

AMATEUR RADIO FACT SHEET / DISCUSSION POINTS

TOPIC: **HF OVERVIEW – Comparison of EOC and Private Ham Stations**

1. What is possible spectrum-wise and why:

VHF, UHF Radio Communications:

- Great for LOCAL and COMMUNITY communications.
- Uses Repeaters. Handheld radios. Mobile+Base.
- Public Safety, Businesses, Personal & Business (FRS), Ham Radio. Licensed except FRS.

HF (HIGH FREQUENCY) also called Shortwave:

- Reaches BEYOND the county, state, regional borders
- Can be used to provide email/information to/from unaffected areas in a major disaster

Who uses HF?

- Federal Armed Forces, DHS SHARES, National Guard, State EOC, Ham Radio Operators
- Works by ionospheric reflections in the sky –
- Disadvantages:
 - ✘ Requires FCC License
 - ✘ Range/distance/signal affected by frequency and sunlight
 - ✘ Lower HF frequencies unusable in the daytime but usable at night
 - ✘ Higher HF frequencies unusable at night, but workable daytime
- Regional communications
 - (Florida, southeast) work best on 3.5 and 7 MHz ham bands
- Nationwide communications
 - 7 MHz, 10 MHz, and 14 MHz ham bands

2. Typical amateur radio HF communications:

- Varies by experience level
 - Hams growing in number, but many newcomers less experienced than those before iPhones
- Experienced HF hams:
 - 100-1000 watts output power,
 - full size antennas that cover 3.5, 7, 10, 14, 21 MHz bands
 - possibly high gain directional antennas on 14 MHz, 21 MHz (similar to military)
- KX4Z:
 - up to 400 watts
 - antennas / equipment fully capable down to atmospheric noise on all HF bands
 - two 24/7/365 auto-computerized gateways scanning five channels each

3. What is present at the EOC?

- 125 watts HF (adequate, not awesome)
- up to 80% wasted in transmission line due to malpositioned HF tuner
- 50%-95% of remainder likely lost on some bands by transformer based match
 - Possibly similar to ALARIS broadband antennas
 - Crucial: losses apply to RECEIVED signals as well
- cannot hear majority of signals on normal amateur bands
- total efficiency at times as low as 1%
- worst on most useful bands for Florida & regional communications
- back-to-back trials EOC/KX4Z were stark