



AMATEUR EXTRA



Extra License Course

Session 1 – Chapter 2 Operating Practices



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2.1 General Operating

- Extra = DX
- Extra = Quieter Bands



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2.1 General Operating

- DXing
 - What is it?
 - Why?
 - The excitement of talking to folks in far off places
 - Learning propagation
 - Personal Bests and Improvement
 - Awards DXCC
 - Everything Phonetic Alphabet
 - Memorize it



2.1 General Operating

- The QSL Card & QSO Verification
 - QSL Card – Card you send to another station confirming a QSO
 - QSL Manager – Service that confirms your contact and issues a QSL Card
 - ARRL only confirms US to DX & DX to US. No US to US
 - Log Book of the World – Free online ARRL Service
 - Online QSL Request System – www.m0urx.com/oprs
- Where do you find DX?
 - Check the current [Band Plan](#) for “DX Windows”
 - Subscribe to ARRL’s DX Bulletin

Table 2.1

DX Windows and “Watering Holes”

<i>Band</i>	<i>Frequency (MHz)</i>
160 meters [*]	1.830 – 1.835
80 meters	3.505
75 meters [†]	3.795 – 3.800
40 meters	7.005 (CW)
20 meters	14.005 and 14.020 (CW) 14.190 – 14.200 (Phone)
15 meters	21.005 and 21.020 (CW) 21.195 and 21.295 (Phone)
10 meters	28.495 (Phone)
6 meters [‡]	50.100 – 50.130 50.125 (US calling frequency)
2 meters [‡]	144.200

^{*}This window is being phased out as allocations continue to align around the world.

[†]The recent change in US amateur allocations and continued realignment of allocations make this window less important.

[‡]Operation begins around the calling frequency, then moves to adjacent channels.



2.1 General Operating

- Pileup
 - Many stations trying to contact one
 - Simplex vs Split
 - Simplex all stations use the same frequency
 - Lots of congestion
 - Interference (QRM) from calling stations
 - You can hear the other stations calling
 - Split station transmits on one frequency, but listens on another (like a repeater)
 - Separates incoming from outgoing traffic
 - More efficient
 - You can only hear the DX station



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2.1 General Operating

- Split (Cont'd)
 - “Listening 5 up ...”
 - **CAUTION!** DX station may be listening on a frequency you don't have privileges
- Listen Carefully
 - Look for a pattern and match it
 - Call only if you can hear the DX Station



2.1 General Operating

- DX Propagation
 - “You can’t work ‘em if you can’t hear ‘em”
 - Beginning of Solar Cycle 25, started 2020
 - +/- 11 years cycle
 - Resources
 - www.spaceweather.com
 - www.swpc.noaa.gov/communities/radio-communications
 - www.hfradio.org



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2.1 General Operating

- DX Propagation (Cont'd)
 - International Beacons
 - www.ncdxf.org
 - Reverse Beacons
 - www.reversebeacon.net
 - www.dxmaps.com
 - Propagation Prediction
 - <https://www.voacap.com/>



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2.1 General Operating

- Contesting
 - Contesting Is ...
 - Exciting, Challenging
 - Great way to test your skills
 - Great way to test your equipment
 - Practice Makes Perfect!
 - All kinds of contest available
 - Mixed modes
 - Single Mode: CW, SSB, Digital
 - Specialty: Sprints, Field Days, Worldwide ...



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2.1 General Operating

- Contest Calendar by WA7BNM @ <https://www.contestcalendar.com/>
- How Does It Work?
 - You make contacts
 - Log your contacts
 - Submit your log to the contest organizer
 - Simple?
- You can make contacts even if you do not enter?!
- Contest Bands are 160, 80, 40, 20, 15, 10, 6, 2, 420, etc ...
- No contesting on 60, 30, 17, 12m (aka WARC bands)
 - Gentlemen's Agreement



2.1 General Operating

- VHF/UHF contests focus on the “Weak Signal” or low end of the bands.
- Every contest has rules!
 - Stated Goals and Objectives (most of the time)
 - Date & Time
 - Bands and Modes
 - Exchange
 - How to submit your log for scoring
- Contest Log
 - Check Logs
 - Submission Logs
 - Or No Log at All



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2.1 General Operating

- Contest Log (Cont'd)
 - Cabrillo Format
 - Text File
 - Free Web Apps to enter your log
 - All Contesting Software Generates Cabrillo files for Submission
 - Spotting Networks (Assisted)
 - Use of the internet to let people know which frequency you are on
 - Special Category
 - Check the Rules!!
 - Self-spotting is rarely allowed

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START-OF-LOG: 3.0
CREATED-BY: N3FJP's Winter Field Day Contest Log 2.7
CONTEST: WFD
CALLSIGN: W6EK
LOCATION: SV
ARRL-SECTION: SV
CATEGORY: 20
CATEGORY-OPERATOR: MULTI-OP
CATEGORY-STATION: EXPEDITION
CATEGORY-TRANSMITTER: TWO
CATEGORY-POWER: LOW
CATEGORY-ASSISTED: NON-ASSISTED
CATEGORY-BAND: ALL
CATEGORY-MODE: MIXED
CATEGORY-TIME: 24-HOURS|
CATEGORY-OVERLAY: OVER-50
CLUB: Sierra Foothills ARC
SOAPBOX: 1,500 points for not using commercial power.
SOAPBOX: 1,500 points for setting up outdoors.
SOAPBOX: 1,500 points for setting up away from home.
SOAPBOX: BONUS 4500
CLAIMED-SCORE: 21972
OPERATORS: AI6JB AI6US
NAME: Orion Endres
ADDRESS: 1201 Wood Oak Court
ADDRESS-CITY: Roseville
ADDRESS-STATE-PROVINCE: CA
ADDRESS-POSTALCODE: 95747-7383
ADDRESS-COUNTRY: USA
EMAIL: ai6jb@arrl.net
QSO: 144 PH 2021-01-30 1904 W6EK 20 SV KK6VHH 1H SV
QSO: 7224 PH 2021-01-30 1907 W6EK 20 SV N0MTN 10 CO
QSO: 7212 PH 2021-01-30 1911 W6EK 20 SV K7STU 1H NV
QSO: 7225 PH 2021-01-30 1913 W6EK 20 SV KI7SS 1H WWA
QSO: 7225 PH 2021-01-30 1915 W6EK 20 SV N6EFF 1H EB

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2.1 General Operating

- Remote Stations
 - Operating your station remotely, usually via the internet
 - Do-It-Yourself
 - For Fee
 - Most Contests allow Remote Operation
 - Must have a license to transmit at the location of the radio station
 - Must have permission to use the station
 - No special identification is required



2.2 Amateur Satellites

- Yes! there are Amateur Satellites
- Check-out www.amsat.org
- Understanding Satellite Orbits
 - Inertia & Gravity
 - Keplers Laws
 - 1st Satellite orbits are shaped like an ellipse
 - 2nd Satellites move faster when close to earth and slower when farther away
 - 3rd The greater the average distance from Earth, the longer is takes to make one orbital period
 - Geostationary orbit – Stays in the same position in the sky



2.2 Amateur Satellites

- Orbital Definitions
 - Inclination – The angle of a satellite with respect to the earth's equator
 - Node – Point where the satellite crosses the earth's equator
 - Ascending Node
 - Descending Node
 - Apogee – Highest point in the orbit, i.e. above the earth
 - Perigee – Lowest point in the orbit
 - Ascending Pass – Satellite is traveling south to north
 - Descending Pass – Satellite is traveling north to south



2.2 Amateur Satellites

- Faraday Rotation & Spin Modulation
 - Signals do not keep their polarization
 - The effect is called Faraday Rotation
 - Satellites are spun to make them stable
 - Spin Modulation
 - Circularly Polarized antennas are best for Satellite work



2.2 Amateur Satellites

- Satellite Operation
 - Repeaters
 - Same as ground repeaters: Set frequency and mode “Channelized”
 - Most cross-band
 - Transponders
 - Receive signals are shifted to IF
 - Amplified
 - Re-transmitted on another frequency
 - Multi-mode & Multi-signal
 - More stations can use the satellite
 - Inverting → Increase in Uplink Frequency, Decrease in Downlink Frequency



2.2 Amateur Satellites

- Store & Forward
 - Packet radio Satellites (PACSATs)
 - One station uploads a message that is stored on the satellite
 - Another station downloads when the satellite is in range
 - ISS has a Store & Forward Packet System.
- Satellite Operating Frequencies
 - Uplink & Downlink Frequencies
 - Up is first, Down is second
 - The Satellite operating mode IDs the Satellite's Frequency
 - Letter Designations "Mode U/V"
 - "U" = UHF
 - "V" = VHF ...