ABSTRACT

Radio signals, reflected from the F region of the ionosphere, have been observed with three closely spaced receivers, using two closely separated radio frequencies. Fading of these radio signals was assumed to be caused by diffraction of the radio waves by horizontal gradients of ionisation, associated with the passage of travelling ionospheric disturbances in the F region of the ionosphere over Jamaica.

The study of travelling ionospheric disturbances, by this method, provided information concerning:

(a) The diurnal variation of the frequency of occurrence of observable disturbances.

(b) The preferred directions of motion of the disturbances.

(c) An estimate of the average speed of the disturbances.

(d) The preferred directions of the most prominent horizontal gradients of ionisation associated with the disturbances.

(e) Vertical variations of the observable parameters of the disturbances.

The study revealed an association between the preferred sense of the meridional component of the movement of the disturbances and certain features in the behaviour of the ionospheric parameters hmF2 and foF2.

Much of the discussion of the experimental results, presented in this thesis, is developed from the basic postulate that the travelling ionospheric disturbances are manifestations of perturbations propagating in the neutral atmosphere od the F region.