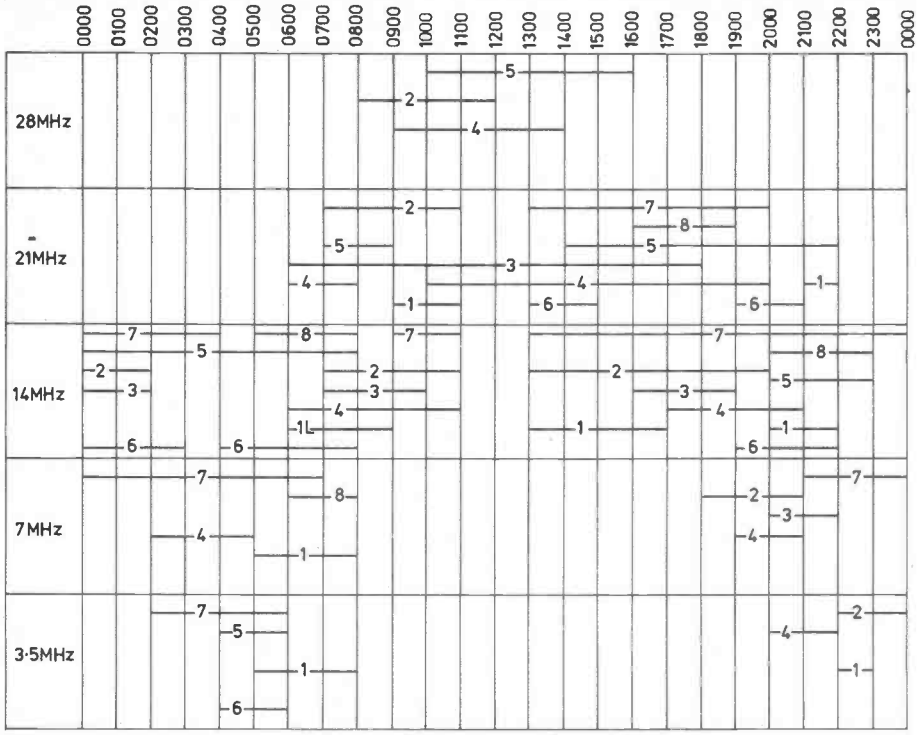
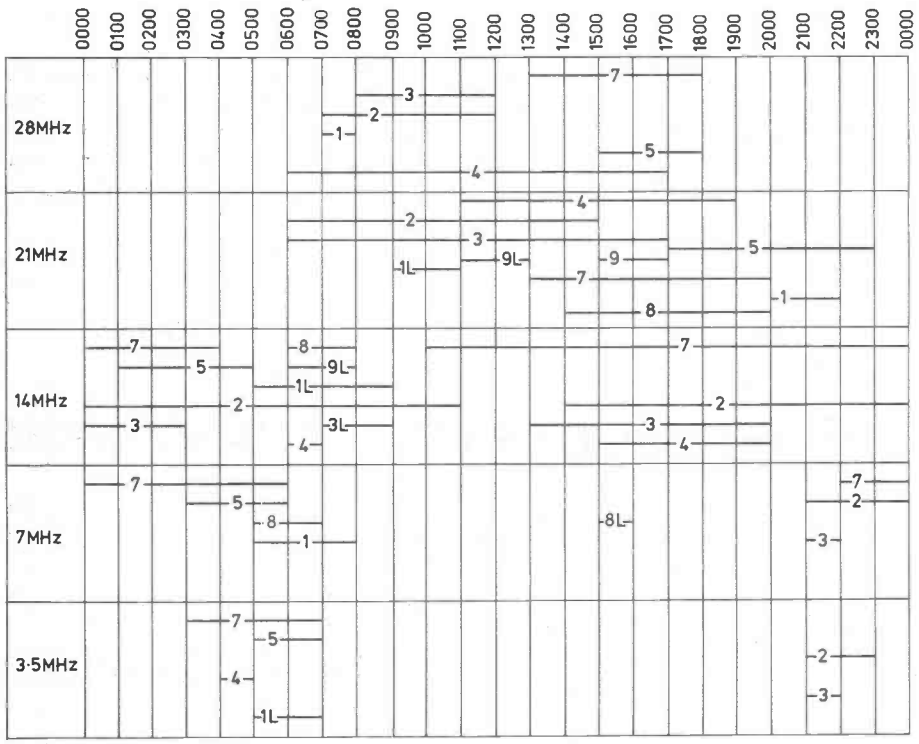


Period June–July–August (L=long path)



Period September–October–November (L=long path)

Propagation conditions in a typical year. Near sunspot maxima the lines will be longer, at the bottom of the cycle shorter. The numbers refer to the great circle bearings given in **Fig 4** *and the table beneath.*

produces the fading signal with which we are all too familiar, especially when we remember that several refractions and reflections will have occured over a long distance of possibly many thousand of miles.

Just to add to the complications it will be found that, in general, the higher the frequency the greater the depth to which the signal penetrates the particular layer and the longer the hop becomes. Should the lower E layer be sufficiently ionised to sustain complete refracation of a signal then the hop becomes much shorter, as shown in **Fig. 1.** In fact the bottom of the E layer may be so low over the earth's surface that signals from very short distances of a 100 miles or so may be received on the higher frequency bands during the day.

Inevitably, some of the radiated signal travels over the earth's surface being rapidly attenuated after only some tens of miles, the remainder forming the sky wave. The distance between the end of the ground wave and the point where the sky wave first returns is commonly called the 'skip distance', obviously a very variable distance depending mainly upon the ionospheric conditions and the frequency in use.

Multipath fading

During periods of maximum sunspot activity the ionosphere will maintain DX conditions on frequencies as high as the 50MHz (6m) band at present only allocated to countries in the Americas but soon to be released to UK amateurs albeit with certain restrictions as the frequency comes within the UK TV Band I allocation. This band is being closed down for 405-line TV and reallocated to the private mobile radio service and certain other mobile uses, as is the Band III TV allocation. The Home Office has already agreed to release a band at approximately 54MHz which will enable UK amateurs to communicate with the Americas directly on this band without recourse to cross-band operation as at present.

Fading of a signal may be due to movements of the refractive layer, as already mentioned, but it may also be due to the reception of two more signals via differing paths, such as by ground wave and sky wave when the signals may be ran-