

## Lesson 8 Answers

8.1

By feeding back the output of an amplifier to its input. This is done via a "frequency determining circuit" The output has to arrive at the input "in -phase" otherwise oscillation will not take place.

8.2

A crystal has a higher frequency stability and a higher "Q" than a normal L and C tuned circuit. Also the crystal is manufactured to a precise pre determined frequency.

8.3

the buffer stage you draw should have a high input impedance and a low or medium output impedance..

8.4

If the output from an oscillator is fed into too low impedance then the oscillator will change frequency or even stop oscillating.

This is called loading an oscillator. to avoid this a buffer stage is added. This has a high input impedance and a low output impedance.

8.5

Changes in temperature can cause tuned circuits to change frequency of resonance. This even applies to crystals. To give the maximum frequency stability the crystal is fitted into a miniature temperature controlled oven.

This is usually set to keep the crystal temperature a few degrees above the maximum temperature that the radio is likely to experience.

8.6

The tuned circuit in the output determines the multiplication factor. This will determine which harmonic of the input signal is selected.

8.7

In 3 hours the VFO will drift up by  $3 \times 120 = 360$  Hz

The VFO would be fed into a multiplier of 12 times (21/1.75)

Thus the total drift at the output is  $360 \times 12 = 4320$  Hz

Thus the output frequency will have drifted up to 21.10432 MHz

8.8

The frequency of operation of a tuned LC circuit is inversely proportional to inductance and capacitance. The use of thick wires in the construction of the coil helps maintain rigidity and therefore maintain the correct inductance. The wires should not be allowed to vibrate.

In a crystal oscillator the tuned circuit is a quartz crystal and this is less prone to vibration problems.

8.9

Key clicks are interference pulses produced by the sudden on-off keying of a carrier wave.

A key click filter is used to slightly slow down the rise and fall of the current.

8.10

All power leads, entering or leaving the unit, should be de-coupled. This means that a small capacitor is connected from the lead to ground/earth. This will prevent from high frequencies 'escaping' along these wires. The circuit should also be fitted inside a metal screening box.

8.11

When the period of communication is longer than 15 minutes, the callsign should be sent at least every 15 minutes.

If a non voice or Morse communication is used then Morse or voice identification should be given at least every 30 minutes. See BR68 7(1) (b) and (f)

8.12

No particular speed is laid down. The BR68 (Note X[b]) in Terms and Limitations says that it should be at "a manual speed".

8.13

It is common sense to send at a speed that suits the person receiving the Morse transmission but there is no limit laid down by the BR68.

8.14

6 months BR68 6.(4)

8.15

the function of a "Dummy load" is to permit a transmitter to be tested and adjusted with out radiating a signal. The dummy load absorbs all the RF output power

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8.17

Stop transmitting and investigate to see if there is a problem with your equipment.

Be polite and helpful.

8.18

Notification by a General Notice published in the London, Belfast and Edinburgh Gazette or other newspaper or by a General Notice broadcast by the BBC.