VHF/UHF FM Voice Transceiver Functions

Inland Empire VHF Radio Amateurs 10/11/18, Rick Nungester WA6NDR@ARRL.net

- Read the Manual. Keep a copy nearby (Dropbox, MS OneDrive, Google Drive). Play.
- Basics: Channel Selection, Volume, PTT. MR/VFO, Squelch/Monitor, Power.
- What frequencies to put in channels?
    - Option 1: Minimum number possible (one or more of the following)
        - Inland Empire VHF Radio Amateurs
        - Spokane County ARES/RACES
        - Kamiak Butte Amateur Repeater Association (KBARA)
        - Spokane Repeater Group
        - Spokane DX Association
        - Kootenai Amateur Radio Society (KARS)
    - Option 2: Maximum number possible (repeaters, simplex, non-ham services)
        - RepeaterBook Proximity Search: 2m / 70 cm, Open, On-Air, < 50 miles (~60). Then make sure all the above local groups are represented.
        - FRM/GMRS (22), MURS (5), WX, Felts/GEG Airport Towers, more...
- TX Offset
    - Standard: VHF Simplex (0) or +/- 600 kHz; UHF Simplex (0) or + 5 MHz
    - Split
        - In-Band (VHF or UHF) non-standard offsets -- Examples?
        - Split-Band (RX VHF, TX UHF or vice versa) -- FM Satellites: 5 channels in sequence to account for UHF doppler. For example switch channels A to E during a pass with UHF RX kHz Doppler = +10 +5 0 -5 -10 and VHF TX Doppler = 0. (Ignore the actual -/+ ~3 kHz VHF doppler.)
- Repeater Reverse: Swap RX/TX frequencies. During nets listen for stations not making it into the repeater. During any repeater QSO, switch to see if the other station is close enough that simplex might work and sound better.
- Scans: Emergency monitoring of a few channels? Trolling for anything of interest?
    - Memory Scan (all programmed channels) and Scan Lockout.
    - Program Scan (low freq, high freq, step) -- ARRL Band Plan, FM repeater outputs, Spokane specifics for 2m and 70 cm bands:
        - 145.110 to 145.490 MHz, 20 kHz step (20 channels)
        - 146.620 to 147.380 MHz, 20 kHz step (39 channels)
        - 145.110 to 147.380 MHz, 10 kHz step (228 channels, all above + unwanted)
        - 442.025 to 444.975 MHz, 25 kHz step (120 channels)
    - Scan Resume Options
        - Time: Stop only for 5 seconds and then continue. Undesired signals/spurs don't stop the scan too long.
        - Carrier: Continue only after 2 seconds of no carrier. Desired signals aren't skipped after 5 seconds.

        - My preferences: Program many channels, Memory Scan, Scan Lockout where needed, Resume by loss of carrier.
- DTMF memories: Autopatch phone numbers (not so much any more). Songs, e.g. Twinkle-Twinkle is 1199##9 6633221. Repeater / Echolink controls.
- Crossband Repeat: In emergencies, roam from your car with a low-power UHF HT while controlling your 50 W VHF/UHF MS acting as a repeater.
    - `HT --> 446.050 --> MS --> 147.940 --> Remote Repeater Input`
    - `HT <-- 446.050 <-- MS <--` **`147.340 <-- Remote Repeater Output`**
    - Caution: As long at the Remote Repeater Output is transmitting, the MS is stuck in the bottom situation. The HT is not in control. Long repeater squelch tails are a problem.
- Crossband Repeat and Remote Control
    - The Kenwood TH-G71A VHF/UHF HT has a function to switch its keyboard keys for remote control of a Kenwood TM-V7A VHF/UHF MS. Each key press sends 8 coded DTMF tones that do a single function. Examples: Repeater On, Repeater Off, Channel Up, Channel Down, Reverse On, Reverse Off...
- Programmable Memory (Kenwood's name for it): Save/recall of all menu settings, active channels... in a big memory. The Kenwood TM-V7A has 4 such memories. Uses: Multiple users sharing the same radio; Crossband Repeat or Remote Control setups; Recall of a VHF/UHF linked repeater pair; Daytime vs Nighttime display setup.
- Baofeng UV-5R (and derivatives) Fun: Alarm (CALL 3s for on, CALL again for off). Flashlight (Press & release MONITOR for On / Blink / Off).
- Not Covered: Digital Voice (D-STAR, DMR, System Fusion, WIRES-X), Digital Data (Packet, GPS/APRS, images, Winlink), Menu Access, Time-Out Timer (TOT), Automatic Power Off (APO), AM reception, FM Broadcast reception, Lock, MR --> VFO transfer, Resets, Lamp, Naming Memory Channels, CALL channel, Speaker Configurations, Visual Scan (Program Scan with spectrum analyzer -like display); Paging Groups (DTMF ID for individuals and groups, for Incident Command), Voice Operated Transmission (VOX), Wideband/Narrowband, Backlight, Digitally Coded Squelch (DCS), Voice Prompts, Roger Beep, etc.

Glossary

- ARES / RACES: Amateur Radio Emergency Service / Radio Amateur Radio Civil Emergency Service
- FM: Frequency Modulation
- HT / MS: Handi-Talkie / Mobile Station
- MR / VFO: Memory Recall / Variable Frequency Oscillator (manual configuration)
- PTT: Push-To-Talk
- RX / TX: Receive / Transmit
- VHF / UHF: Very High Frequency (~144 MHz, 2m) / Ultra High Frequency (~440 MHz, 70 cm)