































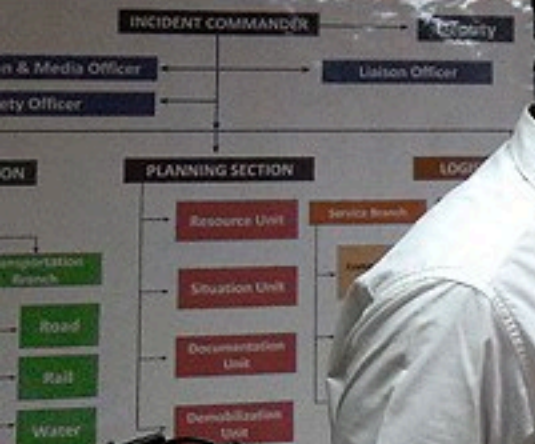
VU2JHM (President, Bangalore Amateurs Radio Club)  
Mother's International School







# Incident Response System Organisation







DR. SANDEEP BARUAH





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by  
EP BARU

Prasar, New  
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# STATE LEVEL HAM RADIO ORIENTATION TRAINING WORKSHOP

*Jointly Organized by*

UTTARAKHAND COUNCIL FOR SCIENCE AND TECHNOLOGY, DEHRADUN

विज्ञान प्रसार, DEPARTMENT OF SCIENCE AND TECHNOLOGY, GOVT. OF UTTARAKHAND







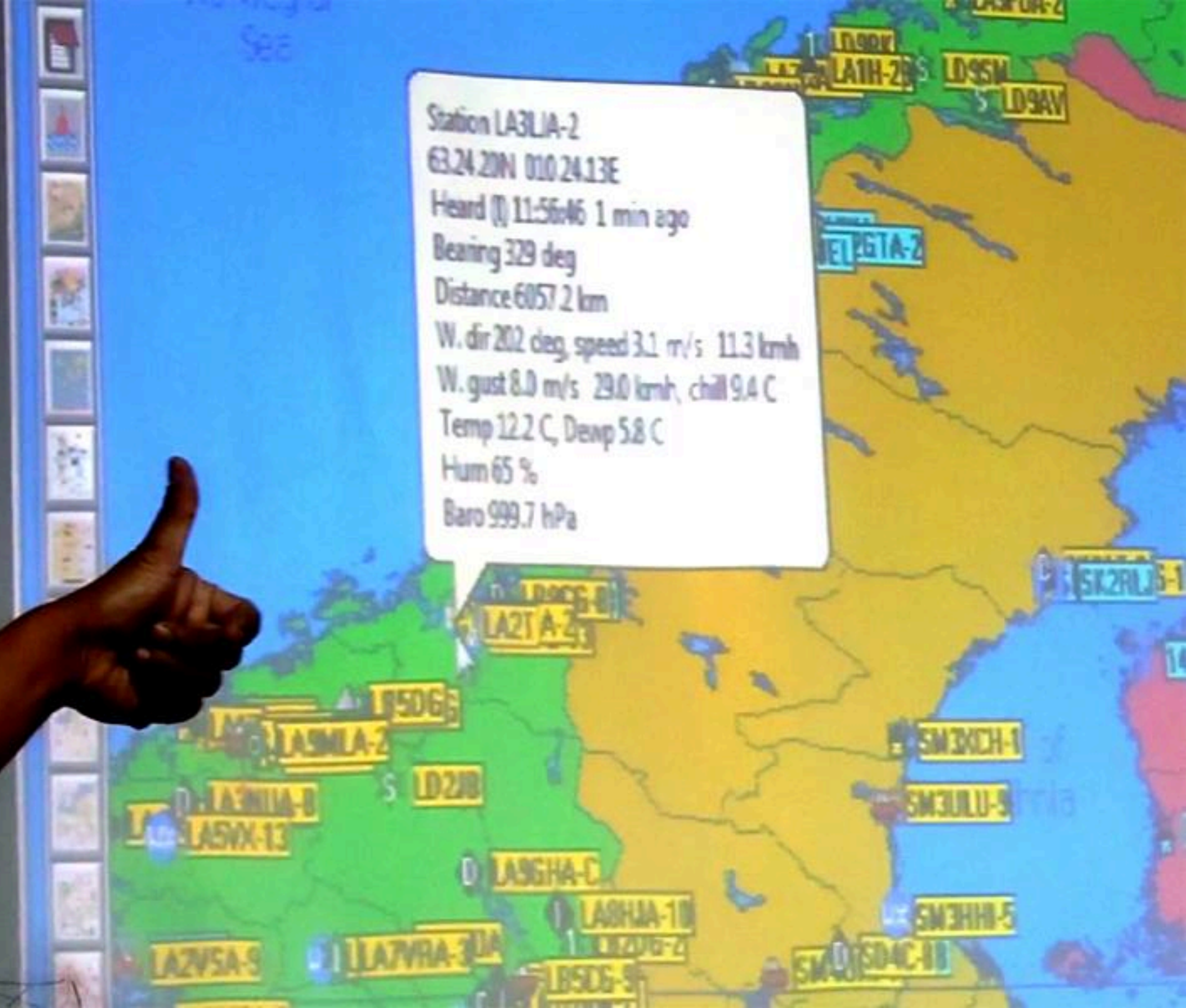








Station LA3LIA-2  
63.24.20N 010.24.13E  
Heard (T) 11:56:46 1 min ago  
Bearing 329 deg  
Distance 6057.2 km  
W. dir 202 deg, speed 3.1 m/s 11.3 kmh  
W. gust 8.0 m/s 29.0 kmh, chill 9.4 C  
Temp 12.2 C, Dewp 5.8 C  
Hum 65 %  
Baro 999.7 hPa





















# Organisational Structure



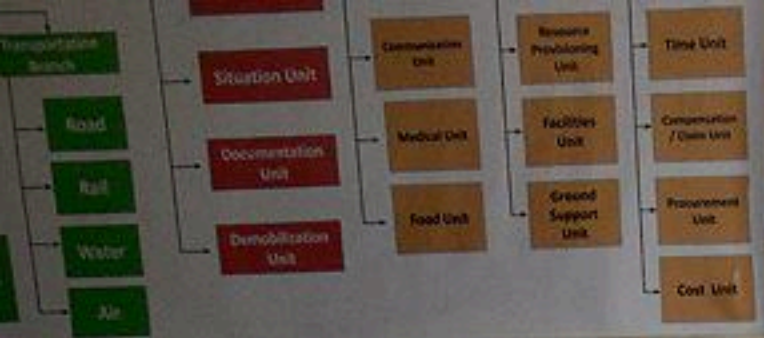












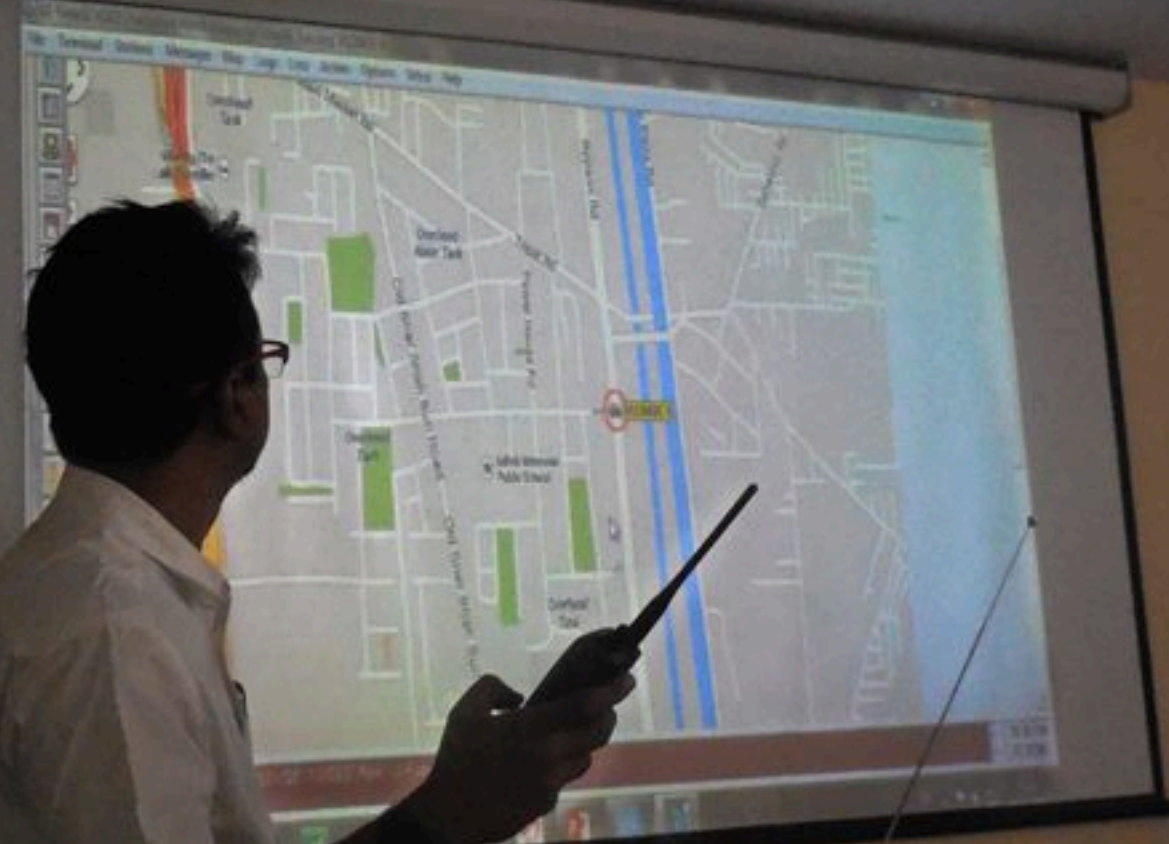
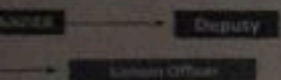
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Personal web <http://www.qsl.net/vu2msy>  
APRS Demopage <http://www.riverdevil.org/APRS>  
E-mail [sandeep@vigyanprasar.gov.in](mailto:sandeep@vigyanprasar.gov.in)





### System Organisation Chart









“health, safety, security or economic well-being of citizens or the effective functioning of governments” stated by [14].

In recent years cheap and energy efficient (low energy) microcomputer devices such as Raspberry Pi (RPi) microcomputer became available which are suitable for education purposes [15, 16, 17, 18] which we used in our project to establish infrastructure for APRS reporting. Together with RPi it is possible to use software (in our case open source software) called software defined radio (SDR) to avoid using expensive hardware components where functions of hardware components are performed by software components [19]. The SDR Forum, in collaboration with the Institute of Electrical and Electronic Engineers (IEEE) P1900.1 group defined SDR as:

*“Radio in which some or all of the physical layer functions are software defined” [19]*

Today there are numerous commercial SDR solutions (hardware and software) with prices in thousands of dollars.

#### *C. Open source SDR, and hardware components for APRS client – server infrastructure*

Together with SDR open source solutions such as *pymultimonaprs* [20] it is possible to use cheap hardware (digital receivers attached to PC) to capture analogue or digital signals and use them to process captured signals on microcomputers such as RPi. In this way it is possible to build cheap SDR solutions which can be used for APRS-IS infrastructure. Core hardware component for this solution is digital receivers which uses RTL2382U [21] chipset which are used as DVB-T tuner for reception digital signals. Functionality of this chipset is to capture

#### *D. Rationale for establishing APRS using iGate on Raspberry Pi*

We wanted to achieve more than one goal in this project because of APRS-IS potential in [24]:

*“Accurate position information about mobile & fixed stations, direction finding for precise beaming. Tracking a mobile station [useful during emergency operation/tactical situation], Non-ham family members of a ham can track him/her and read messages. During emergencies, if the Internet does not fail. Monitoring of real-time weather information originated from ham radio weather stations. Plotting of objects on the map. For example an accident site, crash site, intimation about a traffic jam for route planning, fire site, flood, cyclone, land-slide, road blockage etc. Allows important information to be exchanged without human intervention. This is important during a tactical or emergency situation, when we need to concentrate on other important jobs [for example ‘Search & Rescue’].”*

First goal was to test, research, and to build infrastructure for other projects and for potential disaster situations where radio communication was used [1,2,3] and can be used, and to involve other education institutions in similar projects. This will contribute in future research activities by offering research students real playground for hands on and test activities instead of using simulators. Well educated individuals in alternative communication can play crucial role in any ongoing or post disaster situation. Second goal was to use lessons learned, to build and document study case and to propagate practical and hands-on knowledge for education purposes. Third goal was to build initial infrastructure with two iGate nodes located at two sites in Sarajevo city





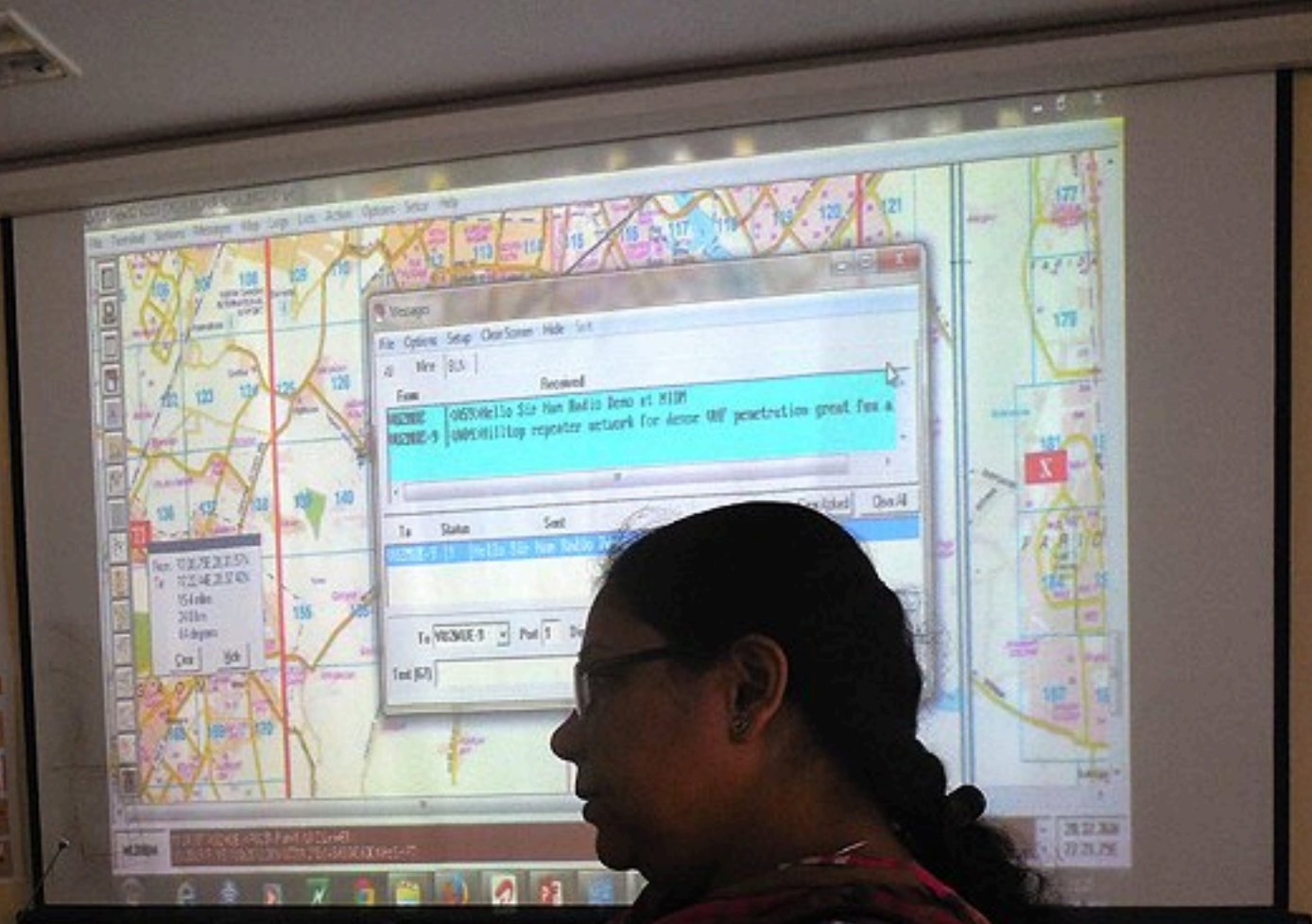












SANDEEP BARUAH



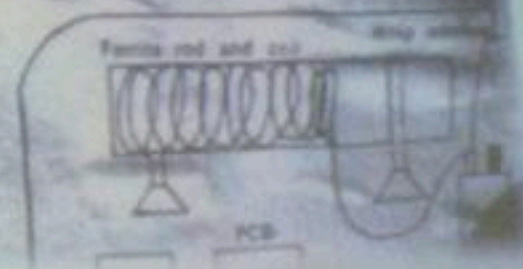
# OFF-TIME ENGAGEMENT SCHEME

## Toy Transmitter

*Off-time engagement scheme*

Many a time you must have seen a policeman communicating with the headquarters or the nearest police station with a wireless transceiver in some riot run or distressed area. Furthermore, you must have also wondered about the working and building up of the transceiver and how quickly it helps in communications in this modern era. Well, the best answer to this project too is to explain the fundamentals of transmitters to

box through the opening. Now fix the Ferrite Rod with the coil a little above on the side of the variable capacitor. Then fix the



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I READ, I FORGET  
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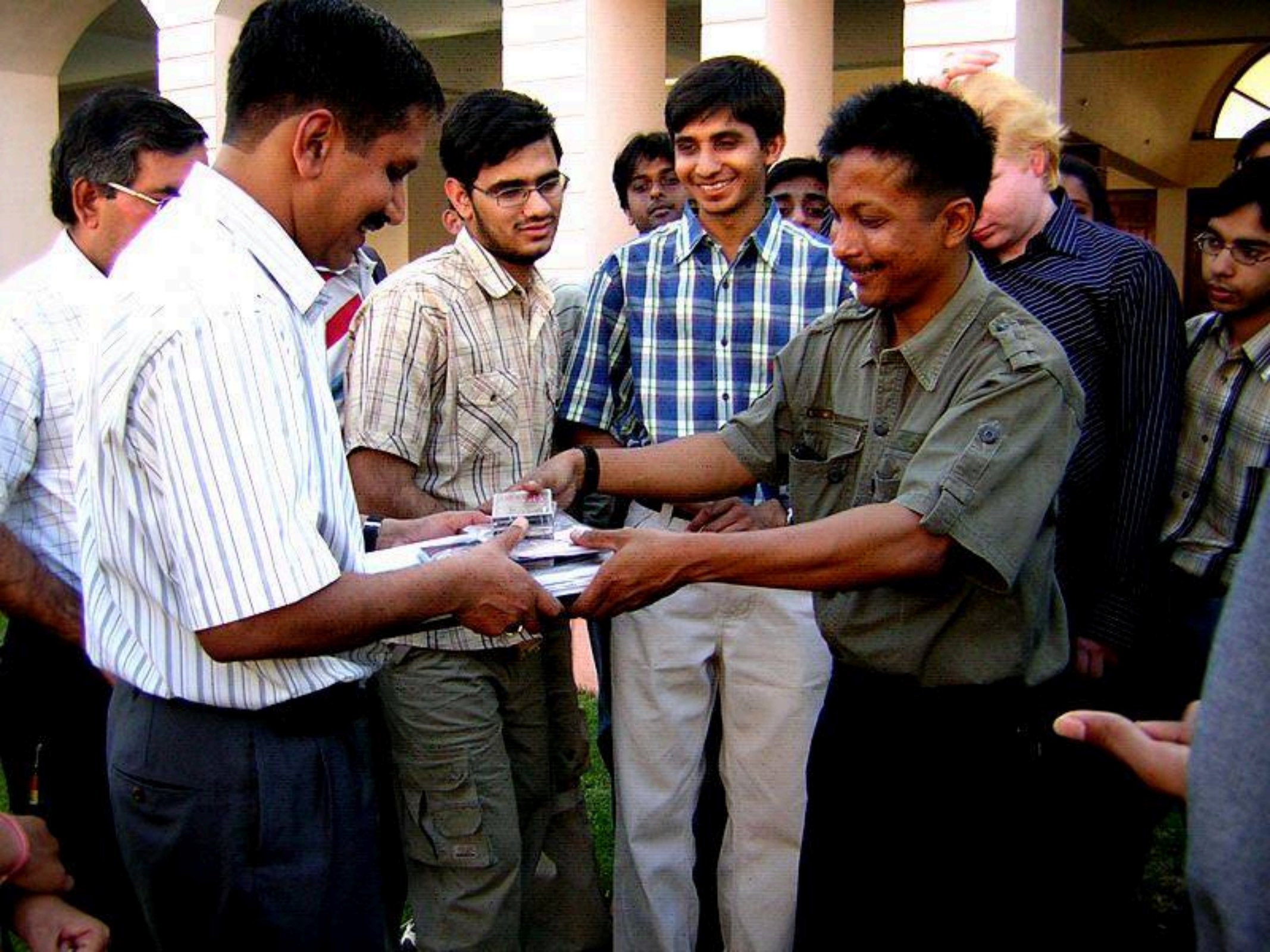




















**STATE LEVEL HAM RADIO ORIENTATION TRAINING WORKSHOP**

*Jointly Organized by:*

UTTARAKHAND STATE COUNCIL FOR SCIENCE & TECHNOLOGY (UCOST), DEHRADUN  
&  
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*In Association with:*

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DOON UNIVERSITY, DEHRADUN

Doon University, Dehradun

Date: 26-27 October, 2012

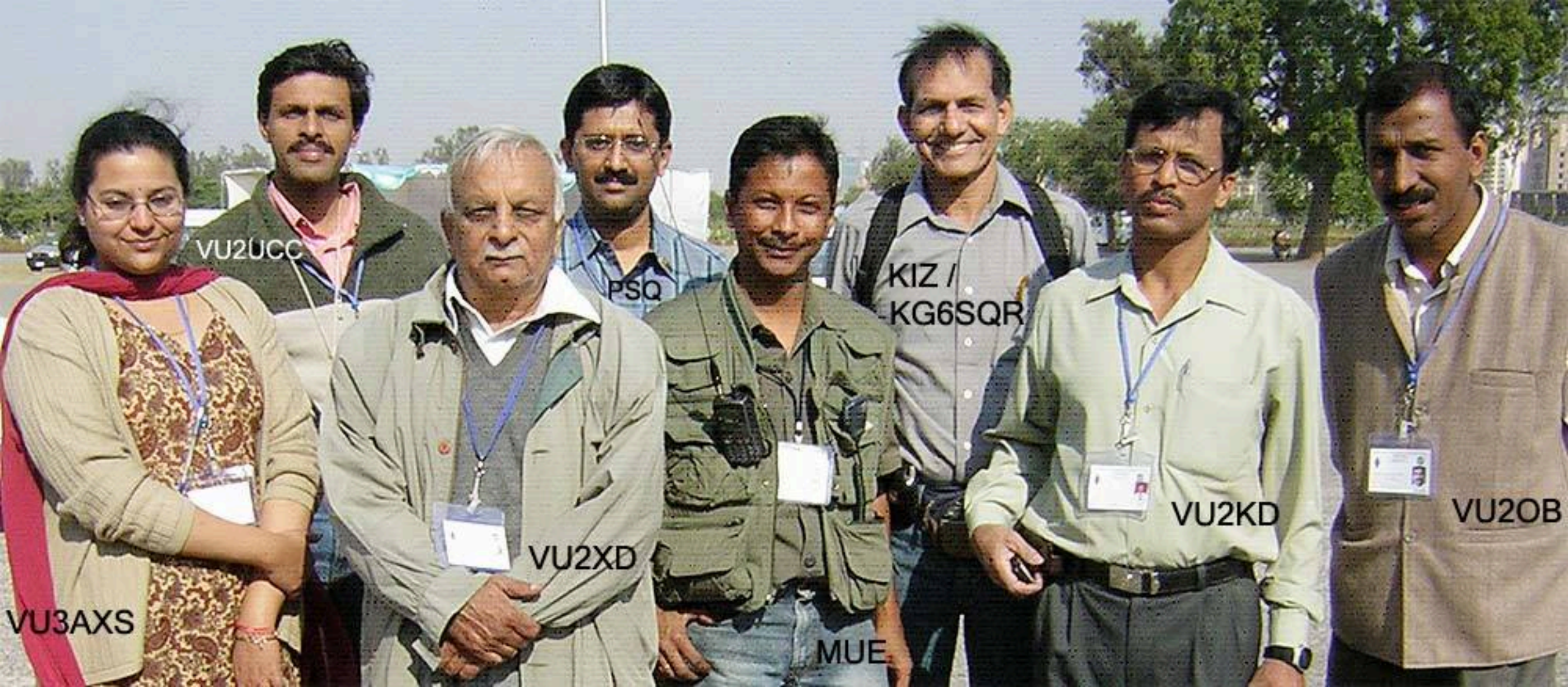




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by sharing with  
frequency

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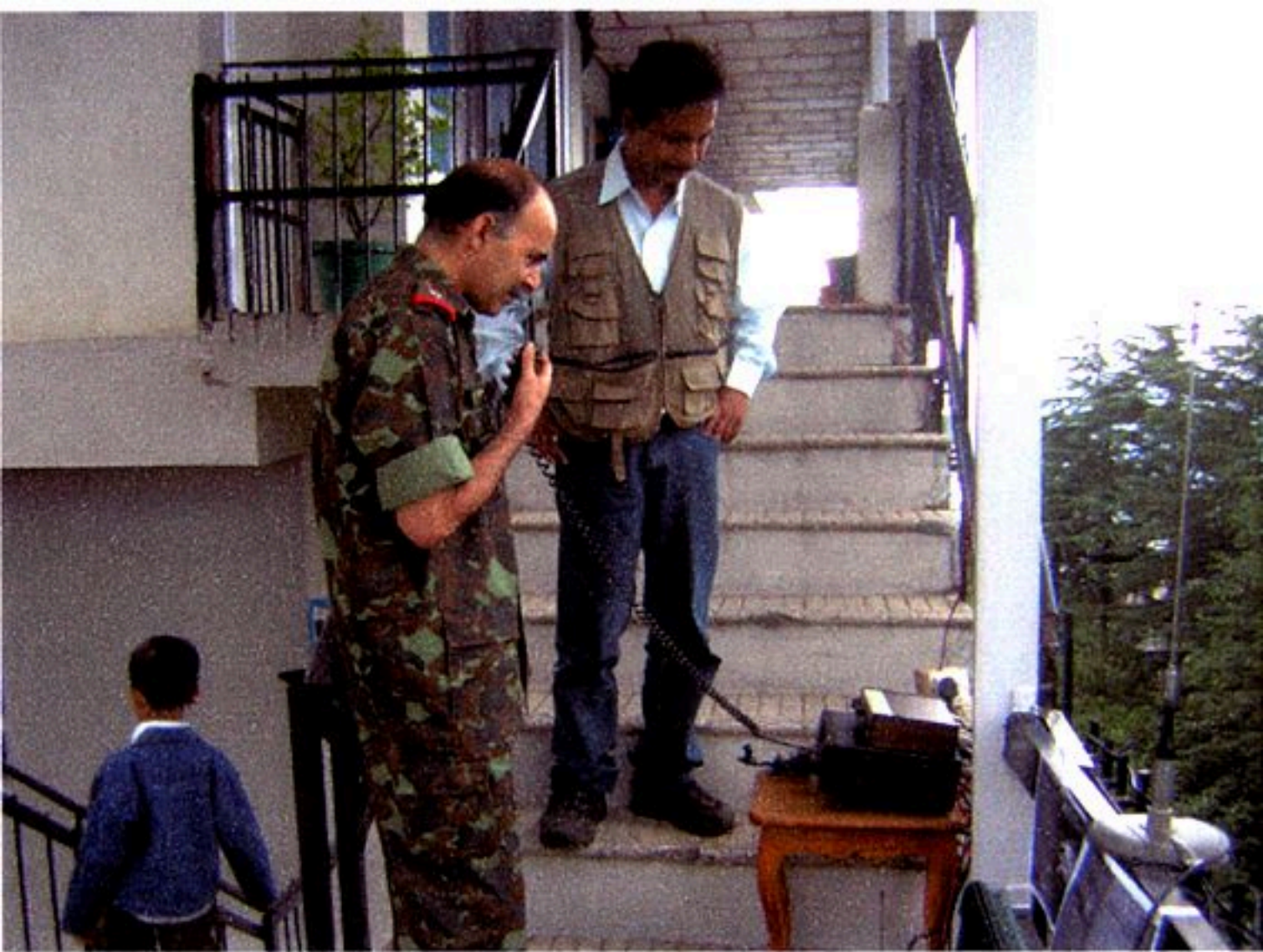
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**Demonstration of Ham Radio to an Army Personnel at Shimla**

































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November 21-29, 2011

























IV

## कैडेट्स को सैटेलाइट सिस्टम बारे दी जानकारी

हिंसार, 7 अक्टूबर (ब्यूरो) : हरियाणा कृषि विश्वविद्यालय में हरियाणा आर.एंड वी. स्क्वाडन एन.सी.सी. में प्रशिक्षण शिविर में कैडेट्स को सूचना सम्पर्क के बारे में जानकारी दी।

इस मौके पर दिल्ली से आए अधिकारी संदीप कुमार ने सैटेलाइट सिस्टम की कारीकियों की जानकारी दी। उन्हें बताया गया कि कैसे जी.पी.एस. सिस्टम प्रणाली कार्य करती है। इस मौके पर कैडेट्स को अभ्यास करवा करके भी दिखाया गया। प्रशिक्षण शिविर के मौके पर लै. कर्नल पी.पी.बोरा, मेजर सुखबीर सिंह, पवन कुमार भी मौजूद थे।



कैडेट्स को सैटेलाइट सिस्टम की जानकारी देते हुए अधिकारी।



















## Training and Response in India

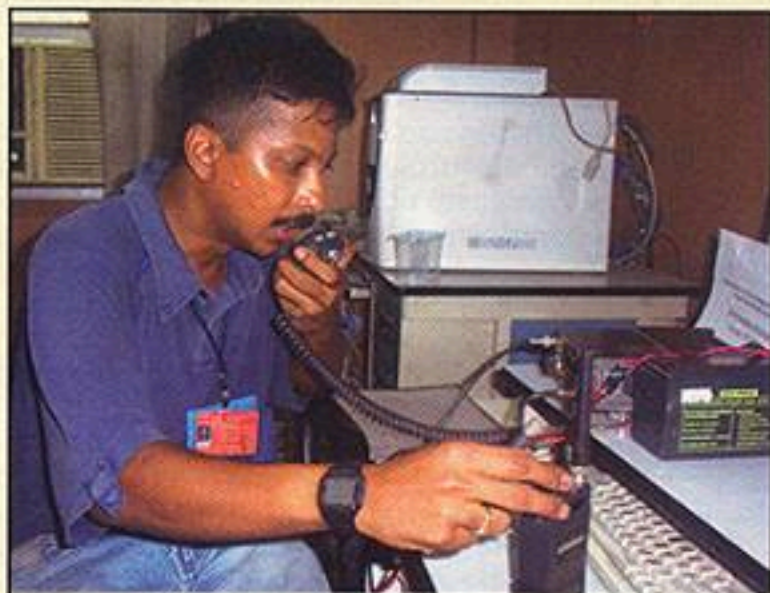
North America is not the only place amateur radio operators are active in emergency communications. Hams in India and other countries actively provide emergency communications support. This past summer, amateur radio operators participated in a simulated earthquake communications drill in the Northeast District of Delhi.

The Delhi Disaster Management Authority notified local hams about the "earthquake." Immediately, three teams of ham radio operators rushed to several critical locations to provide emergency communications. Stations were established at the Office of the Delhi Disaster Management Authority, Police Headquarters, Office of the Deputy Commissioner of Police, and the Divisional Commissioner's office.

According to Sandeep Barauh, VU2MUE, the communications teams brought mobile rigs, antennas, batteries, and solar-panel power backups. A digital communication setup was also established at the Divisional Commissioner's Office. Two-meter links were established on simplex when the local repeater "failed" because of the earthquake. HTs were also used for local communications. Messages were passed from the "disaster site" on behalf of the police and fire departments. Government officials visited the ham stations and felt that amateur radio can play a very important role in disaster communications. The hams were also able to demonstrate the use of Echolink in emergency communications and the potential for retrieving weather information.

In July, five members of the Mumbai Amateur Radio Society (MARS) sprang into action on behalf of the Ministry of Home Affairs and the United Nations Development Program. They were sent to the flood-ravaged areas of Bihar.

Nilesh Rathod, head of the local Amateur Radio Emergency Service, said, "There is a huge crisis in Bihar, but what is startling



Sandeep Barauh, VU2MUE, provides communications during a simulated earthquake exercise. (Photo courtesy of VU2MUE)

is that everyone seems used to the floods and the horrific living conditions."

He said that in the town of Sitamarhi the roads and rails were washed away. The local residents were building bamboo bridges to and charging people to cross them. That is how they recovered the cost of making the bridge and earned a living.

In order to get to his communication assignments, Nilesh would have to jump into a Jeep or risk wading through leech-infested waters.

cedures for emergency incidents. "For the first time," Ridge now says, "the National Response Plan provides a comprehensive roadmap for everyone to follow. As part of this plan, the National Incident Management System was introduced so that those involved in emergency response understand what their role is—and have the tools they need to be effective. It's the nation's first-ever standardized approach to incident management and response and it unifies federal, state, and local lines of government into one coordinated effort. This integrated system makes America safer by establishing a uniform set of processes, protocols, and procedures that all emergency responders—at every level of government—will use to conduct response actions."

## All-Star Playbook

Ridge describes the system as "the playbook for the NFL Pro-Bowl Game." "When you bring together the best players from 26 different teams," he explains, "a plan of 'blue 42, slant right, release' might mean one thing to the quarterback, another thing to the wide receiver, and yet another to the linemen. At the call of 'hike,' chaos might break out on the field. At the very least, the play won't be successful. Now everyone shows up on game day with the same playbook. They will have the same preparation, the same goals and expectations, and—most important—they will be speaking the same language. When the quarterback calls a play, everyone will know what they are supposed to do. And in this battle, safety is far better than two points—in fact, it is the only result worth anything at all. Of course, a plan is nothing without the people to execute it, and many of you will play a vital role should we ever have to put our plan into action."

## Ham Radio is Ready

Now let's take a look at some of the ways amateur radio is

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13:02:20  
10:34:32 A

These are the basic technical skills every ham  
try to learn. Knowledge and skill is  
disseminated from one person to the other.

# Who is a ham?

It is a person who has acquired the theoretical knowledge  
and practical skills to become a ham.

© Govt. Licensed Amateur Radio Operator

Amateur Radio Operator License

Category	Sub-category	Power	Frequency
A	1	100W	1.8-30MHz
	2	100W	3.5-30MHz
B	1	100W	1.8-30MHz
	2	100W	3.5-30MHz
C	1	100W	1.8-30MHz
	2	100W	3.5-30MHz



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DOON UNIVERSITY, DEHRADUN

Venue: Doon University, Dehradun

Date: 26 October, 2012

Er. Sandeep Baruah

Dr. Rajendra Dobhal

Dr. V.K. Jain

Dr. Sarita Khandka

## STATE LEVEL HAM RADIO ORIENTATION TRAINING

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# बड़े काम का है हैम रेडियो का डिजिटल रूप

कार्यालय संवाददाता

कानपुर

रेडियो और इंटरनेट का भला क्या संगम है। क्या बिना सरकारी नियंत्रण के अपना रेडियो सेटअप तैयार किया जा सकता है। विल्कुल, टेककृति में बतौर गेस्ट लेक्चरर आए विज्ञान प्रसार के साइंटिस्ट संदीप बरुआ ने हिन्दुस्तान को 'हैम रेडियो' के आधुनिक और डिजिटल रूप की जानकारी दी। बतावा कि आपातकाल में जब सारे सिस्टम ध्वस्त हो जाते हैं, तब भी हैम रेडियो की मदद से सूचनाओं का आदान-प्रदान किया जा सकता है। हैम रेडियो को कंप्यूटर से और कंप्यूटर को इंटरनेट से जोड़कर टेक्स्ट मैसेजिंग, फाइल अपलोड-डाउनलोड की जा सकती हैं।

श्री बरुआ ने बताया कि दरअसल हैम रेडियो वायरलेस वेस्ट टू वे कम्युनिकेशन है। बोलचाल की भाषा में यह इंटरनेट ऑफ दि पासट है। विश्वभर में रेडियो पर बतियाने के शौकीन सालों से हैम रेडियो के दीवाने हैं। बहुत कम खर्च में और साधारण सी किट के साथ इसका प्रयोग किया जा सकता है। इसके लिए सरकार से लाइसेंस लेना जरूरी है।



संदीप बरुआ

सरकार की ओर से संचार पर पाबंदी लगाने, प्राकृतिक आपदा के दौरान भी हैम रेडियो पर संपर्क बना रहता है। इसीलिए इसे थर्ड पार्टी कम्युनिकेशन कहा जाता है। गुजरात में भुज में आए भूकंप के दौरान यह बहुत कारगर रहा। श्री बरुआ ने बताया कि इसका आधुनिक रूप और भी उपयोगी है। टू वे ट्रानसीवर (ट्रांसमीटर और रिसीवर) को लैपटॉप के साथ इंटरफेस कर रेडियो वेक्स की मदद से इंटरनेट से जोड़ा जा सकता है। इसके बाद टेक्स्ट मैसेजिंग से लेकर फाइल्स की अपलोडिंग-डाउनलोडिंग सब संभव है। डिजीपीटर (डिजिटल रिपीटर) होना जरूरी है। हैम रेडियो का आधुनिक रूप वार्तालाप, मौज मस्ती के साथ ही कम्युनिटी सर्विस में भी कारगर है। देश में वेदर फोरकास्टिंग के लिए करीब 20 हजार स्टेशन की जरूरत है। हैं सिर्फ 300। हैम रेडियो को वेदर स्टेशन से जोड़कर किसानों को मौसम और फसल सम्बन्धी जानकारी देकर उत्पादन बढ़ाया जा सकता है।

हिन्दुस्तान

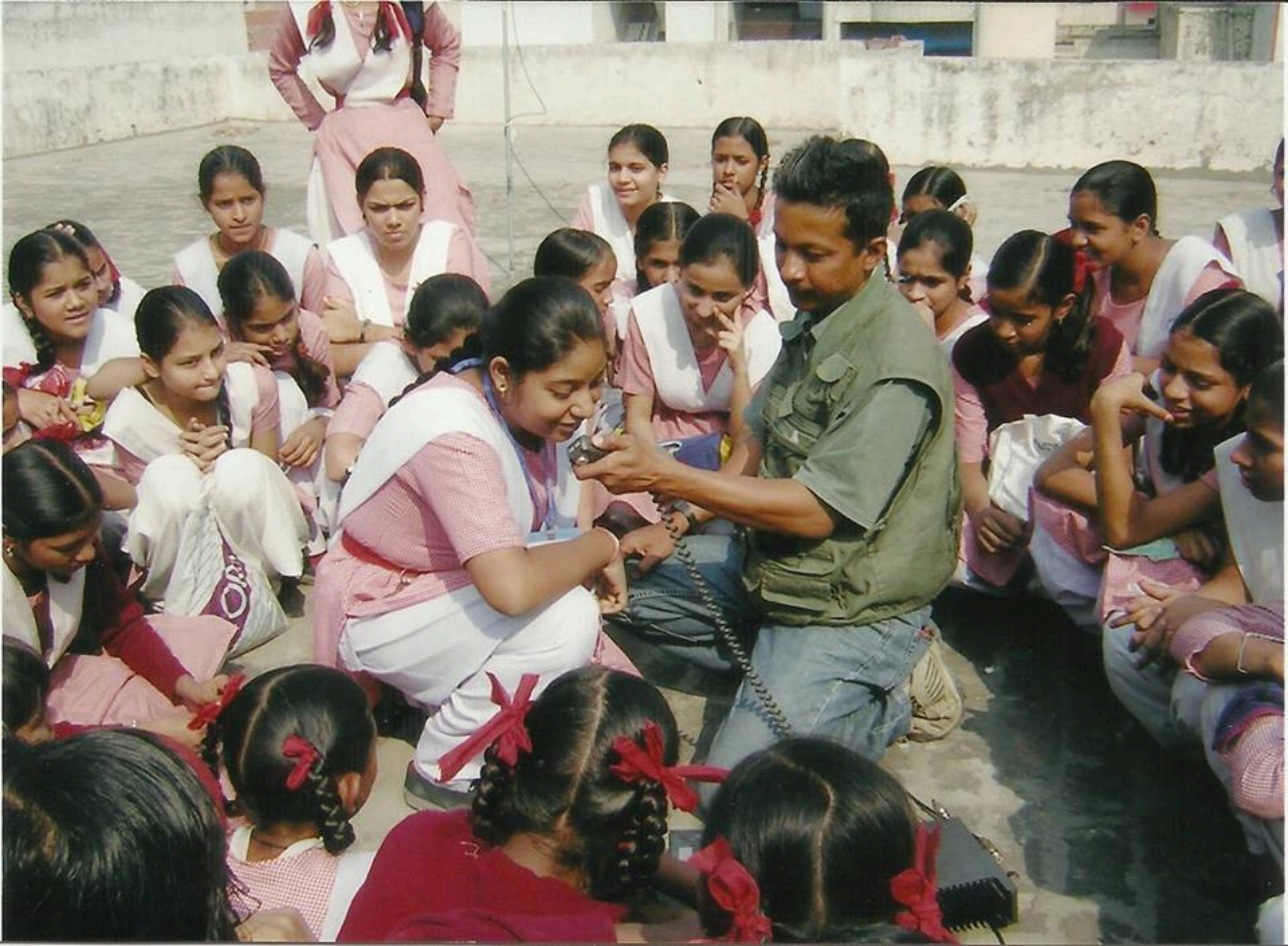
कानपुर

भविष्य में फैब्रिकेशन मोबाइल सेन्सर, आकार में उन्हें चुन रखा और इस तकनीक सस्ते और विश्वसी कानपुर गुरुव नॉलेज आयोजि लेने आ फैब्रिके 10 वर्षे चिप तैय घर, दप चाबियों किया ज अलग मिलेगा ज्यादा तकनीक

























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### GPS CONSTELLATION



### FREQUENCY RANGE FOR GPS SYSTEM

BAND	FREQUENCY	DESCRIPTION
1	1575.42 MHz	Carrier frequency for L1 C/A code and L1 P(Y) code. It is the only frequency used by all GPS receivers.
2	1227.60 MHz	L2 P(Y) code carrier frequency. It is used for high-precision applications. Not all receivers support this frequency.
3	1381.05 MHz	L5 E5a carrier frequency. It is used for high-precision applications. Not all receivers support this frequency.
4	1176.45 MHz	L5 E5b carrier frequency. It is used for high-precision applications. Not all receivers support this frequency.

### GLOBAL POSITIONING SYSTEM



### Demonstration of Working of GPS

LIST OF COMMENTS

The diagram shows a GPS receiver with various components labeled: ANTENNA, RECEIVER, PROCESSOR, and TRANSMITTER. It also includes a section for 'LIST OF COMMENTS' with a grid for recording observations.

A collage of various images and text related to GPS technology, including photos of satellites, maps, and technical diagrams.



# Ham Radio

A fascinating way to learn  
Radio Communication Skills

Sandeep Baruah [ [VU2MUE](http://www.qsl.net/vu2msy) ]

Scientist-E / *Principal Scientific Officer*

VIGYAN PRASAR, Department of Science & Technology

Post Bag No. 11, New Delhi-110 067

Connaught Place, New Delhi

[www.vigyanprasar.gov.in](http://www.vigyanprasar.gov.in)

<http://www.qsl.net/vu2msy>

<http://www.riverdevil.org/APRS/vu2mue>

email [sandeep@vigyanprasar.gov.in](mailto:sandeep@vigyanprasar.gov.in)









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Chairman - Board of Directors, IARU Region 3

President - Amateur Radio Society of India

*Shri Jayant Shankar Rao Bhide (VU2JAU)*

President - Gwalior Amateur Radio Club

National Coordinator - Disaster Communications

### Keynote Speakers:

*Shri Sandeep Baruah (VU2MUE)*

Scientist - Vigyan Prasar, Department  
of Science & Technology, Govt. of India

*Shri Dinesh Chandra Sharma (VU2DCT)*

Secretary - Hindustan Aeronautics Limited  
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Amateur Radio Convention and Conference Samity (ARCCS)

Registration No. S/2L/19566 of 2014 - 2015 under West Bengal Act XXVI of 1961

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# हैम रेडियो के वैज्ञानिक उपयोग से बचेगी जान

देहरादून। यूकॉस्ट और ईएमआरआई 108 ने साथ मिलकर शनिवार को विज्ञान प्रसार नोएडा की तकनीकी सहायता से हैम रेडियो पर विशिष्ट व्याख्यान और प्रदर्शन कार्यशाला का आयोजन किया। उत्तराखंड के दूरस्थ क्षेत्रों में मोबाइल नेटवर्क के काम न करने पर विकल्प के रूप में हैम रेडियो के उपयोग की जानकारी दी। कहा कि इसके वैज्ञानिक उपयोग से लोगों की जान बचाई जा सकेगी।

कार्यशाला में विज्ञान प्रसार के वरिष्ठ वैज्ञानिक संदीप बरुआ ने कहा कि पूरे उत्तराखंड में 2-3 हैम रिपिटर स्टेशन लगाकर यूकॉस्ट की सहायता से बने 32 हैम रेडियो लाइसेंस होल्डर के नेटवर्क से मोबाइल एंबुलेंस, ईएमआरआई कॉल सेंटरों के संपर्क में रह सकती है। कार्यशाला में यूकॉस्ट के वैज्ञानिक अधिकारी डॉ. डीपी उनियाल, डॉ. बीपी पुरोहित, डॉ. आरएस भारद्वाज, जिला समन्वयक डॉ. प्रशांत सिंह, रवींद्र, भास्कर, निर्मल रावत आदि रहे।











CITY BUZZ

# Ham Radio network to be set up in Kaushambi

The Kaushambi Apartments Residents Welfare Association (KARWA), announced a VHF/UHF ham radio repeater network soon to be made functional at Kaushambi under the disaster mitigation plan. An awareness programme and workshop on

ham radio (Amateur Radio) was organised by Kaushambi Apartments' Resident Welfare Association (KARWA) at Nanda Apartments, Ghaziabad on October 11 where children and senior citizens of the area got an opportunity to see the functioning of various ham

radio technologies.

Sandeep Baruah, scientist-D from Vigyan Prasar (Department of Science and Technology, Govt. of India) deliberated a presentation emphasising the need to establish a ham radio and electronics club for the children of the area which will help establishing an alternative radio communication network as a hobby and public service activity.

Various instruments were installed at the roof of the 14th storied Nanda Apartments and its functioning was explained with the help of Vigyan Prasar Repeater Station (VU2DLR) located at South Delhi.

Hams (Amateur Radio Hobbyists) from all over the NCR region participated and assisted the programme by making radio contacts with the temporary ham radio station installed at Nanda apartments. Children were thrilled to exchange pleasantries with senior hams. Francis

During the deliberation, Sandeep Baruah (Scientist-D, Vigyan Prasar, DST) emphasised the formation of the people's own ham radio alternative radio communication network as a 'hobby' and as a 'do-it-your-

their own communication network without depending on other service providers. To establish an effective communication to be functional, it was suggested that several low cost UHF/VHF Ham Cross



Rebello (Ham call VU2XLZ) talked at length to the children via the ham radio setup from his ham radio station located at Green Park. Students were delighted to talk to him via the two-way ham radio communication system. Hams from as far as Gurgaon also came on-the-air to assist the demonstration.

self activity', which would also be useful in the event of any kind of emergency, because when the public telephone network and cellular telephone network break down during large scale disasters, people with ham radio licences and their personal radio communication equipments would be able to maintain

Band Repeater station may be installed on top of all the skyscrapers at Kaushambi. A similar setup was demonstrated to the children. A Ham Radio Club is in the process of formation where hams located near Kaushambi would provide their voluntary support in training the children and other interested people.

Happy Diwali

**श्री Sai Shah**  
FURNITURE & INTERIORS

SPL. IN: WARD ROBES, ALMIRAHS, MODULAR KITCHENS, DOUBLE BEDS, SHOW CASES, T.V. CABINET ETC.







# APRS Protocols/formats APPENDIX to the Research Paper

A PRACTICAL RADIO AND INTERNET BASED  
APPROACH FOR DISASTER RISK REDUCTION AND  
MANAGEMENT THROUGH GEOSPATIAL INFORMATION  
STUDIES USING AUTOMATIC PACKET REPORTING  
SYSTEM (APRS®)

Sandeep Baruah, Scientist-D  
Vigyan Prasar, Department of Science & Technology New Delhi  
<http://www.riverdevil.org/APRS/vu2mue>



Joint International  
ISPRS WG V

Geospatial Data for D  
November 21, 2



# हिन्दुस्तान हंगामा

## सम्मिलित होने का अवसर अभी भी है



## अब झूम उठेगा कानपुर में हिन्दुस्तान का हर पाठक



# दूसरे ग्रह वासियों को लुभाते हुए 'टेककृति' का आगाज

## कला-ज्ञान के मिलन की अद्भुत नजीर

### ज्वाइंट ऑपरेशन में कारगर होगा

### जीआईएस साफ्टवेयर



दूसरे ग्रह वासियों को लुभाते हुए 'टेककृति' का आगाज



अब काम में लगे हैं कला और ज्ञान के मिलन की अद्भुत नजीर



ज्वाइंट ऑपरेशन में कारगर होगा जीआईएस साफ्टवेयर



टेककृति का आगाज के मौके पर निरंजन रायजी का और विपरीत का



ज्वाइंट ऑपरेशन में कारगर होगा जीआईएस साफ्टवेयर

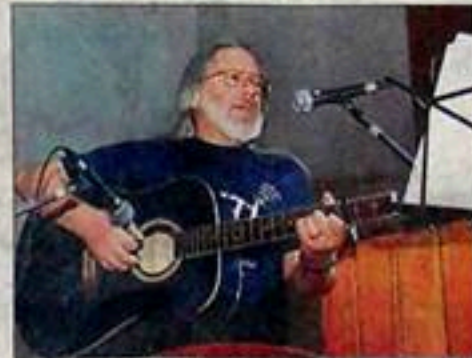


टेककृति का आगाज के मौके पर निरंजन रायजी का और विपरीत का

गिटार की धुन पर प्रो. हार्वर्ट पॉस सक ने अपने शोध को गीत बनाकर प्रस्तुत किया। तकनीक और विज्ञान के साथ ही बुद्धि का होगा संगम।

**कार्यालय संपादन**  
कानपुर

सकल और ज्ञान के अद्भुत संगम में हुए अब टेककृति का आगाज। गिटार की धुन पर प्रो. हार्वर्ट पॉस सक ने अपने शोध को गीत बनाकर प्रस्तुत किया। तकनीक और विज्ञान के साथ ही बुद्धि का होगा संगम।



टेककृति के आगाज के मौके पर निरंजन रायजी का और विपरीत का

### कुछ यूँ रहेगा खास

- मेगु जर्नी (काउन्सिलर रिजर्व) इन्फो जॉर्नी से गिटार, इलेक्ट्रिक जॉर्नी को प्रेरणा मिलेगी। ज्वाइंट ऑपरेशन में कारगर होगा जीआईएस साफ्टवेयर।
- इतिहास और साहित्य के अद्भुत संगम में कारगर होगा जीआईएस साफ्टवेयर।
- टेक और कला के मिलन की अद्भुत नजीर।
- ज्वाइंट ऑपरेशन में कारगर होगा जीआईएस साफ्टवेयर।
- ज्वाइंट ऑपरेशन में कारगर होगा जीआईएस साफ्टवेयर।
- ज्वाइंट ऑपरेशन में कारगर होगा जीआईएस साफ्टवेयर।
- ज्वाइंट ऑपरेशन में कारगर होगा जीआईएस साफ्टवेयर।
- ज्वाइंट ऑपरेशन में कारगर होगा जीआईएस साफ्टवेयर।
- ज्वाइंट ऑपरेशन में कारगर होगा जीआईएस साफ्टवेयर।
- ज्वाइंट ऑपरेशन में कारगर होगा जीआईएस साफ्टवेयर।

### साफ्टवेयर से भाँपो और दुश्मन को नापो



कानपुर। साफ्टवेयर से दुश्मन को भाँपो और दुश्मन को नापो। ज्ञान और कला के मिलन की अद्भुत नजीर।

## बड़े काम का है हैम रेडियो का डिजिटल रूप

### चाबी क्यों, चिप है न भविष्य में पन्नो जैसे टीवी और लैपटॉप आएँगे

कार्यालय संपादन कानपुर। हैम रेडियो और इंटरनेट का साथ क्या होगा? क्या किंग साफ्टवेयर निरंजन रायजी के अद्भुत संगम में कारगर होगा जीआईएस साफ्टवेयर।

## चाबी क्यों, चिप है न भविष्य में पन्नो जैसे टीवी और लैपटॉप आएँगे

### नए अधिकार

कार्यालय संपादन कानपुर। नए अधिकार। ज्ञान और कला के मिलन की अद्भुत नजीर।

### रोजगार परक शिक्षा आज की जरूरत

कानपुर। रोजगार परक शिक्षा आज की जरूरत। ज्ञान और कला के मिलन की अद्भुत नजीर।

### नौकरी के लिए मिलेगी विशेष ट्रेनिंग



नौकरी के लिए मिलेगी विशेष ट्रेनिंग। ज्ञान और कला के मिलन की अद्भुत नजीर।

हिन्दुस्तान 28वाँ महाशिवरात्रि उत्सव। Image of Lord Shiva.











The governmental agencies  
have their own radio  
communication channels already  
existing

- The Police-
- Armed Forces-
- Para-military Forces
- Fire Department-
- Inland Water Department-
- Meteorology Department-
- Electricity Department-









Handwritten notes on a whiteboard, including the words "Skid", "Delaware", and "106".

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# Hams: Riding the radio waves

This band of original social networkers continues an old tradition of licensed amateur broadcasting

■ REEMA GOWALLA

WITH sophisticated tablet computers, smartphones and zillions of social networking sites floating around the Internet, communicating with friends and dear ones does look simple and convenient, but imagine a day when all of these are snapped off in the blink of an eye by a powerful earthquake. That is when an amateur or ham radio comes in handy.

Primarily a recreational activity, amateur radio enables operators — also known as hams — to pick up airwaves to discover a new voice from an unknown land. But it has the potential to be an immensely useful disaster management tool, especially in times of an earthquake, flood, cyclone and even tsunami.

The concept and importance of ham radio — which involves the use of a combined unit of transmitter and receiver, called transceiver, to facilitate a two-way communication between broadcasters across the world — is yet to grab most people's attention. But this does not discourage the small spirited community of operators who consider it a self-training activity involving technical creativity and experimentation with wireless communication.

Sandeep Baruah — principal scientific officer at Vigyan Prasar, department of science and technology — explains, "It's their love for radio science and the thrill of communicating with mostly self-assembled electronic devices that keep ham radio operators pursue their interest."

A portable amateur radio set can be operated using batteries and even solar power. And because only specific individuals attempt to connect with each other through radio waves, it hardly falls unlike most wireline services, phone and internet networks, which often fall victim to jammed bandwidth and overloaded routers during natural calamities.

The hobbyists are referred to as amateurs because their systems are not included in commercial broadcasting or similar two-way radio services often used by the defence forces or firefighters.

An avid ham himself, Baruah first established his station at Assam Agricultural University, Jorhat, in 1989. "It is an interesting method to discover new friends and disseminate knowledge among one another. Hams discuss almost everything under the sun, for which they run 'nets' at scheduled times and previously decided frequencies," he says.

Over decades, these enthusiasts have helped to form new industries by significantly contributing to science, technology, engineering and social services. But the crucial role they play during crises and natural disasters deserves special mention.

The techno-tinkers can quickly set up networks, helping speed up disaster relief. The 2004 tsunami cut nearly all communications with the Andaman Islands. Ham operators are not allowed to set up shop there because of security reasons, but a group of enthusiasts on vacation there did manage to get a station up and running. They then transmitted updates about the disaster to authorities in Delhi and other cities.

Baruah himself was in Delhi at the time and among those in touch with this group of hams in the Andamans. He says, "I had received messages from different parts of the country and abroad, which I relayed to those stationed at Port Blair and vice versa."

Hams also supported rescue activities after the 9/11 terror attacks, Gu-



SAY HELLO: Sandeep Baruah demonstrating his amateur radio equipment in front of schoolchildren during a workshop.

jarat earthquake in 2001, North America blackout in 2003, Hurricane Katrina in 2005, Sichuan earthquake in 2008 and more recently the 2010 Haiti earthquake.

## Ham hum

Just a simple wire antenna connected to the transceiver is enough to attract ham radio frequencies. Licence bearers work using frequencies internationally allotted to them. If a particular wave is not already being used by another ham, it can be used to give a call to the operator in question.

However, the calling procedure should adhere to international radio regulations.

One can give a general, or CQ, call to all stations around the world with his or her assigned 'call sign' on air to legally spot a specific operator or station.

With advances in the field of electronics and technology, ham radio has also undergone a lot of changes over the years. Like mobile phone users, ham enthusiasts can now send text messages.

Operators can even connect their radios to the web. For example, ham equipment connected to the internet in Guwahati can receive messages from other ham radio users in the city, while their conversation can be routed across the world through a system called Echolink.

Digital ham radio is a smart mode of

ONLY specific individuals attempt to connect with each other through radio waves, therefore, it hardly fails unlike most wireline services, phone and internet networks, which often fall victim to jammed bandwidth and overloaded routers during natural calamities

communication. Here all details are sorted into standard-sized digital packets, which are then automatically transmitted using radio waves in small bursts. Through 'packet radio', data can be transmitted in various formats including document, image or even video. To send or receive radio mails, hams need to connect their devices to the computer and log on to a local ham radio server. The receiver gets only the correct data, thanks to an automatic error detection system.

For instance, if a transmitted message reads: "Hello, I am now at the rescue camp. So far, 90 people have been evacuated." And if, due to some radio wave propagation problem, the signal is weak at the receiver's end, 90 may be digitised or demodulated as 9. But the packet modem has a firmware which is in-

telligent enough to understand that the figure is not accurate, and so the radio connected to the computer will send back automated re-send request to the sender.

One can also send emails with the help of free software called 'Airmail', which functions more or less like Microsoft Outlook and can be useful at remote areas devoid of internet facilities.

Sharing an instance, Baruah says, "I get messages from a sailor ham friend through such a system. He keeps sending stories while on long-distance voyages. He is supported by Winlink 2000, an all-volunteer project that arranges for sending emails through radio."

And there is more: hams can also receive images from space now. NASA launched a low earth orbit satellite recently enabling hams to lift pictures using a handheld transceiver and a tiny beam antenna called Yagi.

ISRO also launched a microsatellite called HAMSAT in 2005, enabling India to become one of the few countries in the world to launch an amateur radio satellite.

## Highs & lows

The story of ham radio starts at the beginning of the history of radio itself. In 1895 when Guglielmo Marconi, beginner of long-distance radio broadcasts began sending signals over vast lengths, he also became the first amateur radio broadcaster. That same year Nikola Tesla also sent transmissions in the US.

Indian scientist Sir J C Bose's experiments also contributed to the cause. Apart from providing voluntary help during national emergencies, hams are also said to have supported the Indian Independence movement.

Ham radio suffered a slowdown during global conflicts, when authorities suspended issuing licences and even asked operators to dismantle their devices fearing misuse of the technology by spies. However after the end of World War II, their number started growing again.

It is sad that despite making significant contributions over the years, little has been done to support the enthusiasts or at least raise awareness about ham radio among the public. Getting a licence is an uphill struggle, and so there are just about 15,000 authorised and practicing ham radio users in India, with a mere seven in the Northeast.

Following repeated petitions, the do-it-yourself activity was incorporated in the Central Board of Secondary Education (CBSE) syllabus in 2006, with occasional workshops being conducted on IIT campuses and other educational institutions across the nation. Hams feel the scope of amateur radio is unlimited and so introducing the activity to youngsters could boost their mental faculties as well as impart a sense of unity and self-empowerment.

The wireless, planning and coordination wing (WPC), which forms part of the ministry of communications and information technology, is the regulatory authority of amateur radio in India. Together with controlling radio waves, the WPC also assigns call signs and issues licences.

Any citizen above the age of 12, and with basic knowledge in electronics and radio science, is eligible to become an authorised ham operator after he

## Frequency facts



■ In the early days of amateur radio, most professional operators would use the term ham to taunt the hobbyists, leading to the popularity of the synonym later on.

■ Rewarding the contributions of amateur radio, a postage stamp was issued in the US in 1964.

■ Fox hunting is an interesting activity in which hams use direction-finding techniques to locate hidden transmitters.

■ Hamfests and DX-peditions are among the countable events conducted on regular intervals to promote amateur radio in India.

■ A deceased amateur radio operator is generally referred to as a silent key.

or she clears a 100-mark exam, conducted by the WPC at various wireless monitoring stations across the country. There are two such stations in the Northeast too — at Dibrugarh and Shillong — but due to concerns over ham radio turning into a security threat if fallen into the wrong hands, the examination has not been conducted in the region over the past few years.

Ritu Mahanta, a guest lecturer at an engineering college near the city, agrees that ham radio is an efficient tool for communicating during emergencies. Unfortunately, his own experience at getting a licence has been unsavoury. He first applied for it in 1990 as a student, but was rejected. Over time, he applied several times, to no avail. He then filed an RTI in 2011. "Today I have the equipment, but can only hear hams communicating. Until I get my own call sign, I cannot transmit."

But enthusiasts here argue that ham radio is a fairly simple set up and any suspicious use can be easily detected with the help of direction finding antennas or the method of triangulation. They feel such irregularities could just be another instance of red-tapism and discrimination.

However it's a different story in most other states outside the region where the density of hams is higher, thanks to special clubs and related activities. Bangalore is also usually called the ham radio capital of India.

The hobbyists think more should be done to promote amateur radio in the region, especially for young citizens, who can serve as a band of communicators when the most active networking tools are knocked out by a natural calamity.



# A Better Prepared Amateur Radio Response

**H**ave you been listening to or reading the comments of the homeland security and emergency management leadership? Have you heard their remarks and thought about how they apply to amateur radio? This month we'll take a look at a few of the puzzle pieces and see if we're getting the message.

## Preparation and Preparedness

For decades the Federal Emergency Management Agency has been responsible for preparing and responding to disasters. FEMA has now been integrated into the Department of Homeland Security as the department's Emergency Preparedness and Response Directorate, under the day-to-day direction of Chief Operating Officer Ron Castleman and Undersecretary Mike Brown, who often speaks on the topics of preparation and preparedness.

Over the summer, Secretary of Homeland Security Tom Ridge spoke at a Public Preparedness Symposium. In his speech, he discussed a tabletop exercise in which he and 25 governors participated. According to Ridge, the exercise pointed out that in many cases you do not have all of the information that you would like to have, but "you have to do something. You can't wait until you have it all."

Ridge continued, "You can't secure the country from Washington, DC. You need partners all around the country in order to make it safer and more secure ... Homeland security must be a priority in every home, every city, every neighborhood across America."

"Our goal is to achieve seamless protection, a nation knit tightly together by shared vigilance, readiness, and communication," said Ridge. "Vigilance, readiness, and communication. And nowhere is this more important than in the area of emergency preparedness."

"No government entity, no organization, no information expert can replace individual responsibility. Citizens must choose to take actions," Ridge continued. "And our job is to make the choice an easy one. The success of our preparedness efforts and ultimately the entire homeland security mission depends on the involvement and work of individual citizens. Because if our communities are to rise to new levels of preparedness and security, each individual American must choose to make emergency planning a priority—a priority in our homes and our places of work and in our schools."

## Disasters Spawn Preparedness

According to Secretary Ridge, "If you ask people in south Florida or the Outer Banks of North Carolina about preparedness, they already know about buying supplies, keeping extra batteries handy, and even having a hurricane evacuation route planned. They get it. They hope they're not



*Homeland Security Secretary Tom Ridge: "We've laid out a public goal, and you've got to help me meet it!" (Department of Homeland Security photo)*

going to be hit by a hurricane. Chances are pretty good ... they may or may not, but they're not going to wait for chance. They get prepared."

"I'm just amazed," said Ridge, "that more people don't think of it in terms of providing some peace of mind to their own lives and to their own families." He wants to see people "respond when they have to without thinking about it," and says he feels that "there is a willingness on the part of Americans to take on this responsibility."

## Public Goal

Ridge continued, "We've laid out a public goal, and you've got to help me meet it, please....that by the end of this year, we want at least 50 percent of Americans to have accepted their responsibility to be ready. It's a communication plan; some form of training to assist at the time of a disaster, the kit set aside, the readiness kit. We need to get 50 percent by the end of the year, and I think we can get it done."

"The Department of Homeland Security will add strength to the existing Ready Campaign by launching two new endeavors, Ready for Business, Ready for Kids. It will continue to work with the Citizen Corps to encourage participation from families across America, whether by preparing family ready kits and emergency plans or volunteering to aid in disaster planning or engaging in CPR and training exercises to help people in a life threatening situation."

"I've been amazed at the number of people who have come forward to serve on Citizen Corps councils. All walks of life, all backgrounds, all communities. I think we're near 1000 communities that have a Citizen Corps. You meet some fascinating people. One fellow is in charge of the emergency radio network. You've got a bunch of ham radio operators in a tri-state area. He's got them networked together."

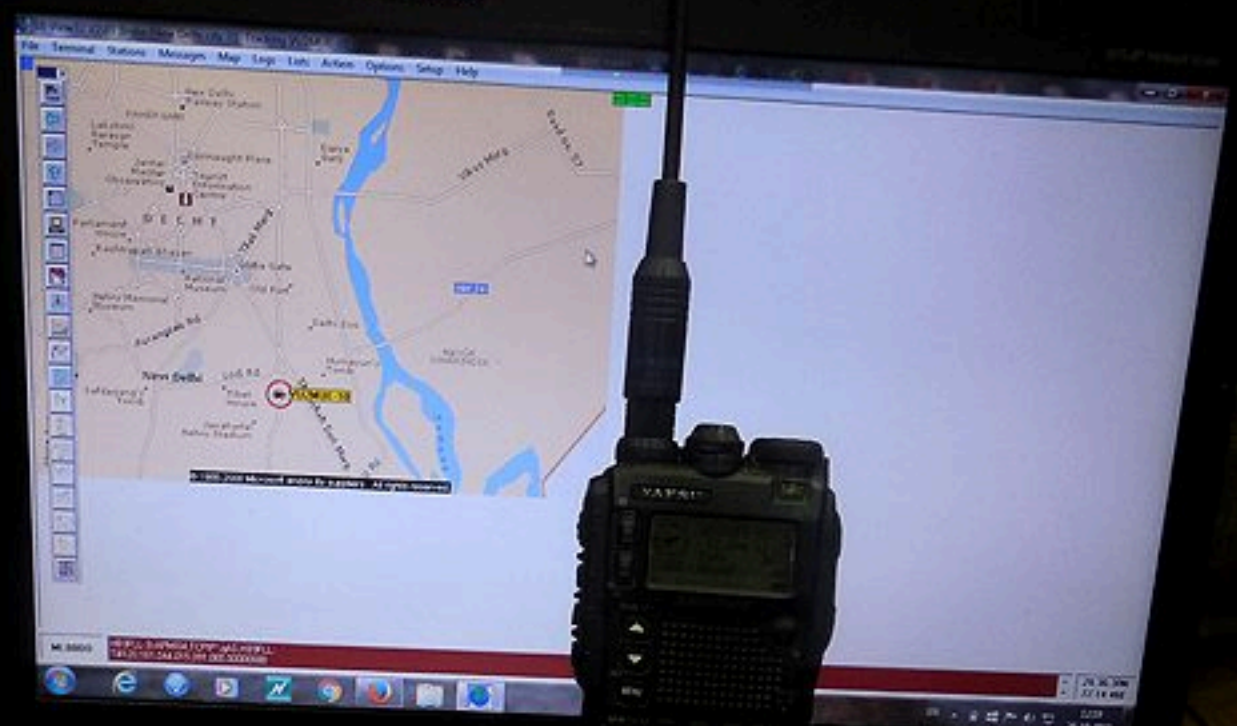
## Unification

Before September 11th every state, every city, and even individual response teams had their own pro-

\*c/o CQ magazine

e-mail: <wa3pzo@cq-amateur-radio.com>





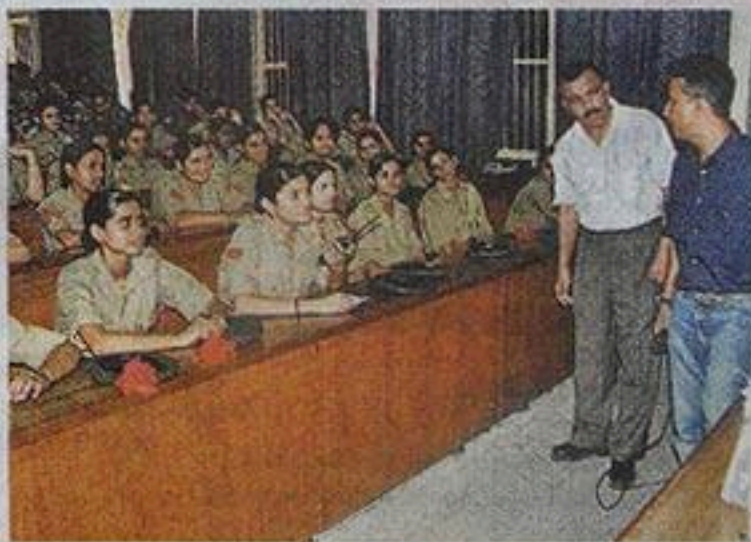
tel 36



# शिविर में कैडेट्स ने हैम रेडियो के बारे में जाना

भास्कर न्यूज़ | हिसार

हरियाणा कृषि विश्वविद्यालय में चल रहे एनसीसी शिविर में कैडेट्स को गुरुवार को हैम रेडियो का प्रशिक्षण दिया गया। विज्ञान प्रसार केंद्र दिल्ली से आए वरिष्ठ वैज्ञानिक संदीप बरुआ ने सभी कैडेट्स को बताया कि इसके माध्यम से बिना किसी मासिक बिल के फ्री में बात, लाइव चैट, मैसेजों का आदान प्रदान किया जा सकता है।



हिसार. एचएयू में कैडेट्स को हैम रेडियो के बारे में जानकारी देते प्रशिक्षक।

तापमान जान सकते हैं अथवा वह कितनी दूरी पर किसी एंगल पर है। इतना ही नहीं वायरलेस से सेट कैसे मैसेज भेजा जाए।

किस तरह से आरकूट, याहू के तरीके से लाइव चैट किया जाए। उन्होंने बताया कि यह सब मुफ्त में मिलता है बस इसकी एक ही शर्त है कि इसे उपयोग करने

वालों की संख्या ज्यादा से ज्यादा हो। उन्होंने बताया कि इस समय देश में आबादी अरबों पार कर गई है लेकिन हैम रेडियो का उपयोग 15 हजार से भी कम लोग कर रहे हैं। कई सेलिब्रेटी ने तो हैम रेडियो ले तो लिया है लेकिन इसका उपयोग बहुत कम ही लोग कर रहे हैं।

## कर्मचारियों का प्रदर्शन, ज्ञापन सौंपा



# शाहटाइम्स

ईएमआरआई व यूकोष्ठ ने किया गोष्ठी  
का आयोजन

## चिकित्सा सुविधा में हेम रेडियो की उपयोगिता अहम्

विशेष संवाददाता

देहरादून। यूकोष्ठ एवं ईएमआरआई 108 में चिकित्सा सुविधा के क्षेत्र में हेम रेडियो के उपयोग पर संयुक्त गोष्ठी का आयोजन कर गहन विचार विमर्श किया।

इस तकनीकी कार्याशाला में प्रमुख वक्ताओं में यूकोष्ठ से निदेशक डॉ. राजेन्द्र डोभाल, ईएमआरआई-108 के प्रमुख कार्यकारी अधिकारी अनूप नौटियाल तथा विज्ञान प्रसार के वरिष्ठ वैज्ञानिक संदीप बरूआ ने उत्तराखण्ड के सूदूरवर्ती क्षेत्रों में फोन तथा मोबाइल नेटवर्क के काम नहीं करने का घायल या मरीजों के फोन प्राप्त न हो पाने के विकल्प के रूप में हेम रेडियो के उपयोग पर विचार व्यक्त किए तथा चर्चा में भाग लिया। श्री संदीप बरूआ ने समाधान प्रस्तुत करते हुए कहा कि पूरे उत्तराखण्ड में 2-3 हेम रिपिटर स्टेशन लगाकर यूकोष्ठ की सहायता से बने 32 हेम रेडियो लाइसेंस होल्डर के नेटवर्क द्वारा मोबाइल एम्बुलेंस ईएमआरआई काल सेंटर्स के सम्पर्क में रह सकती है। इसकी सहायता से एक्सिडेंट साइट पर एम्बुलेंस भेजने के लिए विभिन्न स्थानों पर हेम रेडियो सपोर्ट सिस्टम का प्रयोग किया जाएगा। इसके अनुप्रयोग का परीक्षण करने के लिए शीघ्र ही ईएमआरआई एक संचार रहित मरीज की अधिक संख्या वाला क्षेत्र देखकर यूकोष्ठ तथा विज्ञान प्रसार की सहायता से हेम रिपिटर स्टेशन (मानव जित) की स्थापना करेगी तथा परीक्षण एम्बुलेंस में हेम रेडियो की सहायता से संचालित एपीआरएस अटोमैटिक पोजिशनिंग रिपोर्टिंग सिस्टम लगाकर सम्पूर्ण नेटवर्क का उपयोग परखा जाएगा। यदि यह परीक्षण सफल रहता है तो यह पूरे उत्तराखण्ड में लागू करके दूर-दराज के क्षेत्रों के मरीजों के लिए स्वास्थ्य सुविधाएं समय पर प्राप्त करने का एक उपयोगी वैज्ञानिक माध्यम सिद्ध होगा।

इस कार्याशाला के उदघाटन सत्र में अपने सम्बोधन में डॉ. राजेन्द्र डोभाल, निदेशक यूकोष्ठ ने कहा कि अन्य उपयोगी के साथ ही स्वास्थ्य सेवाओं के लिए हेम रेडियो के वैज्ञानिक उपयोग से दुर्घटना में घायलों व तुरंत चिकित्सकीय सुविधा की आवश्यकता वाले मामलों में जरूरत मंदों की जान बचाने में उपयोगी सिद्ध होगा। डॉ. डोभाल ने कहा कि हेम रेडियो का एम्बुलेंस गाडियों की स्पीड, दिशा, मुख्यालय से दूरी तथा एमएमएस भेजने में प्रयोग से आपदा संचार के क्षेत्र में शीघ्र ही सफलता हासिल होगी।

ईएमआरआई के मुख्य कार्यकारी अधिकारी अनूप नौटियाल ने इस अवसर पर एक व्याख्यान दिया जिससे उन्होंने 108 एम्बुलेंस सेवा के उत्तराखण्ड में स्थापना से अब तक के विकास व भविष्य की योजनाओं के साथ ही विभिन्न विभागों के साथ किए समन्वय के बारे में बताया। उन्होंने अपने अनुभवों के आधार पर उन क्षेत्रों के बारे में बताया जहां के मरीजों की जान मोबाइल नेटवर्क न होने के कारण चिकित्सा सुविधा न पहुंचने की वजह से जोखिम में रहती है। श्री नौटियाल ने कहा कि यूकोष्ठ तथा विज्ञान प्रसार की सहायता से हेम रेडियो सम्पर्क साधने का माध्यम बने ताकि सभी मरीज या घायल संदेश भेजकर काल सेंटर की सहायता से एम्बुलेंस को बुलाकर चिकित्सकीय मदद व प्राथमिक चिकित्सा प्राप्त कर सकें।



# A Low Energy APRS-IS Client-Server Infrastructure Implementation using Raspberry Pi

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**Abstract** – Radio communication has great history of innovations. A hobby which helped in pioneering many innovations in radio communications that we are using today is radio amateurism. Hams are radio amateur hobbyists, which use radio communication to communicate, research, and explore new radio technologies and applications, such as Automatic Packet Reporting System (APRS), which is digital communications information channel for Ham radio. Among other purposes APRS is used to report and map position of any stationery or mobile object via radio. In this paper we presented a low cost APRS client-server infrastructure using Raspberry Pi, APRSdroid, and software defined radio (SDR).

## I. INTRODUCTION

Automatic Packet Reporting System (APRS) is real time radio amateur service able to transmit position reports, weather reports, messages between users which are processed and visualized. Position reports supported by APRS, or more precisely APRS Internet Service (APRS

National Disaster Medical System [7]. In the 1990's there were no widely available digital and detailed geographical maps like today's google maps, and many maps have to be drawn manually. These maps were able to support smaller geographical areas compared with today's available mapping mechanisms which can span whole world. Today's technology allows usage of APRS-IS to transfer locally collected data, or local data collection point via TCP/IP using UDP, TCP, or HTTP directly to APRS-IS, or indirectly via RF and APRS Internet gateways [8] which is our choice since it eliminates need of operational GSM / GPRS or other network that would support TCP/IP communication between data collection point (GPS location data reporting using RF transceiver) and IGates [9] where IGate [9] is a gateway APRS station. IGate nodes are able to communicate in the same time with Internet and radio amateur nodes. The IGate's task is to allow packets to cross from the local RF network to the APRS-IS see Figure 1.



purposes is built which is ready to use. This opens research activities in designing and building different antennas because we have problems in reaching IGate server unit from client unit from specific distances.

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KENWOOD TM-D700  
Data Radio

My YAESU VX-8DR



My Dyna [ France ]

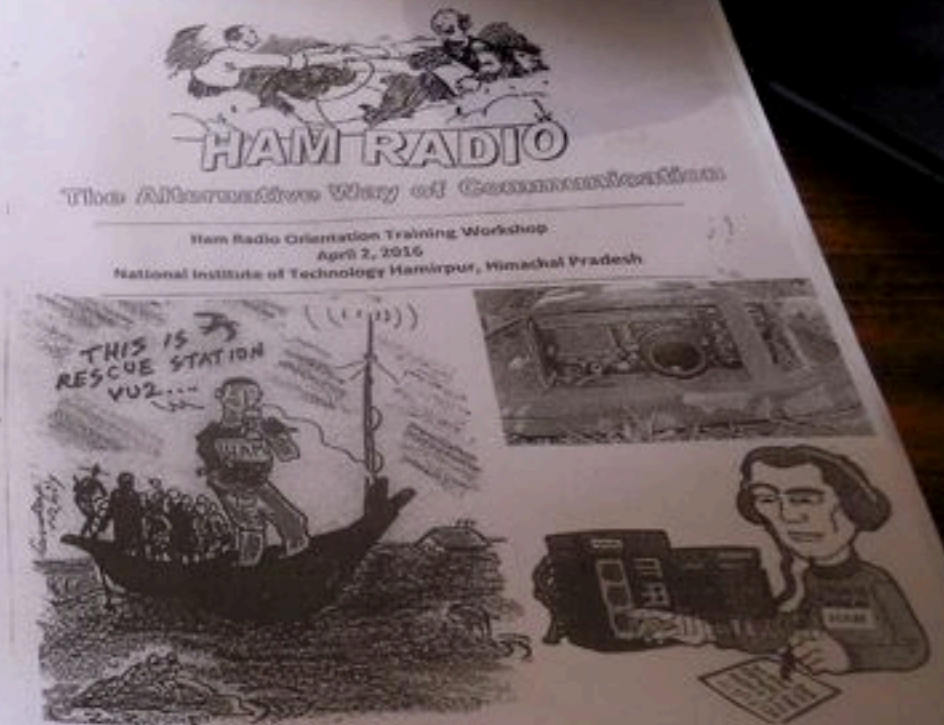
Morse Key  
[ earlier used by  
Boeing Pilots ]

KENWOOD TS-590SG

My Half Wave Dipole  
Antenna



New General mail notification



**VIGYAN PRASAR**  
 (A National Institute for Science & Technology Communication)  
 Department of Science & Technology, Govt. of India  
 C-24, Qutab Institutional Area  
 New Delhi 110 016  
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As we don't see the "Face" like Facebook, we print our face and it is not "Fake" like many Fake Faces in Facebook

QSL Card from Brazil !



# KENWOOD TM-D700 Data Radio/Digipeater

KENWOOD

FM DUAL BANDER TM-D700

▶ 1: VU2MUE-10 11:41 Mic-E  
B01  
N 31° 42.42' 203km  
E076° 31.71' MMS160 317°  
Off Duty cse000° s000k  
APRS demo Simulation  
BACK DEL ↑ ↓ MSG DATE

DATA TM-D700  
XAX-25 PROTOCOL DATA COMMUNICATOR  
KENWOOD







My Field Strength Meter  
[ Armed Forces Junk ]  
to sniff  
“Hidden  
Transmitters”?











KENWOOD

TS-590

USB 142 1009

Power: 1.8 2.5 7  
MAG 1.8 2.5 7  
T-MON 1.8 2.5 7  
PWR 1.8 2.5 7  
SOLAR 1.8 2.5 7  
KEY 1.8 2.5 7  
21 24 28  
CLR 50 ENT

MODE: L.A.M. L.E.V. A.M.P.C. 4000  
P.F.L. HD NR BC  
SPLIT TC KEY A/B  
M.V. M.H. M.V.V.  
CH1 CH2 CH3  
CH4  
SCAN MENU

POWER











 **STATE LEVEL TRAINING PROGRAM ON HAM RADIO**  
*Organised by*  
SIKKIM STATE COUNCIL OF SCIENCE AND TECHNOLOGY  
*Supported by*  
VIGYAN PRASAR, DEPARTMENT OF SCIENCE & TECHNOLOGY,  
GOVERNMENT OF INDIA, NEW DELHI  
DATE: 9<sup>th</sup> - 14<sup>th</sup> MAY 2014

Man speaking at the podium

Panel of four men seated at the table



















**FACE  
of the  
WEEK**

## Ham radio training for Sikkim concludes

SAMIRNUGO

**GANGTOK, May 14:** The weeklong State-level training on ham radio held at science centre at Marchak near Ranipool came to a close today.

The training programme was organized by Sikkim State Council of Science and Technology and supported by Vigyan Prasar, department of Science and Technology, government of India.

The training which started from May 9 had participants from across the districts comprising of Quick Response Team, members of SSDMA, media persons and NGOs members.

Sandeep Baruah, Scientist-E and the main resource person of the training, imparted technical knowledge on ham radio with the skill of theory and practical.

The valedictory function today had the State Science &



Participants using ham radio sets during the training. SE Pic

Technology principal secretary Anil Mainra as the chief guest accompanied by former secretary Rajesh Vema as a guest of honour.

Mainra urged the participants to make ham radio a hobby as it is useful during the time of emergency. He further appealed all the participants to clear its first

hurdle and possess the license after which the department will provide equipments.

The function also had a power point presentation by Vema, who is also a ham radio operator from Sikkim. He encouraged the participants to become ham operators and to help the people in the time of disasters.

Land Revenue joint secretary Ganesh Khanal urged the trainees to be more dedicated and keep the skill in track. He further stated that the department in consultation with the Science & Technology department will soon start the amateur radio (ham radio) in Sikkim for emergency situations like natural disasters.

The trainees will have to appear and qualify a written exam which would make them eligible for a ham license to be issued by the Union Communication & IT ministry.

Amateur radio (ham radio) is a popular hobby and service that brings people, electronics and communication together. People use ham radio to talk across town, around the world, or even into space, all without the internet or cell phones. Ham radio plays a key role in the time of emergency like floods, earthquake, landslides etc when telecommunication network fails to work.



**Eye Spec**  
Dr. Mushar  
Dr. Suprat  
Dr. Swarup

Neotia  
**NE**

Neotia Ge  
**ADVANCE**

Head &  
Brain &  
Paedia  
Cervica  
Vascula





STATE LEVEL TRAINING PROGRAM ON HAM RADIO



Organised by

MIM STATE INSTITUTE OF SCIENCE AND TECHNOLOGY

ASSOCIATION OF SCIENTISTS







# Ham radio training in Sikkim

## SE Report

**GANGTOK, March 9:** A six-day certification training-cum-workshop on Ham Radio started today at Sikkim Science Centre, Marchak. The training programme is being organized by Sikkim State Council of Science & Technology with support from Vigyan Prasar, Department of Science & Technology, Government of India.

The Quick Response Team under State Disaster Management department, teachers, media persons, NGOs and volunteers are undergoing the training programme which will cover in-depth Ham Radio studies, informs a press release.

During the workshop, the participants will also get to know the advance applications of Ham Radio such as packet radio and data transfer using PSK31.

The training programme will be followed by an examination to become certified HAM user which will be conducted by Union Ministry of Communication.

The inaugural session was

attended by Science & Technology principal secretary Anil Mainra as the chief guest.

While welcoming the resource persons and participants, Mainra explained the importance of alternative mode of communication during natural disaster and how it can save several lives if there are trained persons in remote areas to communicate with the help of such device.

He suggested all participants to be serious and take interest during the training so that the State's effort does not go waste.

Scientist Sandeep Baruah from Vigyan Prasar and former State Information Technology secretary Rajesh Verma are the resource persons.

During many of the past large scale disasters all over the world, Amateur Radio Service (Ham Radio) has proved its efficacy in quick dissemination of disaster management information like search and rescue, relief work, tracking of missing person, real-time plotting of vehicles and personnel involved in disaster management and transmission of weather telemetry data.



STATE LEVEL TRAINING PROGRAM



SIKKIM STATE COUNCIL OF SCIENCE AND TECHNOLOGY

Organized by  
VIGYAN PRASAR, DEPARTMENT OF SCIENCE & TECHNOLOGY,  
GOVERNMENT OF INDIA, NEW DELHI

VENUE: SIKKIM SCIENCE CENTRE

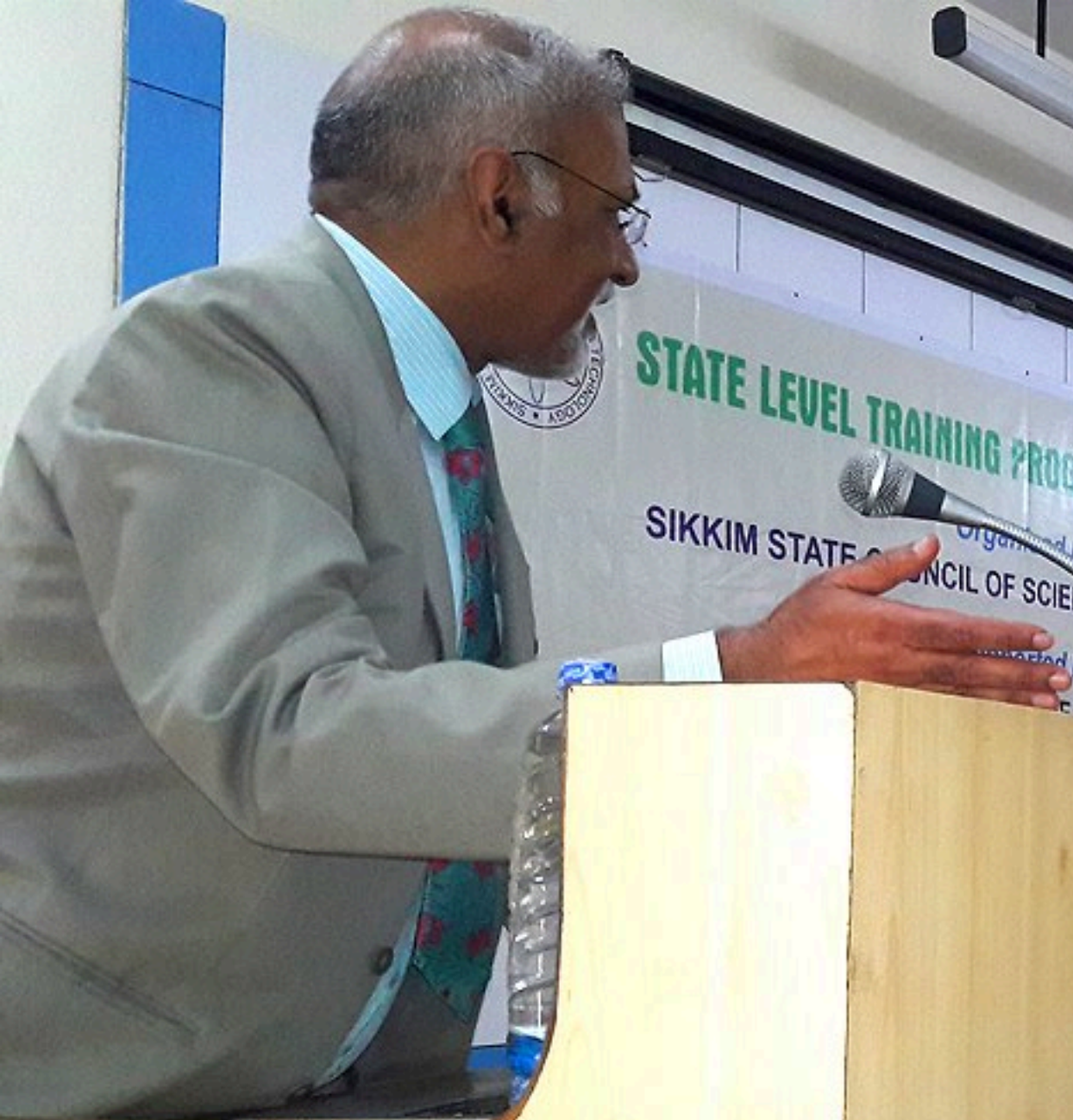
DATE: 9<sup>th</sup> - 14<sup>th</sup> MAY 2016











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MAY 2016





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## Gangtok resident s Mansarovar Yatra

**Staff Reporter**

**GANGTOK, May 9:** An assistant engineer working with the State Rural Development department has been selected to undertake the Kailash Mansarovar Yatra through Nathu La route this year.

Toyanath Sharma (47) from Gangtok would visit Kailash Mansarovar through Nathu La in the fifth batch of the annual pilgrimage. His name was selected after the computerised draw of lots conducted by the Union External Affairs (MEA) ministry in New Delhi on May 6.

Sharma said he is happy but not excited. "I am happy that my name has been listed out in the draw but I am not excited as I have to go through medical test," he told SIKKIM EXPRESS.

A total of 2,482 complete applications, comprising 1948 males and 656 females, were registered for the draw this year. Among them, names of 1,430 applicants have been selected to undertake the yatra starting from June 12.

State Tourism department officials said they are however



**Toyanath**

unaware of Sikkimese shortlisted for

In 2013 pilgrims from selected. The the opening motorable route through Nathu La Sikkim. The following a Indian and C in 2014. The pilgrims are via Nathu La route.

The MEA yatra during each year through routes - the Uttarakhand Pass in Sikkim open to eligible holding valid who wish to Mansarovar purposes.





STATE LEVEL SCIENCE PROGRAM ON HAM RADIO  
Sponsored by  
SIKKIM STATE COUNCIL OF SCIENCE AND TECHNOLOGY  
Supported by  
PRASAR, DEPARTMENT OF SCIENCE & TECHNOLOGY,  
GOVERNMENT OF INDIA, NEW DELHI  
SIKKIM SCIENCE CENTRE  
DATE: 14<sup>th</sup> MAY 2014







# STATE LEVEL TRAINING PROGRAM ON HAM RADIO



Organised by  
SIKKIM STATE COUNCIL OF SCIENCE AND TECHNOLOGY

Supported by  
VIGYAN PRASAR, DEPARTMENT OF SCIENCE & TECHNOLOGY,  
GOVERNMENT OF INDIA, NEW DELHI

VENUE: SIKKIM SCIENCE CENTRE

DATE: 9<sup>th</sup> - 14<sup>th</sup> MAY



































ShopBot

APPS























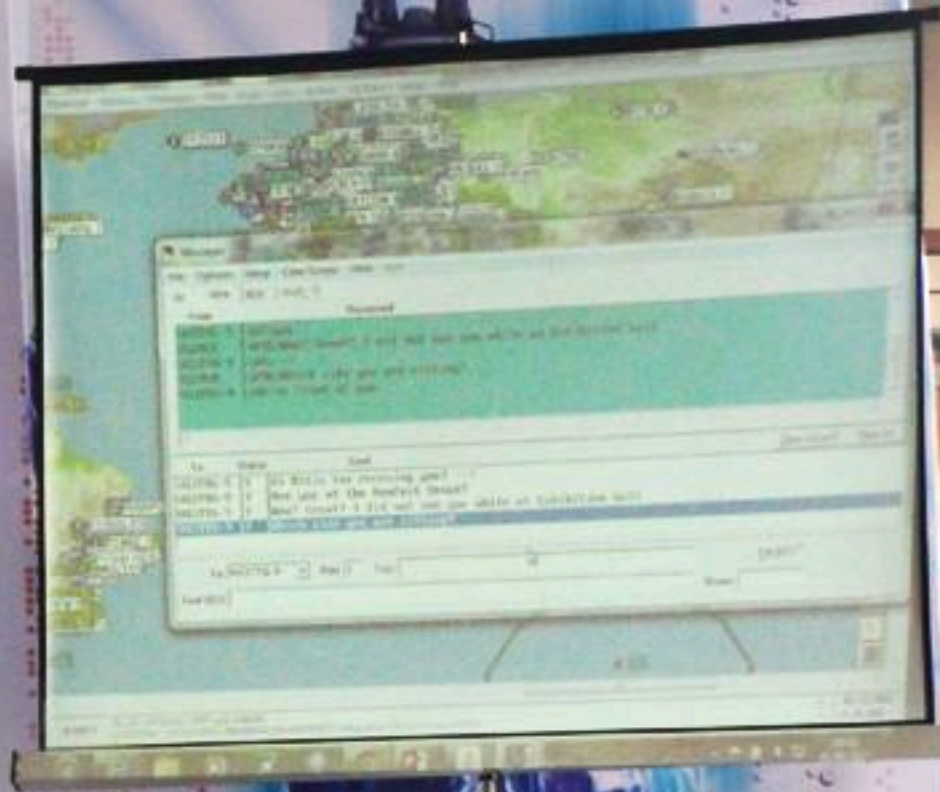




# INDIA 2013

# LIOR

# TEM











 **ABES Engineering College, Chazid**  
NAAC Accredited & Multiple Branches (CSE)  
 **acm**  
**ABES International Workshop**  
Integrating  
from





**Miroslav Skoric, YT7MPB  
Serbia**

ROAD OFFICIALS  
STOP IN  
SLIGHT HOPE



**IP67 [ Dust Proof  
Water Proof ]  
Pelican Case**



**12 Volt Fully  
Charged  
High capacity  
Preferably 47 Ah  
SMF Battery inside**

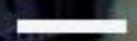


**13.8 Volt  
[ International  
Standard for  
Amateur  
Radio  
Equipment ]**



**23 Ah  
[Ampere hour]**

**Inside it is  
YAESU FT-857D  
HF/VHF/UHF/50 MHz  
9 year old radio & a  
Morse Key**







# DREAM 2047

June 2002

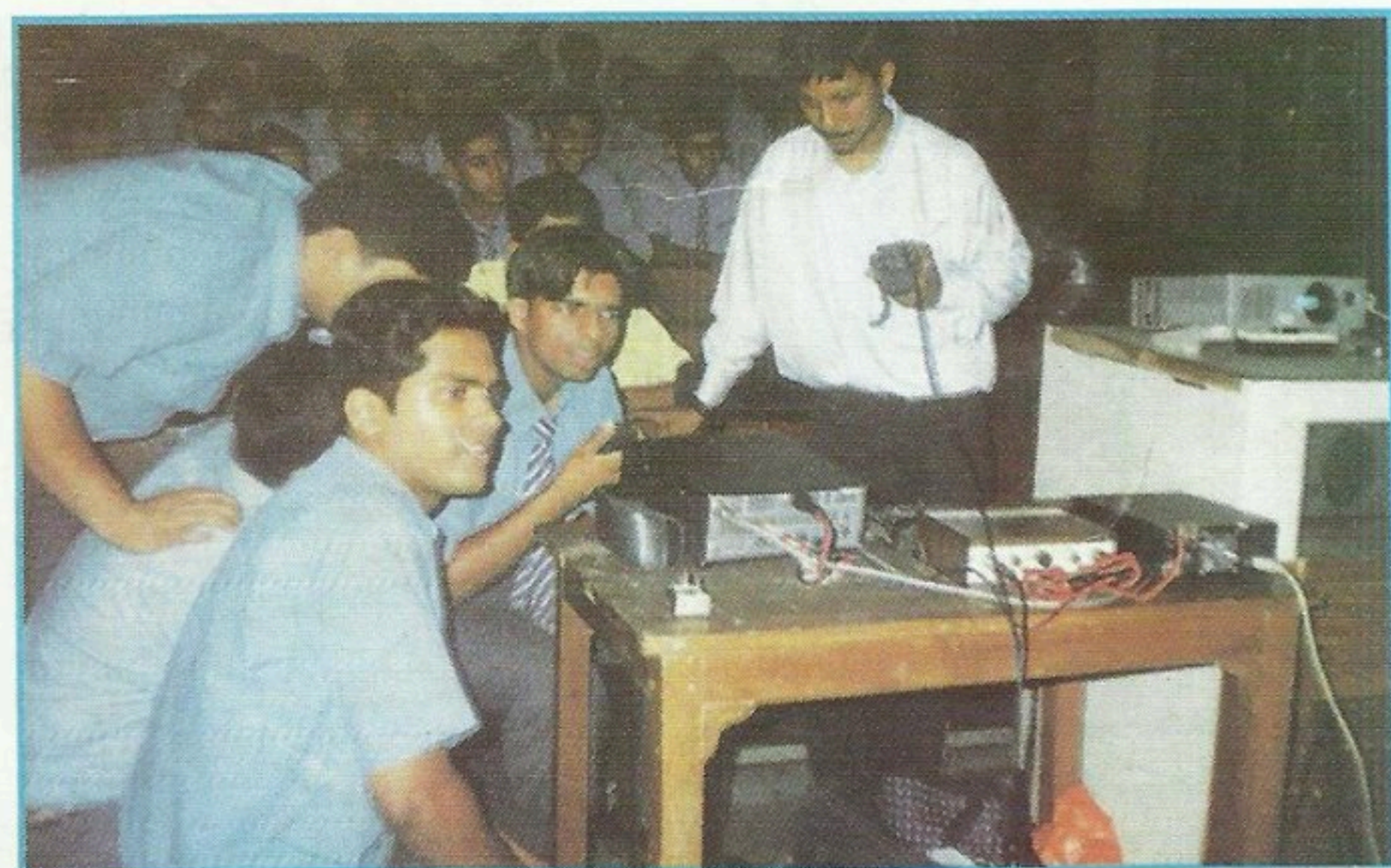
Vol. 4

No. 9

## VP News

### AMATEUR RADIO (HAM RADIO) PROMOTIONAL ACTIVITIES

Vigyan Prasar has been continuing with its effort to popularize the hobby of ham radio amongst school children. On April 24, 2002, a lecture-cum-demonstration programme on ham radio was organized by Vigyan Prasar for the students of Springdale School, Dhaulakuan, New Delhi. It was an exciting experience for the young students to listen to and at the same time talk to an unknown person located hundreds of kilometers away through short wave radio. Shri Dattatry Deogaonkar, VU2DSI, a ham radio operator located in Ahmednagar, Maharashtra responded to the call given from VU2NCT club station of Vigyan Prasar and interacted with the children. Students from sixteen different schools in and around Delhi got an opportunity to attend another such programme organized on May 3, 2002, on the occasion of a science fair 'Indradhanush-2002'. The science fair was organized by SEARCH (Society for Science & Environment, Awareness, Research, Communication & Heritage). The students interacted with Shri Dattatry for almost an hour exchanging varieties of information through the amateur radio club station VU2NCT/MUE. The demonstration programme was assisted by Shri Sushil Dhingra, VU2LFA (New Delhi) by way of on-the-air contact with VU2NCT/MUE. Students from Mount St. Mary's School, Delhi Cantt. attended another awareness programme organized by Vigyan Prasar on May 8, 2002. Shri Muktesh Chander, VU2HJZ, an IPS official with the Delhi Police, also participated in the programme. The utility of amateur radio from the disaster mitigation point of view was explained by him to the students. Mrs. Bharthi Prasad, VU2RBI (New Delhi) and Shri Sushil Dhingra, VU2LFA (New Delhi) assisted the programme by establishing radio contact with the demonstration station VU2NCT/MUE.



Ham Radio demonstration to Mount St. Mary's School, Delhi Cantt



Ham Radio demonstration at "Indradhanush-2002".

## Inside

### EDITORIAL

☛ Charles Robert Darwin



☛ "AIDS is more than a medical problem"

☛ The Universal Physical Constants and the Cluster Hypothesis



☛ Agharkar Research Institute, Pune



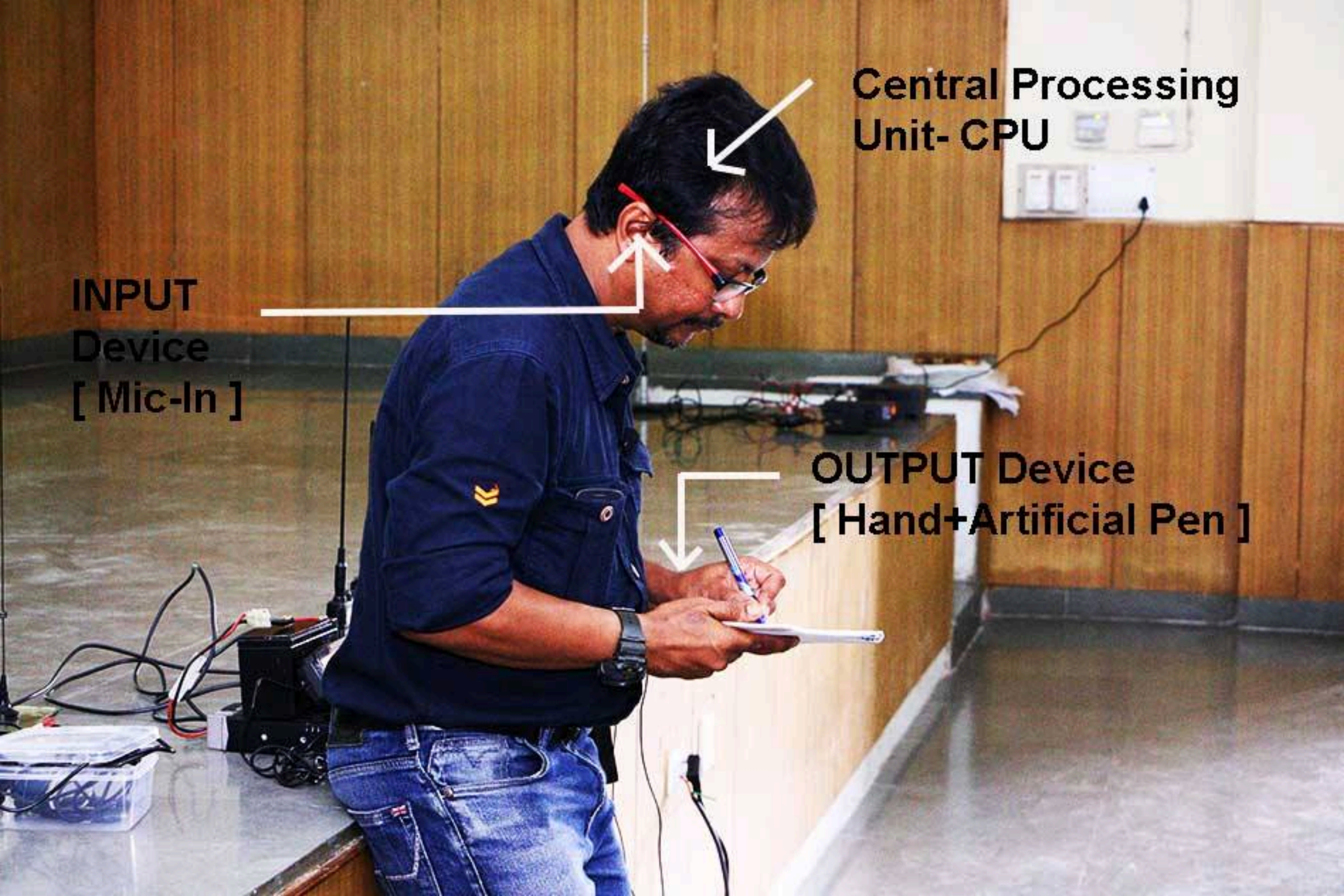
☛ Richard Sonnenfeldt



☛ Recent Developments in Science & Technology

...think scientifically, act scientifically ... think scientifically, act scientifically ... think scientifically, act...



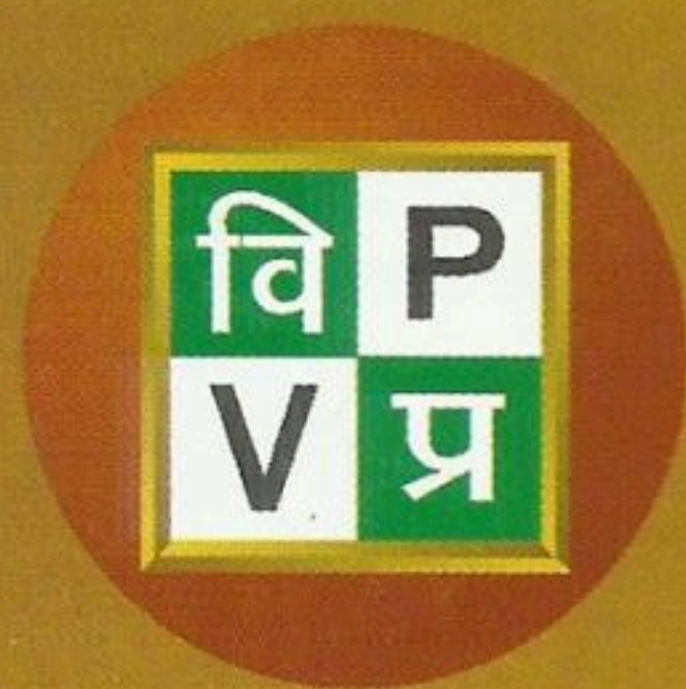


**Central Processing Unit- CPU**

**INPUT Device [ Mic-In ]**

**OUTPUT Device [ Hand+Artificial Pen ]**





# DREAM 2047

July 2006

Vol. 8

No. 10

Price: Rs. 5.00

## VP News

### State Level Ham Radio Training Programme in Uttaranchal

A state level ham radio training programme was organized by Vigyan Prasar at Dehra Dun jointly with the Uttaranchal State Council for Science & Technology (U-COST) and National Service Scheme (NSS), Uttaranchal, from June 7 to 29, 2006.

Uttaranchal being in a highly seismic zone, this effort was initiated to impart radio communication skills to the NSS volunteers and to set up a ham radio communication network for emergency communication. Fifty-two Programme Officers and volunteers of the National Service Scheme (NSS) from thirteen districts of Uttaranchal were trained for the Amateur Radio Licensing examination.



NSS volunteers listening to ham radio transmissions during a demonstration programme

### Workshop on Innovative Experiments in Physics

A two day workshop on 'Innovative Experiments in Physics' was held at Army Public School, Lucknow on 30 and 31 May, 2006. The workshop was inaugurated by Prof. V.D. Gupta, former Vice Chancellor of Allahabad University. Ms K. Dasgupta Misra, Vigyan Prasar welcomed the participants and made a presentation on Vigyan Prasar and its activities. The workshop was attended by more than 35 teachers of physics from various districts of U.P. The participants were from Varanasi, Allahabad, Lucknow, Kanpur, Gorakhpur, Jaunpur, Barabanki, and so on. After the inauguration, the demonstration of innovative experiments in Physics was shown by Shri Mukesh Roy of IIT, Kanpur. More than twenty five innovative experiments in Physics were demonstrated to the participants. Teachers appreciated the workshop and

Contd. on page...21

## Inside

EDITORIAL p.39

Marie-Sophie Germain p.38

Towards Nutrition Security p.33

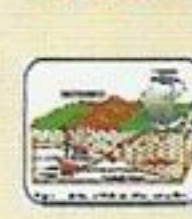
How many planets in the sky? (part-II) p.30

Simple Exercises for Your Back p.28

Earthquake Tips-2 p.25

Recent Developments in S & T p.23

Sky Map for August 2006 p.22



Contd. on page...21



Teachers participating in the workshop

... think scientifically, act scientifically... think scientifically, act scientifically... think scientifically, act...



ABES Engineering College, Ghaziabad

NAAC Accredited & ISO 9001:2015 Certified Branches (CSE, ECE, & ME)



ACM ABES Chennai International Workshop

on

“Amateur Radio Communications & Computational Environments”

for September 2016

Department of IT

by: [Name]  
Date: [Date]







Demo at Guwahati Medical College: Covered in the  
STAR NEWS









Antenna Installation at a demo site





















44th Jamboree On The Air (JOTA) for Kendriya Vidyalaya  
Air Force School, Tughlakabad







# HAM operator helps families connect with Tsunami victims

**RAMESH  
RAMACHANDRAN**  
TRIBUNE NEWS SERVICE

NEW DELHI, DECEMBER 28

An amateur radio enthusiast based in the Capital has succeeded where most government agencies have failed. Sandeep Baruah, a licensed HAM operator who works in a government organisation by day and pursues his hobby from home at night, has managed to establish communication links with Port Blair, the capital of Andaman and Nicobar Islands, and has helped relay messages between the people stranded on the island and their families back home.

Sitting at his terminal Tuesday afternoon, Baruah told The Tribune that he has received 10 "calls" over the past 48 hours. "I have received e-mails and SMSes from several places at home and abroad ... Bangalore, Ranchi, Pune and Thailand .... I have relayed all their messages to this team of HAM operators stationed at Port Blair and forwarded the replies from them to the families wherever they are," he said. One such distraught family is from New Delhi.

Dr Karan Singh Chauhan, who teaches in a college here, was holidaying with his two sons and a daughter on the island when the Tsunami hit the shore. It had only been a few days from the time they reached Port Blair. "Fortunately," Dr Chauhan recalled, "There were these people staying on the fifth floor of the hotel where we were put up ... they had this equipment (HAM), so we asked them if they could relay the infor-

mation of our well-being to people back home."

Within hours, Sandeep Baruah was on the telephone informing Dr Chauhan's domestic help of their whereabouts. Dr Chauhan and his family, who returned to the Capital last night, have not spoken with Baruah yet but he is all praise for him and the amateur radio operators on the island for coming to his help in their hour of need. Baruah, meanwhile, has no regrets. He has no time for that for there are other calls to be attended to, he says as a distant station crackles at his terminal.

Like Dr Chauhan, Mrs Cesar Maia from Bangkok, Thailand, has established contact with Baruah. She wants to if her husband is safe and sound on the island. "I have not received any news about her husband but I am trying ... the audio quality today is poor, so I might have to wait longer to hear from my counterparts stationed on the island," says Baruah, who is happy being Good Samaritan for people he has come to know only in the past few days.

Meanwhile, Dr Chauhan is still to recover from his harrowing experience on the island. "Buildings were literally swaying from side to side, the hotel where we were staying was damaged ... there were cracks in the walls, the sea was violent and washed away anything and everything that came in its way ... even the boundary wall of a college nearby was swept away ... all of us spent the first night outside," he recalls before he, his children and one other family flew to Kolkata on way to Delhi.



Sandeep Baruah, a licensed HAM operator who works in a government organisation by day and pursues his hobby from home at night, has managed to establish communication links with Port Blair.

## Delhiites chip in with relief

TRIBUNE NEWS SERVICE

NEW DELHI, DECEMBER 28

The leader of Opposition in Delhi Legislative Assembly, Prof. Jagdish Mukhi, has expressed grief over the widespread death and destruction caused by the Tsunami in southern India and many countries in the Indian Ocean.

A meeting of the BJP legislature party was called in this regard and it observed a two-minute silence as a mark of respect to the deceased. The BJP legislators have also

decided to donate their one-month salary for the victims.

Meanwhile, the NDMC Vice Chairperson, Tajdar Babar, has moved a resolution for contributing Rs. one crore as financial assistance from the municipal funds. This is in addition to the token contribution from NDMC employees for the quake victims of Tamil Nadu.

The Municipal Corporation of Delhi has also decided to pay Rs. 4 crore to the Prime Minister's Relief fund. This fund is being raised by way of

contributions from MCD councilors who are contributing their one month's stipend and employees who are contributing one day's salary. The contribution of the latter adds up to Rs 3 crore.

According to the mayor, the MCD has set up collection centres in all 12 zones under the supervision of Deputy Commissioner to collect relief materials. The material collected would be handed over to the Ministry of Home Affairs for transportation to the affected areas.









A Guide to Ham Radio

Uttam Girl's Public School, Ghaziabad



e  
nidm  
Towards a Disaster Free India  
Disaster Situations"  
NIDM  
MANAGEMENT  
of India  
shan



Man standing at the front of the room, possibly a speaker or presenter, wearing a dark shirt and glasses.

Panel of five men seated at a long wooden table. From left to right: a man in a dark suit, a man in a white shirt, a man in a dark suit, a man in a dark suit, and a man in a dark suit. They are looking at documents or laptops on the table.

Sandeep Bhatia

Kamini Chugh

Rohit Kumar

RII















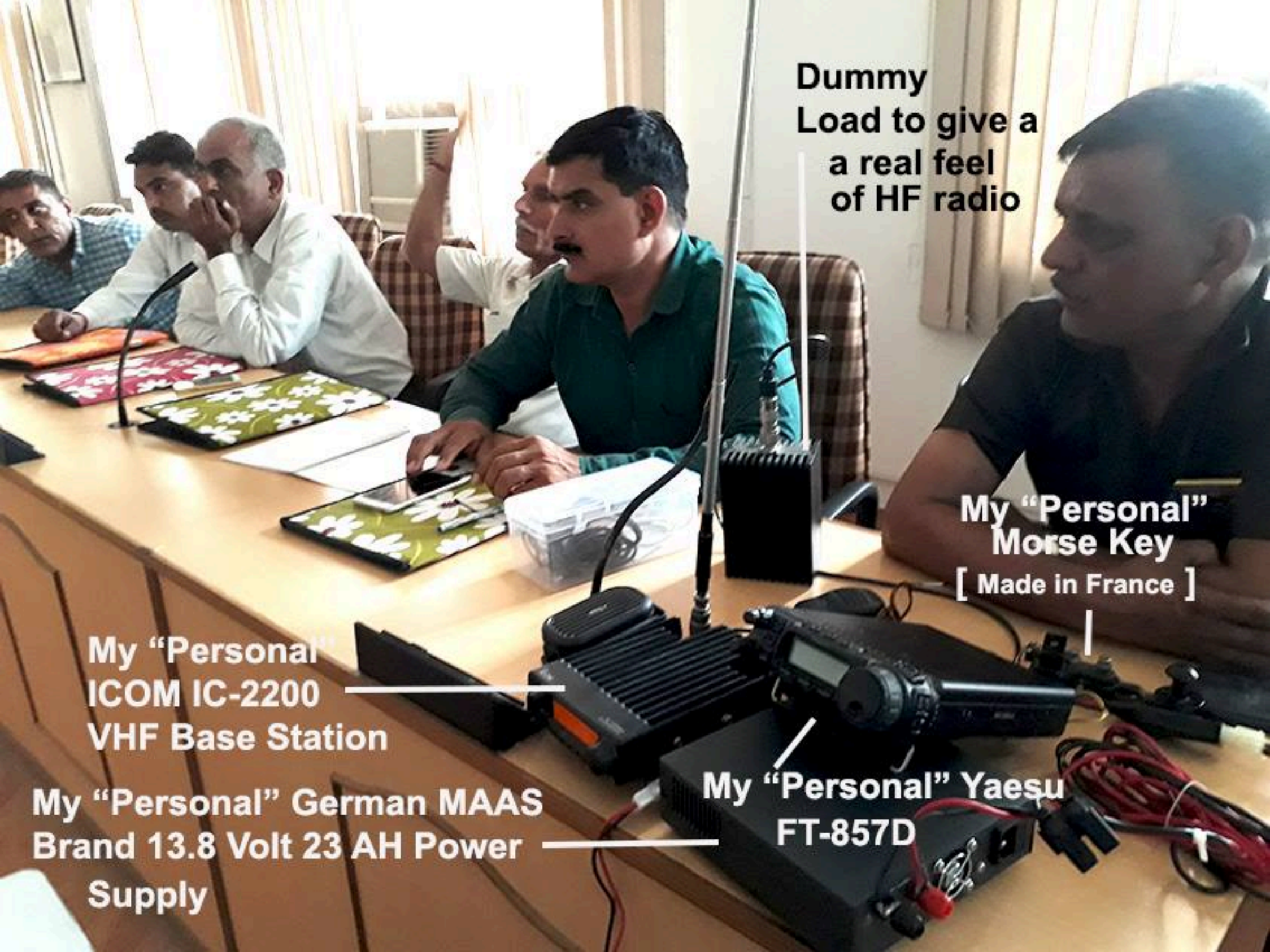
**Dummy  
Load to give a  
a real feel  
of HF radio**

**My "Personal"  
Morse Key  
[ Made in France ]**

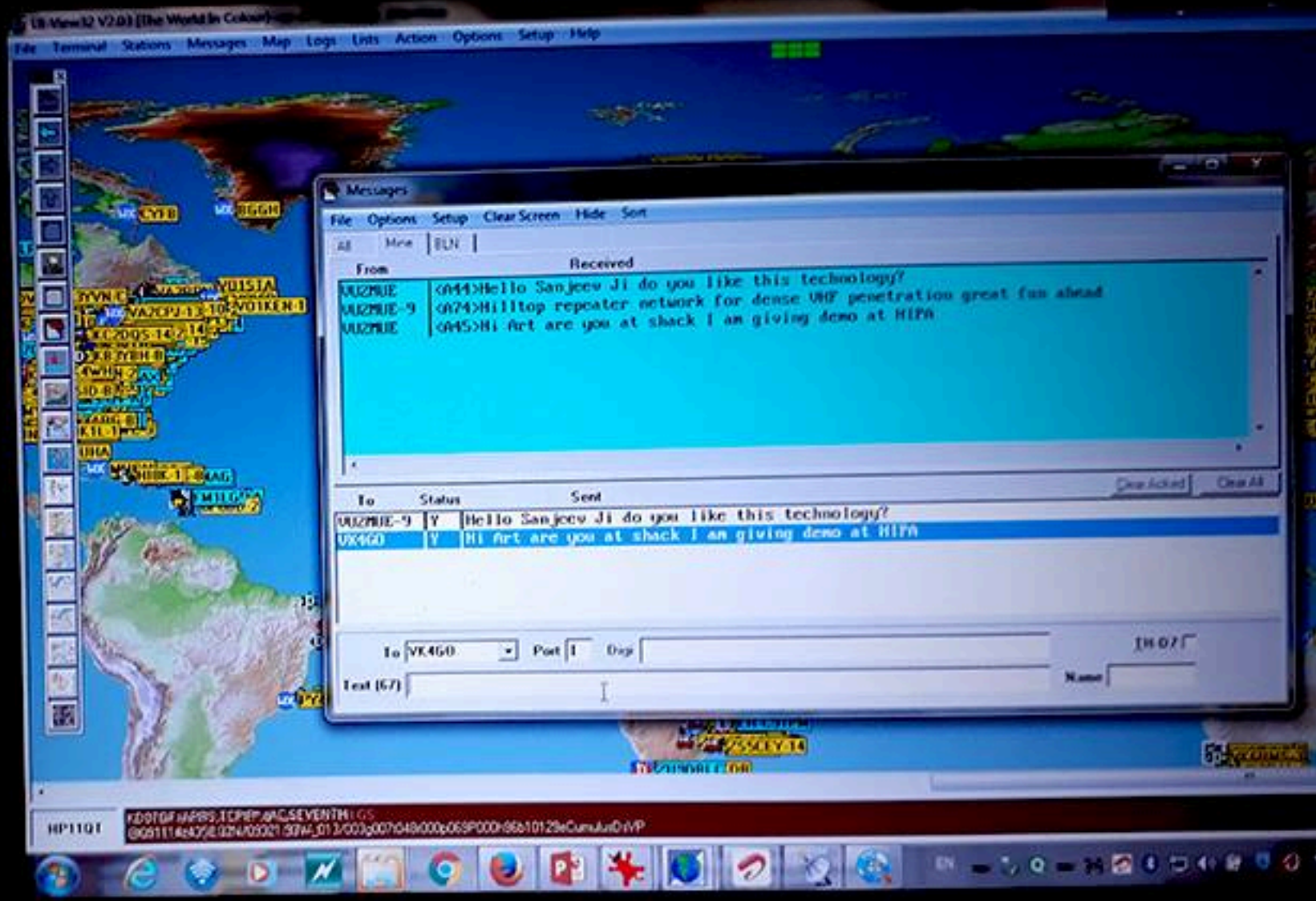
**My "Personal"  
ICOM IC-2200  
VHF Base Station**

**My "Personal" German MAAS  
Brand 13.8 Volt 23 AH Power  
Supply**

**My "Personal" Yaesu  
FT-857D**



















Messages

File Options Setup Clear Screen Hide Sort

All Mine BLN

From	Received
UU2MUE	<A44>Hello Sanjeev Ji do you like this technology?
UU2MUE-9	<A74>Hilltop repeater network for dense VHF penetration great fun ahead
UU2MUE	<A45>Hi Art are you at shack I am giving demo at HIPA

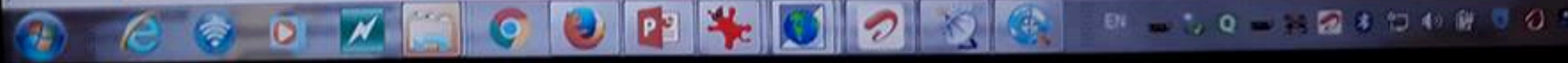
Clear Acked Clear All

To	Status	Sent
UU2MUE-9	Y	Hello Sanjeev Ji do you like this technology?
VK4GD	Y	Hi Art are you at shack I am giving demo at HIPA

To: VK4GD Port: I Digi: IH-D7

Name:

Text (67)













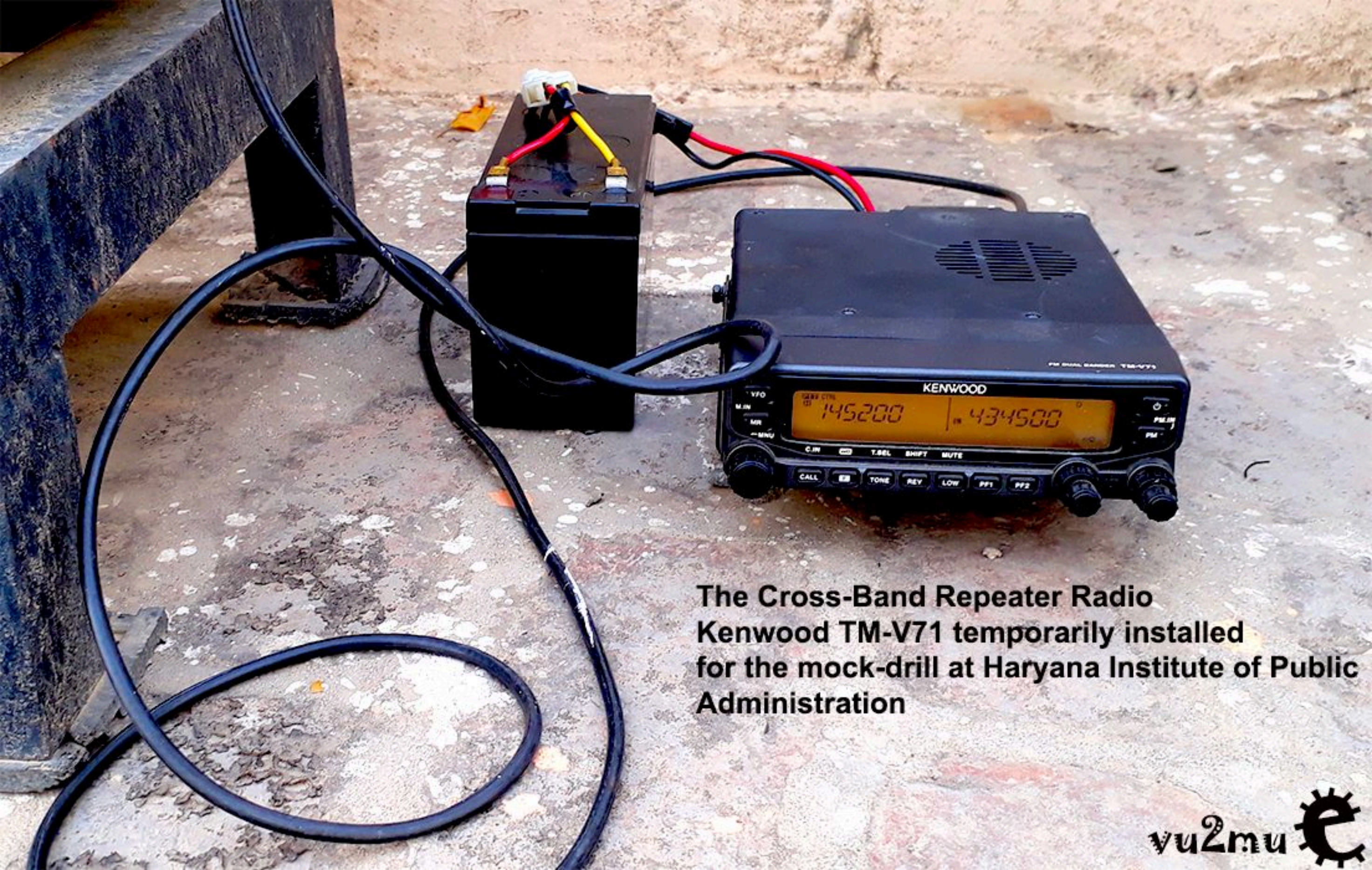
My "Personal"  
Yaesu VX-8DR  
APRS Radio

My "Pelican Case"  
gifted by  
Sudip VU3SFF  
to carry my "Personal"  
Yaesu [Japan]  
FT-857D+Morse Key+13.8 Volt DC Power Supply









**The Cross-Band Repeater Radio  
Kenwood TM-V71 temporarily installed  
for the mock-drill at Haryana Institute of Public  
Administration**





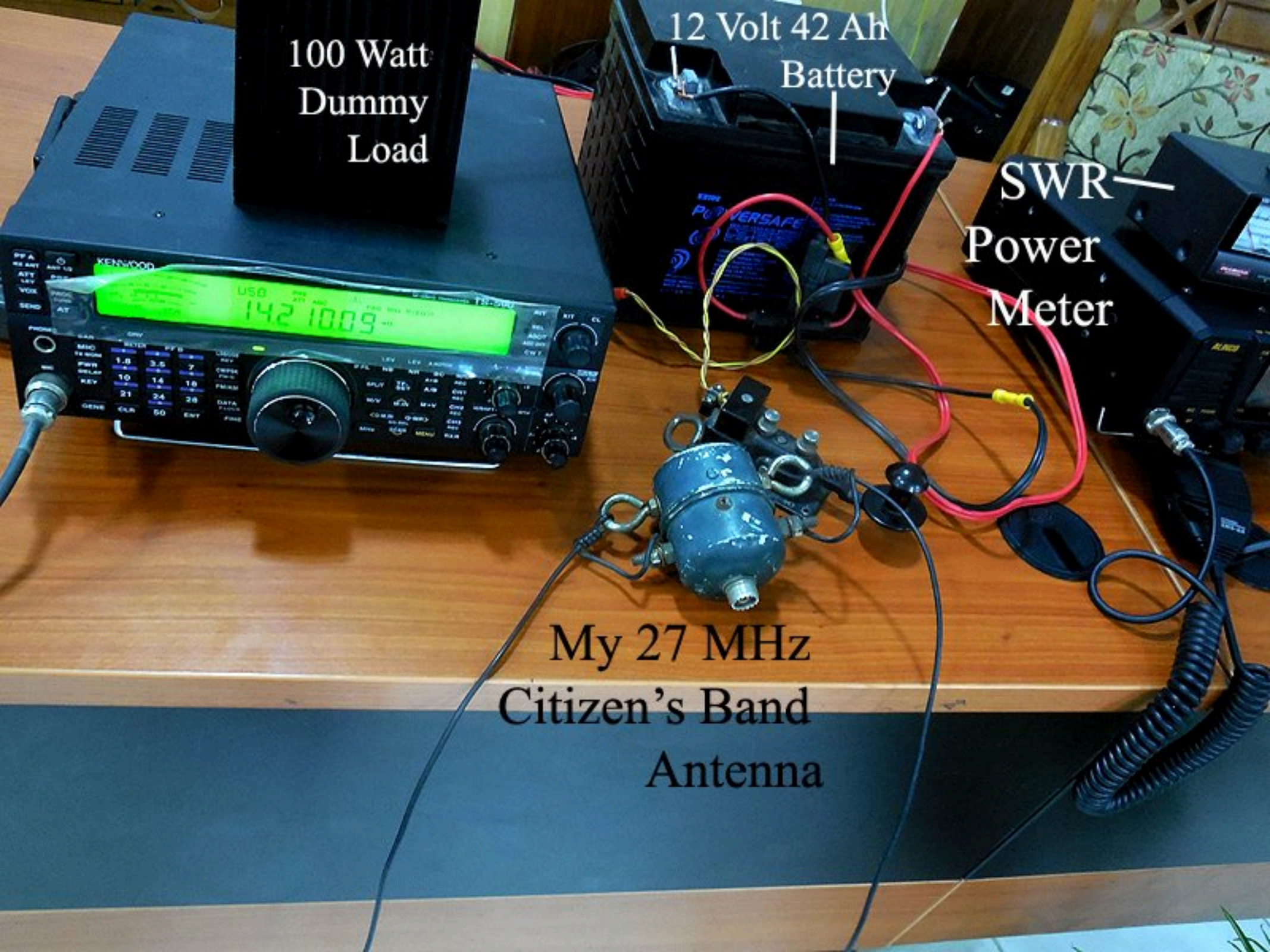


100 Watt  
Dummy  
Load

12 Volt 42 Ah  
Battery

SWR  
Power  
Meter

My 27 MHz  
Citizen's Band  
Antenna











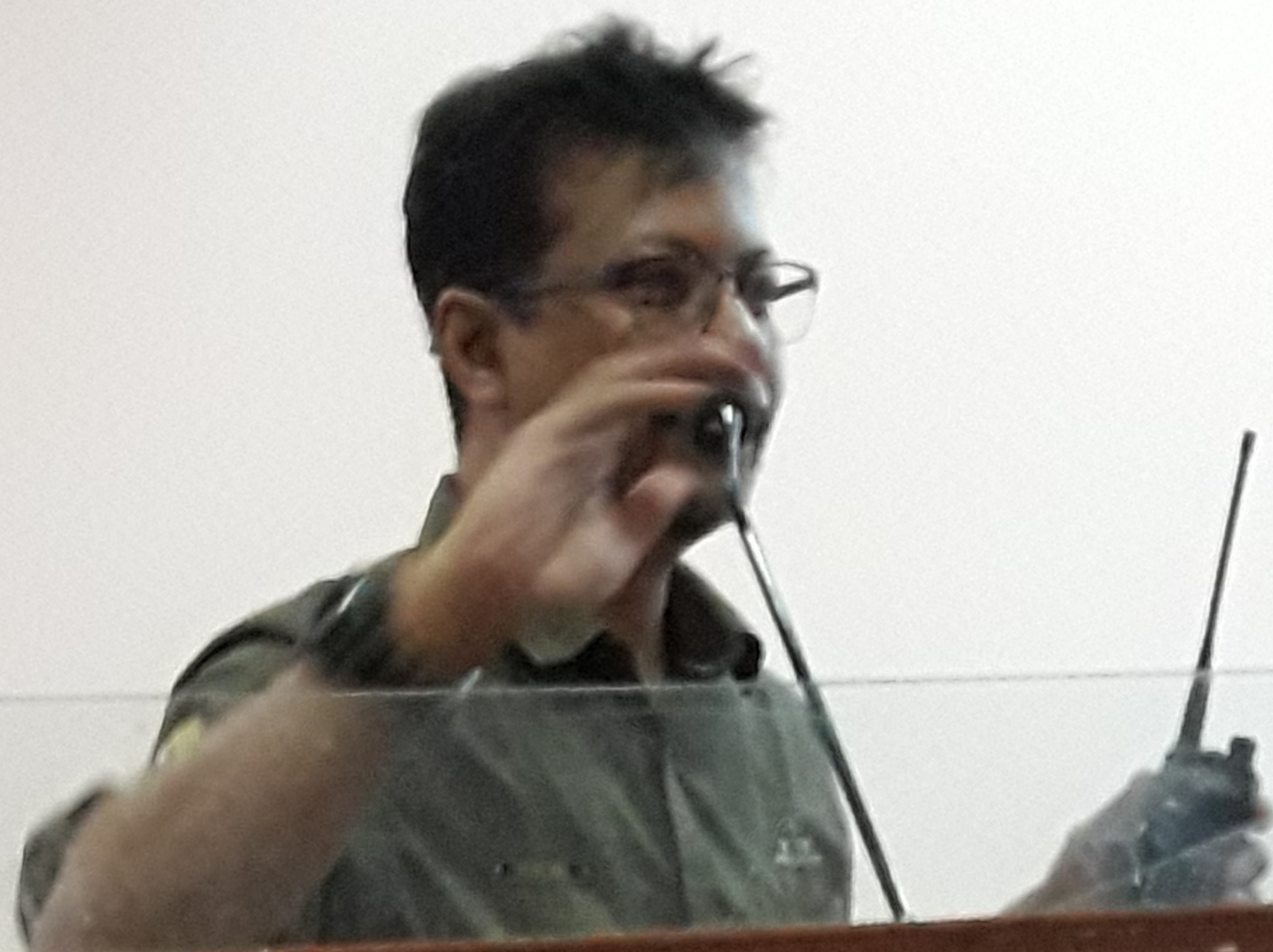


































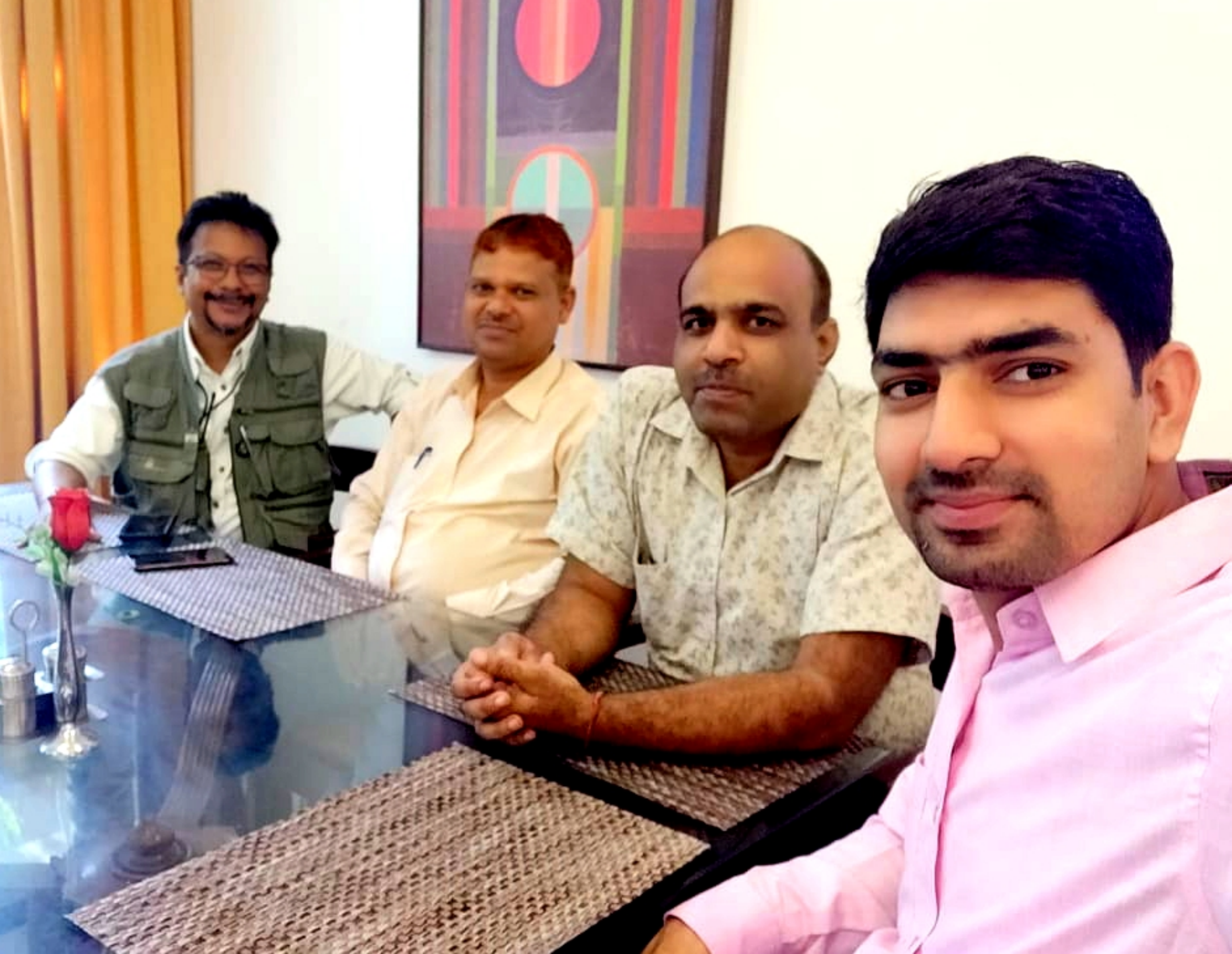


COCO  
5  
HOMME+FEMME

































And Shekhawat

B H And Kumar

SHIVA PRAKASHI







# AMATEUR RADIO ADVANCED DIGITAL COMMUNICATION NETWORK

Supported By  
DEPARTMENT OF INFORMATION TECHNOLOGY  
GOVERNMENT OF INDIA



**NATIONAL INSTITUTE OF AMATEUR RADIO**  
Raj Bhavan Road, Hyderabad, India

Email: [niarindia@hotmail.com](mailto:niarindia@hotmail.com), [vu2nro@gmail.com](mailto:vu2nro@gmail.com), URL: [www.niar.org](http://www.niar.org),  
Telefax: +91-40-23310287, Tel: 65167388





Ham Radio Digital Communication demo  
Vignan Techno SPAES School  
Huzurnagar, Hailgonda.

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27th April, 2013

NIAR  
VU2NRO

Jointly organized by  
Vigyan Prasas [VP], DST, Govt of India  
&  
National Institute of Amateur Radio  
Hyderabad

AMATEUR RADIO  
ADVANCED DIGITAL COMMUNICATION NETWORK

Supported By  
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NIAR  
VU2NRO

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Raj Bhavan Road, Hyderabad, India















TRIG B TRIUMPH Approved by TTA

















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100.000000  
L3E  
2.070000

NEWTRON











94401 64997



Model Community











VU3JOY

VU2MUE

VU2IVV







## SCHEDULE:

**1400 hrs : Assemble in the  
Presentation Hall**

**14.15 Hrs : Keynote**

**14.30 Hrs : Formal Inauguration**

**14.45 Hrs : Project Overview**

**15.30 Hrs : Satellite Tracking  
Demo**

**1600 Hrs : A session on Wireless  
Communication  
by VU2MUE,  
DST-Govt. of India**

**16.30 Hrs : HF,VHF,UHF Live  
Transmission Demo**

## CONTACT US:

ace.gs.team@gmail.com

acegroundstation.blogspot.com

## MEMBERS:

ANUJ TIWARI	9664209976
ANIRUDDHA KHADYE	9029001386
DIVYA ACHARYA	9172401360
NIRALI KHANDAR	9821291532
NIKHIL JOSHI	9869273473
SAURABH SANGHAI	9969474464
SWARNKAMAL SINGH PARMAR	9892702912
VIRAL SHAH	9619207586



ATHARVA COLLEGE OF  
ENGINEERING'S



Atharva Satellite Ground-Station  
presents

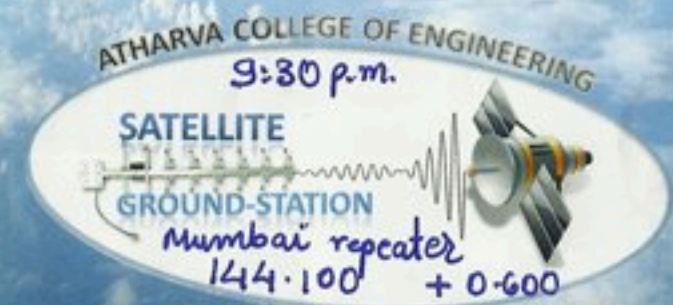
**WIRELESS TECHNOLOGY  
AND  
SATELLITE COMMUNICATION SYMPOSIUM**

on

15th March, 2012

at

**4th Floor Presentation Hall, Phase 3.  
Atharva Educational Complex.**



*Matheran Repeater*

*145.000 + 0.600*

**We Innovate Communication...  
We Communicate Innovation !**









ATHARVA COLLEGE OF ENGINEERING

SATELLITE

GROUND-STATION

Sandeep Baruah - VU2MUE





















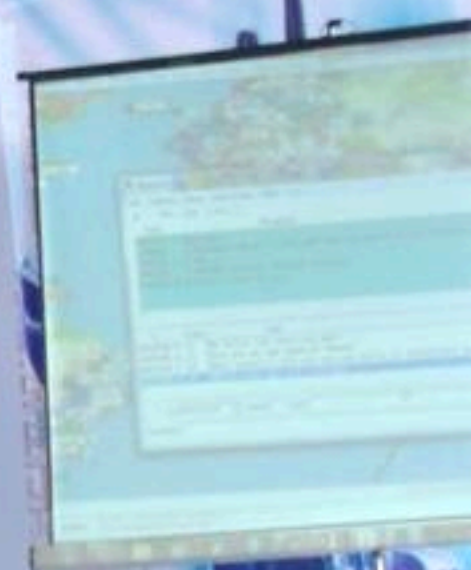
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# HAMFEST INDIA 2013

## GWALIOR

### 21-22 SEPTEMBER







Ham Radio Digital Communication  
Vignan Techno SPAES School  
Huzumager, Hailgonda.

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27th April, 2013

Jointly organized by  
Vigyan Prasar [VP], DST, Govt of  
&  
National Institute of Amateur R.  
Hyderabad



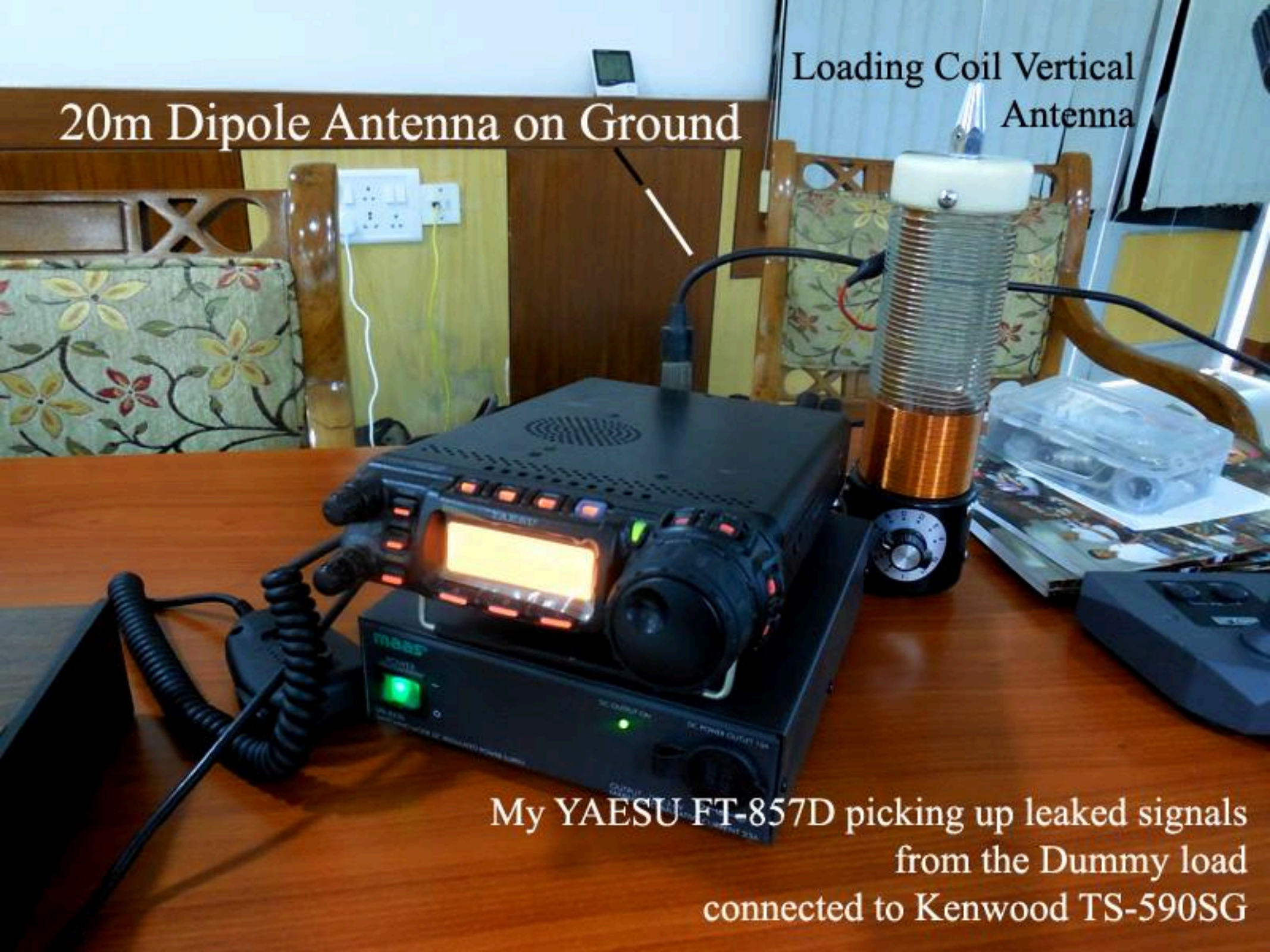






20m Dipole Antenna on Ground

Loading Coil Vertical  
Antenna



My YAESU FT-857D picking up leaked signals  
from the Dummy load  
connected to Kenwood TS-590SG









Vigyan Prasar (VP), DST, Govt of India  
&  
National Institute of Amateur Radio  
Hyderabad

STATE OF AMATEUR RADIO  
Hyderabad India



COMPASSION  
PRO  
KARUNA IM  
Ph : 044 - 252

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2012-13  
2012















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N DL  
www.nidhi.com







Contact : K.Brinhas Rao, Chairman. 94401 64  
**IGNAN**  
O SPAES SCHOOL  
School Of International Diversity





Contact : K.Srinivas Rao, Chairman. 94401 64

# IGNAN

GO SPAES SCHOOL

Centre Of International Community







Ham Radio Digital Communication demo  
Vignan Techno SPASS School  
Muzurnagar, Telangana.

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27th April, 2013

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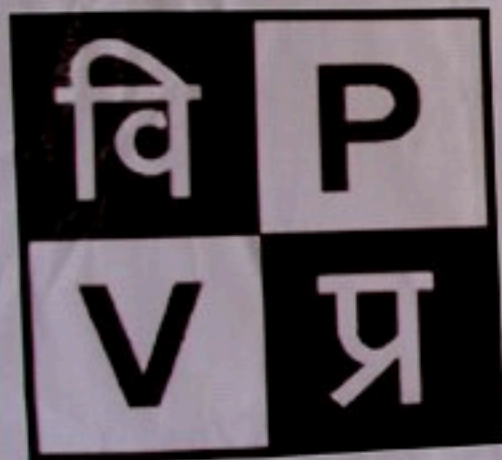
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&  
National Institute of Amateur Radio  
Hyderabad

ADVANCED DIGITAL  
DEPARTMENT OF  
NATIONAL INSTITUTE  
OF AMATEUR RADIO





**Ham Radio Digital Communication demo  
Vignan Techno SPAES School  
Huzurnagar, Nalgonda.**



**27th April, 2013**



**Jointly organized by  
Vigyan Prasar [VP], DST, Govt of India  
&  
National Institute of Amateur Radio  
Hyderabad**





VU2NC

THE WORLD IN YOUR

HANDS (HAM RADIO)

A student from Guruharkishan Public School

















Department Of Electronics & Communication  
**TWO DAY WORKSHOP**  
**ON**  
**APPLICATIONS OF HARDWARE**  
Guest Instructors:  
Mr. Sandeep Baruah      Mr. Satnarayan  
Date: 28<sup>th</sup>-29<sup>th</sup> September, 2018





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Department of Science & Technology, Govt. of India

National Centre for Science & Technology Communication (NCST) - Information Prasar

Lect

[Scientists - Students (Interactive Programme)]







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Science & Technology of India  
Technology Communication (STC) & Vigyan Pr  
Lecture Series  
Students Interac







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Department of Science & Technology India  
for Science & Technology Communication Series  
[Scientists as Interact





Department of Science & Technology, India

Council for Science & Technology Communication (Vigyan Prasthiti)

Lecture Series

[Scientists - Students Interaction Programme]





























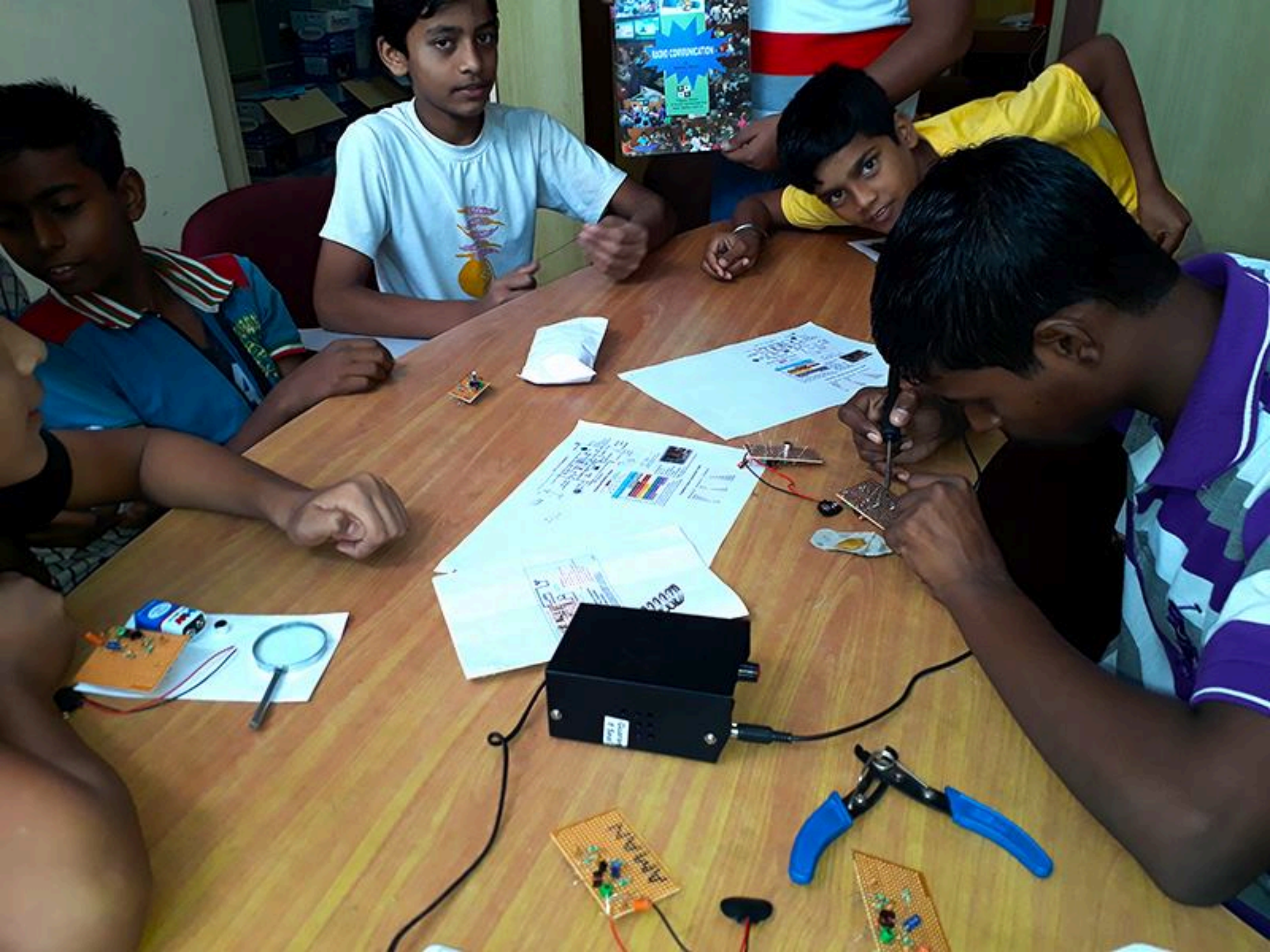




Department of Science & Technology  
National Council for Science & Technology Communic  
Lecture Series  
(Scientists - Students Interaction Progr









WORKSHOP  
OF HAMS OF HAM RADIO  
Mr. Satnam Singh Birdi  
29th September, 2017







Our Experts:

**Mr. Sandeep Baruah**

VU2MUE, SCIENTIST-E, VIGYAN PRASAR

**Mr. Satnam Singh Birdi**

SVUJIPUNJAB AMATEUR RADIO SOCIETY

Date: 28<sup>th</sup>-29<sup>th</sup> September 2017

Workshop: Consultancy Cell









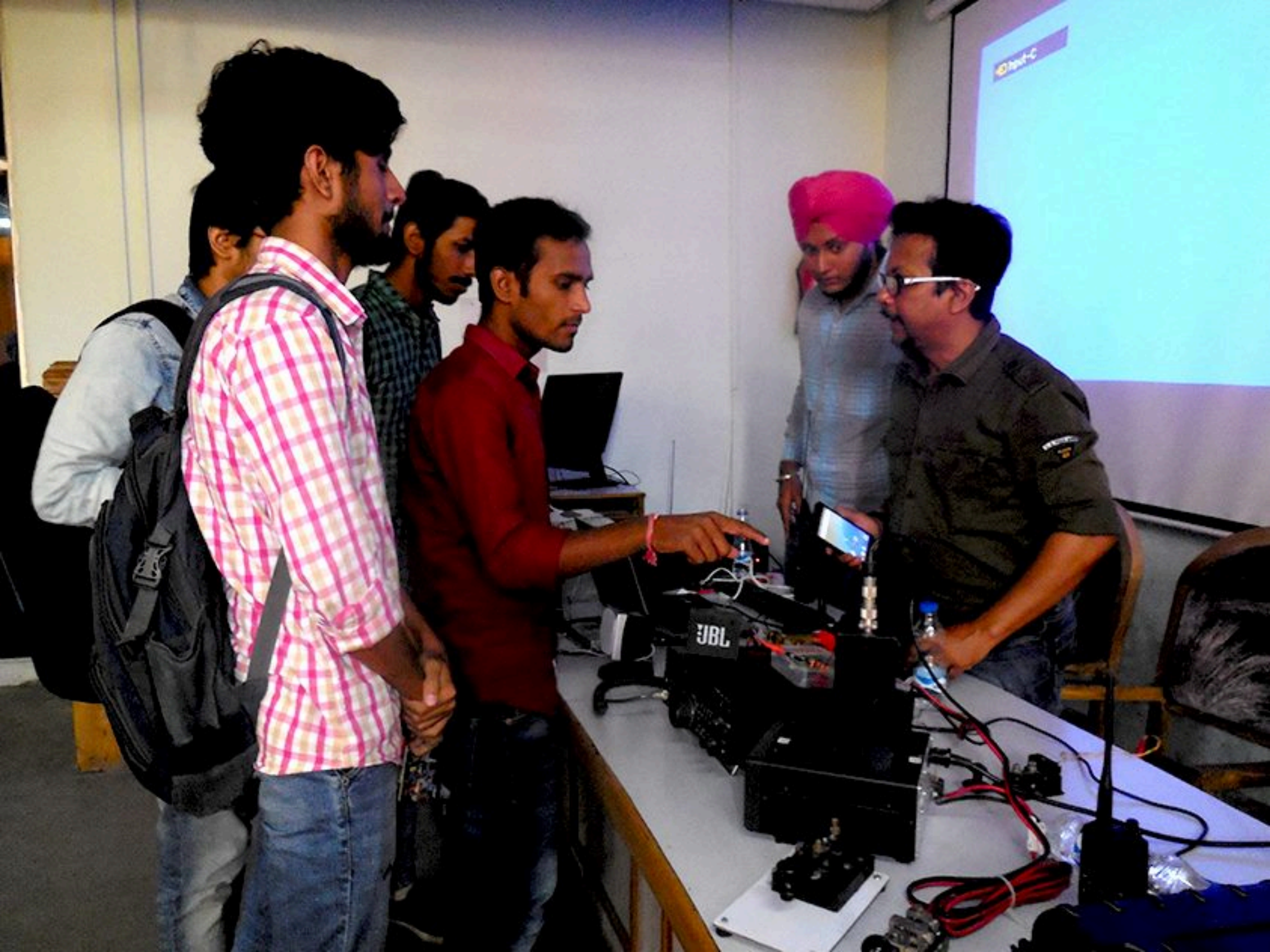


















WORKSHOP  
OF HAMS OF HAM RADIO  
Mr. Satnam Singh Birdi  
29th September, 2017







हैम रेडियो की मदद

भी कर सकते हैं  Digital Addressable केबल टीवी उपभ





DARTS  
VU2DLH  
www.darts.org.in  
P-22 | 1st Floor, Sector 2, Gurgaon, New Delhi - 122002, India  
+91 9891 276 276 | +91 9891 276 276

Amateur Radio  
THE SPACE  
[HAM]

WWW.WC  
on  
HAM R  
Venue



REDMI NOTE 5 PRO  
MI DUAL CAMERA

2019/1/12 17:00





DARTS  
VU2DLH  
Amateur Radio  
THE YOUNG AGE HOBBY



REDMI NOTE 5 PRO  
MI DUAL CAMERA

2019/1/12 16:00





REDMI NOTE 5 PRO  
MI DUAL CAMERA

2019/1/12 15:54





REDMI NOTE 5 PRO  
MI DUAL CAMERA

2019/1/12 15:54





Delhi Amateur Radio Technical Society  
**DARTS**  
 VU2DLH  
 www.darts.org.in  
 9-22/1902, 14 Floor, Sector-2, Rohini, New Delhi-110085, India  
 (P: +91 7996 274 275) | darts@delhi.com

**Amateur Radio**  
 THE SPACE AGENCY  
 (HAM RADIO)

**WORKSHOP**  
 on  
**HAM RADIO TRAINING**  
 Venue - Radio and Electronics Society  
 NATIONAL BANGALORE  
 Kofia Road, New



REDMI NOTE 5 PRO  
 MI DUAL CAMERA

2019/1/12 17:00





Digital Amateur Radio Technical Society  
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VU2DLH  
www.darts.org.in  
F-22 / 102, 1st Floor, Sector-2, Kirti, New Delhi - 110005, India  
Ph: +91 9899 275 275 | vu2dlh@gmail.com

**Amateur Radio**  
THE SPACE AGE  
(HAM RADIO)

WWW.WORLD  
on  
HAM RADIO  
Venue: Ro  
NATI  
Kollia



REDMI NOTE 5 PRO  
MI DUAL CAMERA

2019/1/12 17:00





DARTS  
VUZOLH  
Amateur Radio  
THE SPACE AGE HOBBY



REDMI NOTE 5 PRO  
MI DUAL CAMERA

2019/1/12 16:00







BE ECONOMY  
REDUCE ELE. BILLS  
LONG LIVE YOUR APPLIANCES

Use CFLs Whenever Possible  
Iron Clothes soon as it wash

Avoid the use of IRON, MIXIE GRINDER, PUMP etc.  
8-10 pm to 10.00 pm  
(During peak load hours)

"ZERO" watt is actually 15 watts  
A unit of energy saved = 2 Units of energy produced

KNOW & LEARN THINGS  
REMEMBER

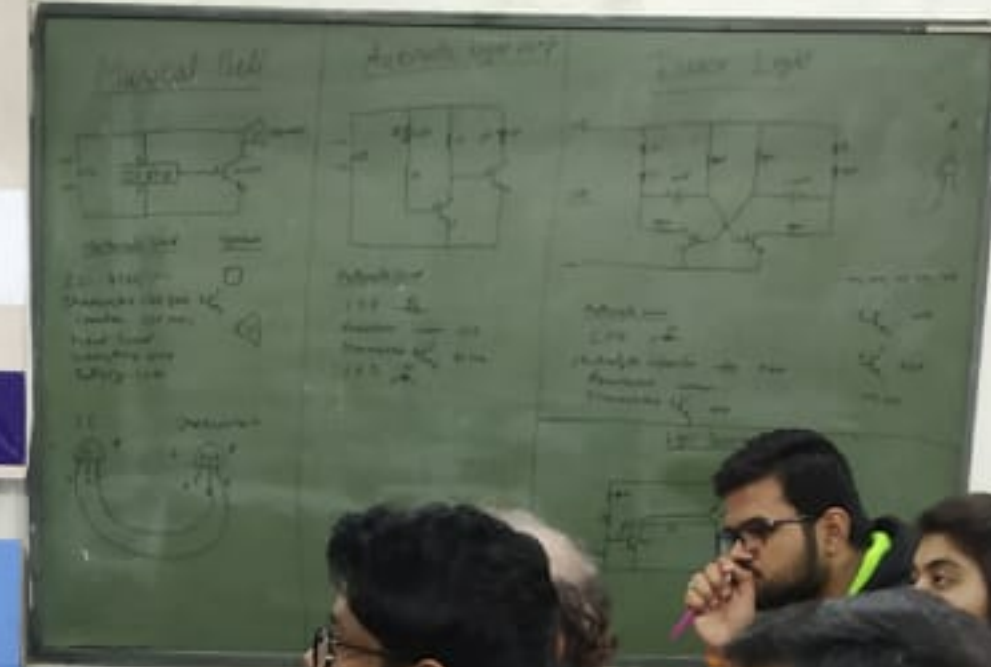


# WORKSHOP

on  
HAM RADIO TRAINING

Venue:- Radio and Electronics Section

 **NATIONAL BAL BHAVAN**  
Kotla Road, New Delhi-2





### CONSERVATION OF ENERGY

KNOW AND OBSERVE      WHAT TO DO

- BE NATURE FRIENDLY
- BE QUALITY CONSCIOUS
- PREVENTION IS BETTER THAN CURE
- BE ECONOMIC & SAVE
- REDUCE ELE. BILLS
- LONG LIVE YOUR APPLIANCES
- KNOW & LEARN THINGS
- REMEMBER

Use Minimum Water Light  
Use ISI and ISI Marked Appliances  
Check Wiring & Insulation periodically. Do the job by Approved Licensed Electricians & Contractors  
Use CFLs Whenever Possible  
Iron Clothes once in a week  
Avoid the use of IRON, MIXIE GRINDER, PUMP etc. 8-6:00 pm to 10:00 pm (During peak load hours)  
"ZERO" watt is actually 13 watts  
A unit of energy saved = 2 Units of energy produced

### GENERATION OF POWER

WIND      TIDAL

### GENERATION OF POWER

LIGHTNING      GEOTHERMAL

### GENERATION OF POWER

SOLAR      NUCLEAR

### GENERATION OF POWER

HYDRO      THERMAL

IDUKKI (KERALA)

# WORKSHOP

on  
**HAM RADIO TRAINING**

Venue:- Radio and Electronics Section  
**NATIONAL BAL BHAVAN**  
Kotla Road, New Delhi-2

### INNOVATIVE DOMESTIC WIRING



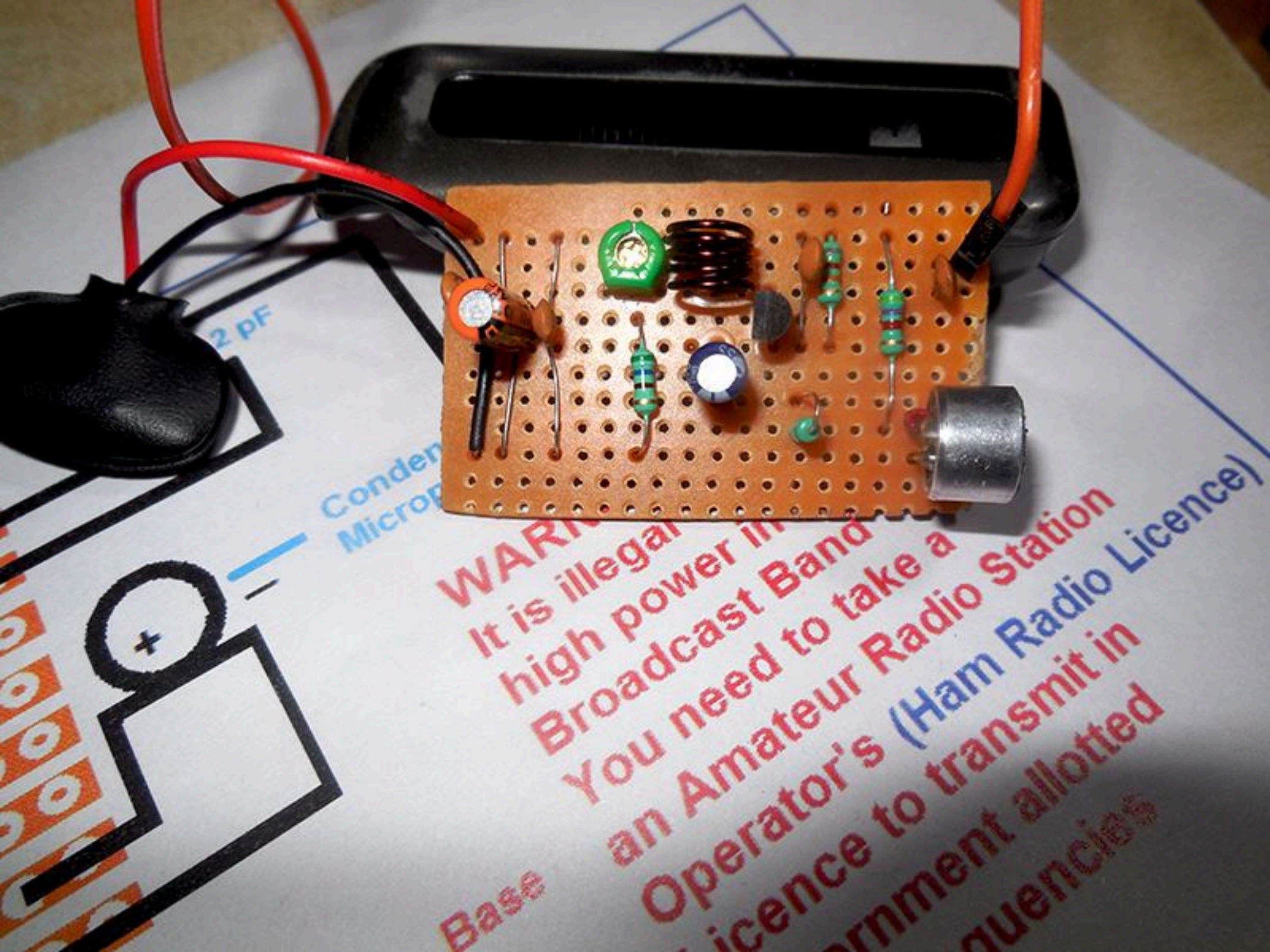












2 pF

Conden  
Micro

**WARNING**  
It is illegal  
high power in  
Broadcast Band  
You need to take a  
an Amateur Radio Station  
Operator's (Ham Radio Licence)  
Licence to transmit in  
frequencies

Base



parents are of different races. **half-crown** (or **half a crown**) a former British coin equal to two shillings and sixpence (12½p). **half-dozen** (or **half a dozen**) a group of six. **half-hearted** without enthusiasm or energy. **half-hour** (or **half an hour**) a period of thirty minutes. **half-life** the time taken for the radioactivity of a substance to fall to half its original value. **half-measures** actions or policies that are not forceful or decisive enough. **half-nelson** a hold in wrestling in which you pass one arm under your opponent's arm from behind while applying your other hand to their neck. **half-term** *Brit.* a short holiday halfway through a school term. **half-timbered** having walls with a timber frame and a brick or plaster filling. **half-time** (in sport) a short gap between two halves of a match. **not half 1** not nearly. **2** *Brit. informal* to an extreme degree.

**halfback** *noun* a player in a ball game whose position is between the forwards and fullbacks.

**halfpenny** or **ha'penny** /hay-pni/ *noun* (plural **halfpennies** or **halfpence** /hay-p'nss/) a former British coin equal to half an old penny.

**halfway** *adverb & adjective* **1** at or to a point equal in distance between two others. **2** to some extent.

**halfwit** *noun* informal a stupid person. **■ half-witted** *adjective*.

**halibut** *noun* (plural **halibut**) a large flat sea fish used for food.

**halitosis** /hali-toh-sis/ *noun* bad-smelling breath.

**hall** *noun* **1** (also **hallway**) a room or space inside a front door, or between a number of rooms. **2** a large room for meetings, concerts, etc. **3** (also **hall of residence**) *Brit.* a university building in which students live. **4** *Brit.* a large country house.

**hallelujah** /hal-li-loo-yuh/ or **alleluia** /al-li-loo-yuh/ *exclamation* God be praised.

**hallmark** *noun* **1** an official mark stamped on objects made of pure

gold, silver, or platinum. **2** a distinctive feature. **■ verb** stamp an object with a hallmark.

**hallo** ⇒ **HELLO**.

**hallowed** /hal-lohd/ *adjective*

**1** made holy. **2** very honoured and respected.

**Halloween** or **Hallowe'en** *noun* the night of 31 October, the evening before All Saints' Day.

**hallucinate** *verb* (**hallucinates**, **hallucinating**, **hallucinated**) see something which is not actually there. **■ hallucination** *noun*

**hallucinatory** *adjective*.

**hallucinogen** /huh-loo-si-nuh-juhn/ *noun* a drug causing hallucinations. **■ hallucinogenic** *adjective*.

**halo** /hay-loh/ *noun* (plural **haloes** or **halos**) **1** (in a painting) a circle of light surrounding the head of a holy person. **2** a circle of light round the sun or moon.

**halogen** /hal-uh-juhn/ *noun* any of a group of elements including fluorine, chlorine, bromine, and iodine.

**halt**<sup>1</sup> *verb* come or bring to a sudden stop. **■ noun** **1** a stopping of movement or activity. **2** *Brit. & minor* stopping place on a railway line.

**halt**<sup>2</sup> *adjective* old use lame.

**halter** *noun* a rope or strap placed around the head of an animal and used to lead it. **■ halter neck** a style of woman's top that is fastened behind the neck, leaving the shoulders, upper back, and arms bare.

**halting** *adjective* slow and hesitant.

**halve** *verb* (**halves**, **halving**, **halved**) **1** divide into two halves. **2** reduce or be reduced by half.

**halves** *plural* of **HALF**.

**halyard** /hal-yerd/ *noun* a rope used for raising and lowering a sail, yard, or flag on a ship.

**ham**<sup>1</sup> *noun* **1** meat from the upper part of a pig's leg which is salted and dried or smoked. **2** (**hams**) the back of the thighs. **■ ham-fisted** clumsy.

**ham**<sup>2</sup> *noun* **1** an actor who overacts.

**2** (also **radio ham**) *informal* **■ amateur radio operator**. **■ verb** (**hams**, **hamming**, **hammed**) *informal* overact. **■ hammy** *adjective*.

**hamburger** *noun* a small cake of minced beef, fried or grilled and typically served in a bread roll.

**hamlet** *noun* a small village.

**hammer** *noun **1** a tool with a heavy metal head and a wooden handle, for driving in nails. **2** an auctioneer's mallet, tapped to indicate a sale. **3** a part of a mechanism that hits another. **4** a heavy metal ball attached to a wire for throwing in an athletic contest.*

**■ verb** (**hammers**, **hammering**, **hammered**) **1** hit repeatedly with a hammer. **2** (**hammer away**) work hard and persistently. **3** (**hammer something in or into**) make something stick in someone's mind by constantly repeating it. **4** (**hammer something out**) work out the details of a plan or agreement.

**hammerhead** *noun* a shark with flattened extensions on either side of the head.

**hammock** *noun* a wide strip of canvas or rope mesh suspended at both ends, used as a bed.

**hamper**<sup>1</sup> *noun* a basket used for food and other items needed for a picnic.

**hamper**<sup>2</sup> *verb* (**hampers**, **hampering**, **hampered**) slow down or prevent the movement or progress of.

**hamster** *noun* a burrowing rodent with a short tail and large cheek pouches.

✓ **no p: hamster, not hamp-.**

**hamstring** *noun* any of five tendons at the back of a person's knee. **■ verb** (**hamstrings**, **hamstringing**, *past and past participle* **hamstrung**) **1** cripple by cutting the hamstrings. **2** severely restrict.

**hand** *noun* **1** the end part of the arm beyond the wrist, with four fingers and a thumb. **2** a pointer on a clock or watch indicating the passing of time. **3** (**hands**) a person's power or control. **4** an active role. **5** help in

doing something. **6** a person who does physical work. **7** a round of applause. **8** the set of cards dealt to a player in a card game. **9** a unit of measurement of a horse's height, equal to 4 inches (10.16 cm). **■ verb** give or pass something to. **■ at hand** (or **on or to hand**) near; easy to reach. **from hand to mouth** meeting only your immediate needs. **hand grenade** a grenade that is thrown by hand. **hand in glove** working very closely together. **hand-me-down** a piece of clothing that has been passed on from another person. **hand-pick** choose carefully. **hand-son** involving direct participation in something. **hand-to-hand** (of fighting) involving physical contact. **in hand** in progress. **out of hand** **1** not under control. **2** without taking time to think.

**handbag** *noun* *Brit.* a small bag used by a woman to carry everyday personal items.

**handball** *noun* **1** a game in which the ball is hit with the hand in a walled court. **2** soccer unlawful touching of the ball with the hand or arm.

**handbill** *noun* a small printed advertisement handed out in the street.

**handbook** *noun* a book giving basic information or instructions.

**handbrake** *noun* a brake operated by hand, used to hold an already stationary vehicle.

**handcuff** *noun* (**handcuffs**) a pair of lockable linked metal rings for securing a prisoner's wrists. **■ verb** put handcuffs on.

**handful** *noun* **1** a quantity that fills the hand. **2** a small number or amount. **3** *informal* a person who is difficult to deal with or control.

**handgun** *noun* a gun designed for use with one hand.

**handhold** *noun* something for a hand to grip on.

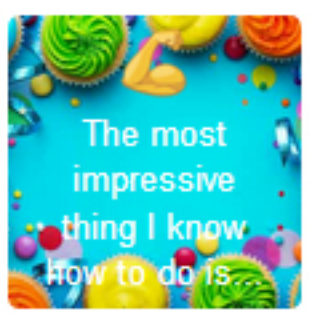
**handicap** *noun* **1** a condition that limits a person's ability to function physically, mentally, or socially.



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Did You Know · 1



+ Add Answer

IPS, IAS officials, NDRF officials, Officials of Director General rank from Doordarshan Dtt #Doord... See More



Like Comment Share

Rajeesh Ramachandran, Dev Vutwodev and 154 others







**Rajkot**  
VU2VMJ VU2BGH

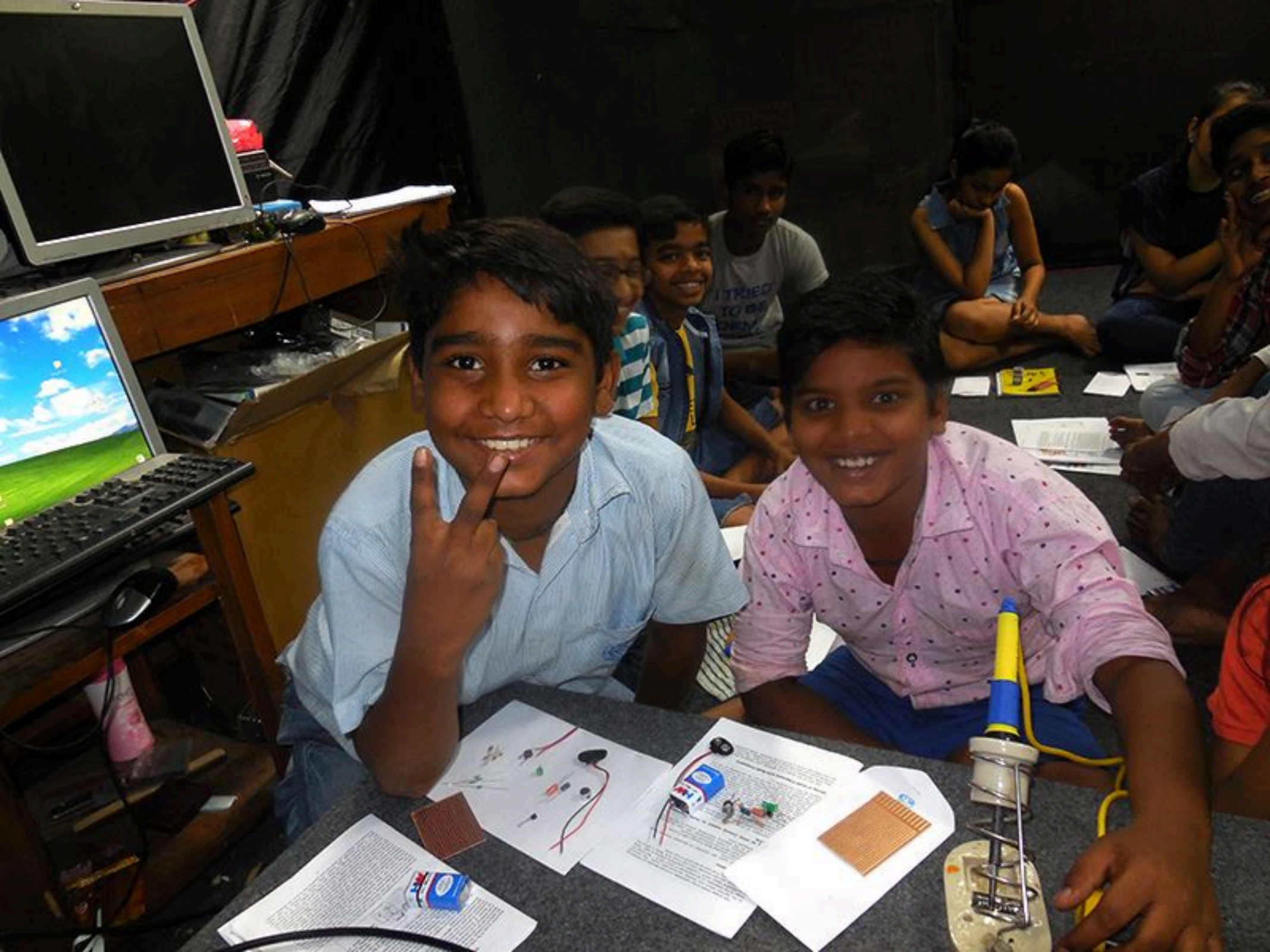
VU2VPR  
Pune

VU3WON  
Vijaypura

Payyanur  
VU3VWB

VU2KOC  
Belagaum



















विद्या मंदिर इंटर कॉलेज में 23 अगस्त को जुटेंगे कई स्कूलों के बच्चे

# अंतरिक्ष यात्रियों से छात्र करेंगे बात

जेरट | हरिष्ठ संवाददाता

शास्त्रीनगर स्थित विद्या मंदिर इंटर कॉलेज में 23 अगस्त को कई स्कूलों के छात्र अंतरिक्ष यात्रियों से बात करेंगे। यह कार्यक्रम एआरआईएसएस (अंतरराष्ट्रीय अंतरिक्ष स्टेशन स्थित अमेच्योर रेडियो संगठन), चंद्रशेखर विज्ञान क्लब के सहयोग से होगा। कार्यक्रम में छात्रों को करीब 10 से 12 मिनट अंतरिक्ष यात्रियों से बात करने का मौका मिलेगा। छात्र अंतरिक्ष यात्रियों से वहां कैसे रहते हैं, क्या खाते हैं, कैसे महसूस करते हैं आदि सवाल पूछेंगे। छात्र अंतरिक्ष यात्री रिकी आरनोल्ड से बात करेंगे। कार्यक्रम से पहले से चुने गए स्कूलों और कॉलेजों में जाकर बच्चों को अंतरराष्ट्रीय स्टेशन एआरआईएसएस के प्रति जागरूक किया जाएगा।



## ये हैं चुने गए स्कूल

कैपिटल पब्लिक स्कूल, सरस्वती शिशु मंदिर, हर मिलाप इंटर कॉलेज, अंबेडकर इंटर कॉलेज, केंद्रीय विद्यालय डोगरा लाइन समेत 15 स्कूलों के बच्चे कार्यक्रम में हिस्सा लेंगे। इस बारे में विज्ञान प्रचारक संजय शर्मा ने कहा कि हमारा क्लब बच्चों में विज्ञान के प्रति रुचि के लिए समय-समय पर ग्रामीण, देहात और शहरों में प्रदर्शनी और अन्य कार्यक्रम कराता है।

कार्यक्रम का काफी समय से था इंतजार

हमारा क्लब बच्चों में विज्ञान के प्रति रुचि के लिए समय-समय पर ग्रामीण, देहात और शहरों में प्रदर्शनी और अन्य कार्यक्रम कराता है। इसके लिए हमारे क्लब को बीनजे अवार्ड से विज्ञान प्रसार ने सम्मानित भी किया है। उक्त कार्यक्रम के लिए हमें काफी समय से इंतजार था। इसके लिए हमने बच्चों को पूर्ण तैयारी करा दी है।

संजय शर्मा, विज्ञान प्रचारक, चंद्रशेखर विज्ञान क्लब



स्कूलों में विज्ञान के कार्यक्रम के लिए मैं अत्यधिक प्रयास करती हूँ। लगभग डेढ़ साल बाद हमें इस प्रोग्राम की अनुमति मिली है। पश्चिम में शायद यह पहला प्रोग्राम होने जा रहा है। रंजना गौड़, प्रधानाचार्या विद्या मंदिर इंटर कॉलेज

हमारी टीम के सदस्य हमें रेडियो के माध्यम से वैज्ञानिकों से बात कराएंगे। इसके लिए अमेच्योर रेडियो सिस्टम से तैयारी की जा रही है। संदीप बरवा, सीनियर वैज्ञानिक





# VIDYA MANDIR INTER COLLEGE

Upto XII

K-Block, Shastri Nagar, Meerut.

Established By - Shakuntla Kaushik



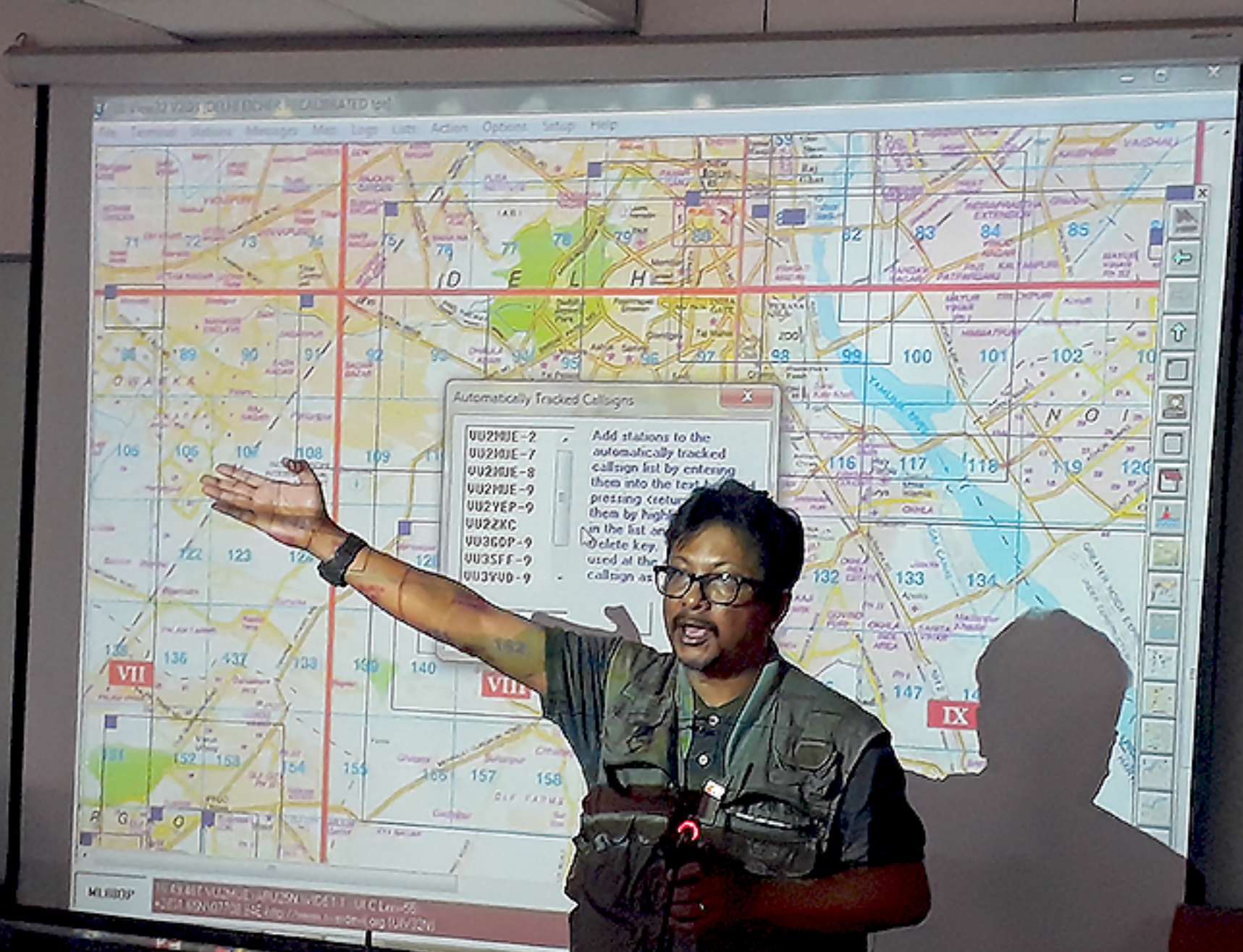
नासा के अंतरिक्ष यात्री से सीधे संवाद हेतु चयनित प्रदेश का प्रथम विद्यालय





**Vigyan Prasar**





### Automatically Tracked Callsigns

- UU2HJE-2
- UU2HJE-7
- UU2HJE-8
- UU2HJE-9
- UU2VEP-9
- UU2ZKC
- UU3GDP-9
- UU3SFF-9
- UU3VUD-9

Add stations to the automatically tracked callsign list by entering them into the text box and pressing **Enter** or **Return**. Then by highlighting the station in the list and pressing the **Delete** key, the station will be removed from the list. The **Enter** key is used at the end of the list to add the callsign as tracked.

ML880P  
HEADSET: N/A  
ARIZONA: VICE  
402.829.0770  
402.829.0770  
http://www.ml880p.org/

FLIP CHART











VU2KOC

VU2MUE





20<sup>th</sup> National Convention  
**HAM FEST INDIA**  
ARCCE VIZAG  
14-17 MARCH 2017  
KOLKATA  
Building Radio  
Amateur and  
Diplomacy Society



