Introduction to Amateur Radio

Presented by :

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What is Amateur Radio ?

- Amateur radio is a hobby involving a worldwide community of people who use their radios and skills to communicate with each other.
- Amateur radio operators, or HAMS as they are known, are people with an interest in the science behind radio communication who are licensed by their respective governments.
- Amateur Radio enthusiasts come from all walks of society. Students, Business professionals, Scientists, Engineers, Movie stars, Retirees, Politicians and even Kings are a part of this fraternity.
- Amateur Radio is all about self-learning and making new friends along the way!

What isn’t Amateur Radio?

- Amateur Radio isn’t a money making venture! All our knowledge and skills are freely available and we do not work for money!
- Amateur Radio isn’t about carrying a walky talky into a disaster zone! While amateurs do offer our services during emergencies, the hobby is about learning and honing radio skills, so that it may be put to good use if there ever is a need.
- Amateur radio isn’t about broadcasting to the public! We do not broadcast music or indulge in broadcasts like your Local FM radio station.
- Amateur radio isn’t about something specific, it’s multifaceted!

Some famous radio amateurs ...

VU2RG, Rajiv Gandhi
Ex. P.M. Of India

JY1, King Hussein
King of Jordan

Some famous radio amateurs ...

Marlon Brando, FO5GJ / KE6PZH
American Film Actor

Kamal Hassan, VU2 HAS
Indian Film Actor

Some famous radio amateurs ...

Dr.Joseph Taylor Jr., K1JT
Nobel Laureate – Discovery of new kind of Pulsar

George. E. Smith, AA2EJ
Nobel Laurate – Discovery of CCD

Amateur Radio in this day and age

- A Hobby is a requirement in today’s monotonous world; Amateur Radio is challenging and provides a platform to experiment while reaping the wonders of radio, simultaneously.
- It helps build personal skills such as communicating effectively with others and broods the concept of self study and learning through doing.
- It is the only form of communication that is not disrupted during calamities, even when regular modes of communications fail!

The legal requirements ...

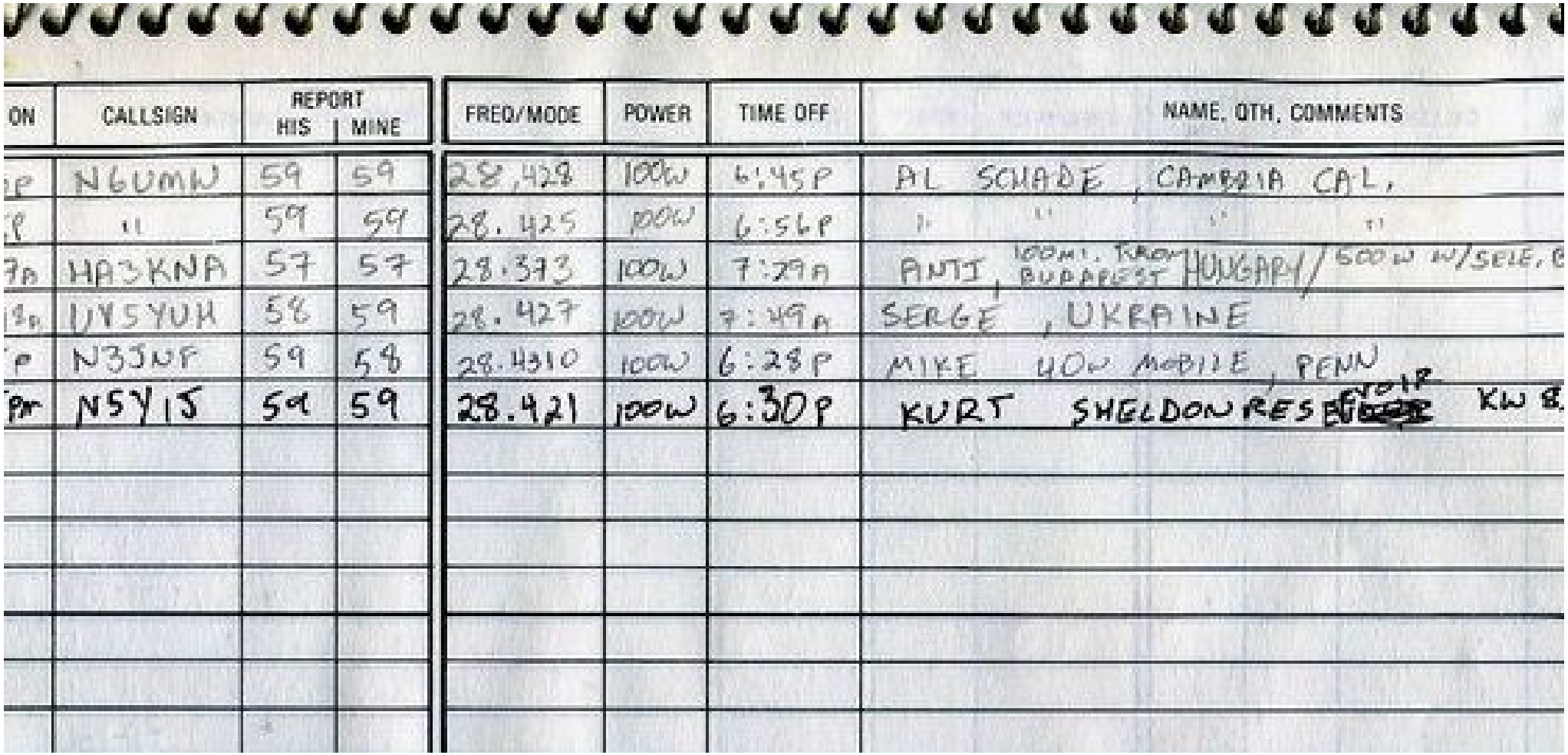
- Amateur Radio operators are licensed by their respective governments by testing for knowledge on basic electronics and operating procedures .
- After the exam, the government allots a callsign, a unique identifier, and grants operating privileges based on the license class.
- Once a callsign is allotted, you are allowed to legally transmit on the allocated bands and contact other radio amateurs.

Practical requirements ...

An amateur radio station , also referred to as the “Shack”, varies from one operator to an other, based on their requirements; however, most of them have a few things in common:

- Radio : Used to convert data (voice, morse code, etc) into radio signals otherwise known as the RIG.
- Power supply : Used to power the radio system and other accessories
- Antenna system: Used to broadcast the radio signals into the ionosphere
- Log book : Used to maintain a record of all communications from the shack


APC



ON	CALLSIGN	REPORT HIS	REPORT MINE	FREQ/MODE	POWER	TIME OFF	NAME, QTH, COMMENTS
E	N6UMW	59	59	28,428	100w	6:45P	AL SCHADE, CAMBRIA CA.
8	"	59	59	28.425	100W	6:56P	" " " "
7D	HA3KNA	57	57	28.373	100W	7:29A	ANTI, 100MI. FROM BUDAPEST HUNGARY // 500W W/SELF.
3D	UY5YUH	58	59	28.427	100W	7:49A	SERGE, UKRAINE
P	N3JNF	59	58	28.4310	100W	6:28P	MIKE HOW MOBILE, PENN
Pr	N5YIS	59	59	28.421	100W	6:30P	KURT SHELDON RES [illegible] KW 8

What are the few things that Radio amateurs do on air?

Amateur Radio is a truly multifaceted hobby! There are many things that we do , and everyone eventually gets attracted to something that fascinates them!

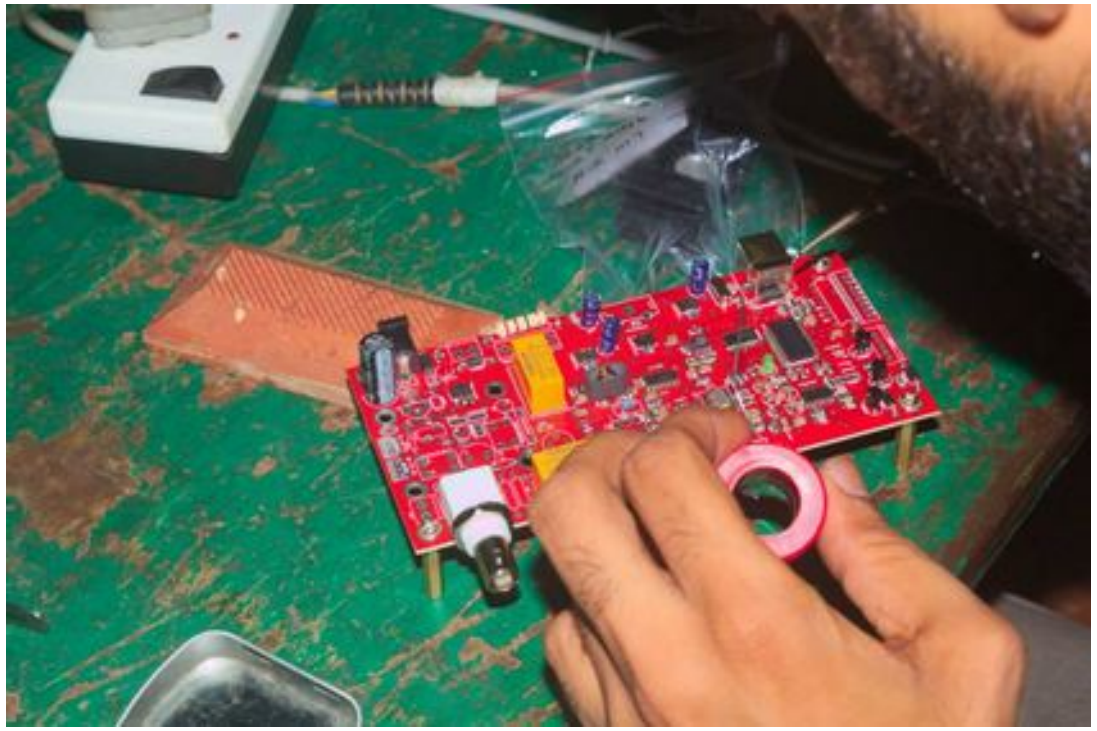
Let’s explore a few activities that radio amateurs engage in ...

Worldwide Communication - HF

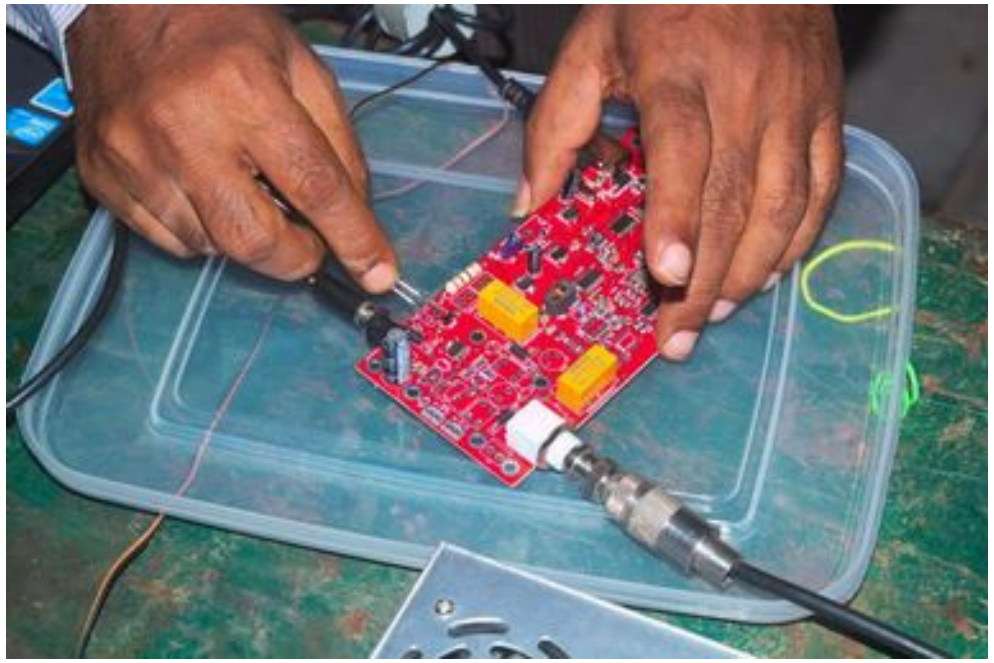
- By bouncing radio signals using the ionosphere, radio amateurs can talk to each other using High Frequency radio waves, otherwise known as “shortwave”

Homebrewing

- Homebrewing is amateur-speak for making electronics and antennas at home from scratch!
- As experimentation is the core of the hobby, many amateur radio operators enjoy building their own radios, antennas and other accessories by themselves!



Participants testing and building a radio



Dxing

- Dx is an abbreviation of the phrase “ Distance Unknown(X)”
- Dxing is the challenge of chasing a weak signal from a far away station!
- The Dx can be any country, like the island nation of Kiribati or a remote research station on the artic circle, or even a remote satellite orbiting earth!

Dxing from Scarborough Reef, South China Sea

QSL Card from Republic of Nauru, South Pacific

Contesting

- Contesting is a radio sport in which the primary aim is to contact as many stations as possible, within a given time period.
- There are many number of contests that cater to different interests and with different rules and scoring systems.
- Contesting is often about balancing the technical deficiencies of a station with operating techniques and skill and is challenging!

Operating a YOTA Contest

Typical Award Certificates issued to winners

Amateur Radio Direction Finding (ARDF)

- ARDF is a radio sport that involves finding a hidden transmitter using radios and directional antennas
- ARDF is a fun event, which combines outdoor skills such as map reading and orienteering along with radio skills. It also doubles up as tool for Search and Rescue, finding interference or even tracking wildlife!

ARDF with a portable antenna

A basic setup for ARDF
Compass, Map, a Directional antenna
and a portable radio

Satellite Communications

- Radio Amateurs use dedicated satellites which orbit the earth to communicate with each other!
- By using these satellites, they are able to communicate vast distances reliably
- Some even build their own satellites with amateur radio gear in them!

A Handheld radio along with
A picosat – a microsatellite with an amateur radio downlink

Satellite communication Antennas
In this case, for the QO 100 Geostationary Satellite

Emergency Communication

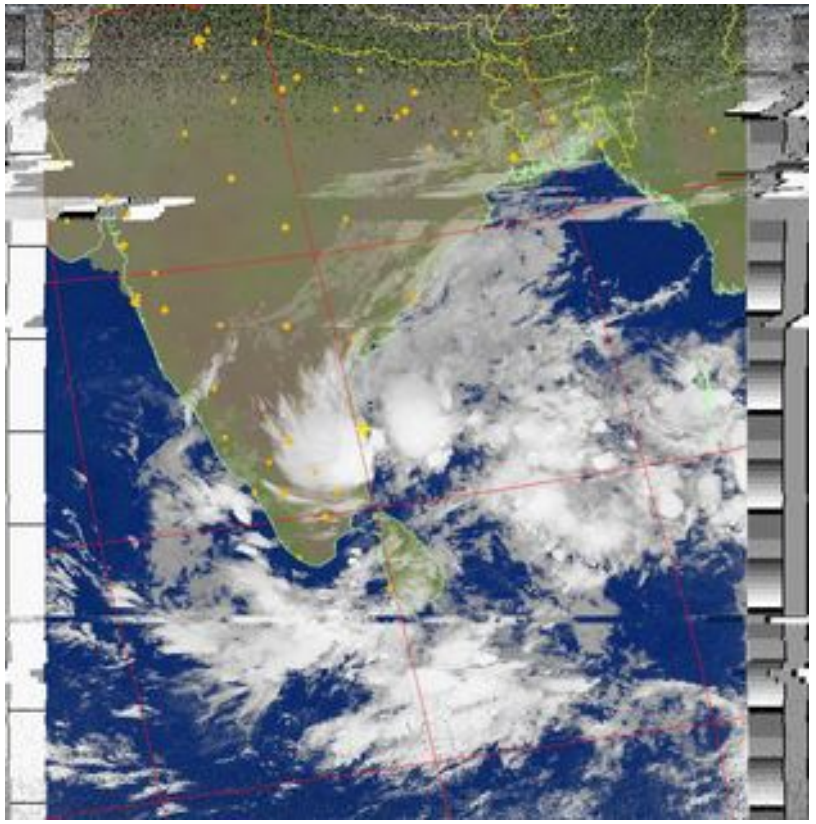
- Amateur radio is often independent of other commercial infrastructure such as power and telephones, and are immune to failure when regular infrastructure fails
- A trained and equipped radio amateur can be on air with a radio running on a battery and simple wire antennas and provide reliable communication support from almost anywhere!
- It takes training, skill, coordination and discipline to efficiently merge the technology with public service

Emergency communication setup
VU3 SMZ, Mukund, during 2015 Chennai Floods

Portable communication setup
Self contained in an waterproof AMMO box

Emergency communication base station in a Garage,
For ease of access to car batteries for emergency power

Real time weather satellite imagery,
downlinked from NOAA Weather Sat, by VU2XSK Suresh



Amateur Radio Volunteers Respond to Flood Emergency in Southern India

In the wake of severe flooding in Southern India resulting from several days of torrential downpours earlier this month, volunteer radio amateurs jumped in to provide emergency communication and other disaster assistance. Amateur Radio Society of India (ARSI) President Gopal Madhavan, VU2GMN, said hams swung into action soon after flood waters -- 3 to 4 meters deep in some places -- overwhelmed India's fourth-largest city, Chennai, and the surrounding region. Power outages in many parts of the affected area hampered Amateur Radio relief operations, and some radio amateurs were caught in the flooding. Hams with emergency power were able to pitch in, however, via two local repeaters. An HF network remained on standby. Local hams, several belonging to the South India Amateur Radio Society (SIARS) in Chennai, contributed to relief and rescue operations, working in part with ALERT, a non-governmental relief organization.

"Once it became possible to move, hams started going out assisting with delivery of food and water to stranded individuals and assisting with rescue from tall buildings, where people were trapped," Madhavan said. ARSI National Coordinator for Disaster Communication Jayu Bhide, VU2JAU, said the flooding was one of the city's worst disasters and was unexpected in a metropolitan area. Most of the cell phone network, Internet, and other communication systems were knocked out

Talk to the ISS

- The International Space Station which orbits the earth, is also equipped with an amateur radio shack on board!
- Astronauts who visit the ISS are usually licensed radio amateurs and often talk to earth using their radios
- The ISS also beams down images during special events; successful attempts are awarded certificates!

Astronaut Sunita Williams, KD5PLB

Astronaut Reid Wiseman, KF5LKT

Portable operation

- Since amateur radio equipment can function independent of commercial power, they can be easily setup in outdoors and in remote locations; there are many who carry their radios on treks up to a hill or during a walk in the park
- There are regular events and contests that encourage portable operation as it builds the skills needed for supporting emergency communication

Portable setup with a directional beam antenna

A fully functional station running on battery power

Moon bounce and Meteor Scatter

- Did you know that radio amateurs often reflect their signals of the moon ? This is known as Earth-Moon-Earth (EME) or Moon bounce communication!
- The same is possible for the ionized trail left by meteors, which scatter the radio waves that are beamed on them, letting amateurs experiment on the ionosphere

Ragchewing

- Ragchewing is the amateur speak term for having Idle conversation!
- Although talks of technical nature are common on air, it is surprisingly often that we hear light hearted topics such as food recipes, travel advice, and everyday topics – these are classic examples of Ragchewing !
- Ragchewing is something every radio amateur does on air, some time or the other

Licensing

- Licensing in India is done by the Government; Wireless Planning Coordination wing of the Ministry of communications and information technology.
- There are two classes of licenses that are granted: General grade and Restricted grade licenses.
- The exam for both grades will be a multiple choice question test that covers basic electronics, radio theory , law and operating procedures.
- General grade exam candidates will have to pass the 8WPM Morse code test, failing which they will be granted restricted grade

Licensing

- The Morse code test consists of a listening and sending sections. The candidate is expected to produce at least one minute of error free morse code copy to pass the test. With proper and continuous training this will be stressfree!
- Once a candidate passes the exam, they apply for a callsign, paying the appropriate licensing fee (2000 for a lifetime license)
- Once a callsign has been allotted, it becomes a permanent identifier for the individual

Training classes

- Every weekend : Saturday and Sundays, 7-9 PM
- Classes will cover Basic Electronics, Radio theory, Law governing Amateur Radio, Operating procedures and Morse code
- Separate Theory and Morse code support is available via whatsapp groups
- Theory study material is available on our website www.siars.org.in
- Regular practice with Morse code leads to proficiency and fluency! Keep at it even if you don’t seem to get it!

Questions?

Please type out your questions in the chat box