BANDPLANNING

The syllabus calls for the reasons and advantages of band-planning rather than actual details (shown below purely as examples)

There is a tine and a place for everything...

As you know the Amateur Hands are laid down by the licensing authority together with the permitted powers and modes of transmission (speech, Morse, TV etc). This means that Amateurs may use any permitted mode in any part of the band in question. In practice this is not a very good idea therefore Amateurs themselves have devised a "plan" for each of their bands.

As an example I shall describe the plan adapted for 80 Metres (3.5-3.8 MHz).
Cu (Morse) is used in the bottom 100 kHz (i.e. 3.5-3.6 MHz).
RTTY (Teleprinters) use frequencies around 3.6 MHz (3.59-3.62 MHz)
SSB (speech) is used from 3.6-3.9 MHz
SSTV (Slow Scan Television) is usually found about 235 kHz from the bottom of the band (IE 3.735 MHz)

The bottom 10 kHz of 80 Metres (3.50-3.51 MHz) is set aside for long distance (DX) CW communication.
The top 10 kHz of 80 Metres (3.79-3.90 MHz) is set aside for Long distance SSB communication.

This voluntary system makes sense. *So much so that some compulsory band planning may be part of the Full Licences in the near future. (Novice Licences already have some formal band planning)*

Imagine you are listening for a weak DX station on 3.605 MHz. You are most likely to hear it if the adjacent frequencies also contain weak stations rather than same locals having a chat across town.

Band-planning has another practical advantage.

There are many facets of Amateur Radio. It makes sense that the various types of transmission are given nominal segments so that you know where to 'look' for your particular interest.. For example, RTTY enthusiasts wishing to operate on 80 Metres would look around 3.6 MHz rather than having to search the whole band.

Don't grow beans amongst the roses

Some bands such as 10m (28-29.7 MHz) have sub-divided the speech section of bandplan to different speech modes SSB, FM etc etc. The various modes of transmission are explained in another lesson but take it from me that they are very different and require totally separate sections of a receiver.
If you are tuning across the band and listening to FM signals your FM receiver will not be able to resolve any SSB signals. In fact SSB would just sound like an intermittent unpleasant noise. Conversely, coming across an FM transmission among SSB signals is equally unwelcome as it will generate annoying whistles and pops in a SSB receiver...

How much room do you need?

There is also the question of bandwidth. Once again this is dealt with in another lesson. but suffice to say that bandwidth is the amount of frequency band that is required for each transmission.
As Amateurs do not generally use "channels" they try and pack as many conversations Into their bands as possible. It is feasible to have SSB signals as close as 2.5KHz but an FM one would need to be at least 10KHz from its neighbour.

While on the subject of bandwidth the mode that comes out on top, as the most efficient user of the radio spectrum, is CW (Morse). With a good receiver and a good ear, CW signals need only be a few 100 Hz apart. This means that there could be 10 CW conversations in the same place as one SSB speech signal…..and more than twice that number in place of an FM transmission

As a further example of band-planning I will outline the system adopted for the Two Metre (144-146MHz) Band.
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The bottom 150KHz (144-144.15MHz) is the CW sector.
SSB speech is used from 144.15 - 144.5MHz.
The section from 144.5-144.9 is open all modes.
Amateurs should not make transmissions between 144.9-144.99MHz as this section is reserved for propagation beacons.

Beacons are specially licensed unattended transmitters that radiate a continuous signal. They transmit their callsign every few seconds and their location every few minutes (both in CW). Beacons are dotted around the country and give a very good guide to the propagation conditions at VHF. It is most important that the beacon section is not used for other Amateur transmissions.
Many people monitor the strength of a distant beacon. Normally it may be inaudible but when it appears out of the noise it is a sign that the conditions are above average. Thus an Amateur using a beacon frequency for normal operation would render this monitoring meaningless.

The upper half of the two metre band (145-146 MHz) is nearly all 'uchannelised".
This means that transmissions take place on specific frequencies or channels.
These channels were spaced at 25KHz Intervals. For convenience these frequencies are given channel numbers. The channel number is prefixed with either S or R.

S stands for Simplex.
This is the normal method of Amateur communication where both stations transmit, in turn, on the same frequency.

R stands for Repeater.
Repeaters are built by amateurs to assist communication between "mobiles" even when they are on opposite sides of a hill. The repeater, mounted on the hilltop, would receive one car's transmission and re-transmit It 600 kHz further up the two metre band at the same time.
145MHz is R0 (repeater input).There are other repeater Inputs (R1-R8) at 25KHz intervals from 145.025 to 145.200MHz.

The simplex channels (S10-S23) use 25Khz spaced frequencies from 145.250 to 145.575 MHz.

This is followed by the repeater outputs (RO-R7) on 25KHz spaced frequencies between 145.6 to 145.9MHz.

All "S" and “R” channels use FM (frequency modulation)
The top of this band Is used for satellite communication and like frequencies on the lower half of this band is not channelised.
By 1999 the channel spacing was reduced from 25kHz to 12.5kHz. The above “S” channels were replaced with “V” channel numbers. The old S20 becomes V40 and S21 becomes V42 etc. Similarly the repeater channels change from R0 - R7 to be RV48 – RV62

There is even further "planning" within the above plan. Here are some examples:-
144.01 MHz Moon bounce
144.05 MHz CW calling
144.3 MHz 553 calling
144.5 MHz SSTU
144.6 MHz RTTY
145.3 MHz (s12)
145.5 MHz (520)
(using frequency shift keying mode) Is used for FM RTTY and not voice communication. FM calling

Why a calling frequency?

Some Amateur Hands$_1$ such as 60 or 40 Metres are very busy and there are always plenty of stations to be heard and worked. Other bands (EG Two Metres and Ten Metres) can be very quiet at times due to proagatlan or geographical difficulties. Therefore certain frequencies are designated as calling frequencies and are used to establish initial contact.

For example 144.3MHz is designated as the SSB calling frequency and many people leave their receivers monitoring this frequency
Whether making a general call (CQ) or calling for someone In particular it Is prudent to call on this frequency. As soon as two way communication has been established one of the stations should ask the other to stand-by while he looks for a clear frequency. He will then return to the calling frequency and suggest that they OSY (change frequency) to that chosen frequency.

Listen first

Before embarking on a new frequency it should always be ascertained that the frequency is not already busy by enquiring "Is this frequency in use please?". At first you may think that if it were in use you would hear a conversation in progress. This is not always so. There are many circumstances where only one side of a conversation may be audible and you may (unwittingly) be interfering with another QSO (conversation).

Most people are in step - but

In general this self-imposed system of band planning works well but sometimes there will be the odd couple of people who decide to talk to each other in the middle of the CW sector. They maintain that there is nothing in the licence saying where they should or should not be inside the band…….

Now read the "Safety" section in your RAE Manual

QUESTIONS FOR LESSON 13A and SAFETY QUESTIONS

1. Is it compulsory, in general, to comply with band-plans while operating amateur radio equipment in the United Kingdom?

2. Give three advantages of band-plans.

3. Who, in general, plans the band-plans?

4. Are there any disadvantages of the band-plan system?

5. What is the purpose of a "calling frequency"?

6. If your radio equipment draws 4 Amps (at 240 Volts) what value fuse would you fit in the 13 Amp plug?

7. Should aerials be disconnected from the radio during an electrical storm?

6. Why do amateur repeaters transmit and receive on different frequencies?

9. What is the purpose of an amateur radio beacon?

10. What precautions should be taken when erecting aerials?

12. When discharging a capacitor a series resistor is used. Why the resistor?

13. Why should you work with one hand in your pocket when faulting live equipment?

14. Why should cold water pipes not be relied on as good earths ?

15. A mains "master switch" is recommended in the radio shack. Why?

