



## CHAPTER III

### Experimental Investigation

3.1 Design of Antenna. The 500 Mc frequency of radio wave is chosen so that the size of reflector will not be too large. The wave length of this radio wave is 60 cm.; the length of dipole should be smaller than 15 cm., for considering as short dipole.

This size of reflectors depends on the wave length of radio wave. The minimum value of reflectors' sides is twice the antenna to corner spacing for square corner reflector. The spacing between antenna and corner is a variable in this experiment, its values will vary from  $90^\circ$  to  $225^\circ$  or about 37.5 cm. Thus reflector side is 75 cm. But the corner angle is varied to  $30^\circ$ , the minimum sides are then lengthen to one wave length. The reflector's sides chosen in the experiment are 120 cm. or twice the wave length, for the effect due to un-infinite sides is really small. The short dipole and reflectors are supported by a tower setting on the roof, total high from ground is 12 wave-lengths.

### 3.2 Apparatus.

- 1 A short dipole and balun made of copper.
- 2 A half wave dipole used as receiving antenna.
- 3 Two Aluminium plates size 1.2x1.2 square meter used as reflectors.
- 4 Unit oscillator, Type 1208-B, General Radio Company Concord Massachusetts USA.
- 5 Unit Regulated Power Supply, Type 1201-B, General Radio Company Concord Massachusetts USA.
- 6 Field Strength Meter, Type MC 16, Prestel, Italy.
- 7 Co-axial Cable, Type RG-8
- 8 Locking Co-axial Connector 50 ohms, Type 874-BBL

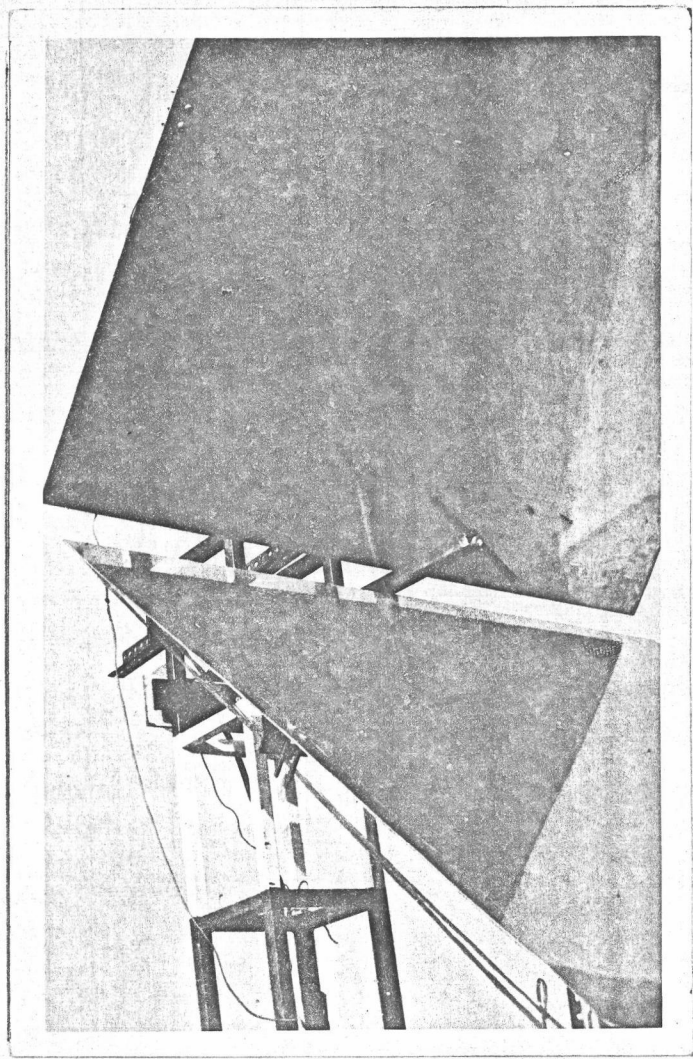


Fig. 3.1  
Corner Reflector Antenna

Place of Experiment: on the deck of six floors building of department of Electrical Engineering, Chulalongkorn University.

The corner reflector antenna is constructed as shown in Fig. 3.1

### 3.3 Procedure

Set the corner angle at  $90^\circ$  and dipole distance at 15 cm. Feed the corner reflector antenna by UHF generator at 500 Mc. Place the half wave dipole in the axis of corner reflector antenna.

- 1 Rotate the receiving antenna in vertical plane  $15^\circ$  at each and record the indicated values from field strength meter.
- 2 Rotate the short dipole  $15^\circ$  at each, then repeat procedure 1 .
- 3 Increase dipole distance to 2.5 cm. at each, then repeat procedure 1 and 2

Set the corner angle at  $45^\circ$  and  $30^\circ$  , then repeat procedure 1,2 and 3 .