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PART 2 : SECTION 2

CHAPTER 1

AIR TRAFFIC CONTROL ORGANIZATION

(For detailed information on air traffic control refer to A.P.3024)

AIR TRAFFIC CONTROL POLICY

Introduction

1. The air traffic control organization in the Royal Air Force is designed to provide, in time of peace and war, aeronautical facilities and a ground organization that will :—

- (a) Assist pilots of R.A.F. aircraft to fly safely in all weather conditions with the minimum restrictions on tactical freedom.
- (b) Alert emergency services and, where practicable, supply flight information for all R.A.F. aircraft.
- (c) Meet the requirements of air defence and other authorities for the notification of aircraft movements.

Air traffic control is exercised through air traffic control centres and approach and aerodrome control units by air traffic control officers who, although not themselves permitted to initiate mandatory instructions to captains of aircraft, may relay them on behalf of an appropriate authority.

Joint Military/Civil Policy

2. In peacetime all service operations must conform as nearly as possible to the civil regulations, and the Air Ministry have therefore agreed that the Royal Air Force shall adhere to the international standards, regulations, and procedures for the control and operation of aircraft as defined by I.C.A.O. (International Civil Aviation Organization), so long as these do not conflict with military requirements. In implementing this policy, aeronautical facilities and ground organization required in the United Kingdom and in British-administered territories abroad for the common use of military and civil aviation may be provided, either jointly or on an integrated basis, by the Air Ministry and the Ministry of Transport and Civil Aviation in the United Kingdom and by the Air Ministry and the Colonial Office in territories abroad. In a national emergency the Royal Air Force will take over control of that part of any joint or integrated organization, service or facility which is operated by civil aviation.

ORGANIZATION AND FUNCTION OF THE AIR TRAFFIC CONTROL SERVICES

International Organization

3. Throughout most parts of the world the airspace has been divided into a number of international flight information regions (F.I.R.), each of which is under the jurisdiction of an air traffic control centre (A.T.C.C.). The responsibility for providing an efficient air traffic control service within each of these regions lies with the country over whose territory or waters it exists.

Joint Military/Civil Organization in the United Kingdom

4. The United Kingdom has divided the international flight information region for which it is responsible into three national F.I.R.s., namely, Scottish, Preston, and London, the first two being under the jurisdiction of joint R.A.F./M.T.C.A., A.T.C.Cs. and the third under the jurisdiction of one M.T.C.A. and two R.A.F., A.T.C.Cs. In addition, an R.A.F. sub-A.T.C.C. handles the predominantly military air traffic in the eastern part of the Preston F.I.R. The civil authorities operate controlled airspaces throughout the country, in the form of airways and control zones, for flight within which military aircraft must comply with certain mandatory regulations; these are relaxed, whenever possible, for aircraft engaged on special exercises. Outside these controlled airspaces the Royal Air Force provides air traffic control service for its own aircraft and, by agreement, for those of the Royal Navy flying outside the jurisdiction of their own aerodromes.

Joint Military/Civil Organization Abroad

5. In British-administered territories abroad, to safeguard British military and civil aircraft moving along international and strategic trunk routes, and also foreign aircraft for which, by international agreement, such safeguards must be provided, an integrated air traffic control service is provided by agreement between the Air Ministry, the M.T.C.A., and the Colonial Office. This is operated from British A.T.C.Cs.

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In areas which lie outside British-administered territory, but over which R.A.F. aircraft regularly fly, certain of these British A.T.C.s., in addition to their responsibilities towards aircraft flying within their own F.I.R.s., maintain a watching brief over all R.A.F. aircraft flying within defined areas known as R.A.F. Areas of Responsibility. As these areas of responsibility often embrace one or more international F.I.R.s., their associated British A.T.C.s. cannot assume responsibility for the provision of in-flight separation outside the boundaries of their own flight information regions.

Operational Control of R.A.F. Organization

6. Although the general air traffic control system is based on a regional form of control, the normal chain of command within the Royal Air Force is from Air Ministry, through commands and groups, to stations. Exceptionally, the R.A.F. elements which man the joint A.T.C.s. in the United Kingdom, known collectively as the United Kingdom Air Traffic Service, are under the direct operational and administrative control of Fighter Command.

Air Traffic Control Centres

7. An air traffic control centre is established to provide air traffic control service within its own flight information region or area of responsibility. It is responsible for :—

(a) The provision of flight information and emergency and alert in services for all aircraft flying within its F.I.R.

(b) The co-ordination of all diversion, emergency and overdue action within its F.I.R. and with adjacent A.T.C.s.

(c) The control of aircraft flying within controlled airspaces under instrument flight rules by day, or under any weather conditions by night.

(d) Maintaining and having instantly available, full and up-to-date aeronautical and meteorological information for its F.I.R., and for providing an aeronautical information service.

(e) Reporting all breaches of air traffic control regulations by aircraft under its jurisdiction.

(f) Maintaining a watching brief over all R.A.F. aircraft flying within its R.A.F. area of responsibility (applicable only to British A.T.C.s. abroad).

Where air traffic control centres are operated jointly by R.A.F. and civil elements, each will

be responsible for dealing with its own air traffic.

Unit Air Traffic Control

8. At R.A.F. aerodromes, air traffic control is divided into two distinct functions, namely, approach control and aerodrome control. At all except those aerodromes which have very low intensity air traffic, watchkeeping is maintained in accordance with the "split control" system, in which a qualified controller is responsible for each function, as follows :—

(a) *Aerodrome Control.* The supervision and control of all traffic on the manoeuvring area, and the control of all aircraft flying in visual reference to the ground in the vicinity of the aerodrome.

(b) *Approach Control.* The control of all aircraft taking off from, landing at, or flying in the vicinity of the aerodrome in instrument flight rule weather conditions (or in visual flight rule weather conditions for instrument training purposes). This includes all flight patterns associated with radio or radar navigation and approach aids.

At aerodromes operating split control, aircraft approaching in I.F.R. weather conditions will normally be handed over from approach control to aerodrome control when they reach V.F.R. weather conditions or clear the runway in use, whichever is the earlier. Responsibility for aircraft movements on the runway in use in I.F.R. weather conditions may, however, be delegated to aerodrome control or to G.C.A. (Ground Controlled Approach), as applicable.

9. To assist in controlling aircraft taxiing, taking off, and approaching to land, and to control the movement of vehicular and pedestrian traffic in the vicinity of the runway in use, a runway controller, who is under the direct jurisdiction of the aerodrome controller, is positioned in a distinctive black and white chequered caravan located at the downwind end of, and to the left-hand side of, the runway in use.

Master Aerodrome Organization in the United Kingdom

10. In order to provide emergency services throughout the 24 hours, certain selected aerodromes, known as master diversion aerodromes, have been established on a geographical basis. They provide navigational and approach facilities and are always available to accept

diversions and aircraft in emergency. Although any R.A.F. aerodrome may be used for diversion during its hours of availability, it is advisable if possible to use a master aerodrome with its fuller facilities.

Flight Information Service

11. Within flight information regions the flight information service (F.I.S.) makes the following information available to aircraft in flight :—

- (a) Information on unusual or dangerous weather conditions (*e.g.* line squalls, severe turbulence, etc.).
- (b) Serviceability states of navigational aids and of aerodromes and their equipment.
- (c) Other information pertinent to the safety of aircraft.

Within the United Kingdom and the British Zone of Germany, the F.I.S. is available from the A.T.C.Cs. to W/T-equipped aircraft and also to aircraft equipped only with V.H.F. R/T; the latter may communicate with the A.T.C.C. either direct or through the master and supplementary aerodromes listed in current aeronautical documents. The F.I.S. frequencies may also be used for the passing of air movement and air traffic clearance messages and for the relaying of position reports and other messages to and from A.T.C.Cs.

Aeronautical Information Service

12. The Aeronautical Information Service functions through Aeronautical information sections (A.I.S.) which are located at all A.T.C.Cs. and at certain selected flight planning sections abroad. The functions of an A.I.S. are to :—

- (a) Collect, record, and disseminate information necessary for the safe conducts of flights.
- (b) Pass to the Aeronautical Information Documents Service any information required for publication.
- (c) Make available to civil aeronautical information services such information as they may require.
- (d) Act at all times in an inforatory and advisory capacity.

The information maintained at an A.I.S. is available on request to the duty air traffic control officer at the centre, to the duty A.T.C.Os. at aerodromes, to station navigation officers (who are responsible for flight planning sections), and to captains of aircraft in flight, through the medium of the flight information service.

13. Stations are responsible for passing to the appropriate A.I.S. information concerning the establishment of, or change in the condition of, any aerodrome under their control, any of its associated navigational, approach or landing equipment, any hazard to air navigation, and any new procedure. Notices to airmen (NOTAMS) are issued for the passing of information to, and distribution by, the A.I.S. Class I NOTAMS relate to information which becomes effective within 48 hours, and are dispatched by signal. Class II NOTAMS are used for information for which a warning period of 48 hours or over is allowed, and are dispatched by memorandum. Where, however, the information refers to a master aerodrome or its associated aids, to the distress organization, or to the flight information service, it is always passed by telephone.

Aeronautical Information Documents Service

14. The Aeronautical Information Documents (A.I.D.) Service is responsible for providing accurate and up-to-date information on navigational aids, air/ground communications and other facilities required by personnel directly concerned with the operation and safety of aircraft. These documents are available in a lettered series which together cover those parts of the world over which R.A.F. aircraft normally fly, each series normally having a distinctive colour for ease of identification. The documents published are :—

- (a) *Radio Facility Charts (A.P. 3192 Series)*. These contain data on radio aids to navigation, airspace restricted areas, time-signal information, and position reporting procedures. They are reprinted at intervals as stated on the General Information page of each document.
- (b) *Supplementary Flight Information Documents (A.P. 3322/3)*. Used in conjunction with radio facility charts, these contain reasonably static flight information applicable to their area of coverage. This includes meteorological data, general A.T.C. information, emergency procedures, and notes on desert and arctic survival, etc.
- (c) *Pilot's Handbooks (A.P. 3193 Series)*. These contain, in loose-leaf form, instrument approach and landing charts for selected aerodromes and also A.T.C. briefs. Additional information on airfields is contained in tabulated lists.
- (d) *Air Traffic Control Supplement (A.P. 3193 Series)*. This consolidates in one volume the A.T.C. information previously contained in

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the Pilot's Handbooks for the United Kingdom, Europe, and Africa/Middle East.

(e) *Pilot's Handbook (Jet) (A.P. 3320 Series)*. This handbook contains in loose-leaf form miniature approach and landing charts depicting high-level let-down procedures for airfields operating jet aircraft.

(f) *Strip Route Charts*. Covering trunk and REFORS routes, these are produced in miniature form for insertion, as required, in Pilot's Handbooks (Jet). These charts depict a skeleton outline of the topography between selected staging posts and are designed to enable jet pilots to insert appropriate frequency data at pre-flight briefing.

15. **Amendment Service.** This is divided into three parts:—

(a) *NOTAMS*. Class I (Signal) and Class II (Memorandum) are distributed by the A.I.D. Service.

(b) *Military Aviation Notices (M.A.Ns.)*. Weekly consolidated lists containing all permanent amendments to radio facility charts and supplementary flight information documents which have been notified by NOTAMS during the preceding seven days. Amendments to the various documents are issued separately.

(c) *Pilot's Handbook Amendments*. For the A.P. 3193 series, amendments are numbered consecutively and issued weekly; they contain details of new and revised instrument approach and landing charts. Amendments to Pilot's Handbooks (Jet) are issued as required.

AIR TRAFFIC CONTROL REGULATIONS

Introduction

16. Because flying, in general is of a complex nature, there are many regulations which must be observed by pilots and air traffic control personnel alike if the maximum degree of safety is to be afforded to flying personnel and civilians, and to property and equipment. The sources of these regulations, and the channels through which they reach the R.A.F. pilot, are as follows:—

(a) Manual of Air Force Law.

(b) Queen's Regulations and Air Council Instructions.

(c) Air Ministry letters, A.M.C.Os. and A.M.Os. ("A" and "N").

(d) A.P. 3296 (Air Ministry Flying Orders).

(e) Command and group air staff instructions.

(f) Station Standing Orders.

(g) Flying Order Book.

(h) Verbal or self briefing.

The regulations reproduced in this chapter are those with the implementation of which the Air Traffic Control Service is directly concerned. They are all found in the sources quoted above, and also in A.P. 3024 (Manual of Air Traffic Control) and in all current Aeronautical Information Supplementary Documents.

General Flight Rules

17. **Right of Way Rules.** The following are some of the basic rules laid down to reduce the risk of collision:—

(a) *Right of Way Procedure*. Aircraft are to give way to each other in the following order:—

(i) Aeroplanes.

(ii) Helicopters.

(iii) Airships.

(iv) Tug and glider combinations.

(v) Gliders.

(vi) Balloons.

For example, aeroplanes give way to all other types of aircraft.

(b) *Converging*. When two aircraft are on paths which cross, the aircraft which has the other on its right is to give way.

(c) *Approaching Head-On*. When two aircraft are approaching head-on, each is to alter heading to the right.

(d) *Overtaking*. An aircraft overtaking another aircraft is to avoid the overtaken aircraft by altering heading to the right, and is to keep clear until all risk of collision is past. Sub-para. (a) does not apply to this rule. An aircraft is overtaking another aircraft if it is approaching from the rear at an angle of less than 70° to the fore-and-aft axis of the overtaken aircraft, i.e. if at night neither of the overtaken aircraft's forward navigation lights are visible.

(e) *Landing*. Aircraft in the final stage of landing have the right of way over aircraft in the air and on the ground. Sub-para. (a) does not apply to this rule.

(f) *Approaching to Land*. The aircraft at the lower altitude on the approach has the right of way; normally, however, as a matter of

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courtesy, captains of light manoeuvrable aircraft give way to the heavier types in which the overshoot procedure is more involved.

(g) *Emergency Landing.* An aircraft seen, or known to be carrying out, an emergency landing has the right of way over all others.

Every aircraft obliged by the above rules to keep out of the way of another is, if possible, to avoid passing over or under the other or crossing ahead of it. The aircraft having the right of way should normally maintain its heading and speed.

Circuit Rules

18. The airfield circuit is the airspace extending to 3,000 ft. above airfield elevation, on a radius of 18,000 ft. from the centre of the airfield. When flying in the circuit, a pilot is to :—

- (a) Keep a sharp look-out for other aircraft in the vicinity.
- (b) Conform with or avoid the traffic pattern.
- (c) During the circuit and approach make all turns left unless instructed otherwise by verbal or visual means.
- (d) Maintain a continuous listening watch on the aerodrome R/T frequencies and keep a sharp look-out for any visual signals which may be displayed.
- (e) Obtain, by R/T or visual means, authorization for any movements.

Minimum Altitudes

19. Except for taking-off and landing, aircraft are not to be flown over built-up areas, or assemblies of people, etc., unless at an altitude that would enable them to be landed clear in the event of an emergency landing being necessary. In all cases, their altitude must be such that a minimum height of 2,000 ft. above the ground is maintained.

Flying along A.T.C. Routes

20. An aircraft following an air traffic route, or being navigated by map reading along lines of landmarks, e.g. railways, canals, coast lines, etc., is to keep such route or line of landmarks at least 300 yds. on its left. The leader of a formation is to lead in such a way that all aircraft in the formation can comply with this rule.

Altimeter Settings

21. The captain of an R.A.F. aircraft is to use the settings QNH and Regional Pressure Setting

(R.P.S.) as follows :—

- (a) *QNH.* This is always to be set :—
 - (i) *At R.A.F. Aerodromes in F.I.Rs.* For take-off, landing, and all flights in the aerodrome traffic patterns.
 - (ii) *At R.A.F. Aerodromes in Control Zones and at all Civil Aerodromes.* For take-off and when cleared to land, or at 1,500 ft. above aerodrome elevation, whichever is the earlier.
 - (iii) At the transition level, where this is prescribed under local rules.

The captain of a fighter aircraft letting-down in an aerodrome entry and exit lane may set the value QNH as required.

(b) *Regional Pressure Settings—United Kingdom.* To be set when :—

- (i) Flying above 3,000 ft. A.M.S.L. in a flight information region, outside controlled airspace, under Instrument Flight Rules.
- (ii) Flying more than 1,500 ft. above aerodrome elevation in a controlled airspace.
- (iii) Engaged in a transit flight under Visual Flight Rules and flying above 3,000 ft. A.M.S.L. outside controlled airspace, in a Flight Information Region.

(c) *Regional Pressure Settings—Abroad.* The regional altimeter setting, as given in the appropriate Pilot's Handbook or as otherwise briefed, is to be used.

22. When passing from one altimeter setting region to another, the captain is to reset his altimeter to the current pressure setting for the region he is entering.

Visual and Instrument Flight Rules

23. To assist in the control of aircraft all flights are governed by either Visual Flight Rules (V.F.R.) or Instrument Flight Rules (I.F.R.), the deciding factor being the actual weather conditions in which the aircraft is being flown, as follows :—

- (a) *V.F.R. Weather Conditions.* Aircraft are in V.F.R. weather conditions provided that :—
 - (i) They remain at least 1 n. ml. horizontally and 1,000 ft. vertically from all cloud and in a flight visibility of at least five nautical miles ; or
 - (ii) They remain clear of all cloud and in sight of land or water, if in flight in a

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flight information region (*outside controlled airspace*) below 3,000 ft.

(b) *I.F.R. Weather Conditions.* Aircraft are in I.F.R. weather conditions if they cannot comply with any of the conditions listed in sub-para. (a).

24. Compliance with V.F.R. and I.F.R. Under V.F.R. there is no air traffic control except at aerodromes. When flying under such conditions, captains of aircraft are to comply with the rules of the air and, if flying *en route* above 3,000 ft. A.M.S.L., are to comply with the quadrantal separation rules (see para. 26) unless otherwise directed. They are to pass position reports as directed in para. 27. Captains of aircraft are to fly in accordance with I.F.R. and as far as possible comply with the Rules of the Air when:—

(a) Flying in Instrument Flight Rule weather conditions.

(b) Flying in a controlled airspace at night during the hours of watch of the controlling authority.

(c) Flying at night outside the United Kingdom and the British Zone of Germany.

They may, however, if they wish, elect to fly in accordance with I.F.R. when flying in V.F.R. weather conditions. They may also fly in I.F.R. weather conditions, or at night in controlled airspace during the hours of watch of the controlling authority, without complying with I.F.R., provided they have obtained air traffic clearance of an appropriate flight plan from air traffic control; this is defined as *Special V.F.R. Flight*.

25. Instrument Flight Rules. When flying in instrument weather conditions captains of aircraft are to comply as far as possible with the rules of the air and with the additional rules stated below:—

(a) When flying within a controlled airspace:—

(i) A flight plan is to be filed with air traffic control at least 30 minutes before E.T.D.

(ii) An air traffic clearance is to be obtained from the appropriate air traffic control.

(iii) Captains are not to deviate from the clearance except in emergency, in which case the A.T.C.C. is to be notified as soon as possible.

(iv) If a captain desires to modify his flight plan he is to notify the appropriate air

traffic control authority of any change of:—

E.T.D. exceeding ten minutes.

Route, destination, or altitude.

E.T.A. exceeding five minutes.

(v) Aircraft are at all times to be under the direction of the controlling authority and a listening watch on the appropriate frequency is to be maintained. Aircraft are to report position when passing specified reporting points or when so directed.

(b) When flying within an F.I.R. outside controlled airspace:—

(i) If at or above 3,000 ft. A.M.S.L. in the United Kingdom, or 1,000 ft. outside the U.K., captains of aircraft are to comply with the quadrantal altitude separation system, as described in para. 26.

(ii) Position reports are to be passed to the appropriate A.T.C.C. as directed in para. 27.

Quadrantal Altitude Separation System

26. For flight in accordance with the quadrantal altitude separation system, aircraft maintain altitudes appropriate to their magnetic tracks, with altimeter sub-scales set to the pressure setting in force for the altimeter setting region in which the flights are being undertaken, as shown in the following table:—

Magnetic Track

000° — 089°	Odd thousands of feet.
090° — 179°	Odd thousands of feet + 500 ft.
180° — 269°	Even thousands of feet.
270° — 359°	Even thousands of feet + 500 ft.

The quadrantal system does not apply:—

(a) In a controlled airspace, unless so directed.

(b) If below 3,000 ft. in the U.K. or below 1,000 ft. outside the U.K.

(c) When a flight is carried out under constant radar surveillance.

(d) In the case of special flights and exercises where prior notification has been made to the appropriate A.T.C.C.

Position Reporting

27. Captains of aircraft are to pass position reports to the A.T.C.C. in whose flight inform-

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ation region they are flying, in the following circumstances:—

- (a) When a deviation from a flight plan is necessary.
- (b) At 30-minute intervals when flying over the sea more than 10 n.m. from the coast of the United Kingdom.
- (c) On entering United Kingdom flight information regions from seaward.
- (d) When crossing the U.K. coast inbound on flights which have extended 10 n.m. from the coast, but within the boundary of a U.K. flight information region, and when crossing the U.K. coast on outbound flights which are intended to extend 10 n.m. or more from the coast.
- (e) When clearance is required into controlled airspace, in accordance with para. 25.
- (f) When flying over foreign territory, in compliance with the reporting procedure of the country concerned.
- (g) In addition to the reports required under sub-para. (f), captains of aircraft flying within the designated R.A.F. areas of responsibility defined in para. 5 are to pass position reports to the appropriate British A.T.C.C. when changing from one area of responsibility to another and at intervals of one hour thereafter, or at more frequent intervals if such are laid down by the R.A.F. authority concerned.

Note.—If two-way communication cannot be maintained with a foreign A.T.C.C. while flying within an R.A.F. area of responsibility, the appropriate British A.T.C.C. is to be requested to relay any messages.

28. Position reports are not required in the following circumstances:—

- (a) When flying outside controlled airspace over the land of the United Kingdom, or the sea areas within 10 n.m. of the U.K. coast.
- (b) By fighter aircraft operating under sector control.
- (c) By aircraft engaged on operational exercises and on flights normally conducted under the control of a group headquarters or similar formation, if other arrangements have been made for meeting the needs of the defence organization.

29. **Contents of Position Reports.** Position reports are to contain the following information, in the order given:—

(a) To A.T.C.Cs. in the United Kingdom:—

- (i) Radio identification.
- (ii) Position in latitude and longitude or as a bearing and distance from an easily identifiable landmark.
- (iii) Time (G.M.T.).
- (iv) Altitude.
- (v) Track (M).
- (vi) True airspeed.
- (vii) Any other information the captain may wish to give.

(b) To A.T.C.Cs. abroad:—

- (i) Radio identification (as shown in the flight plan).
- (ii) Position (reporting point or position in latitude and longitude).
- (iii) Time position established in minutes past the hour (or hours and minutes (G.M.T.) if requested).
- (iv) Altitude (with additional information, when applicable, concerning climbing or descending to a new altitude after passing a reporting point).
- (v) Flight conditions reported as one of the following:—
 - No cloud at any level.
 - Below cloud.
 - Above cloud.
 - Between layers.
 - In and out of cloud.
 - Continuously in cloud.
 - Remarks concerning other conditions such as poor visibility, icing, or turbulence, should be added where appropriate.
- (vi) Estimate of either:—
 - Time (G.M.T.) over next reporting point in minutes past the hour, or position next hour.
- (vii) E.T.A. (G.M.T.) at the aerodrome of first intended landing (hours and minutes).
- (viii) Remaining fuel, in hours and minutes.
- (ix) Any additional information the captain may wish to transmit.

Compliance with Air Traffic Control Regulations Within the United Kingdom

30. The captain of an aircraft flying within the United Kingdom is to comply with the Rules of the Air, with Air Ministry Flying Orders

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(A.P. 3296), and with any air traffic control regulations, except when :—

(a) He considers that compliance with them will jeopardize the safety of his aircraft or when circumstances beyond his control compel a violation.

(b) He is operating under the radar surveillance of a ground controlling authority which is in contact with the A.T.C.C. in whose flight information region the flight is taking place.

(c) He is engaged in an operational flight or exercise for which special arrangements have been made.

The captain of an aircraft using a civil aerodrome is to comply with the civil procedures in force at that aerodrome.

Compliance with Air Traffic Control Regulations Outside the United Kingdom

31. The captain of an aircraft flying outside the United Kingdom is to :—

(a) Comply with the national rules of the country over which he is flying, as given in the Pilot's Handbook for that area, or as otherwise briefed.

(b) Obtain a brief from the Air Traffic Control Service before take-off if he intends to fly in a controlled airspace.

32. The captain of an aircraft flying along a trunk route is, in addition to complying with the instructions in para. 31, to report his position to the British A.T.C.C. controlling the R.A.F. area of responsibility in which he is flying, in accordance with para. 27 (g). In this connexion, an aircraft taking off inside the area counts as if entering the area.

Violations of Air Traffic Control Regulations

33. The captain of an aircraft experiencing circumstances which may lead to an unavoidable violation of A.T.C. regulations is to inform air traffic control by radio as soon as possible, so that other aircraft may be safeguarded. The message is to be passed by the most direct means to the controlling authority concerned and is to include callsign, aircraft type, position, altitude, heading, airspeed, and relevant details of the violation. Air traffic control is also to be informed as soon as regular observance of the regulations can be resumed.

34. Any violation of A.T.C. regulations is also to be reported in writing within 24 hours, giving

full details of the incident, to the officer responsible at the first point of landing.

AIR TRAFFIC CONTROL PROCEDURES

Pre-Flight Procedures

35. Responsibilities for Pre-Flight Action. All flights are to be authorized in accordance with para. 46 of A.P. 3296 (Air Ministry Flying Orders). Under no circumstances may this authority be delegated to an air traffic control officer. The detailed division of responsibility is as follows :—

(a) *Captain and Crew of Aircraft.*

(i) Obtain a meteorological forecast from the meteorological office.

(ii) Have the flight authorized.

(iii) Report to the flight planning section and carry out full flight planning in accordance with Air Ministry instructions.

(iv) Compile a flight plan on Form 2919, in duplicate, where necessitated by the provisions of para. 36.

(v) Notify the duty A.T.C.O. of the flight and if a flight plan has been filed, pass to him one copy.

(vi) Obtain from the duty A.T.C.O. any final air traffic instructions and any air traffic clearance which may be necessary, notify him of any corrections to the flight plan, and obtain his signature on the original copy.

(b) *Duty Air Traffic Control Officer.*

(i) Examine the flight plan to see that all necessary information has been included.

(ii) If air traffic clearance is required, under the provisions of para. 37, obtain this from the air traffic control centre.

(iii) Instruct the captain of the aircraft of any air traffic control requirements applicable to the intended flight.

(iv) Sign the original copy of the flight plan to signify that the foregoing action has been completed.

(v) Notify the flight to the appropriate authorities, in accordance with para. 38.

36. **Flight Plans.** A flight plan is not required for any flight under approved radar control. In other circumstances, the captain of an aircraft

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is responsible that a flight plan, made out in duplicate on Form 2919, is completed and filed with air traffic control as follows :—

(a) 30 minutes before take-off, for :—

- (i) Flight, all or part of which is to take place in a controlled airspace (or advisory route outside the U.K.) in I.F.R. weather conditions or at night during the hours of watch of the controlling authority. (Outside the U.K. and the British Zone of Germany, all flights at night are considered to be under I.F.R.).

(ii) Flight, all or part of which is to take place over the sea, more than 10 n.m. from any coastline.

(b) 60 minutes before take-off, for :—

- (i) Flight between an aerodrome in the United Kingdom and an aerodrome abroad.
- (ii) Flight over foreign territory or along a trunk route.

An example of a correctly compiled Form 2919 is shown in Fig. 1.

AIR TRAFFIC CONTROL FLIGHT PLAN

R.A.F. FORM 2919
(REVISED SEPTEMBER 1952)

TO BE COMPLETED IN DUPLICATE

One copy to be retained by captain of aircraft—one copy to be retained by Air Traffic Control

Radio c/s or aircraft identification		Type of aircraft		Point of departure	
A RAFAIR 206/MGFKA		B LINCOLN		C SHAWBURY	
ROUTE DETAILS				Point of first intended landing	
D	Cruising level	D.R. time	To (place)		E GIBRALTAR
	8000 ft.	0051	PORTLAND BILL		E.T.D.
	9500 ft.	0314	1STRES		A.T.D.
	8000 ft.	0307	3640N. 0100W		Day Hr. Min. Day Hr. Min.
	6500 ft.	0119	GIBRALTAR		F 11 0800
	ft.				True air speed at cruising level
	ft.				G 160
	ft.				Total DR time to point of first intended landing
	ft.				H 0831
	ft.				Alternative aerodromes
	ft.				I 1STRES / LUQA
	ft.				Radio transmitting frequencies
	ft.				J 117.9/116.44/115.56/119.7/115.1/121.5 333/470.5/3481.5/3095/5695.5
Delete navigation aids not to be used in flight					
K	1 <input checked="" type="checkbox"/> ILS	2 <input checked="" type="checkbox"/> SBA	3 <input checked="" type="checkbox"/> DECCA	4 <input checked="" type="checkbox"/> DME	5 <input checked="" type="checkbox"/> VOR
	6 <input type="checkbox"/> GEE	7 <input checked="" type="checkbox"/> LORAN	8 <input type="checkbox"/> RAD COMP	9 <input type="checkbox"/> BABS	10 <input type="checkbox"/> LOOP
Total number of crew and passengers and surname of captain of aircraft					Amount of fuel on board in hours and mins.
L	10 EVANS				M 1200
Pilot's Instrument rating. Rank, name and appointment of any V.I.P. aboard. Any other pertinent information					
N MASTER GREEN					
INFORMATION AND ITEMS NOT FOR TRANSMISSION					
Delete rescue aids not carried in aircraft				Certified flight planning carried out	
1 <input type="checkbox"/> Dinghy	2 <input type="checkbox"/> Life-Belt	3 <input type="checkbox"/> 1st Aid Kit	4 <input type="checkbox"/> Dinghy Radio	5 <input checked="" type="checkbox"/> Water	6 <input type="checkbox"/> Para-chutes
				7 SARAH	8
Take-off time limit				Air traffic clearance instructions	
.....G.M.T.					

Fig. 1. Specimen Completed Flight Plan

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37. Air Traffic Clearance. The permission given by the air traffic control authorities for a flight to proceed under specified conditions is known as air traffic clearance. As the R.A.F. does not operate controlled airspace the term applies only to instructions issued by the civil authorities. If I.F.R. weather conditions are encountered during the course of a flight on which it is intended to enter controlled airspace, but for which no flight plan was filed at the aerodrome of departure, this may be filed by radio. Except for flights which start from an aerodrome situated within controlled airspace, or within 20 minutes flying time distance from its boundary, controlling authorities will seldom, if ever, grant air traffic clearance to enter that airspace until the captain reports at the last reporting point before reaching the boundary. Accordingly take-offs should not be delayed pending receipt of the air traffic clearance of the flight plan.

38. Flight Notification. All flights, including local training flights, and all movements of aircraft within the movements area of the aerodrome, are to be notified to unit air traffic control giving as much notice as possible. Notification may be made in writing, by telephone, verbally, or, in exceptional circumstances, over R/T. Unit air traffic control is responsible for notifying certain aircraft movements to various authorities, in accordance with the provisions of A.P. 3024 (Manual of Air Traffic Control) Section 3.

39. Special Notification. Flights which do not conform with the rules of the air and/or air traffic control regulations, and which are in any way likely to cause a hazard to aviation, *e.g.* flights at night with navigation lights switched off, air firing and bombing exercises, and flights on operational or special training exercises, are to be notified to the air traffic control centre as early as possible before their commencement and not less than :—

(a) Two hours before their commencement if they are to take place within the boundaries of an officially promulgated "no-lite area", or of a bombing or air firing range.

(b) Six hours before their commencement if they are to take place outside the boundaries of those officially promulgated areas, and have previously been cleared by an air traffic control centre.

Such notifications may be made direct to air traffic control centres by operating authorities, but where they are made through unit air

traffic control due allowance is to be made for the foregoing time limits.

40. Inclusion of Pilot's Instrument Rating in Notifications. It is a requirement of all flight notifications that the pilot's instrument rating, as defined in Order No. 49 of A.P. 3296 (Air Ministry Flying Orders), should be stated. While an air traffic control officer has no authority to check a pilot's instrument rating against the actual or forecast weather conditions, or to query in any way his decision to proceed with a flight, the knowledge of the rating enables him to offer the maximum assistance to the pilot in making the wisest choice of an alternate aerodrome should a diversion be necessary.

Post-Flight Action

41. Immediately after landing, the captain of an aircraft is to report to unit air traffic control. If the captain of an aircraft lands at an aerodrome other than his original destination, he is to inform unit air traffic control of the name of that destination. If landing at any place other than an in-use aerodrome, he is to inform the nearest air traffic control unit.

Procedures for Flight within Flight Information Regions

42. Flight Outside Controlled Airspaces. Outside controlled airspaces no air traffic control is exercised, but the following procedures are compulsory for all captains of aircraft:—

(a) They must observe the rules of the air and such other regulations as may be laid down in A.P. 3296 (Air Ministry Flying Orders).

(b) They must pass position reports in accordance with paras. 27 to 29.

(c) If flying at or above 3,000 ft. A.M.S.L. within United Kingdom flight information regions, or at or above 1,000 ft. A.G.L. elsewhere, in I.F.R. weather conditions, they must comply with the quadrantal altitude separation system, as described in para. 26.

(d) If flying at or above 3,000 ft. A.M.S.L. whilst *en route* in V.F.R. weather conditions, they must also comply with the quadrantal altitude separation system unless otherwise directed.

Outside the United Kingdom, an advisory service is often available to aircraft flying in I.F.R. weather conditions outside controlled airspaces. Whilst the procedures to be observed are not compulsory, the service does afford

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continuous separation between all aircraft which are in communication with the A.T.C. unit concerned. Full details of the service may be found in A.P. 3193 (Air Traffic Control Supplement to the Pilot's Handbook).

43. Entry into Controlled Airspace in I.F.R. Conditions. If a captain flying under I.F.R. weather conditions without air traffic clearance wishes to enter controlled airspace, he is to request permission to do so when approximately twenty minutes flying time from the controlled airspace boundary. The request is to be accompanied by the position report referred to in para. 27. When requesting permission to join airways, the selected entry point must be a designated or "on-request" reporting point. When requesting clearance to cross airways, the selected crossing points should be associated with a radio facility and the crossing is to be made at an angle of 90 degrees to the direction of the airway, or as near as possible. In emergency, if unable to obtain clearance to cross an airway, and if it cannot be avoided, it is to be crossed at right angles at the appropriate quadrantal altitude.

44. Flight Within Controlled Airspaces. When flight through controlled airspaces is necessary, captains of aircraft are responsible for acquainting themselves with the relevant regulations and procedures. These are both specialized and complex and, since to give brief general details in this chapter would involve the risk of misinterpretation, aircrew who wish to study the subject in detail are advised to consult A.P. 3024 (Manual of Air Traffic Control—3rd Edition),

Section 10. Full details of procedures applicable to designated controlled airspaces are available in the appropriate aeronautical information documents and in briefing and flight planning sections.

Flights under Unit Air Traffic Control

45. Air-to-Ground Procedures. Captains of aircraft are to carry out the following procedures :—

- (a) Under V.F.R. conditions :—
- (i) When in communication with the A.T.C.C. or approach control, captains are to report when reaching V.F.R. conditions near an aerodrome. They will then be instructed to change frequency to that of aerodrome control unless it is desired to carry out instrument approach training. Captains are then to request permission to join the aerodrome traffic pattern.
 - (ii) After landing, captains are to maintain watch on the aerodrome control frequency to receive instructions.
- (b) Under I.F.R. conditions :—
- (i) Captains of aircraft making a landing are to remain on the approach control frequency until clear of the runway in use, unless otherwise instructed by approach control.
 - (ii) Captains of departing aircraft are to remain under aerodrome control while taxiing and change to approach control only when instructed.

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Communication Procedures

46. **Visual Signals.** When visual control of aircraft is necessary, it is normally carried out by the runway controller both by day and by night, but visual signals may also be given from the control tower. The following visual signals are used for the control of traffic on airfields :—

(a) *Lamp Signals.*

(i) By day—Aircraft on the ground.

<i>Colour</i>	<i>Signal</i>	<i>Sent by</i>	<i>Sent to</i>	<i>Meaning</i>
Green	Intermittent	Runway Controller	Aircraft	Permission to taxi
Green	Steady	Runway Controller	Aircraft	Permission to take-off
Red	Steady	Runway Controller	Aircraft	Stop
Red	Intermittent	Runway Controller	Aircraft	Taxy clear of runway immediately
White	Intermittent	Runway Controller	Aircraft	Return to dispersal

(ii) By day—Aircraft in the air.

<i>Colour</i>	<i>Signal</i>	<i>Sent by</i>	<i>Sent to</i>	<i>Meaning</i>
Green	Steady	Runway Controller	Aircraft	Permission to land
Green	Intermittent	Runway Controller	Aircraft	Return for landing (followed by steady green at proper time)
Red	Steady	Runway Controller	Aircraft	Do not land—look out for other aircraft
Red	Intermittent	Runway Controller	Aircraft	Landing prohibited—airfield unsafe

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(iii) By night—Aircraft on the ground.

<i>Colour</i>	<i>Signal</i>	<i>Sent by</i>	<i>Sent to</i>	<i>Meaning</i>
Green	Letter of aircraft	Runway Controller	Aircraft	Permission to taxi
White	Letter of aircraft on downward identification light	Aircraft	Runway Controller	Request permission to taxi on to the flare-path.
White	Steady downward identification light switched on and left on	Aircraft	Runway Controller	Acknowledgement of permission to taxi
Red	Letter of aircraft or steady	Runway Controller	Aircraft	(a) Do not taxi on to the flare-path. (b) Stop.
White	Letter "T" on downward identification light	Aircraft	Runway Controller	Acknowledgement of signal to stop
Green	Steady	Runway Controller	Aircraft	Permission to take-off
—	Downward identification light switched off and kept off	Aircraft	Runway Controller	Acknowledgement of permission to take-off
Red	Intermittent	Runway Controller	Aircraft on the flare-path	Taxy clear of flare-path immediately

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(iv) By night—Aircraft in the air.

<i>Colour</i>	<i>Signal</i>	<i>Sent by</i>	<i>Sent by</i>	<i>Meaning</i>
White	Letter of aircraft on downward identification light	Aircraft	Runway Controller	Request permission to land
Green	Letter of aircraft or steady	Runway Controller	Aircraft	Permission to land
White	Steady downward identification light switched on and left on	Aircraft	Runway Controller	Acknowledgement of permission to land
Red	Letter of aircraft or steady	Runway Controller	Aircraft in circuit	Give way to other aircraft—continue circling
White	Letter "T" on downward identification light	Aircraft	Runway Controller	Acknowledgement of instruction to give way and continue circling
Red	Letter of aircraft or steady	Runway Controller	Aircraft on final approach	Do not land (cancels permission to land if previously given)
—	Downward identification light switched off and kept off	Aircraft	Runway Controller	Acknowledgement of cancellation of permission to land; or indicates that aircraft has seen a forced landing signal from another aircraft and is going round again.
Red	Intermittent	Runway Controller	Aircraft	Total refusal of permission to land
White	Intermittent on identification light or signal lamp	Aircraft	Runway Controller	Aircraft in distress—am forced forced to land

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(b) *Signals to Vehicular Traffic.* The following table details the use of lamp and pyrotechnic signals for the control of vehicular traffic, and applies either by day or night to vehicles on the manoeuvring area :—

<i>Colour</i>	<i>Signal</i>	<i>Sent by</i>	<i>Sent to</i>	<i>Meaning</i>
Green	Steady	Runway Controller or Control Tower or Vehicle Control	Driver of Vehicle	Permission to move
Red	Steady	As above	As above	Stop
Red	Very light (fired horizontally)	Runway Controller	As above	Emergency Stop

(c) *Pyrotechnic Signals.* Details of all standard pyrotechnic signals are contained in the Allied Combined Publication 168A (ACP 168A), which is held in all air Traffic Control sections. Within the A.T.C. Service in the Royal Air Force the terms "White Pyrotechnics" and "Yellow Pyrotechnics" mean the same thing. It is to be noted, however, that the use of the white illuminating cartridge (as distinct from the ordinary yellow Very Cartridge) is prohibited. Pyrotechnics signals which directly concern air traffic control are listed in the following table :—

<i>Colour</i>	<i>Signal</i>	<i>Where Used</i>	<i>Meaning</i>	<i>Remarks</i>
Red	Single pyrotechnic light (Very cartridge)	From the ground at an airfield	Do not land	For the time being (Cancels any previous permission)
Red	Single or succession of pyrotechnic lights (any type)	From an aircraft over sea or land	Aircraft in Distress	—
Green	Single pyrotechnic light (Very cartridge)	By aircraft in vicinity of airfield	By day : Request permission to land in any direction other than that authorized. By night :— Request permission to land.	Only to be used when an aircraft is unable to pass a message by R/T, W/T, or lamp.
Green	Single pyrotechnic light (Very cartridge)	From the ground at an airfield	Permission granted to land	—
Green	Succession of pyrotechnic lights (Very cartridges)	From an aircraft over sea or land	I have an urgent message to pass concerning the safety of human life.	The message may concern that aircraft or any other aircraft, ship, or vehicle, or the safety of any person on board or in sight.

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<i>Colour</i>	<i>Signal</i>	<i>Where Used</i>	<i>Meaning</i>	<i>Remarks</i>
Green	Series of pyrotechnic lights (Very cartridges at 10 second intervals)	At sea or on land	Aircraft to land at nearest airfield	—
White	Single pyrotechnic light (Very cartridge or mortar projectile)	From the ground at an airfield	Local recall of aircraft; or aid to homing	This signal may be used in fog or mist or for any other reason to indicate the position of an airfield.
White	Cluster of pyrotechnic stars (Signal rocket)	From the ground at an airfield	Aid to homing	This signal may be used with, or instead of, the single white pyrotechnic light to indicate the position of an airfield in poor visibility.
White	Succession of pyrotechnic lights (Very cartridges)	From an aircraft over sea or land	I am in difficulties which compel me to land	—
White	Layout of pyrotechnic lights (Ground - illuminating flares)	On the landing strip of an airfield	Runway in use	Used as an aid to the identification of the runway in poor visibility. These flares burn for approx. 3 minutes.
White Smoke	Single pyrotechnic (Smoke generator)	From the ground at an aerodrome	Do not land. Runway change in progress	Only required when, for any reason, an aircraft flying in the vicinity of an airfield fails to acknowledge the warning radio broadcast.
White Smoke	Single pyrotechnic (Smoke puff)	From the ground	—	May be used to act as a wind direction detector.
Brown Smoke	Single pyrotechnic (Smoke puff)	From the ground	—	May be used to act as a wind direction detector.

(d) *Standard Tyre-Checking Signals—By Night.* Details of the procedure and signals to be used when carrying out tyre-checking at night are contained in A.P. 3024 (3rd Edition) Chapter 15.

(e) *Standard Marshalling Signals (Day and Night).* Full details with regard to the marshalling signals adopted as standard throughout the Royal Air Force are contained in A.P. 3024 (3rd Edition), Chapter 15, and A.P. 3322, Section 3.

47. All air/ground/air communications are to conform to the standard I.C.A.O. phraseologies. Standard R/T communications for aerodrome and approach procedures are set out in the following tables :—

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Table 1

STANDARD R/T PROCEDURE FOR TAKE-OFF IN VISUAL AND INSTRUMENT FLIGHT CONDITIONS

<i>Position</i>	<i>Aircraft to Control</i>	<i>Control to Aircraft</i>	<i>Aircraft to Control</i>
1. At dispersal	Shawbury—Potluck AB Taxy	Potluck AB—Shawbury Runway QNH Elevation or Potluck AB—Shawbury Hold	AB AB Hold
2. At the marshalling point	AB Take-off	AB Take-off or AB Line up or AB Hold	AB Take-off AB Line up AB Hold
3. When leaving the airfield traffic pattern	AB Clearing circuit	AB Regional Pressure Setting	A.B.(mbs.)

Table 2

STANDARD R/T PROCEDURE FOR APPROACH AND LANDING IN VISUAL FLIGHT CONDITIONS

<i>Position</i>	<i>Aircraft to Control</i>	<i>Control to Aircraft</i>	<i>Aircraft to Control</i>
1. Approaching airfield at range of about 10 miles	Shawbury—Potluck AB Joining	Potluck AB—Shawbury Runway QNH QNH Elevation	AB Runway QNH Elevation
2. Downwind leg, appropriate position, depending on type or aircraft. Normally when abeam the upwind end of the runway.	AB Downwind	AB or AB ahead or AB Orbit	No reply AB ahead AB Orbit
3. On ► base leg just before turning ◀ on to final approach	AB Final ► 3 (or 2) Greens ◀	AB Clear to land or AB Continue or AB Round again	AB Clear land AB Continue AB Round again
4. Round again procedure initiated by the captain of an aircraft	AB Round again	AB	No reply
5. When clear of runway	AB Clear	No reply	

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Table 3
STANDARD R/T PROCEDURE FOR STRAIGHT APPROACH AND LANDING IN VISUAL
FLIGHT CONDITIONS

<i>Position</i>	<i>Aircraft to Control</i>	<i>Control to Aircraft</i>	<i>Aircraft to Control</i>
1. Approaching airfield at a range of about 10 miles	Shawbury—Potluck AB Joining	Potluck AB—Shawbury Runway QNH Elevation	AB Runway QNH Elevation
2. —	AB Request straight approach	AB Call 5 miles or AB Negative, join circuit.	AB Call 5 miles AB Join circuit
3. When on final approach at a range of 5 miles	AB 5 miles	AB Call final or AB Join circuit.	AB Call final AB Join circuit
4. When on final approach at a range of 1 mile	AB Final	AB Clear to land or AB Continue or AB Round again	AB Clear land AB Continue AB Round again
5. Round again procedure initiated by the captain of an aircraft	AB Round again	AB	No reply
6. When clear of runway	AB Clear	No reply	

Table 4
STANDARD R/T PROCEDURE FOR BABS RECIPROCAL TRACK LET-DO WN

<i>Position</i>	<i>Aircraft to Control</i>	<i>Control to Aircraft</i>	<i>Aircraft to Control</i>
1. On initial approach, range 10 miles	Shawbury Approach, this is Potluck Alfa Bravo (Range and heading), altitude ft., relationship to cloud request B.A.B.S.	Potluck Alfa Bravo this is Shawbury Approach, clear B.A.B.S. ft., runway QNH elevation ft.	Alfa Bravo ft. Runway QNH..... Elevation ft.
2. Over BABS beacon after initial approach	AB Beacon ft.	AB Visibility Cloud base Surface wind	AB Visibility Cloud base Surface wind
3. Over BABS beacon after intermediate approach	AB Beacon outboundft.	AB Minimum approach altitude ft. Convert to break off altitude	AB Minimum approach altitude ft.
4. At a point 4 miles downwind on QDR of runway	AB Downwind	AB Let down	AB Let down

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Table 4 (continued).

<i>Position</i>	<i>Aircraft to Control</i>	<i>Control to Aircraft</i>	<i>Aircraft to Control</i>
5. At a point 4 miles on QDM of runway for final approach	AB Final	AB Clear to land Minimum approach altitude ft. or AB Clear to visual Minimum approach altitude ft. or AB Round again..... ft.	AB Clear land Minimum approach altitude ft. AB Clear visual Minimum approach altitude ft. AB Round again.....ft.
ROUND AGAIN PROCEDURE			
6. On pilot's initiative	AB Round again	AB Round againft.	AB ft.

Table 5

STANDARD R/T PROCEDURE FOR BABS HOLDING AND LET-DOWN

<i>Position</i>	<i>Aircraft to Control</i>	<i>Control to Aircraft</i>	<i>Aircraft to Control</i>
1. On initial approach, range 10 miles	Shawbury Approach this is Potluck Alfa Bravo (Range and heading), Altitude ft. Relationship to cloud Request B.A.B.S.	Potluck Alfa Bravo this is Shawbury Approach, Hold at..... ft. Runway QNH Elevation	Alfa Bravo, Hold at ft. Runway QNH Elevation
2. Over BABS beacon after initial approach	AB Beacon ft	AB Visibility Cloud base Surface wind	AB Visibility Cloud base Surface wind
3. Over BABS beacon after intermediate approach	AB Beacon outbound,ft.	AB Minimum approach altitude ft. Convert to break-off altitude	AB Minimum approach altitude ft.
4. Holding Pattern	—	AB Descend to.....ft. AB Descend to ft. or AB Let down	AB ft. AB ft. AB Let down
5. At a point 4 miles on QDM of runway	AB Final	AB Clear to land Minimum approach altitude ft., or AB Clear to visual Minimum approach altitude ft., or AB Round again ft.	AB Clear land Minimum approach altitude ft. AB Clear visual Minimum approach altitude ft. AB Round again ft.
ROUND AGAIN PROCEDURE			
6. On pilot's initiative	AB Round again	AB Round again ft.	AB ft

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Table 6

STANDARD R/T PROCEDURE FOR S.B.A./I.L.S. RECIPROCAL TRARK LET-DOWN

<i>Position</i>	<i>Aircraft to Control</i>	<i>Control to Aircraft</i>	<i>Aircraft to Control</i>
1. On initial approach when approx. 10 mins. flying time from destination air-field	Shawbury Approach this is Potluck Alfa Bravo, Approaching from, Altitude..... ft. Relationship to cloud, E.T.A..... Request S.B.A./I.L.S.	Potluck Alfa Bravo this is Shawbury Approach, Clear S.B.A./I.L.S. at ft, Beam heading (degrees), QNH, Elevation	Alfa Bravo ft. QNH, Elevation Beam heading (degrees)
2.		AB Visibility Cloud base Surface wind	AB Visibility..... Cloud base Surface wind
3. Over Main Beacon on QDR of runway	AB Main Beaconft.	AB Minimum approach altitudeft. Convert to break-off altitude	AB Minimum approach altitude ft.
4. Over Outer Marker on QDR of runway	AB Downwind	AB Let down	AB Let down
5. Over Outer Marker on QDM of runway	AB Final	AB Clear to land, Minimum approach altitude ft. or AB Clear visual Minimum approach altitude ft. or AB Round againft.	AB Clear land, Minimum approach altitude ft. AB Clear visual Minimum approach altitude ft. AB Round again.....ft.
ROUND AGAIN PROCEDURE			
6. On pilot's initiative	AB Round again	AB Round again.....ft.	AB ft.

Table 7

STANDARD R/T PROCEDURE FOR S.B.A./I.L.S. HOLDING AND LET-DOWN

<i>Position</i>	<i>Aircraft to Control</i>	<i>Control to Aircraft</i>	<i>Aircraft to Control</i>
1. On initial approach when approx. 10 mins. flying time from destination air-field	Shawbury Approach this is Potluck Alfa Bravo, Approaching from Altitude ft., Relationship to cloud, E.T.A..... Request S.B.A./I.L.S.	Potluck Alfa Bravo this is Shawbury Approach, Clear S.B.A./I.L.S., Hold at ft., Beam heading..... (deg.), QNH..... Elevation	AB ft. QNH..... Elevation ft. Beam heading (deg.)
2.		AB Visibility Cloud base Surface wind	AB Visibility Cloud base Surface wind
3. Holding Pattern	AB ft	AB Minimum approach altitude ft. Convert to break-off altitude. AB Descend to ft.	AB Minimum approach altitude ft. AB ft.
4. When at new altitude	AB ft.	AB or AB Descend to ft. or AB Let down	AB ft. AB Let down
5. Over Outer Marker on QDM of runway	AB Final	AB Clear to land, Minimum approach altitude ft. or AB Clear to visual Minimum approach altitude ft. or AB round again.....ft	AB Clear land, Minimum approach altitude ft. AB Clear visual, Minimum approach altitude ft. AB round againft.
ROUND AGAIN PROCEDURE			
6. On pilot's initiative	AB round again	AB round again.....ft.	AB ft.

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Table 8

STANDARD R/T PROCEDURE FOR LOW-LEVEL CONTROLLED DESCENT THROUGH CLOUD
(Q.G.H.)

<i>Position</i>	<i>Aircraft to Control</i>	<i>Control to Aircraft</i>	<i>Aircraft to Control</i>
Prior to initial approach	Shawbury Approach this is Potluck Alfa Bravo, Request controlled descent through cloud	Potluck Alfa Bravo this is Shawbury Approach, Request altitude and in-flight conditions	AB at ft. I.F.R. or V.F.R.

Note.—EXCEPT IN EMERGENCY, if the aircraft is below the minimum safe quadrantal altitude for its direction of approach to the airfield, the pilot will not be given initial homing assistance by the controller.

He will be instructed as follows:—

“AB Circle and climb tofeet (Minimum Safe Quadrantal Altitude), Regional Pressure Setting.....(mbs.), and advise”.

The procedure will then be as follows :—

Initial approach. Homing at appropriate altitude	— or AB Now at ft. (Minimum Safe Quadrantal Altitude).	AB Steer (deg.), Regional Pressure Setting (mbs.)	AB (mbs.)
---	---	--	-----------------

Note.—The form of acknowledgements Aircraft to Control are to be left to the pilot. When C.R. D/F is being used, acknowledgements may be reduced to the pilot's callsign only, but Pressure Settings (R.P.S. and Q.N.H.) and Vital Altitudes (M.A.A.) are always to be read back by the pilot to ensure accuracy.

Homing	—	AB Weather at base, Cloud, Visibility	AB (acknowledges)
Homing	—	AB Minimum approach altitude ft., Convert to break-off altitude	AB ft. (M.A.A.)
Homing	—	AB Type and endurance	AB (type) (endurance) (in hours and minutes)
Homing	—	AB Steer (deg.) or Maintain	
Homing	—	AB Check gyro	AB (acknowledges)
Homing	—	AB Steer(deg.) or Maintain	AB (acknowledges)

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Note.—The pilot will then be homed by A.T.C. until the D/F equipment gives an indication that the aircraft is getting close. The procedure will then be as follows :—

Table 8 (continued)

<i>Position</i>	<i>Aircraft to Control</i>	<i>Control to Aircraft</i>	<i>Aircraft to Control</i>
	—	AB Reduce to low safe cruising	AB (acknowledges)
	—	AB QNH (mbs.) Airfield elevationft.	AB (mbs.)ft.
		AB Stand by to turn Left/Right on to (deg.)	AB (acknowledges)

Note.—The aircraft will be allowed to overfly the “No bearing” srea, transmitting on request. When the first reciprocal QDM is obtained the procedure will then be as follows :—

Overhead	—	AB Turn now Left/ Right on to.....(deg.) and advise	AB (acknowledges)
	—	AB Descend to..... (ft.) QNH(mbs.) Airfield elevation (ft.) (Used when it is desirable to reduce ex- cess altitude during intermediate approach)	AB(ft.) (mbs.)
Outbound	AB Turn complete now steering (deg.)	AB Steer.....(deg.) or Maintain Descend to (ft.) and advise. (This alti- tude is to clear the highest terrain in the QGH approach area by 2,000 ft.)	AB (ft.)

Note.—If the aircraft is on the “Approach Area” side of the airfield the controller will start timing the outbound run using a stop-watch ; and will apply corrections to place and keep the aircraft within the “Approach Area”. When the timed run outbound is almost complete, the controller will advise the pilot as follows :—

Outbound	—	AB Stand by to turn Left (or in certain cases Right) on to (deg.)	AB (acknowledges)
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Note.—When the timed run outbound has expired the controller will advise the pilot as follows:—

Table 8 (continued)

<i>Position</i>	<i>Aircraft to Control</i>	<i>Control to Aircraft</i>	<i>Aircraft to Control</i>
	—	AB Turn now Left/ Right on to(deg.) and advise. Descend in turn to..... ft. (This altitude is to clear the highest terrain in the QGH approach area by 1,500 ft.)	AB (acknowledges)
Inbound	AB Turn complete now steering(degs.)	AB Steer (deg.) or Maintain Descend toft. and advise. (This alti- tude is to clear the highest terrain in the QGH approach area by 1,000 ft.)	AB (acknowledges)
Inbound	AB ft.	AB Steer(deg.) or Maintain Descend to Visual Minimum Approach Altitude.....ft.	ABft. (M.A.A.)
Inbound	—	AB Steer.....(deg.) or Maintain	AB (acknowledges)
Inbound	AB Visual etc. or Breaking-offetc.	(see Note below)	—

Note.—The pilot will be given corrections by A.T.C. until he acknowledges that he can see the airfield or that, having reached the “Break-off Altitude” appropriate to his instrument rating, he is still not visual. In this case the controller will advise the pilot of the appropriate Missed (QGH) Approach Procedure.

A captain of an aircraft is to comply with all instructions received from air traffic control during the course of a controlled descent, except when he considers that such compliance would jeopardize the safety of his aircraft, in which case he is to take whatever action he considers necessary to safeguard his aircraft and inform air traffic control accordingly.

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Table 9

STANDARD R/T PROCEDURE FOR HIGH-LEVEL CONTROLLED DESCENT THROUGH CLOUD (QGH)

<i>Position</i>	<i>Aircraft to Control</i>	<i>Control to Aircraft</i>	<i>Aircraft to Control</i>
Initial call	Shawbury—Potluck AB, Altitude ft., IFR/VFR, * Request controlled descent.	Potluck AB—Shawbury, Steer (deg.) Fly at(ft.— Quadrantal altitude), Regional Pressure Set- ting.....(mbs.)	AB Steer (deg.) Altitude (ft.) Regional Pressure Set- ting.....(mbs.)
Homing	—	AB Steer.....(deg.), Type and Endurance	AB Steer..... (deg.) Type Endurance (hours and minutes)
Homing	—	AB Steer.....(deg.) Cloud base Visibility	AB Steer.....(deg.) Cloud base Visibility
Homing	—	AB Steer.....(deg.), Minimum approach altitude(ft.), Convert to break-off altitude	AB Steer..... (deg.) Minimum approach altitude (ft.)
Overhead (on a minimum of two consecutive transmissions)	—	AB Left/Right on to (deg.) (QDR + 15°) and advise	AB Left/Right on to (deg.)
Overhead	AB Steady..... (deg.)	AB Set QNH.....(mbs.) Airfield elevationft.	AB QNH (mbs.) Elevation (ft.)
Outbound (after minimum of two QDMs. on Safety Lane)	—	AB Commence descent, Steer (deg.)	AB Descending, Steer (deg.)
Outbound	—	AB Steer.....(deg.) At ft., turn Left/Right on to (deg.)	AB Steer.....(deg.) Atft., Left/Right on to (deg.)
At Turning Altitude	AB at(ft.) Turning	AB Advise steady	AB
Inbound	AB Steady(deg.)	AB Steer.....(deg.) Check altitude(ft.)	AB Steer.....(deg.) Check Altitude..... (ft.)
Inbound	AB Check altitude (ft.)	AB Steer..... (deg.) Descend to Visual and advise, Minimum ap- proach altitude.....(ft.)	AB Steer..... (deg.) Minimum approach alti- tude (ft.)
Inbound	AB Visual	AB Steer.....(deg.) Advice airfield in sight	AB Steer.....(deg.)

Pilot will be homed by A.T.C. until he advises "Airfield in Sight".

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48. Radio Telephone Procedures. All voice transmissions are to be conducted concisely in a normal conversational tone, full use being made of standard phraseologies whenever practicable. The following points should be observed when using R/T:—

- (a) *Speed.* The rate of utterance should be kept constant; neither too fast nor too slow.
- (b) *Pitch.* High-pitched voices transmit better than low-pitched ones.
- (c) *Rhythm.* The natural rhythm of ordinary conversation should be preserved by transmitting each sentence phrase by phrase. In separating words so that they do not run together the inclination to introduce the syllable "er" should be avoided.
- (d) *Microphone Position.* The fitting of the microphone to the helmet by means of the standard press studs ensures that it is in the correct relationship to the mouth. Attempts to transmit when holding the microphone by hand in approximately the correct position often result in poor articulation.

49. Phonetic Alphabet. When it is necessary to identify any letter of the alphabet, the following standard phonetic alphabet is to be used:—

<i>Letter</i>	<i>Word</i>	<i>Spoken as</i>
A	ALFA	AL FAH
B	BRAVO	BRAH VOH
C	CHARLIE	CHAR LEE
D	DELTA	DELL TAH
E	ECHO	ECK OH
F	FOXTROT	FOKS TROT
G	GOLF	GOLF
H	HOTEL	HOH TELL
I	INDIA	IN DEE AH
J	JULIETT	JEW LEE ETT
K	KILO	KEY LOH
L	LIMA	LEE MAH
M	MIKE	MIKE
N	NOVEMBER	NO VEM BER
O	OSCAR	OSS CAH
P	PAPA	PAH PAH
Q	QUEBEC	KEH BECK
R	ROMEO	ROH ME OH
S	SIERRA	SEE AIRRAH
T	TANGO	TANG GO
U	UNIFORM	YOU NEE FORM
V	VICTOR	VIK TAH
W	WHISKEY	WISS KEY
X	X-RAY	ECKS RAY
Y	YANKEE	YANK KEY
Z	ZULU	ZOO LOO

50. Standard Pronunciation of Figures. When figures are to be transmitted over R/T the following standard pronunciations are to be adopted:—

<i>Number</i>	<i>Spoken as</i>	<i>Number</i>	<i>Spoken as</i>
0	ZERO	5	FIFE
1	WUN	6	SIX
2	TOO	7	SEVEN
3	TREE	8	AIT
4	FOW-ER	9	NIN-ER

Numbers are to spoken digit by digit except that multiples of hundreds and thousands may be spoken as such. For example:—

<i>Number</i>	<i>Spoken as</i>
44	FOW-ER FOW-ER
90	NIN-ER ZERO
138	WUN TREE AIT
500	FIFE HUNDRED
1478	WUN FOW-ER SEVEN AIT
7000	SEVEN TOU-SAND

Numbers containing a decimal point are to be spoken as follows:—

<i>Number</i>	<i>Spoken as</i>
121.5	WUN TOO WUN DECIMAL FIFE
5695.5	FIFE SIX NIN-ER FIFE DECIMAL FIFE

51. Standard Words and Phrases. The following standard words and phrases are to be used in air traffic control R/T communications:—

<i>Word or Phrase</i>	<i>Explanation</i>
AIRFIELD IN SIGHT	I am below cloud and in sight of the airfield boundary.
BACKTRACK	The execution of a 180-degree turn on the ground in order to retrace a path.
BREAK	I hereby indicate the separation.
CONTACT	I have an indication on my radar.
CONTACT ESTABLISHED	I am in two-way communication with..... (Used in VHF Emergency Procedures).
CORRECTION	An error has been made in this transmission (or message indicated). The correct version is
FIGURES	Numerals or numbers to follow.
How Do You Hear Me ?	Self-explanatory.

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<i>Word or Phrase</i>	<i>Explanation</i>
I SAY AGAIN	I am repeating transmission or portion indicated.
I WILL REPEAT	Self-explanatory.
I SPELL	I shall spell the next word phonetically.
OVER	My transmission is ended and I expect a response from you.
OUT	This transmission is ended and NO response is expected.
READ BACK	Repeat all the message back to me after I have given "OVER".
REPEAT	Self-explanatory.
ROGER	I have received all your transmission satisfactorily. (ROGER is not replaced by ROMEO in this sense.)
RUNWAY AHEAD	I am below cloud and can see the runway in use ahead.
SAY AGAIN	Repeat all your last transmission. Followed by indication data means—"Repeat.....(portion indicated).
SILENCE	Cease transmissions immediately. Silence is to be maintained until instructions to resume.
SILENCE LIFTED	Silence can be lifted only by the station imposing it or higher authority.
SPEAK SLOWER	Your transmission is at too fast a rate. Reduce speed of transmission.
STANDBY	Self-explanatory.
THAT IS CORRECT	You are correct, or what you have transmitted is correct.
THIS IS	This transmission is from the station aircraft whose designation follows immediately.
TIME	That time which follows immediately is the time or date/time group of the message.
VISUAL	I am below cloud and in sight of land or water.
WAIT	I must pause for a few seconds.
WAIT OUT	I must pause longer than a few seconds.
WILCO	I have received your message, understood it, and will comply.

<i>Word or Phrase</i>	<i>Explanation</i>
WRONG	Your transmission was incorrect, the correct version is.....

Note.—Signal strength and readability are to be reported by means of a concise description of the reception of the signal. For examples:—

WEAK but READABLE : STRONG but DISTORTED : LOUD and CLEAR

Phrases such as "FIFE by FIFE", "STRENGTH TREE", etc., are not to be used.

PROCEDURES FOR THE GENERAL SAFETY OF AIRCRAFT

Overdue Aircraft

52. An aircraft is deemed to be overdue if it fails to arrive at, or is not in communication with, air traffic control at the destination aerodrome, alternate aerodrome, or appropriate air traffic control centre:—

- (a) If a jet aircraft, on E.T.A.
- (b) If a piston-engined aircraft:—
 - (i) Within one hour after E.T.A., or
 - (ii) Within its notified endurance.

53. When an aircraft is known or believed to be overdue, the unit air traffic control concerned will notify the appropriate A.T.C.C. and will also take such other local action as may be considered necessary. The A.T.C.C. will make every possible endeavour to trace the aircraft by seeking information from aerodromes along the route and by co-ordinating information received from adjoining A.T.C.Cs. If it is considered that the aircraft may have crashed or made a forced landing on land or in the sea, the A.T.C.C. will initiate search and rescue action with the appropriate authorities.

54. In order that overdue action should not be initiated unnecessarily, it is most important that captains of aircraft should report delays in E.T.As., and that when landings are made at places other than aerodromes of destination the nearest air traffic control authority is notified with the minimum delay.

Diversion Action

55. **Introduction.** Diversion is the act of flying to an aerodrome other than the original intended destination in order to effect a landing. It applies equally whether the captain of the aircraft makes the decision or whether the instruction, or advice, emanates from an appropriate ground authority.

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56. Reasons for Diversion. Diversion may be advised, or instructed, for any of the following reasons :—

- (a) Weather at destination, or *en route*, below the minimum for the pilot's instrument rating.
- (b) Airfield obstructed.
- (c) Failure of ground or other equipment.
- (d) Aircraft in emergency.
- (e) Congestion of air traffic (normally applicable only at aerodromes within controlled airspace).
- (f) The closure of destination aerodrome. (For full details regarding the closure of aerodromes, see A.P. 3024, Chapter 7.)

57. Categories of Diversion. Apart from diversions initiated by captains of aircraft, either through an operating authority or through the Air Traffic Control Service, diversions are normally categorized as follows :—

(a) *Weather Diversions.*

(i) *Grade 1.* The captain of an aircraft is to comply with a Grade 1 diversion unless he considers that in doing so he will endanger the safety of his aircraft. It can be ordered only by an operating authority. If the captain considers that he cannot comply with the instructions given, he is either to inform the appropriate control of his intentions, giving reasons, or to request alternative instructions.

(ii) *Grade 2.* A Grade 2 diversion is advisory. A captain who decides to ignore the advice is to inform the appropriate control of his intentions. He is only to proceed to his original destination if, in the event of his attempt to land at that aerodrome being unsuccessful, he will subsequently be able to reach the diversion aerodrome with enough fuel to ensure a safe instrument landing.

(b) *Administrative Diversion.* A diversion made for purely administrative reasons which is to be treated as mandatory if initiated by an operating authority.

(c) *Landing Hazard Diversion.* This form of diversion, usually necessary owing to crashed aircraft, iced runways, etc., is normally advised by unit air traffic control.

58. The provision of suitable diversion facilities at all times constitutes a vital responsibility of the Air Traffic Control Service. Full details regarding the responsibilities for diversion action may be found in A.P. 3024, Chapter 8.

Emergency Procedures

59. The following procedures are available from air traffic control at all R.A.F. aerodromes:—

(a) Homing and controlled descent of aircraft with unserviceable magnetic compass and/or directional indicator, using any of the following methods of track determination:—

(i) "90 Degree" method.

(ii) "Odd Ratio" method.

(iii) "Continuous Turn" method, applicable only to jet aircraft.

(iv) "Sun's Azimuth" method.

(b) Homing and controlled descent of aircraft when the pilot's microphone is unserviceable, using the "Speechless Aircraft" system.

(c) Homing and landing of jet aircraft experiencing "flame-out".

Full details of these procedures may be found in A.P. 3024, and, in certain cases, in A.Ps. 3322/23 (Supplementary Flight Information Documents).

60. The following emergency facilities are available in the United Kingdom and at some R.A.F. aerodromes abroad :—

(a) D/F bearings and homings on the H.F. emergency frequency.

(b) Fixes and bearings on the M.F. emergency frequency.

(c) Triangulation and homing on the V.H.F. emergency frequency.

The detailed procedures to be followed in emergency by captains of aircraft are contained in Part 4, Sect. 3, Chap. 1 of this volume, and they are also repeated in all aeronautical information documents.

61. Full details of the Search and Rescue Organization, which forms part of the Air Traffic Control Service, may be found in Part 2, Sect. 4, Chap. 15 of this volume.

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