RADIOTELEPHONY COMMUNICATIONS 1

HANDBOOK

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2 RTF GENERAL OPERATING PROCEDURES

Pilots and air traffic controllers communicate by using the radiotelephony phraseology that consists of

a set of standardized words and phrases approved for the radiotelephony communications by ICAO in all

routine aircraft situations. The communication is made possible due to their common and work-related topics,

especially because the situations they find themselves in are highly predictable. Even if misunderstandings do

occur, they are rather easily dealt with since both parties engaged in the conversation know what replies to

expect from each other. Problems arise in non-routine and emergency situations, when pilots and controllers

have to resort to plain English because the phraseology lacks the communicative means for effective

communication in unpredictable situations such as on board medical emergencies, engine problems, fuel

shortage or terrorism. When both parties stick to the rules prescribed, problems in communication will rarely

occur. First of all, good transmitting technique is
needed.

2.1 TRANSMITTING TECHNIQUE

According to the ICAO Doc 9432 Manual of Radiotelephony the following transmitting techniques will assist in

ensuring that transmitted speech is clearly and satisfactorily
received:

1. Before transmitting, listen out on the frequency to be used to ensure that there will be no interference

   with a transmission from another station.

2. Be familiar with good microphone operating techniques.

3. Use a normal conversational tone, speak clearly and distinctly.

4. Maintain an even rate of speech not exceeding 100 words per minute. When it is known that elements

of the message will be written down by recipient, speak at a slightly slower rate.

5. Maintain the speaking volume at a constant level.

6. A slight pause before and after numbers will assist in making them easier to understand.

7. Avoid using hesitation sounds such as "er".

8. 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.

9. An irritating and potentially dangerous situation in radiotelephony is a "stuck" microphone button.

Operators should always ensure that the button is released after a transmission and the microphone

placed in an appropriate place that will ensure that it will not inadvertently be switched on.

2.2 TRANSMISSION OF LETTERS

The phonetic words shall be used when individual letters are required to be transmitted.

Some abbreviations have become unmistakable through common usage and are transmitted without using the

phonetic word for each letter e.g. ILS, QNH, QFE.

The following words are to be used when it is required to transmit individual letters.

Table 1: THE RADIOTELEPHONY SPELLING ALPHABET (ICAO, Annex 10, Chapter 5)

Letter	Word	Pronunciation	Morse code
A	Alpha	AL FAH	. _
B	Bravo	BRAH VOH	_ . . .
C	Charlie	CHAR LEE or SHAR 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	KEY LOH	_ . _
L	Lima	LEE MAH	. _ . .
M	Mike	MIKE	_ _
N	November	NO VEM BER	_ .
O	Oscar	OSS CAR	_ _ _
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 NEE FORM or OONEE FORM	. . _
V	Victor	VIK TAH	. . . _
W	Whiskey	WISS KEY	. _ _
X	X -ray	ECKS RAY	_ . . _
Y	Yankee	YANG KEY	_ . . _
Z	Zulu	ZOO LOO	_ _ . .

The underlined syllables are to be emphasised when being pronounced.

2.3 TRANSMISSION OF NUMBERS

All numbers except whole hundreds, whole thousands and combinations of thousands and whole hundreds

shall be transmitted by pronouncing each digit separately.

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 TOUSAND as appropriate. Combinations of

thousands and whole hundreds shall be transmitted by pronouncing each digit in the number of thousand

followed by the word TOUSAND and the number of hundreds followed by the word HUNDRED.

The following examples illustrate the application of this procedure:

Table 2: Pronunciation of numbers

Numeral	**Pronounced as:**
0	ZERO
1	WUN
2	TOO
3	TREE
4	FOWER
5	FIFE
6	SIX
7	SEVEN
8	AIT
9	NINER
Hundred	HUN DRED
Thousand	TOU SAND
Decimal	DAY SEE MAL
Point	POINT

Table 3: Examples of pronunciation of numbers

Number	**Pronounced as:**
10	WUN ZE-RO
75	SEV-en FIFE
100	WUN HUN-dred
583	FIFE AIT TREE
2500	TOO TOU-SAND FIFE HUN-dred

5000 FIFE TOU-SAND

11000 WUN WUN TOU-SAND

18900 WUN AIT TOU-SAND NIN-er HUN-dred

25000 TOO FIFE TOU-SAND

38143 TREE AIT WUN FOW-er TREE

Numbers containing a decimal point shall be transmitted with the decimal point in appropriate sequence being

indicated by the word DECIMAL (in case of frequencies) or POINT (in all other cases).

a) indicated by the word DECIMAL

e.g. 124,725 - one two fower decimal seven two five

b) pronounced point in all situations except for frequencies

e.g. distance 11.5 miles - distance one one point fife miles

Table 4: Reporting Mach number

CTN123, report Mach number

CTN123, 0.75 (point seven fife)

CTN123, reduce to 0.72 (point seven two).

When the frequency of an aeronautical station is an intermediate 25 kHz the full figure will comprise 6 digits:

124,725 - ONE TWO FOWER DECIMAL SEVEN TWO FIFE

Table 5: Pronunciation of numbers containing decimal point

Number Transmitted as:

0,72 Mach MACH POINT SEVEN TWO

1,2 Mach MACH ONE POINT TWO

25,5 NM TWO FIFE POINT FIFE MILES

120.375 ONE TWO ZERO DECIMAL THREE SEVEN FIVE

118.000 ONE ONE EIGHT DECIMAL ZERO

118.005 ONE ONE EIGHT DECIMAL ZERO ZERO FIVE

118.050 ONE ONE EIGHT DECIMAL ZERO FIVE ZERO

118.125 ONE ONE EIGHT DECIMAL ONE TWO FIVE

118.150 ONE ONE EIGHT DECIMAL ONE FIVE ZERO

118,300 ONE ONE EIGHT DECIMAL TREE

2.4 EXCEPTIONS TO NUMBERS

Excepted from these above mentioned regulations
are:

1. azimuth in terms of 12 o "ten", "eleven" or "twelve" o
g traffic information in radar environment shall be transmitted affic information, traffic is at 12 o'clock, 6

passing left to right, B737, FL 350")

2. course, heading, track, radial, flight level, speed (e.g. heading 300 – "tree zero
zero")

3. QNH (1000)

4. squawk (7500)

turn to the left.")

5. instruction to fly a 360

6. instruction to make a U-turn on ground, (e.g. "Make one eighty turn".)

7. visibility over 10 (ten) km.

VERIFICATION OF
NUMBERS

When necessary to verify the accurate reception of numbers, the person transmitting the message shall

request the person receiving the message to read back the numbers.

2.5 TRANSMISSION OF TIME

All time references should be made in Co-ordinated universal time (UTC). This used to be called Greenwich

Mean Time (GMT). This time zone is sometimes referred to as Zulu (Z). Time is always in the 24 hour clock.

2400 is midnight and 0001 begins the new day.

When transmitting time, only the minutes of the hour are normally required, each figure being pronounced

separately.

However, if there is any possibility of confusion or if crossing the hour, the full four-figure group will be spoken.

Correct time, expected approach time (EAT and revised EAT) and SLOT time are to be spoken in hours and

minutes (in four figures). EAT and SLOT are to be read back always.

Apart from UTC (Co-ordinated universal time), estimated times of arrival may sometimes be given as local time.

Table 6: Transmission of time

Time Statement	
0920	TWO ZERO or ZERO NINER TWO ZERO
EAT 1015	EAT ONE ZERO ONE FIFE

CORRECT TIME 2010 CORRECT TIME TWO ZERO ONE ZERO

1300 WUN TREE ZE-RO ZE-RO

2057 TOO ZE-RO FIFE SEV-en

Pilot may check the time with the appropriate ATS unit. Time check shall be given to the nearest half minute.

Table 7: Time check

	CTN 654, REQUEST TIME CHECK
CTN 654, TIME 0611	
CTN 654, TIME 0715 AND A HALF	

2.6 CALL SIGNS

ICAO, Annex 10, Chapter 5 distinguishes two types of call signs. Call signs can be considered as names used in

aviation to indentify aircraft stations and aeronautical stations which are in fact stations on the ground.

2.6.1 AERONAUTICAL STATIONS Aeronautical stations are identified by the name of the location followed by a suffix denoting unit or the type of

service provided.

Table 8: Aeronautical station call signs

Unit or service	***Call sign suffix***
Area control centre	CONTROL
Radar (in general)	RADAR

Approach control APPROACH

Approach control radar arrivals ARRIVAL

Approach control radar departures DEPARTURE

Aerodrome control TOWER

Surface movement control GROUND

Clearance delivery DELIVERY

Precision approach radar PRECISION

Direction finding station HOMER

Flight information service INFORMATION

Apron control APRON

Company dispatch DISPATCH

Aeronautical station RADIO

When satisfactory communication has been established, and provided that it will not be confusing, the name of

the location or the call sign suffix may be omitted.

2.6.2 CALL SIGNS – AIRCRAFT An

aircraft call sign shall be one of the following types:

a) the characters corresponding to the registration marking of the aircraft; *G-ABCD or Cessna G-ABCD*.

(The name of the aircraft manufacturer or name of aircraft model may be used as a radiotelephony

prefix);

b) the telephony designator of the aircraft operating agency, followed by the last four characters of the

registration marking of the aircraft; *Speedbird DCAB*;

c) the telephony designator of the aircraft operating agency, followed by the flight identification. *CTN*

662.

Full radiotelephony call signs shall always be used when establishing communication (initial call).

After satisfactory communication has been established, and provided that no confusion is likely to occur,

aircraft call sign may be abbreviated as follows:

a) the first and at least the last two characters G-CD *or* of the aircraft registration; *Cessna G-CD*;

b) the telephony designator of the aircraft operating agency followed by at least the last two characters

of the aircraft registration; *Speedbird AB*;

c) No abbreviated form; *CTN 662*.

Table 9: Aircraft call signs

TYPE	FULL CALL SIGN	ABBREVIATED CALL SIGN
TYPE A	CESSNA FABCD N 57826	CESSNA CD N26
TYPE B	VARIG PVMA	VARIG MA
TYPE C	SCANDINAVIAN 937	SCANDINAVIAN 937

An aircraft shall not change its type of call sign or alter its call sign during flight except when there is a

likelihood that confusion may occur because of similar call sign. Then, an aircraft may be instructed by an air

traffic control unit to change the type of its call sign temporarily:

a) instruction to change its type of call sign:

CHANGE YOUR CALL SIGN TO (new call sign) ✓ISED TIL FURTHER ✓ISED ;

UNTIL FURTHER

b) instruction to an aircraft to revert to the call sign indicated in the flight plan:

REVERT TO FLIGHT PLAN CALL SIGN (call sign) [(significant point) [(significant point)

.

An aircraft shall use its abbreviated call sign only after it has been addressed in this manner by the

aeronautical station.

Aircraft in the heavy wake turbulence category shall include the word "HEAVY" immediately after the

aircraft call sign in the initial contact between such aircraft and ATS units.

2.7 CATEGORIES OF MESSAGES AND ORDER OF PRIORITY

According to ICAO, Annex 10, Chapter 5 all the communication between pilots and air traffic controllers can be

categorised into 6 categories of messages depending on the priority of information being transmitted. Croatian

regulations (AIC A03/08) distinguishes the 7th type, called state telegram:

1. DISTRESS CALLS, DISTRESS MESSAGES, AND DISTRESS TRAFFIC (poruka nevolje) - A condition of being

   threatened by serious and /or imminent danger and of requiring immediate assistance (MAYDAY –

   radiotelephony signal)

2. URGENCY MESSAGES, including messages preceded by the medical transports signal – (poruka

   hitnosti) - A condition concerning the safety of an aircraft but does not require immediate assistance

   (PAN,PAN or PAN, PAN MEDICAL – radiotelephony signal)

- Medical transport – “any means of transportation by land, water, or air, whether military or civilian, permanent or temporary, assigned exclusively to medical transportation and under the control of a competent authority of a Party to the conflict”

3. DIRECTION FINDING MESSAGE/COMMUNICATION RELATING TO DIRECTION FINDING (poruke radiogoniometrijskog smjera) - VDF using Q codes, radar vectors

4. FLIGHT SAFETY MESSAGES (poruke o sigurnosti leta)

- movement and control messages

- messages originated by an aircraft operating agency or by an aircraft, of immediate concern to an aircraft in flight;

- meteorological advice of immediate concern to an aircraft in flight or about to depart (individually communicated or for broadcast);

- other messages concerning aircraft in flight or about to depart.

5. METEOROLOGICAL MESSAGES (meteorološka poruka) - reports, forecasts, warnings); comprise meteorological information to or from aircraft.

6. FLIGHT REGULARITY MESSAGES (letačko operativna poruka)

- messages regarding the operation or maintenance of facilities essential for the safety or regularity of aircraft operation;

- messages concerning the servicing of aircraft;

- instructions to aircraft operating agency representatives concerning changes in requirements for

passengers and crew caused by unavoidable deviations from normal operating schedules.

- messages concerning non routine landings to be made by the aircraft;

- messages concerning aircraft parts or materials urgently required;

- messages concerning changes in aircraft operating schedules.

7. STATE TELEGRAM – (državni telegram – in Croatia)

3 ESTABLISHMENT AND CONTINUATION OF COMMUNICATION

In radiotelephony communications it is considered that the communication has been established after the

station being called has answered the call being made by the station calling. After the initial call only the

aircraft call sign shall be used and the aeronautical station call sign is omitted since there can be many aircraft

under jurisdiction of the same aeronautical station and communicating with it during a certain time.

3.1 INITIAL CALL

Initial call is the call usually initiated by the pilot and it consists of the pilot's message and the controller's reply.

When establishing RT communications, if the pilot initiates it, s/he shall use the full call sign of aeronautical

station and the full aircraft call sign. The contact is established when the called station replies using full call sign

of the station calling and the station being called. Each message shall include:

1. A CALL (THE STATION CALLED AND THE STATION CALLING)
2. A CONTENT

Table 10: Initial call

ATC	**PILOT**
	ZAGREB TOWER, 9ADDC, request start up
9ADDC, ZAGREB TOWER, start up approved.	
	PULA TOWER, ------ 345
STATION CALLING PULA TOWER, SAY AGAIN YOUR CALL SIGN.	
	PULA TOWER, CTN 345
	All stations, CTN 622 request assistance for Split, relay the message (no call sign was heard).

Station calling Zagreb Tower, say again the call sign

After the initial call, only the aircraft call sign is to be used. When a station is called, but it is not certain what

the identification of the station calling is, the calling station should be requested to repeat its call sign until

identification is established.

3.2 MULTIPLE CALL

Stations in the aeronautical mobile service may simultaneously call several stations. Stations called in multiple

call shall acknowledge receipt of the message in the sequence used by the calling station.

3.3 GENERAL CALL

When an aeronautical station broadcasts information to all stations on the same frequency, the message

should be prefaced by “all stations” and end with the word “OUT”. Aircraft (pilot) shall not attempt to

acknowledge the receipt of the general call message.

Table 11: General call

ALL STATIONS, ZAGREB TOWER, ANTI-HAIL ACTIVITY

SOUTH OF THE AERODROME COMPLEDTED. OUT.

3.4 ACKNOWLEDGEMENT OF MESSAGE RECEIPT

Acknowledgement of the receipt of aircraft/aeronautical station message is made by transmission of the

aircraft call sign and the word ROGER may be
added.

4 STANDARD WORDS AND PHRASES

According to ICAO, Annex 10, Chapter 5 the following phrases and their meanings are to be used in

standard

communication between the pilots and air traffic controllers. Phrases written in *Italics* are still to be found in

Croatian regulations (AIC A03/08) but have been excluded from the ICAO documents.

Table 12: Standard words and phrases

ACKNOWLEDGE Let me know that you received and understood this message.

ADVISE (HR) Tell us/Inform us on/of/about...

AFFIRM Yes.

AIRBORNE (HR) The time the flight has started after the take-off phase.

APPROVED Permission for proposed action granted.

BREAK I hereby indicate the separation between portions of the message. (To be used where there is no clear distinction between the text and other portions of the message.)

BREAK BREAK I hereby indicate the separation between messages transmitted to different addressees in a very busy environment.

CANCEL Annul the previously transmitted clearance.

CAUTION (HR) Beware of the following conditions or situations.

CHECK Examine a system or procedure. (No answer is normally expected.)

CLEARED Authorized to proceed under the conditions specified.

CLIMB (HR) Climb to maintain (to level out).

COMPLY (HR) Act in compliance with a request or instruction.

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...

CROSS (HR) Fly/taxi across. Pass from one side to the other side of...

DEPART (HR) Leave.

DEPARTURE (HR) Take-off, departing.

DESCEND (HR) Descend to maintain (to level out).

DISREGARD Ignore.

ESTIMATE (HR) Calculate/make approximate calculation.

EXPEDITE (HR) Speed up, increase speed/rate.

HOLD (HR) Keep in place or condition.

HOLD SHORT (HR) Keep at a distance/keep away of/ stop before reaching the specified location...

HOW DO YOU READ What is the readability of my transmission?

IMMEDIATEL(LY) (HR) At once, without delay due immanent risk/hazard

I SAY AGAIN I repeat for clarity or emphasis.

LEAVE (HR) Depart, abandon, go away from.

LOOK OUT (FOR) (HR) View over, survey inspection (watch out for immanent risk/hazard.)

MAINTAIN Continue in accordance with the condition(s) specified or in its literal sense, e.g. Maintain VFR.

MONITOR Listen out on (frequency).

NEGATIVE No/Permission not granted/That is not correct/Not capable.

OUT This exchange of transmission is ended and no response is expected. (Not normally used in VHF communications)

OVER My transmission is ended and I expect a response from you. (Not normally used in VHF communications)

READ (HR) Hear and understand

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...

REVISION (HR) Reconsidered or corrected version/calculation of time.

ROGER I have received all of your last transmission.

SAY AGAIN Repeat all, or the following part of your last transmission.

SLOW DOWN (HR) Reduce your speed

SPEAK SLOWER Reduce your rate of speech.

SQUAWK (HR) Set the mode/code as instructed.

STANDBY Wait and I will call you.

UNABLE I cannot comply with your request, instruction or clearance. (normally followed by a reason)

VERIFY (HR) Check and confirm with originator.

WILCO I understand your message and will comply with it.

WORDS TWICE a) As a request: Communication is difficult. Please send every word, or group of words, twice.

b) As information: Since communication is difficult, every word, or group of words, in this

message will be sent twice.

Manual or Radiotelephony distinguishes ATC clearance from ATC instruction.

Air traffic control clearance (ODOBRENJE) is an authorization for an aircraft to proceed under conditions

specified by an air traffic control unit. (*For convenience, the term "air traffic control clearance" is frequently*

abbreviated to "clearance" when used in appropriate contexts. The abbreviated term "clearance" may be

prefixed by the words "taxi", "take-off", "departure", "en-route", "approach" or "landing" to indicate the

particular portion of flight to which the air traffic control clearance relates).

Air traffic control instruction. (UPUTA) Directives issued by air traffic control for the purpose of requiring a

pilot to take a specific action.

5 READ BACK REQUIREMENTS

Important instructions issued by the ATCO need to be repeated by the pilots so that it is made certain that the

pilot has heard the message correctly. The ATCO will acknowledge the correct read-back by transmitting the

aircraft call sign and the phrase
“CORRECT”.

The following instructions are to be read back, i.e. are to be transmitted by verbatim repetition using the same

words and the same sequence and are to be concluded with the aircraft call
sign.

1. LEVEL INSTRUCTIONS

C: CTN 320, descend to 3000ft.

C: CTN 320, after passing ZAG descend to FL
210.

2. **SPEED INSTRUCTIONS**

C: CTN 663, maintain present speed.

C: CTN 663, increase speed to 220
kt.

3. **HEADING INSTRUCTIONS**

C: 9A DDA, turn right heading 150.

C: CTN 663, fly present heading.

**4. SSR OPERATING
INSTRUCTIONS**

C: 9A CBE, squawk 6502.

C: CTN 320, confirm squawk 5505.

5. **ATS ROUTE
CLEARANCES**

C: CTN 663, cleared to Zagreb via flight planned route, FL 190, CRE 2D, squawk
7065.

C: AUA 644, Zagreb Radar, identified, cleared to PIS, descend to 9 000 ft, QNH 1010, TL 95, expect ILS

approach RWY 05.

6. **ALTIMETER SETTINGS**

C: 9A BPW, QNH 1003.

7. **VDF INFORMATION**

C: 9ADDA, transmit for DF. P: 9ADDA, transmitting for DF 1,2,3,4,5.

C: 9ADDA, fly QDM 045. P: Flying QDM 045, 9ADDA.

8. **FREQUENCY CHANGES**

C: 9A DDA, contact Zagreb Tower
118,3.

C: 9ADDA, monitor 135,8.

9. **APPROACH CLEARANCES (EAT - ESPECTED APPROACH TIME inclusive)**

C: CTN 505, EAT 1010

10. **ATIS CODE LETTER AND DATA**

C: 9ADDA, check information C.

11. TAXI INSTRUCTIONS

C: 9AHGD taxi to holding point RWY 23, wind
220/16.

12. **TRANSITION LEVEL**

C: CTN 663, descend to 6000 ft, QNH 1013, transition level
70

13. **POSITION UPON THE TERMINATION OF RADAR VECTORING OR RADAR SERVICE**

C: CTN 642, radar service terminated, position 25 NM to CRE, on track 192 degrees, resume own

navigation to Pula.

14. **SLOT TIME**

C: CTN 622, slot time 0805.

15. **CONDITIONAL CLEARNACES**

C: CTN 663, after passing KOPRY, climb to FL 290.

16. **RUNWAY DESIGNATOR AND CLEARANCES TO:**

a) **ENTER**

C: CTN 662, cleared to enter RWY 31.

b) **LAND ON**

C: CTN 662, cleared to land RWY 05, wind 050 degrees, 4 kn.

c) **TAKE OFF**

C: CTN 662, cleared for take off, wind 230 degrees, 5 kn.

d) **REJECT TAKE OFF**

C: CTN 662, stop immediately, CTN 662, stop immediately, aircraft crossing the RWY.

C: CTN 662, hold position, cancel, I say again, cancel take off clearance, vehicle on the RWY.

e) **CROSS**

C: CTN 662, cleared to cross RWY 05.

f) **BACKTRACK**

C: CTN 662, cleared to backtrack RWY 09.

g) **LINE UP**

C: CTN 662, line up RWY 05.

h) **HOLD SHORT OF AN ACTIVE RUNWAY**

C: CTN 662, hold short of RWY 05.

(INCLUDING THE CONDITION OF A CODITIONAL CLEARANCE)

6 TEST PROCEDURES - RADIO CHECK AND READABILITY SCALE

When radio checks are made, the following readability scale is to be used to indicate the quality of the

transmission:

Table 13: Readability scale

Quality Scale
Unreadable 1
Readable now and then 2
Readable but with difficulty 3
Readable 4
Perfectly readable 5

Test transmissions should consist of the following
items:

1. the identification of the aeronautical station being called
2. the 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. information regarding the readability of transmission

Table 14: Radio check procedure

9A DAS, Zagreb Tower, reading you five	Zagreb Tower, 9A DAS, radio check 118,3 (box 1)
9A HBD, Zagreb Tower, reading you three, with a loud background whistle.	
9A HBD, Zagreb Tower, you are unreadable	

NOTE. - The readability of a transmission should be classified by the number (Table 13), together with any other information regarding the transmission which may be useful to the station making the test.

Exercise 1: Work in pairs. Produce examples of radio check using the following prompts:

ZAGREB TOWER

CTN 692 /NIK TOWER

118.275 /NIK TOWER

MAH 492
MAH 492

120.005
120.005

ZAGREB TOWER

DLH 392

119.005

ZAGREB TOWER

OAL523

121.225

ZAGREB TOWER
ZAGREB TOWER

THY 226
THY 226

118.350
118.350

PULA TOWER

BAW 407

117.255

ZAGREB TOWER
ZAGREB TOWER

7 Q CODES

The Q code is a standardized collection of three-letter message encodings, all starting with the letter "Q",

initially developed for commercial radiotelegraph communication, and later adopted by other radio services,

especially amateur radio. Although Q codes were created when radio used Morse code exclusively, they

continued to be employed after the introduction of voice transmissions. To avoid confusion, transmitter call

signs have often been limited to restrict ones starting with "Q" or having an embedded three-letter Q

sequence. The codes in the range QAA-QNZ are reserved for aeronautical use; QOA-QOZ for maritime use, and

QRA-QUZ for all services.

Q codes were used extensively in aviation when much of the communication work (especially HF-long range)

was done in Morse code. QNH was quicker to “key-in” than A.L.T.I.M.E.T.E.R. S.E.T.T.I.N.G S.E.A. L.E.V.E.L.

P.R.E.S.S.U.R.E.

Today some Q-codes are still widely used because they are useful abbreviations. They are spoken in plain

English, not phonetically.

(adapted from Wikipedia)

Table 15: Altimeter setting

Q CODE	MEANING
QFE	Atmospheric pressure at aerodrome elevation (or at RWY threshold)
QFU	Magnetic orientation of runway
QGH	Controlled descent through cloud
QNE	Standard pressure (1013.25 hPa) baseline pressure setting equivalent to the ISA at sea level
QNH	Altimeter sub-scale setting to obtain altitude above mean sea level (elevation when on the ground)

Table 16: Direction finding

Q CODE	MEANING
QDM	Magnetic direction TO a facility/ Magnetic heading (with nil wind)
QDR	Magnetic bearing (radial) FROM a facility
QTE	True bearing FROM a facility (station)
QUJ	True bearing TO a facility (station)

8 METEOROLOGICAL INFORMATION

Meteorological information in the form of reports, forecasts or warnings is made available to pilots using

aeronautical mobile service either by broadcast (e.g. VOLMET) or by means of specific transmissions from

ground personnel to pilots. Standard meteorological abbreviations and terms should be used and the

information should be transmitted slowly and enunciated clearly in order that the recipient may record such

data as are necessary. The following forms should be used:

a) WIND (number) DEGREES (number) (units)

b) WIND AT (height/altitude/flight level) (number) DEGREES (number) (units)

c) VISIBILITY (distance)

j) REPORT FLIGHT CONDITIONS
i) MODERATE (or TURBULENCE)

(area)

9A-DDA, ZADAR PRESENT WEATHER:
WIND 360

DEGREES, 5 KNOTS, VISIBILITY 10 KILOMETRES,

FEW AT 2500 FEET, QNH 1008

QNH 1008, 9A-DDA

9A-DDA, CORRECT

CTN 662, ZAGREB: WIND 360 DEGREES, 25

KNOTS, VISIBILITY 1000 METRES, CONTINUOUS

MODERATE RAIN, OVERCAST 600 FEET, QNH

1001

QNH 1001, WHAT IS THE TEMPERATURE, CTN

662

CTN 662, CORRECT, TEMPERATURE 7

CTN 662

d) PRESENT WEATHER (details)

e) CLOUD (amount,
nt of base) (or SKY

f) CAVOK

g) TEMPERATURE (number))

) (and/or DEW POINT
) (and/or DEW POINT
) (and/or DEW POINT

MINUS
MINUS
MINUS
MINUS

h) QNH (or QFE) (number)

8.1 WAKE VORTEX SEPARATION

Wake turbulence is turbulence that forms behind an aircraft as it passes through the air. This turbulence

includes various components, the most important of which are wingtip vortices and jetwash. Jetwash refers

simply to the rapidly moving gasses expelled from a jet engine; it is extremely turbulent, but of short duration.

Wingtip vortices, on the other hand, are much more stable and can remain in the air for up to two minutes

after the passage of an aircraft. Wingtip vortices make up the primary and most dangerous component of wake

turbulence.

Wake turbulence is especially hazardous during the landing and take-off phases of flight, for three reasons. The

first is that during take-off and landing, aircraft operate at low speeds and high angle of attack. This flight

attitude maximizes the formation of dangerous wingtip vortices. Secondly, takeoff and landing are the times

when a plane is operating closest to its stall speed and to the ground - meaning there is little margin for

recovery in the event of encountering another aircraft's wake turbulence. Thirdly, these phases of flight put

aircraft closest together and along the same flight path, maximizing the chance of encountering the

phenomenon.

ICAO mandates separation minima based upon wake vortex categories that are, in turn, based upon the

Maximum Take Off Mass (MTOM) of the aircraft.

These minima are categorized as follows:

Light - MTOM of 7,000 kilograms or less;

Medium - MTOM of greater than 7,000 kilograms, but less than 136,000 kilograms;

Heavy - MTOM of 136,000 kilograms or greater.

8.2 BRAKING ACTION

Braking action in aviation is a description of how easily an aircraft can stop after landing on a runway. Either

pilots or airport management can report the braking action.

When reporting braking action, any of the following terms may be used:

Good

Medium (Medium used to be known as Fair)

Poor

Nil - bad or no braking action, not measured, (in SNOTAM NIL refers to the deposits over total runway

length= clear and dry)

Table 17: Friction measurements on each third of Runway and friction measuring device (from SNOTAM)

MEASURED OR CALCULATED COEFICIENT	ESTIMATED SURFACE FRICTION
040 and above	Good 5
0.39 to 0.36	Medium/good 4
0.35 to 0.30	Medium 3
0.29 to 0.26	Medium/poor 2

0.29 and below	Poor 1
9 - unreliable	Unreliable 9

8.3 ESSENTIAL INFORAMTION ON AERODROME CONDITIONS

Essential information on aerodrome conditions is information necessary to safety in the operation of aircraft,

which refers to the movement area or any facilities usually associated with it. For example, construction work

on a taxi strip not connected to the runway-in-use would not be essential information to any aircraft except

one that might be taxied in the vicinity of the construction work. If all traffic must be confined to runways, that

fact should be considered as essential aerodrome information to any aircraft not familiar with the aerodrome.

1. construction or maintenance work on or immediately adjacent to the movement area
2. rough or broken surfaces on a RWY, TWY or apron whether marked or not
3. snow, slush or ice on a RWY, TWY or apron
4. water on RWY, TWY or apron

5. snow banks or drifts adjacent to RWY, TWY or apron

6. other temporary hazards including parked A/C and birds on the ground or in the air

7. failure of irregular operation of a part or all of the aerodrome lighting system

8. any other pertinent information

8.4 AMOUNT OF WATER ON THE RUNWAY

The runway conditions are very important for the aircraft landing and taking off from a certain airport. The controller shall inform the pilot of the amount of water on the runway whenever possible. The terminology used is the following:

DAMP – the surface shows a change of colour due to moisture.

WET – the surface is soaked but there is no standing water.

WATER PATCHES – patches of standing water are visible on the runway.

FLOODED – extensive standing water is visible on the runway.

8.5 SKY COVERING IN OKTAS

Sky covering refers to the amount of sky being covered by clouds. The sky is divided into eight parts or oktas

and according to the number of oktas being covered by clouds, the following expressions are used:

are:

1) FEW – Few 1/8 – 2/8

SKC – sky clear (0/8)

2) SCT – Scattered 3/8 – 4/8

3) BKN – Broken 5/8 – 7/8

4) OVC – Overcast 8/8

Other terms being used in connection to cloud cover

NSC – nil significant clouds

CAVOK – clouds/ceiling, visibility and weather
O.K.

8.6 WEATHER INFORMATION

Weather information should include the following information given in this order:

1) RUNWAY

2) WIND

3) QNH

4) TEMPERATURE

5) DEW POINT

7) CLOUDS

8) PRECIPITATION

9) CORRECT TIME

INFORMATION

CTN 662, ZAGREB TOWER, DEPARTURE RWY 05,

WIND 040 DEGREES, 5 KNOTS, QNH 1016,

TEMPERATURE 6, DEW POINT 5, VISIBILITY 6 KM,

BKN AT 1500FT, OVC AT 4000FT, LIGHT RAIN,

CORRECT TIME 0611

DEPARTURE RWY 05, QNH 1016, CTN 662

CTN 662, CORRECT

8.7 AUTOMATIC TERMINAL INFORMATION SERVICE (ATIS)

To alleviate RTF loading at some busy airports, ATIS messages are broadcast to pass routine arrival/departure

information on a discrete RTF frequency or on an appropriate VOR. It is a recorded message being played in a

continuous loop. It is coded using the phonetic alphabet and with every change in ATIS message, the code

(name) of the ATIS changes. Pilots inbound to the airports are normally required on first contact with the

aerodrome ATSU to acknowledge receipt of current information by quoting the code letter of the broadcast.

Pilots of outbound aircraft are not normally required to acknowledge receipt of departure ATIS except when

requested on the actual ATIS broadcast.

Aerodromes possessing ATIS, the hours of ATIS operation and the frequency employed are published in the

AIP.

ATIS broadcast will include the following:

1. Message identification i.e. "This is Zagreb Information Alpha".
2. Time of origin of weather report
3. Weather report
4. Runway(s) in use
5. Short term AIS information such as unserviceability of NAV AIDS, runway surfaces, etc.
6. Any other routine information useful to pilots operating at the aerodrome.

The QFE and RVR/RVRs are not included.

Rapidly changing meteorological situations sometimes make it impractical to include weather reports in the

broadcast. In these circumstances, ATIS messages will indicate that weather information will be passed on RTF.

Any significant change to the content of a current ATIS message will be passed to pilots by RTF until such time

as a new message is broadcast.

The highest cloud base that will be reported is 10,000 feet.

An example of ATIS broadcast:

"This is Zagreb Information Alpha, 0850 hours weather. Wind 240 12kt 10 km, intermittent slight rain, 3 octas 1000 ft, 8 octas 1800 ft, temperature +12, dew point +7, QNH 1011 hPa, landing RWY 23."

The pilot should report “Information Alpha received” on first contact with the Tower

8.8 VOICE WEATHER BROADCAST (VOLMET)

Meteorological aerodrome reports for certain aerodromes are broadcast on specified frequencies. The call sign

of the VOLMET, frequency, operating hours, aerodromes contained within the group, and contents are

published in the AIP.

The content of a VOLMET broadcast is as follows:

1. aerodrome identification
2. surface wind
3. visibility
8. dew point
9. QNH
10. Trend (if applicable)

Non essential words such as "surface wind", "visibility" etc. are not

spoken.

"SNOCLO" is used to indicate that aerodrome is unusable for take off/landings due to heavy snow on runway(s)

or snow clearance.

All broadcasts are in English.

9 ORDER OF INSTRUCTIONS IN AERODROME CONTROL ENVIRONMENT

VFR
DEPARTURES

1. INITIAL CALL + TAXI (DEPARTURE) INSTRUCTIONS
2. ATC CLEARANCE
3. TAKE OFF CLEARANCE
4. AIRBORNE AND/OR POSITION REPORT
5. FREQUENCY CHANGE

VFR ARRIVALS

1. INITIAL CALL + POSITION REPORT
2. JOINING INSTRUCTIONS
3. JOINING TRAFFIC CIRCUIT

4. LANDING CLEARANCE (LOW PASS/LOW APPROACH/ TOUCH AND GO CLR.)

5. INSTRUCTION TO VACATE THE RUNWAY (OR INSTRUCTION WHAT TO DO AFTER LOW PASS/LOW APPROACH/ TOUCH AND GO)

IFR DEPARTURES

1. INITIAL CALL + DEPARTURE INFORMATION
2. START UP CLEARANCE
3. TAXI INSTRUCTIONS
4. ATC CLEARANCE
5. TAKE OFF CLEARANCE
6. AIRBORNE
7. FREQUENCY CHANGE

IFR ARRIVALS

1. INITIAL CALL + POSITION REPORT
2. REPORT OUTER MARKER
3. LANDING CLEARANCE
4. INSTRUCTION TO VACATE THE RUNWAY

9.1 DEPARTURE INFORMATION

At the airports with no ATIS, departing aircraft will ask for departure information upon first contact with the

tower air traffic controller.

	CS, CS, (IFR/VFR TO DESTINATION), REQUEST **DEPARTURE INFORMATION**
CS, CS, DEPARTURE RUNWAY, WIND, QNH, **TEMPERATURE, DEW POINT, RVR, (VISIBILITY),** **DEPARTURE SLOT, CORRECT TIME**	

Zagreb Tower

	ZAGREB TOWER, CTN 622, IFR TO SPLIT, REQUEST DEPARTURE INFORMATION
CTN 662, ZAGREB TOWER, DEPARTURE RWY 05, WIND 040 DEGREES 5 KNOTS, QNH1018, TEMPERATURE 6, DEW POINT 5, VISIBILITY 6 KM, DEPARTURE SLOT 0705, CORRECT TIME 0611.	
	DEPARTURE RWY 05, QNH 1018, SLOT 0705, CTN662
CTN662, CORRECT	

Zagreb Tower

Zagreb Tower, 9AHGD, request departure information

9AHGD, Zagreb Tower, (good morning),

departure RWY 23, wind 220o/16kt, QNH 1005,

temperature 21, dew point 9, (correct) time 1015

RWY23, QNH 1005, 9AHGD

9AHGD, correct

Zadar Tower

Zadar Tower, 9AHGD, request departure information

9AHGD, Zadar Tower, departure RWY 32, wind

300o/16kt, QNH 1001, temperature 2, dew point

3, RVR 800m, time 0715

RWY 32, QNH 1001, 9AHGD

9AHGD, correct

Pula Tower

Pula Tower, 9AZVJ, request departure information

9AZVJ, Pula Tower, departure RWY 09, wind

060o/10kt, QNH 999, temp. 25/4, correct time

1645.

RWY09, QNH 999, 9AZVJ

9AZVJ, correct

Exercises 2: Work in pairs. Using the given data produce the pilot/controller communication on departure

information.

1. 09, 090/8, 1018, 15/4, 1010
2. 23, 280/15, 998, 24/3, 1600
3. 36, 310/10, 1010, 15/2, 0911
4. 09, 100/20, 1014, 18/3, 0926

9.2 ENGINE STARTING PROCEDURES

Engine starting procedures also known as start up clearance are procedures when a pilot asks the controller for

the permission to start the engines. It is being done to save fuel in case there are delays at the aerodrome and

the aircraft is not allowed to depart immediately. In case the pilot has not requested departure information

before start-up, departure runway and QNH are to be given to the pilot together with the start-up clearance.

If the pilot has received departure information just before start-up request, QNH does not have to be given to

the pilot together with the start-up clearance unless it changed in the meantime.

1.

9AHGD, request start up

9AHGD, unable to approve start up
(reason)

OR 9AHGD, negative start up

(reason)

9AHGD, roger

2.

9AHGD, request start up

9AHGD, expect departure at 20 start up at own

discretion

9AHGD, roger

(9AHGD)

3.

9AHGD, request start up.

9AHGD, start up approved, (departure RWY
05,

QNH 1012), report ready to taxi

Starting up, (RWY 05, QNH 1012), wilco,
9AHGD

9AHGD, correct

4.

9AHGD, request start up

9AHGD, your slot is 1002, start up at own

discretion

Slot 1002, roger, 9AHGD

9AHGD, correct

5.

9AHGD, request start up

9AHGD, expect start up at 02, QNH 1012

Roger, QNH 1012, 9AHGD

9AHGD, correct

6.

9AHGD, request start up

9AHGD, start up at 20, QNH 1012

To start up at 20, QNH 1012, 9AHGD

9AHGD, correct

Exercises 3: Work in pairs. Using the given data, produce start up clearances:

AC CALL SIGN QNH DEP. SLOT EXPECTED S/U START UP TIME

BAW 678 1008 1055

MAH 417 1003 0654

CTN 471 1022 1016

AZA 542 1014 1516

AUA677 1016 2036

ADR3S 998

DLH2CJ 1000 2140

9.3 PUSH-BACK/POWER-BACK PROCEDURES

When an aircraft is parked nose-in to the terminal, it has to be pushed backwards by tugs or by its own power

before taxiing for departure (power-back).

BAW 234, request push back from stand 13

BAW 234, pushback approved RWY 30

BAW 234

BAW 234, stand 23, request start up and push

back

BAW 234, start up and push back approved

runway 13

BAW 234, roger

BAW 234, stand 23, request push back

BAW 234, expect 2 minutes delay, B737 taxing

behind you

BAW 234, roger

9A BAV, request push back

9A BAV, negative, hold position, A/C taxing

behind you

9A BAV, roger

9A BAV, request push back

9A BAV, pushback at own discretion runway 05

Roger, RWY 05, 9A BAV

Ground crew – pilot

This exchange is followed by a visual signal to the pilot to indicate that disconnection is completed and all is

clear for taxiing.

Ground-cockpit, ready for push back

Cockpit-ground, confirm brakes released

Brakes released

Confirm brakes set

Brakes set

Commencing push back

Push back completed

Stop push back

Disconnect

Disconnecting, stand by for visual at your right/left

Towing procedures: Ground - vehicle

Ground, tug 9, request tow Croatia Airbus 319 from maintenance hangar to stand 12

Tug 9, tow approved via Taxiway F to stand 12

Apron, Tug 9, request tow DLH B737 from gate 20 to gate 14

Tug 9, proceed via A, hold short of RWY 15

Tug 9, to proceed via A, to hold short of RWY 15

Tug 9, hold position

Tug 9, holding

Tug 9, stand by

9.4 ATC CLEARANCE

ATC clearance is in fact a term often used for ATS route or en-route clearances. It is a clearance give to a pilot

before departure (either during taxiing or at the holding point) which confirms the filed flight plan. The pilot

should not enter the runway without having received and read back ATC clearance. ATC clearance consists of

the information about destination, route, departure procedure, level and transponder code of the departing

aircraft. There are slight differences between IFR and VFR ATC clearances.

9.4.1 IFR IFR ATC clearance should consist of the following:

CS, CLEARED TO destination VIA FLIGHT PLANNED ROUTE, LEVEL , SID , SQUAWK

.

IFR FLIGHT TO
SPLIT

CTN662, are you ready to copy ATC clearance?

CTN662, ready /affirm

CTN662 cleared to Split via flight planned route,

FL 130, SID MABAN 2R, squawk 7034

Cleared to Split via flight planned route, FL 130,

SID MABAN 2R, squawk 7034, CTN662

CTN662, correct

IFR FLIGHT TO
PULA

CTN662, cleared to Pula via flight planned route,

FL130, (when airborne) climb straight ahead until

passing 3000ft, then turn left cleared to GOLUN,

CRE, squawk 7015

Cleared to Pula, via flight planned route FL130, to

climb straight ahead and after passing 3000ft to

turn left to GOLUN, CRE next, squawk 7015,

CTN662.

CTN662, correct

9.4.2 VFR VFR ATC clearance should consist of the following:

CS, CLEARED VFR FLIGHT TO clearance limit/point/FIR boundary, etc., WHEN AIRBORNE TURN LEFT/RIGHT,

PROCEED TO (instructions), LEVEL , **SQUAWK**

VFR FLIGHT TO LUČKO

9ADDA, VFR flight to Lučko, ready to copy ATC

clearance

9ADDA, cleared VFR flight to Lučko, when

airborne turn left, proceed to Lučko, at 1500ft,

squawk 0015

Cleared VFR flight to Lučko, when airborne to

turn left, to proceed to Lučko, at 1500ft, squawk

0015, 9ADDA

9ADDA, correct

VFR FLIGHT TO SINJ

9ADDA, VFR flight to Sinj, ready to copy ATC

clearance

9ADDA, cleared VFR flight to Sinj, when airborne

turn right, proceed to S1 point, (altitude) 3000ft,

squawk 0017

Cleared VFR flight to Sinj, when airborne to turn

right, to proceed to S1 point, 3000ft, squawk

0017, 9ADDA

9ADDA, correct

VFR TRAINING FLIGHT

9ADKH, for VFR zone Toplana training flight,

ready to copy ATC clearance

9ADKH, cleared VFR training flight, when

airborne turn left, proceed to Toplana, altitude

2500ft, squawk 0016

Cleared VFR training flight, when airborne to turn

left, to proceed to Toplana, altitude 2500ft,

squawk 0016, 9ADKH

9ADKH, correct

VFR FLYING IN TRAFFIC CIRCUIT

9ADKH, for aerodrome traffic circuit training

flight, ready to copy ATC clearance

9ADKH, cleared left-hand traffic circuit RWY 05

training flight, when airborne turn left, join left-hand downwind RWY 05, altitude 1500 ft, squawk 0012

Cleared left-hand traffic circuit RWY 05 training flight, when airborne to turn left to join left-hand downwind RWY 05, altitude 1500 ft, squawk 0012, 9ADKH

9ADKH, correct

Exercise 4: Using the information provided in flight strips produce the ATC clearances for the following aircraft:

VFR PA18/L 0005 1500'

9ADPA TGL

110 LDZA LDZA

VFR C210/L 0015 2500'

9ACHD S1

120 LDSS

IFR AT72/M 6521 FL160

AZA 545 MABAN2C

250 LIMC

IFR A320/M 7073 FL130

CTN646 TEBLI2C

460 1125 LDDU

VFR C172/L 0023 1500'

9ADFC TGL

100 LDZA LDZA

VFR C172/L 0017 3000'

9ADEG E

100 LDOS

VFR C172/L 0010 3000'

9ADEG N1

100 LDVA

VFR PA18/L 0015 2500'

9ADRB S1

LDSB

IFR A320/M 6521 FL140

450 CTN510 NEDEL2C

450 EDDF

IFR AT43/M 7126 FL130

160 CTN623 GOLUN 2R

245 LDPL

IFR A319/M 6506 FL140

350 DLH450 NEDEL2C

460 EHAM

IFR A319/M 6342 FL140

350 MAH 485 RASIN2C

460 LHBP

9.5 TAXI PROCEDURES

Taxi instructions undergo readback which means that they should be repeated exactly as received since it can

greatly reduce the number of runway incursions especially at larger airports with a vast network of taxiways

and runways.

IFR FLIGHT – TAXI INSTRUCTIONS

CTN662, request taxi (instructions).

CTN662, taxi via taxiway Alpha to holding point

RWY 05.

To taxi via taxiway Alpha to holding point RWY

05, CTN662.

CTN662, correct

VFR FLIGHT TO LUČKO – TAXI INSTRUCTIONS

9ADDA, general aviation apron, VFR flight

to

Lučko, request taxi.

9ADDA, taxi to holding point RWY05 via taxiway

Bravo, wind 040o/5kt, QNH 1018, correct time

0611

To taxi to holding point RWY 05 via taxiway

Bravo, QNH 1018, 9ADDA

9ADDA, correct

VFR FLIGHT - TAXI INSTRUCTIONS

9ACDH, taxi via TWY B, C to holding point RWY

05, wind 070o/10kt, QNH 1009

To taxi via TWY B, C to holding point RWY 05,

QNH 1009, 9ACDH

9ACDH, correct

VFR FLIGHT – ZAGREB, RWY 23

9AHGD, starting up, request taxi instructions

9AHGD taxi to holding point RWY 23, wind

220o/16kt

To taxi to holding point RWY 23, 9AHGD

9AHGD, correct

9A UWX, request taxi clearance

9A UWX, taxi via TWY A to holding point RWY

23,

report approaching TWY B

To taxi via TWY A to holding point RWY 23,

wilco, 9A UWX.

9AUWX, correct.

9A UWX, approaching TWY B.

9A UWX, hold position.

Holding (position), 9A UWX.

9AUWX, correct.

9AUWX, approaching TWY B

9AUWX, roger, continue taxiing

9AUWX, roger

9A DDC, hold short of TWY B

Holding short of TWY B, 9A DDC

9A DDC, correct

9A BAV, request TWY B

9A BAV, TWY B approved, taxi via TWY B to

holding point B, RWY 23

To taxi via TWY B to holding point RWY 23, 9A

BAV

9A BAV, correct

9A BAV, give way to Airbus 319 passing ahead

of you

9A BAV, giving way to Airbus 319.

9A BAV, roger

OR

9A BAV, traffic/Airbus 319 in sight

9A BAV, roger

AFTER LANDING INSTRUCTIONS TO VACATE THE RUNWAY

CTN662, request taxi instructions

CTN662, vacate the runway via taxiway Delta,

taxi via taxiway Foxtrot to the apron, report

runway vacated

Via TWY Delta and Foxtrot to the apron, wilco,

CTN662

CTN662, correct

CTN662, runway vacated

CTN662, roger

CTN662, expedite vacating the runway via

taxiway Delta, traffic on final RWY 05, report

runway vacated

Expediting vacating via TWY Delta, wilco, CTN

662

CTN 662 correct

BACKTRACKING

CTN662, backtrack RWY 05, expedite vacating

the runway via taxiway Charlie, traffic on final

RWY 05, report runway vacated

To backtrack RWY 05 and to expedite vacating

the runway via taxiway Charlie, wilco, CTN662

CTN662 correct

CTN662, runway vacated

CTN662, roger

CTN 123, request backtrack RWY 11

CTN 123, backtrack RWY 11 approved

Backtrack RWY 11 approved, CTN 123

CTN 123, correct

CTN 123, request backtrack RWY 11

CTN 123, backtrack RWY 11

To backtrack RWY 11, CTN 123

CTN 123, correct

VARIOUS TAXI

INSTRUCTIONS:

CTN 123, expedite taxi (reason)

Expediting, CTN 123.

CTN 123, caution taxi slower (reason)

Slowing down, CTN 123.

CTN 123, vacate runway via taxiway A

Vacating runway via taxiway A, CTN 123

CTN 123, give way to Dash 80 entering the TWY C.

Giving way Dash 80 entering the TWY C, CTN 123

Take/turn first/second left/right

Taxi/turn right/left at the far end.

Taxi carefully

Follow (description of other aircraft or vehicle)

Taxi with caution

Taxi into holding bay

9.6 LINE UP

Line up is an instruction given to an aircraft to enter the runway, align with the runway centreline, do all the

necessary checks and wait for take-off clearance.

	9A DDC, at holding point RWY 23 ready for
	departure
9A DDC, line up (and wait).	
	Lining up, 9A DDC.
9A DDC, correct	
	9A DDC, approaching holding point RWY 23
(9A DDC, are you ready for immediate departure)	
	9A DDC, ready (or affirm).
9A DDC, line up and be ready for immediate	
departure	
	Lining up, 9A DDC
9ADDC, correct	

MULTIPLE LINE UPS ON THE SAME RUNWAY

When multiple runway/intersection departures are given, runway number is to be uttered. Line-up instructions

may be issued to more than one aircraft at different points on the same runway, taking into account that the

intersection take-off criteria shall be complied with and conditions of application fulfilled according to local

operating instructions.

9A DDC, line up RWY 23

Lining up RWY 23, 9A DDC

9ADDC, correct

9A DDC, line up and wait RWY 23, intersection C

Lining up RWY 23, intersection C, 9A DDC

9ADDC, correct

9.7 CONDITIONAL LINE-UP CLEARANCE

Conditional clearance affecting the active runways may be given only when the arriving aircraft is seen both by

the controller and the pilot of the departing aircraft and after the departing aircraft has correctly identified the

arriving aircraft on which the conditional clearance is based.

CTN662, traffic is Airbus 319 on final RWY 05.	
Report traffic in sight	
	CTN662, traffic in sight.
CTN662, roger, behind Airbus 319 line up behind	
	Behind Airbus 319 to line up behind, CTN662.
CTN662, correct	
CTN662, cleared for take off RWY 05, wind	
060o/5kt	
	Cleared for take off RWY 05, CTN662.
CTN662, correct	

9.8 TAKE OFF CLEARANCE

An aircraft is not allowed do take off without the take off clearance. Take off clearance can be given to the

aircraft during taxiing, at the holding point or on the line up position. It should be followed by the information

on wind direction and velocity. When visibility is good, the controller will also give the aircraft airborne time.

9A DDC, cleared for take off, wind 220o/14kt	
	Cleared for take off, 9A DDC

9ADDC, correct.

9A DDC, airborne at 23

In poor visibility (Applicable for Low Visibility operations) the controller will ask the pilot to report airborne

time.

9A DDC, cleared for take off, wind 220o/14kt,

report airborne

Cleared for take off, wilco 9A DDC

9ADDC, correct.

9A DDC, airborne at 23

When there is a possibility of confusion because there is more than one runway in use, the runway designator

is to be uttered together with the take-off clearance.

9A DDC, runway 05, wind 020o/14kt, cleared for

take off

RWY 05, cleared for take off, 9A DDC

9ADDC, correct.

9A DDC, airborne at 23

There are situations when the pilot has been given the take off clearance and has entered the runway in use

but has not commenced the take off. Then, the controller is to determine the pilot's intentions:

9A DDC, cleared for take off, wind 190o/20kt

THE AIRCRAFT IS NOT

MOVING

9A DDC, take off immediately or vacate the RWY

Taking off, 9A DDC

9ADDC, correct

9A DDC, cleared for take off, wind 190o/20kt

THE AIRCRAFT IS NOT MOVING

9A DDC, take off immediately or vacate the RWY

Vacating the RWY, 9A DDC

9ADDC, correct

CTN662, expedite departure, approaching traffic

on 2 mile final RWY 05

Taking off, CTN662

CTN662, correct

CTN662, take off immediately or vacate the RWY

via taxiway Bravo

Vacating the runway via taxiway B, CTN662

CTN662, correct

In situations when the pilot has been given the take off clearance, but is still at the holding point and is not

entering the runway in use to commence the take off, the controller is to determine the pilot's intentions:

CTN662, holding point RWY 23, ready for

departure

CTN662, cleared for take off, wind 210o/12kt.

THE AIRCRAFT IS NOT
MOVING

CTN662, take off immediately or hold short of

RWY.

Holding short, CTN662.

CTN662, correct

CTN662, holding point RWY 23, ready
for

departure.

CTN662, cleared for take off, wind 210o/12kt.

THE AIRCRAFT IS NOT
MOVING.

CTN662, take off immediately or hold short of

RWY.

Taking off, CTN662.

CTN662, correct

9A DDC, hold short of RWY.

Holding short, 9A DDC.

9A DDC, correct

9.8.1 CANCELLATION OF TAKE-OFF CLEARANCE AT THE HOLDING POINT

The take off clearance can be cancelled on the line up position or on the runway holding point.

In situations when the pilot has been given the take-off clearance but has not yet started the take-off roll and

there is some obstacle on the runway, the controller will attempt to stop the pilot/aircraft from taking off:

CTN 662, hold position, cancel take off, I say

again, cancel take off clearance, vehicle on the

runway

Holding position, CTN 662

CTN 662 correct.

9.8.2 REJECTING THE TAKE OFF CLEARANCE DURING THE TAKE OFF RUN

In situations when the pilot has been given the take-off clearance and has started the take-off roll and there is some obstacle on the runway, the controller will attempt to stop the pilot/aircraft from taking off:

CTN 662, stop immediately, CTN 662, stop immediately.

Stopping, CTN662

CTN 662, correct.

9.9 REPORTING AIRBORNE

In case the visibility is good the controller will provide the pilot with the airborne time. If the visibility is low, the controller will ask the pilot to report airborne time.

9A DDC, report airborne.

9A DDC, wilco

9A DDC, airborne at 25

9A DDC, roger, contact Zagreb Radar at 118,5

118,5, 9A DDC

9A DDC, correct, bye

9A DDC, cleared for take off, wind 220o/13kt,

report airborne

Cleared for take off, wilco, 9A DDC

9A DDC, correct

9A DDC, airborne at 27.

9A DDC, roger.

9A DDC, report leaving the control zone

9A DDC, wilco

9A DDC, leaving the control zone.

9A DDC, roger, contact Zagreb Radar on 118,5

118,5, 9A DDC

9.10 GO AROUND

A go-around is an aborted landing of an aircraft which is on final approach. If for some reason the pilot decides

not to land, s/he can simply fly back up to circuit height, and complete another circuit — in other words,

go

around again. The term go-around is still used even for modern airliners, though they may not use traditional

circuit patterns for landing. The manoeuvre is also known as a Balked Landing. The go-around procedure may

be initiated either by the air traffic control or by the pilot in command of the aircraft. The controller may

instruct the pilot to go around if there is an aircraft, vehicle or object on the runway or some other unsafe

condition. In both controlled and uncontrolled fields, the pilot in command may decide to go around at any

time, for example if the aircraft is not lined up or configured properly for a safe landing; an aircraft, vehicle or

other object has not cleared the runway; no landing clearance was received (in a controlled field); the landing

gear is not properly extended; a dangerous meteorological condition is experienced on final approach (e.g.,

poor visibility, excessive cross-winds, etc.); excessive energy (too high or too fast); or some other unsafe

condition is detected. IFR flights refer to "executing the missed approach" rather than a (VFR) go around

(adapted from Wikipedia).

VFR flight – go around initiated by the controller

9ADDB, go around, I say again, go around (not below	
1000 ft), traffic on the RWY, report downwind	
	Going around, wilco, 9ADDB
9ADDB, correct, report downwind	
	9ADDB, wilco

IFR flight - go around initiated by the controller

CTN 622, go around and follow missed approach	

procedure

Going around to follow missed approach procedure, CTN 622.

CTN 622, correct, contact Zagreb Radar 118,275

118,275, CTN622

CTN 622, correct

The pilot himself saw something on the runway or due to some other reason has decided to go around:

9ABBC, going around

9ABBC, roger, report right-hand downwind RWY 14.

9ABBC, wilco

9.11 LOW APPROACH

Low approach is an approach along or parallel to a runway descending to a specified minimum level. It is some

sort of a training flight when aircraft are flying along or parallel to a runway with its gear retracted

intentionally.

9A DDA, request low approach RWY 09 for training

9A DDA, cleared low approach RWY 09, wind

120o/6kt, not below 1000 feet, QNH 1009

Cleared low approach RWY 09, not below 1000 feet,

QNH 1009, 9A DDA

9A DDA, correct, after low approach proceed to E

point, climb to 3000 ft, squawk 1001

After low approach to proceed to E point, to climb to

3000 ft, squawk 1001, 9A DDA

9A DDA, correct

9ADDA, low approach completed.

9A DDA, roger, report passing 2000ft

9ADDA, wilco.

9.12 LOW PASS

In case of unsafe gear indication (left or right landing gear), the pilot may request to fly past the control tower

or some other observation point for the purpose of visual inspection from the ground. Low pass is to be

executed not below a certain level depending on the altitude of the observation point. Reasons given may be

unsafe indication of the left or right landing gear.

CTN 423, request low pass due unsafe indication of the

nose wheel

CTN 423, cleared for low pass RWY 23, wind

220o/12kt not below 500 feet, QNH 1010.

Cleared for low pass not below 500 ft, QNH 1010, CTN

423.

CTN 423, correct, after low pass turn right, join

right-hand downwind RWY 23.

After low pass to turn right, to join right-hand

downwind RWY 23, CTN 423.

50

CTN 423, correct

When passing the tower the controller can provide the pilot with the following information:

CTN 423, landing gear appears up

CTN 423, nose gear appears down

CTN 423, nose gear appears jammed

CTN 423, landing gear doesn't appear up

CTN 423, landing gear doesn't appear down

9.13 TOUCH AND GO

When a pilot wishes to land and take off again immediately for training purposes, thus reducing the time spent

on the ground s/he will ask for touch-and-go.

9ADKH, on final RWY 05, for touch-and-go (training)

9ADKH, cleared for touch-and-go RWY 05, wind

060o/5kt

Cleared for touch-and-go RWY 05, 9ADKH

9ADKH, correct, after touch-and-go turn right,

join right-hand traffic circuit RWY 05, report

downwind.

After touch-and-go to turn right to join right-hand traffic circuit RWY 05, wilco, 9ADKH

9ADKH, after touch-and-go turn right, join right-hand downwind RWY 05

OR

After touch-and-go to turn right, to join right-hand downwind RWY 05, 9ADKH.

9ADKH, correct

9.14 FULL STOP LANDING

After a number of touch-and-gos the pilot may ask for a full stop landing or in case the traffic situation does not

permit another execution of touch-and-go, the controller shall issue the instruction for the full stop landing.

9ADDA, request another touch-and-go for training.

9ADDA, unable to approve touch-and-go, make

full stop landing, cleared to land, wind 050o/4kt

OR

9ADDA, negative (due (to) traffic), make full stop landing, cleared to land, wind 050o/4kt.

Cleared

9ADDA, correct

9.15 FLYING IN THE TRAFFIC CIRCUIT/PATTERN/ZONE

Controlled airspace is an airspace of defined dimensions within which air traffic control service is provided to

IFR flights and to VFR flights in accordance with the airspace classification.

Airway is a control area or portion thereof established in the form of a corridor equipped with radio

navigational aids. (5 NM wide from the central line to each side)

Control zone (CTR) is a controlled airspace extending upwards from the surface of the earth to a specified

upper limit.

Terminal control area (TMA) is a control area normally established at the confluence of ATS routes in the

vicinity of one or more major aerodromes.

At uncontrolled airports and in CTR Croatian is spoken to VFR flights, and in all other situation English is spoken,

i.e. English phraseology.

ENTERING THE CONTROL ZONE – VFR

Zagreb tower, 9ADDA, S point , 2 000 ft, request

joining instructions for landing.

9ADDA, Zagreb TWR, roger, join left-hand pattern for

RWY 23, wind 200o/12kt, QNH 997, report downwind.

To join left-hand pattern for RWY 23, QNH

997,

wilco, 9ADDA.

9ADDA, correct

9ADDA, left-hand downwind (for) RWY 23

9ADDA, roger, you’re number 1.

9ADDA, join left-hand downwind RWY 23, wind

190o/14kt, QNH 1013.

To join left-hand downwind, RWY 23, QNH 1010,

9ADDA

9ADDA, downwind RWY 23

9ADDA, roger, report turning to base

9ADDA, wilco.

9ADDA, turning base

9ADDA, roger, report turning final

9ADDA, wilco

9ADDA, turning final

Exercise 5: Produce initial calls and joining instruction for the following aircraft:

VFR TRAFFIC
CIRCUIT

VFR PA18/L 0005 LDZL 1500'

9ADPA 1 TGL AT LDZA

3000' S1

110 LDZL LDSS

VFR C210/L 0009 2500'

9ADEG S1

120 LDSS

VFR C172/L 0006 2500'

9ADHV N1

100 LDZA LDVA

VFR C172/L 0001 1500

TGL

9ADDA

LDZA LDZA

VFR C150/L 2000'

9ADAB W

LDRG

VFR C210/L 0005 3000'

9AREG E

LDOS

VFR 0015 2500' N

9ACDH L/A

LDVA LDVA

Exercise 6: Produce complete exchange of messages (initial call, departure information, ATC clearance, take off

clearance or joining instructions for the following IFR
FLIGHTS

IFR F70/M 6543 FL140

280 AUA 333 MACEL2C

380 LOWW

IFR A320/M 7073 FL130

SWR 646 PODET2C

460 LSZH

IFR A320/M 6535 FL140

450 BAW 450 PODET2C

450 EGLL

IFR AT43/M 7076 FL130

160 CTN 369 RUDIK2C

245 LDSP

IFR A319/M ETO/PIS

AFR 698 1512

460 LFPG

IFR A319/M ETO/PIS

AZA123 1530

465 LIRF

IFR AT72/M 6521 FL160

AZA 545 MABAN2C

250 LIMC

9.16 DELAYING ACTIONS

For the purpose of maintaining the safe and orderly flow of traffic in the traffic circuit, the controller shall

sometimes use delaying actions to separate traffic. The pilot can be asked to orbit at a certain position, to make

one orbit or one 360 or to extend downwind.

MAKING 360/ AN ORBIT

When making an orbit the aircraft will lose 2 minutes. The controller needs to specify whether the orbit should

be made to the left or to the right and which will depend on the position in the traffic circuit. It is preferable to

make orbits away from the runway in use. Upon the completion, the pilot shall inform the controller that the

orbit has been completed.

9ADDA, make a three sixty right, (report three

sixty completed).

One three sixty right, (wilco), 9ADDA.

9ADDA, correct.

9ADDA, orbit completed.

9ADDA, roger, continue approach, report final.

9ADDA, roger, wilco.

ORBITING

The controller can ask the pilot to orbit at a certain position, which means that the aircraft will be orbiting

(doing orbits, each lasting 2 minutes) until the controller asks it to stop.

9ADDA, orbit right at position left-hand

downwind RWY 05.

To orbit right at L-H downwind RWY 05, 9ADDA.

9ADDA, stop orbiting, continue approach,

report final RWY 05.

Stopping, to continue approach, wilco, 9ADDA.

9ADDA correct.

9ADDA, orbit left at present position.

To orbit left at present position, 9ADDA.

9ADDA, correct.

9ADDA, you are number 3 for landing, orbit

over S point.

Number 3 for landing, to orbit over S point., 9ADDA.

9ADDA, correct.

9ADDA, hold over S until 25.

To hold over S until 25, 9ADDA.

9ADDA, correct.

EXTENDING DOWNWING

The pilot can be asked to extend downwind which means that the downwind section of the traffic circuit will be

prolonged and the aircraft will turn base later than usual, thus making the final leg of the traffic circuit longer

as well. The controller shall ask the pilot to turn base when the adequate separation has been established.

9ADDA extend left-hand downwind RWY 05,

(call you back for turning to base/final)

Extending left-hand downwind RWY 05, (roger), 9ADDA

9ADDA, correct (expect onward instructions

shortly)

9.17 AERODROME CONTROL - TRAFFIC INFORMATION

Traffic information shall be passed in order to arrange sequencing, to avoid unnecessary delay and to manage

safety issues evaluating time most efficiently. It shall consist of the call sign of the aircraft being addressed, and

information on the traffic consisting of the aircraft type, its position and level (when known).

Traffic information on VFR traffic:

9ADML, traffic is Piper 28 from Lučko to N

point at 2000 ft. (Report traffic in sight)

9A DKL, traffic is C150 just departing (from)

RWY 05, proceeding to N point, climbing to

2000 ft (Report traffic in sight)

9A DKL, traffic is Cessna 172 just airborne and

joining left-hand traffic circuit RWY 05

CTN 662, traffic is C 150 on left-hand

downwind RWY 05 at 2000 ft

The pilot can provide the following answers to acknowledge the receipt of the traffic information:

9ADDA, looking out.

9ADDA, traffic in sight.

9ADDA, negative contact.

Here is a combination of joining instructions and traffic information to traffic No. 2 regarding traffic No. 1:

Zagreb TOWER, 9ADKH departed from Lučko,

maintaining 1500 ft, for low approach at Zagreb

(request joining instructions).

9ADKH, Zagreb Tower, RWY in use 05, wind

060/5kt, QNH 1018, join left-hand traffic circuit

RWY 05, at 1500 ft, report downwind.

RWY 05, QNH 1018, to join left-hand traffic circuit RWY

05, at 1500 ft, wilco, 9ADKH.

9ADKH, correct.

9ADKH left-hand downwind RWY 05, 1500ft.

9ADKH, traffic/number one is A320 just passing

OM RWY 05, report traffic in sight.

9ADKH, traffic in sight.

9ADKH, roger, number two, follow A320,

report on final, caution wake turbulence.

Number two, wilco, roger, 9ADKH.

9ADKH, correct.

9ADKH, on final RWY 05.

9ADKH, cleared low approach RWY 05, wind

065o/7kt, not below 1000 ft, QNH 1018

Cleared low approach RWY 05, not below 1000 ft, QNH

1018, 9ADKH

9ADKH, correct, after low approach, turn left proceed to Lučko, climb to 1500ft, report over N point

Roger, after low approach to turn left to proceed to Lučko, to climb to1500 ft, wilco, 9ADKH

9ADKH correct

9.18 JOINING INSTRUCTIONS, FINAL APPROACH AND LANDING

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ARRIVING IFR TRAFFIC

Zagreb Tower, CTN 662, ILS established RWY 05.

CTN 662, Zagreb Tower, (roger) cleared to land

RWY05, wind 060/7kt.

Cleared to land RWY05, CTN662.

CTN662, correct.

ON 4NM FINAL

CTN 423, (on) final.

CTN 423, roger, do you have RWY in sight?

CTN 423, affirm.

CTN 423, cleared to land RWY 23, wind

190o/17k.t

Cleared to land RWY 23, CTN 423.

CTN 423, correct

ARRIVING VFR TRAFFIC

Zagreb Tower, 9ADDA, 7NM NE of the field at

1500ft, for landing.

9ADDA, Zagreb Tower, cleared for straight in

approach RWY 23, wind 220o/5, QNH 1009

Cleared for straight in approach RWY 23, QNH

1009, 9ADDA

In case the RWY is occupied and/or landing clearance will not be issued during the first contact, the pilot on an

instrument approach shall be instructed as follows:

Zagreb Tower, CTN 662, ILS established RWY 05

CTN 662, Zagreb Tower, (roger), continue

approach, report passing OM

Continuing approach, wilco, CTN662

CTN662 passing OM

CTN662 cleared to land, wind 060o/7kt

Cleared to land, CTN662

CTN662 correct

Zagreb Tower, CTN 662, ILS established

CTN 662, Zagreb Tower, continue approach,

report passing OM

Continuing approach, wilco, CTN662

CTN662, passing OM

CTN662, continue approach, expect landing

clearance shortly, (landed) aircraft still on the

RWY

Continuing approach, roger, CTN662

CTN662 cleared to land, wind 060/7kt

Cleared to land, CTN662

CTN662 correct

In case the RWY is occupied and landing clearance cannot be issued, the pilot on a visual approach shall be

instructed as follows:

Zagreb Tower, CTN 662, on final RWY05

CTN 662, Zagreb Tower, continue approach,

expect landing clearance shortly, RWY occupied

by landing aircraft

Continuing approach, roger, CTN662

CTN662, cleared to land, wind 060/7kt

Cleared to land, CTN662

CTN662, correct

VFR FLIGHT

Zagreb Tower, 9ADKH departed from Lučko to

Zagreb, maintaining 1500 ft, for landing (request

joining instructions).

9ADKH, Zagreb Tower, RWY in use 05, wind

060o/5kt, QNH 1018, join left-hand traffic circuit

RWY 05, report downwind, at 1500ft

RWY 05, QNH 1018, to join left-hand downwind

RWY 05, wilco, 1500ft, 9ADKH

9ADKH, correct

When there is no other traffic or there is sufficient time before another approaching traffic:

Zagreb Tower, 9ADKH departed from Lučko to

Zagreb, maintaining 1500ft, for landing.

9ADKH, Zagreb Tower, join left-hand base RWY

05, wind 060o/5kt, QNH 1018.

To join left-hand base RWY 05, QNH 1018,

9ADKH.

9ADKH correct.

9ADKH on left-hand base RWY05

9ADKH roger, cleared to land RWY05, wind

060o/5kt

Cleared to land, 9ADKH

9ADKH correct

Instructions to arriving traffic NDB Approach RWY 23 (Initial/intermediate fix /holding ZAG VOR)

Zagreb Tower, CTN 662, 7 miles ZAG

DME/inbound SK

CTN 662, Zagreb Tower, continue approach,

report SK inbound/final RWY 23.

CTN662 wilco

CTN662 passing SK

CTN662 cleared to land RWY 23 wind 200o/10kt

Cleared to land RWY 23, CTN662

CTN662 correct

Instructions to arriving traffic for LZ Approach RWY 23 (Initial/intermediate fix /holding ZAG VOR)

Zagreb Tower, CTN 662, inbound SK.

CTN 662, Zagreb Tower, roger, report SK.

CTN662 wilco

CTN662, passing SK.

CTN662, roger continue approach, expect landing

clearance shortly, runway still occupied

Continuing approach, roger, CTN662

CTN662, cleared to land RWY 23, wind 195/11 kt

Cleared to land RWY 23, CTN662

CTN662 correct

Instructions for visual departure

CTN 662 request visual departure

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CTN 662, cleared to ..., when airborne turn left/right, climb to 3000 ft visually, then proceed to ..., climb to 6000ft.

Cleared to ..., when airborne turn left/right, climb to 3000 ft visually, then proceed to ..., climb to 6000ft, CTN 662

CTN 662, correct

SOURCES:

1. ICAO Annex 2

2. ICAO Annex 10, volume II, Chapter 5

3. ICAO Doc 4444

4. ICAO Doc 9432 RTF Manual of Radiotelephony

5. AIC A03/08