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## President's Message



### **We are in 2020. We are living in the Future!**

It is hard to imagine that we're living in the year 2020, the futuristic age projected in numerous sci-fi novels and movies!

Though we are seeing plenty of impressive technological advances, from artificial intelligence to phones that unlock by scanning our faces, it is not yet the world of flying cars and robotic personal assistants that people once imagined we'd be living in by now.

According to Ross Dawson, an Australian author, futurist, entrepreneur and former stockbroker, who is best known for his book 'Living Networks' published in 2002, "Predictions are not valuable unless they inspire useful action. Rather than simply looking at the future, we need to work to create the future. And the best way to do that is to help the right ideas, people and resources to connect".

Now, what relevance does it have in the universe of hams? Well, in the middle of the twentieth century, the average ham could basically communicate by voice, Morse code, or teletype. It was fun and exciting to use simple equipment to communicate around the world.

We have been witnessing an interesting trend in the past decade - when we share our adventures in ham radio with others, their response is usually along the lines of: Do people still become Radio Amateurs? Does it still exist?

Amateur Radio has evolved with the growth of the analog and digital technologies. We will not be wrong if we say, a lot of the advancement in Radio communication is because of Radio Amateurs who have contributed to the growth of the technology.

One area of amateur radio that has grown by a significant amount since the introduction of personal computers is the use of digital modes of transmission. The most widely used digital modes in the past two decades have been the RTTY, AMTOR, PACTOR, Packet Radio and the PSK31 modes.

The more recently popular mode of digital communication is the WSJT - **W**eaK **S**ignal communication by K1JT. As the name implies, it is a form of digital communication optimised for weak signal communication. Originally developed by K1JT, the software is now open source and its development has continued. It is now managed by a small team of radio amateurs. WSJT variants include: FSK441, JT6M, JT65, JT4, FT8 and others.

Interestingly, FT8 has become very popular because of its advantages for HF long distance communication. FT8 is one of the most popular communication modes for

the radio amateurs today, more so because of the current poor propagation conditions on HF. So, Amateur Radio is here to stay, no matter what!

Let us hope the predictions that the HF Bands will open up soon in this decade will come true and inspire us to enjoy talking to the world.

Ramesh Kumar VU2LU

## From the Editor's desk



Let me start by wishing everyone a Happy New Year. Last year saw a lot of activity – *contests, Hamfest, Jamboree-on-the-air, Fox Hunts, Field Day, Hill-Topping and so on*. Let's look forward to an eventful year 2020.

In this issue, I have included an article on "Radio Amateurs of the Indian Defence Services" which I am sure you will find interesting. There were so many high ranking offers of the Indian Army who were keen on amateur radio;

some have started clubs wherever they were posted. Sad that there are not any defence personnel in this unique fraternity at present.

We need to consider bringing back the defence personnel into Ham Radio. For starters, any member having a friend or relative in the Defence Forces may kindly pass on a copy of this issue of the HRN to him/her, highlighting the article mentioned above. And then, find ways of enlightening them on the advantages of taking up this scientific hobby. Organizing lectures and demonstrations for them would be a good idea.

We are experiencing the deepest solar minimum of the last hundred years and propagation has been poor. Solar cycle #25 has begun - and the predictions are that the solar minimum will continue till 2025 or so.

The current issue is filled with activity from amateurs in Pune - I invite other clubs in the country to send me information on the club activities so that I can include them in the newsletter. Let members know what is happening!

73 - de Ganesh VU2TS





## **THE HOBBY OF AMATEUR RADIO AND HAMS OF INDIAN DEFENCE SERVICES**

**By Arasu Manohar VU2UR**

**INDIA** is a vast country with sizeable land, sea, and air-space to defend. We have a well-established Defence force with the three important wings like the Army, Navy and the Air Force. The other assisting services are those like the Indo Tibetan Border Police, Border Security Force, Coast Guards, etc.

Amateur radio in India began in the pre-independence days, with a few civilians and a few army men taking up this hobby. A civilian has lots of free time to pursue a hobby apart from his profession. The man in the Services is bound all the 24 hours a day in the service of his nation, and seldom finds some time to take up a hobby and pursue it. If a few, from the services have taken up amateur radio as a hobby, it must be quite a great effort of theirs which is highly commendable. Several Officers of the forces, have guided their men, and have emphasised about the need of such a self-educating hobby. Only this quality among the leadership made some keen amateur radio operators in the Services.

In India, from among the Defence Forces, the greatest number of amateur radio operators are from Indian Army, and Air Force is in the middle, and the Navy is at the tail end, for the obvious reasons. The Air Force and Navy use sensitive wireless/electronic communications for their regular work, as such, many times, have not permitted operations of amateur radio, with the fear that it may jeopardise the security and interfere with their own communications in the base and on board the war ships. This may be based on the fact that the signals from amateur radio may, at times, radiate harmonic emissions or other spurious signals interfering with their communications.

So far, in India, we do not have any complaint about an amateur radio operator's signal interfering with the signals of other services, but the reverse is true. As a Monitor, I have observed, logged and reported many such signals of the government agencies interfering with amateur signals inside amateur bands.

The international allocation of amateur radio bands are well defined ranges, mostly harmonic related, with least possibility of interfering with other signals.

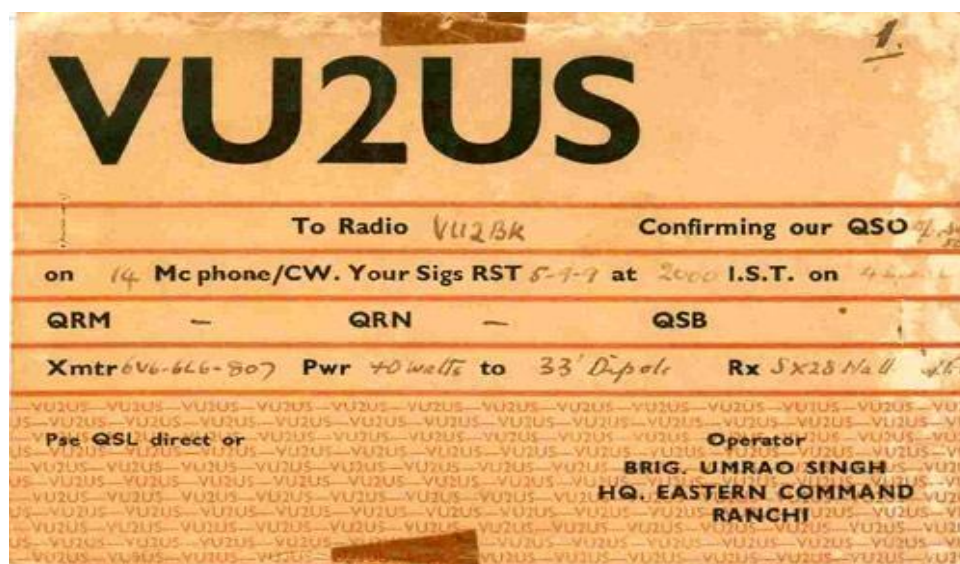
### **Amateur Radio Operators of the Army**

The post-independence era saw quite a number of VU amateur radio operators from the Indian Army with a few keen DXpeditioners too.

Lt.Gen.Umrao Singh VU2Us, Maj.Gen.R.Z.Kabraji (AVSM), VU2BK, Brig.Leslie King VU2AK, and Brig.B.M.Chakravorty VU2BM were the leading names of hams from the top-ranking officers of the Indian Army.

Lt.Gen.K.Umrao Singh VU2US, inspired by Maj.Gen.Kabraji VU2BK and with Brig.P.S.Gill VU2PS and Maj.T.A.Ramakrishnan VU2TN, gave the world of Dxers a new country –

“Bhutan” in 1962 with the All-Army Dxpediton assisted by the Amateur Radio Society of India (ARSI). The beauty of this expedition was that home brewed gear and a cubical quad antenna was used. The use of a cubical quad for a Dxpediton is very unusual – and never heard of, even today. The QTH was Yembola – at 4000 ft altitude, 20 miles south of Tashigangdzong, Bhutan. The callsign was VU2US/AC5. The QSOs were meticulously logged and the QSLs sent scrupulously. The team used 20 and 15 meter bands for the activity. The very rare and invaluable log is still available with OM Zal, VU2DK.



Another Dxpediton followed much later – to the Lakshadweep Islands. The callsign this time was VU7US. That was by Lt.Gen.K.Umrao Singh VU2US who led this ARSI sponsored Dxpediton in April 1971 accompanied by Col.R.S.Kalha VU2RK, Maj.Haveli Ram VU2HV, Karta Ram VU2KM and V.Ananthanarayana VU2QM. A number of DX contacts were made during this Dxpediton; the noteworthy QSOs were with King Hussein JY1 of Jordan, Queen Muna, JY2 - his XYL. The whereabouts of this log is not known.

The many contemporaries of Kab, were a well-knit fraternity of amateur radio operators, who were distinguished Officers of the Army. I fail in my detailing, here, if I forget the well-known few, like the following:

Maj.Gen.V.Rangaswami . VRC, BAR. VU2EVR (SK). A keen ham in late 90s. Gen.Rangaswami was a well decorated Officer of the Army Medical Corps . Had the distinction of being an active paratrooper. Was active in SSB, and performed Para Jumping at various Indian cities.

Maj.Gen.S.G.Vombatkere. VU2DY. (earlier VU2DAY) and Gen.Sudhir was responsible for building a few steel bridges and one of the highest motorable highways in the world.

Maj.Gen.Kunwar Bhagwati Singh. (SK), VU2IB,--Brother of VU2US-Gen.Bhagwati Singh was the first officer to pass out from the IMA at Dehra Dun. Was an active Para trooper of the Army..the only Ham to become the Director General of Civil Defence at Delhi.

Brig.H.H.Sukhjith Singh MVC – the 9<sup>th</sup> Maharaja of Kapurthala is another highly decorated officer of the 14<sup>th</sup> Horse (Scinde Horse) of the Armoured Corps. Educated at Doon School, graduated from the Indian Military Academy Dehra Dun, he was commissioned in 1954. He attended Staff College Wellington and the Joint Services Staff College, Latimer (UK). He won his MVC on 11<sup>th</sup> Dec 1971 for his bravery in the Indo Pak war of 1971. He is a Platinum Cavalier.

Brig.Minoo N. Patel (SK)-- VU2JM, Active till early 80s-Brig.Minoo Patel was one of the first persons to develop the electrical musical organ.--He was a clever Engineer of the Corps of Engineers.

Brig. B.M.Chakravorty VU2BM, was instrumental in a lot of amateur radio activity in Bangalore city in the sixties. He was quite active, and his XYL Asha was the first to get the call VU2YL (both SK) The Electronics and Radar Development Establishment.,LRDE club station VU2TE, was well known for the operator Nambi VU2TD who put his regular AM signal on 40 metres and other bands. Several SWLs continuously monitored the technical topics discussed, and other amateurs were regular in rag-chewing with him.

Brig.Leslie King (SK)- VU2AK. Well known ham through all the years; Was active from Bangalore in SSB, with XYL Audrey VU2YL;LES KING and VU2BK were great home-brewers.They dodged official PT classes for building new gizmos.

Col Bhanu Kumar Rai, VU2RB, was a former Secretary to Government of India, 3rd Graduates Course of the IMA Signals Regiment, Premature Retirement in 1970, B Tech from I T BHU, Post Graduate from IISc Bangalore, Worked as Founder Chairman of UPTRON group, HCL and over 20 other companies. Distinguished fellow of IETE, INAE; Chairman of the Electronics group (BEL, ITI, MTNL, BSNL, ECIL , CMC etc)..Was for seven years Chairman of the Services group (STC, MMTC, PEC, ITPO, ITDC etc.), Director of the Hotline Group of Companies for 16 years. Now settled in Bangalore. Was instrumental in setting up the club station VU2UPT, at Lucknow. He is the only VU to have had a QSO on the air, with Lord Mountbatten while he was using a VS7 call from Ceylon and then an eye-ball QSO when came to India.

Lt.Col.Dady Major VU2MD and Maj.Gen.Kabraji VU2BK were the flag bearers of VUs on CW mode. The world knows them for their regularity and good CW. VU2MD had a flair for Award hunting and was a DXCC awardee. He had won several other rare awards, all on CW which no one else had at that time. We are unfortunate that we did not see him achieve the Honour Roll in DXCC. He had 295+ countries all on CW only. We do not know the present condition of those precious awards.

Maj.Ken Gillon VU2CD. Was active in the fifties, migrated to VK land. Ken was another one trained by VU2BK Ken did work on the ancient History of the Corps of Signals.

There may be many more from the other ranks, whom, I have not come across or heard of; I feel sorry for missing their call signs, details, activities, and whereabouts.

Apart from their personal amateur radio stations, some of the Army Officers were quick to establish Club stations in Army Establishments so that the 'state-of-the-art' hobby

can be demonstrated and other officers and ranks could get trained and pursue the hobby.

There were two Army Club Stations, one each at Mhow (Military Headquarters of War) VU2SS in Madhya Pradesh, and at Indian Military Academy at Dehra Dun VU2MA and a third at a civilian centre at Bangalore LRDE with the call VU2TD.

**VU2SS** – The Amateur Radio Club of India ARCI was started and located at Mhow, Madhya Pradesh, the suffix tells us that it was the School of Signals. After an organisation to represent amateur radio operators was formed, the ARCI moved in May 1954, to Delhi as the Amateur Radio Society of India ARSI – but the club station VU2SS remained at Mhow only.

**VU2SS** was very active working local and DX stations too. The call was famously known in DX circles with the nick name **VU2 SUFFERING SUSSIE** !! The signals of this station with Officers and other ranks at the Key/Mike, was famous round the world. The reason for this activity was the Standing Instructions of the Commanding Officer that the Club station should be on the air regularly. The only time all this changed for the worse, was when all and sundry, started applying for the club ticket\WPC changed the rule and laid down that the club operator must hold his own valid licence...Even then, the activity was possible as quite a few, had their own call signs in those years. But, it became an irregular feature, as officers and other ranks used to get posted out of Mhow, and thus, the club would lie idle.

In the late sixties, Capt. Shivaswamy VU2GK, took a lot of interest and got the Club going in his tenure there. Back to square one, after he was posted out, to lie IDLE.

As years went by, it became worse. This club with a huge collection of equipment and expertise as the Military College of Telecommunications Engineering, one of the best in the world – is lying idle.

**VU2MA** came into existence after the authorities noticed VU2SS and its usefulness. They wanted the Gentlemen Cadets passing out of the Indian Military Academy at Dehra Dun to take some interest in this unique hobby.

It worked because, quite a few Army hams came up after that, but the WPC rules made this club also go idle. The last I saw VU2MA was in 1975 when the station was looked after by Maj.Appachchu. The station was an RCA BC-610 transmitter, BC 348 and SX 28 receivers and dipole antenna.

It may not be out of place to recall that the station ET3MA was started in Ethiopia, after their trainees at IMA had seen the club station VU2MA in action.

**VU2TD** – the third club station in the fifties and sixties was located at the Electronics and Radar Development Establishment at Bangalore. The station was very well operated by Nambi VU2TE, and the QSOs of this club had lots of technical details. It was very well known among other amateurs and SWLs for the fine AM signals.



This office is now a part of the Defence Research Development Organisation DRDO Bangalore. However, the club station does not exist any more.



RADIO CLUB, Mil. Wing, N. D. A. Dehra Dun (INDIA)	REMARKS
TO RADIO <u>VU2BK</u> .....	<i>Best of luck and 73's</i> <i>Tons of dx.</i>  <i>TAKHAR</i>
This confirms our pleasant Q. S. O. on <u>15/5/51</u> at <u>1815 hrs</u> IST.	
Your phone/cw. signal on.....	
MC. <u>14</u> ..... were R.S.T. <u>5-9</u>	
Tx. <u>BC 610 E modified</u>	
Rx. <u>SA 28</u> .....	
ANT. <u>1/2 dipole</u>	
Please Q. S. L.	

When the clubs were active, great interest was shown by SWLs, hams and everyone in undertaking various experiments, designing and home brewing. A great ham spirit was involved – so much so, we as youngsters got highly motivated in the hobby after seeing all such activities and encouragement.

The WPC rules stipulate that a permanent employee of the organisation with a Grade I licence should be in charge as the custodian of a Club Station. As all the Army Officers and other ranks get frequent transfers, this condition forced on the Defence Services Club stations too brought club activities to a stand-still.

The forces which fight for the country's security, sovereignty and freedom is thus deprived of educating its fighters in practical two-way communications in times of peace.

## Amateur Radio Operators of the Indian Air Force

From amongst the elite Air Force, there were no amateurs, either British or Indian ever active in the pre-independence era. But Air Cdr.V.Subramaniam VU2UV was well known after

independence, for his work in VHF/UHF/HF communications. The Air Force had some other ranks very active in peace time than other Officer cadre. The most famous among them was MWO P.M.Subramaniam VU2SU who was active in all the peace time stations of the Indian Air Force – mostly on CW, using a home brew TX with a pair of 807s in the final, BC 342 receiver and a simple half wave dipole. He made India well known among Russians as he never denied anyone a QSO. I had personally visited him in Chandigarh, Halwara and Barnala Air Force Stations. Seeing him operate CW using a semi-automatic bug-key inspired me to take up CW seriously and remain a CW fan for ever.

Then, there was Cpl.T.V.George VU2TV who was briefly operational from Bombay. He was well known for his highly technical work of triple-conversion of the BC 348 receiver with a final IF of 85 KHz. He was famous more as a designer than an operator.

Adolf VU2AF, Marcus VU2VTM, Gururaj VU2GUR, Murthy VU2MOK – all from the Indian Air Force – started their activities after their retirement from service. They are still very active in training newcomers and in SSB/CW operation.

N.R.Gopal VU2GO, was from the No.3, GTS of Indian Air Force, Bangalore. Gopal too made few QSOs during the Service life but thousands of QSOs, after he retired from service.

The postings in forward areas made all these operators go QRT – as, operating an amateur radio station was restricted for security reasons. Keeping this in mind, the only Air Force operator who never took an amateur radio operator's licence and remained an SWL with a high-speed CW capability all through his career was MWO Viswanathan who brought name and fame to Indian amateurs by sending his "de SWL VU-0020" reports to over 320 countries and has about 300 confirmed countries. This is an unique achievement. Whoever has attended the recent Hamfests would not have missed the beautiful albums of QSL cards received by him. Sorted by DXCC, IOTA, ARLHS, FIRAC, etc. Unfortunately the latest trend in the National Society and Ministry is to drop the SWL category altogether. Alas, they do not know, in several countries unless an SWL proves activity, he cannot get a transmitting licence of his own. The Iron Curtain countries encouraged the SWL to operate an amateur club station under the guidance of the Chief of the Club who was invariably a "Master of Radio Sport".

## **Amateur Radio Operators of the Indian Navy**

Among the Navy personnel, the very first one heard with a lot of activity was Cdr.Harkirat Singh VU3HKQ who was very active from various cities of India and was QRV from Dakshin Gangotri – the Antarctic Research Base Station of India. The second amateur from the Navy was Lt.Cdr. M.S.Prakash VU2MSW who was active from the Maitri base in the Antarctic between 1991-1993.

## **Amateur Radio Operators of other Services**

Very few are there, in the BSF, CRPF, SPG, NSG, etc., whose details and activities are not known at the moment. I remember only one call and that is of Om Praksh Sharma, VU2OPS, who was in one of these services.

## **The Postal Strike of 1960**

During the All India Post & Telegraphs strike of 1960, quite a few amateurs from the Indian Army and civilians assisted the Government in handling the telegraph traffic from different cities, clearing the messages on a All India basis. Kab VU2BK and Les VU2AK, Haveli Ram VU2HV, Ram VU2TN and others from the Army with many forgotten civilians stood the ground, proved the worth of Amateur Radio in all seriousness, to the Government.

## **Maritime Expeditions by Army Officers**

Among the maritime expeditions / voyages, the two famous ones using the "Trishna" – a Swan class boat, one under the command of Brig. A.P.Singh, S.M.Bar, VSM, O.M. – I am not able to recollect the callsign – in the period 1999-2000, are well known. One was around the world and the other was in South East Asia. It is interesting to note that Army Officers had amateur radio callsigns in a maritime expedition and successfully completed the voyages as planned, and several amateurs from India kept tracking and communicating with them.

I am highly grateful to OM Zal VU2DK for all the help, without which this writeup would not have been possible.

73, Arasu VU2UR

## **JAMBOREE ON THE AIR 2019**

### **BENGALURU, KARNATAKA**

BARC got a special call sign AU2JOTA for JOTA operations, and set up three Radio Stations in Bangalore and one in Mysore with help of MARC, About 900 Scouts and Guides got the awareness on Amateur Radio, and about 300 were delighted talking to one another and Radio Amateur's, Introduction of Amateur Radio PPT by OM Ram VU2GRM, learnt about General Radio Operations on HF, VHF and UHF, Digital modes, Direction Finding, various types Antenna and its uses, Satellite communication etc. the ethics and rules, Most of the students were not aware of Amateur Radio and were very excited to learn about the hobby.

The States Commissioner for Scouts Mr. P G R Sindhia addressed the Scouts and Guides over the Radio and in person, he also made them aware the importance of Radio, the Fun, Knowledge etc.,

Camp 1- Scouts Head Quarters, Operated by VU2NPI Madhu, VU2GRM Ram Mohan, VU3CIQ Arvind, VU3GDX Girish Das, SWL Harmonics and also Scouts Chirag and Gaurav, VU3SXE Sundeep, VU3UDK Anil, VU3JIM JIM, Visited by VU3PKE Kiran, VU3HNA Appana, VU2NPI setup his Full Loop Delta Home brew antenna, with his HF and Digital Station.



Camp 2 - The Historic Chamundi Scouts was managed by VU2JVJ James and VU2TWZ Alex, VU3JBH Iyappan, VU3JIM manage for Logistics, VU3UDK Anil, The Senior Scouts remembered OM VU2DEV who always used to setup Amateur Radio Station for JOTA here every year for several years.

camp 3 - The Huge Annie Besant Camp at Dodaballapur station was setup by VU3UNO Krishna Kumar, VU2RPS Rajesh Shah, VU3SXE Sundeep, VU2EDG Pradeep, VU2ZLS, VU3ZNG, VU3ULP, VU3UDK, VU3HST, VU3NEO came for Eyeball.



Rajesh VU2RPS, KK VU3UNO and others getting the 2 meter ground plane ready



Camp 4 (Mysore) - In a short notice MARC managed by OM Madhu and Team setup radio station in Jaya Chamarajendra Scouts in Mysore, VU2SPK Shankar, VU2ETS Savrav, VU2MTK Kesari, OM Ganesh VU2TS assisted the demo.



Shankar VU2SPK talking to the Scouts and Guides

ISRO VU2URC Club station was active with OM Mani answering to various questions on satellite and space from the scouts and Guides.

BARC extensively used the RSB repeater and are very thankful to RSB.

**Sundeep Shah- VU3SXE**  
Hon. Secretary

## **JOTA at Dombivli, Maharashtra**

October 19<sup>th</sup> and 20<sup>th</sup> was a special for Scout and Guides across the globe as they celebrated the Jamboree On The Air (JOTA) and Jamboree On The Internet.

Abhinav Vidyalaya, Dombivli and Bharat Scout and Guide Dombivli chapter organised the JOTA/JOTI on 20<sup>th</sup> October and over 300 students from various schools in Dombivli turned up for this event. The event started by sharp 8.00am

These youngsters were looking forward to talking to their fellow scout/guides using Amateur (HAM) Radio. The event started with children getting a brief introduction of how two-way communication is done using HAM Radio, the equipment used in the process and some radio communication lingo. Even before the lecture could end, students were excited to use the radio set.

Few lucky students had a chance to help out installing VHF and HF antennas and setting up the radios.



The HF propagation was not that good, but each and every scout/guide got the opportunity to talk on VHF Radio and HAMs from Thane, Mumbai and Panvel were very well supported to communicate with them.

While all the students communicated through VHF, some students got the chance to experience Echolink, SSTV, Satellite Tracking etc were also experience by each student, teachers and parents.

VU2WSM -Satheesh, VU2PCT Paresh, VU2TCE Sashi, VU3VOZ Sanjay, VU3JOY Joy, VU3VOY Sanketh, VU3OGE Anand, VU3CLM Rajendra, VU3CFC Ameya, VU3CLX Apoorva, SWL Kedar Soni, SWL Vinaya supported the entire event.

## **Fox Hunt conducted by Bangalore Amateur Radio Club**

The BARC conducted the 20th edition of Fox hunt synchronizing with its Diamond Jubilee celebrations, on 8th of December 2019, and the 'fox' being Veteran VU3JBA OM Soms .

Since no one was able to reach the foxhole within the stipulated time, the winners were declared on Lucky dip and the prizes were distributed.

The fox hunt was inaugurated by the Chief Guest OM Old timer Dr. Justice Prabhakar Sastry, VU2QFZ. The Venue for flagging of was at The Bharat Scouts and Guides HQ on Palace Road. The foxhole was located further down from the Hope Farm Junction and was in two stages. First stage the antenna was put up on a tree and second antenna for the transmitter was around 150 yard from it.



Flagging off

However none were able to reach the foxhole in the stipulated time due to cloudy weather and the due to the time constraints the fox hunt was declared closed and it followed with complementary lunch And The Prize Distribution.

The first prize was the VHF ground plane antenna sponsored by Nitin VU3TYG. Second place and third was a whip antenna. There were many goodies distributed at the ceremony on a lucky dip method. There were number of applications - 78 people had registered for the event and around 20 teams hunting the fox on two wheelers and four wheelers.



Poru honouring the first prize sponsor Nitin VU3TYG

The ARDF committee headed by OM Anil VU3UDK and Sundeep VU3SXE, and were ably assisted by VU3JBH, VU3GLS and VU3KSP. A volunteer support by VU3BOP OM bops cannot be forgotten.

We look forward to similar enthusiastic participation in our future events too.



## FOX HUNT conducted by the Indian Institute of Hams

ARDF was organized in association with Department of Youth Empowerment and Sports, Government of Karnataka, REVA University, RV College of Engineering, Indian Public School, Tuverkere, Tumkur District, National Institute of Amateur Radio, Amateur Radio Society of India and IEEE, Bengaluru section.

Total number of participants: 118 – in 45 teams

Shri. K. Srinivas, IAS, Commissioner for Youth Empowerment and Sports, Government of Karnataka - addressed all the participants, spoke about importance of Ham especially for youth and role played during recent cyclones. Mr Ramesh Kumar, VU2LU President- ARSI, Mr Ram Mohan, VU2MYH Director-NIAR, Mr B.A.Subramani, VU2WMY from Upagraha Amateur Radio Club, ISRO, Dr. R.V.Siva Reddy, VU3UFF, Asst. Professor Mrs Usha Rani- VU3DGC, Dr. Rudrayya Hiremath-VU3IGP Chairman, Indian Public School, and Sri R.J. Marcus, Director-IIH spoke on the occasion.

Hon'ble Commissioner flagged off the teams at 9.30am. Three whatsapp locations was shared for participants and instructed to reach any one particular location to take the bearing at 10am. Fox was located on Akkamma Hills, Bagalur (near the International Airport) approximately 7 – 8 kms from the given locations.



The Fox: R.Manjunatha, VU3CJM & Bharath, VU3VXX. Most of the hunters were able to locate the fox within 60 minutes. The idea was to make it simple for novice participants.



## **The Winners:**

**1st Place: Mohammed Asif Khan VU3JVY and Mohammed Ali Jinnah VU3XMA**

**2<sup>nd</sup> Place: G.S.Adithya VU3ULQ and Ajay V – SWL**

**3<sup>rd</sup> Place: Avinash B.M. VU3ORO and Harsha M.Krishna VU3WSZ**

**4<sup>th</sup> Place: Vlnith Kumar VU3WTT and Saujanya VU3UFT**

**5<sup>th</sup> Place: Dr.M.Devanathan VU3OEG and Ramesh M.S. – SWL**

Around 12.30pm prize distribution was organised at REVA UNIVERSITY which was around 7 kms from fox hole: Dr. S.Y.Kulkarni, Vice-Chancellor, REVA University was the chief guest. Each participant was honoured by a certificate given away by VC. The trophies carrying the logo of the State Government were given to the winning teams.

73, Dr.S.Sathyapal VU2FI  
Game Control, IIH Radio Sports

## **PUNE, MAHARASHTRA**

**On behalf of the PUNE HAMS AND AMATEUR RADIO CLUB (VU2PHQ) Udaya Patil - VU2UPQ reports:**

The September 2019 edition of the PUNE HAMS EYEBALL was held on Sunday, 1st September 2019 at the PUNE HAMS AND AMATEUR RADIO CLUB- VU2PHQ Pune Cantonment.

SWL Prasanna & SWL Smita shared their experience of their ASOC Exams in Hyderabad that they had appeared for and cleared Restricted Grade.

It was followed with a discussion on the learning experiences that the various mobile teams had during the Club's recent VHF mobile activities that was held on 18th August 2019 and on the use of such experiences when called to assist in times of Emergencies and Disaster. Members at this time were encouraged to volunteer their services with the ARSI Amateur Radio Emergency Communication services.

The Round table discussion "**What's on your workbench**" was very interesting. Members shared information on their various ongoing projects.

The technical presentation and discussion was on antennas, SWR, antenna analysers and antenna tuners; the discussions on the subject was highly appreciated.

It was the club's Elmer VU2 ASH Ashok Joshi's birthday on the 29th August and during the eyeball he cut the birthday cake that was distributed along with the snacks at the end of the meeting during fellowship.

On **5th September 2019**, VU2LU - Ramesh Kumar - President ARSI had a EYEBALL QSO in Pune with VU2UPQ Udaya Patil of the PUNE HAMS AND AMATEUR RADIO CLUB. They discussed matters relating to the PUNE HAMs and the ARSI.

## **28th September 2019**

On Saturday 28th September 2019, the PUNE HAMS AND AMATEUR RADIO CLUB - VU2PHQ in collaborate with the COLLEGE OF ENGINEERING PUNE (COEP) HAM CLUB VU2COE conducted a full day workshop on Amateur Radio as part of the COEP's annual event on technology called MINDSPARK 2019. THE WORKSHOP was well attended and there was a lot of active participation.

The topics covered by the PUNE HAMS AND AMATEUR RADIO team during the work were:

(1) Overview of HAM Radio. (a) "what in this world of such technically advanced communication what is the place for amateur radio. (b) What all does Amateur radio have to offer for those who are interested.

(2) Home brewing Projects and their Demonstration.

(3) Earth Moon Earth or *Moon bounce* communication, International Space Station, Slow Scan TV, Video calls with ISS Astronauts, types of Amateur Satellites, Communication using Amateur Satellites, radios & antennas used in Amateur Radio satellites communication.

(4) Amateur Radio Direction Finding and on Amateur Radio during (ARDF) /FoxHunt exercise. On behalf of the College, SWL Marisha Chopde led the team that organised the workshop. She was assisted by SWL Omkar Dhaygude and a team of students. Both Merisha & Omkar have cleared ASOC Exam held in March in Pune and are awaiting their respective Amateur Radio licenses.

The VU2PHQ Team that conducted the workshop included VU3YWK - Ajay Kashikar, VU2TFG - Anil Sharma, VU2SFJ Srinivas Nyayapathi, VU2PST - Paresh Tilekar and the Elmer of the team VU2ASH- Ashok Joshi.

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

## **II. The October 2019 edition of the PUNE HAMS EYEBALL**

The October 2019 edition of the PUNE HAMS EYEBALL was held @ 10.30 am on Sunday, 6th October 2019 at the PUNE HAMS AND AMATEUR RADIO CLUB- VU2PHQ.

After a brief introduction of all the new comers, SWL Marisha & VU2TFG - Anil gave a brief overview of the workshop on HAM Radio / Amateur Radio that members of the club conducted at the College Of Engineering Pune (COEP) as part of their Tech Festival MindSpark19.

Since there were many new comers at the meeting,

1. Anil briefly elaborated on the topic, "In this world of such technically advanced communication systems what is the place for amateur radio and on what all does Amateur radio have to offer for those who are interested".
2. VU3YWK Ajay spoke about his presentation on satellite communication and on Earth Moon Earth (EME)
3. SWL Merisha elaborated about Amateur Radio Direction Finding (ARDF) /FoxHunt exercise that was conducted during the event.

VU3YWK AJAY presented SWL MERISHA with the cap of the PUNE HAMS AND AMATEUR RADIO CLUB for the outstanding leadership qualities she showed in organising and coordinating the Amateur Radio workshop during the event.



Members shared their current projects, experiences and learnings. Here VU2ASH Ashok Joshi demonstrated & shared information about the CW keyer and decoder that he had homebrewed.

VU2SFJ Srinivas answered questions from new comers who are stuck because they either do not have antennas or related materials or are facing difficulties in installing their antennas because of space constraints or due to objections from the housing complex they live in. He also explained the reason why Radio Amateurs often homebrew their requirements.



**Kuniaki ARAI - JL1STZ** of Tokyo spoke about Amateur Radio in Japan and about his Shack back home. He also spoke about the Active mobile multibrand HF Antenna that he has been using.

VU3CER Dhirendra Singh Kholia (DHIRU) recently got his Amateur Radio License. During the meeting he was presented with the CLUB members BLACK CAP. The meeting concluded with snacks and fellowship.

### **III. The Mid-month Technical Eyeball QSO of the PUNE HAMS and AMATEUR RADIO CLUB - VU2PHQ**

Members of the Pune Hams and Amateur Radio Club VU2PHQ met at their Club Station for a mid month Technical Eyeball QSO on Sunday 20th October 2019.

VU2SFJ shared about the project that he and VU3CER Dhiru are undertaking of constructing the direct conversion receiver (DCR) designed by VU2ASH Ashok Joshi but by using torroids this time as filters in place of IF Transformers.

SWL Prasanna displayed the 12 v/10w power supply that he had built.

The topic for discussion chosen for the day was ***“types of antennas - and which antenna would be the best suited for me my QTH”***.

The discussion was lead by VU2ASH Ashok Joshi. SWL Prasanna Waichar, VU3YWK Ajay Kashikar and VU2SFJ added their inputs to the discussion.

The discussion began with the question, **“ How does electric charge that comes from a transmitter get detached from the antenna to form a radio waves? ”**

This lead to a discussion about electromagnetic fields, its propagating and radiating through space, and electromagnetic energy, about photons and how they traveling in a wave-like pattern at the speed of light, about radio waves that have low energies photons, microwave photons that have a little more energy than radio waves and about infrared photons.

The discussion went on to elaborate how electric current transmitted by a transmitter to the antenna's terminals radiates electromagnetic waves (radio waves), forward movement of these waves and how it works the other way round while receiving.





Resonant frequency of an antenna and the resonant length that provides the time delay and space delay that helps in the radio wave formation, about how antennas work at resonant frequencies and about tuning of an antenna.

Ashok then went on to discuss about what would happen if an antenna tuned to a particular resonant frequency say 7.100mhz is used as a wide band antenna and is loading at other frequencies besides the resonant frequency say 3.5mhz, 14.1 Mhz and 21mhz.

The discussion then went onto antennas and the most widely used half-wave dipole, about the variants of the dipole antenna including the folded dipole, the Yagi antenna, the vertical antennas, the loop antennas, characteristics of these antennas & their limitation.

About performance of antenna in the context of distance of antenna from the ground and what will determine which Antennas will suit ones location were discussed.

While concluding the discussion Ashok Joshi elaborated on the construction of traps for a multiband dipole antenna and on how to construct them using a RG58 coax cable.

#### **IV. PUNE HAMS EYEBALL QSO 3rd November 2019**

The monthly Pune Hams eyeball QSO was held on Sunday 3rd November 2019 at the PUNE HAMS AND AMATEUR RADIO CLUB STATION- VU2PHQ in Pune Cantonment.

VU2ASH - Ashok Joshi initiated the discussion on HF Field Day readiness and the making of GoTo kit that would include regular and low power transceivers, power supply units, portable antennas and standby material for a quick to install antennas, adaptors, spares, rope, antenna tuners and SWR meters and a well-equipped handy tool box.



During the course of the discussion Ashok displayed the kit that he has made that can easily be carried even while going on a short holiday.

VU3YWK - Ajay Kashikar moderated the discussion " What's brewing?" where members shared about projects they have recently completed or about the projects

that are either on their work bench as work in progress or projects that they plan to start and about their experiences and learnings.

VU2MMJ OM Mohan and VU2PST OM Paresh shared the status about their antenna projects while SWL Manan shared his experience in receiving VHF frequencies on plateau against receiving the VHF signals on Western Ghat area using SDR and a J Pole antenna. VU2TFG Anil spoke at length about him setting up of the Rig Pi and wip pi- L network tuner. VU2TFF OM Vishwas shared the status of installation of his Hex beam antenna.

SWL OM Chandrakant Deshmukh shared the setup he has deployed for his SWL activities. Prof Aniket Garud shared the status of VHF/UHF antenna and there was a good discussion regarding various antenna designs for specific application. VU2SFJ OM Srinivas shared status on his projects viz. Antenna Tuner and Freq. counter. The session ended with VU2ASH OM Ashok displayed his homebrewed CW Reader and Keyer that has a built in touch paddle , speed adjustable keyer with provision to connect to ubitx or any rig to give switching the rig for full breaking CW operation.

It has a built in Morse reader with LCD display to show decoded text up to 30 wpm CW speed when connected to Rx Headphone socket.

It also has a provision to display sent Morse text when using as CW keyer.

The ideas and alternatives that emerged from the participants made this section very interesting.

The meeting ended with fellowship and snacks.

## **V. ASOC Exams held at Maharishi Parshuram College of Engineering, Ratnagiri - Maharashtra**

With active help, guidance and support from the PUNE HAMS AND AMATEUR RADIO CLUB - VU2PHQ, The Maharshi Parshuram College Of Engineering (MPCOE) Ratnagiri, Maharashtra successfully conducted the ASOC Exam at their college at Ratnagiri on 12th October 2019. 29 candidates including three staff members of the college appeared for the Exam.



## VI. Mid Month PHARC Tech Eyeball QSO.

The Nov 2019 Mid Month PHARC Tech Eyeball QSO was on Sunday 17th November 2019 at the Pune Hams and Amateur Radio Club (PHARC) - VU2PHQ in Pune Cantt.

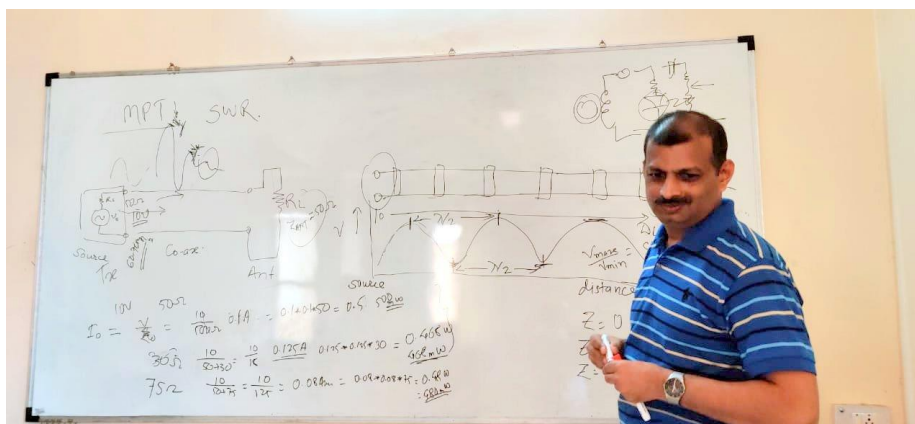
Last month the discussion was on how electric charge from a transmitter get detached at the antenna to form a radio waves and about the forward movement of these waves through various mediums in space and how it works the other way round while receiving.

This month we touched upon and looked at in depth:

1. in line resistance and how it is different from impedance,
2. The Theory of Maximum Power Transfer
3. Standing Waves and Standing Wave pattern and measuring Standing Wave Ratio.

Thanks to VU3OOI - Prasanna Waichal who with graphics and examples dwelt on the subject in a very simple manner.

Thanks to VU2ASH Ashok Joshi who from time to time adding his practical input on the subject.



While dealing with Maximum Power Transfer Theory, Prasanna explained how a transmission system has optimum performance when the transmission line impedance and the antenna impedance match the impedance of the RF source i.e., the TRANSMITTER.

He then went on to explain about Standing Waves, Standing Wave pattern on a given transmission line, measuring the SWR using a simple RF voltmeter like a diode detector or RF field strength meter and how to convert the graphic plotted representation of the actual standing waves of the highest voltage denoted as Maxim ( $V_{max}$ ) and the lowest voltage point denoted as Minima ( $V_{min}$ ) into a simple ratio denoting SWR (Standing Wave Ratio)

It was really a very educating & enlightening session.

Prior to the session VU3YWK - Ajay Kashikar displayed his Raspberry Pi devices that he has assembled that he intends to use for logging during field activities.

VU2SFJ - Shrinivas N. displayed the audio interface for digital communication that he had constructed after incorporating certain modifications to the audio interface board that VU2ASH- ASHOK JOSHI had designed and as a project members of the club had assembled.

At this meeting VU3YWK Ajay Kashikar facilitated VU2SFJ - Srinivas N. for introducing him and many of the members and past members of the club into the various facets of the hobby and VU2UPQ- Udaya Patil for similarly encouraging him and many of the members and past members of the club to come on air and to regularly be on air. Pune being the seat of education and Oxford of the East, Ajay presented both VU2SFJ & VU2UPQ with the traditional '**Puneri Pagdi**' (turban) a symbol of education - and a shawl and presented to each of them the ARRL Elmer's certificate.



VU3OOI Prasanna who had got his license just a few days back was presented the prestigious black cap of the PUNE HAMS AND AMATEUR RADIO CLUB. The cap carries the club's logo.

### **Vilas Rabde – VU2VPR reports:**

Bharat Scouts & Guides HQ Pune witnessed Ham Radio - under the leadership of OM Mangesh VU3OUM, in action along with presentation on Jamboree On The Air by V.K. Arya (VU2VAB) from Delhi.

VU2YZ OM Sampat and VU3UEL OM Dilip shared their HAM experiences with the scouts.

Pune Hams with Bharat Scouts demonstrated Radio Scouting on Saturday 19th October 2019, More than 60 scouts from different schools around Pune participated in a truly interactive session from 9 AM to 1:30 PM. The Scouts enjoyed all the sessions including hands-on session.





The following Pune Hams participated in the JOTA JOTI

1. VU2VAB V.K. Arya (Delhi)
2. VU2YZ M.R.SAMPATH KUMARAN (Bengaluru)
3. VU3UEL Dilip Bapat (Alibag)
4. VU3YYO Arvind
5. VU3OUM Mangesh
6. SWL Mandar Kulkarni
7. SWL Ranjit Pendse
8. SWL Richal Abhang
9. SWL Ninad Abhang
10. SWL Prasad Kumavat
11. SWL Gopi Shetti
12. SWL Narendra Saralkar

Pune Hams are thankful to Bharat Scouts and Guides team working under Mr Pradeep Takawale for their active participation and support making event successful.

II. Pune Hams celebrated Diwali in monthly eyeball meet on 03 November with attendance of 20 Hams and SWLs. The meeting started with Diwali snacks and Tea. Every one brought home made delicious Diwali snacks and sweets for fellowship.

The certificates were distributed to the participants by **Mr SG Chavan , Executive Director AILSG** Pune to the participants of ***One day outbound training*** on "**Role of Amateur Radio in Disaster Management**" It was organised by "Pune Hams" in association with All India Institute of Local Self Government, Pune - a local NGO.

Pune Hams SWL member and **DEMA president Nr Shirish Deshmukh** gave excellent presentation on I G M D P , Integrated Guided Missiles Development Program and with special reference to AGNI missile. During his talk, he covered

Missile and its sub systems , The Missile launchers, The Firing Range, launch pad, and shown some slides and actual missile firing videos. Also briefly covered 84mm RL weapon system and Video of its firing.



Mr Shirish Deshmukh, is a Graduate in Electronics and Telecommunications - He is the Director of Padmashree Electronics, a Pune based MSME, where they have developed many import substitute electronic systems. For last 25 years he is mainly involved in developing electronics for Defense. He had designed a PC (intel 286 ) based electronic Engine testing system ( 1992) an attachment to Eddy current Dynamo meters, A PC ( Intel 386) based solution for Digital Resolution and Direction Finder( DRDF) For Indian Air Force, Electronic Control Unit ( E C U ) for Safety.

***All these systems were designed to meet harsh operating environment, complying To JSS 55555 standards and also EMI/ EMC standards.***

The efforts he had put in during the development stage of AGNI were well appreciated by all those associated with the missile program. He is privileged to have worked with our Respected, late President, Dr A P J Abdul Kalam, during this development of AGNI and whom he often used to meet .

In 1980 he had passed the ASOC exam but could not continue with it due to his career. Now again attending classes and appear and clear next month. He is the President of Defence Equipment Manufacturer's Association, ( DEMA ) a Pune Based association.



**III. Pune Hams October monthly meet** for New comers and SWL's on (Sun 6th Oct 2019) at Milind Vaidya's **Farm house in Malen village near Kolvan**; 45 Kms from Pune had overwhelming response with **record attendance of 24 Hams and SWLs.**;

***The theme of the day long meet was Disaster communications.***

All the Hams & SWLs arrived at the site around 10:30AM. After breakfast and registration of all the participants, Ice breaking and self introduction session changed the atmosphere in friendly relations.

**Ham and ex Radio officer Milind Vaidya** of All India Institute of local help Development ; gave presentation on Disasters and effective use of various modes of communication which gave direction to a day long workshop.

\*Aniruddha Bapu group\* team Praveen VU2PDL and Shailesh VU3 ULV gave excellent presentation on How recent Sangli Kolhapur Flood \*Radio communication through Ham Radio\* was handled by trained team. The Group have 1300 trained Ham Radio operators all over Maharashtra. The presentation was very motivating.

VU3OPY OM Atul shared information on how to handle Battery management during emergency communication. He demonstrated his own designed Solar system and it's features with some quick calculations.

The young Hams team installed \*G5RV Multiband HF Antena\* under the guidance of Milind VU2MSB. Milind demonstrated all the antenna parameters using MFJ Antenna Analyser.

Mr VK Arya VU2VAB explained how to handle disaster communication. He explained On site problems and essential preparedness. The disaster communication "Grab kit" produced by ARSI was demonstrated to the gathering as a very good example of thoughtfully created kit for use in emergencies.

\*Mangesh VU3OUM\* talked about Pune's VHF Repeater VU2ETD and its 24 x 7 service with echo link connectivity and its Remote Control operation.

The post lunch session was demos and hands on \*Mangesh VU3OUM gave demo on Icom IC 7300 - FT8 and Winlink\* E mail without Internet Steve(K9AN) and Joe(K1JT) have developed a potential new mode for WSJT-X. They are calling the mode "FT8" (Franke-Taylor design, 8-FSK modulation)

*FT8 is designed for situations like multi-hop Es where signals may be weak and fading, openings may be short, and you want fast completion of reliable, conformable QSOs.*

Comparison with slow modes JT9, JT65, QRA64:\* FT8 is a few dB less sensitive but allows completion of QSOs four times faster.



<http://physics.princeton.edu/pulsar/k1jt/ft8.png>

The winlink is designed for E Mail operation without Internet. It allows mail exchange over HF bands

<http://yo3hiv.blogspot.com/2016/06/setting-up-ic-7300-and-winlink-winmor.html?m=1>

He also talked about the geo-stationary \*Es'hail 2, a Qatari satellite\* and it's Ham Radio transponder for effective utilization in emergency communication.

Watch for more details on <https://youtu.be/NgsnyETnjAs>

The group felt the ARSI should appeal to ISRO for a Transponder for Indian Hams in INSAT.

Vilas VU2VPR demonstrated Super capacitor based SMPS with 7.5 Ah battery for 100W HF Transceiver.

**IV. Pune Hams celebrated 161st birth anniversary of Sir JC Bose, Father of Radio yesterday 30th November 2019.** The venue was be MES societies \*Sou Vimlabai Garware High school\* on Prabhat Road Pune 411004.

The theme selected this year by Pune Hams was \***Learning Science through experiments**\* Which was inaugurated by Industrialist Mr Vishvas Kale & a booklet in Marathi on Sir JC Bose was published and circulated among students and all present. VU2DSI Datta ji gave introduction to Sir JC Bose and his various research. Mr Ravindra Godbole explained methodology Saturday classes learning Science through experiments. Physics teacher Mrs Meghna Deshpande shared students selection methodology. Principal Mr Avinash Waghmare in his speed blessed the activity. Mr Shende from IETE explained their Pune chapter activity.



**The Activity will be conducted at the school every Saturday for two hours throughout the year.**

30 students were selected from 7th standard of the school. **The entire program was dedicated to Physics teacher Late Shri. PY Joshi sir who started science Hobby club some time in 1962.** His son was present on the occasion.



All 30 students assembled Toy **\*FM transmitter\*** in memory of Sir JC Bose, inventor of Radio. The following Senior Hams supported the FM Tx assembly activity. VU2ARN, VU2MSB, VU3UEL, VU3OUM and swls Ranjeet. Richal, and Ninad



**Japanese Ham JA1STZ OM Aki grace the event with his presence and interacted with students**

**Mr Sudhir Phakatkar, (VU3CGD)** from GMRT Khodad demonstrated Sir JC Bose Microwave experiment replica and explained details of his research through power point presentation.

**Dilip Bapat from Alibag (VU3UEL)** member of Pune Hams, gave introduction to Ham Radio

**SWL Sahil demonstrated the Drone Flying and it's Radio control system**

## **RAJKOT, GUJARAT**

Special Hands on Workshop of Applied Physics was organised at well-known School of Science - RK University, Rajkot (Gujarat) India. It was 5 day event from 2nd Dec to 6th Dec 2019. Prof. Harshal Desai, Dr. Savan Katba (Coordinator), Dr. Ashish Tanna (HOD Physics) & School of Science RK University Rajkot provided this wonderful platform to conduct this memorable Ham Session with Live Demos.

Fifty students of the final year B.Sc Physics from various Colleges across the state had registered for this special program.

On 4th December 2019, **Rajesh Vagadia VU2EXP** (Regional Coordinator of AMSAT-INDIA) conducted detailed presentation on **Ham Radio & it's Application** along with **Live Satellite Demo** amongst the students & faculties.



In beginning I gave a complete overview of Ham radio hobby ranging from CW to Satellites!

My presentation Included operating procedure & protocols, various ham events, different modes including CW, SSB, FM, Digital, SSTV, APRS. Licensing procedure & ASOC exam syllabus was covered. For practical observing collection of radio stuff were displayed incl antennas, accessories, CubeSat model, SDR Dongle, VHF Base, HTs, PSU, Morse Keyer, Paddle, QSL Cards, ARISS Awards etc. And of course my homebrewed IOio Sat Antenna.

**AMSAT** functioning & its motto was explained in detailed. Few amateur satellites were bring into notice made or supported by various AMSAT organisations.

'*ARISS student outreach program*' highlights were also given & played original audio conversation happened between 13 year Student (Sakshi Vagadia) and female Astronaut Sunita William aboard ISS, particular ARISS event was carried out on 14th Nov 2012 at Science City Ahmedabad Gujarat by we few hams. Below is the link to enjoy-conversation:

My <https://tinyurl.com/sakshi-talks-sunita>

Students were surprised to see the scientific capabilities of ham radio reaches up to ISS Astronauts & even further to moon with EME experiments!

Lots of queries were raised on different topics throughout the session, and students as well as faculties were satisfied with the given answers. I always encourage students to raise query at any point of time and get immediate reply :-)

Thereafter Students also enjoyed practical Demos as below:

- Students find it funny to learn **Sound** act as a language during **Morse code** demo with my keyer & paddle.

- VHF **Voice demo** was given by making 3 groups and students introduce each other with Radio, simple HT created more excitement amongst students who used to carry expensive iPhones, hi..

For **APRS Demo** a prior information were shared to University administration & students to track my QTH to Venue journey on <https://aprs.fi> with Callsign (SSID) VU2EXP-10. To my own surprise, the group of Faculties stepped out to welcome me exactly on arrival of my car at Campus! Infact everybody were live tracking my journey on APRS!

- Star attraction was for **Live Satellite Demo** amongst group of students. Tiny cubsat **AO91** was preferred for demo considering elevation of 44° & AOS Time 1247 (IST). Demo was previously announced to get support of Ham community. All students, faculties and admins get assembled 15 minutes prior to AOS at terrace of the building. There were no obstacles or tall buildings in any side.

I made students familiar with important Satellite terms such as AOS, TCA, LOS, Uplink Freq, Downlink Freq, Doppler shift, Tracking with apps etc. I used **IOio dual band antenna** with two separate HTs. Necessary frequency & tx ctcss tone was set & tested before pass. For Tx Speaker Mic was used for convenience, and for Rx small PA was connected to HT so whole group can listen to our possible two way QSO. I was prepared aiming IOio antenna at 180° (South), on AOS time at 1247 (IST) I gave few Sat calls... **De VU2EXP on AO91 Satellite...** repeat... soon heard a station replying me!!! **Cheers!!!**

Initially his signal was fading, but finally we establish 1st Satellite QSO, it was **VU3PEN** from Hyderabad (MK97em) 955 Kms from us. Students can't stop their excitement and started cheering up!!!



Soon we worked 2nd station with **VU3BXS** from Haryana (MM80pd) 1083 Kms away.



To our surprise 3rd contact was made with DX station **A65BP from UAE** (LL75qj) 1602 Kms away.

4th contact was with **VU2DGR** from Kerala (MJ89gg) 1576 Kms away from us.

Now we were near to LOS at NNW direction and at low elevation we heard 5th station, mostly it was **R9LR** (MO27qf) 3907 Kms away, I gave repeated call but two way contact was not established. Students were very excited to learn such things & just thrilled to witness live Sat Demo. Many new queries were answered on SatCom and we had memorable group photo in terrace too.

My session was extended to 4 hours for presentation & various demos. This was my first Live Satellite Demo (AO91) amongst group of students & faculties who all thoroughly enjoyed whole session.

Best 73,

**Rajesh Vagadia-VU2EXP**

Rajkot-Gujarat

Regional-Coordinator-West India Zone

**AMSAT India**

vu2exp@gmail.com

M: 9898283916

## GWALIOR, Madhya Pradesh

### Role of HAM Radio during natural disasters

*A program was organized in LNIP College, Gwalior where Jayu VU2JAU handled a session on role of HAM Radio during disaster, on 10 June 2019 from 2.00 pm to 5.00 pm in LNIP where 36 Professors from AMITY University, Gwalior attended the program. Everyone liked it. Many have shown their interest to appear in the HAM Radio license examination and asked questions about it. Also gave them a small demo on Handies and the use of proper operating procedure. It was very nice gathering of learned people from the great University.*

The Second Session of Role of Amateur Radio during Emergency and Disaster in LNIP, Gwalior was conducted on Friday 14/06/2019 where about 30 plus professors of AMITY University Gwalior and outstation attended the program.





It was explained to them what HAM Radio operators can do in most difficult situation during disasters including handling the different types of messages and agencies at the same moment. It was also explained to them that what are the other activities of Amateurs including satellite communication and the different types of satellites like weather, communications and many more.

The use of ISS for HAMs was also explained. A practice session of speaking on handy was organized, to pass on the messages in minimum time. A basic knowledge of Morse code was also given to them showing the importance of Morse code in communication. All of them too very keen interest and have shown their interest to join the HAM Radio fraternity.

### **Teaching Methodology & Communication skill during Emergency**

On 26 November 2019, Jayu VU2JAU gave two promotional lectures from in LNIP Gwalior. One lecture was Disaster Communication and its practical use during emergencies and Research & Developments.



Another was on Effective teaching Methodology. Both the lectures were attended by 40 Professors from Maharashtra, U.P., Bengal and many other states. All were happy to prove their reactions on the sessions. Happy to provide some interactive and knowledgeable information to all the learned professors.

73, Jayu VU2JAU

*In the October 2019 issue of Ham Radio News, news of the annual Field Day of the South India Amateur Radio Society was published; since it was sent by Aravind VU2ABS, credit was given to him. However, the editor received a mail from Raghav VU3VWR stating that the piece was written by him; this was confirmed by Aravind . Therefore, the credit goes to Raghav VU3ABR.*

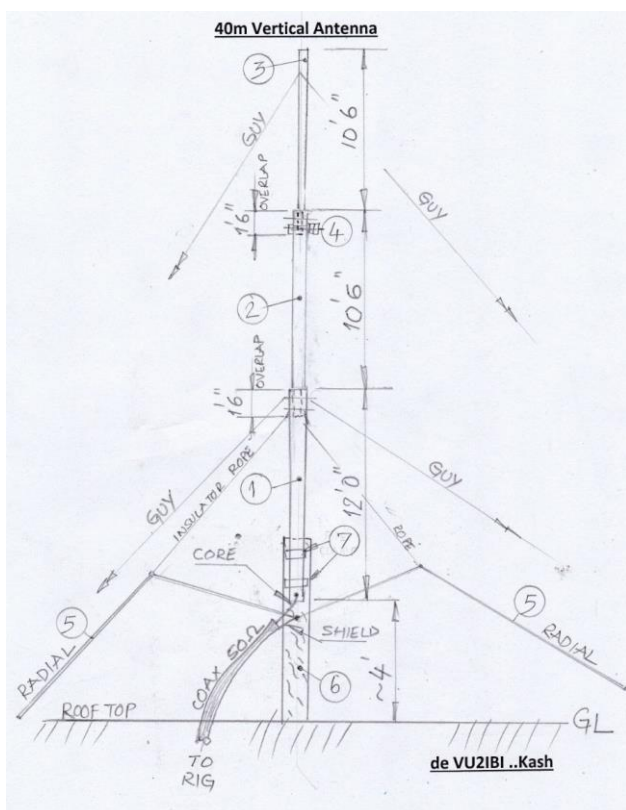
## A 40M Vertical - by Kash VU2IBI

I had the opportunity to homebrew a 40m vertical antenna. I am sharing my construction details.

The total height of the antenna is 33 feet and it has only two radials. The bill of material is given below:-

1. Aluminium Pipe Grade 7608 Dia 32mm, wall 3mm thick - 1 No.
2. Aluminium Pipe Grade 7608 Dia 25mm, wall 3mm thick - 1 No.
3. Aluminium Pipe Grade 7608 Dia 19mm, wall 3mm thick - 1 No.
4. Stainless bolts and nuts, Dia 6mm - 5 nos.
5. PVC wire - 24awg XO.2mm - 33 feet. - 2 nos.
6. Wooden pole or any insulator 6 feet tall. - 1 no.
7. Pipe clamps - 2 nos.

The above elements are assembled as shown in the sketch below.



Tuning for SWR is done by finding a suitable position of the elevated radials to minimise the SWR.

To ensure wind stability, ensure the vertical is guyed at two places as shown in the sketch.

Notes:-

1. All guys are of non-conducting material.
2. Aluminium tubing used 1~rigid as it has a wall thickness of 3mm.
3. The radials are elevated to give a better performance.
4. Number of radials can be increased, but we can start operating with just two.

73 ...De VU21BI ... Kash

## Measuring of Power Level, Return Loss and SWR using Mobile Radio Directional Couplers at GHz Frequencies

By Reinhardt Weber DC5ZM & AI6PK

More and more OM's operate on satellite Oscar-100. But very few of them own equipment measurements at 2.4 GHz. I have developed a very low cost device to solve this problem.

Due to technical modifications by mobile providers, the Chinese sellers offer commercial directional couplers for peanuts – on eBay.



Fig 1 Chinese Directional Couplers

### Specifications:

$f = 800\text{MHz to } 2,5\text{ GHz}$ , Coupling 5 to 40dB,  $P_{\text{max}} = 200\text{W}$ , Insert Loss  $< 0,05\text{ dB}$ , Isolation  $\geq 20\text{ dB}$ .

For ham radio applications, these specifications are sufficient. To measure power level, return loss and SWR, an electronic measuring device is needed. Such a device is presented now. It should help you to optimize your OSCAR-100 uplink on 2.4 GHz.

The tool is based on a Arduino Uno with output on LCD 1602 Keypad Display. To measure power of incident and reflected wave, two China-Module AD8318s are used. The modules contain a logarithmic amplifier AD8318 chip made by Analog Devices. Frequency range extends from 1 MHz to 8 GHz based on 50 ohm systems. Up to 6 GHz, the measuring error is  $\pm 1\text{ dB}$  within a dynamic range of 55 dBm. The module uses an on board 5V regulator, so the Vcc must be connected on Arduino pin Vin. Modules without voltage regulator must be connected to Arduino pin +5V.

For completion of the device, no PCB is needed. Fig 2 shows all components mounted on a small acrylic baseplate using spacer bolts for piggy-back assembly.

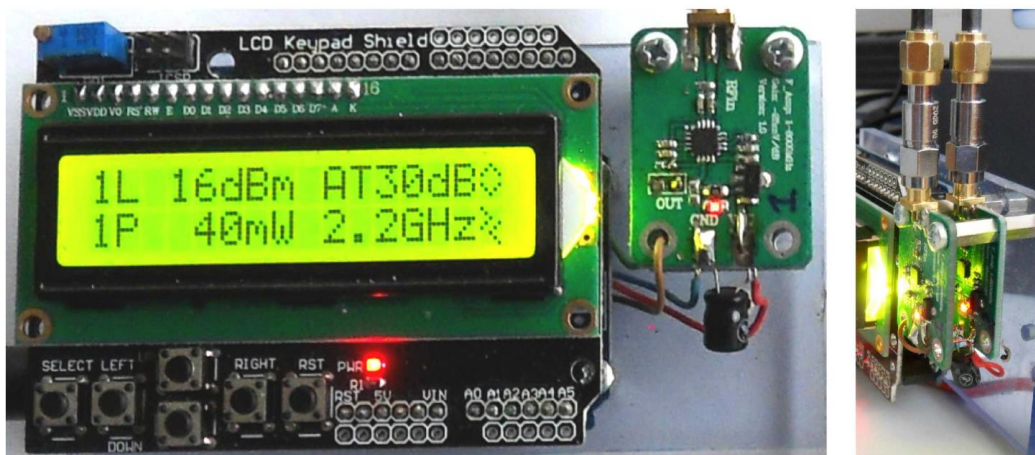


Fig.2 Arduino Uno connected to two AD8318 Modules

The parameters of directional couplers are frequency dependent. Unfortunately no calibration curves are provided by the manufacturer. That's why you should use two identical units for measuring. For calculating the return loss and SWR, just the relation of incident and reflected power is important. Only for determining power levels, absolute values are needed. How to do this is explained below.

The maximum input level value of AD8318 module is 12 dBm. Using 20 dB couplers, the highest input level is 100 mW, and with 30 dB couplers, the input level is 1W. For higher power levels, use additional attenuators on the input SMA socket of the modules. Input levels of around -30dBm yield the



lowest measuring errors. (For center-of-frequency curves, see Fig.4). The Fig.3 shows a typical setup for antenna testing.

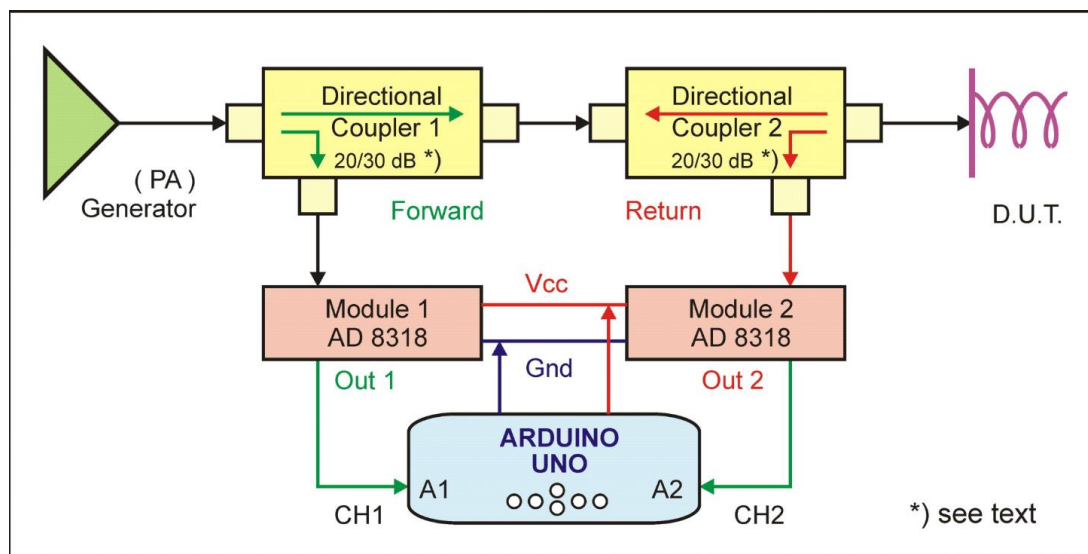


Fig.3 Setup for Antenna Measuring

Switching on the device display Menu 1. The Left/Right keys select one of six frequency calibration curves according to the data sheet of AD8318. The frequency calibration set is always valid for both channels.

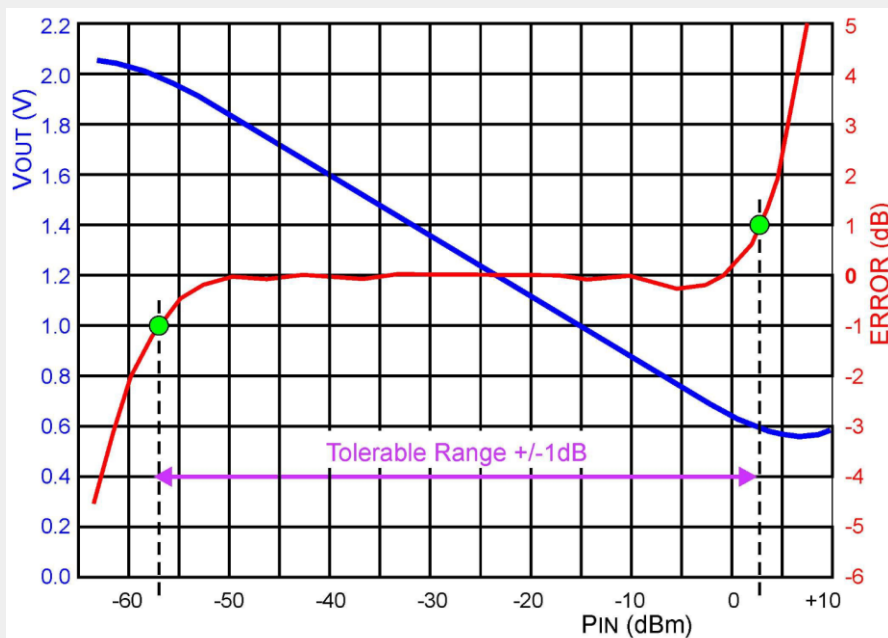


Fig.4 Typical Calibration Curve of AD8318

Adjust the sum of the coupling value attenuators using UP/DOWN keys for Channel CH1. Press and hold down key to increment or decrement values in steps of 1 dB ranging from 0 dB up to 60 dB. 1L shows the level of CH1 in dBm, 1P is the power in linear units as shown in Fig.5 below.



Fig.5 Menu-1

Pushing SELECT key and holding it for a second chooses Menu-2 for setup of Channel 2. Operation is the same as for Channel 1. Settings for frequency and attenuator values are stored in EEPROM and recalled by powering up.

Pushing SELECT key for a second once again displays Menu-3 (Fig.6)



Fig.6 Menue-3

On the left side are shown the level values of Channel 1F (forward) and Channel 2R (reflected). Based on these values, the controller programme calculates the return loss (RL) and stading wave ratio (SWR). The dynamic value of AD8318 ranges from -55 dBm to 0 dBm. If the level error from 1 MHz to 5.8 GHz exceeds +/- 1 dBm the corresponding channel starts blinking. At 8 GHz operation, +/- 2 dBm tolerance is accepted. An input level of 12 dBm should not be exceeded.

If the power of the reflected wave (2R) is higher than the power of the incident wave (1F), an error message is issued. (Fig.7)



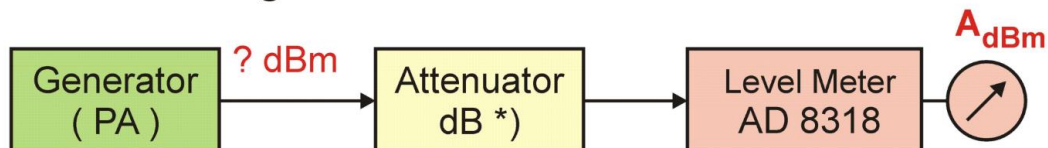
Fig.7 Error Message

Pressing SELECT key for a second leads back to Menu-1.

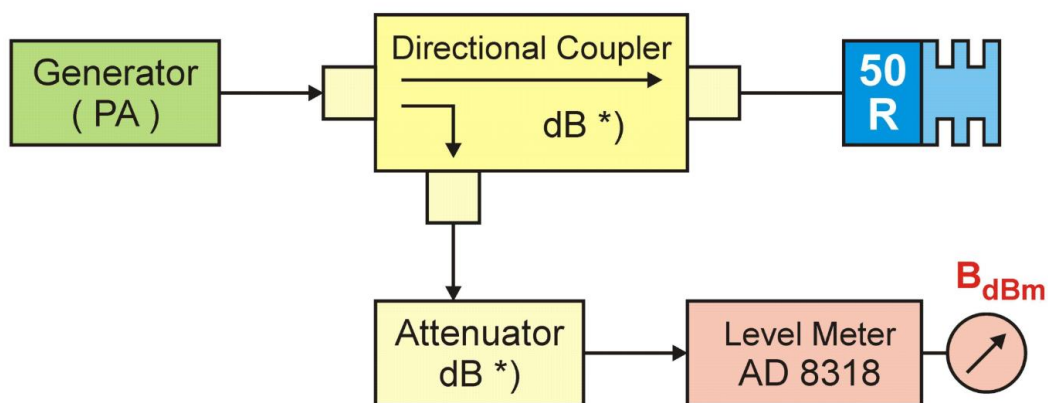
The controller software for Arduino (dBm-Meter-AD8318\_dyak\_V1.ino) may be downloaded from our Club server or requested from the author.

If you use couplers with unknown data or different couplers for incident and reflected wave, coupler characteristics must be determined. Fig.8 shows setup for measuring.

### A: Measuring Generator Level



### B: Measuring Forward Power



### C: Measuring Reflected Power

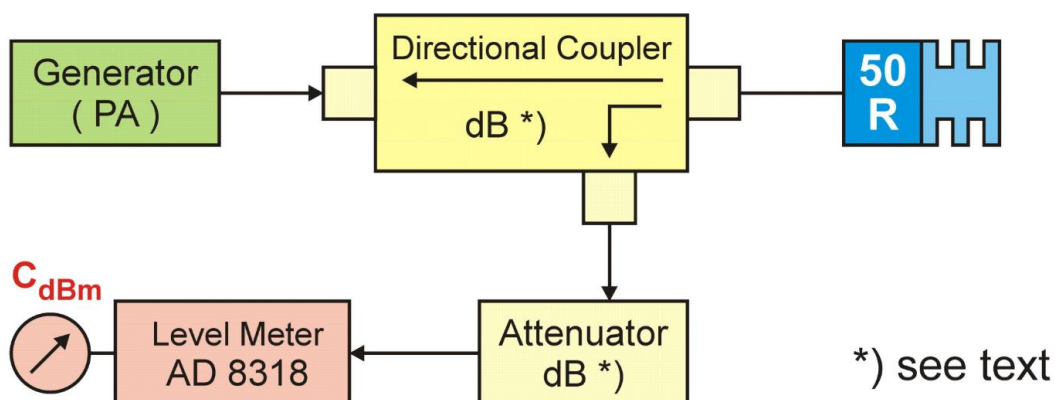


Fig.8 Determining essential Direction Coupler Characteristics

### Measuring A:

Select suitable frequency curve. Choose total attenuation for approximately -30dBm input level on meter and set ATT to this value (CH1)

1L and 1P show generator (PA) power AdBm

### Measuring B:

Choose settings as mentioned in A. Displayed power value applies for incident wave BdBm. The quality of 50 Ohm termination resistor is essential for precise measuring. Some types with SMA or BNC sockets specified for up to 6 GHz without stating of SWR are unusable. The low-cost 50R/5W type with SWR=1.2 is recommended (2).

### Measuring C:

This setup is same as shown in B. Displayed power value applies for reflected wave CdBm.

### Evaluation of Measurement.

The ratio between generator power and incident wave is called 'coupling factor'. Since all values are given in logarithmic units, the dB ratio building corresponds with the subtraction of two values in math.

Coupling factor = AdBm – BdBm

Subtracting the reflected power from the incident power yields the return loss of the coupler.

Return loss = BdBm – CdBm

This value indicates how well the coupler distinguishes the power of incident and reflected waves.

Knowing the return loss (RL) calculating the SWR is just a mathematical operation. The RL should be as high as possible because it determines the lowest measurable SWR. Fig.9 shows how RL and SWR correlate. An RL of 20 dB is good value and enough for ham radio.

If you want to inform yourself in detail about the construction, function, and the significance of characteristic values of directional couplers, just google it. (6)

The **ADF 4351 Eval Board** from China is a low-cost test generator for a frequency range from 35 MHz up to 4.4 GHz. Output level of -4 dBm, -1 dBm, +2 dBm, and +5 dBm may be adjusted. The Module may be controlled by Arduino Uno via SPI-Bus (Fig.10)



Return Loss dB	SWR	Return Loss dB	SWR
1	17.4	11	1.79
2	8.72	12	1.67
3	5.85	13	1.58
4	4.42	14	1.50
5	3.57	15	1.43
6	3.00	16	1.38
7	2.62	17	1.33
8	2.32	18	1.29
9	2.10	19	1.25
10	1.92	20	1.22

Fig.9 Correlation between RL and SWR

The ADF4351 chip from Analog Devices works with a 3.0V to 3.6V power supply. The module uses an on-board 10MHz crystal oscillator for clocking. The module provides an SMA socket to feed external clock signals, for example – GPS disciplined oscillators.



Fig.10 Test Generator module ADF 4351 controlled by Arduino Uno.

Alain Fort - F1CJN – has posted on the internet, a nice article with all infos for construction and wiring including the Arduino controller programme. (7)

Summary:

Using Mobile Radio directional couplers low cost equipment for measuring at 2.4 GHz is acceptable. When judging the performance of the device, you should bear in mind that precision couplers made by renowned manufacturers exceed a purchase price of \$500/-

Have lots of fun homebrewing!

73, Reinhardt DC5ZM ([weber.r1@t-online.de](mailto:weber.r1@t-online.de))

## Tid-bits

\*According to NASA's most recent Orbital Debris Quarterly News, NASA calculates about 8 million kilograms of objects are in earth orbit.

\*The famous long-wave radio station **Europe-1** on 183 kHz closed down on 31<sup>st</sup> December 2019 after 64 glorious years on the air.

\*At 11:09 UTC on Saturday the 28th of December 2019, Ian White, GM3SEK in the south-west of Scotland managed to work D41CV on FT8 on 432 MHz extending the IARU Region-1 tropo record to an amazing 4,562 kms.

\*2019 ended with more number of days without Sunspots than any year since 1913. Space weather reported a total of 271 spotless days in 2019. A space-age record for the number days without sunspots in a year.

\* The theme for the **2020 Dayton Hamvention** will be "*Amateur Radio, The Future.*"



## OFFICE BEARERS

### PRESIDENT

Ramesh Kumar K G VU2LU  
Care of Linux Learning Centre Pvt. Ltd.  
635, 6<sup>th</sup> Main, Hanumanthanagar  
Bengaluru KA 560019  
e-mail: [president@arsi.info](mailto:president@arsi.info)

### VICE PRESIDENT

Saravana G VU2ETS  
364. 6<sup>th</sup> Cross / Kamakshi Hospital Road  
Kuvempunagar, Mysuru KA 570009  
e-mail : [vicepresident@arsi.info](mailto:vicepresident@arsi.info)

### SECRETARY

Govind Girimaji VU2GGM  
36, Sneha Colony  
Chikkallasandra, Bengaluru KA 560061  
e-mail: [secretary@arsi.info](mailto:secretary@arsi.info)

### TREASURER

Krishna Kumar R VU3UNO  
466, 19<sup>th</sup> Main / 36<sup>th</sup> Cross  
4-T Block Jayanagar  
Bengaluru KA 560041  
e-mail: [treasurer@arsi.info](mailto:treasurer@arsi.info)

### EDITOR

Ganesh T S VU2TS  
Watapi, B R Hills  
Karnataka KA 561441  
e-mail: [editor@arsi.info](mailto:editor@arsi.info)

### QSL MANAGER

Ramesh Kumar K G VU2LU  
Care of Linux Learning Centre Pvt. Ltd.  
635, 6<sup>th</sup> Main, Hanumanthanagar  
Bengaluru KA 560019  
e-mail: [qslburo@arsi.info](mailto:qslburo@arsi.info)

### Monitoring Systems Co-Ordinator

Sanil M.Deep VU2SIO  
"Daylight" 23/1862, Kannanchery Road,  
Kozhikode KE 673003

### Contests and Awards Manager

Prakash (Kash) Srinivas VU2IBI  
"Vauhini" 61, 11th Cross Indiranagar,  
Bengaluru, KA 560038

### The address of the Society to which all correspondence is to be mailed:

Ramesh Kumar K G VU2LU  
Care of Linux Learning Centre Pvt. Ltd.  
635, 6<sup>th</sup> Main, Hanumanthanagar  
Bengaluru KA 560019



