



RADIOTELEPHONY BASICS

1. General operating procedures

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.

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.

2. 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
- Depress 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 a new frequency, using TeamSpeak, the active transmission can be not heard all the time. So, it must be important to listen first before transmitting.

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3. Transmission of letters

With the exception of the telephony designator and the type of aircraft, each letter in the aircraft call sign shall be spoken separately using the phonetic spelling.

Character	Morse Code	Letter Code	Pronunciation
A	• –	Alfa	AL-FAH
B	– • • •	Bravo	BRA-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	• – – –	Juliet	JEW-LEE-ETT
K	– • –	Kilo	KI-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	ROW-ME-OH
S	• • •	Sierra	SEE-AIR-RAH
T	–	Tango	TANG-GO
U	• • –	Uniform	YOU-NE-FORM
V	• • • –	Victor	VIK-TAH
W	• – –	Whiskey	WISS-KEY
X	– • • –	Xray	ECKS-RAY
Y	– • – –	Yankee	YANG-KEY
Z	– – • •	Zulu	ZOO-LOO

To expedite communications, the use of phonetic spelling should be dispensed with if there is no risk of this affecting correct reception and intelligibility of the message.

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4. Transmission of numbers

The numbers shall be transmitted using the following pronunciation:

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.

4.1. Transmission by pronouncing each digit separately

The numbers in the table below shall be transmitted by pronouncing each digit separately:

Aircraft call signs	Transmitted as
CCA 238	Air china two three eight
OAL 242	Olympic two four two

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

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

Transponder codes	Transmitted as
2400	Squawk two four zero zero

Runway	Transmitted as
27	Runway two seven
30	Runway three zero

Altimeter	Transmitted as
1010	One zero one zero
1000	On zero zero zero
999	Nine nine nine

4.2. Transmission by pronouncing digit

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 thousand four hundred
12000 ft	one two thousand

cloud height	Transmitted as
1000 ft	visibility one thousand
700 ft	visibility seven hundred

runway visual range	Transmitted as
600 m	RVR six hundred
1700 m	RVR one thousand seven hundred

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4.3. 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

4.4. 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 TWO ZERO
1643 (4:43pm)	FOUR THREE ONE SIX FOUR THREE

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5. 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	<i>Let me know that you have received and understood this message</i>
AFFIRM	<i>Yes</i>
APPROVED	<i>Permission for proposed action granted</i>
BREAK	<i>I hereby indicate the separation between portions of the message.</i>
BREAK BREAK	<i>I hereby indicate the separation between messages transmitted to different aircraft in a very busy environment</i>
CANCEL	<i>Annul the previously transmitted clearance</i>
CHECK	<i>Examine a system or procedure</i>
CLEARED	<i>Authorized to proceed under the conditions specified</i>
CONFIRM	<i>I request verification of: (clearance, instruction, action, information)</i>
CONTACT	<i>Establish communications with ...</i>
CORRECT	<i>"True" or "Accurate"</i>
CORRECTION	<i>An error has been made in this transmission (or message indicated). The correct version is ...</i>
DISREGARD	<i>Ignore</i>
HOW DO YOU READ	<i>What is the readability of my transmission?</i>
I SAY AGAIN	<i>I repeat for clarity or emphasis</i>
MAINTAIN	<i>Continue in accordance with the condition given or last</i>
MONITOR	<i>Listen out on (frequency).</i>
NEGATIVE	<i>No or Permission not granted or That is not correct or not capable</i>
OVER	<i>My transmission is ended and I expect a response from you. (military use)</i>
READ BACK	<i>Repeat all, or the specified part, of this message back to me exactly as received.</i>
RECLEARED	<i>A change has been made to your last clearance and this new clearance supersedes your previous clearance or part thereof.</i>
REPORT	<i>Pass me the following information ...</i>
REQUEST	<i>I should like to know ... / I wish to obtain ...</i>
ROGER	<i>I have received all of your last transmission.</i>
SAY AGAIN	<i>Repeat all, or the following part, of your last transmission</i>
SPEAK SLOWER	<i>Reduce your rate of speech.</i>
STANDBY	<i>Wait and I will call you."</i>
UNABLE	<i>I cannot comply with your request, instruction, or clearance</i>
WILCO	<i>I understand your message and will comply with it</i>
WORDSTWICE	<i>Communication is difficult. Please send every word or group of words twice.</i>

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6. Establishing communication

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

6.1. 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 maneuvers.

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.

6.2. First contact

When establishing communications, an aircraft should use the full call sign of both the aircraft and the aeronautical station and an ATC shall start his message with pilot callsign.

Pilot ✈️	ATC 🚦
✈️ DEHBA, Highvilla tower, DEHBA	
	🚦 DEHBA, Highvilla tower, hello.

The pilot must pass his call sign at the end of the message all the time, because air traffic controller can handle many aircraft at the same time. The pilots identify themselves using their call signs.

An ATC shall begin his message with the concerned pilot call sign to be sure that the right pilot listen carefully the clearances given in. An ATC is not need to say his call sign. He can do it at the first contact or when the pilots spell wrong his call sign.

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6.3. Read back requirements

Read-back requirements have been introduced in the interests 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 1033, DEHBA	
	↑ DEHBA, Negative I say again, QNH 1003
✈ QNH 1003, DEHBA	

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6.4. Test procedure

When a communication seems to be difficult with an air traffic controller, 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

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