

LESSON 7A answers

7a.1

You are correct that the detector does rectify (changes the AC to DC) but this could be misleading. It is better to say that it recovers the "audio" from the Intermediate Frequency (in the case of a superhet receiver). At the output of the diode it will be varying DC but as soon as this passes through a coupling capacitor it will AC, but at a low or audio frequency.

7a.2

The purpose of AGC is to respond to changes in strength of the received signal and automatically adjust the gain of the I.F. amplifier to maintain a more or less constant audio output.

7a.3

An advantage of a TRF receiver is that it is much simpler than a superhetrodyne receiver.

7a.4

The incoming radio frequency signal is mixed with a local oscillator frequency to produce an intermediate frequency. This is often 465kHz or 10.7 Mhz for domestic receivers. Amateur equipment also often uses an I.F. of 9.0 MHz. A double superhet uses two I.F.s. A high I.F. gives good image rejection and a low I.F. gives good selectivity. The double type is used for communications receivers where as the single conversion would normally be used in domestic radio receivers.

7a.5

A high intermediate frequency enables much better rejection of the image frequency.

7a.6

A low intermediate frequency gives good selectivity and enables narrow bandwidths to be used.

7a.7 A mixer having inputs of 6 MHz and 4 MHz will have an output containing: 6, 4, 10 and 2 MHz

7a.8

The intermediate frequency amplifier should only amplify a narrow band of frequencies. The tuned circuits ensure that only the right frequencies are amplified.

7a.9

The Beat Frequency Oscillator is used to "beat" (mix) with a SSB or CW signal to render it audible.

7a.10

The signal strength meter (S Meter) is usually connected to the AGC (automatic gain control) line.

7a.11

To have control over the selectivity of the receiver enables the bandwidth to be adjusted to suit the conditions and the station to be listened to. For example a broadcast station needs quite a large bandwidth. If this same bandwidth was used to listen to a Morse transmission would mean that you would hear several different Morse transmissions at the same time.

7a.12

A ganged capacitor is a variable capacitor having two (or more) sections, electrically independent but mechanically coupled.

7a.13

A detector is used to "retrieve" the audio from an AM signal.

A discriminator is used to retrieve the audio from a FM signal.

7a.14

A crystal calibrator is used to generate "marker pips" to calibrate a receiver. For example, a 100 kHz crystal would generate a pip (or whistle) every 100 kHz across the band. This can then be used to make sure that the dial pointer is lined up correctly.

7a.15

It is permitted to record an Amateur transmission and transmit it back to him so far as the original call signs are removed.

The licence says (terms and limitations) 5.(1) (a) and (b)

7A.17

Your receiver must be capable of receiving on frequencies that you transmit on (not necessarily at the same time). See Terms and Regs 4(5)

7A.19

I don't know why there is this restriction within 100 km from Charing Cross. I can only guess that it is avoid interference with some critical radio system in central London.

7a.20

A simple noise limiter consists of back to back diodes in the I.F. amplifier chain. It would clip the peaks of noise where their amplitude is significantly higher than the audio modulation peaks. Under normal circumstances these diodes would be non conducting and have no effect on the received signal.

7a.21

The high intermediate frequency is used to ensure there is good separation of the "wanted" frequency from the "image" frequency. The low intermediate frequency would give good "selectivity". In other words it would ensure that stations on adjacent frequencies are not heard.

7a.22

Distortion has occurred if the shape (not size) of the signal has been changed._