

## Section 2. Radio Communications Phraseology and Techniques

### 4-2-1. General

- a.** Radio communications are a critical link in the ATC system. The link can be a strong bond between pilot and controller or it can be broken with surprising speed and disastrous results. Discussion herein provides basic procedures for new pilots and also highlights safe operating concepts for all pilots.
- b.** The single, most important thought in pilot-controller communications is understanding. It is essential, therefore, that pilots acknowledge each radio communication with ATC by using the appropriate aircraft call sign. Brevity is important, and contacts should be kept as brief as possible, but controllers must know what you want to do before they can properly carry out their control duties. And you, the pilot, must know exactly what the controller wants you to do. Since concise phraseology may not always be adequate, use whatever words are necessary to get your message across. Pilots are to maintain vigilance in monitoring air traffic control radio communications frequencies for potential traffic conflicts with their aircraft especially when operating on an active runway and/or when conducting a final approach to landing.
- c.** All pilots will find the Pilot/Controller Glossary very helpful in learning what certain words or phrases mean. Good phraseology enhances safety and is the mark of a professional pilot. Jargon, chatter, and “CB” slang have no place in ATC communications. The Pilot/Controller Glossary is the same glossary used in FAA Order JO 7110.65, Air Traffic Control. We recommend that it be studied and reviewed from time to time to sharpen your communication skills.

### 4-2-2. Radio Technique

- a. Listen** before you transmit. Many times you can get the information you want through [ATIS](#) or by monitoring the frequency. Except for a few situations where some frequency overlap occurs, if you hear someone else talking, the keying of your transmitter will be futile and you will probably jam their receivers causing them to repeat their call. If you have just changed frequencies, pause, listen, and make sure the frequency is clear.
- b. Think** before keying your transmitter. Know what you want to say and if it is lengthy; e.g., a flight plan or IFR position report, jot it down.
- c.** The microphone should be very close to your lips and after pressing the mike button, a slight pause may be necessary to be sure the first word is transmitted. Speak in a normal, conversational tone.
- d.** When you release the button, wait a few seconds before calling again. The controller or [FSS](#) specialist may be jotting down your number, looking for your flight plan, transmitting on a different frequency, or



c. Be alert to the sounds of the *stuck mike* in your receiver. Check your volume, recheck your frequency, and *make sure that your microphone is not stuck* in the transmit position. Frequency blockage can, and has, occurred for extended periods of time due to unintentional transmitter operation. This type of interference is commonly referred to as a “stuck mike,” and controllers may refer to it in this manner when attempting to assign an alternate frequency. If the assigned frequency is completely blocked by this type of interference, use the procedures described for en route IFR radio frequency outage to establish or reestablish communications with ATC.

f. Be sure that you are within the performance range of your radio equipment and the ground station equipment. Remote radio sites do not always transmit and receive on all of a facility's available frequencies, particularly with regard to VOR sites where you can hear but not reach a ground station's receiver. Remember that higher altitudes increase the range of VHF “line of sight” communications.

### 4-2-3. Contact Procedures

#### a. Initial Contact.

1. The terms *initial contact* or *initial callup* means the first radio call you make to a given facility or the first call to a different controller or FSS specialist within a facility. Use the following format:

- (a) Name of the facility being called;
- (b) Your *full* aircraft identification as filed in the flight plan or as discussed in paragraph 4-2-4, Aircraft Call Signs;
- (c) When operating on an airport surface, state your position.
- (d) The type of message to follow or your request if it is short; and
- (e) The word “Over” if required.

#### **EXAMPLE-**

1. *“New York Radio, Mooney Three One One Echo.”*
2. *“Columbia Ground, Cessna Three One Six Zero Foxtrot, south ramp, I-F-R Memphis.”*
3. *“Miami Center, Baron Five Six Three Hotel, request V-F-R traffic advisories.”*

2. Many FSSs are equipped with Remote Communications Outlets (RCOs) and can transmit on the same frequency at more than one location. The frequencies available at specific locations are indicated on charts above FSS communications boxes. To enable the specialist to utilize the correct transmitter, advise the location and the frequency on which you expect a reply.

#### **EXAMPLE-**

*St. Louis FSS can transmit on frequency 122.3 at either Farmington, Missouri, or Decatur, Illinois, if you are in the vicinity of Decatur, your callup should be “Saint Louis radio, Piper*



5. If radio reception is reasonably assured, inclusion of your request, your position or altitude, and the phrase “(ATIS) Information Charlie received” in the initial contact helps decrease radio frequency congestion. Use discretion; do not overload the controller with information unneeded or superfluous. If you do not get a response from the ground station, recheck your radios or use another transmitter, but keep the next contact short.

***EXAMPLE-***

*“Atlanta Center, Duke Four One Romeo, request V-F-R traffic advisories, Twenty Northwest Rome, seven thousand five hundred, over.”*

**b. Initial Contact When Your Transmitting and Receiving Frequencies are Different.**

1. If you are attempting to establish contact with a ground station and you are receiving on a different frequency than that transmitted, indicate the VOR name or the frequency on which you expect a reply. Most FSSs and control facilities can transmit on several VOR stations in the area. Use the appropriate FSS call sign as indicated on charts.

***EXAMPLE-***

*New York FSS transmits on the Kennedy, the Hampton, and the Calverton VORTACs. If you are in the Calverton area, your callup should be “New York radio, Cessna Three One Six Zero Foxtrot, receiving Calverton V-O-R, over.”*

2. If the chart indicates FSS frequencies above the VORTAC or in the FSS communications boxes, transmit or receive on those frequencies nearest your location.

3. When unable to establish contact and you wish to call *any* ground station, use the phrase “ANY RADIO (tower) (station), GIVE CESSNA THREE ONE SIX ZERO FOXTROT A CALL ON (frequency) OR (V-O-R).” If an emergency exists or you need assistance, so state.

**c. Subsequent Contacts and Responses to Callup from a Ground Facility.**

Use the same format as used for the initial contact except you should state your message or request with the callup in one transmission. The ground station name and the word “Over” may be omitted if the message requires an obvious reply and there is no possibility for misunderstandings. *You should acknowledge all callups or clearances* unless the controller or FSS specialist advises otherwise. There are some occasions when controllers must issue time-critical instructions to other aircraft, and they may be in a position to observe your response, either visually or on radar. If the situation demands your response, take appropriate action or immediately advise the facility of any problem. Acknowledge with your aircraft identification, either at the beginning or at the end of your transmission, and one of the words “Wilco,” “Roger,” “Affirmative,” “Negative,” or other appropriate remarks; e.g., “PIPER TWO ONE FOUR LIMA, ROGER.” If you have been receiving services; e.g., VFR traffic advisories and you are leaving the area or changing frequencies, advise the ATC facility and terminate contact.

**d. Acknowledgement of Frequency Changes.**



new frequency, without an acknowledgement, the controller's workload is increased because there is no way of knowing whether you received the instruction or have had radio communications failure.

2. At times, a controller/specialist may be working a sector with multiple frequency assignments. In order to eliminate unnecessary verbiage and to free the controller/specialist for higher priority transmissions, the controller/specialist may request the pilot "(Identification), change to my frequency 134.5." This phrase should alert the pilot that the controller/specialist is only changing frequencies, not controller/specialist, and that initial callup phraseology may be abbreviated.

**EXAMPLE-**

*"United Two Twenty-Two on one three four point five" or "one three four point five, United Two Twenty-Two."*

**e. Compliance with Frequency Changes.**

When instructed by ATC to change frequencies, select the new frequency as soon as possible unless instructed to make the change at a specific time, fix, or altitude. A delay in making the change could result in an untimely receipt of important information. If you are instructed to make the frequency change at a specific time, fix, or altitude, monitor the frequency you are on until reaching the specified time, fix, or altitudes unless instructed otherwise by ATC.

**REFERENCE-**

*AIM, Para 5-3-1, ARTCC Communications.*

**4-2-4. Aircraft Call Signs**

**a. Precautions in the Use of Call Signs.**

1. Improper use of call signs can result in pilots executing a clearance intended for another aircraft. Call signs should *never be abbreviated on an initial contact or at any time when other aircraft call signs have similar numbers/sounds or identical letters/number*; e.g., Cessna 6132F, Cessna 1622F, Baron 123F, Cherokee 7732F, etc.

**EXAMPLE-**

*Assume that a controller issues an approach clearance to an aircraft at the bottom of a holding stack and an aircraft with a similar call sign (at the top of the stack) acknowledges the clearance with the last two or three numbers of the aircraft's call sign. If the aircraft at the bottom of the stack did not hear the clearance and intervene, flight safety would be affected, and there would be no reason for either the controller or pilot to suspect that anything is wrong. This kind of "human factors" error can strike swiftly and is extremely difficult to rectify.*



remained before taking action on an ATC clearance. ATC specialists will not abbreviate call signs of air carrier or other civil aircraft having authorized call signs. ATC specialists may initiate abbreviated call signs of other aircraft by using the *prefix and the last three digits/letters* of the aircraft identification after communications are established. The pilot may use the abbreviated call sign in subsequent contacts with the ATC specialist. When aware of similar/identical call signs, ATC specialists will take action to minimize errors by emphasizing certain numbers/letters, by repeating the entire call sign, by repeating the prefix, or by asking pilots to use a different call sign temporarily. Pilots should use the phrase “VERIFY CLEARANCE FOR (your complete call sign)” if doubt exists concerning proper identity.

**3.** Civil aircraft pilots should state the aircraft type, model or manufacturer's name, followed by the digits/letters of the registration number. When the aircraft manufacturer's name or model is stated, the prefix “N” is dropped; e.g., Aztec Two Four Six Four Alpha.

***EXAMPLE-***

**1.** *Bonanza Six Five Five Golf.*

**2.** *Breezy Six One Three Romeo Experimental (omit “Experimental” after initial contact).*

**4.** Air Taxi or other commercial operators *not* having FAA authorized call signs should prefix their normal identification with the phonetic word “Tango.”

***EXAMPLE-***

*Tango Aztec Two Four Six Four Alpha.*

**5.** Air carriers and commuter air carriers having FAA authorized call signs should identify themselves by stating the complete call sign (using group form for the numbers) and the word “super” or “heavy” if appropriate.

***EXAMPLE-***

**1.** *United Twenty-Five Heavy.*

**2.** *Midwest Commuter Seven Eleven.*

**6.** Military aircraft use a variety of systems including serial numbers, word call signs, and combinations of letters/numbers. Examples include Army Copter 48931; Air Force 61782; REACH 31792; Pat 157; Air Evac 17652; Navy Golf Alfa Kilo 21; Marine 4 Charlie 36, etc.

**b. Air Ambulance Flights.**

Because of the priority afforded air ambulance flights in the ATC system, extreme discretion is necessary when using the term “MEDEVAC.” It is only intended for those missions of an urgent medical nature and to be utilized only for that portion of the flight requiring priority handling. It is important for ATC to be aware of a flight's MEDEVAC status, and it is the pilot's responsibility to ensure that this information is provided to ATC.



transmissions by stating “MEDEVAC” followed by the FAA authorized call sign (AOC, GED, or Special, or local) or the aircraft civil “N” registration numbers/letters.

**EXAMPLE-**

*If the aircraft identification of the flight indicates DAL51, the pilot states “MEDEVAC Delta Fifty One.”*

*If the aircraft identification of the flight indicates MDSTR1, the pilot states “MEDEVAC Medstar One.”*

*If the aircraft identification of the flight indicates N123G or LN123G, the pilot states “MEDEVAC One Two Three Golf”.*

2. If requested by the pilot, ATC will provide additional assistance (e.g., landline notifications) to expedite ground handling of patients, vital organs, or urgently needed medical materials. When possible make these requests to ATC via methods other than through ATC radio frequencies.

3. MEDEVAC flights may include:

(a) Civilian air ambulance flights responding to medical emergencies (e.g., first call to an accident scene, carrying patients, organ donors, organs, or other urgently needed lifesaving medical material).

(b) Air carrier and air taxi flights responding to medical emergencies. The nature of these medical emergency flights usually concerns the transportation of urgently needed lifesaving medical materials or vital organs, but can include inflight medical emergencies. It is imperative that the company/pilot determine, by the nature/urgency of the specific medical cargo, if priority ATC assistance is required.

4. When filing a flight plan, pilots may include “L” for MEDEVAC with the aircraft registration letters/digits and/or include “MEDEVAC” in Item 11 (Remarks) of the flight plan or Item 18 (Other Information) of an international flight plan. However, ATC will only use these flight plan entries for informational purposes or as a visual indicator. ATC will only provide priority handling when the pilot verbally identifies the “MEDEVAC” status of the flight as described in subparagraph b1 above.

**NOTE-**

*Civilian air ambulance aircraft operating VFR and without a filed flight plan are eligible for priority handling in accordance with subparagraph b1 above.*

5. ATC will also provide priority handling to HOSP and AIR EVAC flights when verbally requested. These aircraft may file “HOSP” or “AIR EVAC” in either Item 11 (Remarks) of the flight plan or Item 18 of an international flight plan. For aircraft identification in radio



will use the **UNICOM** call sign.

### c. Student Pilots Radio Identification.

1. The FAA desires to help student pilots in acquiring sufficient practical experience in the environment in which they will be required to operate. To receive additional assistance while operating in areas of concentrated air traffic, student pilots need only identify themselves as a student pilot during their initial call to an FAA radio facility.

#### **EXAMPLE-**

*Dayton tower, Fleetwing One Two Three Four, student pilot.*

2. This special identification will alert FAA ATC personnel and enable them to provide student pilots with such extra assistance and consideration as they may need. It is recommended that student pilots identify themselves as such, on initial contact with each clearance delivery prior to taxiing, ground control, tower, approach and departure control frequency, or **FSS** contact.

### 4-2-5. Description of Interchange or Leased Aircraft

a. Controllers issue traffic information based on familiarity with airline equipment and color/markings. When an air carrier dispatches a flight using another company's equipment and the pilot does not advise the terminal ATC facility, the possible confusion in aircraft identification can compromise safety.

b. Pilots flying an “interchange” or “leased” aircraft not bearing the colors/markings of the company operating the aircraft should inform the terminal ATC facility on first contact the name of the operating company and trip number, followed by the company name as displayed on the aircraft, and aircraft type.

#### **EXAMPLE-**

*Air Cal Three Eleven, United (interchange/lease), Boeing Seven Two Seven.*

### 4-2-6. Ground Station Call Signs

Pilots, when calling a ground station, should begin with the name of the facility being called followed by the type of the facility being called as indicated in [TBL 4-2-1](#).

**TBL 4-2-1**

**Calling a Ground Station**

<b>Facility</b>	<b>Call Sign</b>
Airport UNICOM	“Shannon UNICOM”
FAA Flight Service Station	“Chicago Radio”
Airport Traffic Control Tower	“Augusta Tower”
Clearance Delivery Position (IFR)	“Dallas Clearance Delivery”
Ground Control Position in Tower	“Miami Ground”
Radar or Nonradar Approach Control Position	“Oklahoma City Approach”
Radar Departure Control Position	“St. Louis Departure”
FAA Air Route Traffic Control Center	“Washington Center”



The International Civil Aviation Organization (ICAO) phonetic alphabet is used by FAA personnel when communications conditions are such that the information cannot be readily received without their use. ATC facilities may also request pilots to use phonetic letter equivalents when aircraft with similar sounding identifications are receiving communications on the same frequency. Pilots should use the phonetic alphabet when identifying their aircraft during initial contact with air traffic control facilities. Additionally, use the phonetic equivalents for single letters and to spell out groups of letters or difficult words during adverse communications conditions. (See TBL 4-2-2.)

TBL 4-2-2

## Phonetic Alphabet/Morse Code

Character	Morse Code	Telephony	Phonic (Pronunciation)
A	• –	Alfa	(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-TEL)
I	••	India	(IN-DEE-AH)
J	• – – –	Juliett	(JEW-LEE-ETT)
K	– • –	Kilo	(KEY-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-NEE-FORM) or (OO-NEE-FORM)
V	••• –	Victor	(VIK-TAH)
W	• – –	Whiskey	(WISS-KEY)
X	– •• –	Xray	(ECKS-RAY)
Y	– • – –	Yankee	(YANG-KEY)
Z	– – ••	Zulu	(ZOO-LOO)
1	• – – – –	One	(WUN)
2	•• – – –	Two	(TOO)
3	••• – –	Three	(TREE)
4	•••• –	Four	(FOW-ER)



7	-- ● ● ●	Seven	(SEV-EN)
8	--- ● ●	Eight	(AIT)
9	---- ●	Nine	(NIN-ER)
0	-----	Zero	(ZEE-RO)

#### 4-2-8. Figures

a. Figures indicating hundreds and thousands in round number, as for ceiling heights, and upper wind levels up to 9,900 must be spoken in accordance with the following.

**EXAMPLE-**

1. 500 . . . . . *five hundred*

2. 4,500 . . . . . *four thousand five hundred*

b. Numbers above 9,900 must be spoken by separating the digits preceding the word “thousand.”

**EXAMPLE-**

1. 10,000 . . . . . *one zero thousand*

2. 13,500 . . . . . *one three thousand five hundred*

c. Transmit airway or jet route numbers as follows.

**EXAMPLE-**

1. V12 . . . . . *Victor Twelve*

2. J533 . . . . . *J Five Thirty-Three*

d. All other numbers must be transmitted by pronouncing each digit.

**EXAMPLE-**

10 . . . . . *one zero*

e. When a radio frequency contains a decimal point, the decimal point is spoken as “POINT.”

**EXAMPLE-**

122.1 . . . . . *one two two point one*

**NOTE-**

*ICAO procedures require the decimal point be spoken as “DECIMAL.” The FAA will honor such usage by military aircraft and all other aircraft required to use ICAO procedures.*

#### 4-2-9. Altitudes and Flight Levels

a. Up to but not including 18,000 feet MSL, state the separate digits of the thousands plus the hundreds if appropriate.

**EXAMPLE-**

1. 12,000 . . . . . *one two thousand*

2. 12,500 . . . . . *one two thousand five hundred*



the flight level.

**EXAMPLE-**

1. 190 . . . . . *Flight Level One Niner Zero*

2. 275 . . . . . *Flight Level Two Seven Five*

**4-2-10. Directions**

The three digits of bearing, course, heading, or wind direction should always be magnetic. The word “true” must be added when it applies.

**EXAMPLE-**

1. (Magnetic course) 005 . . . . . *zero zero five*

2. (True course) 050 . . . . . *zero five zero true*

3. (Magnetic bearing) 360 . . . . . *three six zero*

4. (Magnetic heading) 100 . . . . . *heading one zero zero*

5. (Wind direction) 220 . . . . . *wind two two zero*

**4-2-11. Speeds**

The separate digits of the speed followed by the word “KNOTS.” Except, controllers may omit the word “KNOTS” when using speed adjustment procedures; e.g., “REDUCE/INCREASE SPEED TO TWO FIVE ZERO.”

**EXAMPLE-**

(Speed) 250 . . . . . *two five zero knots*

(Speed) 190 . . . . . *one niner zero knots*

The separate digits of the Mach Number preceded by “Mach.”

**EXAMPLE-**

(Mach number) 1.5 . . . . . *Mach one point five*

(Mach number) 0.64 . . . . . *Mach point six four*

(Mach number) 0.7 . . . . . *Mach point seven*

**4-2-12. Time**

a. FAA uses Coordinated Universal Time (UTC) for all operations. The word “local” or the time zone equivalent must be used to denote local when local time is given during radio and telephone communications. The term “Zulu” may be used to denote UTC.

**EXAMPLE-**

0920 UTC . . . . . *zero niner two zero,*

*zero one two zero pacific or local,*

*or one twenty AM*



### Standard Time to Coordinated Universal Time

Eastern Standard Time	Add 5 hours
Central Standard Time	Add 6 hours
Mountain Standard Time	Add 7 hours
Pacific Standard Time	Add 8 hours
Alaska Standard Time	Add 9 hours
Hawaii Standard Time	Add 10 hours

#### **NOTE-**

*For daylight time, subtract 1 hour.*

**c.** A reference may be made to local daylight or standard time utilizing the 24-hour clock system. The hour is indicated by the first two figures and the minutes by the last two figures.

#### **EXAMPLE-**

*0000 . . . . . zero zero zero zero*

*0920 . . . . . zero niner two zero*

**d.** Time may be stated in minutes only (two figures) in radiotelephone communications when no misunderstanding is likely to occur.

**e.** Current time in use at a station is stated in the nearest quarter minute in order that pilots may use this information for time checks. Fractions of a quarter minute less than 8 seconds are stated as the preceding quarter minute; fractions of a quarter minute of 8 seconds or more are stated as the succeeding quarter minute.

#### **EXAMPLE-**

*0929:05 . . . . . time, zero niner two niner*

*0929:10 . . . . . time, zero niner two niner and one-quarter*

### **4-2-13. Communications with Tower when Aircraft Transmitter or Receiver or Both are Inoperative**

#### **a. Arriving Aircraft.**

##### **1. Receiver inoperative.**

**(a)** If you have reason to believe your receiver is inoperative, remain outside or above the Class D surface area until the direction and flow of traffic has been determined; then, advise the tower of your type aircraft, position, altitude, intention to land, and request that you be controlled with light signals.

#### **REFERENCE-**

*AIM, Para 4-3-13, Traffic Control Light Signals.*

**(b)** When you are approximately 3 to 5 miles from the airport, advise the tower of your position and join the airport traffic pattern. From this point on, watch the tower for



downwind and/or turning base leg.

**2. Transmitter inoperative.** Remain outside or above the Class D surface area until the direction and flow of traffic has been determined; then, join the airport traffic pattern. Monitor the primary local control frequency as depicted on Sectional Charts for landing or traffic information, and look for a light signal which may be addressed to your aircraft. During hours of daylight, acknowledge tower transmissions or light signals by rocking your wings. At night, acknowledge by blinking the landing or navigation lights. To acknowledge tower transmissions during daylight hours, hovering helicopters will turn in the direction of the controlling facility and flash the landing light. While in flight, helicopters should show their acknowledgement of receiving a transmission by making shallow banks in opposite directions. At night, helicopters will acknowledge receipt of transmissions by flashing either the landing or the search light.

**3. Transmitter and receiver inoperative.** Remain outside or above the Class D surface area until the direction and flow of traffic has been determined; then, join the airport traffic pattern and maintain visual contact with the tower to receive light signals. Acknowledge light signals as noted above.

**b. Departing Aircraft.** If you experience radio failure prior to leaving the parking area, make every effort to have the equipment repaired. If you are unable to have the malfunction repaired, call the tower by telephone and request authorization to depart without two-way radio communications. If tower authorization is granted, you will be given departure information and requested to monitor the tower frequency or watch for light signals as appropriate. During daylight hours, acknowledge tower transmissions or light signals by moving the ailerons or rudder. At night, acknowledge by blinking the landing or navigation lights. If radio malfunction occurs after departing the parking area, watch the tower for light signals or monitor tower frequency.

**REFERENCE-**

*14 CFR Section 91.125 and 14 CFR Section 91.129.*

**4-2-14. Communications for VFR Flights**

**a. FSSs and Supplemental Weather Service Locations (SWSL)** are allocated frequencies for different functions; for example, in Alaska, certain FSSs provide Local Airport Advisory on 123.6 MHz or other frequencies which can be found in the Chart Supplement. If you are in doubt as to what frequency to use, 122.2 MHz is assigned to the majority of FSSs as a common en route simplex frequency.

**NOTE-**

*In order to expedite communications, state the frequency being used and the aircraft location during initial callup.*

**EXAMPLE-**

*Dayton radio, November One Two Three Four Five on one two two point two, over Springfield V-O-R, over.*



services and appropriate frequencies are listed in the Chart Supplement. On VFR flights, pilots are urged to monitor these frequencies. When in contact with a control facility, notify the controller if you plan to leave the frequency to monitor these broadcasts.

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