THE DESIGN AND DEVELOPMENT OF A HIGH POWER PULSE TRANSMITTER FOR THE STUDY OF IONOSPHERIC RADIO WAVE ABSORPTION

BY

M.G.C.Peiris

Thesis submitted in partial fulfilment of the requirements for the Degree of Master of Science of the Faculty of Applied Science, University of Sri Jayewardenepura , Nugegoda , Sri Lanka.

June , 1982.

THE DESIGN AND DEVELOPMENT OF A HIGH POWER PULSE TRANSMITTER FOR THE STUDY OF IONOSPHERIC RADIO WAVE ABSORPTION

M.G.C. Peiris

ABSTRACT

A new high power r.f. pulse transmitter was developed for ionospheric absorption measurements using vertical incidence pulse technique. Since the emphasis was to explore the D region it was designed to operate over the frequency range 1.8 MHz to 2.2 MHz. The target output power of the transmitter was 50 kW (rms) while the tested maximum power was 44 kW.

The absorption measurements were taken daily during a period of one month on two frequencies, 2.0 MHz and 2.2 MHz. The average noon absorption measured was 62.3 dB for 2.0 MHz and 57.9 for 2.2 MHz. In addition, the average virtual height was 99.3 km for 2.0 MHz and 100.9 km for 2.2 MHz. The present series of observations made using the new r.f. pulse transmitter is in good agreement with the earlier measurements taken in Colombo during the period of 1964 to 1970 under similar solar conditions.

* * * *

TABLE OF CONTENTS