

## Air traffic control (ATC)

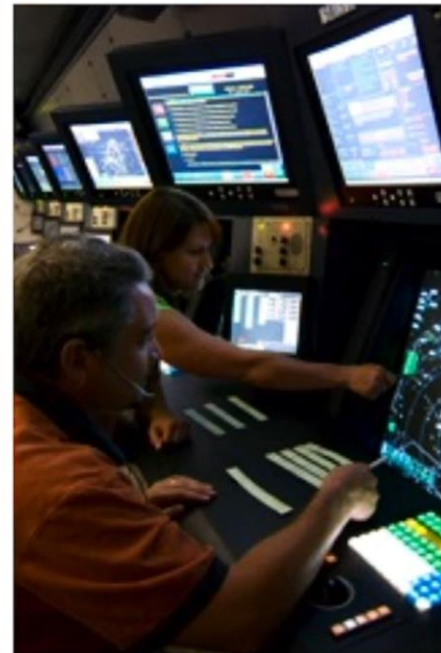
### Obtaining Airspace Authorizations

- ATC has the authority to approve or deny aircraft operations
- When ATC authorization is required, it must be requested and granted before any operation in that airspace
- Remote PICs should contact the appropriate ATC facility as soon as possible prior to any operation in Class B, C, D and E, provided their waiver mandates to do so.



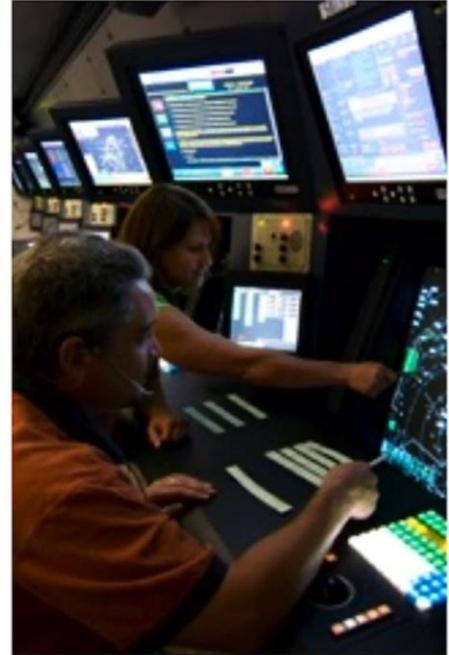
### Recurring or Long-Term Operations

- For recurring or long-term operations in controlled airspace, prior authorization could include a letter of agreement or LOA to establish operating procedures for small unmanned aircraft, which includes if the Remote pilot in command should establish 2-way radio operations with ATC.



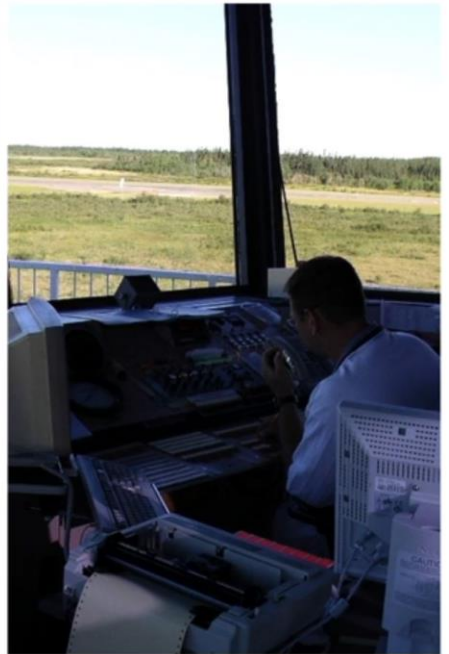
## Recurring or Long-Term Operations

- This LOA will outline the ability to integrate into the existing air traffic operation and may improve access to the airspace where operations are proposed
- This agreement ensures all parties are aware of limitations and conditions and help maintain safety. Even with a letter of agreement, you still need permission to enter the airspace



## FSS

- Flight Service Stations or FSS are air traffic facilities that provide pilot briefings, enroute communications and more services. They will issue, when necessary airport advisories, and weather observations



## Radio Technique

- Make sure the radio is audible
- Make sure the microphone is plugged in!
- Place the microphone close to your lips
- Listen before you transmit
- Think before you transmit
- Speak clearly
- Be patient for a response



The following examples demonstrate the proper form of address for ground facilities:

- Airport Unicom - "Freeway Unicom"
- Common Traffic Advisory Frequency (CTAF) - "Freeway Traffic"
- Airport Control Tower - "Easton Tower"
- Airport Ground Control - "Easton Ground"
- Flight Service Station (FSS) - "Montgomery County Radio"

## The following examples demonstrate the proper form of address for ground facilities:

- Enroute Flight Advisory Service (EFAS) - "Houston Flight Watch"
  - Clearance Delivery - "Austin Clearance Delivery"
  - Radar Approach Control - "Potomac Approach"
  - Radar Departure Control - "Patuxent Departure"
- 
- "Acknowledge"
  - "Advise intentions"
  - "Affirmative"
  - "Final"
  - "Hold for"
  - "Hold short"
  - "How do you hear me?"
  - "Immediately"
  - "Negative" - "No" or "permission not granted"
  - "Read back"
  - "Roger"
  - "Stand by"
  - "Unable"
  - "Verify"
  - "WILCO"
  - "Without delay"

- “500” should be spoken “fife hundred”
- “4,500” should be annunciated “four thousand fife hundred”
- The number nine is spoken “niner”
- The number five is spoken “fife”
- The three digits for course, heading or wind direction should be magnetic and spoken individually. 90 degrees is “Zero – Niner – Zero”
- Speed should be followed by the words “knots” or “mile per hour.” For example, the speed 87 knots is spoken “eighty-seven knots”

## Airports

When not listed on the chart, MULTICOM frequency is always 122.9 MHz, and the correct procedure for manned aircraft is to broadcast intentions when 10 miles from the airport



## Airports

- Who you are calling
- Who you are
- Where you are (position and altitude)
- What you want to do (unless you are just advising traffic of your position)
- Who you are calling (yes, say their name again)



## Examples

- “Freeway airport Skyhawk 474 sierra papa, five miles east at one thousand two hundred, inbound one eight, Freeway”
- This means I intend to land on runway 18

## Examples

- “Freeway Traffic, unmanned aircraft X-ray Yankee Zulu is 2 miles south, Level 200 and below, Freeway”
- “Freeway Unicom, unmanned aircraft X-ray Yankee Zulu is 3 miles south, at 200, airport advisory please”

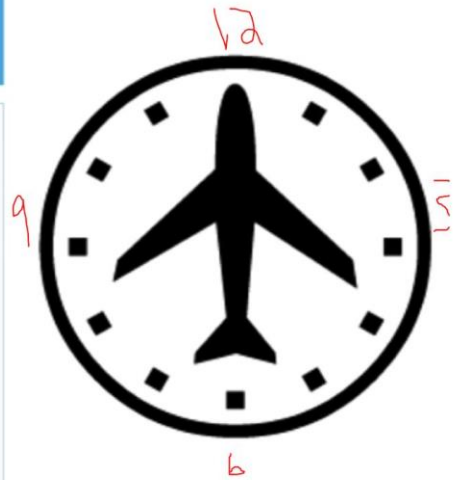
## ATC and Towered Airports

- Keep it brief; if the controller needs to know more, he or she will request further information



## Things To Remember

- A pilot who has just landed should not change from the tower frequency to the ground frequency until directed by the controller
- Traffic information will be given in terms of the 12-hour clock
- Monitor frequency and announce when appropriate
- Announce yourself when necessary



## Communications with Flight Service Stations

- Services provided by Flight Service Stations include dissemination of weather information
- Frequencies of Flight Service Stations are found on Sectional Aeronautical Charts above the frequency boxes of VOR facilities

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### Featured Capabilities

- Flight Plan Aids
- Inflight Electronic PIREP Submission
- ACAS - Adverse Condition Alerting Service
- NGB - Next Generation Briefings

### Flight Plan Aids

Flight Plan Aids help pilots optimize their flight plan altitude, departure time, and routing.

[Read More](#)

### Partnerships

Honeywell spidertracks  
GARMIN DELORME  
ForeFlight Naviator  
iFly GPS SkyVector  
aerovie AVARE

### News & Announcements

August 2, 2016

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## Lost Communication Procedures

- Remain outside of controlled space
- Radio malfunctions should be repaired before further flight
- No radio (NORDO) procedure arrivals are not accepted at busy airports
- If radio communication is lost, it may be a prudent to land immediately



## The Phonetic Alphabet

- |           |            |           |
|-----------|------------|-----------|
| • Alpha   | • Juliet   | • Sierra  |
| • Bravo   | • Kilo     | • Tango   |
| • Charlie | • Lima     | • Uniform |
| • Delta   | • Mike     | • Victor  |
| • Echo    | • November | • Whiskey |
| • Foxtrot | • Oscar    | • Xray    |
| • Golf    | • Papa     | • Yankee  |
| • Hotel   | • Quebec   | • Zulu    |
| • India   | • Romeo    |           |





## Line of Sight and Frequency Obstructions

- Both sUAS radio frequency bands (2.4GHz and 5.8GHz) are considered line of sight
- Be aware that the command and control link between the control station and the small unmanned aircraft may not work properly when barriers are between the control station and the unmanned aircraft

## Line of Sight and Frequency Obstructions

- Frequency interference is one of the most common causes of fly-aways; therefore remote PICs should assess the risk of such interference prior to and during flight

# Spectrum Authorization

- Some Frequency spectrum used for small UA operations are regulated by the FCC
- Some other operating frequencies are unlicensed and can be used freely
- For further information, visit: <https://www.fcc.gov/licensing-databases/licensing>