

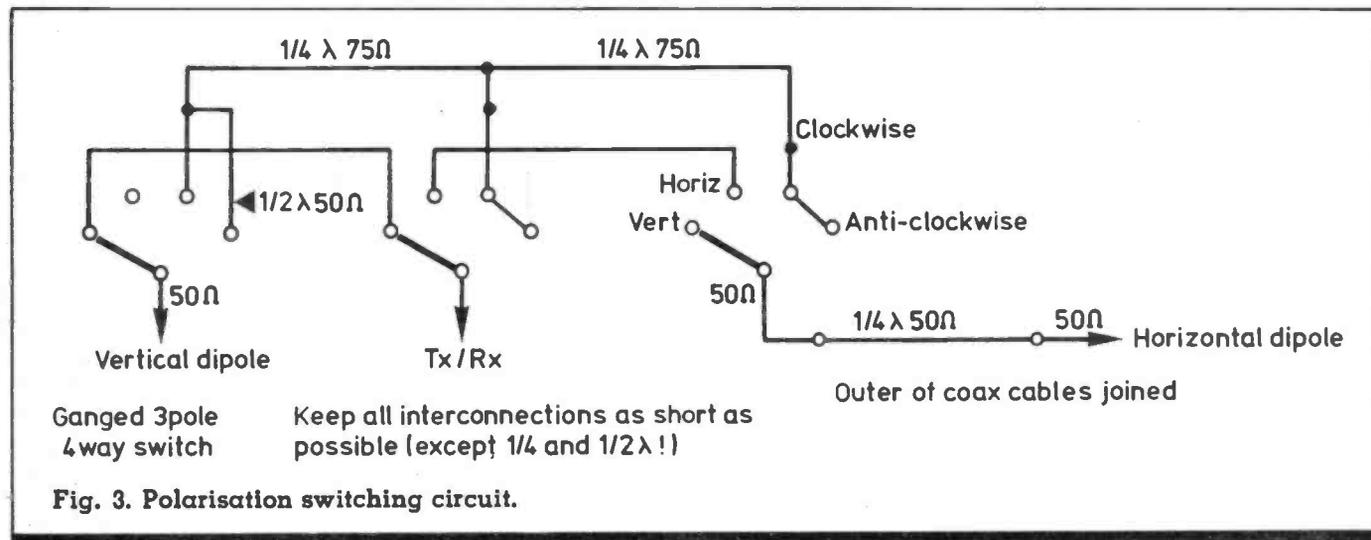
a large loss of signal between them, of the order of 30dB — more than the horizontal/vertical linear case loss.

There is a situation under which opposite sense circular polarisation will be achieved, and that is when two stations are using the same sense, but one is receiving the other off the back (or even the side) of the beam! So having both sense circular polarisations available makes sense.

of HF antennas where the antennas being compared have differing polarisations, as unless the comparative signals have been averaged over a period of time, any quoted results could be very misleading. This is because due to these effects, one antenna could have been receiving a favourable polarised signal, the other unfavourable — five minutes later as the ionosphere shifts about, the position may well

would not penetrate. Of course, obstructions large enough to attenuate the signal will still cause flutter, but this is very much reduced over a linearly polarised signal.

Those of you in poor radio locations, especially in cities with most of the surrounding buildings higher than your aerial, may find that circular polarisation is the best thing since sliced bread!



The sense can also be inverted by reflection from a large surface acting as a mirror, such as a mountain, or even a very large building.

There was a proposal some time ago that VHF stations used clockwise for terrestrial communications in the Northern Hemisphere, and this would be worth continuing.

So, thus far we can show that a circularly polarised receiving antenna will actually give a GAIN in signal strength of in excess of 20dB, when compared with the worst case linear cross polarisation, and at worst, a loss of 3dB, the latter more likely to occur only with more local signals, where it would be acceptable. So, most of the time, you should find a gain in signal strength.

Beware of aerial comparisons...

There is one other result of all the foregoing. This changing polarisation will also occur at HF frequencies, although it is difficult to do much about a circularly polarised HF antenna in the average garden (except possibly at 28MHz). Be cautious when reading comparisons

have been reversed and a different result put to paper!

Other gains

We mentioned earlier that obstructions, besides causing polarisation shifts, will also cause a loss in signal strength. With circularly polarised signals, these losses will probably not exceed 3dB at the worst as, in the case of trees, only a very small proportion of the signal is at the same polarisation as the obstruction.

The other advantage of circularly polarised waves is that they have much better penetration into built-up areas, and into dips in the terrain, than linearly polarised waves due to there being much more opportunity for a circularly polarised wave to be reflected from a compatibly polarised reflecting surface.

The result is that mobile communications are much enhanced when the base station is circularly polarised, and you will find that the signal is much steadier, and will travel a greater distance. Often, communications will be possible where a linearly polarised signal

Practicalities

There have been a number of articles published on the construction of the Helix antenna, more usually used on 70cm for satellite rather than terrestrial contacts, and there is no reason why this same antenna should not be used on that band, or 2m, for normal earthbound contacts. It does have the disadvantage that the sense of the circular polarisation cannot be switched as it is fixed by the thread of the helix when built.

As many stations will already have crossed Yagi's — these are easily obtainable commercially — but may not be using them circularly polarised, then some details on how to set up a switching system are called for.

If you are putting up a crossed antenna for the first time, you will probably have some debate as to which way to mount it, i.e., with the elements vertical and horizontal, or in an X-configuration. If you are going to use circular polarisation exclusively, then the X-configuration is the best, but as most people will want to convince themselves about the results, you will probably feel