PART 1 : SECTION 4

CHAPTER 2

PLANNED FLYING AND PLANNED SERVICING

Function and Operation

1. Planned flying and planned servicing is a system of planning the flying effort and servicing of a unit in such a way that the maximum useful effort (flying hours, tons of bombs lifted, passenger miles flown, etc.) is achieved from the resources available (aircraft, men, airfields, hangars, tools, ground equipment, time, and other essentials). By this means each unit can be organized to achieve a definite flying effort, and the necessary aircraft, aircrew, and servicing personnel required can be calculated. The variable and limiting factors affecting such calculations are clearly defined by means of a *task chart*. Theoretically, therefore, each unit will have a definite servicing capacity to back a specific flying programme. In practice, a balance must be maintained between the two ; this balance being interpreted in the number of unserviceable aircraft required to keep the servicing personnel efficiently employed.

2. Adequate supervision by the unit commander is essential in order to adjust the programme to meet the unforeseen or unpredictable circumstances which inevitably arise. A careful watch must be kept to see that, while the flying task is completed in the one instance, the flow of unserviceable aircraft is controlled at the required rate into the servicing organization.

3. However, it is one thing to arrange for an even flow of servicing work, but quite another to ensure that the work itself is tackled methodically. The old servicing schedules merely listed the parts of the aircraft that were to be serviced, leaving the manner and order of servicing for the tradesman to decide. In planned servicing, the schedules are developed for each aircraft type by the Central Servicing Development Establishment, which decides the precise sequence of operations needed to turn out a thoroughly reliable aircraft as speedily and economically as possible. A careful analysis of these operations is then made to determine the number and type of tradesmen who will make up the servicing team. In this way it is ensured that :—

(*a*) The necessary tools, equipment, and spares are known and are to hand before the work starts.

(*b*) Work is co-ordinated to prevent men getting in each other's way—for instance, three people trying to get into a cockpit at the same time.

(*c*) Repetition of work is avoided—such as one man replacing a panel before another tradesman has finished his job.

(*d*) The most economical number of tradesmen is used.

4. The planned servicing schedule is apportioned to each member of the servicing team in the form of a *work card*. This card enumerates all the tools and the spares needed for each part of the schedule. It describes, in proper sequence, the operations to be performed, giving the average time required for each item. Each work card has a corresponding *servicing record slip* on which the tradesman signs progressively for the work he does, to provide the essential permanent record. The reverse side of this form has on it the certificates for completion by the tradesmen concerned, and the name of the supervising N.C.O. responsible for the quality of work done.

5. By so organizing the work of the tradesmen, the system eliminates congestion by allowing them to work in cockpits, turrets, and other confined places, in rotation. No time is wasted in needless removal and replacement of cowlings and inspection panels, or in running for tools and replacement parts. Each man's card also shows when and whom he will assist with a particular job, so that the man in need of assistance receives it automatically at the proper time.

6. When a major repair is necessary, a *repair and rectification* team will take on this additional task to avoid upsetting the timing of the servicing schedule. Their work will be synchronized to the servicing schedule by the N.C.O. in charge, to interfere as little as possible with the servicing team. Similarly, if a unit's aircraft require extensive modification, and the unit is large enough to justify it, a separate modification team may be established to specialize in these operations.

7. A work progress chart is provided for the N.C.O. in charge of servicing, to maintain control of all the work going on. The chart shows the progress of the servicing as a whole and, if lagging, which men or trades are involved. The N.C.O. can then organize reinforcement by referring to a disposition chart of all servicing personnel, and reallocating duties as necessary.

8. The planned servicing system is applied along similar lines to the bays used for servicing aircraft components—power plants, propellers, sparking plugs, wheels and tyres—as well as the sections dealing with electrical, wireless, radar, instrument, armament, and safety equipment.

9. Thus, second-line servicing work is controlled, both in extent and timing, by precise servicing schedules. In addition, the responsibility for the work done is established by the signatures, on the servicing record slips, of the supervising N.C.Os. and the airmen doing the work. The saving of man hours is of the order of 10 to 30 per cent. and former turn-round times have been cut by at least 50 per cent.

Spare Parts Reserves

10. For the success of any servicing scheme, replacement parts and assemblies must be available when required, otherwise aircraft will lie around partly dismantled, and servicing and flying programmes will be thrown out of gear. Adequate stocks of spare parts must, therefore, be held on each station where aircraft servicing is undertaken.

11. The average life of each part of an aircraft can be assessed in flying hours or by calendar periods. When sufficient records are available, statistics can be compiled and a fairly reliable pattern of spares wastage established. Simple arithmetic will then determine the quantity of each item required for, say, a three-month period at a given rate of flying. Stocks based on such computations are held in unit equipment sections.

12. Should a need arise for an item not held in equipment section stocks, a procedure exists for signalling a priority demand to an equipment depot, where special arrangements are made for immediate issue and dispatch. Priority demands must not be made unnecessarily, since abuse of the system reduces its value.

Reporting of Failures or Defects

13. Up to this point, the emphasis in aircraft servicing has been on the replacement of parts that are worn or defective. However, the detection of defective parts is only the first phase in the problem of increasing aircraft reliability. The second, and equally important phase, is the examination of failed components to determine the underlying causes, so that steps can be taken to eliminate them.

14. When a part fails for reasons other than the normal rate of wear, the failure is examined and investigated with the single object of preventing recurrences, thus ensuring continued aircraft serviceability and safety. Except for specialized procedures for reporting defects of a serious nature, defects occurring on transport aircraft employed on route flying, and those on aircraft undergoing special flying trials, the system for reporting is briefly as follows. Components and parts which fail for reasons other than normal wear are reported to command headquarters on a weekly defect return. Based on statistics maintained at commands—garnered from previously submitted defect returns—the decision is made whether or not Form 1022 action is to be taken. If it is, the reporting unit is advised and Forms 1022 are submitted on the NEXT case of similar failure. The investigation then passes to the specialist branch at the Air Ministry which has access to the Ministry of Supply, the design authority, and the manufacturer. The investigation may result in a revised and perhaps more frequent servicing, and/or the redesign or modification of the existing part concerned.

15. Because of its relations with manufacturers of aircraft components, the Ministry of Supply is brought into the picture, to take further action with the manufacturer of the part in question for any modification or redesign that may be necessary.

Unit Servicing Organization

16. The broad divisions of responsibility for the various categories of aircraft servicing have already been defined, first- and second-line servicing being stated to be within station capacity.

17. The senior technical officer (S.T.O.), who commands the technical wing, is responsible for the general control and co-ordination of all servicing at unit level. Although first-line servicing is done by squadrons, the O.C. technical

wing keeps a check on the technical practices adopted, and may advise squadron commanders on any technical matter.

18. Second-line servicing is done by the technical wing, and is, therefore, the direct responsibility of the S.T.O. The technical wing includes engineers, signals and armament specialist officers (the O.C. may himself be a specialist in one of those subjects), who are individually responsible for the aspects of servicing appropriate to them—directly in the case of the unit's second-line servicing, and in an advisory capacity for the first-line servicing.

19. Detailed individual responsibilities at unit level may vary with local conditions, and are, therefore, defined in Unit Servicing Orders, which are issued by the S.T.O. at each unit holding aircraft on charge. Unit servicing orders define the unit technical organization and the servicing procedure to be adopted, including such things as refuelling orders, and orders governing the ground handling, towing, and picketing of aircraft.

20. The necessity for a thorough pre-flight check by pilots cannot be too highly stressed. The details will naturally vary with the type of aircraft concerned, but all are important, many are vital, and neglect of any one may hazard the safety of aircraft and crew.

21. Additionally, pilots may be required to make percentage checks of the first-line servicing done by ground personnel. When sufficiently experienced, and subject to their being certified competent by the S.T.O., they may also be called upon to undertake and sign for a complete daily servicing.

Conclusion

22. The R.A.F. system of servicing is no mushroom growth. From humble beginnings, it has evolved steadily to meet the exacting demands of modern developments in aircraft design and construction.

23. It depends for its success not only on the skill and enthusiasm—rarely, if ever, lacking—of the ground personnel, the fitters and riggers, electricians, instrument repairers, and wireless mechanics, but also on the co-operation of aircrews. The pilot has certain well-defined responsibilities for the servicing of the aircraft which he flies ; and so have the flight engineer, the wireless operator, the navigator, and the air-gunner. The more lively the interest of all in the discharge of those responsibilities, the easier is the servicing task likely to be. It is essentially a combined operation in which good team-work may make all the difference between success and failure.

24. The need to achieve the maximum number of flying hours for the least possible amount of servicing, which becomes more acute as aircraft grow more complicated and expensive, demands that servicing schedules should be kept as brief as possible. Much, therefore, depends upon early and accurate reporting of snags by aircrew. Without this, the ground crews are inevitably seriously handicapped, and their time wasted. Close co-operation between flying and ground personnel, the development of the team spirit which no amount of organization or regulation can of itself bring about, is in fact the keystone of the R.A.F. servicing system.

NOTE.—Further information on aircraft servicing is to be found in A.P.3158, Vols. 1 and 2.