Radar Systems for Warships

THE MARCONI COMPANY has always played an important part in meeting the Royal Navy's radar requirements, and equipment designs offered are based on considerable engineering experience in the naval field. The Company has also been privileged to design and install complete radar systems for various foreign navies.

Equipment can be supplied both for the conversion of existing ships to meet changing operational requirements and for fitting in vessels of new construction.

A wide range of equipment can be offered covering the operational requirements of early warning, surface warning, target indication and fire control. These can be supplied as separate equipments or engineered into an integrated ship's system.

The defence needs of a warship in the atomic age demand that more and more radar equipment must be carried on board and consequently size, weight and power consumption become extremely important factors. With this in mind the Company, which has always been in the forefront in implementing new techniques, has designed a new series of radar display equipments. This series, which is described on page 373, utilizes printed-board and semiconductor techniques to provide the most modern display systems available to the Navies of the world.

By using these displays the system can be adapted to provide particular operational facilities which the customer may require.

The Company will collaborate with the shipbuilder to plan the operational and equipment layout of both radio and radar to suit the user's requirements, and will undertake installation of the equipment if desired. Details of equipment offered for warship installation will be sent on request and the Company will be pleased to discuss any requirements with the client. Enquiries will be treated confidentially.

The main performance details of Marconi radar systems for warships are listed in the following paragraphs.

(a) Early-warning radar

TRANSMITTER

Wavelength: 150 cm band.
Peak power output: 450 kW.
Pulse duration: 3·8 μs.
P.R.F: 200 or 400 p.p.s.

RECEIVER AND VIDEO EQUIPMENT

Intermediate frequencies: 45 Mc/s and 13·5 Mc/s.
Noise factor: 8·5 dB.
Outputs: 6 video.

AERIAL

Beamwidth: Horizontal, 19° at 3 dB points. Vertical, lobed pattern dependent upon aerial height.
Polarization: Horizontal.
Rotational speed: 10 rev/min.

(b) Air/surface warning and tactical radar

TRANSMITTER

Frequency: 2900–3100 Mc/s.
Peak power output: 1 MW tunable or 2·5 MW fixed frequency.
Pulse length: 1 or 3 μs.
P.R.F: 500–1250 p.p.s.

RECEIVER AND VIDEO EQUIPMENT

Intermediate frequency: 45 Mc/s.
Noise factor: Not greater than 8·5 dB.
Outputs: 6 video, switchable logarithmic or linear i.f amplification.

AERIAL

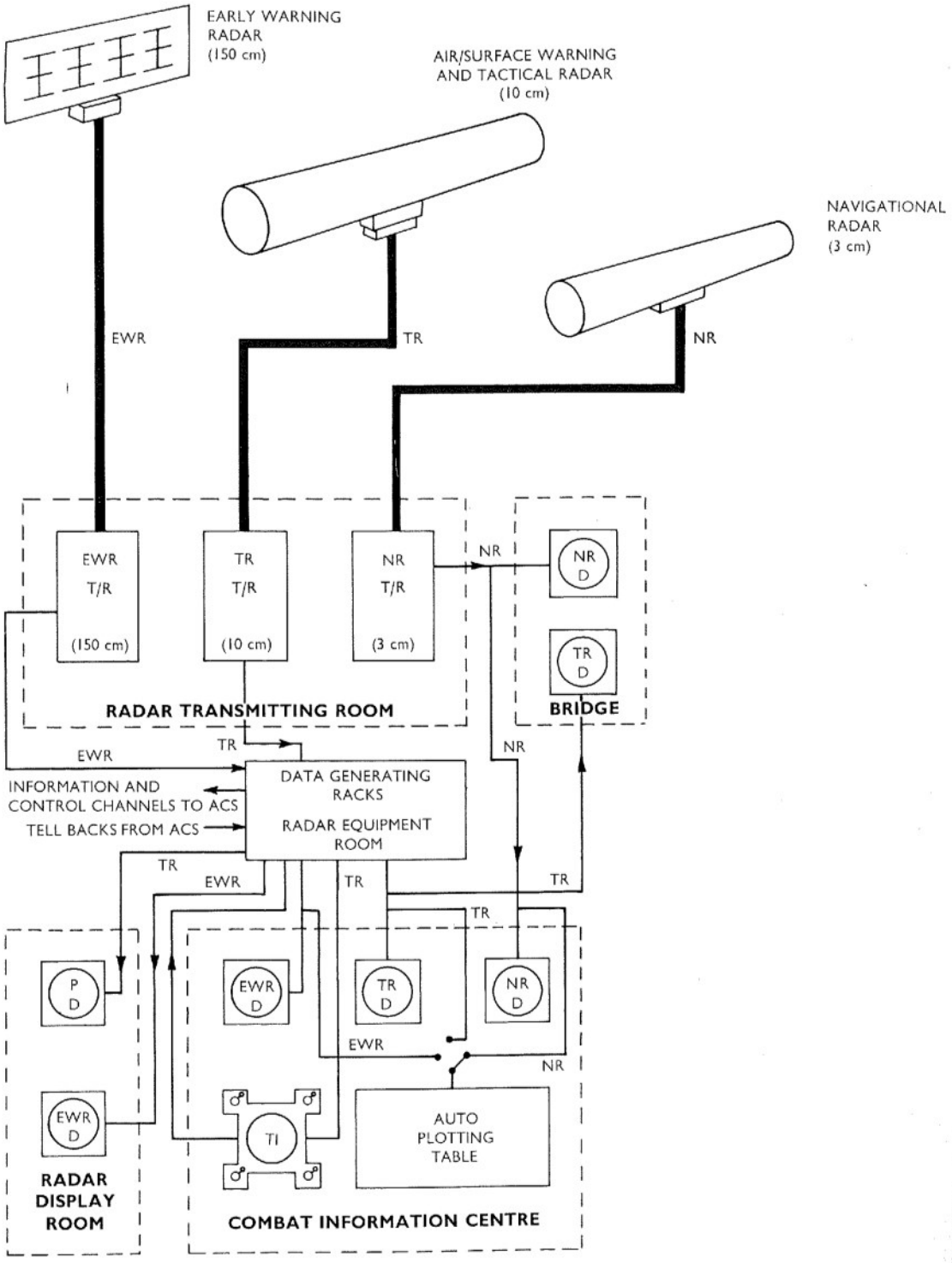
Beamwidth: 1·1°.
Polarization: Horizontal.
Rotational speed: 30 rev/min.

(c) Navigational radar

For details of navigational radars see page 334.

Display Equipment

For details of display equipment available for integration with the above systems see page 370.



LEGEND—EWR = Early warning radar
TR = Tactical radar
NR = Navigational radar
PD = Plotting display
T/R = Transmitter-receiver
D = Display
TI = Target indicator
ACS = Armament control system

A typical warship radar system.

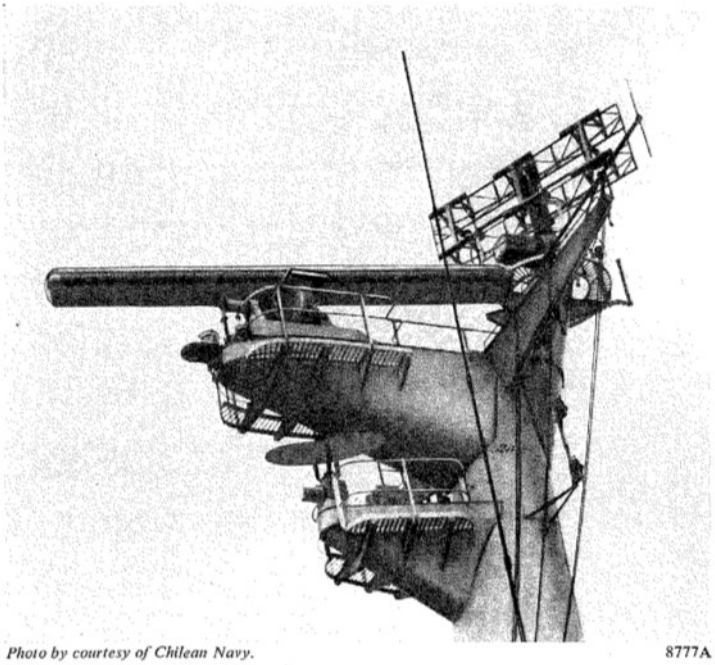
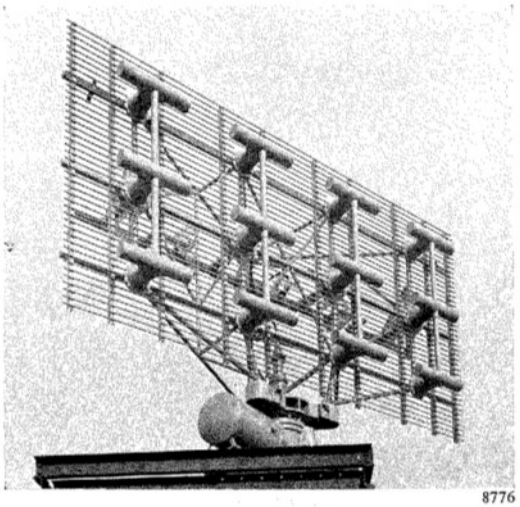


Photo by courtesy of Chilean Navy. 8777A

Left: A destroyer's radar aerial group. On the mast head is the aerial for SNW 10 Early Warning System and on the sponson below, that for Type SNW 20 General-purpose and Target Indication Radar.



8776

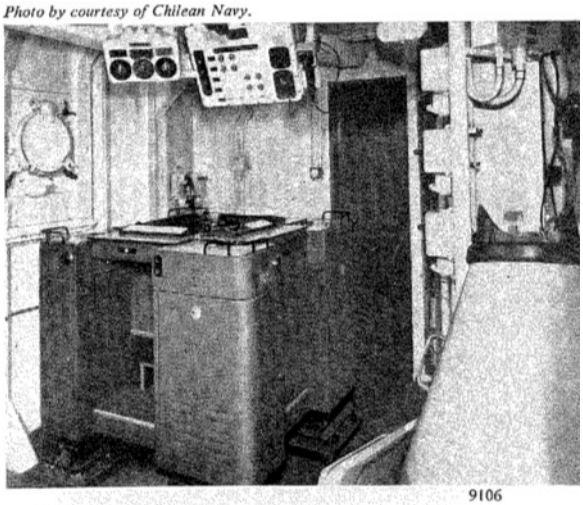
Aerial of Warship Early Warning Radar Type SNW 12.

9103

British aircraft-carrier 'Hermes' (above) and destroyer 'Broadsword' (below) are fitted with Marconi radar. *Admiralty official photos.*

9104

Photo by courtesy of Chilean Navy.



9106

An SD 1000 target indication display, installed in a destroyer.

Harbour and Coastal surveillance radar

THE LATEST SERIES of harbour surveillance radar equipment (see page 343) is based on the notable NR 506 equipment (page 334) coming into use world-wide for marine navigation.

The compact rugged equipment is eminently suitable for housing in a small blockhouse, lighthouse or signal station, and the aerial is specially designed to withstand the rigorous weather conditions encountered in coastal areas.

For long range coastal surveillance, the 10-centimetre S 314 Series (page 344) has been designed to fulfil the requirements of a coastal defence radar system.