



RT DISCIPLINE

(For Pilots & ATC)



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1 INTRODUCTION

The need for clear and unambiguous communication of level change and heading instructions, including the correct use of callsigns and readback requirements between Air Traffic Control (ATC) and the Flight Deck, has long been recognised as an important factor in assisting the safe and expeditious operation of aircraft. It is therefore vital that the RT discipline practised by both pilots and controllers alike reflects this philosophy. **The importance of using correct and precise standard RT phraseology and techniques cannot be over-emphasised.**

Whilst this Safety Sense Leaflet is primarily aimed at professional

aircrew and air traffic controllers, its contents and broad principles are equally applicable to all users of RT in the aviation industry.

2 WHY IS RT DISCIPLINE IMPORTANT?

When RT discipline is relaxed, for example by the use of non-standard procedures or phraseology, misunderstandings can arise. There are many examples in the UK and throughout the world where these misunderstandings have directly contributed to fatal accidents, AIRPROX events, and other safety related incidents.

3 WHAT CAN BE THE RESULT OF POOR RT DISCIPLINE?

There are many instances of accidents, AIRPROX events, and incidents available for reference. Let us identify some actual examples of poor RT discipline and examine the effect they had.

INCIDENT 1

To provide a more fuel-efficient profile for an aircraft, ATC asked the pilot of aircraft 'A' whether he wished to climb to a higher level. The pilot of another aircraft 'B' replied in the affirmative but did not use his callsign. ATC then cleared aircraft 'A'

to climb but pilot 'B' took the instruction to climb even although it was clearly addressed to aircraft 'A'. The callsign of Aircraft 'A' consisted of a different operator designator and a different flight number. However pilot 'B' read back the clearance using his own designator but with the same flight number as that used by aircraft 'A'. ATC did not detect this error and an AIRPROX occurred when the aircraft commenced climb through the level of a third aircraft 'C' almost directly overhead.

RT Causal Factors

- **Pilot 'B' did not listen out properly**
- **Pilot 'B' did not use his callsign initially leading ATC to assume that the correct aircraft was responding.**
- **Pilot 'B' used an incorrect callsign subsequently.**
- **ATC did not pick up the incorrect callsign when pilot 'B' responded.**

INCIDENT 2

An ATC error placed two aircraft in confliction with each other and the controller was late in recognising the developing situation. When the controller became aware of the confliction he gave prompt heading and level instructions to resolve it but in a manner of delivery which would be used for routine communications. This resulted in the aircraft's manoeuvre rate being insufficient to provide adequate separation and an AIRPROX occurred. Use of the phrase 'Avoiding Action' plus the provision of 'Traffic Information' would have allowed the pilots to react expeditiously and may have assisted in early visual contact being established. Visual acquisition can help provide the crew with the means to ensure that separation is sufficient to prevent a mid-air collision.

RT Causal Factors

- **When taking action to resolve the situation, ATC did not use standard phraseology that would immediately alert pilots to take immediate avoiding action.**

INCIDENT 3

A foreign ATC unit cleared an aircraft for descent and a procedural approach using the phrase 'Descend two four zero zero, cleared for NDB approach'. It was night, there was no radar available, and the flight was following a procedural approach which commenced at the NDB at 2400 feet amsl. The pilot read back 'OK, four zero zero'. Playback of the cockpit voice recorder indicated that the pilots received a momentary GPWS warning 20 seconds before impact as it passed through 700 feet amsl during the descent. A further continuous GPWS alert continued from 8 seconds before impact until the aircraft crashed into a wooded hillside at 437 feet amsl. It is evident that no action was taken on either GPWS warning and the aircraft was destroyed, killing all on board. The impact point was 1 nm before the NDB and 8 nm from touchdown.

RT Causal Factors

- **The pilot misheard this as a clearance to descend 'to' 400 feet amsl.**
- **The pilot's readback was non-standard.**
- **ATC did not hear the incorrect readback and so failed to correct the error.**

Note: In the UK, to prevent such occurrences, clearances to climb and descend are to include the expression 'Flight Level', 'Altitude' or 'Height'. The word 'to' after the verb must be used when clearing an aircraft to an altitude or height; it should not be used when a flight level is involved. Thus the above example would be passed as 'Descend to Altitude two thousand four hundred feet ...'.



INCIDENT 4

Aircraft 'A' was climbing on a Standard Instrument Departure (SID) within busy TMA airspace, initially to 6000 feet amsl. Aircraft 'B' was descending to FL90 inbound to a TMA airfield and conflicted in plan with the departing aircraft. To establish separation which would allow continuous climb and descent for the subject aircraft, ATC cleared aircraft 'A' to 'Head one hundred degrees and climb Flight Level eight zero'. The pilot read back 'One zero zero and Flight Level eight zero'. Subsequently aircraft 'A' was noted on radar by ATC climbing through FL80 and confirmation of his level was sought by the controller. The pilot reported 'We were cleared climb one zero zero'. Aircraft 'A' was instructed to stop its climb immediately at FL90 and aircraft 'B' was instructed to stop descent at FL100. However due to the late call and the fact that radar updates lag behind an aircraft's true vertical position, aircraft 'B' was unable to arrest its descent until FL93. Specific avoiding action was then given and the aircraft passed with less than 1 nm horizontal and only 300 feet vertical separation. The subsequent AIRPROX investigation also revealed that the ATC controller's RT discipline leading up to the incident was

generally poor with regular omissions of key phrases such as 'to Altitude XXXX' when passing level instructions, e.g. he said 'Descend one thousand feet' and 'Climb six thousand feet'. Phrases such as these could be open to misinterpretation, particularly where English may not be the pilot's first language. The pilot could interpret that ATC require him to change his height or altitude by an amount rather than fly to a cleared height or altitude.

RT Causal Factors

- **ATC used the phrase 'One hundred' when passing a heading instruction. ('One hundred' must only be used for Flight Level instructions.)**
- **Although the pilot of aircraft 'A' read back the clearance in the correct format, the second pilot on board erroneously set the autopilot's Flight Level/Altitude selector to FL100, probably due to the association of Flight Level one hundred with the incorrect phraseology used by ATC to give vectoring instructions.**
- **When taking action to resolve the situation, ATC did not use standard phraseology that would immediately alert pilots to a deteriorating situation.**

INCIDENT 5

A foreign ATC unit cleared an aircraft for descent using the phrase 'Re-clear to three thousand feet...(pause)... expect an ILS approach report level at three thousand feet'. There was no radar available and the pilot was flying in intermittent IMC. The pilot read back 're-cleared to two thousand feet' however this transmission commenced during the pause in the ATC transmission and was missed by the controller. ATC did not query the lack of a readback from the pilot. In addition, although not a RT factor, ATC had also passed an incorrect QNH value, which placed the aircraft 240 feet lower than was indicated on the aircraft altimeter. The playback of the cockpit voice recorder indicated that the crew took action to level at an indicated 2000 feet amsl and almost instantaneously the aircraft received a GPWS warning. This was 7 seconds before impact as the aircraft passed through an actual altitude of 1800 feet amsl. No action was taken on the GPWS warning and the aircraft crashed into a mountainside at 1795 feet amsl, only 100 feet below the summit. All 144 persons on board were killed.

(Note: 'Re-clear' is not permitted phraseology in the UK.)

RT Causal Factors

- **The pilot misheard this as a clearance to descend to 2000 feet amsl.**
- **A pause during a continuous ATC transmission meant that the pilot's incorrect readback, which took place simultaneously, was not heard by ATC.**
- **ATC did not query the lack of a readback from the pilot.**

4 WHAT CAN RT DISCIPLINE ACHIEVE?

By adhering to standard phraseology and technique, pilots and ATC can play a very important part in preventing accidents and incidents. The following tangible benefits are readily apparent:

- **Standard phraseology prevents misunderstandings or language difficulties, particularly where English may not be the pilot's first language.**
- **Standard phraseology can assist pilots in building up situational awareness of the other airspace users in their vicinity.**
- **By making standard reports and correctly carrying out readbacks, the need for further confirmation by ATC from pilots can be reduced, leading to workload reductions and a decrease in frequency congestion.**
- **Potential errors by either ATC or aircrew can be detected and corrected, thus preventing potential accidents, AIRPROX events, and incidents.**

5 WHAT CAN I DO TO IMPROVE MY RT DISCIPLINE?

The following points will help you to improve your RT discipline.

- **Always aim for accurate, brief, and clear transmissions. Listen carefully to transmissions and don't just 'hear' what you expect to hear.**
- **Before transmitting, it is important to listen out first. Ensure that you don't interrupt a dialogue or block another transmission.**
- **Always use your full callsign, except where the ground station has abbreviated it.**

- On first contact with an ATC Centre (i.e. London, Manchester or Scottish Control), pilots must report their actual Flight Level/Altitude and cleared Flight Level/Altitude if different. On a Standard Instrument Departure (SID) pilots must report the passing altitude, initial cleared level, and SID identification. These reports provide ATC with a safety check and level verification and allow other airspace users to build up situational awareness.
- All instructions and clearances should be passed in a clear and unambiguous manner using standard phraseology. This is especially important for heading and level instructions which should contain the correct term (Height, Altitude, Flight Level or Heading).
- Controllers should endeavour to limit the number of instructions passed in any one transmission to a maximum of three - ideally only two if practicable. Where there are large amounts of numbers to be passed, then speak clearly and slowly.
- Pilots should always read back the ATS messages detailed in CAP413. Controllers should always ensure that they receive these readbacks. The mandatory items are:
 - ⇒ Taxi instructions
 - ⇒ Level instructions
 - ⇒ Heading instructions
 - ⇒ Speed instructions
 - ⇒ Airways or route clearances
 - ⇒ Runway-in-use
 - ⇒ Clearances to enter, land on, take-off on, backtrack, cross, or hold short of an active runway.
 - ⇒ SSR operating instructions
 - ⇒ Altimeter settings
 - ⇒ VDF information
 - ⇒ Frequency changes
 - ⇒ Types of radar service
- If you are in doubt about any transmission received, or do not receive an expected read back, then CHECK.



6 WHERE CAN I FIND OUT ABOUT RT PHRASEOLOGY AND TECHNIQUE?

The UK RT phraseology, technique, and procedures are based on ICAO SARPS and can be found in the following documents:

CAP413	CAA Radiotelephony Manual
CAP493	Manual of ATS Part 1
CAP32	UK AIP (ENR Section)
GA Safety Sense Leaflet 22	Radiotelephony

Copies of these documents may be obtained from:

WESTWARD DIGITAL LIMITED (formerly CAA Printing and Publication Services)

37 Windsor Street Telephone (01242) 235151 (mail order)
Cheltenham
Glos. GL52 2DG General Fax (01242) 584139

or by e-mail at custserve@westward.co.uk

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Other CAA leaflets:

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- 5C *VFR Navigation*
- 6B *Aerodrome Sense*
- 7B *Aeroplane Performance*
- 8C *Air Traffic Services Outside
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- 15A *Wake Turbulence*
- 16 *Balloon Airmanship Guide*
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