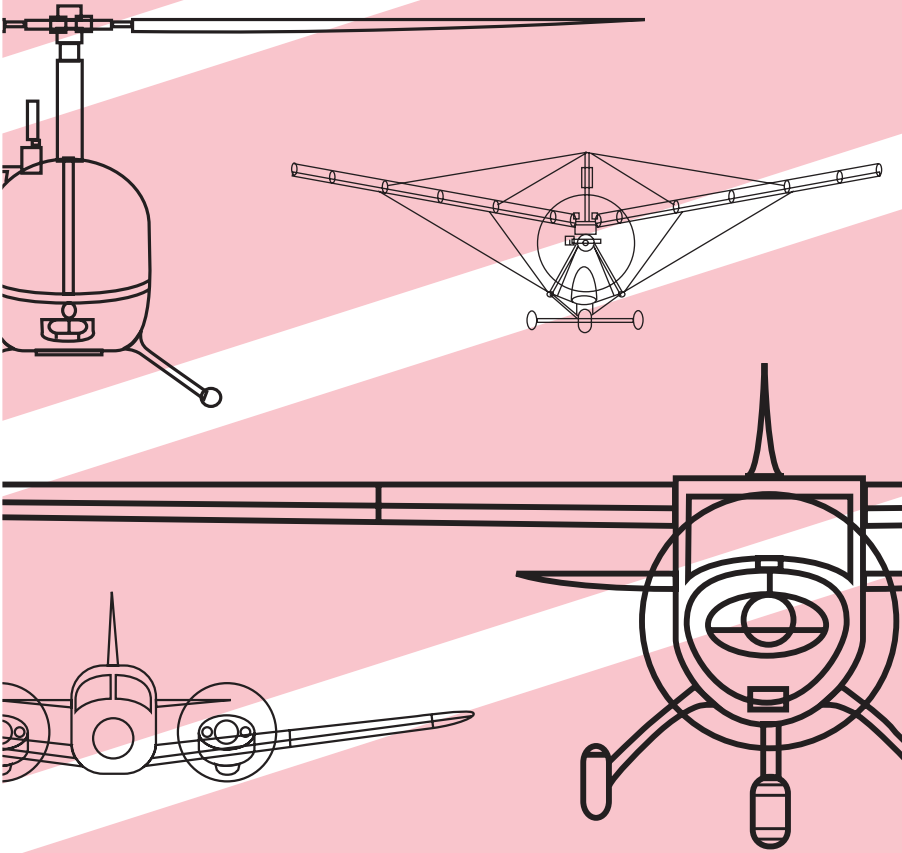**CIVIL AVIATION AUTHORITY**

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RADIOTELEPHONY

RADIOTELEPHONY

Photos: John Thorpe

1 INTRODUCTION

a Radiotelephony (RTF) is essential for the safe operation of aircraft in a busy environment. RTF enables a pilot to obtain aerodrome information, weather information, and instructions relating to the safe movement of air traffic. Many student pilots find the process of learning to use the radio more daunting than learning to fly.

b Radio waves are not confined by national boundaries and for this reason radio is regulated on an international basis. Radio regulations agreed at World Radio Conferences of the International Telecommuni-cations Union (ITU) and are binding in international law on member states, including the UK.

c In the UK the primary legislation is the Wireless Telegraphy Act 1949 (the WT Act). This act empowers the Secretary of State to make and enforce regulations regarding the installation and use of radio, including the requirements to be met by users, manufacturers and importers of any radio equipment that is capable of causing radio interference. Responsibility rests with the Secretary of State for Trade and Industry and the Radiocommunications Agency (RA). In the case of aeronautical radio stations, the responsibility for the

issue of operator licences and the approval of the equipment and its installation is delegated to the Civil Aviation Authority. Regulations regarding the operation of aircraft radio equipment and aeronautical radio stations are contained in the Air Navigation Order 2000 (ANO) Articles 15, 21, 46, 104 and Schedule 8.

d All radio transmitting equipment requires a WT Act licence unless that type or class of equipment has been specifically exempted by regulation from the need for licensing by the Secretary of State.

Licence exempt equipment (generally operating over short ranges) must conform to a specification and can only be used in a manner for which it is intended as described in the exemption. Such equipment bears an exemption mark showing the specification against which it has been tested eg MPT1340. Any aircraft that uses radio, whether installed or non-installed (portable), requires an Aircraft Radio Licence issued by the RA. When specialist knowledge or procedures are required by the radio user, an additional operators licence is also required. In the case of aircraft radio equipment a Certificate of Approval for Aircraft Radio Installation issued by the CAA and an Aircraft Radio Licence issued by the RA, are required for all aircraft. In addition, the radio operator must also be in possession of a Flight Radiotelephony Operators Licence (FRTOL). Glider pilots and student pilots under training are exempt from the requirement to hold a FRTOL. However, glider pilots without a FRTOL, are confined to the use of air/ground communication using the nominated 'glider frequencies'.

2 FLIGHT RADIOTELEPHONY OPERATORS LICENCE

a The Flight Radiotelephony Operators Licence (FRTOL) entitles the holder to operate the radio equipment in any aircraft. FRTOLs issued prior to April 1998 contain the word 'Restricted', this is often mistaken for a 'VHF Only' limitation which, if applicable, will be endorsed on the reverse of the licence. In the UK the term 'Restricted' referred only to the type of equipment that may be operated (see ANO Schedule 8). Older radio equipment designed for use by specialist radio operators who were 'Unrestricted' is no longer in use, therefore the word 'Restricted' has been eliminated from the FRTOL. The privileges however remain unchanged. When the FRTOL is limited to 'VHF Only', the holder may not use radio equipment operating in the High Frequency (HF) aeronautical bands (below 60 MHz). This limitation may be removed by obtaining a pass in the HF written examination with an RTF Examiner authorised to conduct the HF examination, or by obtaining a pass in the UK Navigation group examinations at CPL/ATPL level.

b It is essential that the holder of a FRTOL is familiar with the phraseology and procedures used for aeronautical communication. ATC frequencies are often busy, necessitating the use of concise phrases without ambiguity. Long winded radio calls waste time and may endanger others.

c On 27th March 1977 two heavily laden Boeing 747s collided on the runway at Los Rodeos airport Tenerife in poor visibility, resulting in 575 fatalities. A KLM 747 commenced take-off whilst a Pan Am 747 was still taxiing towards it on the same runway. There was clearly a breakdown in communication;

perhaps a misunderstood radio call! The Pan Am aircraft had been asked by the controller, who was unable to see either aircraft due to low cloud, *'Are you CLEAR of the runway'?* The KLM aircraft had already commenced the take-off roll without clearance; could the KLM pilot have mistaken the call to the other aircraft thinking that he was *'CLEAR to Take-Off'?* The answer remains a mystery, the cure is straightforward; use the correct RTF phraseology which is designed to be unambiguous, acknowledge and read back all clearances and above all, if in doubt ASK!!

Boeing 747 Tenerife Accident

d As a direct result of aircraft accidents RTF phraseology has been progressively modified to avoid any possibility of ambiguity or confusion. Specific phrases have well defined meanings and should not be modified by the operator. Some recreational pilots consider that they don't need to know the full vocabulary used for RTF communication, yet when communicating with an Air Traffic Service Unit (ATSU) they may encounter any aspect of it. It is therefore incumbent upon every radio user to be fully conversant with the nature of the air traffic service provided, and to be able to understand the radio calls they may hear.

3   RADIO EQUIPMENT

a Aircraft VHF radio communications equipment operates in the band 118.00 MHz to 136.975 MHz. Individual frequencies are allocated every 25 KHz giving rise to 760 channels. Some older radios may have 720, or even 360 channels with an upper limit of 135.975 MHz, neither type is allowed for IFR flight, or for VFR flight in certain countries including Germany. Many VHF aeronautical radios also include coverage of the 108.00 MHz – 117.975 MHz band which is allocated to radio navigation such as VOR and ILS. These frequencies may also be used to provide radiotelephony channels for one way transmission of aerodrome information to aircraft.

b Aircraft radio equipment is designed with a minimum number of controls. The operating frequency is selected by rotary knobs or switches, allowing the frequency to be adjusted in steps of 1 MHz, 100 KHz and either 50 or 25 KHz. On some equipment an additional switch selection is necessary in order to select 25 KHz resolution. This may

take the form of a toggle switch or require a rotary selector knob to be pulled In or Out. Many radios do not display the last figure of the frequency which may end in a (0) or a (5). This creates the impression that the frequency ends in a (.x2) or a (.x7) rather than (.x25 or .x75).

e.g.

121.025	shown as	121.02
121.050	shown as	121.05
121.075	shown as	121.07

This may mislead the user into thinking that a particular frequency cannot be selected. Additional frequencies spaced at 8.333KHz, will be introduced in 1999, giving rise to even more frequency combinations. e.g. 118.0333 MHz and 118.0583 MHz, to be designated **118.03(5)** and **118.06(0)** MHz respectively. The (5) and the (0) will not be stated.

c All too often the receiver VOLUME and SQUELCH controls may be incorrectly set. SQUELCH is an electronic switch that mutes the receiver audio output when no signal is received. This facility is designed to reduce operator fatigue which can result from continuous exposure to white noise. When a continuous radio signal (carrier) is received, it activates or 'lifts' the SQUELCH causing the speaker or headphones to be activated. Where a variable SQUELCH control is fitted, this allows the operator to determine the strength of the received signal required to lift the SQUELCH which may also be activated by bursts of noise. The correct setting procedure for the SQUELCH control is:

• set the volume control to approximately halfway;

• turn the SQUELCH control up until a hiss appears, this is background noise;

• turn back the SQUELCH control until the hiss just stops, this occurs quite abruptly;

• leave the SQUELCH control in this position.

Some radios are not fitted with an external SQUELCH control, instead they have a switch marked TEST. Operating the switch 'lifts' the SQUELCH and allows the volume control to be set at a level where the background hiss is audible, or alternatively where the receiver volume is acceptable.

Note:

♦ The SQUELCH cannot be set correctly whilst you are receiving a station.

♦ If the VOLUME control is set excessively high, distortion may occur within the radio making it more difficult to hear stations. Ideally the VOLUME control should not exceed 70% of its rotation.

d VHF aeronautical radios use amplitude modulation (AM), the same system used by broadcast radio stations in the long and medium wave bands. When two AM stations transmit simultaneously on the same frequency the signals can mix together and may render one or both stations unreadable. If the two transmitters are not exactly on the same frequency, an annoying whistle or 'heterodyne' equal to the difference between the two frequencies may be heard. **It is therefore important not to transmit at the same time as another station or you may render both signals unreadable. Always listen before speaking and keep transmissions short.**

e If you experience difficulty contacting another station the following checks should be made:

• The correct frequency is selected *

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* Frequencies ending (.025 MHz) and (.250 MHz) are easily transposed.

- The correct radio has been selected on the comms panel e.g. COMM 1, or COMM 2. (Transmit and receive switching are often independent)

- The ground station is open for watch

- The station is within range (This varies with altitude)

- Volume and Squelch are correctly set

f The simplicity of an aircraft radio may be downgraded by the addition of separate intercom systems. Before flight these should be checked and adjusted independently of the radio equipment. It is important to obtain a good balance between intercom volume and radio volume to prevent radio calls being swamped by the intercom. **Always seek instruction if you are unfamiliar with a particular radio installation. KNOW THE EQUIPMENT.**

g Most light aircraft are now equipped with a **Transponder.** This is an important aid to flight safety and permits an air traffic controller to positively identify an aircraft. The transponder transmits a 4 digit code (SQUAWK) selected at ATC request, by the pilot, to the ground station where it is displayed on the radar screen. If Mode C (Charlie) is incorporated in the transponder the aircraft's level (relative to 1013.2 Mb) is also transmitted and displayed on the ATC radar screen. The transponder mode switch must be selected to Altitude (ALT). **Adjustment of the altimeter pressure setting has no effect on the Mode C altitude information.** A switch marked 'IDENT' is provided on the transponder, this enables the display to be modified so that it is readily seen by the controller. The IDENT switch should not be operated unless requested by ATC.

h In recent years an Airborne Collision Avoidance System **(ACAS)** has been employed in airliners in order to provide automatic collision avoidance information. Mode C information from the transponder is essential for ACAS to be effective. It is important that aircraft fitted with Mode C always select ALT when the transponder is used. One of the most commonly known ACAS systems is the Traffic Alert and Collision Avoidance System (TCAS) pronounced 'TEEKAS'.

i To avoid radar clutter, aircraft flying in a Control Zone (CTR) are advised to select 'Stand-By' unless a SQUAWK is requested by ATC. In the absence of a code from ATC aircraft should set the conspicuity code 7000 on the transponder.

4   RADIO PHRASEOLOGY

a The correct radio phraseology is detailed in CAP413 Radiotelephony Manual. In some cases it may seem very pedantic, however, it must be remembered that it has evolved for a purpose; primarily to avoid ambiguity. Many incorrect phrases are regularly heard.

b **FINAL** is a position in the circuit pattern between 4 nautical miles and the landing threshold, in circuit parlance it is singular not plural! An Air Traffic Control Officer (ATCO) hearing a call such as **'ON FINALS'** might easily believe the traffic to be **'LONG FINAL'** (a position between 4 and 8 miles from the landing threshold); in poor visibility, such a mistake could result in the ATCO giving another aircraft clearance to Take-Off as he believes the landing traffic to be in excess of 4 miles away, when in reality, it may be as little as only half a mile away! There is no official report 'SHORT FINAL' however, the distance from the landing threshold may serve as a more accurate indication of position i.e. 'Half Mile Final'.

c The phrase **'at my discretion'** should **NOT** be used by pilots. This is commonly heard at small aerodromes with either an Air/Ground (A/G) or a Flight Information Service (FIS).

d **'Land at your discretion, one on well up'** *This is illegal at an aerodrome with only A/G or FIS.* You must not land on a runway whilst another aircraft is on that runway unless authorised by an ATCO. (Rules of the Air Rule 17).

e **Requests for landing instructions**, should not be made.

f **Requests for 'instructions' should not be made to stations providing a A/G or FIS.** A/G operators and Flight Information Officers (FISO) are not permitted to give instructions.

g Public correspondence messages (including air to air conversations) are not permitted on the VHF aeronautical band.

5   MICROPHONE TECHNIQUE

a Use a headset, it cuts out aircraft noise and avoids the distraction of a handheld microphone.

b Keep the microphone close to your mouth.

c Speak directly into the microphone, ensuring the transmit button is held firmly pressed **UNTIL** you have finished speaking.

6   AERODROME RADIO STATIONS

a The nature of the ground radio facilities at an aerodrome are usually dependent upon the number of air traffic movements. Some minor aerodromes have no provision for radio at all, whilst others may have an allocated frequency but no actual ground station. The majority of aerodromes have a ground radio station and provide one of three types of air traffic service:

- A/G   Callsign **'RADIO'**

- FIS   Callsign **'INFORMATION'**

- Air Traffic Control (ATC) Callsigns: **'GROUND**; **TOWER**; **APPROACH**; **RADAR**; **DIRECTOR**; **DELIVERY'**

Each service employs different procedures and it is important for pilots to be familiar with the differences. Small aerodromes may provide an A/G or Aerodrome FIS (AFIS) utilising a single frequency, whereas a busy airport will have an ATC service with separate frequencies for Radar, Approach, Tower, Ground and possibly an Automated Terminal Information Service (ATIS).

b In some countries a common frequency (UNICOM) is allocated for use by aircraft visiting aerodromes not equipped with a ground radio station. In the UK the only frequencies allocated for UNICOM are: 130.425 MHz for use by aircraft transiting in the vicinity of an incident or emergency (see AIC Pink 29/1997); and 122.950 MHz allocated as a landing site Departure Communications (DEPCOM) frequency for use by helicopters departing from landing sites where there is no radio communication. A number of minor aerodromes have an allocated A/G frequency but provide no permanent ground station. At these airfields aircraft taxiing, taking-off, landing and flying in the circuit pattern should

self announce their position and intentions on the appropriate frequency to alert other pilots of their presence. Initial calls should be addressed to: Airfield Name with the suffix **'RADIO'**. Calls should NOT be addressed to 'XXXX Traffic'.

> *e.g. 'WILTON RADIO G-ABCD transmitting blind, downwind 24 left to land'.*

It is then obvious to a pilot taxiing or waiting to back-track the runway the intention of the airborne aircraft. He may reply:

> *'WILTON RADIO G-ZZXY holding point 06 awaiting landing traffic.'*

Avoid using the word 'CLEAR', it may be mistaken as a clearance!

Announce your intentions to assist other traffic whilst making your presence noticed. Altimeter settings will need to be determined in relation to the aerodrome elevation. The QNH of a neighbouring aerodrome will be approximately correct and invariably more accurate than the regional pressure.

c   An **Air/Ground (A/G) Station** is the simplest form of aeronautical radio communication. The callsign uses the aerodrome name followed by the suffix **'RADIO'**. The ground radio operator is not an air traffic controller and *must not give any air traffic instructions or clearances.* This service provides aerodrome and traffic information only. In some instances the A/G station may be located in a flying club or building that does not have an unrestricted view of the aerodrome. In order to operate an A/G station the operator must be in possession of a Radio Operators Certificate of Competence (CAA Form CA1308) which must be countersigned by the aeronautical radio station licensee. A/G operators should **NOT** use the expression:

'At your discretion'.

The A/G operator may pass information to a pilot such as the runway, pressure settings, wind velocity and details of any known traffic. **Pilots should not request clearances or instructions as they cannot be given.** Before entering the Aerodrome Traffic Zone (ATZ) during the published hours of operation of an aerodrome with a notified A/G service, a pilot must obtain **'information'** from the A/G operator to ensure that the flight can be conducted safely. The A/G operator may pass messages on behalf of the aerodrome operator but, any such message must be passed as information and must include details of the originator of the message. e.g.

> *'G-AYZZ Message from the airport manager. You are requested to report to the Tower after landing'*

On arrival at an aerodrome with an A/G service, taxying and parking are also the responsibility of the pilot. The A/G operator may not give taxy instructions but, may suggest a suitable parking location if requested by the pilot.

> *' is there a convenient parking space? G-ZZ'*

> *'G-ZZ there is parking space available next to the blue Cessna'*

ALL INFORMATION PASSED BY AN A/G STATION IS ADVISORY; THEY CANNOT GIVE CLEARANCES OR INSTRUCTIONS TO AN AIRCRAFT.

d A Flight Information Service Officer is qualified to provide an Aerodrome Flight Information Service (AFIS) in order to:

• pass 'Instructions' to Vehicles and persons on the aerodrome, to

aircraft on the ground but not beyond the holding point and in the case of aircraft landing, not until the landing roll is completed; and

• to pass 'Information' for the safe conduct of aerodrome traffic on the runway and within an ATZ.

Practically, there is little difference from an A/G service, but the FISO is required to undergo training and is tested by the CAA. The FIS callsign uses the suffix **'INFORMATION'** to identify the type of service. **Air traffic clearances must not be given.** The service must revert to A/G if a qualified FISO is not available, in which case the callsign suffix reverts to **'RADIO'.** The phrase 'At your discretion' may be used by a FISO and will follow any advisory information. Pilots requesting departure may be advised:

'Take off at you discretion' or 'Depart at your discretion'

The pilot **should not respond** by repeating the phrase: *'at my discretion' No clearance has been given,* there is no requirement to read one back. The pilot should simply respond:

'G -XX Roger' or 'G-XX'

e Examples of A/G and FISO RTF phraseology are contained in CAP413 CAP452 Aeronautical Radio Station – Operators Guide and CAP410 Manual of Flight Information Services respectively.

An Aerodrome Flight Information Service Officer (AFISO) may control aircraft on the ground up to the holding point and after the landing roll is complete. An AFISO may NOT issue clearances to Aircraft in the Air or on the Runway. Pilots are reminded that they are responsible at all times for the safety of their aircraft and collision avoidance, LOOKOUT is always paramount.

7 AIR TRAFFIC CONTROL

a Pilots familiar with small aerodromes providing either an A/G or AFIS may find larger aerodromes somewhat daunting. Busy aerodromes will employ separate controllers for Ground, Tower, Approach and possibly Radar. If the purpose of each is fully understood, it will help to eliminate any confusion regarding who to talk to and when.

Photo: Flight Refuelling Ltd

b The **GROUND** controller is responsible for all movements on the manoeuvring area; this will include all taxiing aircraft and vehicular traffic equipped with radio. Initial calls will be made to GROUND, including taxy clearance, (start clearance at some aerodromes), departure clearance * if applicable, and all calls up to the holding point. Landing traffic will change to GROUND after vacating the runway.

*The departure clearance tells a pilot what he is required to do on departure and will include any frequency changes required, together with routeing instructions and altitude restrictions.

Note: this is NOT a clearance to take-off or to enter an active runway.

c   The **TOWER** controller is responsible for all traffic in close proximity to the aerodrome including the circuit. Normally an aircraft will change to TOWER when at the holding point, with all checks complete and ready for departure. The first call will usually be:

> *'WRAYTON TOWER G-ABCD holding point RW 30 Ready for departure'.*

Aircraft remaining in the circuit will remain with **TOWER,** whereas departing aircraft will change to either **APPROACH** or **RADAR.** Pilots arriving at an aerodrome will be directed to contact TOWER for circuit joining instructions when they are in visual contact with the aerodrome. After landing, aircraft should vacate the runway and advise the controller:

> *'Runway Vacated G XX'*

and then advise changing to the GROUND frequency. **Do not use the phrases:**

'Clear the Active' or 'Clear of the Runway'

d   **GROUND** and **TOWER** controllers are located in the glass uppermost part of the ATC Tower, they are invariably located side by side and should have an unrestricted view of the aerodrome and circuit.

e   The **APPROACH** controller is responsible for traffic arriving at and departing from an aerodrome. They are usually located in the lower part of the ATC tower and have no visual contact with the aerodrome. Control may be either radar or non-radar. At busy aerodromes a **RADAR** controller may be used in addition to the APPROACH controller to provide services for traffic transiting the area.

f   It is not uncommon for controllers to conduct more than one function when traffic is light, The **RADAR** and **APPROACH** controllers work in close proximity such that the jobs may be combined. The **GROUND** and **TOWER** controllers are also ideally situated to combine functions. At the very small provincial airports **TOWER** and **APPROACH** control may also be conducted by one controller. If it is apparent that one controller is doing all of the work, do not expect to obtain a radar service as the controller will not have the capacity. At smaller airports the service may revert to a **FIS** outside the busy period in which case, the service will be apparent from the Callsign Suffix **'INFORMATION'** and no clearances or instructions will be given.

g   **ATIS** uses a dedicated frequency on which a recording of aerodrome information is broadcast continuously. This information is updated at least hourly. Such a facility allows pilots to obtain weather information without having to establish radio contact with the aerodrome, thus considerably reducing the workload of the controller. ATIS information is time coded using a letter of the alphabet to signify the time of the observation.

> *e.g. 'This is Langford information Delta time ten hundred hours'*

the message concludes:

> *'on initial contact with Langford advise information Delta received'.*

The pilot advises ATC on his initial call that he has received ATIS Delta. Pilots who call ATC without passing the ATIS code may be asked if they have received the latest 'ATIS information'. **To the unwary this may cause confusion!**

8   ATC SERVICES

Lower Airspace Radar Service (LARS) is available to pilots when flying outside controlled airspace below FL95. The General Aviation Safety Sense Leaflet 8 provides details of Air Traffic Services Outside Controlled Airspace.

Photo: Dave Alcock, Manchester ATC

9   MILITARY ATC

a   When LARS is available it is more often than not provided by a military ATC unit. The terminology used by military controllers differs from that used by civil controllers. Military controllers are not obliged to be aware of the civil Rules of the Air, and it is possible that you may be asked to fly in a manner that might not conform with civil practices or law. It is the pilot's responsibility to advise the controller if he/she is unable to comply with the instruction and why. e.g. being asked to overfly a built up area below 1500 ft or at a height where it is not possible to glide clear, and when altitude changes might place an unqualified pilot in IMC.

b   Military ATC predominantly use frequencies in the UHF band (225-380 MHz) whilst VHF frequencies are secondary, and facilitate communication with civil aircraft. When calling a military ATC unit on VHF always allow time for the controller to reply as he may be in communication with a military aircraft on UHF. Occasionally you may hear only one side of the conversation when transmissions are made on both VHF and UHF simultaneously; you may hear the VHF transmission from ATC, but not the reply from the aircraft on UHF.

10 RADIO OPERATION

a   It is not intended to reproduce CAP 413 the Radiotelephony Manual, but rather to highlight certain aspects of radio operation.

b   Radio Check. Before embarking upon a flight it is essential to know that the radio equipment is working. The radio receiver may be checked by listening to other stations but, in order to check the transmitter it is necessary to talk to another station and let them confirm that they have received your transmission in an intelligible form. It is also important to be sure that the equipment switches channels and that the channel indicated is the correct one. Where two frequencies are in use at an airfield, equipment may be checked by selecting the frequencies alternately. The transmitter may be checked on the initial call for the aerodrome information. When more than one radio is installed, the second radio should be checked on a subsequent call.

c   The golden rule of RTF operation is: **know what you are going to say before you say it.** Whilst this may seem obvious, once the transmit switch is pressed the human brain often forgets the obvious. Secondly, anticipate **what the reply is likely to be.** That way, it will not be a surprise, for example when calling for aerodrome information, the reply

will include the QFE, QNH, surface wind and runway (R/W) in use. The pilot may obtain the pressures in advance by the using the altimeter, whilst a good indication of the R/W and wind direction can be obtained by observing the windsock and any other traffic. **Always read-back the reply in the same order that it was given – avoid reversing the order.**

d   A **Departure clearance** can often pose problems for the inexperienced, it may be a lengthy clearance which must be read back to the controller. Prior to departure it is normal to 'Book-Out' with ATC, specifying your departure details; flying instructors should allow students to observe and practice this procedure as part of the learning process. The departure clearance will normally be a confirmation of the routeing already requested, although occasionally, it may involve changes. It should therefore be no surprise when the controller passes a clearance that closely resembles the information passed by the pilot when 'Booking Out'. If a frequency change is required on departure it will be to a published frequency, know where to look it up and whenever possible, select it on a second radio as a reminder. Invariably, when departing VFR, the first two digits of the transponder code will remain the same for a particular ATSU.

Remember: The departure clearance is NOT a clearance to Enter a runway or to Take-off!

After take-off you are required to follow the departure clearance, remember the basic rule:

• **Aviate**

• **Navigate** and then

• **Communicate**

When safely airborne and established in the climb advise TOWER of the change in frequency:

e.g. G-ABCD to APPROACH 126.1.

To omit this call could result in uncertainty over your whereabouts and may waste the **TOWER** controllers time having to confirm with the **APPROACH** controller that you are safely airborne!

e   **En-Route** calls usually take the form of position reports. A useful mnemonic is:

T.R.P.A.C.E.R. The initial call to an ATSU should begin:

• **Station** being called

• Aircraft **Callsign** in full

• **Request**

e.g. 'WILTON RADAR G-AAXX request Radar Information Service'

Do not say any more until the ATSU invites you to 'pass your message'. If you are advised to Wait or Stand-By, do so but **do not acknowledge.** When requested to pass you message it will consist of:

• **Full call-sign** – so that the controller can write it down.

• **Type** – PA28, C172, Robin 400 etc

• **Routeing** – i.e. point of departure and destination, *do not include a list of turning points* – if there are any queries or you subsequently fail to report the controller can contact your departure or destination aerodrome!

• **Position** – should be given relative to a well known landmark, the controller will not be familiar with small villages and disused airfields. If you are visible on radar, your **Heading** should confirm the movement of the radar response!

- **Altitude/Level** – together with the pressure setting this will enable the controller to assess if there is any confliction with other traffic in the vicinity at the same level!
- **Conditions** – Whilst inflight conditions are important the type of service you receive is dependent upon the flight rules being observed e.g. Are you IFR or VFR?
- **Estimate** – pass the ETA for your next position (turning point). Remember ETA is a clock time expressed in Universal Time Co-ordinated (UTC) formerly GMT.
- **Request** – What service or information do you require? e.g. Flight Information Service (FIS), regional pressure settings etc.

Common mistakes are a failure to make any request of the controller, and inadequate or misleading position reporting, leaving the controller unaware of your present position and/or the next turning point. In order to provide you with a Service, the controller needs to know:

- **Who you are!**
- **Where you are!** and
- **What do you want!**

Then **WAIT...**

If you cannot remember what to say,

- ♦ **Stop transmitting**

The controller will ask you for anything you miss out!

f   Many pilots will avoid flight through a Control Zone (CTR) by flying a longer route around it. The majority of CTRs in the UK are designated Class D airspace which permits VFR flight subject to an ATC clearance. In the case of a CTR designated Class A airspace, a Special VFR (SVFR) clearance is required.

Requesting a clearance is straightforward, however, the ATCO will form a mental picture of a pilot from the radio calls made. The ATCO is unaware of a pilot's qualifications, private or professional, from the aircraft callsign alone. A radio call delivered in a professional manner will be treated accordingly, whereas, a poorly structured and hesitant call will probably lead the controller to question the pilot's ability to understand and follow instructions. If there is any doubt, the ATCO will not issue a clearance to transit controlled airspace without adequate separation from other traffic. A call such as:

'SOLENT APPROACH G-ABCD request zone transit'

followed by:

'G-ABCD is a Cessna 172 from Popham to Sandown, 10 miles North of Winchester Heading One Eight Zero. Altitude Two Thousand Feet on One Zero Zero Six. VFR, Sierra Alpha Mike Two Five, request zone transit'.

will probably result in a reply:

' G-CD is cleared to enter the Southampton zone abeam Winchester not below altitude two thousand feet Solent QNH One Zero Zero Nine. Maintain VFR. Report overhead'

Whereas a call:

'SOUTHAMPTON this is G-ABCD Err! a 172 at two thousand feet Err! Point of departure Popham. 4 Persons on board. Err! Can we transit over Southampton to the Isle of Wight Sir? or if not we will go round. Err! we are North of Winchester. Over'

may result in the reply:

'G-ABCD remain clear of controlled airspace. Route via Romsey, Totton and Calshot for the IOW. Maintain VFR Solent QNH One Zero Zero Nine. Report Romsey'.

g   Aerodrome Arrival. Unless you have filed a Flight Plan (CA48) or have telephoned in advance, (essential at PPR aerodromes) VFR flights usually arrive at an aerodrome unannounced. You may arrive at the same time as other VFR or IFR traffic. If the aerodrome provides a RADAR service it is a good idea to talk to them as soon as you are within range, they may look after you until you are in visual contact with the aerodrome at which point you will be asked to contact **TOWER**. If there is no radar service the initial call will be to **APPROACH** not greater than 25 nm from the aerodrome. Joining procedure will depend upon the type of traffic when you arrive, if there is IFR traffic arriving and departing it is unlikely that you will be able to join overhead. You may be asked to report your position at, or relative to one of the established Visual Reference Points (VRPs). Occasionally, you may be asked to route via a position not obvious to you, **if in doubt ASK**. The change to **TOWER** can occur quite late; on landing you may be asked to vacate the runway at a specific point and change to **GROUND.** Be prepared for references to published ground positions, stand numbers and holding points. In other words, use a plan of the aerodrome! For arrival at a small aerodrome with either Air/Ground radio stations **(A/G)** or an Aerodrome Flight Information Service **AFIS,** initial contact should be made within 10 miles of the aerodrome. If unfamiliar with the aerodrome an overhead join is preferred (but not always

permitted – see the UK AIP) as it enables orientation with the aerodrome and circuit traffic. Remember you must establish radio contact with the aerodrome **BEFORE** you enter the ATZ. See General Aviation Safety Sense Leaflet 6B, Aerodrome Sense.

h   Any pilot arriving at an unfamiliar aerodrome will experience a high workload and may not recognise geographical features. The aircraft has to descend, there are checks to be completed and frequencies to be selected. It is essential to **LOOKOUT,** listen out and keep your wits about you. Be prepared, have a plan and select the required frequencies as far in advance as possible. **Check the Aeronautical Information Publications (AIPs) prior to departure and do not use out of date documents.**

11 EMERGENCY PROCEDURES

a   Fortunately such events are rare however, there have been a number of occasions when a pilot has recognised the need to land as soon as possible, (*e.g. No oil pressure but the engine is still running OK)* but has not wanted to 'make a fuss about it.' Clearly if a situation arises where there is a possibility of danger or a worsening situation it is in your best interest to make an URGENCY call, that way immediate help, or a priority landing is available to prevent the situation getting out of hand.

b   The states of EMERGENCY are:

- **Distress.** (MAYDAY) A condition of being threatened by serious or imminent danger and of requiring *immediate assistance.*

- **Urgency.** (PAN PAN) A condition concerning the safety of an aircraft or other vehicle, or some

person on board or within sight, *but does not require immediate assistance.*

c The EMERGENCY MESSAGE advises others:

- *Who you are!*
- *What the problem is,*
- *What you intend to do about it and*
- *Where you are!*

The format is as follows:

- **MAYDAY** (3 times) or **PAN PAN** (x 3)
- **STATION** addressed when appropriate
- **CALLSIGN** (once)
- **TYPE** of Aircraft
- **NATURE** of emergency
- **INTENTION** of person in command
- **POSITION – HEIGHT and HDG**
- Pilot qualification: e.g. Student pilot, No Instrument qualification, IMC rating or full Instrument Rating (IR) (Not required by ICAO).
- **ANY other information –** POB, endurance etc

It is probable that in a real emergency you will not wish to be bothered with talking further on the radio. By ending the call: *MAYDAY OUT* you will convey the message that you do not expect a reply.

d Further attention can be attracted in an emergency by selecting the appropriate code on the transponder:

Emergency **7700**
Radio Failure **7600**

12 THE PRACTICAL COMMUNICATIONS TEST FOR THE FRTOL

a Candidates wishing to obtain a FRTOL are required to sit a written examination and a practical communications test with an authorised RTF examiner. The practical test involves the use of an approved RTF simulator. The candidate is briefed to follow a typical light aircraft route from one aerodrome to another passing through a Military Air Traffic Zone (MATZ) and possibly at some stage into or through a CTR. The candidate is required to make all the appropriate radio calls and frequency selections as if he were actually flying the route. The examiner performs the function of an A/G radio operator, FISO or ATCO. Other aircraft may be heard so the candidate is required to listen out. At some stage there will be an emergency involving either the candidate or another aircraft. At all stages of the test the candidate is required to make the appropriate radio calls. There are a number of options available to the candidate and in most cases it is the candidates responsibility to select an appropriate agency with whom to communicate with. The candidate is provided with a route map, a completed navigation flight plan and a list of all communications facilities available to him. The candidate must be familiar with the procedure for obtaining VHF Direction Finding (VDF) bearings from stations equipped with this facility.

b A typical examination route would be for a C172 aircraft routeing from Shipdham in East Anglia to East Midlands Airport via Huntingdon and Melton Mowbray. The aircraft is equipped with a single channel radio and a transponder with no mode C.

The pilot is a PPL holder. On this particular route a LARS service is available for most of the route, it would be a shame not to use it. The route passes South of RAF Marham and then through the Combined MATZ (CMATZ) at RAF Wittering and RAF Cottesmore, finally arriving at East Midlands which is in Class D airspace. Special entry and exit lanes are provided to assist VFR and SVFR traffic.

Map of Route (1:500,000 Topo)

c   A typical narrative for the flight could be as follows:

Note: for the sake of clarity numerals are used in this example in preference to spelling out numbers.

Shipdham Information G-ZAON request radio check 119.55

G-ZAON Shipdham Information Readability 5

G-ZAON Roger, request airfield information, Taxi, VFR to East Midlands

G-ON RW 20 Surface Wind 250/07 QNH 1009. Taxi holding point RW20

Taxi Holding Point R/W 20 QNH 1009

G-ON

G-ON Ready for departure.

G-ON traffic is a Cessna 152 on a half mile FINAL.

ROGER G-ON

G-ON depart at your discretion no known traffic to affect surface wind 260/05.

G-ON

G-ON climbing in the overhead.

G-ON report setting course

WILCO G-ON

G-ON overhead altitude 2500 ft QNH 1009, setting course

G-ON ROGER report leaving the frequency.

WILCO G-ON

G-ON changing to Marham 124.15.

G-ON ROGER

Marham Approach G-ZAON request LARS

G-ZAON Marham Approach pass your message

G-ZAON
Cessna 172
From Shipdham to East Midlands
2 miles North of Watton Heading 260
Altitude 2500 ft 1009
VFR
Huntingdon 37
Request Radar Information Service and Chatham Pressure

G-ON Squawk 2632 with Charlie

Squawk 2632; unable comply, negative Charlie, G-ON

G-ON you are radar identified 8 miles SE of Marham Radar Information Service, Chatham 1005 report Huntingdon

Radar information, Chatham 1005, WILCO G-ON

Marham G-ON 15 miles East of Huntingdon request change to Cambridge 123.6 for VDF

G-ON change to Cambridge 123.6 report returning to this frequency

WILCO G-ON

Cambridge Homer

G-ZAON request true bearing G-ZAON

G-ZAON Cambridge Homer transmit for bearing.

True Bearing/True Bearing
G-ZAON request true bearing G-ZAON

G-ZAON Cambridge Homer true bearing 355 degrees class Bravo I say again 355 degrees class Bravo

True bearing 355 degrees class Bravo G-ZAON changing to Marham 124.15

G-ON ROGER

Marham Approach G-ZAON back on frequency.

G-ON ROGER report Huntingdon

WILCO G-ON

G-ON Huntingdon 37
altitude 2500ft 1005
Melton Mowbray 02

G-ON ROGER Free-call Cottesmore on 130.2 Squawk 7000

Free-call Cottesmore 130.2 squawk 7000 G-ON

Cottesmore Approach G-ZAON request MATZ penetration

G-ZAON Cottesmore Approach pass your message

G-ZAON
Cessna 172
Shipdham to East Midlands
5 miles North of Huntingdon
Hdg 300
Altitude 2500 ft Chatham 1005
Melton Mowbray 03
request cross Wittering MATZ, Radar Information and Barnsley pressure

G-ON Squawk 6554

Squawk 6554 G-ON

G-ON identified Radar Information Service, maintain 2500 ft Cottesmore QFE 993 millibars, Barnsley 1007

Maintain height 2500 ft QFE 993 millibars, Barnsley 1007 Radar Information, G-ON

G-ON ROGER, report abeam Oundle

WILCO G-ON

G-ON abeam Oundle

G-ON is cleared to cross the CMATZ not above 2500 ft QFE 993 millibars, maintain VFR report abeam Oakham

Cleared to cross the CMATZ not above height 2500ft 993 *millibars* Wilco G-ON

G-ON abeam Oakham

G-ON Squawk 7362

Squawk 7362 G-ON

G-ON contact East Midlands Radar 119.65 they have your details

East Midlands Radar 119.65 G-ON

(If possible listen to East Midlands ATIS 128.225 MHz to obtain airfield information)

East Midlands Radar G-ZAON on handover from Cottesmore with Information 'Golf' (The ATIS code)

G-ON Stand-by

G-ON route direct to the Shepshed Lane Entry Point expect a VFR arrival RW 27 surface wind 270/08 QFE 998 millibars

Route to Shepshed Lane RW 27 QFE 998 millibars, G-ON

G-ON Cleared to enter the zone VFR report field in sight

Clear to enter the Zone VFR, WILCO G-ON

G-ON Field in Sight

G-ON contact East Midlands Tower 124.0

East Midlands Tower 124.0 G-ON

East Midlands Tower G-ZAON

G-ON join left base RW 27 QFE 998 millibars, No 2 to a Boeing 737 on a 1 mile FINAL.

Join left base RW 27 QFE 998 millibars No 2. G-ON

G-ON report FINAL caution vortex wake the recommended spacing is 6 miles.

WILCO G-ON

G-ON FINAL

G-ON continue approach surface wind 265/07

Continue approach G-ON

G-ON Cleared to land RW 27 surface wind 270/07

Cleared to land RW 27 G-ON

G-ON landing time 1417 vacate next left contact East Midlands Ground 121.9

Vacate next Left, Ground 121.9 G-ON

East Midlands Ground G-ZAON Runway vacated Holding point Charlie

> *G-ON turn right onto taxi-way Alpha turn left at Delta 2 for the flying club*

Taxi-way Alpha via Delta 2 for the Flying Club G-ON

> *G-ON report closing down*

WILCO G-ON

G-ON Closing Down

Note: At some stage in a practical test you will also be required to make an Urgency and an Emergency call.

13 ALTERNATIVE TO THE COMMUNICATIONS PRACTICAL TEST

The system known as 'Continuous Assessment' whereby ab-initio candidates for a PPL may use airborne training in lieu of having to pass the RTF practical test, was discontinued with effect from 31 December 1998. All applicants for a FRTOL (except practising ATCOs) are required to obtain a pass in both the RTF written examination and the RTF practical test conducted by an authorised RTF examiner. In some circumstances, the RTF written examination only, may also be administered by other examiners authorised by the Authority to conduct ground examinations for the PPL. It is however recommended, and in the candidates interest, to sit both RTF examinations with a specifically authorised RTF examiner.

Useful References:

CAP 413 Radiotelephony Manual

CAP 452 Aeronautical Radio Station – Operators Guide.

CAP 410 Manual of Flight Information Services

AIC 79/1998 Flight Radiotelephony Operators Licence (VHF and HF) –Examinations

(Replaced annually and includes listing of all authorised RTF Examiners)

CAA Flight Safety Poster FSP 4 'Cut the Chat'

The Private Pilot's Licence Course – Air Law and Radiotelephony by Jeremy M Pratt – AFE

The Air Pilots Manual – Volume 7 – by Trevor Thom – Airlife Publishing Ltd

CAA publications are obtainable from:

Westward documedia Ltd
37 Windsor Street
Cheltenham
Gloucestershire
GL52 2DG

Tel: (01242) 235151
Fax: (01242) 584139

14 MAIN POINTS

- It is illegal to use a radio without a licence

- All aircraft radio equipment and installations must be approved

- Know how to use the aircraft radio equipment

- Be familiar with CAP413, it is revised from time to time with new phraseology

- Use correct phraseology, it is designed to prevent ambiguity

- Use a headset, speak directly into the microphone positioned close to the mouth

- Listen out before transmitting

- Keep transmissions short

- If uncertain of what to say, STOP TRANSMITTING!

- Know the types of Air Traffic Service provided and the limitations

- Know the Emergency Procedures