

III. EXPERIMENTAL EQUIPMENT AND PROCEDURES

The experiments were conducted in the internal waves tank, 24 meters long by .6 meters wide and 1.22 meters high, with a wind section above the water .95 meters wide and .6 meters high (Figure 1). A complete description of the tank was given by Sheppard, Shemdin, and Wang (1973). The tank was initially filled to a level of 37.5 cm with fresh water, then filled slowly from the bottom with .02% salt water to bring the level to 75 cm. From this an approximately linear profile was obtained by dragging a board the length of the tank, at the interface between the salt and fresh water. The board was positioned perpendicular to the length of the tank and the interface, so that as it moved along the interface the turbulent eddies which formed behind the board caused mixing between the two layers. This process was continued until the desired degree of mixing was obtained.

The density profiles were measured initially with a single electrode conductivity probe (Gibson and Schwarz, 1963) but due to the low frequency drift, calibration was impossible, so the probes were modified by insertion of a length of tygon tubing into each probe so that samples of water could be siphoned from the wave tank at any level. The density could then be measured with a hydrometer to an accuracy of four decimal places, although the procedure is rather tedious.

Once the desired density profile was set, wind was produced by pulling air through the tank with an axial flow variable pitch fan, manufactured by Joy, and an integral part of the wave tank unit. Three fans settings were used over the course of the experimentation, corresponding to wind velocities of 2, 2.5, and 3 meters per second. Wind velocity profiles were