

UK Foundation Amateur Radio License Operating

Voice Communications

- The first and most obvious use of Amateur Radio
- Recall analog voice modulations:
 - Frequency Modulation
 - Single Sideband AM
- FM usually used on 144.500 MHz and above
 - Usually 12.5 kHz bandwidth (Narrow Band FM – NBFM)
- SSB usually used on 50 MHz and below
 - Usually 2.4 – 5 kHz bandwidth, most common is 3 kHz

Talking on the air - Step by Step

- Select a frequency to transmit/receive on
 - Check the reference *band-plan* table to see where you have access
- Select a modulation (FM, SSB {LSB/USB}, ...)
 - Different frequency bands have recommended modes
 - Often your radio will default to a particular mode
 - Sometimes only one mode supported by the hardware!
- Select a power level
 - Check the reference table again

Talking on the air - Step by Step

- For example, lets use a handheld radio
- The society loaner radios are Yaesu FT-65s
 - Modulations: NBFM
 - Frequencies: VHF/UHF
 - Power: 5 Watt maximum

Foundation Licence Parameters			
Frequency Bands (in MHz)	Status of allocations in UK to the Amateur Service	Status of allocations in UK to the Amateur Satellite Service	Maximum Peak Envelope Power level in Watts (and dB relative to 1 Watt)
144.0-146.0	Primary	Primary	10W (10 dBW)
430.0-431.0	Secondary	Not allocated	10W (10 dBW) e.r.p.
431.0-432.0	Secondary. Not available for use within 100km radius of Charing Cross, London (51°30'30"N, 00°07'24"W)	Not allocated	10W (10 dBW) e.r.p.
432.0-435.0	Secondary	Not allocated	10W (10 dBW)
435.0-438.0	Secondary	Secondary	10W (10 dBW)
438.0-440.0	Secondary	Not allocated	10W (10 dBW)



144MHz (2m)	NECESSARY BANDWIDTH	UK USAGE
144.400-144.490		Propagation Beacons only
144.000-144.025MHz	2700Hz	All Modes – including Satellite Downlinks
144.025-144.100	500Hz	Telegraphy (including EME CW) 144.050MHz – Telegraphy Centre of Activity 144.100MHz – Random MS Telegraphy Calling, (Note 1)
144.110-144.150	500Hz	Telegraphy and MGM EME MGM Activity (Note 7)
144.150-144.400	2700Hz	Telegraphy, MGM and SSB 144.175MHz – Microwave Talk-back 144.200MHz – Random MS SSB 144.250MHz – GB2RS News Broadcast and Slow Morse 144.260MHz – See Note 10 144.300MHz – SSB Centre of Activity 144.370MHz – MGM MS Calling
144.490-144.500		Beacon guard band 144.491-144.493 Personal Weak Signal MGM Beacons (BW: 500Hz max)
144.500-144.794	20kHz	All Modes (Note 8) 144.500MHz – Image Modes Centre (SSTV, FAX, etc) 144.600MHz – Data Centre of Activity (MGM, RTTY, etc) 144.6125MHz – UK Digital Voice (DV) Calling (Note 9) 144.625-144.675MHz – See Note 10 144.750MHz – ATV Talk-back 144.775-144.794MHz – See Note 10
144.794-144.990	12kHz	MGM Digital Communications (Note 15) 144.800-144.9875MHz – MGM/Digital Communications 144.8000MHz – Unconnected Nets – APRS, UiView etc (Note 14) 144.8125MHz – DV Internet Voice Gateway 144.8250MHz – DV Internet Voice Gateway 144.8375MHz – DV Internet Voice Gateway 144.8500MHz – DV Internet Voice Gateway 144.8625MHz – DV Internet Voice Gateway 144.9250MHz – TCP/IP Usage 144.9375MHz – AX25 Usage 144.9500MHz – AX25 Usage 144.9625MHz – FM Internet Voice Gateway 144.9750MHz, 144.9875MHz To Be Decided (Note 11)
144.990-145.1935	12kHz	FM/DV RV48-RV63 Repeater Input Exclusive (Note 2 & 5)
145.200	12kHz	FM/DV Space Communications (eg ISS) – Earth-to-Space 145.2000MHz – (Note 4 & 10)
145.200-145.5935	12kHz	FM/DV V16-V48 – FM/DV Simplex (Note 3, 5 & 6) 145.2250MHz – See Note 10 145.2375MHz – FM Internet Voice Gateway (IARU common channel) 145.2500MHz – Used for Slow Morse Transmissions 145.2875MHz – FM Internet Voice Gateway (IARU common channel) 145.3375MHz – FM Internet Voice Gateway (IARU common channel) 145.5000MHz – FM Calling (Note 12) 145.5250MHz – Used for GB2RS News Broadcast 145.5500MHz – Used for Rally/exhibition Talk-in 145.5750MHz, 145.5875MHz (Note 11)
145.5935-145.7935	12kHz	FM/DV RV48-RV63 – Repeater Output (Note 2)
145.800	12kHz	FM/DV Space Communications (eg ISS) – Space-Earth
145.806-146.000	12kHz	All Modes – Satellite Exclusive

Talking on the air - Step by Step

- Check that no one else is using the frequency
 - Having tuned to the frequency and setup your radio, listen
 - Ask “Is this frequency in use? GCOCDF”
 - It’s your first transmission on the frequency, including your callsign is **mandatory**
- Either ask if the person you want to talk to is there
 - “Dave are you listening?”
 - “2W0LDX, are you monitoring?”
- Or call out to anyone!
 - “Are there any stations monitoring? GCOCDF calling CQ”
 - Repeat with pauses until someone responds

Talking on the air - Step by Step

- Can use *calling channel* to find people
 - A set frequency reserved as a meeting spot
 - **Must** move to another frequency after you find them

Dave, are you monitoring? MW0LNA

Hi Derek, Yes I'm on. 2W0LXD

Great, lets move to 145.200

OK, catch you there. 2W0LXD changing frequency.

MW0LNA clear of the frequency.

Talking on the air

- Every time you change frequency, check if it is use
- Band plans include *centres of activity*
 - Where to go to find activity of a specific purpose or modulation
 - CW, Data modes (PSK, FT8, video), AM, satellite, etc
- Not allowed to transmit music or use offensive language
 - If you hear this on the air, ignore the person

Phonetic Alphabet

- Analog voice modes can have noise problems
 - Useful to spell out callsigns or important words using the *phonetic alphabet*

CHARACTER	MORSE CODE	TELEPHONY	PHONIC (PRONUNCIATION)
A	• —	Alfa	(AL-FAH)
B	— •••	Bravo	(BRAH-VOH)
C	— • — •	Charlie	(CHAR-LEE) or (SHAR-LEE)
D	— ••	Delta	(DELL-TAH)
E	•	Echo	(ECK-OH)
F	•• — •	Foxtrot	(FOKS-TROT)
G	— — •	Golf	(GOLF)
H	••••	Hotel	(HOH-TEL)
I	••	India	(IN-DEE-AH)
J	• — — —	Juliett	(JEW-LEE-ETT)
K	— • —	Kilo	(KEY-LOH)
L	• — ••	Lima	(LEE-MAH)
M	— —	Mike	(MIKE)
N	— •	November	(NO-VEM-BER)
O	— — —	Oscar	(OSS-CAH)
P	• — — •	Papa	(PAH-PAH)
Q	— — • —	Quebec	(KEH-BECK)
R	• — •	Romeo	(ROW-ME-OH)
S	•••	Sierra	(SEE-AIR-RAH)
T	—	Tango	(TANG-GO)

U	•• —	Uniform	(YOU-NEE-FORM) or (OO-NEE-FORM)
V	••• —	Victor	(VIK-TAH)
W	• — —	Whiskey	(WISS-KEY)
X	— •• —	Xray	(ECKS-RAY)
Y	— • — —	Yankee	(YANG-KEY)
Z	— — ••	Zulu	(ZOO-LOO)
1	• — — — —	One	(WUN)
2	•• — — —	Two	(TOO)
3	••• — —	Three	(TREE)
4	•••• —	Four	(FOW-ER)
5	•••••	Five	(FIFE)
6	— ••••	Six	(SIX)
7	— — •••	Seven	(SEV-EN)
8	— — — ••	Eight	(AIT)
9	— — — — •	Nine	(NIN-ER)
0	— — — — —	Zero	(ZEE-RO)

Signal Reports

- Useful for letting the other person know how well their signal is reaching you

Readability (R)	Strength (S)	Tone (T)
1 – Unreadable	1 – Faint signal	1 – 50 Hz noise, very rough
2 – Barely Readable	2 – Very weak signals	2
3 – Readable with difficulty	3	3
4 – Readable	4	4
5 – Perfectly clear	5	5
	6 – Good Signal	6 – Good tone, a little distorted
	7	7
	8	8
	9 – Very strong signal	9 – Perfect tone

Keeping a Log

- Record of
 - **Who** you spoke with (*worked*)
 - **When** (Date and Time in UTC)
 - **How** (Frequency, Modulation, and power level)
- Required for contests and awards
 - Usually you exchange a contact number (ie “#49 worked today”)

Frequency and Band Plans continued

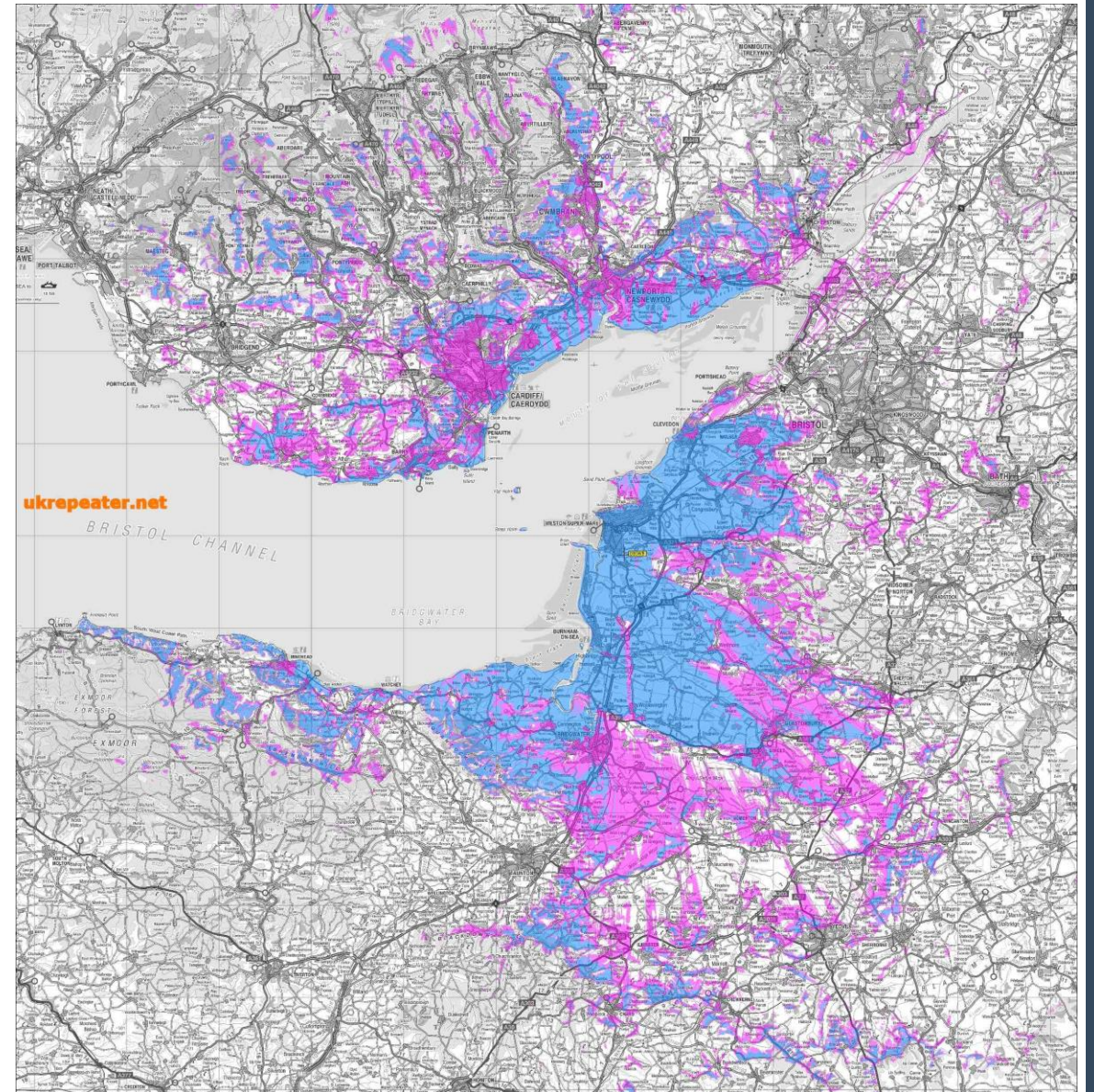
- Official Frequency Plans are allocations
 - Primary
 - You are the main user
 - Others either not allowed or have to not interfere
 - Secondary
 - Have to avoid or not interfere with the Primary users
- Frequency and Band plans identify users/purpose
 - Aeronautical, Broadcast, Amateur Radio
 - Satellite
 - Don't talk locally on satellite frequencies

Repeaters

- Wireless signals have limited range
 - Sometimes that range is world wide or well into space, but not usually
- Repeaters listen on one frequency and re-transmit on another
 - Usually with much higher power and with a better location and antenna
 - First they listen for a *CTCSS* tone then start repeating
 - The frequency pair is called a *split*
 - The difference in Rx (input) and Tx (output) frequencies is the *offset*
- Courtesy tone sounds at the end of a transmission
- Timer will cutoff long transmissions (30-90 seconds usually)

Repeaters

- Weston Super Mare
 - GB3WE
 - FM
 - Input: 145.0875 MHz (you transmit)
 - Output: 145.6875 MHz (you receive)
 - Split: -600 kHz
 - CTCSS: 94.8 Hz



Practical Assessment!

- Starting next Tuesday and Friday during “alternative” lab session
- Have a quick conversation on both VHF (FM) and HF (SSB)
- Use the calling channel, change frequency, exchange a report
- Mandatory before taking the test
 - Not graded, “done/not-done”

Test registration!

- Must register online in the next week

www.cardiffars.org.uk/info/licensing