	Skin Depth
1.8 MHz	56.6 µm
3.6 MHz	40.1 µm
7 MHz	28.7 µm
14 MHz	20.3 µm
21 MHz	16.6 µm
28 MHz	14.4 µm

Visual approximation

As one can see at 10 mtr band, all RF current is within 14.4 µm depth and even if there is high RF current, at those frequencies, there is no much penetration underneath. However, as the frequencies gets lower, skin depth increases and reaches near the bottom of Copper track. That means to carry the same RF current at lower frequencies width of the copper trace can be smaller than at higher frequencies. This is because we have more volume of conductor to carry the current than at higher frequencies. This is not PCB related article and neither I am expert in that field, however thought of this point as in many hams discuss about antenna wire size.

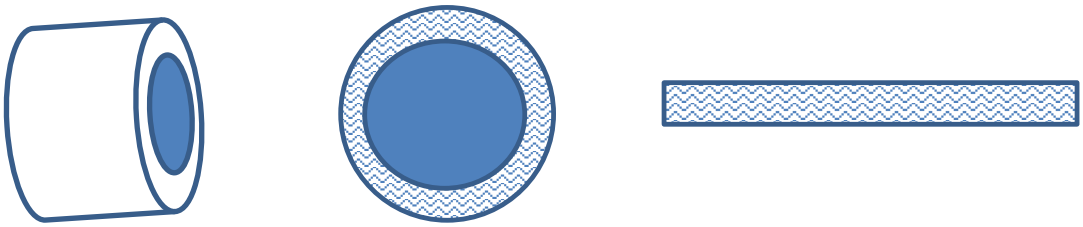
Let us take one of my friend's example, he once asked if 1mm wire can be used for 40mtr dipole antenna. 1mm is equivalent to 1000 µm. obviously, if one just considers skin depth in this case, it is only 2.87% of depth of 1mm wire. Hmm… but then why people suggest larger diameter?

There are two aspects to be considered:

1. Material strength of wire: small diameter of copper stranded wire is weaker than larger diameter to hold up firmly
2. Surface area per inch for RF current flow.

We can just expand on second point a bit to show the volume available for RF current flow in the conductor.

Imagine, we slice the wire and unroll/spread the surface to show as follows:



Wire | Imaginary cross section | Unrolled cross section

Now you see that the conducting material is very thin from RF perspective - (circumference area = 2*π*r or π*d) i.e. 3.14*1mm = 3.14 mm. So, we will have a surface of wire which looks like 3.14mm wide conducting strip with 28.7um (skin depth at 40mtr) height to the RF current!.

The ohmic loss per 100 meters mentioned by wire manufacturer will not apply for RF current as they publish at DC level. For RF current, depth required is many times of the DC specs. Else, one will see a good amount of RF dissipating as heat. For example, typical 1mm Copper wire has resistance of around 22ohms/1000m and its current carrying capacity is around 8 Amps (for 4-6 core conductor).

Now in our 40mtr case, we considered skin depth as 2.87um which is 2.87% of 1mm. If we just do some simplification on current carrying capacity based on the volume of conductor, it would be around 8*2.87% = 230mA peak. A typical RMS low power used in VU on 40mtr is 70.7watts from 100 watts rig (for a peak power of 100 watts).

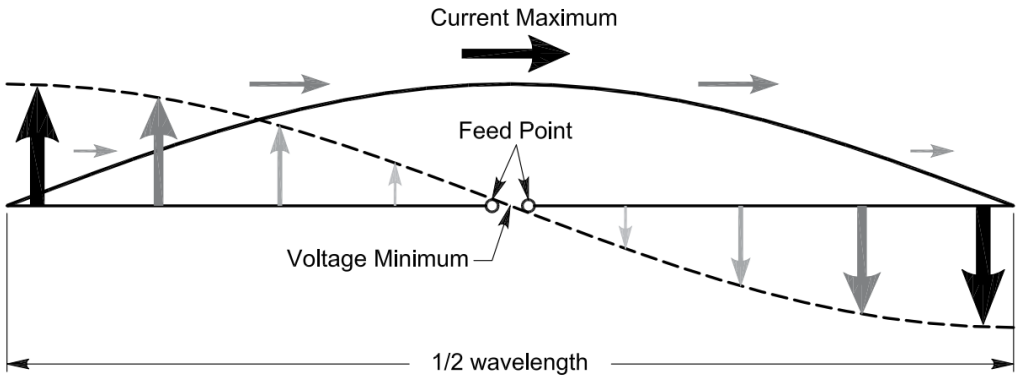
Using formula for power, we derive current as follows:

$P = I^2R$

I= SQRT (70.7/50) = 1.18A.

So, 1mm wire is not much adequate ideally! Increasing the diameter of conductor wire will surely a better choice not only for physical strength reasons, but also for lowering resistive losses of conductors.

Following diagram from ARRL antenna book shows voltage and current distribution in half wave dipole (which is true for vertical as well). Here we can see that at the feed point there is high amount of current and towards the tip minimum RF current exists. So, what we calculated above with $P = I^2R$ Is not uniform across various points of our typical antenna. It is 1.18A at feed point and 0A at the tip of perfect dipole or vertical. It is bit complex to understand the power dissipation in antenna system, however we need to ensure that conductors nearing to feed point poses minimum resistance to maximize efficiency.



This is more critical when we go for wire verticals. We can discuss more on vertical antenna efficiency in some future article. For now relax and work a little DX on low bands!

Best 73 - **Kiran VU2XE**

Reference: https://www.engineeringtoolbox.com/wire-gauges-d_419.html

P.S: If there are any corrections to the article presented here or ideas for future topics, Please send to VU2XE.Kiran [at] gmail.com. I would love to hear from you and learn.

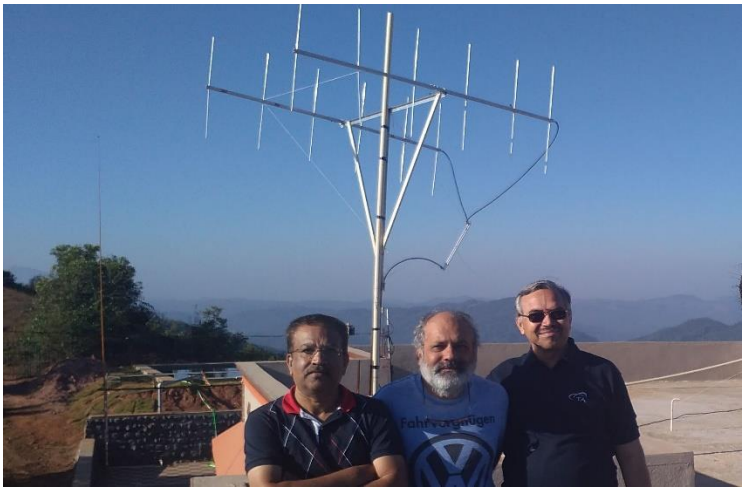
Power of two - Stacking VHF yagis

(By Kiran VU2XE)

ARSI VHF hill topping earlier this year provided many hams a time to learn new aspects of the hobby. I was part of VU2MUD group with VU2MUD, VU2AE and VU2IBI at Sakleshpur, Karnataka - a Hill station on Western Ghats mountain range. We had a very good time learning operating techniques from each other. As a preparation, we had planned to stack two 6 element VHF yagis with some kind of matching network. This experiment taught us many small nuances normally overlooked. This article not only talks about our stacking and learnings, but also introduces a better, easier matching network I had homebrewed after the event.

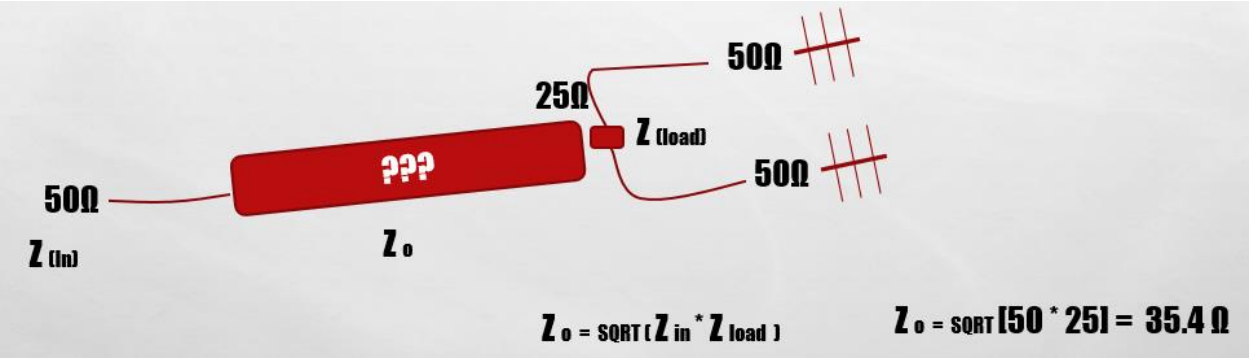
Why stack?

Stacking is a technique of placing the two antennas in a close proximity to increase gain or angle of radiation in desired direction. Upto 3dB of additional theoretical gain can be achieved by stacking two yagis. There are many web resources for knowing about the antenna distance calculation. We went with what we could do with available support hardware at out field day to place vertically polarized yagis at around 7 feet apart and connecting to our harness.



Picture with our stack in the background (VU2IBI, VU2AE, VU2MUD)

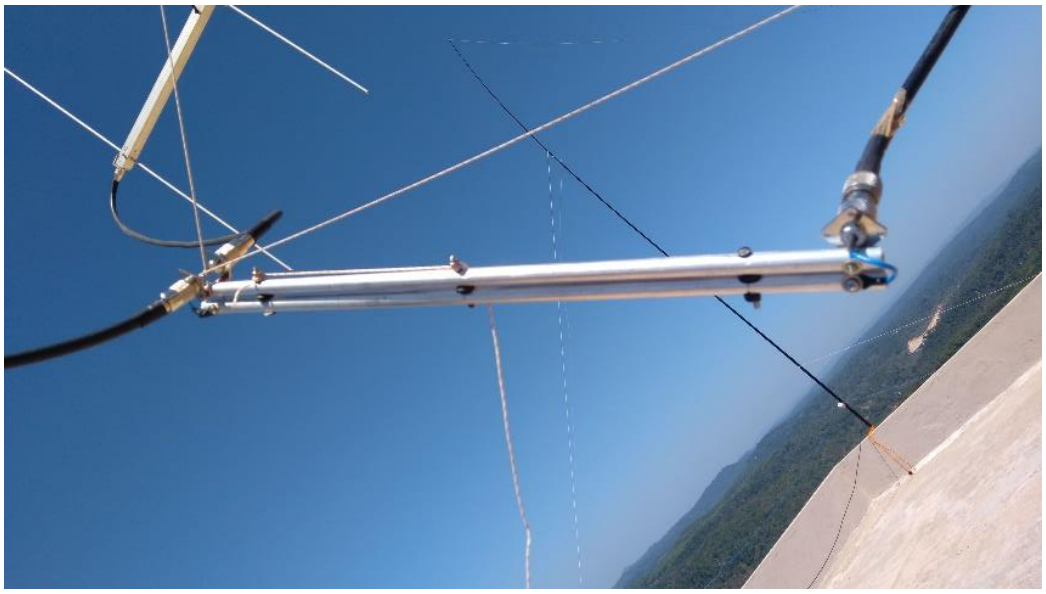
Typically when two antennas connected to each other, the impedance will be 25 ohms which then needs to be transformed back to 50ohm of transmission line and the rig. Following picture depicts this impedance transformation using quarter wave transmission line method.



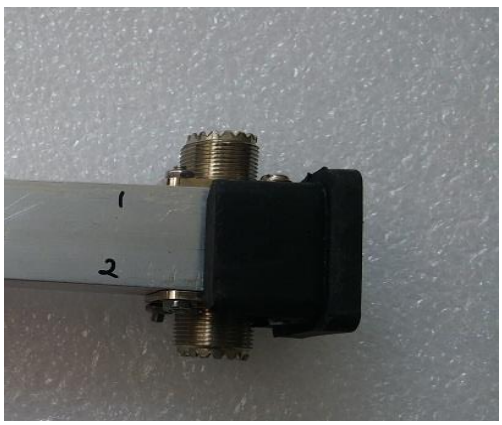
Z (in) is Transmission line impedance, Z (load) is antenna side impedance and Zo is what we call as transformation.

In this case, if we place a quarter wave (at design frequency) coax of 35.4 ohm line should do the job (see the picture above for formulae). But, most of our Coaxes are either 50 ohm (RG 58, RG213, LMR 400 etc.) or some are 75 ohm for TV (RG 59, RG 6 etc.). We could have just made our transformer with two parallel

quarter wave 75 ohm coaxes (total 37.5 ohm) providing near to 35.4 ohm. Electrical length of such Coax is = (physical length * velocity factor) of Coax. We could have done this if I had 75 ohm cable in hand, but went with parallel strip line method. Which ultimately did not last on the field due to ingress of dew and moisture changing the dielectric constant between conductors.

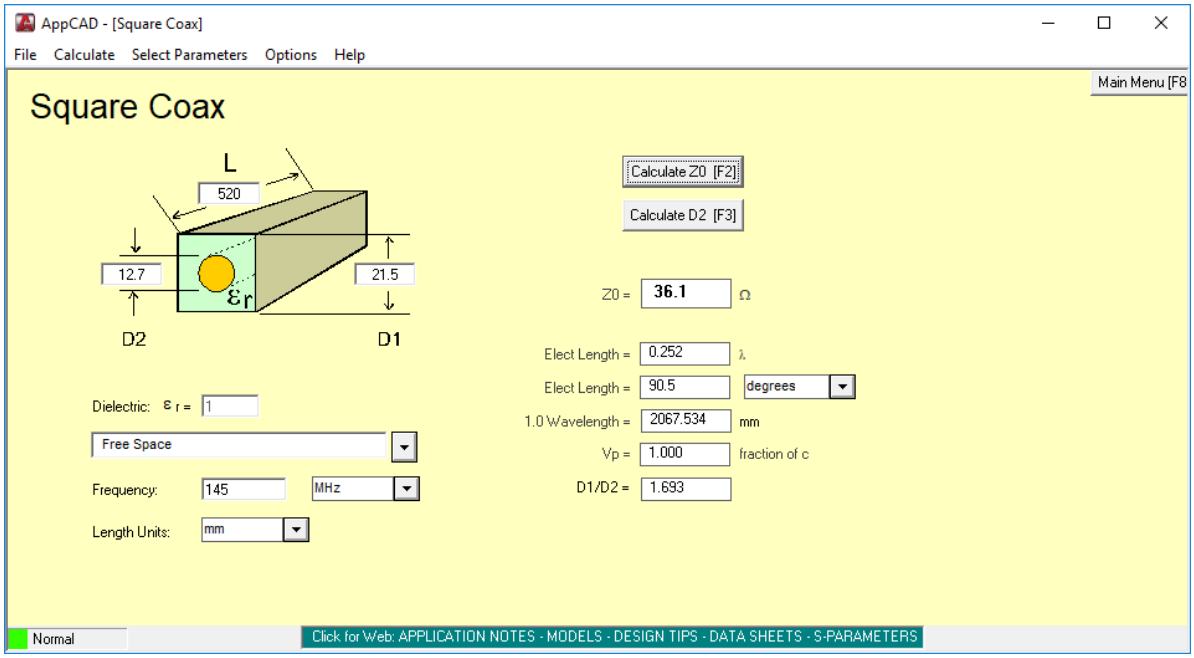


Our parallel tube transmission line for transformation.



Improvised method – easy to build, robust on the fields:

I downloaded and installed a free RF design software called **AppCad.** It has many useful modules and one such utility is for designing transmission lines. Here we chose square Coax. All we needed is to make Quarter Wave Coax at 145Mhz. I used one inch square aluminum tube for outer and half inch round tube for inner core. Entered values as shown in following snapshot:



The Software suggested that there is a tiny deviation with length and impedance. It was OK with me, as I was not looking for *micrometer* level perfection.

Construction:

Materials needed:

- 1 inch Square Aluminum tube (inner D1= 21.5 or 22mm) of 540mm length
- ½ inch round aluminum tube of 520 mm length
- 3 SO 239 (UHF Female connectors)
- 2 set of ¾ inch SS M3 screws +washer+nuts
- 4 to 5 Tap washers (rubber washers) with inner dia as ½ inch as spacers
- Wire terminal lugs
- End caps for square tubes – rubber caps available at furniture shops

Method:

1. First ensure that the length of the tubes are cut accurate as much as possible

2. Mark one side of Square tube as input and other as antenna
3. Drill two mounting holes for SO239 on opposite sides of antenna side and one hole on input side. Ensure that the edge of SO239 connectors are touching edge of Square tubes. Do not fit them yet
4. Drill M3 holes on near the edge of the round tubes
5. Place all rubber washers over the round tube at some distances (as spacers inside the square tube)
6. Use M3 screws, place wire lugs on each side of the tube and tighten the nuts. Ensure that there is some gap between outer Square tube and these nut bolts when you insert inside(outer tube and inner tube should not short)
7. Bend the lugs over the outer edge of the round tube and ensure that the lug collars are straightened out
8. Repeat this process on other side of the tube as well
9. Now carefully push the inner tube inside the square tube. Ensure that the edges are directly underneath the SO239 mounting holes.
10. One may have to file inner tube a bit or flatten the wire lug collars so that when you place SO239 over the outer tube, the center pin touches the wire lug. One may have to even clip/trim the SO239 center pin a bit (be careful of this step as it can damage the connectors)
11. Now fasten the screws and nuts for SO239 over the square tube. I had difficulty in reaching rear side nuts. So could only manage fastening at 3 places
12. Now solder the center pin of SO239 to the wirelugs on the edge of center tube. Bit tricky but can be doable (lugs will get the solder if you apply flux and good amount of solder heat)
13. Repeat the process on other side of the tubes as well. Ensure nothing is short and spacing is intact.
14. Weather proof the ends with silicon paste or Rubber caps (available at local furniture hardware shops)

That's it. There is no further tuning required. I tested this harness by connecting 50 ohm VHF loads to antenna ends and analyzer on the input side. It is fairly broadband to cover entire VHF band in India with less than 1.1 VSWR. Now you just need two equal length 50ohm regular coaxes connecting to two Yagis spaced at around one to two wave length apart and start enjoying the long haul VHF contacts!

With some tools and materials available locally you can try this Quadrature wave transformer/ power divider and take to your next field day!

See ya!

VU2XE Kiran

P.S: Do you have any construction projects around your shack? Ideas/tips to share? Please send them across to editor[at]arsi.info .

VHF/HF NETS

(By Prakash VU2IBI)

VHF nets have been very popular in South India since the 90's. There have been many repeaters operating in regions of Chennai, Yercaud, Bengaluru and other places.

The main idea of the Nets were to keep in touch with other Hams. As this was getting to be boring, senior Hams thought of having an Information bulletin every Sunday morning. This gave Hams a new world to Knowledge in the fields of Technical, Medical and General information.

Senior Hams VU2TS OM Ganesh, VU2WP OM Rag, VU2AMR OM Amar, VU2ZAP OM Raj, VU2CAP OM Shankar and many others actively participated in the Information bulletin. Some of the Topics discussed included Submarine Communications, Spaceship Communications, Diseases and their cures, how to Navigate in a Desert, even various techniques to catch a Rat - and so on. The net used to extend to about 90 minutes and hams were eagerly looking forward to Sundays.

When conditions are favourable contacts as far as 200 Km are achievable. The total VHF net check-ins these days is in the order of 30 to 100. The nets in the Morning and Evening are very popular even today. Announcements regarding Ham meets, Field Days, Fox Hunts and other Ham related information is being done on the Nets, also Nets gives a lends a hand to new hams coming on the air.

In spite of the advent of Mobile communications and Internet, HF nets even today as a practice call for any Emergency traffic. The olden days the emergency traffic would include obtaining medicines from other places when it was not available locally. This gave a tremendous boost to Hams about their ability to help humanity.

As time has proven, the very motto of Hams helping other Hams has been effectively carried out by the VHF and HF Nets. These Nets were conducted in VHF-FM, HF-CW and HF-SSB. Special nets were there for YL's called the YL Nets. A considerable number of YL Check-ins was present.

The HF Net controller even today has to have the knowledge of CW as some CW only Hams were able to Check-in, the reply was in Voice!! Hi.

The Net Controllers other area was to give Critical reports when asked for when Hams used to test their New Rigs or antennas. This is very useful to fine tune the Shack for better Tx and Rx and be better prepared for a Contest perhaps.

Enjoy being on the air, 73

de VU2IBI, Prakash

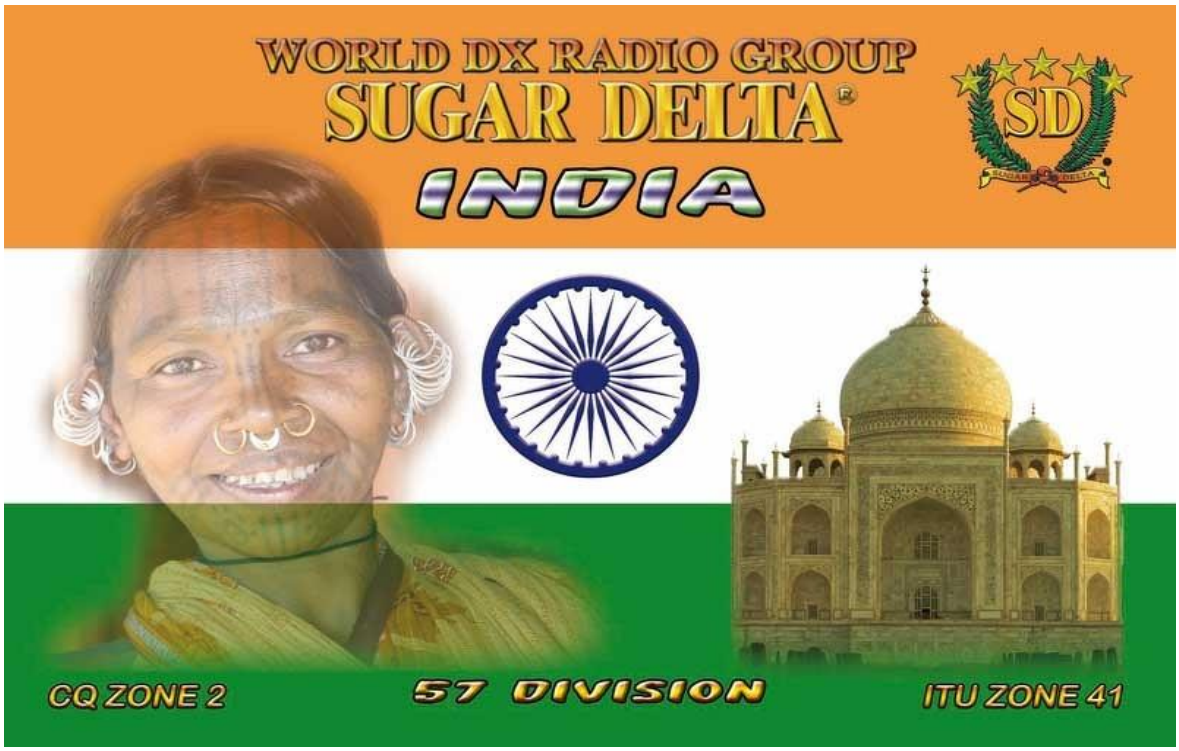
ARSI QSL BURO

In the previous issue of HRN it was announced that the QSL Bureau has moved to Bengaluru and the new QSL Manager is Lucky VU2LBW. Lucky informs us that the Bureau is functional – and more than 15,000 cards have been sorted out and he will be sending out individual mails to each recipient when the cards are ready to be mailed out. He has also revamped the rules on how to use the Buro and will be publishing the document on our group shortly.

WHAT IS "SUGAR DELTA"?

Did you know that there are radio amateurs using the 11 meter band? The frequency band used is 26.9650 MHz to 27.4050 MHz (40 channels), power output is 4 watts for AM and FM and 12 watts PEP for SSB. Channel 9 is reserved for emergencies, and channel 11 is a calling channel. In good old days, this used to be known as CB or citizen's band. And it's free.

The worldwide group is simply known as SUGAR DELTA – and they do have an India Chapter too - ITU Zone 41 and CQ Zone 2.



This is just for information. Halloa! Worldwide, we hams do not encourage CBers, Hi. Remember that ham radio dates from the very beginning of radio, and that many early hams had to fight for its existence. 11 meter CB was entirely a creation of The U.S.Federal Government in the 70s, - it was made 'free' for everyone because it was considered the upper 'edge' of the HF spectrum and was useless for long distance propagation.

In the U.S. you can hear truckers using 27.185. Breaks the monotony of long haul driving; they warn each other of the road conditions, traffic, and of course, the police. They even have their own jargon!

Further info: http://www.sugar-delta.org

This year JAMBOREE ON THE AIR is happening between 19th and 21st October and the theme for this year is *Life on Land — United Nations Sustainable Development Goal 15*. It is defined as: Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. Find more information at http://jotajoti.info/2018-jota-joti-theme/

We are all familiar with JOTA – Jamboree on the Air. Now, JOTI - Jamboree On The Internet - is part of JOTA-JOTI, an international jamboree taking place around the world simultaneously. It is organised by WOSM, the World Organization of the Scout Movement. Scouts from all over the world communicate over the Air (amateur radio) and the Internet using any technology locally available. There are loads of different ways to communicate, including text-based chat, voice chat, video chat, emails, blogs, and social media networks. JOTA-JOTI allows scouts and guides to build friendships around the world and to find out more about their culture and scouting life.

More info: https://www.scoutlink.net/joti/about/

DX TIDBITS

The new 144 MHz Tropo record

On Tuesday the 25th of September 2018, Peter Torry G3SMT set a new IARU Region 1 tropo record on 144 MHz when he worked D4Z in the Cape Islands Island off the coast of Africa. The distance was a remarkable 4431 kms which breaks the previous record of 4163 kms which was set by Mark Turner EI3KD only a few weeks previously.

According to the Amateur Radio Cluster Network, during mid-September, there were 201 countries active on the bands

SIMPLE & EASY MOON-BOUNCE

We are all aware that 'Moon Bounce' or EME is pretty complicated. We need a stacked antenna, kilowatts of power and so on. Right? Wrong.

On Saturday the 8th of September, the Essex Dx Group achieved a world first by making a moon bounce EME contact using nothing more than a dipole. It was a "Blade Dipole", to be precise. *(Most blade antennas are trapezoidal in shape. Variations have been made on this shape for aerodynamic purposes and notches have been introduced in order to achieve a better broad band performance. Generally used in aviation for VHF and UHF frequency range).*

The contact was made on 432 MHz with DL7APV Bernd who uses a 128x11 element Yagi array which is not so simple, Hi

(Tnx: Tom MXØCNS – via Southgate ARC)

This reminds me of the old days – during the sixties and seventies I used to make hundreds of contacts with stateside stations, using only a dipole and about 70

watts. My success was due to the fact that the other side used directional Yagis and linear amplifiers, Hi

/Ed

The 17th **IARU Region 3 Regional Conference**, hosted by the Korean Amateur Radio League (KARL), was held between September 10-14 in Seoul, Korea. Our president Gopal/VU2GMN represented India. A report has already been posted on the ARSI group reflector.

Hams in China

It is reported that the population of radio amateurs in China is expanding steadily and the number of amateur radio operators now stands at:

Class-C - 626 - Max permitted 1 KW on HF, 25W above 30 MHz
Class B - 17,626 - Max permitted 100W on HF, 25W above 30 MHz
Class A - 102,089 - Max permitted 25W on all bands

Total - 130,115 Licences

There are about 80,000 active stations in China today.

Class C is the highest license in China permitting 1 kW on HF
Class B permits 100 watts on all HF bands and 25 watts above 30 MHz
Class A permits 25 watts on bands between 30 and 3000 MHz only

Tnx Southgate ARC

Chinese Satellite sending pics of the Moon

The microsatellite Longjiang-2, aka DSLWP-B, launched in May has quietly been allowing radio amateurs to download images from the spacecraft taken along its elliptical lunar orbit. The satellite was developed by students at the Harbin Institute of Technology (HIT) in Heilongjiang Province, northeast China. Despite having a mass of just 47 kg, the tiny satellite managed to use its own propulsion to slow down and enter lunar orbit while the relay satellite continued past the Moon to its special destination. Downlink is between 435.400 / 436.400 MHz

During its time in orbit Longjiang-2 has used a student-developed camera to take images of the Moon, Mars, the Sun and other objects. UHF tests have seen data transmitted by Longjiang-2 and received and decoded by radio operators on Earth.

Link: https://gbtimes.com/change-4-update-queqiao-relay-satellite-in-halo-orbit-longjiang-2-returns-amazing-images-from-moon

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