The use of ultra-high radio frequencies is developing rapidly. It may soon be possible to direct a radio beam (approximately 1/2 metre in wave length) from the upper structure of a ship and orient it forward in such a fashion that a highly directive receiver, underneath the transmitter and oriented to receive forward, will receive the signal only when some reflecting object exists in front of the ship.

A NEW ROTATING RADIO BEACON.

(Extract from *Nature*, London, 6th April 1935, p. 539).

A new type of rotating radio beacon, likely to simplify navigation both by sea and air, was recently developed in Japan. It is common knowledge that taking bearings with the rotating radio beacon generally requires, at the receiving station, the aid of a stop-watch or chronometer. In the new type, however, the use of the chronometer becomes unnecessary. This new device is described in a paper by U. OKADA, published in the report of Radio Research in Japan, Vol. IV, October 1934, page 185; it makes use of a vertical loop transmitting aerial as previously, to give the usual "figure-of-eight" radiation characteristic. Instead of rotating this loop continuously, however, it is swung backwards and forwards about a vertical axis through an arc of 180°. During its movement the speed of rotation is uniform and equal to one revolution per minute. The movement in each direction starts from a north and south position alternately, at each of which a characteristic morse signal is emitted. This signal is then followed during the rotation of the loop by a succession of 90 dots, at the rate of 1 dot for every 2°. By counting the number of dots from the starting point to the signal minimum, the bearing of the receiver from the transmitter may be calculated. The additional observation taken with the loop moving in the reverse direction enables the midpoint of a broad minimum to be accurately determined. Tests carried out in Japan on land and at sea have shown that an accuracy of observation of $\pm 6°$ was obtained at distances up to 46 km. with an experimental beacon operating on a wave-length of 950 m. It is considered that by attention to details of the apparatus the maximum error could be reduced to 2°, which it is suggested is sufficient for practical purposes.

EXPERIMENTS AT SEA WITH THE BUBBLE SEXTANT.

The following is a short summary extracted from the *Revue d'Optique Théorique et Instrumentale*, Paris, October 1934, of an article by E. O. HULBURT appearing in the *Journal of the Optical Society of America*, Volume 23, 1933, entitled *Experiments with the bubble sextant at sea.*

In the Bubble Sextant the bubble is used to provide an artificial horizon. Unfortunately the bubble is subject to two sorts of perturbations: the first, the period of which is less than one second, is due to the vibrations of the vessel and the second, the period of which reaches several seconds, is due to the rolling and pitching. If it be assumed that the rolling is represented by a sinusoidal function, the plane defined by the bubble at any moment lies, with reference to the horizontal plane, at an angle d such that $d = \tan f/g$, f being the acceleration of the rolling and g the acceleration of gravity. This relation, when applied to the case of a destroyer under average conditions, suggests an error of the order of 163' in sextant observations. As but few data are available as to the accuracy of observations in practice, the author examined the results given by existing bubble sextants under various conditions. Observations taken on land under good conditions showed errors of the order of 3'. At sea, in a vessel of 950 tons under average conditions, the error for an isolated observation may reach 60'; when the mean of 5 consecutive observations is taken, the error is usually less than 30'. On