

REPAIR, DEPOT AND MAINTENANCE SHIPS.

The entry of Japan into the war, and the loss of Hong Kong, Singapore and the Dutch East Indies, focussed attention on the shortage in the Eastern theatre of resources for repair and maintenance of ships and craft of all types. These resources would have been scanty enough even if the Allies had not lost their Eastern bases. The vast distances in this theatre, coupled with the time required to establish repair and maintenance bases and the fact that many of the areas in which these bases would be required were in enemy hands, clearly indicated mobile shipborne facilities as the only solution.

Prior to this war, when Naval expenditure was strictly limited, it had not been possible to build many repair and depot ships, since most of the money available had to be spent on fighting ships.

A number of repair, depot and maintenance ships had therefore to be provided, at a time when labour for new construction or conversion was already fully stretched by demands for existing shipbuilding programmes and ship repairs. There was also a world shortage of merchant ships suitable for conversion. Consequently, the original estimates of requirements for these ships had to be very severely curtailed. These requirements, so far as possible, have been met by conversions of existing merchant ships or by taking over standard merchant ships while still building and making the best arrangements possible with the minimum amount of alterations.

Extensive alterations.

This procedure, though necessary by force of circumstances, is not altogether satisfactory. The main watertight sub-divisions and existing deck heights do not fit in with the best workshop arrangements. The installation of heavy machines, relatively high up in the ship where space is available for working large plates, etc., necessitates the addition of large quantities of ballast which in turn complicates the provision of stowage for fuel and water. The additional evaporators, electric generators and steam-operated equipment call for extensive adaptation or increase in the auxiliary steam lines, with added complications if the boilers are fitted with superheaters.

In addition to carrying out their functions of repairing or maintaining the hull and machinery of attached vessels, the various types of repair ships are also fitted to provide electric power, compressed air, fuel, water and petrol. Certain ships are being fitted with oxygen or acetylene producing plants which will ease the burden of the supply and distribution of compressed gases for repair work and aircraft requirements.

The functions of the various types of ships covered by the foregoing remarks are broadly as follows :—

Repair ships.

Vessels of this class are capable of working with a floating dock and of carrying out the duties, to a limited degree, of a small dockyard. Some are fitted with rolls and presses for hull repair work. Others, in which it has not been possible to install such equipment, work with a hull repair ship which can supply the necessary facilities. In addition to work ordinarily carried out for the fleet, the ships may be called upon to construct platforms, etc., for boom defence work and to fabricate equipment and fittings for use on shore.

Portable plant such as welding sets, L.P. air compressors and pneumatic tools, in addition to underwater equipment is carried for use in vessels which

cannot be berthed alongside. The underwater equipment comprises oxy-hydrogen cutting torches, arc welding sets, Temple Cox guns and pneumatic tools specially adapted.

In view of the fact that these ships would be operated in conjunction with a floating dock, consideration had to be given to equipment for boring out "A" bracket and stern tube bushes after re-wooding or re-metalling. A fixed machine, suitable for dealing with the large bushes fitted in battleships and aircraft carriers could not be entertained. A portable equipment was therefore designed with the co-operation of a machine tool maker and certain repair shops have been supplied. This machine can be erected on the floor of a dock in cases where the bush is too large to be accommodated in a boring machine in the machine shops of the repair ship.

The selection of the machine tool equipment generally in these ships is governed more by the requirement that any job can be tackled than the necessity for a high production rate. Furthermore, the range and type of tools have to be chosen to make the best use of the space available in the workshops. Due to the operations of the Machine Tool Control, all production of machines was, until recently, rationalised, i.e., the various makers were restricted to the manufacture of a limited range on each type of machine.

Installation in a ship imposes limitations on certain workshop machines, such as the pneumatic hammer. The maximum size installed is of the 3-cwt. type and with this in use, considerable vibration is set up throughout the ship with adverse effect on precision work being undertaken at the same time. Even the use of anti-vibration mountings has not solved the problem satisfactorily. A forging press is also fitted and this can deal with work above the capacity of the 3-cwt. hammer.

Destroyer depot ships.

These ships are capable of maintaining three flotillas of destroyers and have a fairly comprehensive workshop equipment with facilities for light plating and foundry work. Provision is made for supplying water, fuel and power to attached vessels. They have also to act as depot ships in the domestic sense as well as providing maintenance facilities and a balance has been struck between the two functions.

Submarine depot ships.

These are capable of maintaining from 12 to 18 submarines. The workshop equipment provided is on a slightly smaller scale than in the case of the destroyer depot ships as more space must be provided for accommodation and amenities for the submarine crews. Nevertheless, on occasion, this class of ship has been able to take over the duties of a destroyer depot ship, with marked success.

Maintenance ships.

Many of this class are converted "Victory" type merchant ships and are designed to maintain escort vessels, L.S.T.s, landing craft, coastal forces and motor craft. The workshop equipments of the escort and L.S.T. maintenance ships are similar and are best described as "scaled down" destroyer depot ships, with a total workshop area of about 40% of the latter. The L.C., C.F. and M.C. maintenance ships have even less machine tool equipment, the space available being devoted to engine stripping facilities and stowage for spare engines and engine spares.