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ADMIRALTY FLEET ORDERS

AIRCRAFT—POWER PLANTS (A) AND (E) AND AERO-ENGINES. PROCEDURE FOR REPORTING AND HANDLING

AIRCRAFT—MONTHLY RETURN OF FLYING.

ADMIRALTY, S.W.1,
25th October, 1945.

The following Orders having been approved by My Lords Commissioners of the Admiralty are hereby promulgated for information and guidance and necessary action.

By Command of Their Lordships,

H. V. Markham

Distribution Limited

To Commanders-in-Chief, Flag Officers, Senior Naval Officers, Captains and Commanding Officers of H.M. Aircraft Carriers and Aircraft Maintenance and Repair Ships, Commanding Officers of R.N. Air Stations, Sections, Training Establishments and Squadrons, Superintendents and Officers in Charge of H.M. Naval Establishments, and Naval Store Depots.

NOTE:—The scale of distribution is shown in the Admiralty Fleet Order Volume, 1941, Instructions, paragraph 10.

6051.—Aircraft—Power Plants (A) and (E) and Aero-Engines—Procedure for Reporting and Handling

(A.E. 1867/45.—25 Oct. 1945.)

PART I.—INSTRUCTIONS FOR RETURNS OF POWER PLANTS AND AERO-ENGINES

This Order revises and consolidates previous Admiralty instructions with regard to power plants and aero-engines. It is complementary to the instructions in A.F.O. 1380/45 except in certain instances where it supersedes them as explained in the text; in these cases a reference to this Order should be made against the relevant Section of A.F.O. 1380/45.

2. Definitions :—

- (i) An *aircraft* for all purposes of allotment and reporting under A.F.O. 1380/45 is to be taken as including an airframe, a power plant (where applicable) or an aero engine. Where a bare airframe is held without an appropriate engine or power plant that can be earmarked for it, the airframe is to be reported separately at the end of the signal under A.F.O. 1380/45, Section B, and at the end of the forms A.10 and A.10 (a) under Section E of the A.F.O.
- (ii) A *power plant* for all purposes of allotment and reporting under this Order is to be taken as comprising a power-plant structure and aero engine complete. Where an engine is removed from a power-plant structure for repair, etc., it, or a replacement, is to be earmarked for the power plant structure and the whole considered as one power plant.
- (iii) *Spare power plants* are power-plant structures and engines complete or separated for repairs held additional to the number of airframes to which they are applicable.
- (iv) *Spare engines* are aero engines held additional to the number of power-plant structures to which they are applicable.

3. Power-plant nomenclature :—

- (a) *Power plants (A)* are designed for a particular type and mark of aircraft and will be referred to by the aircraft name and mark.
- (b) *Power plants (E)* are designed for a particular type and mark of engine and will be referred to by the engine name and mark.
- (c) *Assembly numbers.*—Power plants (A) and (E) will also carry an assembly number which will indicate their modification state. (See also Part II.)
- (d) All power plant structures will be assigned a serial number.
- (e) *American aircraft* have engine mountings known in the U.S.N. as "quick change mounts". These are to be treated as for power plants (A) except that assembly numbers will not be used.

4. Examples of the method of referring to power plants are therefore as follows :—

- (i) Firefly IV power plant (A), Assembly No. 1.
- (ii) Griffon II power plant (E), Assembly No. 3.
- (iii) Hellcat II power plant.

Administrative authorities will need to record the assembly numbers of individual power plants in the same manner as they record the modification state of aircraft and demands for replacement power plants must always specify the assembly number required.

It is not, however, necessary to distinguish between power plants of different assembly numbers in the reports to the Admiralty called for by this Order as it is not practicable for Admiralty to keep records of the state of modification of individual power plants any more than it is for individual aircraft.

5. Aero-engine nomenclature.—Aero engines are assigned a name and mark.

Two sets of serial numbers are normally assigned to aero engines. The first is the maker's number and the second is the Service number. Only the second serial number, consisting of six figures, is to be used for allotment and reporting purposes within the Naval Service.

6. *Procedure for reporting state of spare power plants and spare aero engines held.*—A signalled report of the state of spare power plants and spare aero engines held at 0001 on the 1st of each month is to be rendered by all Naval authorities concerned. This signal is to replace Part IV of the signalled report called for under A.F.O. 1380/45, Section B, and is to be made in the following form :—

Addressed to—Admiralty

Info—Administrative Authority

Quote this A.F.O. and state date of return

- (i) Designation of power plant followed by numbers of *spares* (complete with engine installed or earmarked) held under the following headings :—
 - A.—Number effective
 - B.—Number non-effective
 - C.—Number in obsolescent pool awaiting disposal.
- (ii) Designation of engine followed by numbers of spares held *additional to* those included in A, B and C :—
 - D.—Number effective
 - E.—Number non-effective
 - F.—Number in obsolescent pool awaiting disposal.

Note.—(a) In the case of power plants (E) where the designation of the power plant at (i) is the same as the engine this need not be repeated at (ii).

- (b) If for any reason bare power-plant structures have to be held without an appropriate engine that could be earmarked for them these are to be reported separately at the end of the signal under the general heading "bare structures".

7. The following form will be found suitable for preparing this return and copies should be made locally as required :—

Spare power plants (complete with engines)				Spare engines			
Designation of power plant	Num-ber held Effective	Num-ber held non-effective	Num-ber held O.P.	Designation of engine	Num-ber held effective	Num-ber held non-effective	Num-ber held O.P.
	A	B	C		D	E	F
Firefly IV ...	2	1	—	Griffon 72 ...	1	—	—
Firebrand III ...	—	—	2	Centaurus VII ...	—	2	—
Firebrand IV ...	1	1	—	Centaurus IX ...	—	1	—
Griffon II ...	2	1	—	Griffon II ...	1	—	—
				Merlin 55M ...	3	1	—
				Merlin 32 ...	—	—	6

Example of signalled report as tabulated above :—

To :—Admiralty

From :—N.A.S.

Info. :—Admiral (Air)

A.F.O. for 1st December

Firefly IV, A2, B1

Griffon 72, D1

Firebrand III, C2

Centaurus VII, E2

Firebrand IV, A1, B1

Centaurus IX, E1

Griffon II, A2, B1, D1

Merlin 55M, D3, E1

Merlin 32, F6

8. *Return of individual power plants and aero engines held.*—When rendering the returns of individual aircraft and engines held, on forms A.10 and A.10 (a) in accordance with A.F.O. 1380/45, Section E, details of the serial numbers of power plants preceded by the letters PP are to be included in column 2 of forms A.10 and A.10 (a) as in the following examples:—

Aircraft type and mark	Serial number of aircraft and power plant	Engine type and mark	Serial number of engine
(i) Firebrand IV ...	EK.632 PP.75241 ...	Centaurus IX	638725
(ii) Firebrand IV ...	PP.72852 ...	Centaurus IX	674813
(iii) —	PP.52847 ...	Griffon II ...	835694
(iv) —	—	Griffon II ...	847215

Example (i) is for a complete aircraft fitted with power plant.
Example (ii) is for a complete spare power plant (A).
Example (iii) is for a complete spare power plant (E).
Example (iv) is for a spare engine.

Items under each of the above headings (i) to (iv) should be segregated in the returns, all items under (i) being shown before starting on (ii) and so on.

9. *Returns of Aircraft, Power Plants and Engines held by Non-Naval Authorities Abroad.*—It is important that Administrative Authorities abroad shall make arrangements to cover the reporting of aircraft, power plants and engines held for repair or further disposal by other than a naval authority (e.g. R.A.F., M.U. or C.R.O.) as laid down in A.F.O. 1380/45, section E, paragraph 6, as otherwise all track of such aircraft, etc., is lost in Admiralty records. Separate arrangements are made in the case of the United Kingdom.

PART II.—PROCEDURE FOR HANDLING POWER PLANTS WITHIN THE NAVAL SERVICE

1. *Power Plant Assembly Numbers.*—(i) Each power plant will be given an assembly number which will indicate a certain modification state. The embodiment of modifications which affect operational standard or interchangeability as between power plant and aircraft will involve a change of assembly number (e.g. when Griffon II Assembly No. 1 has modification Griffon/P.P.59 embodied it becomes Griffon II Assembly No. 2). It is important to note that a change of assembly will only become operative when either interchangeability or operational standard are effected.

(ii) Power plant assembly numbers will be recorded on an identification plate carried on each power plant. A corresponding plate will be fitted to the aircraft which will indicate the assembly number of the power plants which may be fitted to that aircraft.

2. *Conversion of Assembly Numbers.*—(i) As the difference between certain power plant assemblies may be small, one assembly can often be converted to another by changing one or more items. Instructions to enable such conversion to be effected will be issued as follows:—

- (a) Power plants (E) and (A) as Vol. II, Part 7, of the appropriate Power Plants Publication except in the case of—
 - (b) Certain older power plants (A) for which instructions are issued as Vol. I, Section 5, Chapter 2 of the appropriate Airframe Publications.
- (ii) Instructions for conversion will include:—
- (a) A schedule of power plant assemblies.
 - (b) A list of conversion sets.
 - (c) An interchange chart indicating those assemblies which are completely interchangeable and listing the various assemblies obtainable by conversion, including the time required for conversion.
 - (d) Conversion instruction sheets detailing the changes of accessories necessary to effect a conversion.

(iii) Whenever a power plant is converted from one assembly to another the Air Engineer Officer or Inspection Officer, as appropriate, will be responsible for amending the assembly number on the plate attached to the power plant. Similarly, whenever the power plant acceptance standard of an airframe is altered or whenever a power plant with a different assembly number is installed, the appropriate plate on the aircraft is to be amended accordingly. Thus, the assembly numbers on a power plant and on the aircraft in which it is installed should be identical.

3. *Modifications.*—Power plants (E) will continue to have their own series of modifications. Power plants (A), whose modifications were heretofore included in the relevant series of airframe modifications, will henceforward have their modifications numbered in a separate series. Leaflets for individual modifications to both power plants (A) and (E) will be promulgated in the relevant Vols. II, Part I. The classification and numbering of power plant modifications will be as follows:—

- (i) *Power Plants (A).*—(a) Classifications will be the same as for *Airframe* modifications.
 - (b) All modifications will be in a separate series with the prefix letters P.P. before the modification number to differentiate between power plant (A) modifications and modifications to the airframe (e.g. Firefly IV, Power Plant Mod./P.P.15 as opposed to Firefly Mod./15).
- (ii) *Power Plants (E).*—(a) Classifications will be the same as for *Engine* modifications.
 - (b) Modifications will be in a separate series with prefix letters P.P. in the case of Rolls Royce power plants (E) (e.g. Griffon II Power Plant (E), Mod. P.P.15) Bristol power plants (E) have the prefix letter P. but no Naval aircraft at present have a Bristol Power Plant (E).
- (iii) (a) The *separate* numbering system for power plant (A) modifications outlined in sub-paragraph (i) above will not be applied retrospectively and is only applicable to new types or marks of aircraft fitted with power plants. This system will be applicable to:—
 - Firebrand T.F., Marks III and IV.
 - Firefly F.R., Mark IV and N.F., Mark IV.
 - Barracuda V.
 - Sea Mosquito, Mark 33.
 - Sea Hornet, Mark XX.
 - Seafang, Mark 31.
 - Monitor T.T., Marks I and II.
 - Subsequent types.
- (b) In the case of Griffon engined Seafires and Barracuda, Marks II and III, modifications affecting the power plants will continue to be numbered in the airframe modification series but new modifications will carry the prefix letters P.P. before the airframe modification number to denote that embodiment of the modification concerned is to be logged in the power plant log card as opposed to the airframe log card. This will have effect as from the introduction of the Power Plant Assembly Scheme (see paragraph 2 above) i.e. in all Marks of Griffon engined Seafires and in Barracuda II and III from Mod. 582 onwards.
- (iv) In cases where a power plant modification involves a consequential airframe modification and vice versa, the titles of both modifications will bear reference to one another by the addition of the words "complimentary to modification . . ." (e.g. Firebrand Power Plant P.P.21 supercharger automatic gear change introduced. Complimentary to Firebrand Alt./261—and vice versa).
- (v) The embodiment of Power Plant Modifications prefixed P.P. is invariably to be logged in the Power Plant Log Card, Form 701 (see paragraph 4 below), not in the Airframe Log Card.

4. *Log Cards, Form 701* will be issued with each power plant indicating on the Form 1125 its full nomenclature (e.g. Barracuda III Power Plant (A), Assembly No. 2). These log cards must be kept up to date as with airframe or accessory log cards and must be transferred with the power plant wherever it is sent.

5. *Publications.*—Power plants (A) and (E) will each have their own separate air publications. These will include:—

- Volume I ... Descriptive handbook.
- Volume II, Part 1 ... Leaflets.
- (Volume II, Part 2 ... Not applicable—will not be issued.)
- Volume II, Part 3 ... Repair instructions.
- Volume II, Part 7 ... Assembly conversion instructions.
- Volume III ... Schedule of spare parts.

6. *Checking Lists.*—Each type of power plant will have a checking list which will be included in the Volume III of the appropriate power plant air publications.

7. *Internal Procedure at Units.*—(i) Holding units are to conform to the procedure detailed in the Appendix to this order in the event of damage, defect or deterioration of power plants, or engines in power plants, whether installed in aircraft or held as spare.

(ii) Engines, whether serviceable or unserviceable, and other power plant components are *not* to be removed by the despatching unit before sending the power plant away for repair, although serviceable parts may be replaced by unserviceable parts from other power plants if this will render the latter serviceable. The return of incomplete power plants results in considerable delay at contractor's works due to deficiencies not being noticed until assembly has been commenced.

(iii) If it is desired to retain an engine from an aircraft fitted with a power plant (A) or (E), when the airframe is to be sent to the repair contractor for repair, the *complete power plant* must be removed and retained.

(iv) Airframes fitted with power plants (A) or (E) are *not* to be sent to a contractor for repair with the engine removed and the structure still installed.

(v) Power plants (E) may only be left in airframes being sent away for repair at contractors if the structure and engine are both serviceable, no parts have been removed, and the unit is complete in all respects.

(vi) Power plants (A) returned with the airframe should have the condition of the engine and structure indicated clearly on a label.

8. *Storage and transportation of Power Plants.*—The same conditions of storage apply to power plants as to aircraft and engines.

The oil coolers and coolant radiators of power plants in storage are to be stored in a filled condition.

Engines in stored power plants are to be inhibited.

Stored power plants are to be kept up to the latest modification standard.

Special trolleys are being introduced for the transportation and storage of power plants and will be the subject of a further Fleet Order covering their introduction, use and supply.

APPENDIX
Internal Handling of Power Plants by Holding Unit

Condition. (Column 1.)	Immediate Action by Squadron. (Column 2.)	Follow up Action by Station or Ship Workshop Section. (Column 3.)	Further Action by Station or Ship Workshop Section. (Column 4.)	Final Action. (Column 5.)
Engine: U/S or time expired.		(1) Remove engine from power plant. (2) Clean power plant structure and components, clean and examine systems for contamination and carry out major inspection on plant (see Note (ii) below). (3) Install serviceable replacement engine in power plant. (4) Pass complete power plants to storage as serviceable spare.	(a) Rectify unserviceable engine if this is within capacity of unit, and hold as spare engine.	
Power plant structure: S.	If defect to engine or structure cannot be rectified while installed in aircraft:— (1) Remove complete power plant from aircraft. (2) Install serviceable replacement power plant. (3) Pass unserviceable power plant complete to workshops.	(5) If structure is repairable at unit, proceed as in (1) to (4) above, and repair structure. (6) If structure is beyond capacity of unit to repair, do not remove engine or any components but request disposal instructions. (7) If structure can be repaired by unit, repair structure and give engine major inspection and re-install (see (1) to (4) above). (8) If structure is beyond unit's capacity to repair, proceed as in (6) above.	(b) If engine is beyond the capacity of unit to repair, request disposal instructions in normal way (A.F.O. 1380/45, Section K). (c) If structure has been repaired at unit, proceed as in (a) and (b) above. (d) On receipt of instructions despatch complete power plants on the appropriate power plant trolley for repair or disposal. (e) Hold complete power plant as spare in storage.	(i) Despatch engine for repair as directed. (ii) Receive replacement engine by allotment from Administrative Authority. As for (i) and (ii) above.
Engine: U/S or time expired.				
Power plant structure: U/S.				(iii) Receive complete replacement power plant by allotment from Administrative Authority.
Engine: S. ...				
Power plant structure: U/S.			(f) Proceed as at (d) above ...	(iv) As at (iii) above.

Notes—

(i) If due to shortage of supply of engines it becomes necessary to remove serviceable engine from unserviceable power plant before despatch as at (8) above, the unserviceable engine with which this is exchanged must be installed in the unserviceable power plant complete with all components before despatch to avoid loss of small items.

(ii) Where engine failure is suspected of having caused contamination of the oil system, e.g. bearing failure, a spare oil cooler and C.S. unit are to be fitted. Those removed should be returned to store for repair, being labelled "Repairable—contaminated due to engine bearing failure".

(A.F.O. 1380/45).
(A.F.O. 3079/43 is cancelled.)

6052.—Aircraft—Monthly Return of Flying

(A.E. 1914/45.—25 Oct. 1945.)

The flying intensity of Naval aircraft is a basic factor in all aircraft statistical calculations whether concerned with aircraft provisioning, aircraft maintenance, flying training or accident analysis. Full information of all flying carried out in the Naval service is therefore required by the Admiralty and is provided by the monthly returns on Form S.1209 called for in this order. In addition a monthly signalled summary is required to provide the information upon which a monthly analysis of aircraft accidents can be based and promulgated by the Admiralty without the delay that would occur if written reports were awaited.

2. *Instructions for Forwarding Returns.*—Form S.1209 is to be completed for each calendar month up to 2359 on the last day of the month and is to be despatched as early as possible by the speediest means available. Returns should normally be despatched before the 4th of the month and the microgram service should be used when available to ships and stations abroad. A signalled summary is to be sent in addition in the form outlined in paragraphs 14 and 15, as soon as the draft S.1209 has been made out.

3. Copies of returns should be supplied as follows :—

2 to the Admiralty.

1 to the administrative authority.

1 to unit files.

Other copies as administrative authorities may direct.

Signalled summaries should be addressed similarly.

4. Returns are to be forwarded by all ships, Naval air stations and other units holding Naval aircraft.

The senior officer of any detached unit is responsible for forwarding a separate return and signal of flying done by the unit whilst detached from any R.N. aircraft carrier or Naval air station, *e.g.*, when working under R.A.F. control at an R.A.F. station, etc.

The Commanding Officer of the parent unit is to ensure that the provisions of this Order are complied with.

5. Carriers disembarking squadrons and ceasing to operate aircraft for a period are to forward a return for the uncompleted portion of the month concerned up to, but excluding the actual disembarkation flights. Such returns may be sent as early as convenient after the disembarkation.

6. A covering memorandum is not required if the form is signed by the Commanding Officer.

7. *Nil returns are to be made*, but Forms S.1209 should not then be used.

8. *Instructions for Completing Form S.1209.*—Form S.1209 is to be completed in the appropriate columns to show separately for operational and non-operational flying for each type and mark of aircraft the flying carried out during the previous month in terms of :—

The number of hours flown to the nearest hour.

The number of sorties.

The number of deck landings or A.D.D.Ls,

in accordance with the following rules.

9. *Returns by Ships.*—(i) are to include :—

(a) Flying by aircraft of squadrons or units embarked, including the embarkation flight.

(b) Flying by other aircraft temporarily aboard for D.L. training or trials, including the embarkation flight (but not the disembarkation flight).

(c) Flying to other ships or shore stations and back again and any flying carried out at the visited ship or shore station, so long as the aircraft are not detached for duty away from the parent ship.

(ii) are to exclude :—

(a) Flying by aircraft held on charge, but which are detached temporarily for duty with other ships or shore stations.

(b) Disembarkation flights of aircraft under (i) (a) or (b), provided that the aircraft are taken on charge by another ship or station.

10. *Returns by Naval Air Stations and Sections.*—(i) Are to include :—

(a) Flying by aircraft of Squadrons, Units or Stations flights attached to the station or section, including flights to the station from other shore stations or from ships, of aircraft which are taken on charge or otherwise attached.

(b) Flying to other shore stations or ships and back again and any other flying carried out at the visited ship or shore station, so long as the aircraft are not detached for duty away from the parent station.

(ii) Are to exclude :—

(a) Flying by aircraft temporarily detached for duty elsewhere, *e.g.* for D.L. Training or Trials.

(b) Departure flights of aircraft under (i) (a) being transferred to other stations or ships provided that the aircraft are taken on charge by another station or ship.

(An aircraft which for any reason fails to arrive at the receiving station or ship should have the hours flown during the transfer flight returned by the ship or station from which the flight started.)

11. *Definition of Sorties.*—A sortie is to be taken as a single flight from take-off to landing. When carrying out a series of A.D.D.Ls. or "circuits and landings," in which the aircraft touches down but immediately takes off again without stopping, the series is to be counted as one sortie. In the case of A.D.D.Ls., each touch-down is to be recorded as a separate A.D.D.L.

12. In interpretation of paragraphs 9, 10 and 11 the following examples are given :—

(a) A shore-based aircraft embarks on a carrier for D.L.T. carrying out a total of ten deck landings and then returns to base.

The ship includes in its return :—

The flying time from leaving the shore station to final departure from the ship.

Ten sorties and ten deck landings.

The shore station includes in its return :—

The flying time for the return flight.

One sortie.

(b) An embarked aircraft flies to a shore station to land a passenger, after doing so carries out an engine test flight, and then returns to the ship.

The ship includes in its return :—

The total flying times.

Three sorties.

One deck landing.

The shore station excludes this flying from its return.

(c) An aircraft of a communication squadron carries out a routine flight, calling at three other air stations and returning to its base.

The home air station includes in its return :—

The total flying time.

Four sorties.

13. The following additional points are to be noted.

(a) Ships and stations must include all flying carried out during the month, including that of squadrons temporarily attached which may have moved away before the end of the month. The flying hours of any one Squadron may thus be split between two or more ships or stations.

(b) Admiralty will check squadron flying returns against reports of squadron movements under A.F.O. 1380/45, Section C, and the reports rendered under Section B. Any squadron that has been held during the month must therefore be included on Form S.1209 and in the signalled summary but with a nil return if no flying has taken place.

(c) Where an amendment to signalled reports is necessary an amended Form S.1209 is also to be forwarded unless the amendment has already been incorporated in the original form.

Instructions for making the Signalled Summary.

14. The signalled summary is to include the entries on Form S.1209 under Hours flown and Deck landings and is to be made in the following form:—

Reference—S.1209 stating month of return.

Part I.—Flying hours by:—

(i) Squadron or flight or miscellaneous (e.g. test flights).

(ii) Aircraft type and mark.

followed by hours flown under the sub-headings:—

A. Operational day.

B. Operational night.

C. Non-operational day.

D. Non-operational night.

Totals for all aircraft under A, B, C and D, for whole ship or station.

Part II.—No. of deck landings (required from ships only) as for Part I.

15. Examples of signalled summary:—

(a) By a shore station.

Admiralty.

from N.A.S.

Info: Administrative Authority.

S.1209 for August.

Part I.

600 Squadron	...	Seafire LIII	...	A.53	C.63		
		Seafire XV	...	A.10	B.10	C.30	D.5
620 Squadron	...	Nil.					
Station Flight	...	Reliant	...	C.18			
Miscellaneous	...	Seafire XV	...	C.12			
Totals	...	A.63	B.10	C.123	D.5		

(b) By a carrier.

Admiralty.

from Carrier.

Info: Administrative Authority.

S.1209 for September.

Part I

610 Squadron	...	Seafire LIII	...	A.70	C.20
630 Squadron	...	Seafire LIII	...	A.50	C.30
Totals	...	A.120	C.50		

Part II

610 Squadron	...	Seafire LIII	...	A.40	C.15
630 Squadron	...	Seafire LIII	...	A.30	C.25
Totals	...	A.70	C.40		

(C.A.F.Os. 2499/44, 755/45 and A.F.O. 1380/45, Section H, are cancelled).