San Juan CERAP – Tower Cab Training Manual

Initial Release: v2.0
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Document Information

Purpose

This document prescribes the training requirements, procedures, and standards necessary to operate the Clearance Delivery, Ground and Tower controller positions at the San Juan CERAP. This document is intended to serve as a reference for controllers to use in preparation for their training sessions and as a tool for continuing education once certified.

Distribution

The San Juan CERAP Tower Cab Training Manual is distributed to all controllers of San Juan CERAP.

Responsibility

This document is the responsibility of the San Juan CERAP Air Traffic Manager and Training Administrator to maintain. The document is to be approved by the VATSIM Caribbean Division Training Director prior to release.

Updates and Changes

This is version C of the training manual. Any updates or changes to this document are noted in the Table of Revisions section of this document.

Cancellation

This document cancels any previous release version of the San Juan CERAP Tower Cab Training Manual published prior to June 30th, 2024

Table of Revisions

Date	Revision	Editor
2022/07/01	A - Initial Release	Jannes van Gestel
2022/10/01	B - Minor Revisions - Updated airspace diagrams - Updated navigation definitions - Added figure legends - Removed Section 9. Document Change Log	Francis Reilly
2024/02/29	C - General Updates - Revisited VATSIM rating information - Revisited ATC Basics Section - Updated Airspace Definitions - New section created for Navigation material. - Revisited Weather section - Included VFR minimums subsection - Minor revisions on Communications section - Updated Clearance Delivery Section - Updated Ground Operations Section - Updated Tower Operations Section	Francis Reilly

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Preface

Welcome to San Juan CERAP!

San Juan CERAP is part of the Caribbean Division of the VATSIM network (VATCAR). We are pleased you have chosen to join our team of controllers.

The San Juan CERAP (Combined En-Route Radar Approach Control) is strategically located in the Caribbean and handles a major part of the international route structure and traffic volume for the Eastern Caribbean and South American regions. Our airspace is complex in nature since it makes use of a combination of FAA and Oceanic procedures.

The following document is designed to help you become familiar with the Air Traffic Control (ATC) knowledge required to become a proficient Delivery, Ground and Tower controller.

We are here to ensure you succeed in your goal of becoming a VATSIM air traffic controller and look forward to working with you.

Francis Reilly
Air Traffic Manager
ZSU - San Juan CERAP
VATSIM Caribbean Division

Chapter 1. VATSIM Explained

1.1. VATSIM Caribbean Division (VATCAR)

VATCAR is composed of a series of Flight Information Regions (FIRs) which includes the San Juan CERAP (ZSU). Each facility is managed by an Air Traffic Manager (ATM) that reports directly to the Division Director (VATCAR1). During your application process, you selected San Juan CERAP as your home facility. The training team is responsible for your progression through all VATSIM controller ratings from Observer (OBS) to Controller 1 (C1).

1.2. VATSIM Ratings

VATSIM has an established controller rating system to provide a standardized way of identifying an air traffic controller's duties and responsibilities.

- OBS – Observer
  - The OBS rating is automatically assigned to any person that registers to become an air traffic controller on the VATSIM network.
  - This rating allows you to connect to the network using an approved ATC client to monitor air traffic communications on any active position.
  - The maximum visibility range for an OBS is 300 nautical miles.
  - **You are NOT authorized to control or communicate with ANY aircraft. This is a watch and listen ONLY rating.**

- S1 – Tower Trainee
  - The S1 rating is conferred after successfully completing your initial training and passing the S1 OTS (Over the Shoulder) exam.
  - This rating allows you to connect to authorized Clearance Delivery (DEL) and Ground Control (GND) positions within the lateral boundaries of the San Juan CERAP.
  - Ground (GND) controllers have positive control of all aircraft on the movement areas of an airport, with the exception of active runway(s).
  - The maximum visibility range for Clearance Delivery (DEL) and Ground (GND) is 20 nautical miles (NM).
  - Once you have controlled <u>at least 30 hours</u> as an S1 you will be eligible for S2 training.
  - Prior to taking the S2 rating exams, the S1 student must have controlled <u>at least 10 hours</u> on DEL or GND within the preceding 30 days.

- S2 – Tower Controller
  - The S2 endorsement is obtained after successfully completing S2 training and passing the S2 OTS.
  - Tower (TWR) controllers have positive control of all aircraft on the active runway(s) and the local airspace surrounding the airport.

    - The maximum visibility range for Tower (TWR) is 50 nautical miles.
    - TWR controllers are also responsible for providing GND and DEL services when these positions are not being staffed by another controller. This is known as **top-down controlling**.
    - Once you have controlled at least 40 hours on any Tower (TWR) position with your S2 rating you will be eligible for S3 training.
    - Prior to taking the S3 rating exams, the S2 student must have controlled at least 10 hours on TWR (or APP/DEP using a solo certification) within the preceding 30 days.

- S3 – TMA (Terminal) Controller
    - After completing this training and successfully passing another OTS, you will be endorsed as an S3 controller.
    - This rating will allow you to connect to authorized approach (APP) and departure (DEP) positions within the lateral boundaries of your home facility.
    - These positions can also be controlled using the top-down concept to include covering TWR, GND, and DEL.
    - Approach (APP) and Departure (DEP) controllers have positive control of most aircraft within the terminal area.
    - The size and dimension of the terminal airspace is unique to each facility.
    - The maximum visibility range for Approach (APP) and Departure (DEP) is 150 nm.
    - Once you have controlled at least 50 hours on any Approach (APP) or Departure (DEP) position with your S3 rating you will be eligible for C1 training.
    - Prior to taking the C1 rating exams, the S3 student must have controlled at least 10 hours on APP or DEP (or CTR using a solo certification) within the preceding 30 days.

- C1 – Enroute Controller
    - After completing this training and successfully passing another OTS, you will be endorsed as an C1 controller.
    - This rating will allow you to connect to and provide enroute services to all aircraft within the lateral boundaries of the CERAP.
    - These positions can also control using the top-down concept to include covering APP/DEP, TWR, GND, and DEL.
    - The maximum visibility range for Center (CTR) is 600 nautical miles.

Chapter 2. ATC Basics

2.1. ATC Duties

The objective of the VATSIM network is to emulate real world air traffic control, within the limitations of the environment. The San Juan CERAP uses guidance from FAA Order 7110.65 to carry out operations, with certain adaptations to fit the VATSIM model.

- What is the purpose of ATC?

  "The primary purpose of the ATC system is to prevent collisions between aircraft operating in controlled airspace and to provide safe, orderly, and expeditious flow of traffic."

- What are the duties of ATC?

  "Prioritize providing adequate separation between aircraft and issuing safety alerts as needed. Good judgement must be used when prioritizing all other provisions of the 7110.65 based on the requirements of the situation at hand."

2.2. Clearance Delivery (DEL)

The clearance delivery controller is responsible for issuing appropriate IFR (Instrument Flight Rules) and VFR (Visual Flight Rules) clearances to departing aircraft. The primary responsibility of the DEL controller consists of ensuring that departing aircraft have appropriate flight plans and cruise altitudes for the proposed flight based on aircraft type and equipment category. On the network, and many airports in real-life, the responsibilities of the DEL controller are delegated to the ground controller. In the San Juan CERAP, the only DEL position available for staffing is at the Luis Muñoz Intl. Airport (TJSJ).

2.3. Ground Control (GND)

The ground controller is responsible for safe and efficient movement of aircraft from parking areas (ramps, gates, aprons, etc.) to the active runway(s) and vice versa. It is important to note that ground controllers **do not control active runways**.

2.4. Tower/Local Control (TWR)

The tower controller is responsible for aircraft movements on active runway(s) and the overlying airspace within the vicinity of the airport. The primary role of the tower controller is to provide safe and efficient flow of arriving and departing aircraft. The San Juan CERAP contains 6 airports with operating control towers:

- FAA Facilities:
  - Luis Muñoz Marín Intl. Airport (SJU)
  - Fernando Luis Ribas Dominicci Airport (SIG) – also known as Isla Grande

  - Rafael Hernández Airport (BQN) – also known as Borinquen
  - Cyril E. King Airport (STT)
  - Henry E. Rohlsen (STX)

- ICAO Facilities:
  - Terrance B. Lettsome Airport (EIS) – also known as Roadtown/Beef Island

2.5. Terminal Control (APP/DEP)

The terminal controller is a radar controller that is responsible for providing safe and efficient flow of traffic between the enroute environment and the terminal area. In VATSIM the terminal controller typically manages both departing and arrival traffic. Depending on traffic demands or controller availability the terminal position can be split into approach (APP) or departure (DEP) sectors.

At San Juan CERAP, the terminal area provides coverage to five out of six towered airports contained in the CERAP airspace. These include: SJU, SIG, STT, STX, EIS. The terminal controller is responsible for providing radar services to participating aircraft (those on IFR flight plans or VFR flight following) within the lateral bounds of the terminal area that are below 10,000 ft MSL.

2.6. Enroute Control (CTR)

The enroute controller, typically known as the center controller, is responsible for providing adequate separation, weather advisories, and route amendments (when required) to aircraft that are withing the lateral boundaries of their airspace.

Chapter 3. Airspace

3.1. Overview

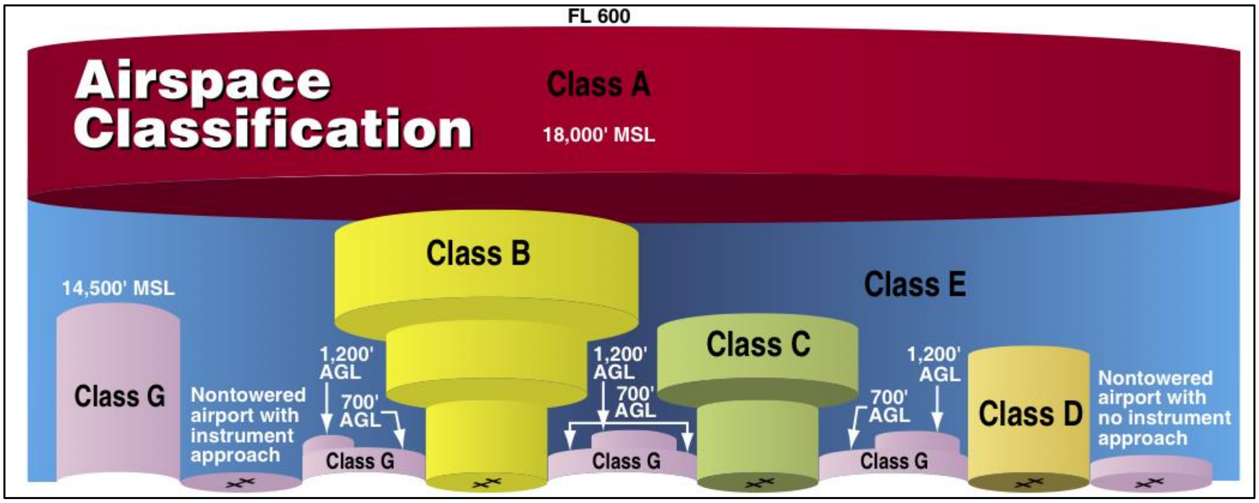


Figure 1. Depiction of Controlled Airspace within the FAA National Airspace System (NAS). (www.faasafety.org)

3.2. Class A (Alpha)

Within the FAA National Airspace System, Class A airspace begins at 18,000ft MSL (FL180) extending upwards to 60,000ft MSL (FL600). Class A airspace is not depicted on aeronautical charts. All aircraft that intend on flying within Class A airspace require to be on an active IFR Flight Plan. No VFR traffic is allowed in Class A airspace.

3.3. Class B (Bravo)

Class Bravo airspace is the most restrictive type of airspace and is found around large airports with high traffic density. This type of airspace is the most complex given that it extends several miles from the airport and covers different “shells” that start at different altitudes. Shelf altitudes can be found on the aeronautical chart; boundaries are depicted by solid blue lines or curves. When you encounter a Class Bravo, think “busy”.

Entry requirements for aircraft:

- Two-way radio communication (ATC has to acknowledge aircraft callsign on frequency)
- Mode C transponder
- VFR aircraft must have clearance to enter by ATC

San Juan CERAP does not have any Class B airports.

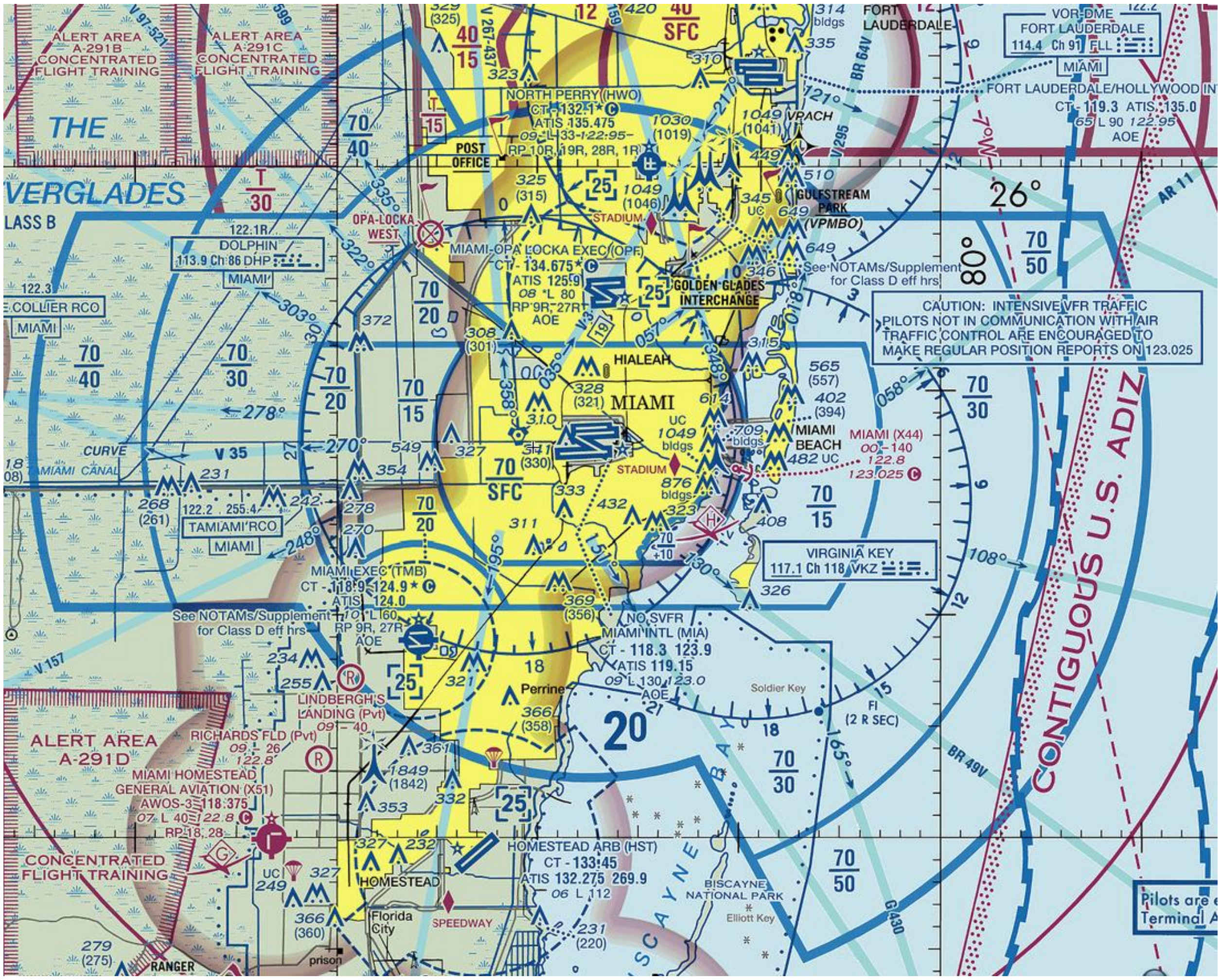


Figure 2. Miami Class Bravo Airspace. (Miami VFR Sectional; www.skyvector.com)

3.4. Class C (Charlie)

Class Charlie airspace surrounds airports with a control tower that have elevated levels of traffic. Class C airspaces are composed of an inner ring that extends 5 nautical miles outwards from the airport and a second ring which extends 10 nautical miles from the airport. The vertical extent of the inner ring goes from the surface (SFC) up to 4000 feet. Shelf altitudes for the outer ring vary and can be found on the aeronautical chart. Boundaries are depicted by solid magenta lines. When you encounter a Class Charlie, think “congested”.

Entry requirements for aircraft:

- Two-way radio communication (ATC has to acknowledge aircraft callsign on frequency)
- Mode C transponder

San Juan CERAP has two Class C airports:

- San Juan (SJU)
- St. Thomas (STT)

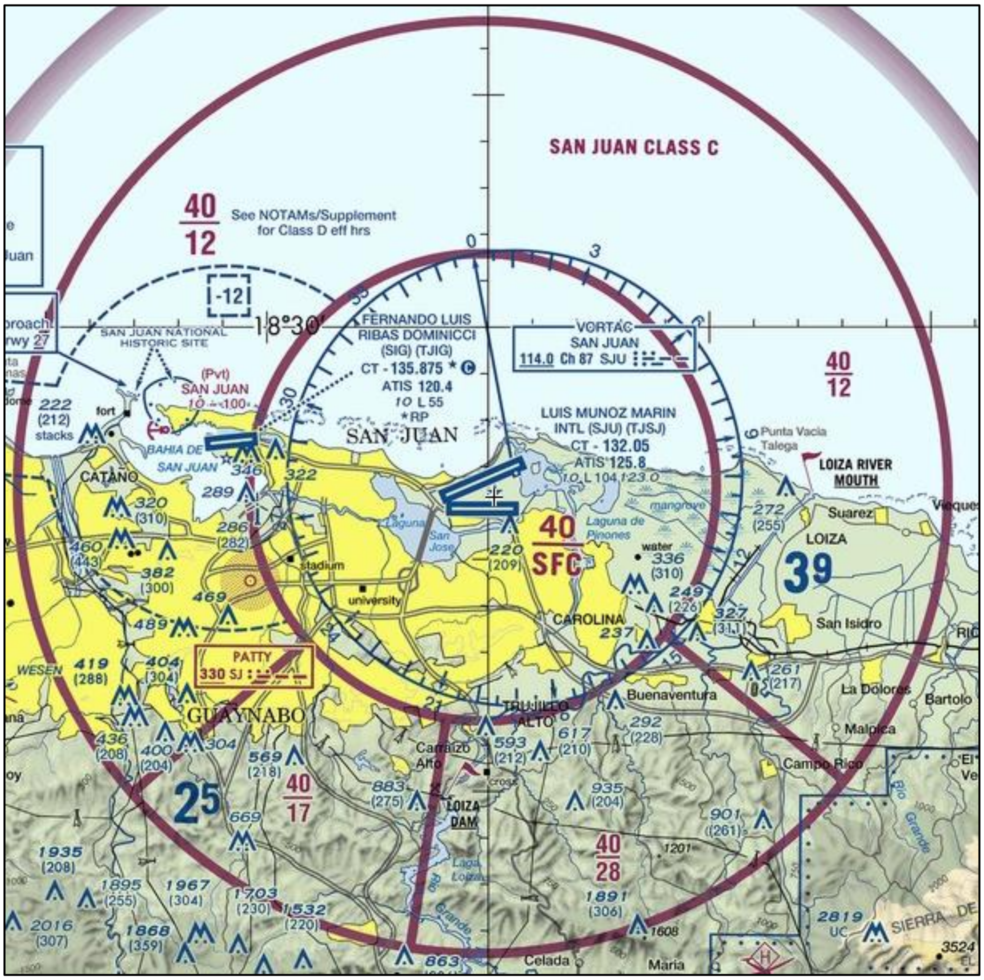


Figure 3. San Juan Class Charlie Airspace. (PR-VI TAC Sectional; www.skyvector.com)

3.5. Class D (Delta)

Class Delta airspace is the least complex type of airspace given that is composed of a single ring that commonly extends 5 nm from the airport and up to 2500 feet. The airspace altitude can be found on the aeronautical chart. Boundaries are depicted by dashed blue circles.

Entry requirements for aircraft:

- Two-way radio communication (ATC has to acknowledge aircraft callsign on frequency)

San Juan CERAP has five Class D airports:

- Isla Grande (SIG)
- Aguadilla (BQN)
- St Croix (STX)
- Beef Island (TUPJ)
- Anguilla (TQPF)

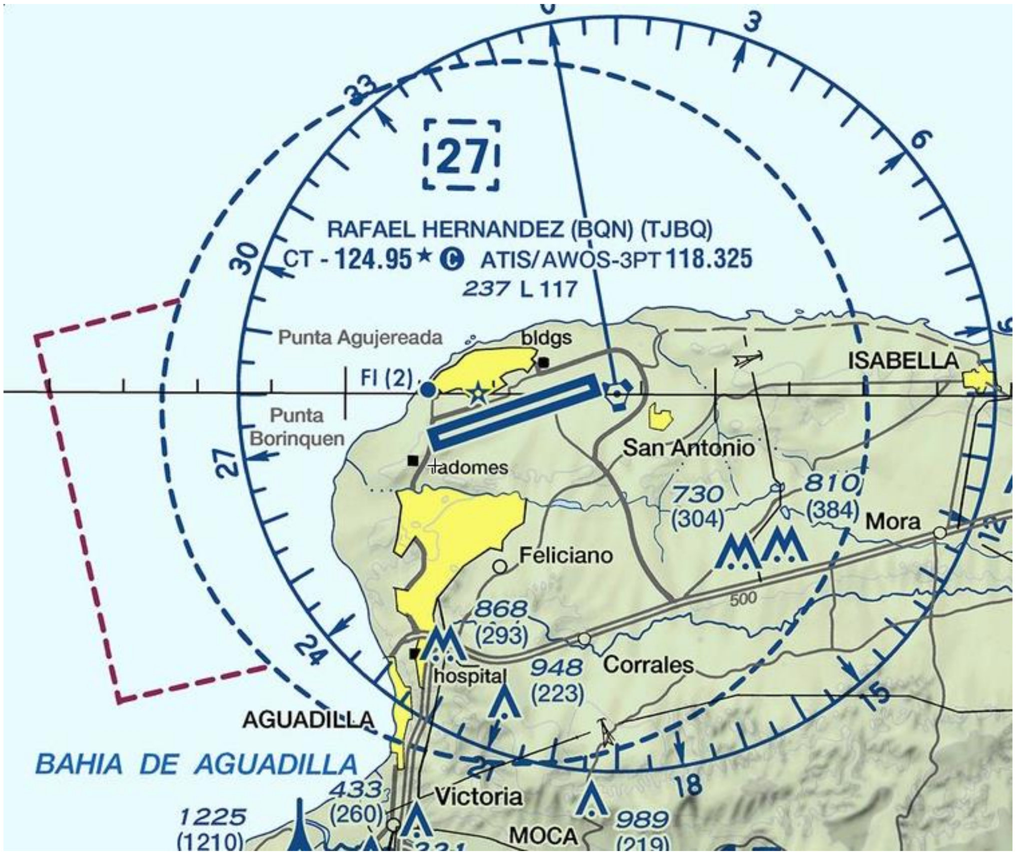


Figure 4. Borinquen Class Delta Airspace. (PR-VI TAC Sectional; www.skyvector.com)

3.6. Class E (Echo)

This type of airspace depicts controlled airspace and establishes weather minima for VFR flight. Airspace is depicted many different ways on the aeronautical charts. Can begin at the surface, 700ft above ground level (AGL), 1,200ft AGL, or others. FL600 and upwards is also Class E. Airports surrounded by Class Echo airspace do not operate an active air traffic control tower.

Entry requirements for aircraft:
- None

San Juan CERAP has two Class E airports:
- Mercedita (PSE)
- Eugenio María de Hostos (MAZ)

Figure 5. Ponce Class Echo Airspace. (PR-VI TAC Sectional; www.skyvector.com)

3.7. Class G (Golf)

Class G airspace is uncontrolled and has distinct requirements for weather minima. This type of airspace is not depicted on aeronautical charts, but can be determined by referencing the other types of airspace in the surrounding area. Class G airspace will not exceed 14500 ft.

3.8. Special Use Airspace

- Prohibited Areas
  - Airspace in which entry is NOT allowed under any circumstances except in an emergency.
- Restricted Areas.
  - Airspace that is prohibited under certain conditions without an explicit clearance to enter.
- Warning Areas.
  - Airspace with defined dimensions that contain hazardous conditions to non-participating aircraft.
- Military Operations Areas
  - Airspace in which military activities are regularly conducted. ATC services will usually be delegated in these areas.

Special Use Airspace VFR Chart Depictions:

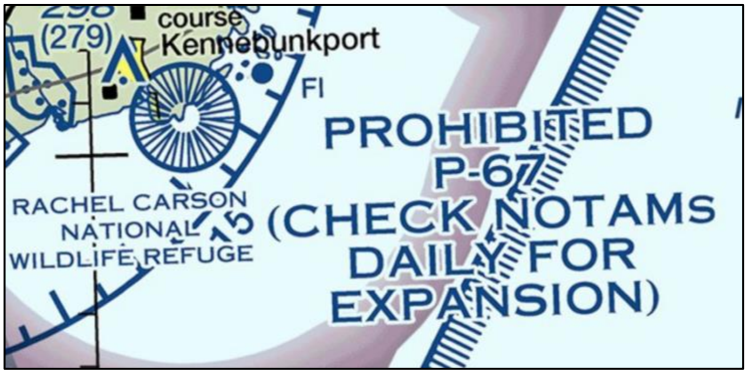


Figure 6. Prohibited Area P-67 in Kennebunk, ME

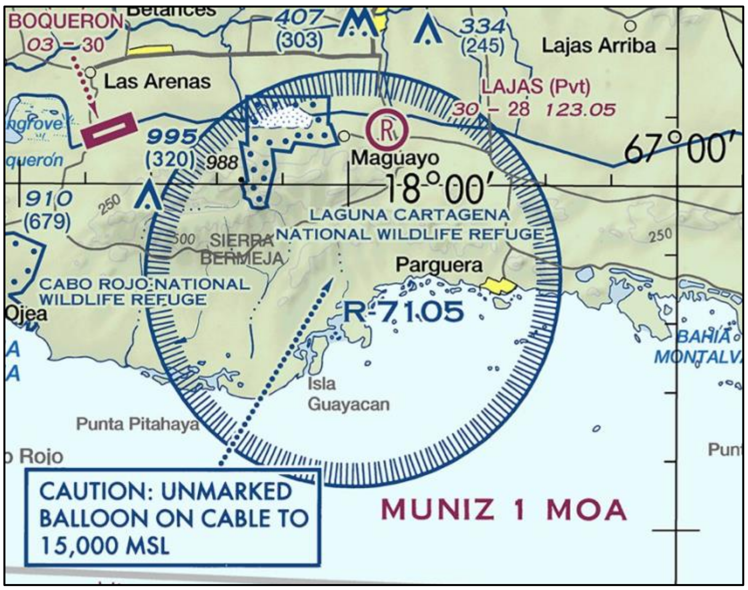


Figure 7. Restricted Area R-7105 within the ZSU airspace.

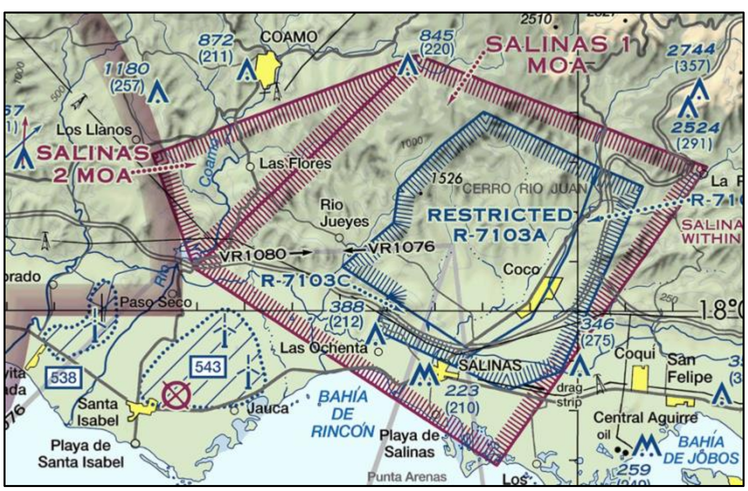


Figure 9. Salinas 1 and Salinas 2 MOAs.

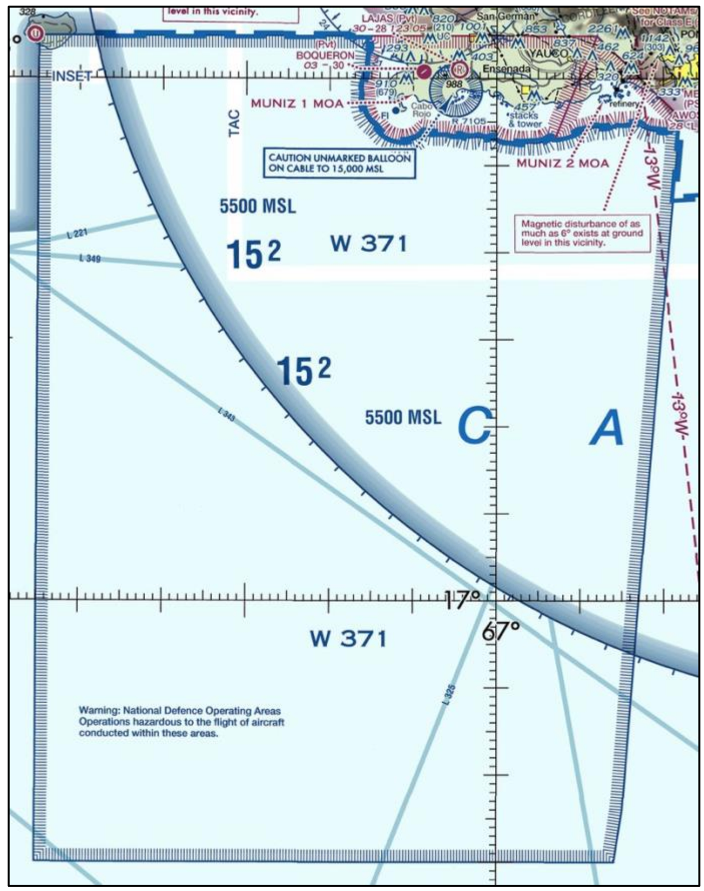


Figure 8. Warning Area W-371 located on the South West portion of ZSU's airspace.

Chapter 4. Navigation

Material for this section has been sourced, in part, from the Instrument Flying Handbook (FAA-H-8083-16B) and the Instrument Procedures Handbook Glossary (FAA-H-8083-16B).

4.1. NDB

A **N**on-**D**irectional **B**eacon (NDB) is a ground-based radio transmitter. NDBs transmit in the frequency range of 190 kHz to 535 kHz. Pilots can use an <u>A</u>utomatic <u>D</u>irection <u>F</u>inder (ADF) to tune an NDB frequency and navigate. Typically, NDB stations are identified by a two or three letter code.

Figure 10. Depiction of the Dorado NDB (DDP) on a VFR sectional chart.

4.2. VOR

A **V**ery High Frequency **O**mnidirectional **R**ange (VOR) is a ground stations that is oriented to magnetic north and transmits azimuth (location in degrees from North with respect to the VOR station) information to aircraft. It provides 360 courses TO or FROM the VOR station. Typically, they are equipped with **D**istance **M**easuring **E**quipment (DME) to provide distance information. VOR are the primary source of instrument navigation used on non-GPS equipped. Additionally, most navaid-based routes are designed based on the signal range of VORs. VORs are identified by a three-letter code.

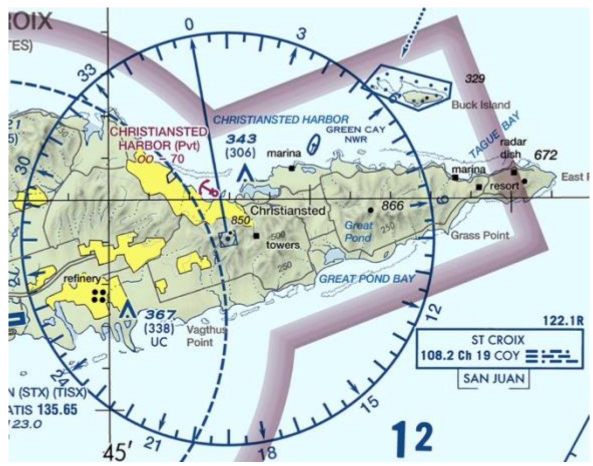


Figure 11. Depiction of the St. Croix VOR (COY) on a VFR sectional chart.

4.3. Fix

A **fix** is a point in geographical space that is most commonly defined by reference to one or more radio (ground-based) NAVAIDs or GNSS (global navigation satellite system) based systems. Fixes are composed of a five-letter identifier.

4.4. Waypoint

A **waypoint** is a fix that is defined by a geographical location that is not dependent on ground-based NAVAIDs. They are used to define navigation routes or the flight path of an aircraft that is employing area navigation tools. <u>All waypoints are fixes, but not all fixes are waypoints.</u>

There are different types of waypoints:

- Published
  - Represent fixes that are included as part of an official IFR navigation chart.
- Floating
  - Represent airspace fixes at a point in space not directly associated with a conventional airway. Typically, they are established by ATC as traffic metering sites, holding points, among other purposes.
- User-defined
  - Are typically created by pilots for use in their own random RNAV direct navigation. They are unpublished (typically). Phantom waypoints also fall under the category of user-defined waypoints, which consists of a point in space formed by a bearing and distance from a NAVAID.
- Fly-by
  - A waypoint that requires the use of turn anticipation to avoid overshooting the next flight segment.
- Fly-over
  - A waypoint that precludes any turn until the waypoint is overflown, and is followed by either an intercept maneuver of the next flight segment or direct flight to the next waypoint.

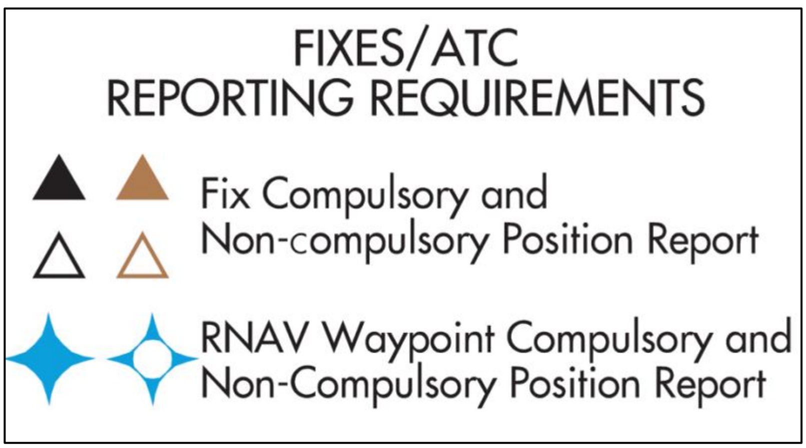


Figure 12. Chart symbols for Fixes and Waypoints Black symbols represent fixes that correspond to VHF/UHF navaids while brown symbols represent fixes with L/MF navaid sources. (Aeronautical Information Services - Aeronautical Chart Users' Guide, FAA)

4.5. Airways

The primary routing method for aircraft operating under Instrument Flight Rules (IFR) is the Federal Airway System. Each federal airway is based on a centerline that connect one NAVAID, waypoint, fix, or intersection to another NAVAID, waypoint, fix, or intersection for that airway. Federal airways include the centerline and the corresponding airspace that is bound by two parallel lines that extend 4 nautical miles in each direction from that centerline.

- **Victor Airways/Routes (V)**
  - Serve routes below FL180.
  - Are depicted on Low-Altitude IFR charts by the letter V followed by a number.

  - Typically are odd-numbered when they run North/South and even-numbered when they run East/West.

- **Jet Airways/Routes (J)**
  - Exist only above FL180 up to FL450.
  - Are depicted on High-Altitude IFR charts by the letter J followed by a number.

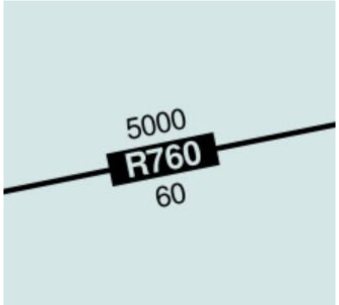
- **T-Routes (T)**
  - RNAV equivalent of Victor Airways.
  - Exist below FL180.
  - Depicted in aeronautical blue.

- **Q-Routes (Q)**
  - RNAV equivalent of Jet Airways.
  - Exist above FL180 up to FL450.
  - Depicted in aeronautical blue.

- **Colored Routes (LF/MF)**
  - Correspond to routes that rely on low/medium frequency (L/MF) ground-based navigation aids.
  - Their names correspond to a color (denoted by a single letter) followed by a number.
  - East/West oriented routes are identified with either **Green (G)** or **Red (R)**.
  - North/South oriented routes are identified with either **Amber (A)** or **Blue (B)**.
  - The San Juan CERAP is a host of a variety of Colored Routes.

- **Puerto Rico Airways (RTE)**
  - A type of route based on ground-based navaids for the Puerto Rico area.
  - They are identified by the prefix RTE followed by a number.
  - They are primarily flown by jet and turboprop aircraft navigating within our airspace or headed towards the Santo Domingo FIR.

- **Preferred IFR Routes:**
  - Are typically established between facilities to guide pilots in planning their routes of flight to minimize route changes and aid in the management of air traffic on Federal airways.
  - Preferred routes are typically found in the Airport/Facility Directory (AFD; pages 561-565).



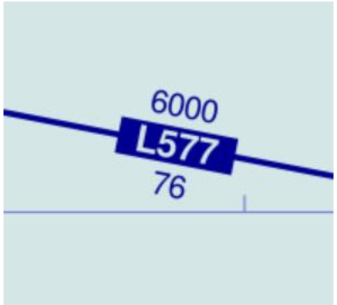


Figure 13. Chart depiction of navaid and RNAV based airways. (World Lo; www.skyvector.com)

4.6. Instrument Departure Procedures

Departure procedures are ATC requested and developed departure routes designed to increase capacity in the terminal airspace, effectively control the flow of traffic with minimal communication, and reduce environmental impact through noise abatement procedures.

- **Obstacle Departure Procedures (ODPs):**
    - Provide obstruction clearance via the least complex route from the terminal environment to the en-route structure.
    - ODPs are recommended for obstacle obstruction and may be flown without ATC clearance unless an alternate departure procedure (a SID or vectors) has been assigned.
    - ODPs are found on the TERPS (Terminal Instrument Procedures Supplement) and are described using text.

LUIS MUNOZ MARIN INTL (SJU) (TJSJ)
TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES
AMDT 8 26MAR20 (21280) (FAA)
DEPARTURE PROCEDURE:
Rwy 8, climb on a heading between 258° CW to 108° from DER, or min. climb of 352' per NM to 5000 for headings 109° through 257°.
Rwy 10, climb on a heading between 282° CW to 105° from DER, or min. climb of 357' per NM to 4900 for headings 106° through 281°.
Rwy 26, climb on a heading between 258° CW to 077° from DER, or min. climb of 304' per NM to 4800 for headings 078° through 257°.
Rwy 28, climb on a heading between 261° CW to 101° from DER, or min. climb of 311' per NM to 4800 for headings 102° through 260°.

Figure 14. ODPs for the Luis Muñoz Marín Intl. Airport (SJU/TJSJ).

- **Standard Instrument Departures (SIDs)**
    - Are ATC procedures that are printed in graphic form for pilot and controller use.
    - SIDs are primarily designed for system enhancement while still ensuring terrain/obstacle clearance.
    - ATC clearance must be obtained before flying a SID.
    - Can be categorized as follows:
        - Radar vector SID:
            - ATC provides radar guidance (via vectors) to a fix depicted on a SID.
        - Pilot-nav SID:
            - Allows aircraft to get from the departure runway to its assigned routing with no need for vectors.
        - Hybrid SID:
            - Combines elements from radar vector and pilot-nav SIDs.
            - Initial segment involves a vector (runway to first fix on the SID).
            - Pilot assumes responsibility for navigation once fix is reached.

Chapter 5. Weather

5.1. Introduction

Weather phenomena has a strong influence at defining how aircraft operations occurs within the Air Traffic Control Environment. For instance, wind direction and velocity determine the runways that are in use for takeoff and landing. If winds are strong, they can also affect the number of aircraft that can takeoff or land. The presence of rain, mist, fog, among others, creates several challenges for pilots that are navigating from point to point or attempting an approach for landing.

Given that weather greatly influences how aircraft operations are carried out (i.e. whether or not VFR flight can be performed), it is of great importance that controllers know how to read and interpret weather information that is provided through METARS and Terminal Area Forecasts (TAFs).

5.2. Clouds

Clouds are masses of condensed water vapor that float in the atmosphere. Depending on their altitude and the temperature of the atmosphere at that altitude, clouds can be composed of water droplets, frozen crystals, or a mix of both.

Clouds can be divided into three different altitude groups:

- High Clouds (20,000 ft – 60,000 ft)
- Middle Clouds (6,500 ft – 25,000 ft)
- Low Clouds (Surface to 6,500 ft)

Thunderstorm clouds, known as *Cumulonimbus (CB)*, are characterized by having extensive vertical development (meaning that they can be several thousand feet tall). Whenever CB clouds are present in a weather report for a specific area, pilots and controllers should make every effort possible to maintain aircraft well separated from these clouds (no closer than 20 nautical miles).

5.3. Precipitation

Precipitation occurs when the water droplets that are found in clouds becomes too heavy to remain suspended in the air. Depending on atmospheric conditions, precipitation can occur in various ways: rain, snow, freezing rain, ice pellets, sleets, and more. Precipitation also varies in intensity. When reading a weather report, the intensity of the precipitation will be denoted by a minus sign (“-“), a plus sign (“+”) or just the precipitation descriptor.

Examples:

- Light Rain: **-RA**
- Moderate Rain: **RA**
- Heavy Rain: **+RA**

5.4. Visibility

Visibility is defined as the distance from which an object can be observed. For the purposes of weather reports, Air Traffic Controllers and pilots are interested in knowing the **Horizontal** and **Vertical** visibility. How much or how little visibility is available will greatly influence the types of flight that can be performed.

Horizontal visibility is measured in Statute Miles (SM). During periods of dense or heavy fog, larger/busier airports have special equipment on some or all of their runways that can measure visibility in feet. This is known as the Runway Visual Range (RVR).

Vertical visibility refers to the degree that the sky is covered by clouds. Cloud layers are presented on a weather report through a combination of two elements: the type of cloud coverage + the altitude at which the cloud layer is located. The “ceiling” is the altitude at which the first occurrence of a cloud layer categorized as “broken” or “overcast” is found.

IDENTIFIER	CONDITION	SITUATION
SKC / CLR	SKY CLEAR	No clouds
FEW	FEW	Less than 25% of the sky is covered in clouds
SCT	SCATTERED	26 – 50% of the sky is covered in clouds
BKN	BROKEN	51 – 90% of the sky is covered in cloud
OVC	OVERCAST	100% of the sky is covered in clouds.
VV	SPECIAL	Caused by non-precipitation conditions like blowing snow or fog

5.5. Pressure Settings

Air pressure affects the altimeter setting of the aircraft. Additionally, it defines what the lowest usable flight level is. The United States reports air pressure using the inches of mercury unit (inHg) while the rest of the world primarily uses the hectopascal (hPA). The FAA has standardized the lowest usable flight level to FL180 (18,000 ft MSL). However, depending on the atmospheric pressure, the lowest usable flight level may not be FL180. The following table details what the lowest usable flight level is according to the atmospheric pressure.

ALTIMETER (inHG) (FAA)	LOWEST FL
29.92 or greater	FL180
29.91 - 29.42	FL185
29.41 - 28.92	FL190
28.91 - 28.42	FL195
28.41 - 27.92	FL200

27.91 - 27.42	FL205
27.41 - 26.92	FL210

5.6. METAR

A METAR (**Met**eorological **A**erodrome **R**eport) is a weather observation that is updated every hour to provide information regarding the weather conditions at the airport of interest. The METAR contains a quick summary of the most relevant information for pilots and air traffic controllers to carry out their duties. The information contained in the METAR is also transmitted via a dedicated frequency called the ATIS (**A**utomatic **T**erminal **I**nformation **S**ervice). ATIS broadcasts are updated every hour, similar to the METAR, and carry a phonetic identifier to ensure that pilots have the latest weather information when checking in on a frequency. If weather conditions are rapidly changing both the METAR and ATIS will update in less than an hour. Typically, the METAR will include a *SPECI* descriptor to denote a 'non-standard' issuance of the weather report.

We are providing a breakdown on how to decode a METAR. Please note that this is a general example and does not cover the full extent of possibilities. A full list of METAR abbreviations and acronyms can be found in the Learning Center of the San Juan CERAP website.

TJSJ 271556Z 10009KT 5SM RA BR SCT033 BKN040 OVC050 24/22 A3018 RMK AO2 RAB35 SLP218 VIS LWR E-SE P0000 T02390217

- **TJSJ**
  - Airport or weather station identifier.
  - In this case, the Luis Muñoz Marín Intl. Airport (SJU/TJSJ).

- **271556Z**
  - The date (day of the month) and time the observation was taken.
  - In this case, taken on the 27^{th} day of the month at 1556 Zulu time.

- **10009KT**
  - The first three digits represent the wind direction (without magnetic deviation). The last two digits represent the average wind velocity in knots.
  - In this case, the winds are blowing from 100˚ at 9 knots.
  - *Note: If winds are gusting, there will be a "G" descriptor after the initial wind velocity followed by the peak gust velocity*.

- **5SM**
  - The horizontal visibility in statute miles.
  - In this case, the visibility stands at 5 statute miles.
  - Occasionally, the horizontal visibility will be reported with fractions. This typically happens when Instrument Meteorological Conditions (IMC) are present. Horizontal visibility will be reported as shown: **1 1/2SM** (one and a half statute mile visibility).

- **RA BR**
  - Weather descriptors. These can appear individually or as part of a group. For example: SHRA = Showers + Rain. They can also include intensity descriptors (- or +).
  - In this case, the METAR is reporting the presence of Rain (**RA**) and Mist (**BR**).

- **SCT033 BKN040 OVC050**
  - Cloud coverage report. Altitudes are reported in feet above ground level (AGL).
  - To determine the altitude at which the cloud coverage layer is found you add two zeros to the three-digit number that is being reported.
  - In this case, the cloud coverage is as follows:
    - SCT033: Scattered clouds at 3,300 ft AGL
    - BKN040: Broken clouds at 4,400 ft AGL
    - OVC050: Overcast clouds at 5,000 ft AGL

- **24/22**
  - This is the surface air temperature and dewpoint in degrees Celsius (˚C).
  - In this case, the temperature would be 24˚C and the dewpoint 22˚C.
  - If the temperature is negative, a letter M would be added prior to the temperature. For example: negative 5˚C would be represented as M5.

- **A3018**
  - This is the atmospheric pressure readout in inches of mercury (inHg).
  - In this case, the atmospheric pressure is 30.14 inHg.

- **RMK**
  - This denotes the start of the remarks section.
  - Remarks will include additional information that provides more precision or detail with regards to certain measurements that are reported on the METAR. These may include providing weather station equipment (A02 – precipitation discriminator), start/end and location of rain/snow/etc. rapid changes in pressure among others.

5.7. VFR Weather Minimums

Visual Flight Rules (VFR) flight relies on the core principle that pilots are able to look outside the cockpit to maintain coordinated flight (by referencing the horizon) and navigate through the use of visual landmarks. Controllers need to understand if the weather conditions are sufficient to allow for VFR flight so that they can advise pilots if it is recommended or not to perform a flight given the current weather.

Below is a summary of the VFR weather minimums for Class C and Class D airspaces.
- **Visibility:** 3 SM or better
- **Ceiling:** 1000 ft AGL (AGL = Above Ground Level)
  Note: Although 1000 ft AGL is the minimum ceiling, remember that pattern altitude typically starts at 1000 ft. Therefore, pilots should still be encouraged to fly IFR when this weather condition occurs.

Chapter 6. Communication

6.1. Phonetic Alphabet

The phonetic alphabet is the governing phraseology used in real-world aviation and also on the VATSIM network. It is crucial that you become knowledgeable with the phonetic alphabet since it will allow you to be consistent with your ATC communications.

A - ALPHA	B - BRAVO	C - CHARLIE	D - DELTA	E - ECHO	F - FOXTROT
G - GOLF	H - HOTEL	I - INDA	J - JULIETT	K - KILO	L - LIMA
M - MIKE	N - NOVEMBER	O - OSCAR	P - PAPA	Q - QUEBEC	R - ROMEO
S - SIERRA	T - TANGO	U - UNIFORM	V - VICTOR	W - WHISKEY	X - XRAY
Y - YANKEE	Z - ZULU				

Phonetic numbers are very similar to how numbers are pronounced in daily communications with a few minor exceptions to reduce confusion.

0 - ZERO	1 - WUN	2 - TOO	3 - TREE	4 - FOAR
5 - FIFE	6 - SIX	7 - SEVEN	8 - ATE	9 - NINER

6.2. Differences between FAA and ICAO Phraseology

Due to the nature of the San Juan CERAP airspace, we use a combination of FAA and ICAO phraseology depending on the location of the traffic. The majority of the San Juan CERAP is bound by the rules and regulations of the FAA. However, due to how airspace has been delegated in VATSIM, San Juan CERAP controllers can also provide services at certain ICAO facilities.

When referring to a runway, two-digit runways will have their numbers separated. For example:

- SJU (FAA) RWY 10: “Runway One Zero” (not ten).
- TNCM (ICAO) RWY 10: “Runway One Zero” (not ten).

When a runway has a single digit, FAA phraseology has no zero at all at the beginning, whereas in ICAO phraseology, they add a zero that must be pronounced. For example:

- SJU (FAA) RWY 8: “Runway Eight”.
- TUPJ (ICAO) RWY 07: “Runway Zero Seven”.

When referring to an aircraft, the flight numbers are combined/grouped using FAA phraseology but must be separated into individual digits with ICAO phraseology. For example:

- AAL1328 (FAA): "American Thirteen Twenty-Eight".
- AAL715 (FAA): "American Seven Fifteen".
- AAL1328 (ICAO): "American One Three Two Eight".

Additionally with FAA phraseology, when an aircraft has a maximum takeoff weight (MTOW) greater than 300,000lbs (B777, A340, etc.) the term "heavy" is placed after their flight number. An aircraft with greater than 1.4 million lbs MTOW (A380, AN-225) uses the term "super". ICAO phraseology does **NOT** adopt this descriptor. For example:

- DAL87 (B77W) (FAA): "Delta Eighty-Seven Heavy".
- DAL87 (B77W) (ICAO): "Delta Eight Seven".

Finally, when talking about a radio frequency, FAA phraseology calls the decimal point in the middle a "point". Using ICAO phraseology, it is called a "decimal":

- SJU (FAA): "Contact Juliana Approach, One Two Eight **Point** Nine Five".
- TNCM (ICAO): "Contact Juliana Approach, One Two Eight **Decimal** Nine Five".

6.3. Airline Callsigns

When controlling on the network you will encounter a variety of real-world callsigns as well as a multitude of virtual airline or custom callsigns. We have compiled a list of frequently encountered callsigns in the San Juan CERAP airspace. It can be found on the San Juan CERAP website. Please note that not all possible callsigns are listed and in case of encountering an unknown callsign controllers are required to use their best judgement.
Suggestions on handling unknown 3-letter ICAO identifiers:

- Verify the aircraft flight progress strip remarks to see if there's a definition for the callsign:
  - "ZZZ = Test-Flight Airlines"
- If no information is provided, refer to the aircraft by spelling out the three-letter code using the phonetic alphabet and then ask the pilot how to pronounce the callsign.
  - Callsign: TSU123
  - "**T**ango **S**ierra **U**niform one twenty three, San Juan Ground..."

6.4. Two-Way Radio Communication

When contacting an aircraft, it is important to indicate which aircraft you are calling and let them know which controller is calling them by first stating the aircraft callsign, after which you say your controller callsign.

For example:

- SJU_GND to UAL347: "United Three Forty-Seven, San Juan Ground".

6.5. Controller Coordination

The same type of communication is used when contacting another controller for coordination purposes. This coordination is **REQUIRED** when staffing or closing a position to an adjacent controller that is active. For example:

- "San Juan Approach (who you are contacting), San Juan Ground (who you are)."
    - Wait for a response.
- "Approach, Ground is ready for a position briefing to open."
    - You will be given all relevant information about aircraft you will be assuming control of.
    - Be sure to ask questions if needed.
    - Approach will then release control to you.
- "You have control, XX."
    - XX is the approach controller's operating initials.
- "My control, YY."
    - YY are your operating initials, found on the controller roster.
    - *Note: Controller operating initials (OI) consist of the controllers first and last name initials and are assigned on a "first come, first served" basis. They do not rely on seniority. In the case that duplicated OIs, the second controller is assigned an OI that consist of the first name initial and the last letter of the controller's last name.

Chapter 7. Clearance Delivery

7.1. Position Duties and Responsibilities

The clearance delivery controller is responsible for issuing appropriate IFR clearances to aircraft and issuing departure instructions to VFR traffic. Thus, the primary responsibility of the delivery controller is to verify and confirm that a filed route is appropriate and correct for the proposed flight. In the following sections we will discuss how this process is carried out and the software used to achieve this.

7.2. Flight Progress Strip

The flight progress strip is the main source of information for the Delivery controller. The flight progress strip is prepared using the information that the pilot provides when filing a flight plan through any of the VATSIM-compatible flight-planning services or the pilot clients. A controller can modify flight progress strip through the Flight Plan Editor. The flight plan editor can be accessed in different ways, here we will discuss two strategies:

- **CTRL+F:** This command will open the editor but will display all information as blank. In order to retrieve the information for a specific aircraft, you will need to type the aircraft callsign into the AID field. If a flight plan has been filed previously, the information will populate after pressing <ENTER>. If no flight plan has been filed, an empty flight plan will be created for that plane and the pilot will have to "file the flight plan through their pilot client" or "provide the information to the controller through voice communication".
- **<F6> + Left-Click** aircraft of interest: Opens the flight plan editor and displays flight plan information for the aircraft of interest.

A properly prepared flight progress strip will include the following information:

- **Aircraft ID (AID)** – Also known as the callsign. It is how the aircraft will be identified through radio communication as well as on radar displays for terminal and enroute controllers.
- **Computer ID (CID)** – Assigned identifier generated by the vNAS system. This code is relevant for enroute controllers.
- **Beacon Code (BCN)** – Also known as the squawk code. It is a 4-digit code that is used to provide an identity to the targets being identified by a radar system. For FAA facilities, this beacon code is automatically assigned when an IFR flight plan is filed. Thus, there is no need to generate (recycle) the squawk code. VFR aircraft do not require a squawk code assignment unless one of the following conditions is met:
    - Aircraft is requesting Flight Following (or Traffic Advisories) when departing from a Class D.
    - Aircraft is departing VFR (with or without Flight Following) from a Class C or Class B airport.
    - Facility SOP requires issuance of a squawk code for all VFR aircraft.
- **DEP** – Departure airport identifier.

- **DEST** – Intended destination airport identifier. VFR flight plans may have this field empty. IFR flight plans will have a DEST airport (note: the destination can be the DEP airport).
- **SPD** – The cruise speed of the aircraft. This field is optional.
- **ALT** – Cruise altitude for the intended flight. It is shown in 100s of feet. Example: 360 = 36,000ft or FL360. If a flight is VFR the controller should fill the ALT field with “VFR”.
- **RTE** – The aircraft’s filed route.
- **RMK** – Flight plan remarks. This can include a multitude of descriptions including: how to pronounce the callsign if it’s non-standard (e.g. Virtual Airlines), an explanation of what the intended flight will be (in case that there is an odd routing), equipment limitations (no GPS), etc.

7.3. Direction of Flight Altitudes

Once an aircraft departs from an airport, whether it be on an IFR flight plan or maintaining VFR, they become part of the invisible yet complex network or routes in the sky. In an effort to increase safety, there are rules established to ensure that aircraft at cruise flying in opposite directions (head-on) are not at the same altitude. Similar to how opposite direction traffic on highways is typically separated by a physical barrier (metal rails, concrete walls, separate highway roads, etc.)

- IFR aircraft must be separated by a minimum of 1,000 ft vertically up to FL410.
- IFR aircraft must be separated by a minimum of 2,000 ft vertically above FL410.
- IFR aircraft that are flying on Eastbound directions (magnetic course of 0˚-179˚) must cruise at an “odd” altitude or flight level (e.g. 5000ft, 13000ft, FL190, FL370, etc.).
- IFR aircraft that are flying on Westbound directions (magnetic course of 180˚-359˚) must cruise at an “even” altitude or flight level (e.g. 6000ft, 10000ft, FL180, FL320, etc.).
- VFR aircraft follow the same convention with the modification that separation requirements are reduced to 500 ft vertically from other VFR/IFR traffic.
- VFR aircraft are expected to follow direction of flight altitudes above 3,000 ft. unless given a different instruction by a radar controller.
    - Eastbound: 3,500 ft, 5,500 ft, 7,500 ft, etc.
    - Westbound: 4,500 ft, 6,500 ft, 8,500 ft, etc.

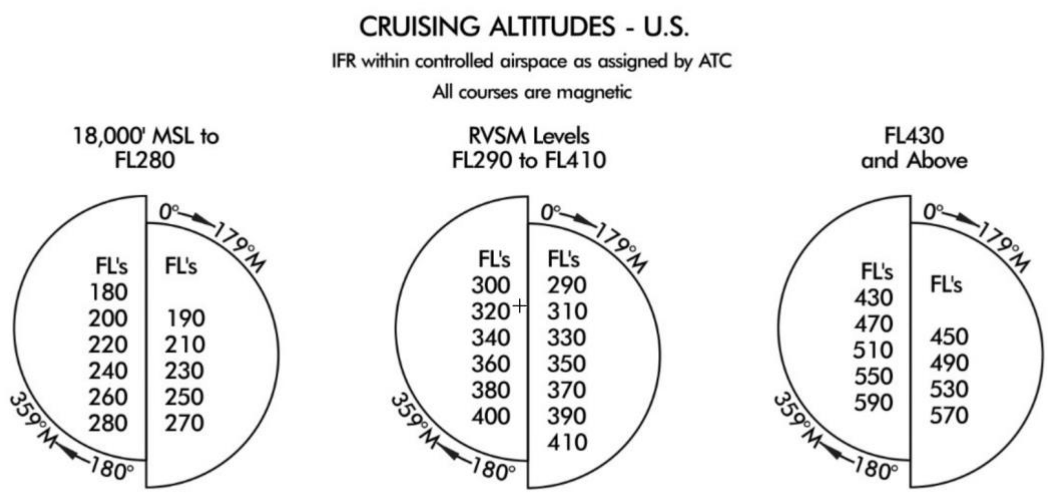


Figure 15. IFR and VFR direction of flight altitudes. (FAA EHUS7, www.skyvector.com)
Filing a wrong flight level is a common error made by pilots. You are responsible to assign them a correct flight level and edit their flight plan accordingly. Use the following as a reminder: "NEODD SWEVEN" (North-East ODD, South-West EVEN).

*Note that above FL410, the East-West direction of flight altitude rules no longer hold true. Verify **Figure 15** to ensure proper altitudes are being filed in flight plans.

7.4. RVSM (Reduced Vertical Separation Minima)

RVSM airspace was established in an effort to maximize traffic density on airways while maintaining a high degree of safety and optimizing aircraft efficiency profiles. RVSM is only applicable to aircraft that meet certain criteria for reducing altimeter errors among other factors. In VATSIM it is assumed that most (if not all) modern aircraft that can cruise within RVSM airspace are RVSM-capable. RVSM airspace consists of the Class A airspace withing the vertical bounds ranging from FL290 up to FL410. It enables aircraft to cruise with just 1000ft of vertical separation. Above FL410, aircraft are no longer in RVSM airspace and the vertical separation requirements increase to 2000ft.

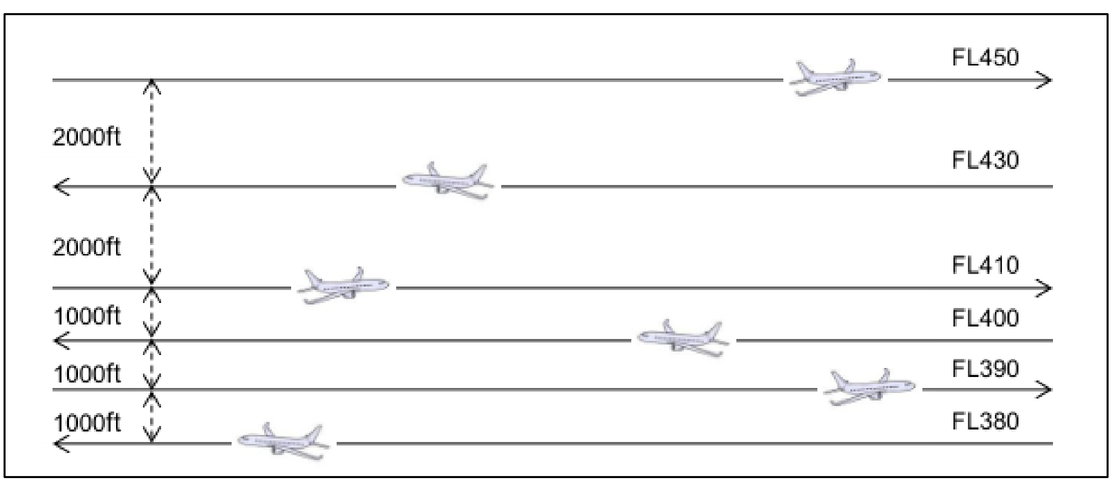


Figure 16. Visualization of RVSM and non—RVSM altitudes for westbound and eastbound flights.

7.5. Equipment Codes

An equipment code describes the communication, navigation, approach aids and surveillance transponder equipment on board an aircraft. These alphabetic codes are used on FAA and ICAO flight plans to aid controllers in their handling of aircraft.

- On an FAA flight plan, the equipment code is a single character used to represent a radio navigational capability and transponder combination.
- On an ICAO flight plan, multiple letters are used to describe individual radio navigational capabilities and a single letter is used to designate the transponder.
- The FAA began requiring the ICAO format for domestic flights desiring RNAV routes in 2008.
- The ICAO format has already been in use for all domestic flight plans in Canada, Mexico, and many other countries for a number of years.

On VATSIM several rules and simplifications have been implemented that make equipment codes virtually useless. These are the following:

- All aircraft filing a flight plan with a cruise altitude at FL290 or above, into RVSM airspace, are deemed RVSM capable regardless of what aircraft they are flying and equipment codes they have filed.
- All aircraft are required to have a transponder with mode C capability on board and use it when in active flight regardless of what aircraft they are flying and equipment codes they have filed. This is made possible through external pilot clients like vPilot which offer a transponder with mode C capability for use on VATSIM regardless of what aircraft you are flying.

7.6. Transponder

A transponder is an electronic device that produces a response when it receives a radio-frequency interrogation. Aircraft have transponders to assist in identifying them on the controller's radar. Controllers use the term "squawk" when they are assigning an aircraft with a transponder code. A pilot may be requested to squawk a given code by a controller, via the radio, using a phrase such as :

- "Cessna 123AB, squawk 0363".

The pilot then selects the 0363 code on their transponder and the target/track on the controller's radar screen will become correctly associated with their identity. Squawk code requirements depending on airspace:

- Class Bravo Airspace:
    - VFR: Discrete squawk code is **always** required (not Class B in San Juan CERAP).
- Class Charlie Airspace:
    - VFR: Discrete squawk code is **often** required. Required for departures, optional for arrivals.
- Class Delta Airspace:

  - VFR: Discrete squawk code is **not** required (available on request if on flight following).
- Class Echo Airspace:
  - VFR: Discrete squawk code is **not** required (available on request if on flight following).

Some codes can be selected by the pilot if and when the situation requires or allows it, without permission from air traffic control. Other codes are generally assigned by the controller. For flights on instrument flight rules (IFR), the squawk code is typically assigned as part of the departure clearance and stays the same throughout the flight.

Flights on visual flight rules (VFR), when in uncontrolled airspace, will "squawk VFR" (1200 in the US and Canada, 7000 in Europe). Upon contact with a controller, they will be told to squawk a certain unique or discrete code. When changing frequency, for instance because the VFR flight leaves controlled airspace or changes to another ATC unit, the VFR flight will be told to "squawk VFR" again.

In order to avoid confusion over assigned squawk codes, controllers will typically be allocated blocks of squawk codes, not overlapping with the blocks of nearby controllers, to assign at their discretion.

The numbers used in a squawk code range from 0 to 7. The numbers 8 and 9 can **not** be used.

7.7. Departure Procedures (VFR)

VFR aircraft operating within the FAA NAS are not required to file flight plans. For the purposes of easing frequency congestion, it is recommended that VFR aircraft file VFR flight plans. ICAO airports do require a flight plan to be filed for VFR flight (this applies to TUPJ and the uncontrolled airports in the British Virgin Islands).

At the San Juan (SJU/TJSJ) and St. Thomas (STT/TIST) airports, VFR flights that will exit the local airspace, require a VFR altitude limit, the departure control frequency (if available), and a discrete squawk code assignment.

Per the San Juan SOP, the following phraseology should be used to issue the Standard East/West Departure for VFR traffic departing from TJSJ:

- “San Juan Delivery, N58FF, requesting VFR departure to the East with information L”
- “N58FF, San Juan Delivery, Standard East Departure approved, maintain VFR at or below 5000, departure frequency 120.9, squawk 1402”
- “Standard East Departure approved, departure 120.9, squawk 1402, for N58FF”
- “N58FF, readback is correct, contact San Juan Ground 121.9, have a good flight”
- “N58FF, Ground on 121.9, see ya!”

VFR departure instructions at TIST should adhere to the following format:

- “N58FF, maintain VFR at or below 3000, departure frequency 128.65, squawk 1302”

At Class D airports (TJBQ, TJIG, TISX), the delivery controller position does not exist, and the ground controller should only issue a squawk code and departure frequency if the pilot is requesting VFR flight following or traffic advisories for the intended flight. Otherwise, if the pilot is ready for taxi you can issue taxi instructions.

VFR aircraft that will remain in the pattern do not require a squawk code assignment, they are expected to maintain the VFR squawk.

-Special VFR (SVFR)-

SVFR is a procedure to allow VFR aircraft to fly into or out of an airport when the weather is below the minima for the defined airspace with the help of charted routes, landmarks, or other visual cues. The FAA has put several limits on SVFR operations:

- Only within the lateral boundaries of Class B, C, D, and E surface areas.
- Only below 10,000ft MSL.
- Only when requested by the pilot.
- On the basis of weather conditions reported at the airport of intended landing/departure.

The following is an example of a Special VFR clearance for an aircraft departing San Juan (SJU):

- N238BV maintain Special VFR at or below 2,000ft.

SVFR aircraft are not assigned fixed altitudes to maintain because of the clearance from clouds requirement.

When the ground visibility at the airport of intended landing/departing is below 1 mile, a clearance cannot be issued, unless an emergency exists. Request the pilot’s intentions for what he wants to do next.

- “San Juan Visibility less than 1 mile. ATC unable to issue departure clearance. Advise Intentions.”

7.8. IFR Clearance

Aircraft intending to fly via Instrument Flight Rules (IFR) will file an IFR flight that contains their proposed route of flight as well as their requested cruise altitude/level. Once this flight plan is received by the controller, it is the responsibility of the controller to ensure that the proposed route of flight is reasonable with the intended destination and that the requested cruise level/altitude adheres to the direction of flight rules. Once the controller confirms that the flight plan is “appropriate” they can issue the IFR clearance to the aircraft.

The acronym **CRAFT** is very useful to remember the different elements of an IFR clearance.

- Clearance Limit
    - On VATSIM this will consist of the destination airport.
- Route
    - Contains the proposed route of flight requested by the pilot.

  - Make sure to reference local SOPs and LOAs for any restrictions or preferred routes between the departure and destination airports.
- Altitude
  - Consists of the initial altitude and expected cruise level.
- Frequency
  - Departure controller frequency.
- Transponder
  - Discrete squawk code.

Below we are providing some examples for how to review, modify and issue and IFR clearance through the flight plan editor. For all of these examples assume that runways 8 and 10 are in use (East Ops).

Flight Plan #1:

When verifying a flight plan, it is a good idea to reference CRAFT to make sure that you cover all the required elements of the IFR clearance and ensure that they are appropriate.

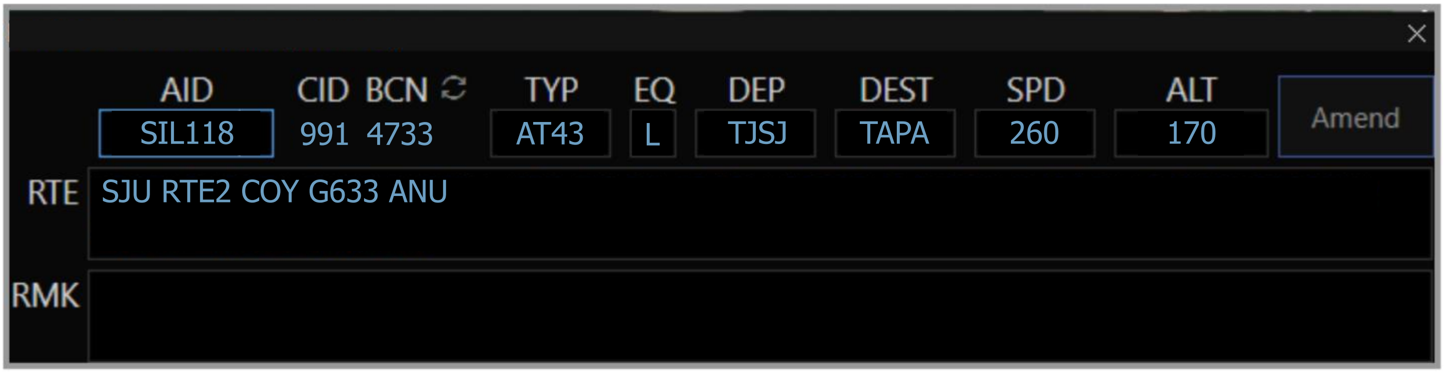
- Clearance Limit: KBOS
- Route: **[GLADA3 MACOR]** L455 SAVIK... (Contains a SID or appropriate departure routing)
- Altitude: FL380 (Appropriate for direction of flight; Westbound)
- Frequency: Either SJU_APP or SJU_CTR (if online) otherwise UNICOM 122.8
- Transponder: 5010 (Assigned)

Based on the information contained in the flight plan we can confirm that it is appropriate for the intended flight and can be issued without modification.

Phraseology:

- "JBU862, San Juan Delivery, cleared to the Boston airport via the GLADA3 departure, MACOR transition, then as filed, climb via SID, expect FL380 10 minutes after departure, departure frequency 119.400, squawk 5010"

Flight Plan #2:



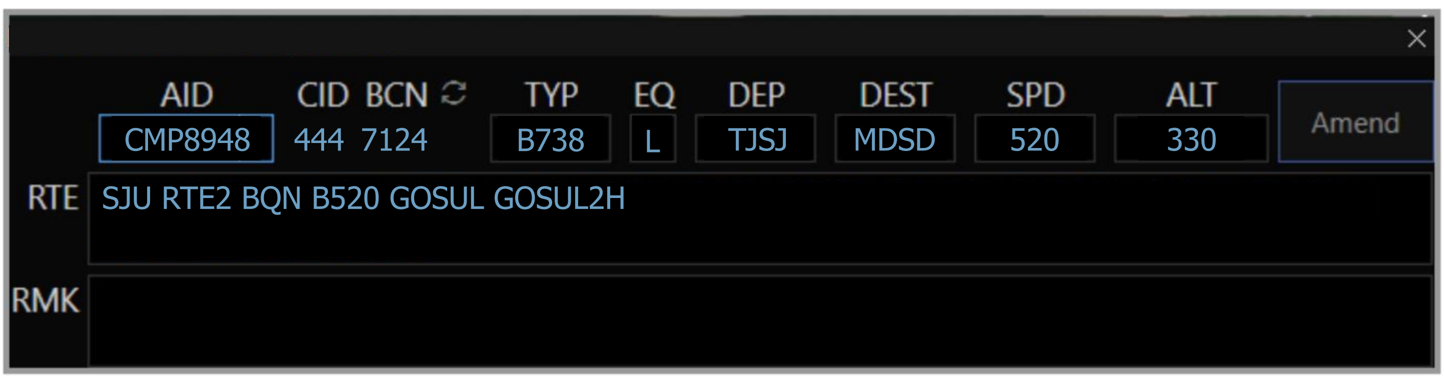
- Clearance Limit: TAPA
- Route: SJU RTE2 COY G633 ANU (Route is valid – requires a radar vector assignment)
- Altitude: 17,000 (Appropriate for direction of flight; Eastbound)
- Frequency: Either SJU_APP or SJU_CTR (if online) otherwise UNICOM 122.8
- Transponder: 4733 (Assigned)

Based on the information contained in the flight plan we can confirm that it is appropriate for the intended flight and can be issued without modification.

Phraseology:

- "SIL118, San Juan Delivery, cleared to the V.C. Bird airport, via radar-vectors to join RTE2, then as filed, maintain 5000, expect 17000 10 minutes after departure."

Flight Plan #3:



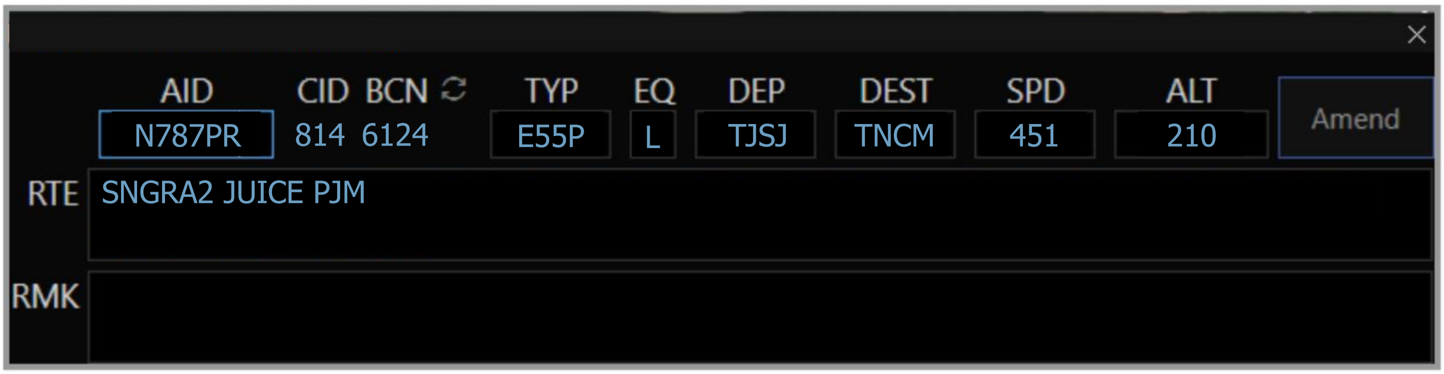
- Clearance Limit: MDSD
- Route: SJU RTE2 BQN B520 GOSUL GOSUL2H (Route is valid – requires a radar vector assignment)
- Altitude: FL330 (Not appropriate for direction of flight; Westbound requires even altitude)
- Frequency: Either SJU_APP or SJU_CTR (if online) otherwise UNICOM 122.8
- Transponder: 7124 (Assigned)

The proposed flight plan contains a valid route of flight. However, the cruise altitude is not valid for the direction of flight. "Odd" altitudes are intended for Eastbound flights. In this case you would need to issue the pilot a new cruise altitude. Given that an aircraft might be performance limited, it is better to ask the pilot which valid cruise altitude they are capable of accepting. A good rule of thumb is to provide the pilot with the first valid altitude below their filed cruise altitude and the first valid altitude above their filed cruise altitude.

Phraseology:

- "CMP8948, San Juan Delivery, your cruise altitude is invalid for direction of flight, are you able to take FL320 or FL340?"
- "We can take FL340 for CMP8948"
- "CMP8948, cleared to the Santo Domingo Airport, via radar vectors to join RTE2, then as filed, maintain 5000, expect FL340, departure frequency 119.400, squawk 7124"

Flight Plan #4



- Clearance Limit: TNCM
- Route: SNGRA2 JUICE PJM (Route is invalid – SNGRA2 SID is only applicable when departing from runways 26 and 28. Additionally, SNGRA2 SID is for Turboprop & Prop only. Moreso, per ZSU policy, JUICE intersection is not a valid entry point into the Juliana TMA. Therefore, a full route clearance is required)
- Altitude: FL210 (Appropriate for direction of flight; Eastbound)
- Frequency: Either SJU_APP or SJU_CTR (if online) otherwise UNICOM 122.8
- Transponder: 6124 (Assigned)

This flight plan has some issues with the proposed route of flight. The SNGRA2 departure is a valid SID for TJSJ. However, it can only be assigned when West Ops (runways 26 and 28) are in use. Additionally, the SNGRA2 SID only applies to Turboprops and Props. Given that the aircraft requesting this route is an E55P (i.e. a jet), it cannot be assigned the SNGRA2 departure. Lastly, although the JETSS1, HAMAR2, and SNGRA2 SIDs include the JUICE intersection as a transition, ZSU and Juliana TMA prohibit the use of JUICE intersection as an entry fix into Juliana TMA. Therefore, this aircraft requires a "Full Route Clearance" (i.e. a new route provided by ATC). When issuing route amendments, you are required to mention all waypoints and routes in the amendment up to and including the first waypoint included in the original route. In the case of full route clearances, you will need to mention the entire route. Aside from the routing issues the rest of the flight plan looks appropriate.

Phraseology:

- “N787PR, San Juan Delivery, I have a full route clearance available. Advise ready to copy.”
- “N787PR, is ready to copy.”
- “N787PR, cleared to the Juliana Airport via the JETSS1 departure (Juliet-Echo-Tango-Sierra-Sierra-1), SLUGO transition (Sierra-Lima-Uniform-Golf-Oscar) then Juliana VOR (Papa-Juliet-Mike), then direct destination, climb via SID, expect FL210 10 minutes after departure, departure frequency 119.4, squawk 6124.”

These examples do not cover the full range of situations that can be encountered when making amendments to flight plans. We expect that controllers will use their best judgement when faced with situations that go beyond the scope of this document. If an overlying controller is available, you can also consult them on how to proceed.

7.9. Tower Data Link Service (TDLS)

The San Juan Airport (TJSJ) uses the TDLS system to issue “Pre-Departure Clearances” (PDCs) to participating aircraft as a way to minimize frequency congestion.

TDLS can be accessed through the following link: https://tdls.virtualnas.net/
TDLS documentation can be found in the following link: https://tdls.virtualnas.net/docs/#/

Important notes when using TDLS:

- Once a PDC has been sent through TDLS it cannot be changed. If for some reason you need to provide an amendment to an already sent clearance, you will need to do this by voice communications.

- It is recommended that flight plans that require an amendment be corrected prior to being sent through the TDLS system.
    - If a Full Route Clearance is issued, please include an FRC comment in the remarks section of the flight plan. Following the FRC comment include the original route that was filed by the pilot. This is intended to bring awareness to the pilot that a change has been made.
    - If only a segment of the original routing is amended, please include the following comment in the remarks “FRC/fix”, where “fix” is the last waypoint in the amended route. Include the original route in the remarks.

Chapter 8. Ground Operations

8.1. Responsibilities

The Ground controller is responsible for all aircraft and vehicle operations on the movement areas (excluding active runways) on the airport surface. The ground controller should strive to provide safe and efficient movement of aircraft to/from the ramps, gates aprons, and runways by providing sequencing, taxi instructions or progressive taxi instructions when necessary.

8.2. Airport Layouts

Every airport is different. Thus, it is important that a ground controller becomes familiar with the taxiways and movement and non-movement areas to provide efficient ATC services.

A non-movement area is a section of the airport surface where aircraft and airport vehicles can maneuver (taxi, pushback, tow, etc.) without approval from air traffic control. Aircraft and vehicles operating on a non-movement area are expected to maintain awareness of their surroundings and maintain clear of obstructions. In order for aircraft or vehicles to taxi out of the non-movement area, they are required to contact the appropriate ground controller.

A movement area is the section of the airport surface area where aircraft or vehicles require an ATC instruction before operating within it. This includes taxiways, runways, and certain ramps or aprons.

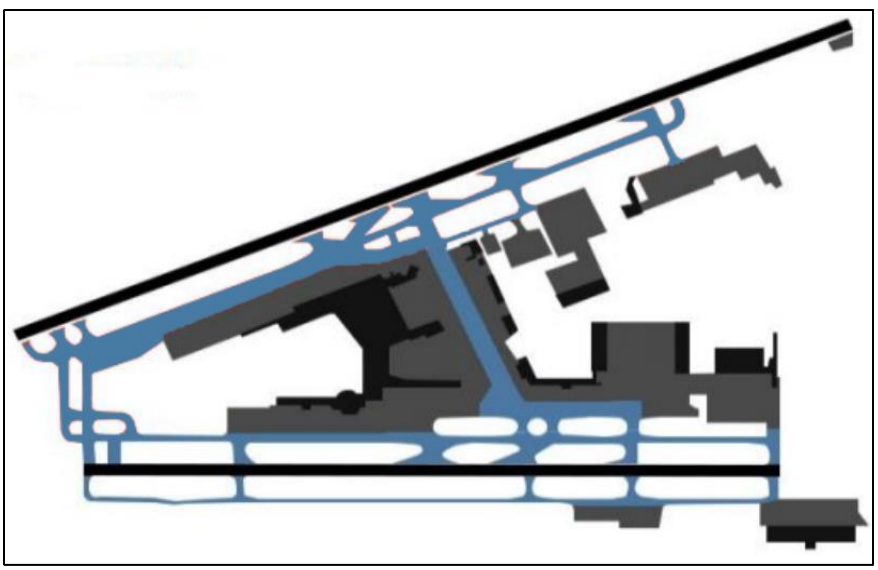


Figure 17. TJSJ (SJU) ground diagram. Movement areas in blue, non-movement areas in gray.

8.3. Ground Movements

All fixed wing aircraft will taxi along published taxiways when moving to and from the active runways. As a ground controller, you must provide the proper taxi route for the aircraft to use. Sometimes, aircraft will be required to "hold short" of an assigned taxiway or runway. When this instruction is issued, the pilot must readback the hold short instruction. If they do not readback the instruction the ground controller has to repeat the instruction to the pilot. Below are some examples:

Taxi to the runway:
- Ground: "JBU1010, runway 8, taxi via Hotel, Lima, November, Sierra."

Taxi to the ramp/apron/gate after arrival:
- Ground: "AAL1308 Heavy, gate Charlie 7 (C7) taxi via Sierra, November."

Taxi with a hold short instruction.
- Ground: "ABX641 Heavy, runway 8 taxi via Juliet, Juliet 6, Hotel, Lima, November, Sierra. Hold short of one-zero (Runway 10) at Juliet 6."
- ABX641: "Runway 8, taxi via Juliet, Juliet 6, Hotel, Lime, November, Sierra. Hold short of one-zero at Juliet 6, ABX641 Heavy."

*Note: This taxi instruction, provides the entire route the aircraft will follow to reach runway 8. Given that the aircraft in this example is parked to the south of runway 10 it will need to cross the runway. Since runway 10 is an active runway, the ground controller issues a hold short instruction to ABX641 heavy until coordination with the Local controller is performed to grant authorization for ABX641 heavy to cross runway 10. Once that is achieved you can issue a crossing instruction to ABX641 heavy.

- Ground: "ABX641 Heavy, cross runway 10 at Juliet 6."
- ABX641: "Cross 10 at Juliet 6, ABX461 Heavy."

8.4. Progressive Taxi

As a ground controller you will sometimes encounter pilots that are unfamiliar with the ground layout of the airport. You can provide progressive taxi instructions to these pilots. Progressive taxi consists of issuing step-by-step instructions to a pilot in order to get them from one point to another. Standard taxi phraseology is used:

- Ground: "N123TP, taxi to Jet Aviation via Hotel."
- Ground: "N123TP, turn right onto Lima."
- Ground: "N123TP, turn left onto November."
- Ground: "N123TP, turn right onto November 2."
- Ground: "N123TP, turn right onto Apron 5A. Have a good day."

8.5. Rotary Aircraft

Helicopter taxi instructions can vary significantly from fixed-wing aircraft because of their ability to perform vertical takeoffs and landings (VTOLs). If equipped with wheels, a helicopter can be given normal taxi instructions to a runway or parking spot. Helicopter with or without wheels, can also perform a hover taxi, which is accomplished a few feet above the ground and at a speed of 20 knots or less.

- Ground: "Helicopter N294CC, taxi to Apron 5B via Sierra, November, November 2."

An air taxi is used for expeditious taxi at 100 feet off the ground.

- Ground: "Helicopter N249CC, air taxi direct to Apron 5B."

When issuing air taxi instructions be sure to issue "caution" advisories when necessary.

8.6. Aircraft Categories

For the purposes of ground operations, you should observe for basic weight categories of aircraft.

CATEGORY (FAA/ICAO)	AIRCRAFT
Light	C172, C208, PA-28, C310, PA-44, BE-350, TBM-9, etc.
Large/Medium	ERJ, CRJ, MD80, B737, A320, B757, etc.
Heavy	A330, A340, A350, B747, B767, B777, B787, etc.
Super	A380, AN225

8.7. Coordination

- Controllers must coordinate all runway crossings.
  - Blanket releases are possible with the Tower/Local controller's approval.
  - A blanket release means you are able to cross active runways without asking Tower/Local for approval.
  - This should be coordinated at the start of your control session.
- Verify aircraft are squawking the assigned code.
  - This does **NOT** mean you should ask the aircraft to squawk Mode C, you do not have radar capability after all.
- When asking an aircraft to do something quickly, use one of the following phrases:
  - "Without delay".
  - "Expedite".

8.8. Ground Sequencing

Whenever possible, it is recommended that the ground controller provides an efficient sequence of departure traffic to the Local controller. Every controlling session on the network will be different but we are providing certain considerations that you can use to provide good sequences to your fellow controllers.

- Aircraft weight categories: Sequence lighter categories ahead of heavier categories. This reduces wait times between subsequent departures.
  - Example: PC-12 ahead of a Boeing 737

- Direction of flight: If possible, avoid sequencing departures on the same SID or heading back-to-back to avoid delays due to building up sufficient in-trail separation.
  - Example: JETSS1 then ACONY3 then JETSS1 rather than JETSS1 then JETSS1 then ACONY3.

Chapter 9. Tower Operations

9.1. Responsibilities

The tower controller is responsible for aircraft operations on all the active runways of an airport and its surrounding airspace.

9.2. Runway Selection

Local standard operating procedures (SOPs) will define the parameters that are considered when selecting runways at the various airports in the San Juan CERAP (ZSU). As a general rule of thumb, runway selection should match the direction from which the winds are blowing. In the Caribbean, winds typically prevail from the east.

9.3. ATIS

The Automated Terminal Information Service (ATIS) is a continuous broadcast of a recorded message that provides a fully decoded METAR to pilots which is automatically updated at fixed time intervals (~ every hour). On the VATSIM network, we use a software called vATIS to provide this service. Each updated iteration of an ATIS broadcast is identified by a letter which lets pilots know if they have the most up-to-date weather information. This letter should not be similar to that of nearby airfields to avoid confusion.

Whenever an ATIS broadcast is updated, you must inform all aircraft on frequency and note the relevant changes, primarily winds and altimeter setting.

Example:
- Local: "Attention all aircraft, ATIS information [Letter] is current at [Airport]. [Altimeter], [Winds].

9.4. Takeoff Clearance

One of the main responsibilities as a local/tower controller is to issue takeoff clearances. Takeoff instructions are varied and depend on the required information that needs to be provided for the pilot.

In its simplest form, the takeoff clearance will include wind information and the clearance.
- Local: "American 1334, winds 060 at 10, runway 8, cleared for takeoff."

If an aircraft is not assigned to a SID, you will also provide an initial heading for departure.
- Local: "Goodspeed 104, fly heading zero-niner-five (095˚), winds 080 at 12, runway 8, cleared for takeoff."

If you have an aircraft of a heavier weight category that departed ahead of the current aircraft, you should issue a wake turbulence advisory.
- Local: "JetBlue 1304, caution wake turbulence from previously departing Boeing 757, fly heading 330, winds 090 at 8, runway 8, cleared for takeoff."

Once an aircraft is airborne, beyond the end of the runway, on an adequate course and there is no conflicting traffic, issue a handoff to the appropriate radar controller.

9.5. Line-Up and Wait (LUAW)

At times, it is beneficial or even necessary to have an aircraft to taxi into takeoff positions, but not yet commence the takeoff roll. This is known as a Line-Up and Wait procedure. LUAWs can be utilized when some wake turbulence delays are required, in-trail spacing is needed, there's traffic on the takeoff roll, coordination, etc. As a courtesy to the pilot you should advise the purpose or reason for the LUAW.

- Local: "Execjet 210, runway 10, line up and wait. Traffic will cross down field."
- Local: "United 455 Heavy, runway 8, line up and wait, delay for departure spacing over ACONY."

Provide traffic information to the aircraft that is performing a LUAW procedure if traffic is within 6nm from the same runway.

- Local: "Southwest 1090, runway 8, line up and wait. Traffic is Airbus A320 on a 4 mile final."

Aircraft should not be in LUAW status for more than 90 seconds without further instructions.

9.6. Intersection Departures

A pilot may request to depart from a runway intersection rather than taking the full length of the runway. This can greatly expedite the flow of traffic if done appropriately. When a pilot request an intersection departure, the local controller should indicate the available takeoff distance from that intersection. The takeoff clearance follows the same structure from a full-length takeoff clearance with the addition that the controller specifies the intersection from which the departure is being made.

- Local: "Goodspeed 103, winds 060 at 15, runway 10 at Hotel 4, cleared for takeoff."

9.7. Cancelled Takeoff Clearance

At times, it may become necessary to cancel an aircraft's takeoff clearance. When this occurs, you **MUST** include the reason for cancellation.

- "Delta 514, cancel takeoff clearance. Unauthorized traffic on the runway."

9.8. Landing Clearance

Landing clearances follow the same structure as takeoff clearances.

- "Spirit Wings 993, winds 060 at 12, runway 10, cleared to land."
- "N7237W, winds calm, runway 9, cleared to land. Expect a right turn off to vacate the runway."

- “Silver Wings 424, winds 090 at 8, runway 10, cleared to land. Caution wake turbulence from previous arrival, heavy Boeing 777.”

9.9. Land and Hold Short Operations (LAHSO)

Land and Hold Short Operations (LAHSO) is a landing clearance with a directive to land and stop (or exit) prior to reaching a specified point on the runway. This operation is used to ensure that multiple runways can be used simultaneously while still maintaining positive separation and is primarily used in the United States. Many US airports will publish common LAHSO points and landing distances available. Although LAHSO are not in use at San Juan CERAP since San Juan CERAP does not have crossing runways, this is a standard procedure all tower controllers should be aware of.

- “Bluestreak 565, winds 290 at 15, runway 27, cleared to land. Hold short of Runway 22L for departing traffic.”

9.10. Same Runway Separation

Same Runway Separation (SRS) is not to be confused with wake turbulence separation minima. SRS is an FAA specific procedure and can only be used at FAA operated airports. It can **NOT** be used at Beef Island/Roadtown Airport (TUPJ).

SRS is based on three aircraft categories:

- CATEGORY I
  - Small aircraft weighing 12,500 lbs. or less, with a single propeller driven engine, and all helicopters.
- CATEGORY II
  - Small aircraft weighing 12,500 lbs. or less, with propeller driven twin-engines.
- CATEGORY III
  - All other aircraft.

Separate a departing aircraft from a preceding departing or arriving aircraft using the same runway by ensuring that it does not begin takeoff roll until the other aircraft has departed and crossed the runway end or turned to avert any conflict. If you can determine distances by reference to suitable landmarks, the other aircraft needs only be airborne if the following minimum distance exists between aircraft:

1. When only Category I aircraft are involved- 3,000 feet.
2. When a Category I aircraft is preceded by a Category II aircraft- 3,000 feet.
3. When either the succeeding or both are Category II aircraft- 4,500 feet.
4. When either is a Category III aircraft- 6,000 feet.
5. When the succeeding aircraft is a helicopter, visual separation may be applied in lieu of using distance minima.

9.11. Wake Turbulence

Wake turbulence is created by all aircraft. An aircraft's wake is worst when it is heavy and slow. Therefore, during takeoff and landing, where the tower controller handles the most aircraft, is a critical phase, especially with Heavy and Super aircraft.

Wake turbulence is worst during calm wind conditions. The presence of wind helps to break up any wake turbulence currents.
In an ICAO flight plan, the Wake Turbulence Category indicator follows the aircraft type designator:

- A388/S
- B744/H
- A320/M
- C172/L

It is based on the maximum certificated take-off weight, as follows:

- SUPER (J) - Airbus A-380-800 (A388) and Antonov An-225 (A225).
- Heavy (H) - Aircraft types of 300,000 pounds or more, except for those listed as SUPER (J).
- Medium (M) - Aircraft types less than 300,000 pounds and more than 15,400 pounds.
- Light (L) - Aircraft types of 15,400 pounds or less.

The following separation minima should be applied to aircraft based on time:

Lead / Trail	Light (L)	Medium (M)	Heavy (H)	Super (J)
Super (J)	3 min	3 min	3 min	-
Heavy (H)	2 min	2 min	-	-
Medium (M)	2 min	-	-	-
Light (L)	-	-	-	-

When the succeeding aircraft (trailing) is departing from a runway intersection behind a:

- Heavy - 3 minutes
- Super - 4 minutes

Add one minute if a departure will follow a low or missed approach. Add the following to your takeoff clearance:

- "Caution wake turbulence, [Heavy/Super][Aircraft Type]"

9.12. Go Arounds

Go-around can happen for a number of reasons, but most commonly because of the loss of positive same-runways-separation, runway incursions, or pilot induced unstable approaches. On VATSIM, it is common for pilots to take longer than expected to exit the runway, or to have someone spawn on the runway. In general, it is good practice to issue go-arounds before an aircraft reaches the minimums for the approach.

You may **ONLY** assign a published missed approach if the aircraft was assigned to an instrument or charted visual approach. If the aircraft was given an uncharted visual approach clearance, missed approach instructions must be given. Please refer to the San Juan SOP for further information. Stating a reason for an ATC directed go-around is common courtesy.

- “[Callsign] go around. Fly the published missed approach.”
- “[Callsign] go around. Fly [Heading], climb and maintain [Altitude].”

9.13. Runway Change

At times when an aircraft is on final, you may need to switch their runway for landing, after they have already been cleared for an approach. This is most common with parallel runways but can be used at San Juan (SJU) as well. This maneuver can be used for traffic congestion relief or a runway emergency.

For example, when an aircraft is inbound on a visual approach for runway 10 at San Juan (SJU):

- Local: “JetBlue 316, change to runway 8, runway 8 cleared to land, wind 060 at 12.”

9.14. Circle-to-Land

At times, due to weather, lack of an instrument approach for the wind-favoring runway, or by pilot request, an aircraft may be cleared for an instrument approach to one runway with the intention to have them land on another. This could be used to land on a completely different runway, or the same runway but from the opposite direction. When this happens, the overlying radar controller will also coordinate with the Local controller. As a local controller you will treat a circle-to-land in the same manner as a normal landing operation.

9.15. VFR Operations

The takeoff clearance of VFR traffic is dependent on two major factors:

- Is the aircraft remaining in the VFR pattern, or
- Is the aircraft departing the local area (to another airport, or possibly to go practice and eventually return to the home airport.)

Phraseology will differ in some locations but here are common examples:

- "N6263D, make left closed traffic. Winds 120 at 10, runway 8 cleared for takeoff."
- "N2854T, proceed on course, runway 9 cleared for takeoff."
- "N356DC, right downwind departure approved, runway 10 cleared for takeoff."

Landing clearances for VFR traffic that are going to make a full stop are identical to IFR landing clearances. A full stop landing is when an aircraft intends to land and vacate the runway.

- "N511SV, wind calm, runway 10 cleared to land."

In addition to full stop landings, VFR aircraft may also request one of the following alternatives:

- Make a low approach
- Complete a touch and go
- Complete a stop and go
- Make a full stop landing

A tower controller may specifically clear an aircraft for any one of these, or clear them for the option, which allows the pilot to choose one of the options for himself.

- "N44CS, cleared for touch and go Runway 07."
- "N783KS, cleared for the option Runway 07."

At times, likely due to traffic congestion, you may have to deny a request.

- "N313TX, unable touch and go. Cleared for low approach Runway 10."

It is important to know and understand the differences between the various options:

- Low Approach
  - Aircraft is authorized to overfly the runway, but not land on it.
- Touch and Go
  - Aircraft is authorized to land (wheels down) then reapply takeoff power to begin another takeoff.
- Stop and Go
  - Aircraft is authorized to land and come to a complete stop on the runway.
  - Then re-apply takeoff power to begin another takeoff with the remaining runway distance (most commonly done at night, due to lower traffic density).

It is important to ensure you give climb out instructions for aircraft completing any of these options.

- "N1214T, after touch and go, make left closed traffic."

VFR aircraft will usually conduct pattern operations at 500 ft AGL (Above Ground Level) for helicopters, 1,000 ft AGL for propeller aircraft, and 1,500 ft AGL for jet aircraft. The standard pattern is the left closed traffic pattern.

Be sure to reference local SOPs, since terrain, obstacles, or population densities, can influence traffic pattern direction (left or right) and pattern altitudes can be airport specific.

Remember, although VATSIM ATC clients allow us to see all targets for simulation purposes, you have **NO** radar capabilities. Therefore, you are **UNABLE** to provide any radar separation for VFR aircraft as a tower controller.

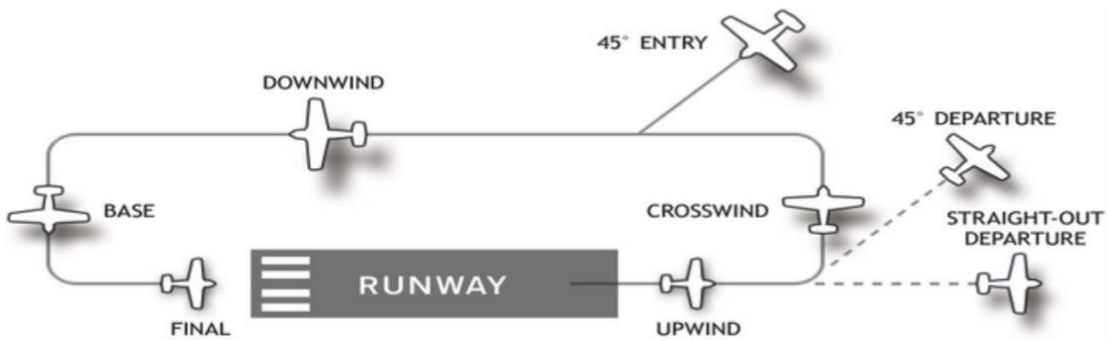


Figure 18. The VFR Traffic Pattern visualized.

The VFR pattern is made up out of several legs:

- Upwind
  - The upwind leg is represented by the portion from which the aircraft departs the runway and extends along the runway centerline.
  - The upwind leg may be extended by ATC when necessary.
  - The upwind leg is a standard leg to depart from the pattern.
- Crosswind
  - The crosswind leg is perpendicular to the runway and its direction will be dictated by ATC in the takeoff clearance.
  - The crosswind leg may be extended by ATC when necessary.
  - The crosswind leg is a standard leg to depart from the pattern.
- Downwind
  - The downwind leg is parallel to the runway in the opposite direction.
  - The downwind leg may be extended by ATC when necessary.
  - The downwind leg is a standard leg to enter the pattern.
- Base
  - The base leg is perpendicular to the runway in the opposite direction from the crosswind leg.
  - The base leg may **NOT** be extended by ATC.
  - The base leg is a standard leg for entry into the pattern.
- Final

- The final leg is in line with the runway.
- The final leg is a standard leg for entry into the pattern.

VFR traffic may be sequenced using a number of different techniques:

- Extending a pattern leg
- S-Turns
- 270/360 degree turns
- Follow traffic
- Visual holds
- Speed restrictions

Upwind, crosswind, and downwind legs may be extended by ATC when necessary. In an effort to help sequence aircraft in/out of the pattern or with inbound/outbound IFR traffic, you can use the following phraseology:

- "[Callsign], extend your [Leg], I will call your [Next Leg]."
- "N714ZF, extend your downwind. I will call your base leg."

Then once they have extended their current leg enough and can turn to the next:

- "[Callsign], turn [Leg] now."
- "N714ZF, turn base now."

Aircraft can be instructed to make one or more S-Turns, which create a longer flying distance for the aircraft, creating space. This is among the shortest sequencing techniques. When commanding an S-Turns, provide the pilot with a direction to make the turn and how many if required.

- "[Callsign], make [Count], [Direction], S-Turns."
- "N67924, make two right S-Turns."
- "N6409H, make one S-Turn left."

Aircraft can be instructed to make a left or right 270 degree or 360 degree turn depending on relative location. Similar to S-Turns, you can specify the number of turns to make. This operation takes time and should be limited in order to prevent confusion or disorientation to pilots. Also, take into account that when a pilot completes a standard rate turn at 3 degrees per second, a 360 degree turn should take 2 minutes.

- "[Callsign], make [Count] [Direction] [Degrees] turn(s)."
- "N67924, make one right 360 turn and rejoin downwind."
- "N6409H, make a left 270 turn to enter base leg."

VFR aircraft can also be instructed to follow another aircraft. This is typically used when you have multiple aircraft in the pattern. It helps to expedite the traffic flow while maintaining separation. You

MUST advise the second aircraft of the traffic ahead, and verify they have them in sight, before giving the direction to follow.

- "[Callsign], follow the [Description] [Position]."
- "N12878, follow the green Cessna Skyhawk on the downwind."
- "N613JG, follow the regional jet on a 2 mile final."

ATC can instruct aircraft to hold over a visual point such as a major landmark, lake, water tower, shopping center, etc. These points are often shown on VFR charts and sometimes used as mandatory reporting points as well. Due to the large variety in scenery files for pilots, this is an uncommon procedure on the VATSIM network.

- "[Callsign], hold visually over [Position]."
- "N363EF, hold visually over the Loiza Dam."

ATC has the ability to instruct aircraft to maintain a specific speed. Due to aircraft limitations and simulator differences, this is not commonly used for sequencing VFR aircraft.

- "[Callsign], maintain [Speed]."
- "N311HE, maintain 90 knots."

9.16. Helicopter Operations

Unlike fixed wing aircraft, helicopters have the ability to takeoff and land from locations on the airfield other than runways. No matter where the helicopter is departing from, you are responsible for issuing all takeoff and landing clearances while maintaining safety.

When doing so, some things to remember are:

- Can I see the helicopter?
- Are there any hazards to the helicopter?

When issuing a takeoff clearance, the following phraseology should be used:

- "Helicopter [Callsign], [Location], [Direction], [Other], Cleared for takeoff."

[Other] may be a reference to avoiding hazards like other traffic, vehicles, power lines, etc. It can also be instructions to turn a specific direction or remain clear of a location. It can also represent caution advisories like wake turbulence.

- "Helicopter N181BA, from Apron 4 southbound departure approved, remain south of runway 8 at all times, cleared for takeoff. B737 on 4 mile final for Runway 10."

Helicopters are authorized to conduct simultaneous takeoffs and landings provided at least 200 feet of separation exist between each helicopter, and their courses maintain that minimum distance on departure. You can safely accomplish this by advising the helicopters to:

- “Maintain visual separation of at least 200 feet.”

Maintaining visual separation by itself is **NOT** enough of a clearance for this operation type. The 200 foot distance **MUST** be stated in your instructions.

Landing clearance is much the same as a takeoff clearance. The following phraseology should be used:

- “Helicopter [Callsign], [Approach], [Direction] for [Location], [Other], Cleared to land.”
- “Helicopter N181BA, make straight in for Helipad 2. Remain between runways 8 and 10. Cleared to land.”

Instructions to make left or right turns in a particular direction may be used if needed. Best practice is to advise the helicopter where you want them to go and what you don’t want them to do.

There are situations where you cannot visually see the helicopter. This can occur when they are parked behind a hangar or are located in an off-airport location (e.g. on the helipad of a nearby hospital). In these situations, a departure/arrival is still possible but you will need to provide different phraseology since a traditional takeoff or landing clearance cannot be issued.

- “Helicopter [Callsign], departure/landing from/at [Location] will be at your own risk, [Other].”
- “Helicopter N181BA, departure from the National Guard Ramp will be at your own risk. Remain north of runway 10 at all times.”

Note: “Report landing assured” is used to have the helicopter report when they have safely touched down. Remember this is when you can’t see the helicopter and confirmation of a safe landing needs to be reported to ATC.