



CANADIAN BASIC AMATEUR RADIO EXAM PREPARATION

SECTION 2 OPERATING & PROCEDURES





**THIS COURSE IS BEING TAUGHT TO THE JULY 15, 2025 UPDATE
OF THE CANADIAN BASIC AMATEUR RADIO EXAM QUESTIONS.**

SECTION 2 QUESTION CATEGORIES:

B-002-001: REPEATER OPERATION AND ETIQUETTE

B-002-002: VOICE STATION IDENTIFICATION AND PHONETIC ALPHABET

B-002-003: VOICE CALLING PROCEDURES AND SIMPLEX VS. REPEATER USE

B-002-004: OPERATING COURTESY AND INTERFERENCE MINIMIZATION

B-002-005: MORSE CODE (CW) OPERATING PROCEDURES

B-002-006: SIGNAL REPORTING SYSTEMS

B-002-007: Q CODES IN AMATEUR RADIO

B-002-008: EMERGENCY COMMUNICATIONS AND PREPAREDNESS

B-002-009: LOGGING, QSLING, CONTESTING AND TIME REFERENCES



QUESTION SECTION B-002-001:

REPEATER OPERATION AND ETIQUETTE

B-002-001: REPEATER OPERATION AND ETIQUETTE

PURPOSE AND BASICS OF REPEATERS

- LOCAL COMMUNICATION ON HAM RADIO IS TYPICALLY DONE ON **VHF** (VERY HIGH FREQUENCY 144-148MHz - 2M BAND) AND **UHF** (ULTRA HIGH FREQUENCY 430-450MHz- 70CM BAND).
- THESE ARE CALLED “**LINE OF SIGHT**” BANDS MEANING THEY WORK GREAT PROVIDING THEY HAVE A CLEAR PATH WITH **FEW OBSTRUCTIONS** IN THE WAY.
- **REPEATERS** OVERCOME THIS SHORT FALL WITH THE ADVANTAGE OF HEIGHT.



B-002-001: REPEATER OPERATION AND ETIQUETTE

PURPOSE AND BASICS OF REPEATERS

- **REPEATERS** ARE RADIOS THAT **INCREASE COMMUNICATION RANGE**, ESPECIALLY FOR HANDHELD/PORTABLE RADIOS WITH LIMITED POWER AND ANTENNA HEIGHT.
- REPEATERS **RECEIVE WEAK SIGNALS** ON ONE FREQUENCY AND **RETRANSMIT THEM AT HIGHER POWER** FROM A BETTER LOCATION — OFTEN ON A HILL OR TOWER — GREATLY EXTENDING VHF/UHF COVERAGE.



B-002-001: REPEATER OPERATION AND ETIQUETTE

PURPOSE AND BASICS OF REPEATERS



B-002-001: REPEATER OPERATION AND ETIQUETTE

PURPOSE AND BASICS OF REPEATERS

- REPEATERS ARE ASSIGNED **SPECIFIC FREQUENCIES** OF OPERATION.
- THEY RECEIVE ON ONE FREQUENCY AND RETRANSMIT ON ANOTHER FREQUENCY.
- THIS DIFFERENCE IS CALLED THE “**OFFSET.**” THE STANDARD DIFFERENCE FOR THIS IS **600 kHz** ON THE 2M BAND (144-148MHZ)

B-002-001: REPEATER OPERATION AND ETIQUETTE

PURPOSE AND BASICS OF REPEATERS



2M REPEATER OPERATION

- RECEIVES ON ONE FREQUENCY 146.940MHz
- TRANSMITS ON ANOTHER 146.340MHz
- STANDARD "OFFSET" IS -600kHz OR -.6MHz

B-002-001: REPEATER OPERATION AND ETIQUETTE

PURPOSE AND BASICS OF REPEATERS

- **FREQUENCY COORDINATION** ON VHF AND UHF BANDS IS DONE BY VOLUNTEER COORDINATORS (EX: RADIO AMATEURS OF CANADA OR REGIONAL GROUPS).
- CAREFULLY RECOMMEND FREQUENCIES TO **MINIMIZE INTERFERENCE** WITH NEIGHBOURING REPEATERS.



B-002-001: REPEATER OPERATION AND ETIQUETTE

HOW TO MAKE CONTACT ON A REPEATER

- PROPER PROCEDURE IDENTIFIES STATIONS CLEARLY AND FOLLOWS INTERNATIONAL CONVENTIONS.
- **SAY THE CALL SIGN** OF THE STATION YOU WANT TO CONTACT, THEN **YOUR CALL SIGN**. EXAMPLE: "VE5ABC THIS IS VE5REV" — CLEAR, CONCISE, AND IDENTIFIES BOTH PARTIES.

B-002-001: REPEATER OPERATION AND ETIQUETTE

JOINING AND PARTICIPATING IN REPEATER CONVERSATIONS (ETIQUETTE)

- GOOD MANNERS PREVENT INTERFERENCE AND KEEP THE REPEATER USABLE.
- TO JOIN A CONVERSATION ON A REPEATER LISTEN FIRST, WAIT FOR A PAUSE, THEN QUICKLY SAY YOUR CALL SIGN — EX: "VE5REV" — THE CURRENT TALKER WILL ACKNOWLEDGE YOU.
- ALWAYS **LISTEN** FOR ANYONE ELSE WANTING TO USE THE REPEATER.
- TRANSMISSIONS SHOULD BE KEPT SHORT ON REPEATERS IN CASE SOMEONE IN AN EMERGENCY NEEDS TO USE IT.



B-002-001: REPEATER OPERATION AND ETIQUETTE

KEY REPEATER FEATURES AND CONTROLS

- REPEATERS HAVE **TIME-OUT TIMERS** TO **PREVENT LENGTHY TRANSMISSIONS.**
- THEY WILL CUT OFF AFTER 2-3 MINUTES TO PREVENT STUCK MICS OR MONOPOLIZING. IF TIMED OUT, WAIT BRIEFLY AND TRY AGAIN.



B-002-001: REPEATER OPERATION AND ETIQUETTE

KEY REPEATER FEATURES AND CONTROLS

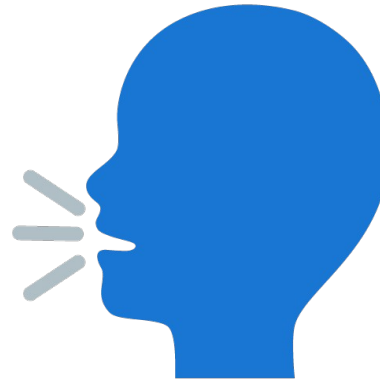
- SOME REPEATERS WILL MAKE USE OF **CTCSS TONES**. (CONTINUOUS TONE-CODED SQUELCH SYSTEM)
- THESE ARE **SUB-AUDIBLE TONES** THAT ACTIVATE A RECEIVER AUDIO OUTPUT WHEN PRESENT. MANY REPEATERS REQUIRE A SPECIFIC CTCSS TONE ON TRANSMIT TO OPEN THE SQUELCH AND RETRANSMIT. IT'S LIKE KEY TO UNLOCK THE REPEATER.
- THIS PREVENTS INTERFERENCE FROM OTHER SIGNALS. SET YOUR RADIO'S "TONE" ACCORDINGLY.



B-002-001: REPEATER OPERATION AND ETIQUETTE

KEY REPEATER FEATURES AND CONTROLS

- QUESTION B-002-001-010: WHAT IS THE ACCEPTED WAY TO ASK SOMEONE ABOUT THEIR LOCATION WHEN USING A REPEATER? **ANSWER: WHERE ARE YOU?**
- REPEATERS AUDIO QUALITY IS USUALLY EXCELLENT SO NORMAL VOICE CONVERSATIONS ARE TYPICAL WITHOUT NEEDING TO SPEAK IN SHORT FORM CODES OR PHONETICS.



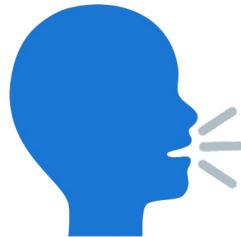


QUESTION SECTION B-002-002:
VOICE STATION IDENTIFICATION AND
PHONETIC ALPHABET

B-002-002: VOICE STATION IDENTIFICATION AND PHONETIC ALPHABET

WHY USE THE PHONETIC ALPHABET IN VOICE TRANSMISSIONS?

- **CLEAR IDENTIFICATION IS A LEGAL AND PRACTICAL REQUIREMENT IN AMATEUR RADIO YOU MUST IDENTIFY WITH YOUR CALLSIGN EVERY 30 MINUTES AND AT THE END OF A CONTACT.**
- **THE **PHONETIC ALPHABET** REDUCES CONFUSION WHEN SIGNALS ARE MARGINAL OR YOU HAVE LOTS OF INTERFERENCE, PARTICULARLY WHEN OPERATING ON THE HF (HIGH FREQUENCY) BANDS.**



ASLEJSA FASDK!



B-002-002: VOICE STATION IDENTIFICATION AND PHONETIC ALPHABET

WHY USE THE PHONETIC ALPHABET IN VOICE TRANSMISSIONS?

- THE **INTERNATIONAL TELECOMMUNICATION UNION PHONETIC ALPHABET** IS THE INTERNATIONALLY AGREED SYSTEM USED BY AMATEURS, MILITARY, AVIATION, MARITIME, AND EMERGENCY SERVICES WORLDWIDE.
- MEMORIZING IT IS ESSENTIAL FOR THE EXAM AND REAL RADIO OPERATIONS. THIS IS SOMETHING YOU WILL ACTUALLY USE ALL THE TIME AS A HAM RADIO OPERATOR.

B-002-002: VOICE STATION IDENTIFICATION AND PHONETIC ALPHABET

PHONETICS ON THE EXAM:

- ALFA
- BRAVO
- DELTA
- ECHO
- GOLF
- INDIA
- LIMA
- PAPA
- ROMEO



A = Alpha	N = November
B = Bravo	O = Oscar
C = Charlie	P = Papa
D = Delta	Q = Quebec
E = Echo	R = Romeo
F = Foxtrot	S = Sierra
G = Golf	T = Tango
H = Hotel	U = Uniform
I = India	V = Victor
J = Juliet	W = Whiskey
K = Kilo	X = X-ray
L = Lima	Y = Yankee
M = Mike	Z = Zulu



QUESTION SECTION B-002-003:

VOICE CALLING PROCEDURES AND SIMPLEX VS. REPEATER USE

B-002-003: VOICE CALLING PROCEDURES AND SIMPLEX VS. REPEATER USE

CALLING “CQ” AND ANSWERING CALLS ON VOICE

- PROPER CALLING PROCEDURE ENSURES CLEAR IDENTIFICATION AND INVITES RESPONSES EFFICIENTLY.
- “**CQ**” IS THE HAM RADIO CODE FOR “I AM SEEKING A CONTACT.” “CQ” SOUNDS LIKE “SEEK-YOU!” I’M SEEKING YOU FOR A RADIO CONTACT.
- TO CALL CQ YOU SAY “CQ” THREE TIMES, FOLLOWED BY “THIS IS,” FOLLOWED BY YOUR CALL SIGN SPOKEN THREE TIMES.

B-002-003: VOICE CALLING PROCEDURES AND SIMPLEX VS. REPEATER USE

CALLING "CQ" AND ANSWERING CALLS ON VOICE

"CQ CQ CQ, THIS IS

VICTOR ECHO FIVE ROMEO ECHO VICTOR,

VICTOR ECHO FIVE ROMEO ECHO VICTOR,

VICTOR ECHO FIVE ROMEO ECHO VICTOR."



B-002-003: VOICE CALLING PROCEDURES AND SIMPLEX VS. REPEATER USE



ANSWERING “CQ” AND ANSWERING CALLS ON VOICE

- SAY THE OTHER STATION'S CALL SIGN ONCE, FOLLOWED BY "THIS IS," THEN YOUR CALL SIGN.
- “VE6ABC THIS IS VE5REV”

B-002-003: VOICE CALLING PROCEDURES AND SIMPLEX VS. REPEATER USE

SIMPLEX OPERATION: DEFINITION AND WHEN TO USE IT

- “**SIMPLEX**” COMMUNICATION IS REGULAR TWO-WAY RADIOS, JUST LIKE ON REGULAR ‘WALKIE TALKIES.’ THERE IS NO REPEATER INVOLVED — **BOTH STATIONS USE ONE SHARED FREQUENCY.**
- COMMON ON VHF/UHF CALLING FREQUENCIES AND HF BANDS



B-002-003: VOICE CALLING PROCEDURES AND SIMPLEX VS. REPEATER USE

SIMPLEX OPERATION: DEFINITION AND WHEN TO USE IT

- USE SIMPLEX IF YOU CAN HEAR EACH OTHER DIRECTLY AND CLEARLY.
- SWITCH TO SIMPLEX TO FREE UP THE REPEATER FOR OTHERS AND REDUCE DEPENDENCY ON INFRASTRUCTURE.
- PRACTICAL TEST: WHILE ON THE REPEATER OUTPUT, **LISTEN ON THE INPUT FREQUENCY** EX: REPEATER OUTPUT 146.910 MHZ, INPUT 146.310 MHZ). IF YOU HEAR THE OTHER STATION CLEARLY ON THE INPUT, YOU CAN SWITCH TO SIMPLEX ON A DIFFERENT FREQUENCY.

B-002-003: VOICE CALLING PROCEDURES AND SIMPLEX VS. REPEATER USE

CHOOSING FREQUENCIES AND AVOIDING INTERFERENCE (VHF/UHF ETIQUETTE)

- BE MINDFUL OF REPEATER INPUTS/OUTPUTS EVEN WHEN ON SIMPLEX.
- ONLINE WEBSITES LIKE WWW.REPEATERBOOK.COM HAVE SEARCHABLE LISTINGS OF REPEATER FREQUENCIES IN YOUR AREA
- THIS WILL MAKE SURE YOU **DON'T INTERFERE** WITH OTHERS USING REPEATERS WHILE OPERATING SIMPLEX.

B-002-003: VOICE CALLING PROCEDURES AND SIMPLEX VS. REPEATER USE

CHOOSING FREQUENCIES AND AVOIDING INTERFERENCE (VHF/UHF ETIQUETTE)

- VHF/UHF ARE LINE-OF-SIGHT AND IDEAL FOR LOCAL/REGIONAL CONTACTS
- YOU CAN USE HF FOR LOCAL COMMUNICATIONS (GROUND WAVE) BUT GENERALLY THE HF BANDS ARE FOR DX (LONG DISTANCE) AND SHOULD BE RESERVED FOR THAT PURPOSE TO **MINIMIZE CLUTTER** AND REDUCE CONGESTION ON THE HF BANDS.



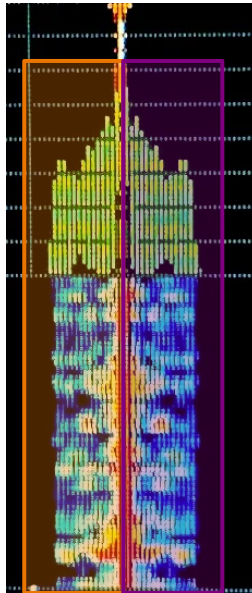
B-002-003: VOICE CALLING PROCEDURES AND SIMPLEX VS. REPEATER USE

HF VOICE SIDEBAND CONVENTIONS

- HF PHONE OPERATION USES SPECIFIC SIDEBANDS BY INTERNATIONAL AGREEMENT AND BAND PLAN.

RULE OF THUMB:

BELOW ~10 MHZ (160M – 30M)
LSB FOR VOICE.



ABOVE ~10 MHZ (20M AND UP)
USB FOR VOICE.





QUESTION SECTION B-002-004:

OPERATING COURTESY AND INTERFERENCE MINIMIZATION

B-002-004: OPERATING COURTESY AND INTERFERENCE MINIMIZATION

THE FUNDAMENTAL RULE: LISTEN BEFORE YOU TRANSMIT

- **LISTENING** IS THE SINGLE MOST IMPORTANT HABIT FOR ANY OPERATOR — IT PREVENTS INTERFERENCE AND SHOWS RESPECT FOR OTHER USERS.
- THIS IS THE #1 RULE OF OPERATING COURTESY AND **A FREQUENT EXAM QUESTION.**



LISTEN!



B-002-004: OPERATING COURTESY AND INTERFERENCE MINIMIZATION

POWER MANAGEMENT AND TRANSMITTER ADJUSTMENTS

- **USE ONLY THE POWER NEEDED** – IT'S BOTH COURTEOUS AND OFTEN LEGALLY REQUIRED.
- **REDUCE TRANSMIT POWER** UNTIL THE OTHER STATION REPORTS YOUR SIGNAL IS STILL SOLID BUT NO LONGER OVERPOWERING.
- THIS REDUCES INTERFERENCE TO OTHERS ON THE SAME OR ADJACENT FREQUENCIES AND CONSERVES ENERGY.

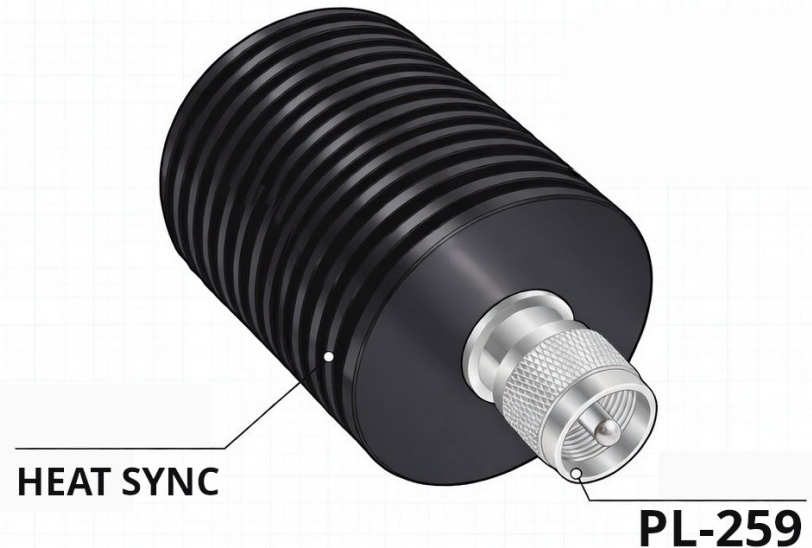


B-002-004: OPERATING COURTESY AND INTERFERENCE MINIMIZATION

TESTING AND TUNING WITHOUT CAUSING INTERFERENCE

- A **DUMMY LOAD** IS A 50-OHM RESISTOR THAT ABSORBS YOUR RF POWER AND PRESENTS A PERFECT MATCH — NO SIGNAL RADIATES. USE IT FOR POWER OUTPUT CHECKS, SWR ADJUSTMENTS, MODE TESTS, OR INITIAL TUNE-UPS. ONLY TRANSMIT ON-AIR WHEN NECESSARY.

RF DUMMY LOAD SPECIFICATIONS



 50W
Power Rating

 DC-3GHz
Frequency

 50 Ohm
Impedance

B-002-004: OPERATING COURTESY AND INTERFERENCE MINIMIZATION

TESTING AND TUNING WITHOUT CAUSING INTERFERENCE

- **QUESTION B-002-004-003: YOU NEED TO TRANSMIT TO ADJUST YOUR ANTENNA TUNER PRIOR TO JOINING AN HF SINGLE-SIDEBAND NET THAT IS IN PROGRESS. ON WHAT FREQUENCY SHOULD YOU MAKE THE ADJUSTMENT?**
ANSWER: 3 KHZ TO 5 KHZ AWAY FROM THE NET FREQUENCY.
- **QUICK, LOW-POWER TUNING A FEW KHZ OFF THE NET FREQUENCY MINIMIZES DISRUPTION. ANNOUNCE BRIEFLY IF NEEDED, EX:"TUNING ON OR NEAR THIS FREQUENCY," THEN MOVE BACK TO THE NET.**

B-002-004: OPERATING COURTESY AND INTERFERENCE MINIMIZATION

NET OPERATIONS AND FREQUENCY COURTESY

- HAM RADIO **NETS** (SCHEDULED GATHERINGS) RELY ON COOPERATION TO STAY ON SCHEDULE. THEY GENERALLY MEET ON THE SAME FREQUENCY AT THE SAME TIME. THIS PROVIDES WINDOWS OF OPPORTUNITY TO CONNECT WITH OTHERS AND/OR TEST EQUIPMENT WHEN YOU KNOW OTHER OPERATORS WILL MOST LIKELY BE ON THE AIR.



B-002-004: OPERATING COURTESY AND INTERFERENCE MINIMIZATION

NET OPERATIONS AND FREQUENCY COURTESY

- NETS ARE PRE-ORGANIZED ACTIVITIES — IF THERE IS ANY CONFLICT OVER FREQUENCY, ETIQUETTE IS TO **YIELD** GRACEFULLY SO THE NET CAN CARRY ON WITHOUT INTERFERENCE.
- IF YOU ARE ASKED TO MOVE FREQUENCY BY NET CONTROL, DO IT. SAY SOMETHING LIKE "QSYING NOW, 73" AND **MOVE TO A DIFFERENT FREQUENCY**.
- IF YOU ARE NET CONTROL AND SOME HOODLUM IS ON YOUR FREQUENCY, POLITELY ASK THE PERSON TO YIELD THE FREQUENCY TO THE NET.

B-002-004: OPERATING COURTESY AND INTERFERENCE MINIMIZATION

UNDERSTANDING BAND PLANS

- **BAND PLANS** PROMOTE **HARMONY** AMONG MODES AND ACTIVITIES.
- BAND PLANS ARE NOT LAWS BUT STRONG RECOMMENDATIONS (GENTLEMEN AGREEMENTS). THEY COMPARTMENTALIZE VOICE AND THE OTHER RADIO MODES (CW, DIGITAL, FM, BEACONS, SATELLITES, ETC).
- ALWAYS CHECK THE CURRENT PLAN BEFORE OPERATING ON A NEW BAND OR MODE.

B-002-004: OPERATING COURTESY AND INTERFERENCE MINIMIZATION

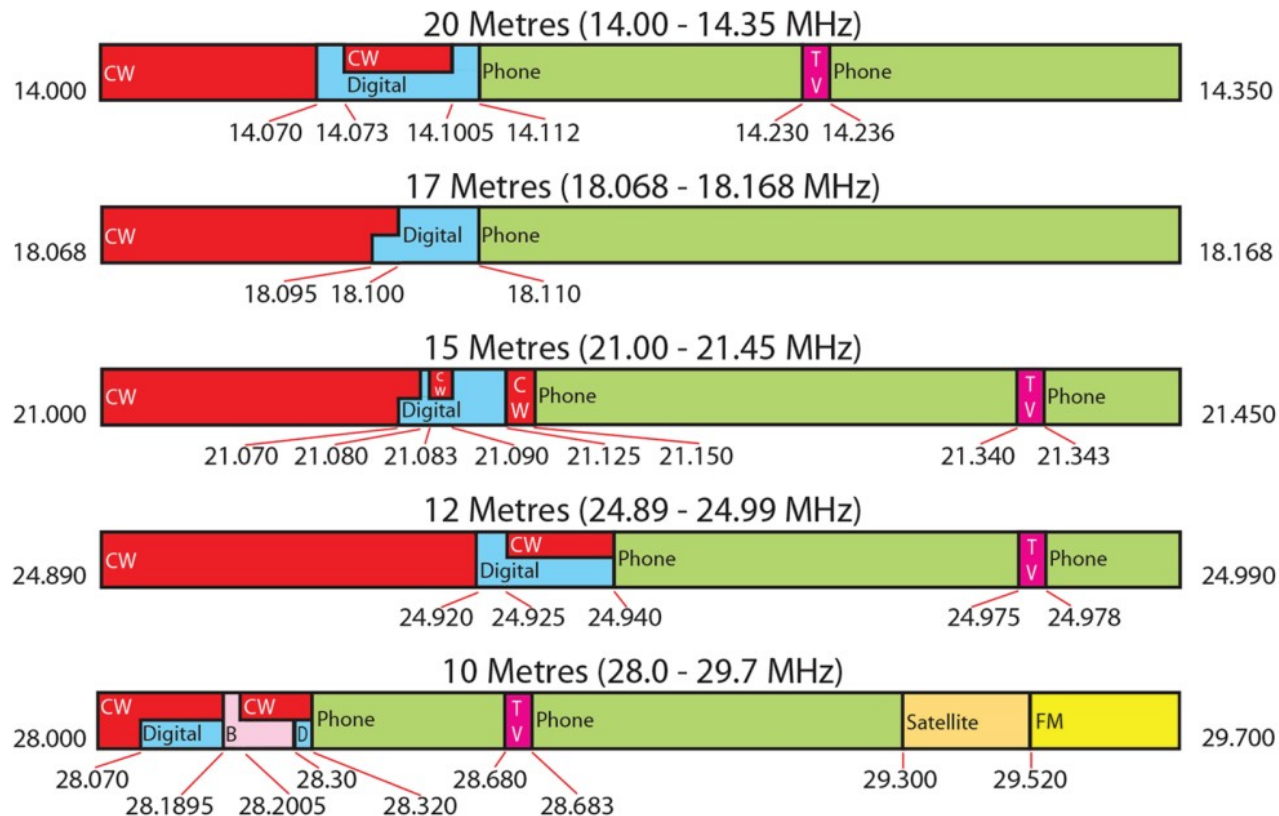
UNDERSTANDING BAND PLANS

Key

 CW	 FM	 SSTV
 CW QRSS	 Beacons	 Digital
 Phone	 Satellite	

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QUESTION SECTION B-002-005:

MORSE CODE (CW) OPERATING PROCEDURES

B-002-005: MORSE CODE (CW) OPERATING PROCEDURES

CALLING CQ AND ANSWERING IN MORSE CODE

- **MORSE CODE** OR **CONTINUOUS WAVE** (CW) IS THE GRAND-DADDY OF ALL RADIO. IT WAS THE FIRST MODE EVER, IMPLEMENTED BY MARCONI BACK IN 1890S. VOICE TRANSMISSION WASN'T POSSIBLE AT THAT TIME.
- HIS FAMOUS 1901 TRANSATLANTIC TRANSMISSION FROM ENGLAND TO NEWFOUNDLAND WAS JUST THE MORSE LETTER "S" (THREE DOTS: •••), PROVING RADIO COULD CROSS OCEANS.

B-002-005: MORSE CODE (CW) OPERATING PROCEDURES

CALLING CQ AND ANSWERING IN MORSE CODE

- MORSE CODE IS A SYSTEM OF **DITS** AND **DAHS**, OR **DOTS** AND **DASHES**, THAT REPRESENT LETTERS AND NUMBERS.
- THE GOVERNMENT REMOVED THE MORSE CODE REQUIREMENT FROM THE BASIC EXAM, BUT THERE HAS BEEN A RESURGENCE OF INTEREST IN LEARNING CW. LOTS OF RESOURCES ARE NOW AVAILABLE ONLINE TO HELP YOU LEARN AND USE HAM RADIO'S MOST HISTORIC MODE.

B-002-005: MORSE CODE (CW) OPERATING PROCEDURES

A	.-
B	-....
C	-.-.-
D	-...
E	.
F	..--.
G	--.
H	
I	..
J	.----
K	--.-
L	.-...
M	--
N	-.

O	---
P	.-...
Q	-.-.-
R	.-.
S	...
T	-
U	...-
V	-
W	.-.-
X	---.
Y	-.--
Z	--..

0	-----
1	-.----
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7	--....
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)	-.-.-.-
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"	.-.-.-.
?	..-.-.-
/	-.-.-.

INTERNATIONAL MORSE CODE

**“DITS
&
DAHS”**



Guglielmo Marconi

B-002-005: MORSE CODE (CW) OPERATING PROCEDURES

CALLING CQ AND ANSWERING IN MORSE CODE

- **STANDARD CQ CALLING FORMAT:** “CQ CQ CQ DE VE5REV VE5REV VE5REV” — REPEAT AS NEEDED. THIS MIRRORS THE VOICE “CQ THREE TIMES, THIS IS, CALL SIGN THREE TIMES” PATTERN.
- **ANSWERING CQ:** “VE6ABC VE6ABC DE VE5REV VE5REV” — KEEPS IT SHORT AND CLEAR. THE CALLING STATION WILL USUALLY REPLY WITH YOUR CALL SIGN AND PROCEED.

B-002-005: MORSE CODE (CW) OPERATING PROCEDURES

CALLING CQ AND ANSWERING IN MORSE CODE

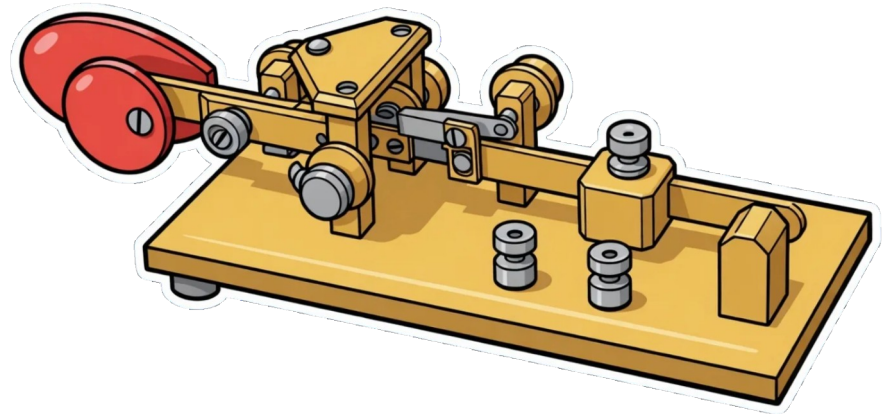
- QUESTION B-002-005-003: AT WHAT SPEED SHOULD A MORSE CODE "CQ" CALL BE TRANSMITTED? **ANSWER: AT ANY SPEED WHICH YOU CAN RELIABLY RECEIVE.**

TRANSMIT CQ AT A SPEED YOU CAN COMFORTABLY COPY YOURSELF — THIS ENSURES YOU CAN READ ANY REPLY. BEGINNERS OFTEN START AT 10-15 WPM; EXPERIENCED OPERATORS MAY GO 20-30+ WPM. TRY TO MATCH THE OTHER STATION'S SPEED DURING THE CONTACT.

B-002-005: MORSE CODE (CW) OPERATING PROCEDURES

ABBREVIATIONS: SENDING MEANING FASTER

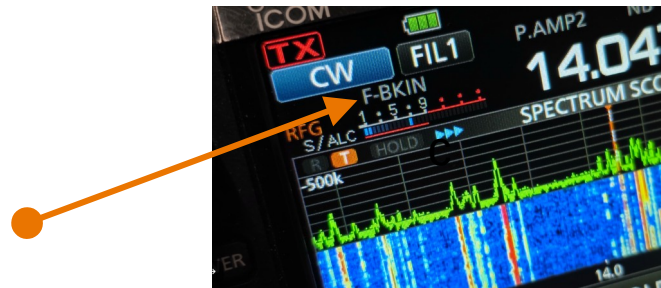
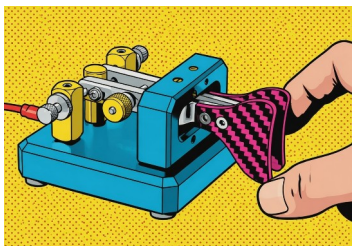
- **CQ: GENERAL CALL TO ANYONE LISTENING**
- **DE: "FROM" YOUR CALL SIGN (FRENCH)**
- **K: "ANY STATION PLEASE REPLY."**
- **DX: "DISTANT STATION."**
- **73: "BEST REGARDS." SEVEN-THREE**
- **R: "ALL RECEIVED."**



B-002-005: MORSE CODE (CW) OPERATING PROCEDURES

ADVANCED CW FEATURES: FULL BREAK-IN (QSK)

- FULL BREAK-IN IS A POPULAR TECHNIQUE THAT MAKES CW FEEL MORE CONVERSATIONAL.
- TRANSCEIVER SWITCHES EXTREMELY QUICKLY BETWEEN TRANSMIT AND RECEIVE—FAST ENOUGH THAT YOU CAN ACTUALLY HEAR INCOMING SIGNALS IN THE TINY SILENT GAPS BETWEEN INDIVIDUAL DITS AND DAHS (DOTS AND DASHES) OF YOUR OWN TRANSMISSION.

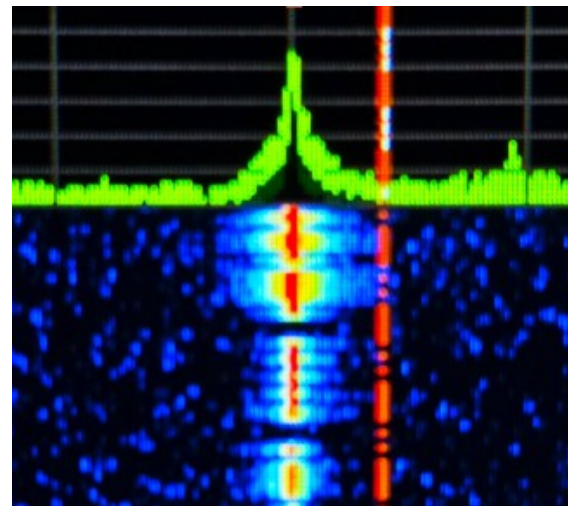


WE HAVEN'T TALKED ABOUT **Q CODES** YET BUT THEY ARE COMING RIGHT UP IN THIS SECTION. FULL BREAK-IN IS ALSO CALLED QSK, FROM THE Q-CODE "CAN YOU HEAR ME BETWEEN YOUR SIGNALS?"

B-002-005: MORSE CODE (CW) OPERATING PROCEDURES

CW FREQUENCY ETIQUETTE AND SEPARATION

- CW SIGNALS ARE **NARROW**, SO PRECISE FREQUENCY CHOICE PREVENTS INTERFERENCE.
- QUESTION B-002-005-010: WHEN SELECTING A CW TRANSMITTING FREQUENCY, WHAT MINIMUM FREQUENCY SEPARATION FROM A CONTACT IN PROGRESS SHOULD YOU ALLOW TO MINIMIZE INTERFERENCE? **ANSWER: 150 HZ TO 500 HZ.**
- CW SIGNALS ARE TYPICALLY 100–300 HZ WIDE DEPENDING ON KEYING SPEED AND FILTER SETTINGS. 150–500 HZ SEPARATION IS COURTEOUS. CLOSER SPACING RISKS OVERLAP, ESPECIALLY WITH NARROW FILTERS. ALWAYS LISTEN CAREFULLY FIRST — USE YOUR NARROW CW FILTER TO CHECK FOR WEAK SIGNALS.





QUESTION SECTION B-002-006:

SIGNAL REPORTING SYSTEMS

B-002-006: SIGNAL REPORTING SYSTEMS

WHAT RST REPORTS DESCRIBE AND WHAT THEY STAND FOR

- **RST** IS THE UNIVERSAL SYSTEM AMATEURS USE TO **DESCRIBE RECEIVED SIGNAL QUALITY**.
- **R** = READABILITY (1-5 SCALE, HOW EASILY THE MESSAGE IS UNDERSTOOD)
- **S** = SIGNAL STRENGTH (1-9 SCALE, HOW STRONG THE SIGNAL APPEARS ON THE S-METER)
- **T** = TONE (1-9 SCALE, USED ONLY FOR CW — HOW CLEAN/PURE THE MORSE TONE IS; 9 = PERFECT TONE)

B-002-006: SIGNAL REPORTING SYSTEMS

- **READABILITY (R)** — SCALE OF 1 TO 5. THIS ASSESSES HOW CLEARLY YOU CAN COPY THE MESSAGE (WORDS/LETTERS).
- **5 — PERFECTLY READABLE (NO DIFFICULTY AT ALL)**
- **4 — READABLE WITH PRACTICALLY NO DIFFICULTY**
- **3 — READABLE WITH CONSIDERABLE DIFFICULTY**
- **2 — BARELY READABLE (OCCASIONAL WORDS DISTINGUISHABLE)**
- **1 — UNREADABLE**

B-002-006: SIGNAL REPORTING SYSTEMS

- **STRENGTH [S]** — SCALE OF 1 TO 9. THIS MEASURES RECEIVED SIGNAL STRENGTH (OFTEN BASED ON YOUR S-METER OR SUBJECTIVE "LOUDNESS").
- **9 — EXTREMELY STRONG SIGNALS**
- **8 — STRONG SIGNALS**
- **7 — MODERATELY STRONG SIGNALS**
- **6 — GOOD SIGNALS**
- **5 — FAIRLY GOOD SIGNALS**
- **4 — FAIR SIGNALS**
- **3 — WEAK SIGNALS**
- **2 — VERY WEAK SIGNALS**
- **1 — FAINT SIGNALS, BARELY PERCEPTIBLE**

B-002-006: SIGNAL REPORTING SYSTEMS

- **TONE (T)** — SCALE OF 1 TO 9 (CW/MORSE CODE ONLY). THIS DESCRIBES THE PURITY/QUALITY OF THE CW TONE (NOT USED FOR VOICE—OMIT IT FOR SSB/FM/AM REPORTS).
- **9 — PERFECT TONE, NO TRACE OF RIPPLE OR MODULATION**
- **8 — NEAR PERFECT TONE, SLIGHT TRACE OF MODULATION**
- **7 — NEAR PURE TONE, TRACE OF RIPPLE MODULATION**
- **6 — FILTERED TONE, DEFINITE TRACE OF RIPPLE MODULATION**
- **5 — FILTERED RECTIFIED A.C. BUT STRONGLY RIPPLE-MODULATED**
- **4 — ROUGH NOTE, SOME TRACE OF FILTERING**
- **3 — ROUGH A.C. TONE, RECTIFIED BUT NOT FILTERED**
- **2 — VERY ROUGH A.C., VERY HARSH AND BROAD**
- **1 — SIXTY CYCLE A.C. OR LESS, VERY ROUGH AND BROAD**



NOTE:

WITH MODERN EQUIPMENT,
TONE IS ALMOST ALWAYS 9.

MODERN TRANSCEIVERS GENERATE VERY
CLEAN CW SIGNALS USING SOLID-STATE
KEYING CIRCUITS & FILTERING.



B-002-006: SIGNAL REPORTING SYSTEMS

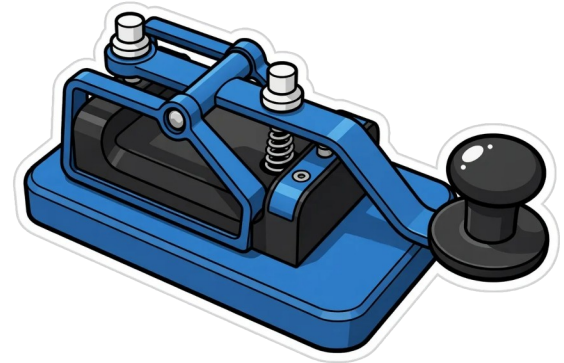
WHAT RST REPORTS DESCRIBE AND WHAT THEY STAND FOR

- VOICE REPORTS USUALLY USE JUST **RS** (**READABILITY + STRENGTH**);
- **TONE** IS USED WITH MORSE CODE REPORTS
- EXAMPLES:
 - **YOUR SIGNAL REPORT IS 5 7** - 5 = PERFECTLY READABLE, 7 = MODERATELY STRONG — A VERY GOOD, TYPICAL REPORT FOR SOLID CONTACTS.
 - **YOUR SIGNAL REPORT IS 3 3** - 3 = READABLE WITH DIFFICULTY, 3 = WEAK — MARGINAL COPY; THE CONTACT WILL BE TOUGH.
 - **YOU ARE 5 9 PLUS 20 DB** - "5 9 +20 DB" OR "5 BY 9 PLUS 20" MEANS FULL READABILITY AND VERY STRONG — S9 IS A STRONG REFERENCE LEVEL EACH +10 DB DOUBLES PERCEIVED POWER ROUGHLY.

B-002-006: SIGNAL REPORTING SYSTEMS

WHAT RST REPORTS DESCRIBE AND WHAT THEY STAND FOR

- CW ALWAYS USES THE FULL RST BECAUSE TONE QUALITY MATTERS FOR CLEAN MORSE.
- EXAMPLES:
 - **RST 579** - (5 = PERFECTLY READABLE, 7 = MODERATELY STRONG, 9 = PERFECT TONE — EXCELLENT CW REPORT.)
 - **RST 459** - (4 = QUITE READABLE WITH SOME EFFORT, 5 = FAIR STRENGTH, 9 = PERFECT TONE — SOLID BUT NOT BOOMING CW SIGNAL.)



B-002-006: SIGNAL REPORTING SYSTEMS

SPECIAL CASE: REPORTING SIGNALS HEARD THROUGH A REPEATER

- REPEATERS ALTER THE SIGNAL, SO REPORTS REFLECT WHAT YOU ACTUALLY HEAR.
- QUESTION B-002-006-006: A DISTANT STATION ASKS FOR A SIGNAL REPORT ON A LOCAL REPEATER YOU MONITOR. WHAT DO YOU REPORT? **ANSWER: THE QUALITY OF THE STATION'S SIGNAL AND AUDIO AS HEARD THROUGH THE REPEATER.**
- REPORT WHAT COMES OUT OF THE REPEATER SPEAKER — READABILITY, AUDIO CLARITY, NOISE, ETC. DO NOT REPORT THE DISTANT STATION'S RAW RF SIGNAL STRENGTH, AS THE REPEATER NORMALIZES IT.

B-002-006: SIGNAL REPORTING SYSTEMS

S-METER CALIBRATION AND POWER CHANGE CALCULATIONS

- THE WHOLE RST REPORTING SYSTEM IS RATHER **SUBJECTIVE**. BUT THERE IS A WAY TO HAVE A PRETTY ACCURATE IDEA.
- THE "**S-METER**" ON YOUR RIG WILL VISUALLY SHOW YOU HOW ANOTHER OPERATOR'S SIGNAL IS BEING RECEIVED ON YOUR RADIO.

B-002-006: SIGNAL REPORTING SYSTEMS

S-METER CALIBRATION AND POWER CHANGE CALCULATIONS

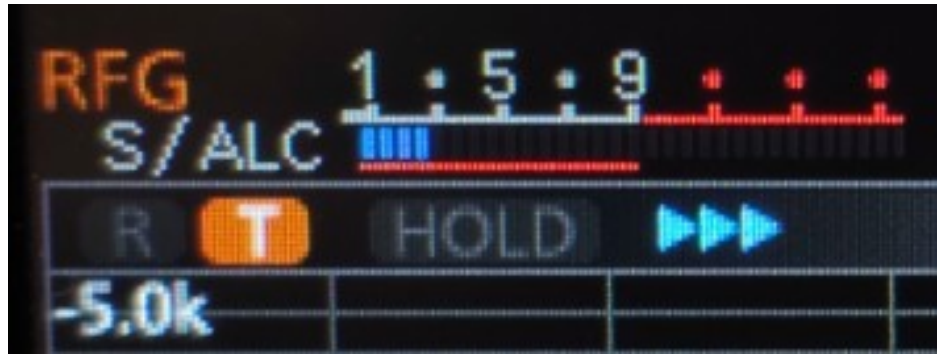
- THIS SLIDE SHOWS THE METER. THE SIGNAL STRENGTH IS SHOWN IN THE BLUE BARS. THIS DIGITAL READOUT SHOWS THE SIGNAL STRENGTH IN "S-UNITS" (S1 TO S9). IF THE SIGNAL IS STRONGER THAN S9, THE BARS GO RED AND THIS DENOTED AS S9+ A VALUE IN DB. SO S9+10 OR S9+20.



B-002-006: SIGNAL REPORTING SYSTEMS

S-METER CALIBRATION AND POWER CHANGE CALCULATIONS

- **DECIBLES (dB)** - UNIT USED TO MEASURE THE INTENSITY OF A SOUND OR THE POWER LEVEL OF AN ELECTRICAL SIGNAL BY COMPARING IT WITH A GIVEN LEVEL ON A LOGARITHMIC SCALE.
- EACH S-UNIT CORRESPONDS TO A **6 dB** CHANGE IN RECEIVED POWER
- GOING UP 1 S-UNIT = +6 dB STRONGER.
- GOING DOWN 1 S-UNIT = -6 dB WEAKER.



S-METER CALIBRATION AND POWER CHANGE CALCULATIONS

- 100 W $\rightarrow$ 50 W
- TYPICALLY DROPS RECEIVED STRENGTH BY ONLY ~3 DB - HALF AN S-UNIT, NOT A FULL S-UNIT.
- 100 W $\rightarrow$ 25 W
- TO RELIABLY DROP ONE FULL S-UNIT (6 DB) YOU'D NEED TO REDUCE TRANSMIT POWER BY A FACTOR OF 4.

B-002-006: SIGNAL REPORTING SYSTEMS

S-METER CALIBRATION AND POWER CHANGE CALCULATIONS

- **QUESTION B-002-006-007: YOUR RECEIVER'S S-METER IS CALIBRATED TO A STANDARD OF 6 DB PER S-UNIT PER A RECOMMENDATION BY THE INTERNATIONAL AMATEUR RADIO UNION (IARU). THE S-METER SHOWS S9 WHEN RECEIVING A STATION TRANSMITTING WITH 100 WATTS. NEGLECTING PROPAGATION CHANGES, WHAT TRANSMITTER POWER WOULD CAUSE YOUR RECEIVER'S S-METER TO READ S8? ANSWER: 25 WATTS.**
- **(ACH S-UNIT = 6 DB. S9 TO S8 IS ONE S-UNIT LOWER = -6 DB = $\frac{1}{4}$ POWER. $100\text{ W} \times \frac{1}{4} = 25\text{ W}$.**

B-002-006: SIGNAL REPORTING SYSTEMS

S-METER CALIBRATION AND POWER CHANGE CALCULATIONS

- **QUESTION B-002-006-008: ASSUME YOUR RECEIVER'S S-METER IS CALIBRATED TO A STANDARD OF 6 DB PER S-UNIT PER A RECOMMENDATION BY THE INTERNATIONAL AMATEUR RADIO UNION (IARU). THE S-METER ON YOUR RECEIVER SHOWS S8 WHEN LISTENING TO A NEARBY TRANSMITTER. APPROXIMATELY HOW MUCH MUST THE TRANSMITTER POWER BE RAISED TO INCREASE THE READING TO S9? ANSWER: 4 TIMES.**
- **S8 TO S9 IS ONE S-UNIT HIGHER = +6 DB = $4\times$ POWER INCREASE.**



QUESTION SECTION B-002-007:

Q CODES IN AMATEUR RADIO

PURPOSE AND USE OF Q CODES

- **Q CODES** ARE THREE-LETTER GROUPS BEGINNING WITH "Q" THAT HAVE SPECIFIC MEANINGS. WHEN FOLLOWED BY A QUESTION MARK (?), THEY BECOME A QUESTION; WITHOUT, THEY ARE A STATEMENT. USED HEAVILY IN CW TO SHORTEN TRANSMISSIONS.
- MANY ARE ALSO SPOKEN IN VOICE (EX: "QRM?" = "ARE YOU BEING INTERFERED WITH?").

B-002-007: Q CODES IN AMATEUR RADIO

FREQUENCY & CALLING RELATED Q CODES:

- **QRL** – IS THE FREQUENCY IN USE
- **QRZ?** – WHO IS CALLING
- **QSY** – CHANGE FREQUENCY

SIGNAL QUALITY & INTERFERENCE Q CODES:

- **QRM** – I AM BEING INTERFERED WITH
- **QRN** – I AM TROUBLED BY STATIC
- **QSB** – YOUR SIGNAL IS FADING

SPEED, LOCATION & FOLLOW UP Q CODES:

- **QRS** - SEND MORE SLOWLY
- **QTH** – MY LOCATION IS
- **QRX** - I WILL CALL YOU AGAIN



EXAM Q CODES

QSO – CONTACT/CONVERSATION BETWEEN TWO STATIONS. NOT ON THE LIST FOR THE EXAM BUT IT IS USED ALL THE TIME.



QUESTION SECTION B-002-008:

EMERGENCY COMMUNICATIONS AND

PREPAREDNESS

DISTRESS SIGNALS AND WHEN THEY MAY BE USED

- AMATEUR RADIO OPERATORS ARE AUTHORIZED TO USE PRIORITY DISTRESS SIGNALS ONLY IN GENUINE **LIFE-THREATENING SITUATIONS**.
- THESE ARE INTERNATIONALLY RECOGNIZED SIGNALS RESERVED FOR GRAVE AND IMMINENT DANGER TO LIFE OR PROPERTY.
- FALSE USE IS **ILLEGAL** AND CAN BLOCK REAL EMERGENCIES.



B-002-008: EMERGENCY COMMUNICATIONS AND PREPAREDNESS

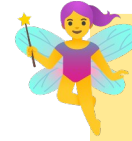
DISTRESS SIGNALS AND WHEN THEY MAY BE USED

- **MAYDAY** - VOICE PROCEDURE: "MAYDAY MAYDAY MAYDAY" FOLLOWED BY YOUR CALL SIGN, POSITION, NATURE OF EMERGENCY, AND ASSISTANCE NEEDED. REPEAT AS NECESSARY.
- **SOS** - CW PROCEDURE: SOS SOS SOS. NO SPACES BETWEEN LETTERS) FOLLOWED BY YOUR CALL SIGN. THE CONTINUOUS "DI-DI-DIT-DAH-DAH-DAH-DI-DI-DIT" IS UNMISTAKABLE WORLDWIDE.

B-002-008: EMERGENCY COMMUNICATIONS AND PREPAREDNESS

MESSAGE PRIORITY LEVELS

- RADIO TRAFFIC FOLLOWS A STRICT HIERARCHY.
- DISTRESS > EMERGENCY > PRIORITY/URGENT > ROUTINE.
- **DISTRESS** = IMMEDIATE LIFE THREAT (MAYDAY/SOS)
- **EMERGENCY** = URGENT BUT NOT IMMEDIATE LIFE THREAT
EX: "PAN-PAN" IN AVIATION/MARITIME OR "EMERGENCY" IN HAM RADIO
- **PRIORITY/URGENT** = TIME-SENSITIVE NON-LIFE-THREATENING
- **ROUTINE** = NORMAL COMMUNICATIONS.



"PAN-PAN" DERIVED FROM THE FRENCH WORD "*PANNE*" WHICH MEANS A BREAKDOWN OR FAILURE.

B-002-008: EMERGENCY COMMUNICATIONS AND PREPAREDNESS

PROCEDURES FOR DISTRESS OR EMERGENCY TRAFFIC

- ACT QUICKLY, CLEARLY, AND COURTEOUSLY WHEN YOU HEAR OR NEED TO SEND PRIORITY TRAFFIC.
- **BREAKING IN TO A CONVERSATION:** SAY "**BREAK BREAK BREAK**" OR JUST "BREAK" LOUDLY DURING A PAUSE, THEN GIVE YOUR CALL SIGN AND "**MAYDAY**" OR "**EMERGENCY**" + BRIEF DETAILS.
- **DO THIS ONLY FOR REAL EMERGENCIES.**



B-002-008: EMERGENCY COMMUNICATIONS AND PREPAREDNESS

PROCEDURES FOR DISTRESS OR EMERGENCY TRAFFIC

- IF YOU HEAR SOMEONE BREAKING IN TO YOUR CONVERSATION:
- **IMMEDIATELY STOP YOUR QSO.** RESPOND WITH: "[THEIR CALL SIGN] THIS IS [YOUR CALL SIGN], GO AHEAD" OR SIMILAR. LISTEN AND RELAY INFO TO AUTHORITIES IF POSSIBLE. TRY TO DETERMINE LOCATION AND WHAT ASSISTANCE MAY BE NEEDED.
- **DO NOT LEAVE THE FREQUENCY** — STAY LISTENING IN CASE THE STATION NEEDS RELAYING OR FURTHER HELP. CALL 911 OR LOCAL EMERGENCY SERVICES WITH DETAILS IF YOU CAN.

B-002-008: EMERGENCY COMMUNICATIONS AND PREPAREDNESS

EMERGENCY STATION PREPAREDNESS

- **BEING READY TO OPERATE WITHOUT NORMAL INFRASTRUCTURE IS A KEY PART OF HAM RADIO'S EMERGENCY SERVICE ROLE.**

EMCOMMS



B-002-008: EMERGENCY COMMUNICATIONS AND PREPAREDNESS

EMERGENCY STATION PREPAREDNESS

- **HAM RADIO GEAR IS DESIGNED TO RUN ON 12V DC**
- **BATTERIES, SOLAR, GENERATORS, OR CAR POWER ALLOW CONTINUED OPERATION WHEN THE MAIN POWER GRID FAILS – CRITICAL FOR ARES/RACES/SKYWARN OR LOCAL EMERGENCIES.**



B-002-008: EMERGENCY COMMUNICATIONS AND PREPAREDNESS

EMERGENCY STATION PREPAREDNESS

- HANDY TALKIES (HT) RUN ON BATTERY POWER BUT LIMITED TO THE BATTERY LIFE.
- **SPARE CHARGED BATTERIES**, EXTERNAL BATTERY PACKS, OR SOLAR CHARGERS EXTEND USEFULNESS DRAMATICALLY.
- NEWER HTs ARE NORMALIZING CHARGING TO USB-C WHICH IS VERY CONVENIENT.



B-002-008: EMERGENCY COMMUNICATIONS AND PREPAREDNESS

EMERGENCY STATION PREPAREDNESS

- **QUESTION B-002-008-008: WHICH TYPE OF ANTENNA WOULD BE A GOOD CHOICE AS PART OF A PORTABLE HF STATION THAT COULD BE SET UP IN CASE OF AN EMERGENCY? ANSWER: A DIPOLE OR A VERTICAL.**



NOTE: IN REALITY, AN END FED HALF WAVE (EFHW) IS MUCH QUICKER AND EASIER TO DEPLOY IN AN EMERGENCY. BUT FOR THE EXAM IT'S DIPOLE OR VERTICAL ANTENNAS.



QUESTION SECTION B-002-009:

LOGGING, QSLING, CONTESTING AND TIME

REFERENCES

B-002-009: LOGGING, QSLING, CONTESTING AND TIME REFERENCES

QSL CARDS AND PROOF OF COMMUNICATION

- A **QSL CARD** IS A POSTCARD-SIZED PAPER CONFIRMATION WITH DETAILS OF THE RADIO CONTACT: DATE, TIME, FREQUENCY, MODE, SIGNAL REPORT, ETC.
- SENDING AND COLLECTING QSL CARDS IS A FUN ASPECT OF THE HOBBY, ESPECIALLY FOR DISTANT STATIONS (DX) AND OFTEN REQUIRED FOR AWARDS.
- BEFORE THE INTERNET, THESE WERE THE ONLY “**PROOF**” OPERATORS HAD OF CONTACTS WITH OTHER STATIONS.

B-002-009: LOGGING, QSLING, CONTESTING AND TIME REFERENCES



VEØCNM
HMCS SACKVILLE
Wireless Office
CQ Zone 5
ITU Zone 9
Grid Square FN84fp

Confirm QSO with:	Date			UTC	MHZ	Mode 2-way	RST
	Day	Month	Year				
VE5REV	18	10	25	1710	21.3	SSB	59

His Majesty's Canadian Ship SACKVILLE is the last surviving WWII Corvette in the world. She served with distinction, escorting 30 convoys across the ocean during the Battle of the Atlantic helping to supply the United Kingdom with vital food, fuel, and weapons. She attacked several submarines and assisted in many other engagements. SACKVILLE is permanently stationed in Halifax, Nova Scotia, serving as Canada's Naval Memorial and is operated by the non-profit organization Canadian Naval Memorial Trust. She is open to the public as indicated on the website: cnmt.ca. SACKVILLE is also a member of Parks on the Air (POTA), CA-5821. The radio set installed in SACKVILLE was owned by Chief Petty Officer (CPO) Wayne Catchpaugh who gave it to CPO Sam Semple and Sam later donated it to the ship. The set was installed by members of the Halifax Amateur Radio Club (HARC). The Wireless Office is manned on an intermittent basis. Contact aradio@cnmt.ca. Photo: Doug Struthers arjstruthers@gmail.com

visit cnmt.ca Become a Trustee!

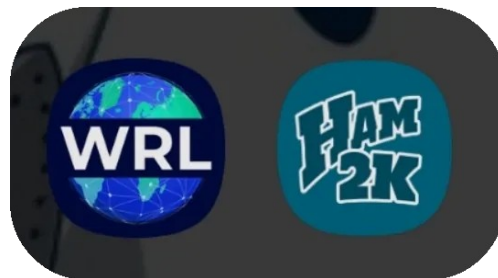
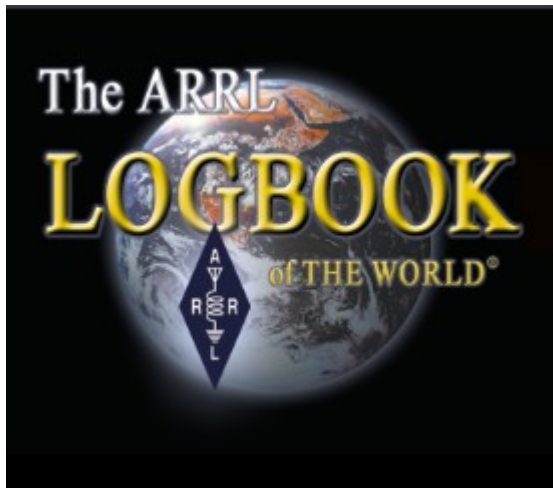
“QSL” OR CONTACT CARDS

B-002-009: LOGGING, QSLING, CONTESTING AND TIME REFERENCES

STATION LOGGING PRACTICES

- LOGGING CONTACTS IS GOOD OPERATING PRACTICE, EVEN IF NOT ALWAYS MANDATORY.
- IN CANADA (AND MOST COUNTRIES), **KEEPING A DETAILED LOGBOOK IS NOT A LEGAL REQUIREMENT** FOR ROUTINE OPERATION — BUT IT IS STRONGLY RECOMMENDED FOR: AWARD CHASING, CONTESTING, TROUBLESHOOTING, EMERGENCY PREPAREDNESS, AND PERSONAL RECORDS.
- MANY OPERATORS USE SOFTWARE & PHONE APPS TO DO THIS.

B-002-009: LOGGING, QSLING, CONTESTING AND TIME REFERENCES



ELECTRONIC LOGGING

100 QSOS	SPOTS	MAP	OPER.
Jan 22	1 QSO		★ 30 🍀 4
Jan 30	4 QSOS		★ 30 🍀 6
23:03z	14.224.0 VE6PFL	AB Graham...	▲ 57 59
23:04z	14.248.0 KF0VQG	🇺🇸 CO ☕ Ry...	▲ 55 44
23:22z	14.074.0 VA1VA	NS Paul Bla...	-03 -02
23:32z	14.046.5 KM7CPE	🇺🇸 OR Rio ...	▲ 559 559
Feb 3	2 QSOS		★ 30 🍀 6
19:38z	14.265.0 WA3LTJ	🇺🇸 BC Andre...	▲ 54 52
19:39z	14.282.0 KE8VC	🇺🇸 MI David ...	▲ 52 53
Feb 4	9 QSOS		★ 30 🍀 6
00:56z	14.074.0 KE9CWZ	🇺🇸 IL John G. H...	02 00
02:14z	10.136.0 KA3ZLS	🇺🇸 CA Chri...	▲ 07 -20
02:17z	10.136.0 KF0FEI	🇺🇸 CA Jar...	▲ -01 -17
02:20z	10.136.0 KE7MRA	🇺🇸 UT Randy E...	02 -07
02:20z	10.136.0 KD9VGL	🇺🇸 WI Gary R. ...	14 -04
02:24z	10.136.0 KC8ZKS	🇺🇸 OH Ken...	▲ 04 -04
02:26z	10.136.0 WA3PBL	🇺🇸 PA Christo...	14 -04
02:28z	10.136.0 W4WFC	🇺🇸 TN William ...	12 -12
02:31z	10.136.0 WW1LDE	🇺🇸 IN Woody ...	12 -10

B-002-009: LOGGING, QSLING, CONTESTING AND TIME REFERENCES

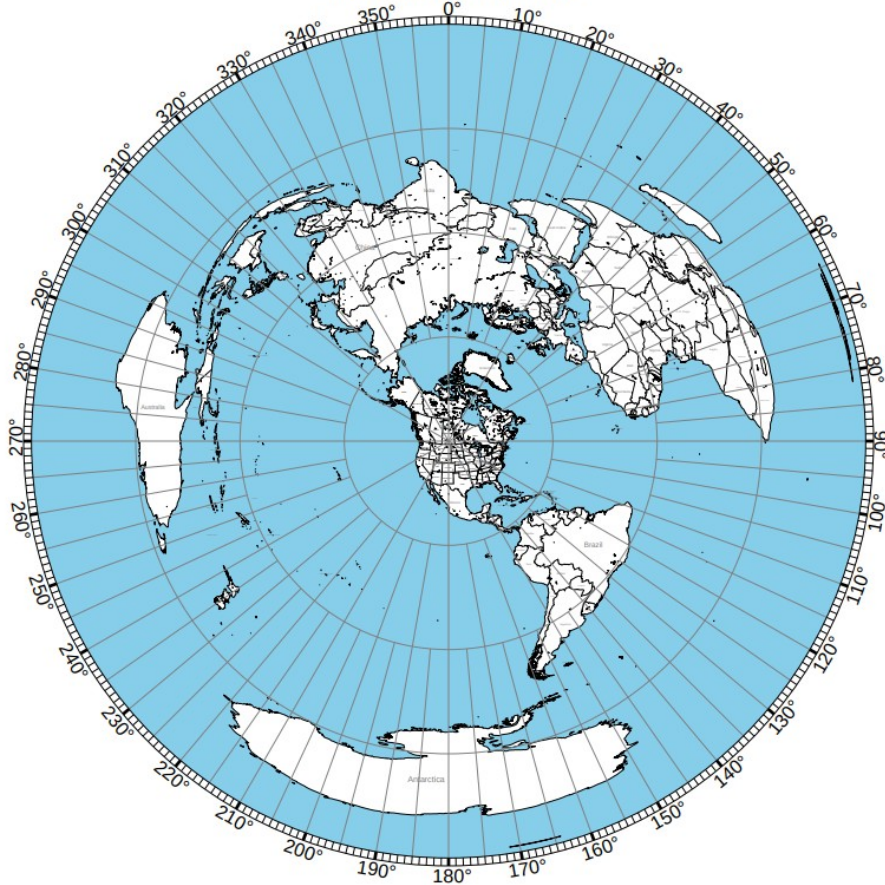
AZIMUTHAL MAPS AND ANTENNA DIRECTION (SHORT PATH VS. LONG PATH)

- UNDERSTANDING GREAT-CIRCLE PATHS IS KEY FOR EFFECTIVE DXING.
- AN **AZIMUTHAL**-EQUIDISTANT PROJECTION CENTERED ON YOUR QTH SHOWS TRUE GREAT-CIRCLE BEARINGS AND DISTANCES TO ANY POINT ON EARTH — ESSENTIAL FOR POINTING DIRECTIONAL ANTENNAS ACCURATELY.

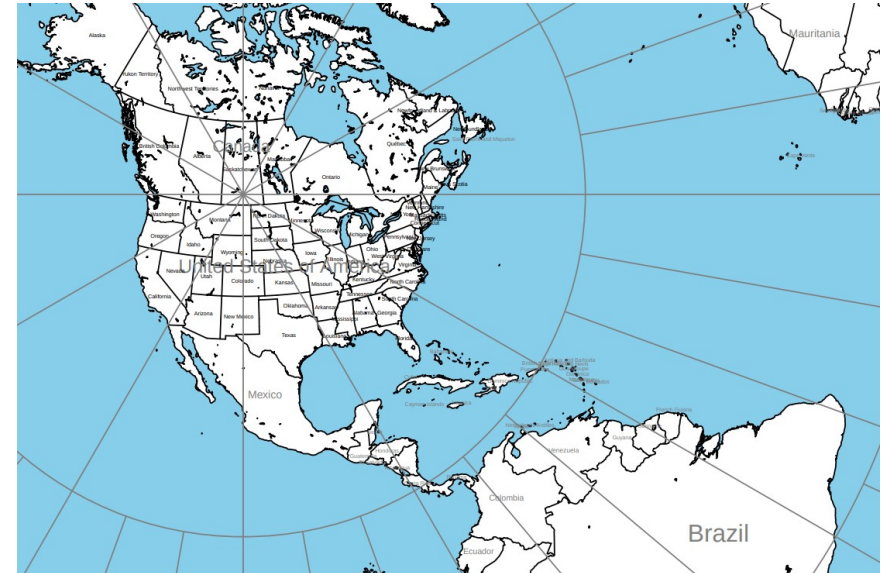


B-002-009: LOGGING, QSLING, CONTESTING AND TIME REFERENCES

Courtesy of Tom (NS6T)



AZIMUTHAL MAP



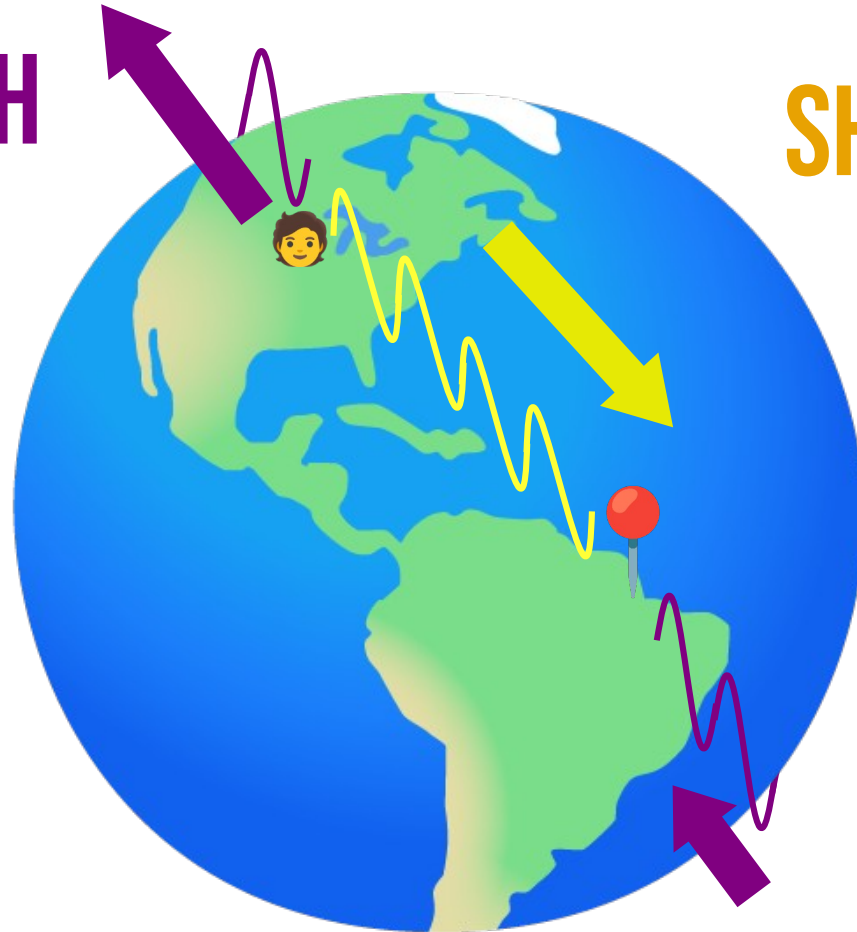
B-002-009: LOGGING, QSLING, CONTESTING AND TIME REFERENCES

LONG-PATH

SHORT PATH = DIRECT GREAT-CIRCLE ROUTE (USUALLY SHORTEST DISTANCE)

LONG PATH = THE OPPOSITE DIRECTION AROUND THE GLOBE (ADDS ~20,000 KM).

LONG-PATH OPENINGS OCCUR WHEN PROPAGATION FAVOURS THE LONGER ROUTE — OFTEN ON 20M, 17M, OR 15M DURING CERTAIN TIMES OF DAY.



SHORT-PATH



EXAM: 180°



B-002-009: LOGGING, QSLING, CONTESTING AND TIME REFERENCES

GRID SQUARES (MAIDENHEAD LOCATORS)

- THE **MAIDENHEAD** LOCATOR SYSTEM (ALSO CALLED **GRID SQUARES**, MAIDENHEAD GRID, OR QTH LOCATOR) IS THE STANDARD WAY HAMS WORLDWIDE QUICKLY SHARE APPROXIMATE GEOGRAPHIC LOCATIONS
- IT WAS DEVELOPED BY DR. JOHN MORRIS, G4ANB, AND ADOPTED IN THE EARLY 1980S (NAMED AFTER MAIDENHEAD, ENGLAND, WHERE IT WAS FORMALIZED). IT REPLACED THE OLDER, EUROPE-ONLY QRA LOCATOR SYSTEM. IT WORKS GLOBALLY AND IS CONCISE ENOUGH TO EXCHANGE EASILY OVER VOICE, CW, OR DIGITAL MODES—EVEN UNDER TOUGH CONDITIONS.

B-002-009: LOGGING, QSLING, CONTESTING AND TIME REFERENCES

GRID SQUARES (MAIDENHEAD LOCATORS)

- MAIDENHEAD GRID SQUARES ARE $2^{\circ} \times 1^{\circ}$ LATITUDE/LONGITUDE RECTANGLES (EX: D062 FOR THE SASKATOON, SK AREA).
- 4 CHARACTERS = FIELD + SQUARE (100 KM $\times$ 150 KM); 6 CHARACTERS = SUBSQUARE (2-3 KM PRECISION). EXAMPLE: "MY GRID IS D062" OR "D0620d".



THERE ARE ALL KINDS OF WEBSITES AND PHONE APPS THAT WILL TELL YOU WHAT GRID SQUARE YOU'RE IN AUTOMATICALLY.

Grid square: Locality: Country:

Enter 6 character grid square or Enter locality or Click on the map!

© 2014 by [HA8TKS](#) Latitude: 061.2619.56°N Longitude: 179.2821.56°W Maidenhead locator or QTH grid square: AP01GK 35gh

B-002-009: LOGGING, QSLING, CONTESTING AND TIME REFERENCES

UTC (COORDINATED UNIVERSAL TIME) AND TIME STANDARDS

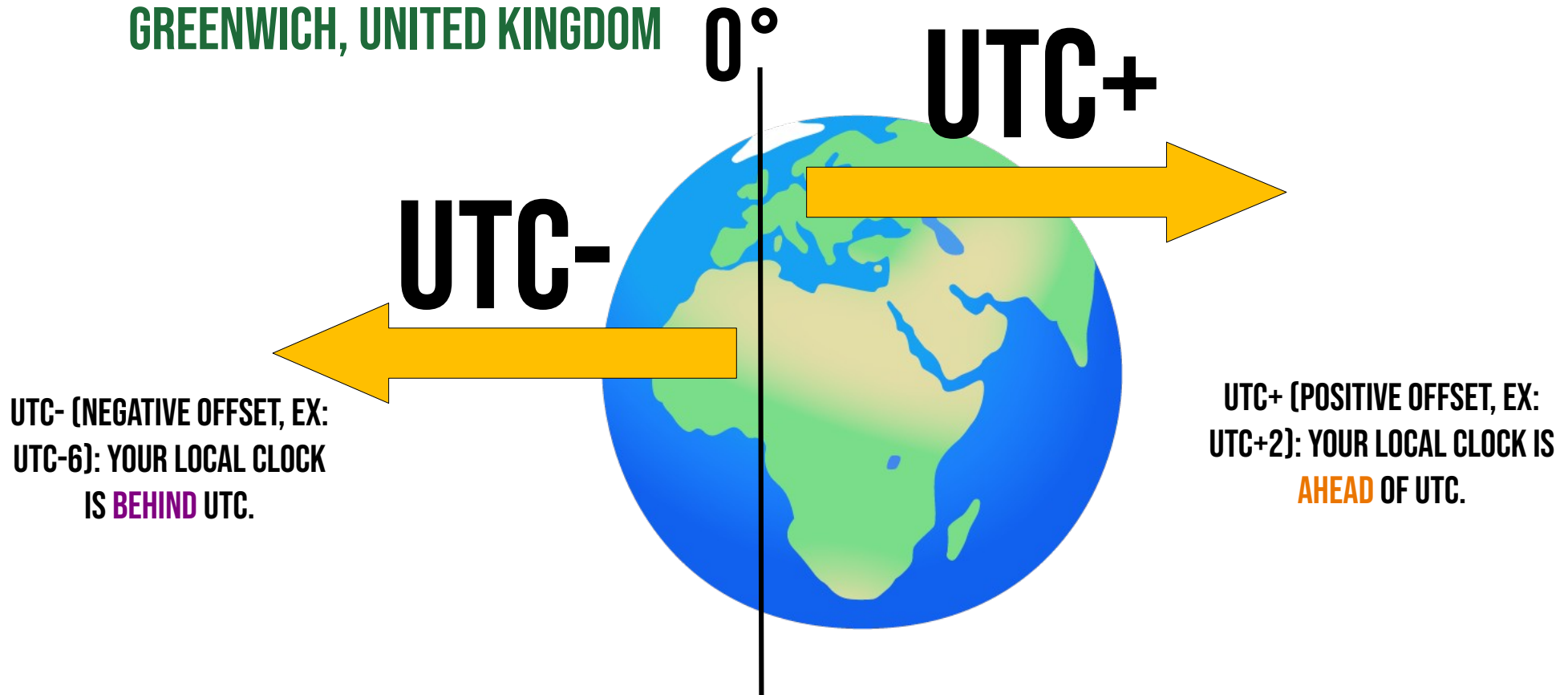
- **UTC** (COORDINATED UNIVERSAL TIME) IS THE WORLD'S PRIMARY TIME STANDARD — THE GLOBAL REFERENCE CLOCK USED EVERYWHERE FOR CONSISTENCY, ESPECIALLY IN INTERNATIONAL ACTIVITIES LIKE HAM RADIO.
- UTC IS A PRECISE, ATOMIC-CLOCK-BASED TIME SCALE (NOT AFFECTED BY DAYLIGHT SAVING TIME OR LOCAL SEASONS). IT'S ESSENTIALLY THE **MODERN SUCCESSOR** TO GREENWICH MEAN TIME (GMT) AND IS OFTEN CALLED "ZULU TIME" (Z) IN MILITARY/RADIO CONTEXTS.

B-002-009: LOGGING, QSLING, CONTESTING AND TIME REFERENCES

UTC (COORDINATED UNIVERSAL TIME) AND TIME STANDARDS

- **WHY "UTC"?: THE ABBREVIATION IS A COMPROMISE — ENGLISH "COORDINATED UNIVERSAL TIME" WOULD BE CUT, FRENCH " *TEMPS UNIVERSEL COORDONNÉ*" WOULD BE TUC, SO UTC WAS CHOSEN AS NEUTRAL.**
- **IT'S TIED TO THE PRIME MERIDIAN (0° LONGITUDE, THROUGH GREENWICH, ENGLAND) AND KEPT WITHIN ~0.9 SECONDS OF ACTUAL SOLAR TIME (UT1) BY ADDING LEAP SECONDS OCCASIONALLY (LAST MINUTE OF JUNE OR DECEMBER GETS 61 SECONDS IF NEEDED).**
- **USES 24-HOUR CLOCK (EX: 14:30 UTC INSTEAD OF 2:30 PM). NO AM/PM.**
- **TIME IS ALWAYS RECORDED IN UTC FOR HAM RADIO LOGGING.**

B-002-009: LOGGING, QSLING, CONTESTING AND TIME REFERENCES

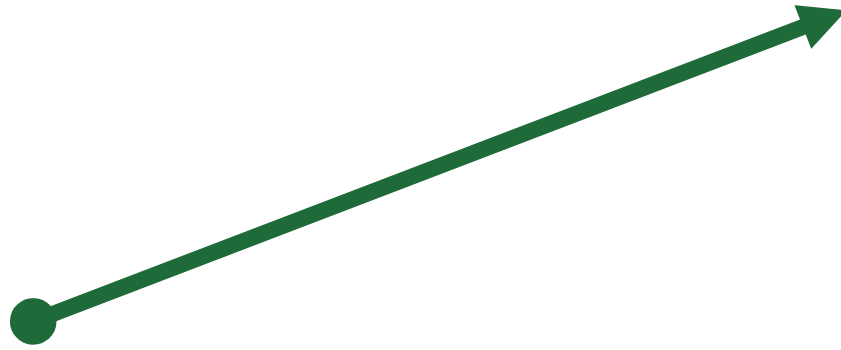


B-002-009: LOGGING, QSLING, CONTESTING AND TIME REFERENCES

UTC (COORDINATED UNIVERSAL TIME) AND TIME STANDARDS

- B-002-009-010 YOUR TIME ZONE IS UTC MINUS 6 HOURS. YOU WANT TO JOIN A NET SCHEDULED FOR 19:00 UTC. WHAT IS THE LOCAL SCHEDULED TIME? **ANSWER: 1PM**

$$\begin{array}{r} 19:00 \text{ UTC} \\ -06:00 \text{ UTC} \\ \hline 13:00 \text{ UTC} \end{array}$$



STANDARD TIME AND FREQUENCY REFERENCE STATIONS

- BESIDES THE INTERNET, ACCURATE AND PRECISE FREQUENCY AND TIME SIGNALS ARE **CONTINUOUSLY BROADCAST** OUT INTO THE WORLD BY GOVERNMENT OPERATED SHORTWAVE TIME-SIGNAL STATIONS 24/7.
- **CHU, WWV, AND WWVH** ARE GOVERNMENT-OPERATED SHORTWAVE TIME-SIGNAL STATIONS THAT BROADCAST PRECISE TIME, FREQUENCY STANDARDS, AND GEOPHYSICAL INFO 24/7.
- ALL THREE PROVIDE ATOMIC-CLOCK-ACCURATE UTC TIME ANNOUNCEMENTS (MALE VOICE ON WWV, FEMALE ON WWVH, BILINGUAL ENGLISH/FRENCH ON CHU).

STANDARD TIME AND FREQUENCY REFERENCE STATIONS

- BEFORE GPS/INTERNET NTP BECAME COMMON, EVERY HAM SHACK HAD A RADIO TUNED TO ONE OF THESE STATIONS FOR TIME SYNC.
- THIS IS STILL HANDY AND USEFUL TODAY AS A BACKUP OR WHEN THE INTERNET IS DOWN OR IF YOU ARE USING DIGITAL RADIO MODES OFF-GRID.
- YOU CAN SYNC YOUR COMPUTER TIME WITH THESE STATIONS FOR ACCURATE TIME WHICH IS CRITICAL FOR DIGITAL MODES.



B-002-009: LOGGING, QSLING, CONTESTING AND TIME REFERENCES



CHU - OTTAWA, ONTARIO. MHz: 3.330, 7.850, 14.670

WWV - FT. COLLINS, COLORADO. MHz: 2.5, 5.0, 10.0, 15.0, 20.0 25.0

WWVH - KEKAHA, HAWAII. MHz: 2.5, 5.0, 10.0, 15.0





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