RADIO TELEPHONY BASICS

INTRODUCTION

Radiotelephony (RTF) provides the means by which pilots and ground personnel communicate with each other. The information and instructions transmitted are of vital importance in the safe and expeditious operation of aircraft.

ICAO standardized phraseology shall be used in all situations for which it has been specified.

Only when standardized phraseology cannot serve an intended transmission, plain language shall be used.

TRANSMITTING TECHNIQUES

The following transmitting techniques will assist in ensuring that transmitted speech is clear:

- Listen out on the frequency some seconds before transmitting to ensure that there will be no interference with a transmission from another station
- Press the transmit switch fully before speaking and do not release it until the message is completed. This will ensure that the entire message is transmitted
- Use a normal conversational tone, and speak clearly and distinctly and maintain the speaking volume at a constant level
- Make a slight pause before and after numbers will assist in making them easier to understand
- Avoid using hesitation sounds such as "er"
- Suspend speech temporarily if it becomes necessary to turn the head away from the microphone

When switching to a new frequency, using TeamSpeak, the active transmission can be not heard all the time. So, it is important to listen first before transmitting.

Incidents and accidents have occurred in which a contributing factor has been the use of non-standard procedures and phraseology.
The importance of using correct and precise standardized phraseology cannot be overemphasized.

When an aeronautical station is called simultaneously by several aircraft stations, the aeronautical station shall decide the order in which aircraft shall communicate.

After a call has been made to the aeronautical station, a period of at least 10 seconds should elapse before a second call is made. This should eliminate unnecessary transmissions while the aeronautical

station is getting ready to reply to the initial call.

PRIORITY

According to ICAO, all communication between pilots and air traffic controllers can be categorised into 6 categories of messages depending on the priority of information being transmitted (priority set by order):

1. DISTRESS: serious and/or imminent danger, requiring immediate assistance (MAYDAY).
2. URGENCY: condition concerning the safety of an aircraft (PAN,PAN or PAN, PAN MEDICAL)
3. DIRECTION FINDING
4. FLIGHT SAFETY
5. METEOROLOGICAL
6. FLIGHT REGULARITY

DISTRESS message is the highest priority and FLIGHT REGULARITY message is the lowest priority.

Flight safety messages shall comprise the movement and control messages

RADIOTELEPHONY PROCEDURES

During flight, aircraft stations shall maintain watch as required by the appropriate Authority and shall not cease watch, except for reasons of safety, without informing the aeronautical station(s) concerned.

LANGUAGE

The air-ground radiotelephony communications shall be conducted in the language normally used by the station on the ground or in the English language.

The English language shall be available, on request from any aircraft station, at all stations on the ground serving designated airports and routes used by international air services.

When proper names, service abbreviations and words of which the spelling is doubtful are spelled out in radiotelephony, use the alphabet in the document linked below.

TRANSMISSION OF LETTERS

With the exception of the radio telephony designator and the type of aircraft, each letter in the aircraft call sign shall be spoken separately using the phonetic spelling (except for airlines prefix which follows another rules).

Isolated letter are also spelled out in radiotelephony.

Please consult International alphabet documentation.

TRANSMISSION OF NUMBERS

All numbers shall be transmitted by pronouncing each digit separately except in the specific cases described in this chapter.

Numeral element	Pronunciation
0	ZE-RO
1	WUN
2	TOO
3	TREE
4	FOW-er
5	FIFE
6	SIX
7	SEV-en
8	AIT
9	NIN-er
'.' or decimal	DAY-SEE-MAL
100 or hundred	HUN-dred
1000 or thousand	TOU-sand

The syllables printed in capital letters are to be stressed.

Aircraft call signs	Transmitted as
CCA238	Air China **two three eight**

Heading	Transmitted as
100°	heading **one zero zero**
080°	heading **zero eight zero**

Wind direction / speed	Transmitted as
200° 25kt	Wind **two zero zero** degrees **two five** knots
160° 18kt	Wind **one six zero** degrees **one eight** knots

Runway	Transmitted as
27	Runway **two seven**
30	Runway **three zero**

TRANSMISSION OF ALTIMETER SETTINGS

The altimeter setting shall be transmitted by pronouncing each digit separately except for the case of a setting of 1 000 hPa which shall be transmitted as ONE THOUSAND

Altimeter	Transmitted as
1010	One zero one zero
1000	One t(h)ousand
999	Nine(r) nine(r) nine(r)

TRANSMISSION BY USING HUNDRED AND THOUSAND

All numbers used in the transmission of altitude, cloud height, visibility and runway visual range (RVR) information, which contain whole hundreds and whole thousands, shall be transmitted by pronouncing each digit in the number of hundreds or thousands followed by the word HUNDRED or THOUSAND as appropriate.

altitude	Transmitted as
800 ft	eight hundred
3400 ft	three t(h)ousand four hundred
12000 ft	one two t(h)ousand

cloud height	Transmitted as
1000 ft	visibility one t(h)ousand

700 ft	visibility seven hundred

runway visual range	Transmitted as
600 m	RVR six hundred
1700 m	RVR one t(h)ousand seven hundred

TRANSMISSION OF FLIGHT LEVELS

Flight levels shall be transmitted by pronouncing each digit separately except for the case of flight levels in whole hundreds, which shall be transmitted by pronouncing the digit of the whole hundred followed by the word HUNDRED.

Flight level	Transmitted as
FL 180	Flight level one eight zero
FL 200	Flight level two hundred

TRANSMISSION OF FREQUENCY

All six digits of the numerical designator should be used to identify the transmitting channel in VHF radiotelephony communications, except in the case of both the fifth and sixth digits being zeros, in which case only the first four digits should be used:

Channel	Transmitted as
118.000	One one eight decimal zero
118.005	One one eight decimal zero zero five
118.010	One one eight decimal zero one zero
118.025	One one eight decimal zero two five
118.050	One one eight decimal zero five zero
118.100	One one eight decimal one

TRANSMISSION OF TRANSPONDER CODES

All numbers used in the transmission of transponder codes shall be transmitted by pronouncing each digit separately except that, when the transponder codes contain whole thousands only, the information shall be transmitted by pronouncing the digit in the number of thousands followed by the word THOUSAND.

Transponder code	Transmitted as

2600	Two six zero zero
1000	One t(h)ousand
2000	Two t(h)ousand
7001	Seven zero zero one

TRANSMISSION OF RELATIVE BEARING IN TERMS OF THE 12 HOUR CLOCK

When providing information regarding relative bearing to an object or to conflicting traffic in terms of the 12-hour clock, the information shall be given pronouncing the double digits as TEN, ELEVEN, or TWELVE [O'CLOCK].

TRANSMISSION OF TIME

Only the minutes of the hour should normally be required to transmit time. Each digit should be pronounced separately. However, the hour should be included when any possibility of confusion is possible.

Time	Transmitted as
0920 (09:20am)	Two zero Zero nine(r) two zero
1633 (4:33pm)	T(h)ree T(h)ree One six T(h)ree T(h)ree|}

RADIOTELEPHONY STANDARD WORDS

The following words and phrases shall be used in radiotelephony communications as appropriate and shall have the meaning given below.

Words	Meaning
ACKNOWLEDGE	*Let me know that you have received and understood this message*
AFFIRM	*Yes*
APPROVED	*Permission for proposed action granted*
BREAK	*I hereby indicate the separation between portions of the message*
BREAK BREAK	*I hereby indicate the separation between messages transmitted to different aircraft in a very busy environment*
CANCEL	*Annul the previously transmitted clearance*
CHECK	*Examine a system or procedure*

CLEARED	*Authorized to proceed under the conditions specified*
CONFIRM	*I request verification of: (clearance, instruction, action, information)*
CONTACT	*Establish communications with ...*
CORRECT	*"True" or "Accurate"*
CORRECTION	*An error has been made in this transmission (or message indicated). The correct version is …*
DISREGARD	*Ignore*
HOW DO YOU READ	*What is the readability of my transmission?*
I SAY AGAIN	*I repeat for clarity or emphasis*
MAINTAIN	*Continue in accordance with the condition given or last*
MONITOR	*Listen out on (frequency).*
NEGATIVE	*No or Permission not granted or That is not correct or not capable*
OVER	*My transmission is ended and I expect a response from you. (military use)*
READ BACK	*Repeat all, or the specified part, of this message back to me exactly as received.*
RECLEARED	*A change has been made to your last clearance and this new clearance supersedes your previous clearance or part thereof.*
REPORT	*Pass me the following information ...*
REQUEST	*I should like to know ... / I wish to obtain ...*
ROGER	*I have received all of your last transmission.*
SAY AGAIN	*Repeat all, or the following part, of your last transmission*
SPEAK SLOWER	*Reduce your rate of speech.*
STANDBY	*Wait and I will call you.*
UNABLE	*I cannot comply with your request, instruction, or clearance*
WILCO	*I understand your message and will comply with it*

WORDS TWICE	*Communication is difficult. Please send every word or group of words twice.*

ESTABLISHING COMMUNICATION

FIRST CONTACT

When establishing communications, a pilot initial call shall contain:

- Designation of the station being called (active controller)
- Call sign of his aircraft, with the word “heavy” for aircraft in the heavy wake turbulence category
- Position (on the apron or on route)
- Additional elements required by controllers (like ATIS information letter, ATC restriction or last clearance to report)

Pilot ✈	ATC
✈ Highvilla tower, **DEHBA**, at general aviation parking, information KILO on board.	
	DEHBA, Highvilla tower, hello.

The pilot usually transmits his call sign at the end of the message, as the air traffic controller may handle many aircraft at the same time. The pilots identify themselves using their unique call signs.

An ATC shall begin his message with the concerned pilot call sign to be sure that the right pilot carefully listens in the clearances given. An ATC is not required to transmit his call sign. He can do it at the first contact or when the pilots misspell his call sign.

ISSUE OF CLEARANCE

Whenever possible, a route clearance should be passed to an aircraft before start up. Controllers should avoid passing a clearance to a pilot engaged in complicated taxiing maneuvers and on no occasion should a clearance be passed when the pilot is engaged in line up or take-off manoeuvres.

Controllers should pass a clearance slowly and clearly since the pilot needs to write it down and wasteful repetition will thus be avoided.

An air traffic control (ATC) route clearance is not an instruction to take off or enter an active runway.

The words "TAKE OFF" are used only when an aircraft is cleared for take-off, or when cancelling a take-off clearance. At other times, the word "DEPARTURE" or "AIRBORNE" is used.

READ BACK REQUIREMENTS

Read-back requirements have been introduced in the interest of flight safety.

The stringency of the read-back requirement is directly related to the possible seriousness of a misunderstanding in the transmission and receipt of ATC clearances and instructions.

Strict adherence to read-back procedures ensures not only that the clearance has been received correctly but also that the clearance was transmitted as intended. It serves as a check that the right aircraft, and only that aircraft, will take action on the clearance.

The following shall always be read back:

- ATC route clearances
- clearances and instructions to enter, land on, take off from, hold short of, cross and backtrack on any runway
- runway-in-use, altimeter settings, SSR codes, level instructions, heading and speed instructions
- transition level

An aircraft should terminate the read-back by its call sign.

Examples of read back:

Pilot ✈	ATC
	DEHBA, taxi holding point runway 01
✈ taxi holding point runway 01, DEHBA	

Pilot ✈	ATC
	DEHBA, squawk 4525
✈ 4525, DEHBA	

If an aircraft read-back of a clearance or instruction is incorrect, the controller shall transmit the word "NEGATIVE I SAY AGAIN" followed by the correct version:

Pilot ✈	ATC
	DEHBA, QNH 1003

✈ QNH 1003, DEHBA	
	DEHBA, Negative I say again, QNH 1003
✈ QNH 1003, DEHBA	

TEST PROCEDURE

When a communication with an air traffic controller seems to be difficult, a pilot can use a radio communication test procedure:

Test transmissions should take the following form as a pilot:

1. the identification of the aeronautical station being called
2. your aircraft identification
3. the words "RADIO CHECK"
4. the frequency being used

Replies to test transmissions should be as follows:

1. the identification of the station calling
2. the identification of the station replying
3. Level of reception regarding the readability of the transmission

Readability of the transmission	Level of reception
Unreadable	**1**
Readable now and then	**2**
Readable but with difficulty	**3**
Readable	**4**
Perfectly readable	**5**

Example:
ROMA TOWER, I-ABCD, RADIO CHECK, 118.5
I-ABCD, ROMA TOWER, READING YOU **3**

SEE ALSO

- International alphabet, Introduction to phraseology

REFERENCE

- none

AUTHOR

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