



# UPARC Intro to Satellites

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# Overview of Amateur Radio Satellites



- Intro/Overview of amateur radio involving low Earth orbit satellites
  - What bands are used for working satellites?
    - 2m
    - 70cm
  - What satellites can I work with a technician license?
    - All of them
  - What are the modes that can be worked on amateur radio satellites?
    - CW
    - FM, incl. packet/APRS
    - SSB
    - FT4



## What are the basic, required items I need to start working satellites?

- Base/Core gear needed (for FM sats only)
  - Dual band HT (full duplex highly rec., not required), or 2 HTs for Rx and Tx
  - Dual band mobile radio (full duplex highly rec., not required), or 2 radios, 1 for Rx and 1 for Tx
  - Dual band antenna (HT whip can work, better results with handheld dual band yagi, which can be a homebrew yagi)
  - Key or paddles if working CW



## “Portable” station gear

- Kenwood D72a, Icom 5100, Kenwood D710
  - *these radios are FM only*
- Yaesu FT-818 (all mode QRP rig)
  - This is a half duplex radio, most that have this will run 2 of these radios, 1 on receive and the other on transmit
- Arrow, Elk or homebrew hand held antenna
- Headphones and recording device



## “Intermediate” level station

- Kenwood TS-2000 (all mode), Icom 9700/9100/910h (all mode), Yaesu FT-847 (all mode), etc
- Light duty TV antenna rotator (RCA, etc)
- Dual band yagi antenna (2m/70cm)
  - Fixed at ~15deg of elevation
- Satellite tracking app (list of apps later in presentation)



## “Advanced” level station

- Icom 9700
- Circular polarized monoband yagi antennas.
  - 1 for 2m and 1 for 70cm
  - Example: M2 LEO Pack (pic on next slide)
- Yaesu G5500DC azimuth and elevation rotator set
- SAT Controller OR tracking control software

# Circular polarized dual beam antennas



## Additional Resources & Info

- Sat passes tracking apps
- SatSat (iOS)
- W1ANT (android)
- NY2O.com
- <https://www.amsat.org/status/>
- <https://www.amsat.org/two-way-satellites/>





# Additional Resources & Info



- Links to resources for further info
  - <https://www.amsat.org/>
  - UPARC Slack site, Satellite channel
  - <https://www.ariss.org/>
  - <https://www.amsat.org/product/macdoppler/>
- Links to gear mentioned:
  - <http://www.igatemi.com/sat>
  - <https://tinyurl.com/5yankhfb> (light duty TV rotator)
- ~70sec video of ISS contact
  - <https://photos.app.goo.gl/w1gLN6nVJKTj8aZ7>