REFIT CO-ORDINATION ORGANIZATION

This article has been re-written from an official report submitted by H.M.S. 'Newfoundland' *in September,* 1955, *on completion of a successful refit. As the organization was essentially team work it is fitting that ' the Ship ' should be the author.*

INTRODUCTION

On 2nd May, 1955, H.M.S. *Newfoundland* was taken in hand by H.M. Dockyard, Singapore, for a 12-months refit. From completion of modernization in November, 1952, to the beginning of this refit, the ship had been 90 per cent available for use, and her sea-time was 40 per cent. The main defect lists had been forwarded before the ship recommissioned at Portsmouth in February, 1955. The working-up period at Malta and the long passage out to the Far East revealed many more defects. Supplementary lists were forwarded from Malta and, by the time the ship arrived at Singapore, many ship's staff items, some requiring dockyard assistance, and a large backlog of maintenance had accumulated. It was desired, after the refit and trials, to start a planned preventive maintenance scheme.

THE AIM

It was clear that good organization would be needed to ensure that the efforts of the dockyard and ships staff were combined and directed to the best advantage. This was the overall aim of the refit co-ordination organization.

THE FUNCTIONS

To achieve this aim the refit co-ordination organization was designed to perform three functions : planning, liaison, and recording. These were complementary, for failure of any one of them would have led to the failure of the others.

	R.C. FORM 3
SECTION 1	*ORIGINAL (SHIP'S COPY).* *Defect List* ..... *Defect Number* ..... *Description :—*
SECTION 2	*Dockyard Dept. Responsible* ..... *Dockyard Dept. Inspector* ..... *Tel. No.* ..... *Dockyard Dept. Chargeman* .....
	R.C. FORM 3
SECTION 1	*DUPLICATE (DOCKYARD COPY).* *Defect List* ..... *Defect Number* ..... *Description :—*
SECTION 2	*Ship's Dept. Responsible* ..... *Ext. No.* ..... *Ship's Officer Responsible* ..... *Ship's Rating Responsible* .....

FIG. 2—LIAISON INFORMATION FORM

Planning

Work was planned so that :—

(*a*) When two or more departments of the dockyard or ship were involved in the same compartment, sequence of work was considered and agreed beforehand, thus avoiding congestion and interference. For example, it was found that three dockyard departments and three ship's departments had work in the ships company galley and this was required to be the first compartment to be completed.

(*b*) The ships staff were able to prepare compartments before the dockyard began work. De-storing had to be carefully planned to allow work to start immediately on such items as fuel tank cleaning, ring main defects, air-testing, etc.

(*c*) The dockyard finished in time for the ships staff to paint and restore by the completion date. Officers of the forecastle, top, quarter deck divisions and the Royal Marines were responsible that all painting in their parts of ship was co-ordinated with dockyard work, through the Refit Office.

To facilitate this planning, every defect item was recorded on the wall displays, provided as damage control equipment. Thus a congestion of defects in any one area was easily seen and, if the majority of these items concerned one department, that department was requested to plan the sequence of work. A full conference of ship's officers and, later, dockyard officers, was necessary to plan the last month of work, the trials, etc. This was done with the aid of a planning board, part of which is shown in FIG. 1. Each department previously stated their requirements, including the length of time required to fulfil them.

R.C. FORM 1				
NATURE OF DEFECT :—				
COMPARTMENT/S INVOLVED :—				
DEPARTMENTS CONCERNED				
SHIPS	*SHIP'S OFFICERS*	*DOCKYARD*	*OFFICIALS*	*TEL. NO.*
DATE WORK COMMENCED :—		*DATE WORK COMPLETED :—*		
DEFECT NUMBER		*DEFECT NUMBER*		

FIG. 3—DEFECT SEQUENCE FORM

These requirements were then translated on to a scaled date-board by means of cut-outs.

Liaison

The Refit Office was the focal point for all liaison. This included :—

(*a*) Providing keys for, and opening, locked compartments as required by the dockyard, often at short notice.

(*b*) Providing sentries when and where necessary.

(*c*) Assisting the dockyard officers to check work done by contract labour.

(*d*) Acting as a clearing house for messages between the dockyard and ship's officers.

(*e*) Keeping a list of dockyard officers and their telephone numbers.

(*f*) Informing dockyard officers of the names of officers, ratings, etc., responsible for various defects and vice versa, i.e., informing ship's officers of their opposite numbers in the dockyard. This was done on R.C. Form 3 (See FIG. 2).

Recording

The Refit Office was the ship's Intelligence Agency. It provided, and kept up-to-date details of all defects and alterations and additions, both in sequence and by compartments (See FIGS. 3 and 4). The percentage progress of each item was shown on a central progress board which was amended weekly from the R.C. Forms 4 (FIG. 5) which were forwarded every Monday by each depart-

R.C. FORM 2

NUMBER OF DEFECTS ON ALL LISTS :—

DEFECT NO. STARTED FINISHED DEFECT NO. STARTED FINISHED

DEPARTMENTS INVOLVED

SHIP *DOCKYARD*

COMPARTMENT NUMBER *COMPARTMENT NUMBER*

DECK.....

FIG. 4—COMPARTMENT DEFECT FORM

ment. The Refit Co-ordination Officer was responsible for drawing attention to any item which was not progressing according to the planned dates, paying particular attention to those which were late in starting. From an analysis of the progress of these individual defects, a weekly percentage completion figure for the whole ship was obtained and plotted on a refit progress graph (See FIG. 6).

The Engineering Department employed a special Defect Card Index System. Each individual defect was allocated its own card, different coloured cards being used for Pink Defects, White Defects or ships staff items (See FIG. 7). The cards were prepared and the top part typed in before the refit started. Remarks were entered in pencil by the section officers to give a complete story of the progress of each item. After the completion of trials this information was transferred into the Fair Defect Book and Machinery Record Book without interfering with the refit and this also helped to keep these books clean and tidy. The cards were filed in a simple box divided into compartments as shown in FIGS. 8 and 9. All cards started in the first pigeon hole and finished in the last. A quick glance thus gave an idea of the progress at any moment. Should a message be received concerning a defect when the section officer responsible was not available, the duty refit officer made the appropriate entry on the card and placed it in the blank pigeon-hole. All section officers inspected the filing system at least daily, so that such matters were not overlooked. It was found desirable for the Engineering Department to keep a similar card filing system for the many electrical items which were connected with their own defects. In fact, from experience of this refit, a combination of this defect card procedure and the progress boards would have been suitable for showing the progress of the

REFIT COMPLETION PROGRAMME

MONTH								
JULY	SAT 23	BOIL OUT B 2	BOIL OUT B 1	DISINFESTATION P.M.	AUXILIARY MACHINERY TRIALS FOR'D UNIT	GOVERNOR AND LOAD TRIALS OF T. G.s	A/S WALK ROUND	
	SUN 24		SHIPS COMP. RETURN BEDDING A.M.	SHIPS COMP. RETURN ON BOARD P.M.				
	25	ADW. M/C TRIALS AFTER UNIT			4 AND 5 T. G. TRIALS	AMMUNITION SHIP		0730 MOVE TO R.N.A.D. JETTY
	26		FLOAT SAFETY VALVES – B					
	27	AFTER EVAP. TRIALS	AUX. M/C TRIALS AFTER UNIT					1400 LEAVE R.N.A.D. JETTY
	28	OIL SHIP (TO CAPACITY)	POWER BOAT TRIALS			STORE SHIP WITH NAVAL STORES	RETURN ARMAMENT STORES TEST TARGET EQUIPMENT	
	29	STEERING GEAR TRIALS						
	SAT 30							PAY WEEKEND
	SUN 31							
AUGUST	BANK 1 HOL.	4" G.E.T.s COMPLETE ON SHIPS SUPPLY		BASIN TRIALS		STORE SHIP WITH NAVAL STORES		
	2		PAY & CAPT's OFFICES RETURN ON BOARD				EMBARK BEER	
	3	No 2 A.C. TRIALS	D.G. RANGING OFF KEPPEL HARBOUR	GUNNERY ALIGN. & CAL. AT ANCHOR	N.F.D.F. CALIBRATION (OFF JOHORE BUOY) 2 HOURS REQUIRED			AT SEA
	4	FULL POWER TRIALS				4" S.C.R.F. TRIALS		

R.C. FORM 4

REFIT—WEEKLY PROGRESS REPORT

FOR WEEK ENDING :— *DEPARTMENT :—*

Defect List	*Defect No.*	*% of Work Remaining*	*Defect List*	*Defect No.*	*% of Work Remaining*

FIG. 5—WEEKLY PROGRESS REPORT

work of all departments and thereby would have saved some of the paperwork described in the previous paragraph.

Labelling

It was realized that a large number of machinery parts would be accepted for repair by the dockyard, subject to removal and replacement by ships staff. The difficulty of getting these parts back in sufficient time for replacement, testing, etc., before trials was assisted by a two-fold labelling system. Before leaving the ship each item was provided with two labels (FIG. 10). The original was secured to the article and the duplicate was kept in the ship, filed under the department concerned. When the item was returned the original label was detached and stapled to the duplicate, both were then filed in the ' completed ' pigeon-hole. Although successful, this system could, however, have been improved. For example, the labels should show ' date required by ', ' name of inspector and chargeman ' and ' name of ship's officer ', as well as ' date left ship ', ' whence ' and ' date returned ', which were already shown on the back. The labels were of course over printed before the refit began, and were filled in as the defect lists were typed, only a few alterations being needed after the Refit Conference.

The time spent in preparing this labelling system and the Defect Card Index System described above was considered well worth the time which they saved during the refit.

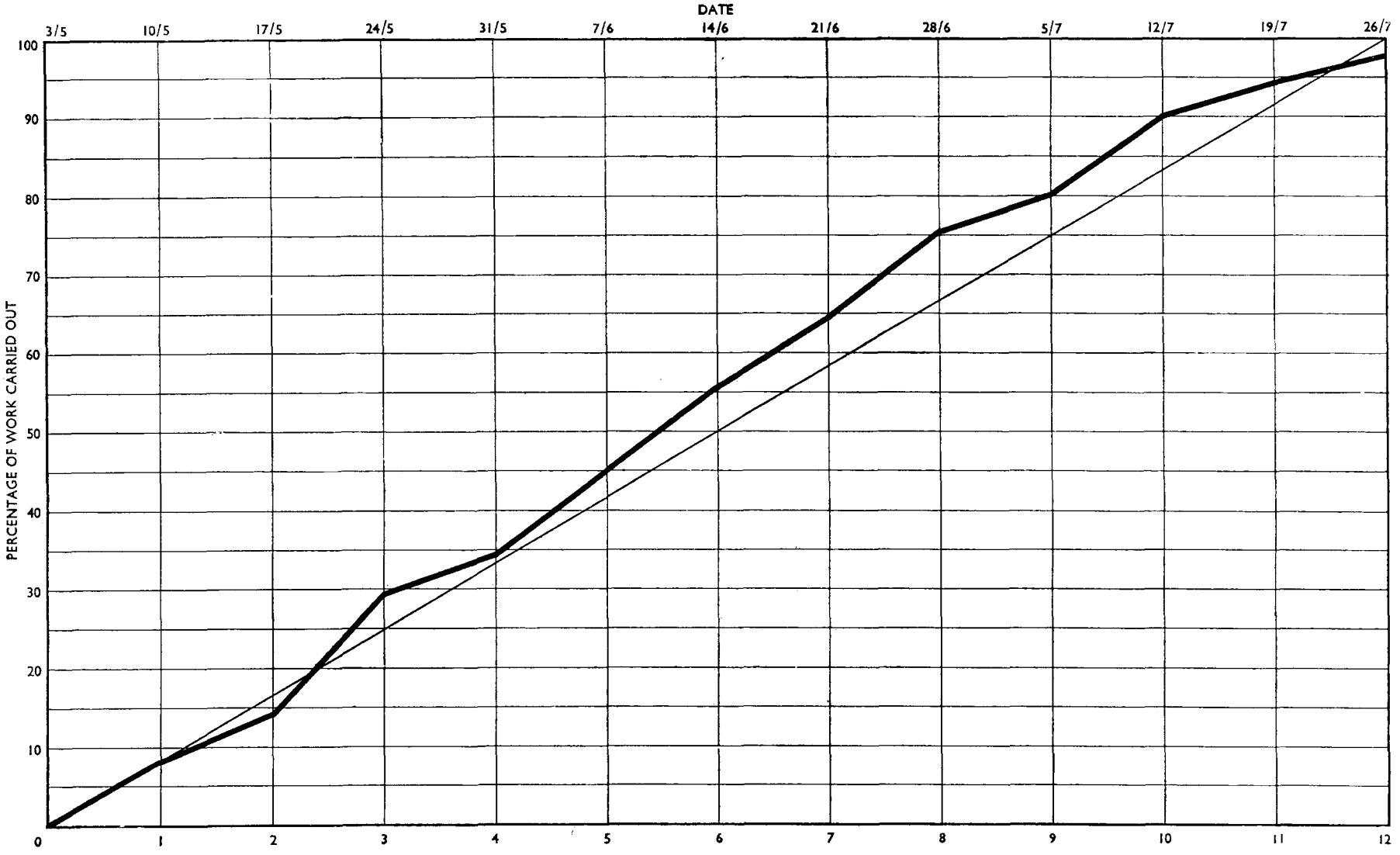

FIG. 6—REFIT PROGRESS GRAPH

(FESJOB 155) Defect List Item No.	DEFECT :	Dockyard Department Ship's Officer
Inspector	Chargeman	

Date	Remarks
	Started

AFTER ACTION } Entered in Fair Defect Book :	Entered in Machinery Record Book :	Date Completed

FIG. 7—A DEFECT CARD USED IN THE INDEX SYSTEM

REFIT OFFICE

The ideal location for the Refit Office was the Damage Control Headquarters 2, because :—

(*a*) It was in the same flat as the Engineering and Electrical Offices

(*b*) Damage control boards of all descriptions were available for maintaining a record of the state of the ship

(*c*) It had good telephone communications

(*d*) It was air conditioned.

Staff

The following staff was employed in the Refit Office :—

One lieutenant-commander (seaman specialist)—in charge
One lieutenant (seaman specialist) —deputy
One lieutenant (engineering specialist)
One lieutenant (electrical specialist)
Six messengers—(two each from the Seaman, Engineering and Electrical Departments).

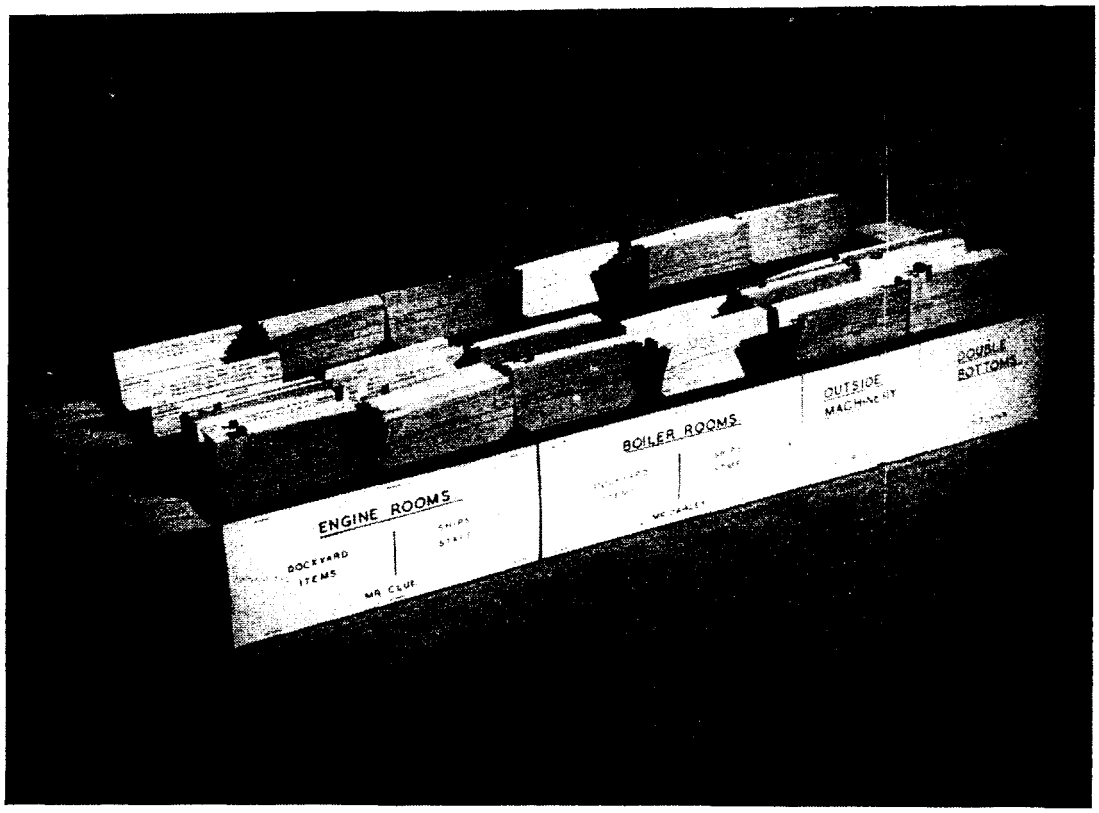

FIG. 8—THE DEFECT CARD FILING BOX

An important feature of the organization was that the officer in charge was responsible to the Captain, through the various heads of departments, and was free to consult directly both them and the heads of dockyard departments as circumstances warranted.

During dockyard working hours at least one officer and two messengers were on duty. The rest of the ships company worked tropical routine. The three lieutenants acted as duty officers, and provided the link between the Refit Office and the ships departments. They were also responsible for procuring the information on which the progress charts were based. The six messengers knew their way round the ship, and were most useful in guiding dockyard officers and employees to any desired station, particularly at the start of the refit.

DEPARTMENTAL RESPONSIBILITIES

The responsibilities of departments, both in the dockyard and in the ship, remained unchanged. To encourage the ships company to take a personal interest, individual ratings were, whenever possible, allocated one or more defect items, and instructed to observe, and report progress. They also made themselves generally useful to the dockyard employees.

RESULTS OBTAINED

The results obtained by the Refit Co-ordination Office were most satisfactory as far as the ship was concerned. Good planning saved much effort ; in particular, ships staff painting was not ruined by subsequent dockyard work, thus saving money and material. Good liaison saved the dockyard much time, for there was seldom a delay in obtaining a key or posting a sentry. The Refit Office could be relied upon to pass telephone messages without delay to ship's officers concerned.

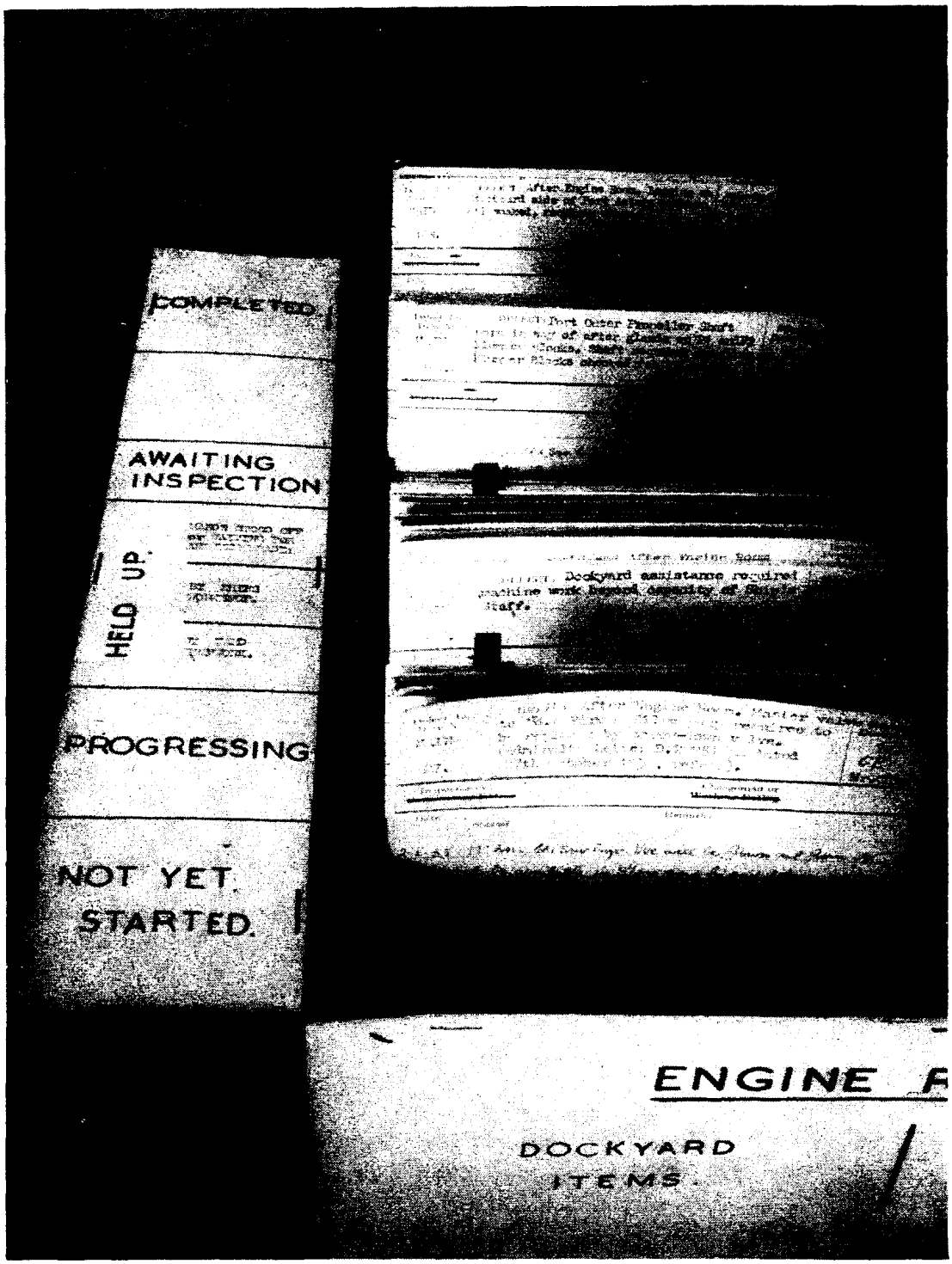

FIG. 9—DETAILS OF THE FILING BOX

Good recording enabled senior officers, both in the ship and in the dockyard, to keep in touch with the general progress of the refit, and to forestall any potential sources of delay. As a by-product, the wall displays enabled the duty security officer to see, before starting his rounds, exactly where the dockyard had been working, and where welding had been done that day. They also showed the exact state of the fire and ring mains, so that appropriate measures could be taken in case of fire. (A.F.O. 1620/55 is relevant).

The refit was planned to complete at 1130 on Saturday, 23rd July, 1955. By noon that day (apart from hawsers and shore electricity supply), the only

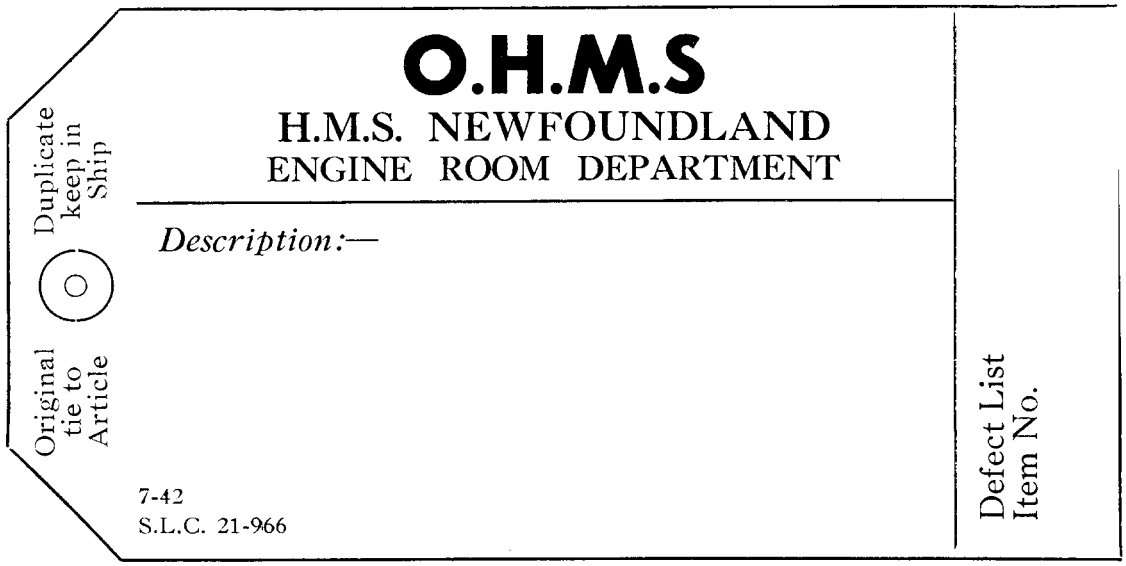

FIG. 10—THE LABEL. ON THE BACK WAS PRINTED
DATE LEFT SHIP :
WHENCE :
DATE RETURNED :

connection with the dockyard was one welding lead which was required to make good a small defect found when testing that forenoon. All mess decks and bathrooms were repainted and ready for the ships company to return on board on Sunday, 24th July. All store rooms had been repainted, the ship had been provisioned, and 75 per cent of the naval stores which had been landed had been re-embarked and stowed. On Monday, 25th July, the ship left the dockyard and moved, by tugs, to the Armament Depot.

During the refit the following items were undertaken :—

(*a*) Pink Defects — 89
(*b*) White Defects and S.339 items — 818
(*c*) Alterations and Additions completed — 16
(*d*) Alterations and Additions progressed — 7
(*e*) 61 watertight compartments, totalling about 100,400 cubic feet were air-pressure tested.

The work involved in (*a*) to (*d*) above was 97·7 per cent finished on completion day. Of the remaining 2·3 per cent, late arrival of spares from the United Kingdom accounted for 1·1 per cent.

By noon on completion day the whole ship's side had been given one undercoat : 60 per cent of the side had previously been chipped and primed, partly by contract labour. Store rooms, magazines and shell rooms had also been painted. The application of one undercoat and one top coat to the superstructure, masts and funnels was completed during post refit trials.

The post refit trials programme was carried out without amendment. During the two-hour full power trial, a greater shaft horse power was maintained than had ever been achieved since contractors trials in 1942.

CONCLUSIONS

This was a good refit. Many factors contributed, but it is considered that the aim of the Refit Co-ordination Organization was achieved. Such an organization should be even more valuable in a larger ship, such as an aircraft carrier. A less comprehensive organization should suffice for destroyers and below.

It is essential that the Refit Office should be manned throughout dockyard working hours, which seldom coincide with those of the ship's routine.

Dockyards should realize their items must sometimes be finished before the completion date, in order to allow ships staff to carry out tests, make good paintwork, and repaint. A central dockyard planning section, working in conjunction with the ship's organization, would help to achieve this. The adoption of a common ship/dockyard job card system would save a great deal of work, especially in transcription.