Radio failure

Although modern aeroplane radios are reliable, the student needs to know the procedure to follow in the event of a communications failure. It is recommended that once the standard overhead join procedure has been mastered by a student, simulated radio failure procedures should be taught before any solo exercises in the training area.

When the student's home aerodrome is controlled, the CFI will provide guidance on what the student should do in the event of a radio failure outside the circuit. The exercise can be simulated if arranged with ATC in advance, and outside peak times.

However, if a diversion is required, training in this procedure will need to be given before solo exercises outside the circuit.

Objective

To join at a controlled or uncontrolled aerodrome in the event of a radio failure.

Considerations

Legally an aircraft cannot enter a control zone without a clearance, so should the student break this rule or divert? Generally, ATC can be expected to accept an aircraft returning to the controlled aerodrome under these conditions, especially if the transponder code 7600 is used.

If a clearance to enter the control zone has been received before the failure, then continuing in accordance with the clearance is what will be expected. If the clearance did not specify a method of joining, a standard overhead join may be the best option, as ATC will be able to predict the aeroplane's movements.

If a radio failure has occurred, it is unlikely to be detected until an attempt to make contact is initiated, for example, when tuning into the ATIS, or when requesting joining instructions. In the case of an uncontrolled aerodrome, where position and intentions only are transmitted, it may not be detected at all.

The general causes of communications failure are:

- wrong frequency selected,
- on/off and volume switch turned down,
- the aeroplane altitude too low and/or range too great,
- alternator failure (although battery power should still be available and the alternator failure detected by other means),
- comm box switches not selected to headphones,
- avionics or master switch accidentally selected off,
- radio loose in its cradle,
- avionics master off,
- faulty headset connections, or
- a popped circuit breaker.

Check for simple solutions first, by recycling – or turning on – master switches or avionics selectors.

Many modern radios can be tested for signal reception by selecting the test function and signal transmission confirmed by the small 'T' illuminating when the press-to-talk switch is depressed.

Airmanship

Anticipate what the wind is likely to be, and therefore circuit direction.

Preparing the aeroplane for arrival involves the use of AIPs, Visual Navigation Charts (VNC), and joining checklists.

Revise the importance of using eyes and ears to lookout. Using the 20 degree per 2 second visual scan technique and listening to radio calls (if available) builds situational awareness, and the student should be able to identify aircraft by both means.

The right-of-way rules are revised, and the requirement to make turns in the circuit direction emphasised.

Terminate your flight plan with ATC after landing.

Aeroplane Management

Before joining the circuit, the airspeed should be reduced to below 120 knots and landing lights turned on.

Human Factors

Information processing limitations and the use of mental models to retain situational awareness will help the student to draw a mental picture of the position of reported traffic.

Air Exercise

With a communications failure established, refer to *AIP's* Emergency Section for the procedure to follow. Obviously it will be of some benefit to the student to have read this section before an in-flight communications failure.

The main points of this procedure are:

- transmit blind (as all normal calls will be made, this action can be simulated)
- squawk 7600 (touch)
- turn on all lights
- use a cellular phone to communicate if available

Once a radio failure has been identified, the student should be instructed to aviate and navigate – remaining clear of controlled airspace, while a possible cause of the problem is investigated.

From the CFI's determination of the procedure to follow in the event of a radio failure, choose from the two options below.

Uncontrolled Aerodromes

The join procedure is exactly the same as the standard overhead join, except that transmissions should be made 'blind'. A keen lookout for other traffic should be emphasised. If in any doubt, return to the orbit overhead at 1500 feet.

Radio failure is simulated and the trouble-shooting sequence or checklist carried out. Completing this sequence gives the student practice in prioritising Aviate – Navigate – Communicate, and often demonstrates the limitations of information processing and the effects of stress. It is

recommended that the student be given adequate practice in systems knowledge and fault detection on the ground, before flight.

With the radio failure established, the AIPs, VNC, and checklist can be referred to and the communications failure procedure adopted.

Controlled Aerodromes

The student will need to know the meaning of the various light signals that will be used by ATC and how to respond to them.

> Radio failure while in the circuit will also require knowledge of the light signals. Therefore, the meaning of light signals and how to respond is best covered in one of the pre-solo circuit revision briefings recommended earlier. The meanings and response need only be revised here by reference to AIPs.

With the radio failure established, the AIPs, VNC, and checklist can be referred to and the communications failure procedure adopted.

Enter the control zone and carry out the standard overhead join procedure, watching out for the light signals and responding appropriately.

Report the communications fault to the control tower after landing.

Airborne Sequence

On the Ground

Make sure the student has had time to study the particular communications failure procedures for your home aerodrome, as well as the general procedures from *AIPs*

The Exercise

Organise with the Tower to show you the light signals.

Simulate radio failure at different times to assess the student's decision-making while operating in the circuit, in the training area, and entering and exiting controlled airspace.