Denver ARTCC

Subject: Training Syllabus

This syllabus is meant to give the students of the training program a way to know what is expected of them during each step of training as well as the flow of training from a new Observer all the way up to C1.

Please note, this order is intended for use on the VATSIM network and only applies in a virtual environment simulated on the VATSIM network. It is not applicable for live operations in the National Airspace System.

Mike Bencivenga
Training Administrator
Denver ARTCC

Table of Contents

1 Purpose

This document establishes and provides the formal rules, regulations, procedures, and guidelines which govern controller training operations within the ZDV ARTCC. This document is considered a supplement to any VATSIM, Executive Committee, VATUSA, and ZDV policies, procedures, and controlled documentation.

2 Roles and Responsibilities

The syllabus shall be maintained by the Training Administrator (TA). Upon vacating the position, the outgoing TA shall provide the source file of this syllabus to the incoming TA, so that they may continue to modify this syllabus as needed. Policies shall be maintained in accordance with established VATSIM Global Rating Policies. At no time shall any provision in this manual conflict with a VATSIM or VATUSA policy.

3 Distribution

This document is authorized for unrestricted public release.

4 Observer to S1

Initial Review Session for the concepts related to S1 rating.

Timeframe: 5-8 Sessions, 9-12 hours

4.1 S1 Concepts

4.1.1 Prerequisites Qualifications:
● VATUSA S1 Exam Complete

4.1.2 Files to Download:
● CRC
● vATIS
● Audio for VATSIM

4.1.3 Basic ATC
● VFR
● IFR
● Overview of the National Airspace System
● Special Use Airspace
● Aircraft
● Aircraft Recognition
● Navigation Facilities and Methods
● Airways and Route Systems
● Basic Weather Reading
● Weather/METAR/TAF
● Clearance and Delivery overview
● SIDs
● Flight Plans
● Altitude
● Routes
● IFR Clearances
● VFR Clearances
● SVFR Clearances
● SOPs and LOAs

4.1.4 Completion Standards
● The student should be able to recollect most topics from the academy, if not either repeat session or review topics.
● The student does not need to be an expert in all areas, but rather have some knowledge of it. They will be reinforced later in the course.

4.2 Clearance and Delivery.

Initial Training Session shall be conducted at KCYS and KAPA on Sweatbox.

Timeframe: 4 Sessions, 4-5 Hours
Airfield: KCYS and KAPA

4.2.1 Prerequisite Qualifications
- S1 Concepts Completed

4.2.2 Prerequisite Reading
- Cheyenne and Centennial ATCT SOP (Only Clearance section)

4.2.3 Elements
- Clarification and/or read over of CYS and APA SOP Clearance Delivery Section
- Clearance and Delivery Overview
- SIDs
- Flight Plans
- Altitude
- Routes
- IFR Clearances
- VFR Clearances
- SVFR Clearances
- SOPs and LOAs
- Sweatbox - CYSCD1
- Sweatbox - APACD1
- Sweatbox - APACD2

4.2.4 Completion Standards
- This section will be considered complete upon a full session with little to no assistance with issuing clearances in both sweatbox files, having reroutes being given in a precise and accurate manner, and instructions for taxi or a runway assignment after the clearance is given if applicable.

4.3   Ground Control - Delta Information at KAPA

Initial Training Session shall be conducted at KAPA.

Timeframe: 1-2 Sessions, 2-3 Hours
Airfield: KAPA

4.3.1   Prerequisite Qualifications
- Clearance and Delivery Completed

4.3.2   Prerequisite Reading
- Centennial ATCT SOP (Only CD/GC sections required)
- Airspace Entry Requirements (Class D Airspace)

4.3.3   Ground Control
- Movement & Non-Movement Areas
- Selecting Active Runways
- Ground Traffic Movement
- Taxi Instructions
- Crossing & Holding Short Runways
- Radio Communication
- Intercom Communication
- Helicopter Operations
- Sweatbox - APAGC1

4.3.4   Completion Standards
- The section will be considered complete once all aspects of this module are fully met and are able to be described or demonstrated without assistance to the instructor or mentor.

4.4 Ground Control - Class C Operations

Timeframe: 1-2 Session(s), 2-4 hours total
Airfield: KCOS

4.4.1 Prerequisite Qualifications
- Ground Control Class Delta Completed

4.4.2 Prerequisite Reading
- Colorado Springs ATCT SOP (Only CD/GC sections required)
- Airspace Entry Requirements (Class C Airspace)

4.4.3 Introduction to KCOS
- SIDs
- Flight Plans
- Altitude
- Routes
- IFR Clearances
- VFR Clearances
- SVFR Clearances
- SOPs and LOA Compliance
- Movement & Non-Movement Areas
- Selecting Active Runways
- Ground Traffic Movement
- Taxi Instructions
- Crossing & Holding Short Runways
- Radio Communication
- Intercom Communication
- Helicopter Operations

4.4.4 S1 Practical Evaluation
- The student must create a CRC profile for KCOS without assistance with at least 75% of the above listed elements demonstrated to a satisfactory level.
- Sweatbox - COSGC1

4.4.5 Completion Standards
- For this section to be considered complete, the student will have been able to control all aspects of Springs Ground without any assistance from the instructor or mentor.
- The student will be awarded an S1 certificate if all aspects are complete to a satisfactory level.

4.5   Tier 2 Complex Procedures - Aspen

Timeframe: 1-2 Session(s), 2-4 hours total
Airfield: KASE

4.5.1   Prerequisite Qualifications
- S1 Rating

4.5.2   Prerequisite Reading
- Aspen ATCT SOP (Only CD/GC sections required)
- Airspace Entry Requirements (Class D Airspace)

4.5.3   Introduction to KASE
- SIDs
- Flight Plans
- Altitude
- Routes
- IFR Clearances
- VFR Clearances
- SVFR Clearances
- SOPs and LOA Compliance
- Movement & Non-Movement Areas
- Selecting Active Runways
- Ground Traffic Movement
- Taxi Instructions
- Crossing & Holding Short Runways
- Radio Communication
- Intercom Communication
- Helicopter Operations

4.5.4   S1 Practical Evaluation
- The student must create a CRC profile for KASE without assistance with at least 75% of the above listed elements demonstrated to a satisfactory level.
- Sweatbox - ASEGC1

4.5.5   Completion Standards
- For this section to be considered complete, the student will have been able to control all aspects of Aspen Ground without any assistance from the instructor or mentor.
- The student will be awarded an S1 Tier 2 ASE certification if all aspects are complete to a satisfactory level.

4.6 Tier 2 Complex Terrain - Eagle

Timeframe: 1-2 Session(s), 2-4 hours total
Airfield: KEGE

4.6.1 Prerequisite Qualifications
  ● S1 Rating
4.6.2 Prerequisite Reading
  ● Eagle County FCT SOP (Only CD/GC sections required)
  ● Airspace Entry Requirements (Class C Airspace)
4.6.3 Introduction to KEGE
  ● SIDs
  ● Flight Plans
  ● Altitude
  ● Routes
  ● IFR Clearances
  ● VFR Clearances
  ● SVFR Clearances
  ● SOPs and LOA Compliance
  ● Movement & Non-Movement Areas
  ● Selecting Active Runways
  ● Ground Traffic Movement
  ● Taxi Instructions
  ● Crossing & Holding Short Runways
  ● Radio Communication
  ● Intercom Communication
  ● Helicopter Operations
4.6.4 S1 Practical Evaluation
  ● The student must create a CRC profile for KCOS without assistance with at least 75% of the above listed elements demonstrated to a satisfactory level.
  ● Sweatbox - EGEGC1
4.6.5 Completion Standards
  ● For this section to be considered complete, the student will have been able to control all aspects of Eagle Ground without any assistance from the instructor or mentor.
  ● The student will be awarded an S1 Tier 2 EGE certification if all aspects are complete to a satisfactory level.

4.7　Denver Major Certification - Class B Ops

The student starts training at KDEN.

Timeframe: 2 sessions, 1-2 hours total
Airfield: KDEN

4.7.1　Prerequisite Qualifications
- S1 Rating
- 20 hours controlling at S1 rating
- DEN Ground exam, prior to full certification. Not required to begin training.

4.7.2　Prerequisite Reading
- KDEN ATCT SOP
- D01 / DEN ATCT Letter of Agreement (LOA)
- All other ZDV LOAs (Specifically focus on required routes)
- KDEN airport chart

4.7.3　Introduction to KDEN
- SOP/LOA Reread and Review
- RNAV SID Review and "Climb Via SID" Phraseology
- CRC profile for KDEN
- PDC – Pre-Departure Clearance
- Review airspace classes and entry requirements

4.7.4　Sweatbox
- Student will run through two separate situation files for KDEN on Sweatbox and will continue practicing them until proficiency is demonstrated:
  - DENCD1: IFR / VFR with complete flight plans. VFR aircraft have little information in their flight plans.
  - DENGC1: IFR / VFR with complete flight plans. VFR aircraft have little information in their flight plans.
-

4.7.5　Completion Standards
- Upon completion of this section the student will receive a Denver Solo Endorsement if the student can competently control all aircraft above the normal daily traffic level. If a student demonstrates all competencies proficiency a full certification may be issued at the mentor/instructor's discretion, once DEN Ground exam has been completed.

4.8 Denver Major Certification Exam (OTS)

An OTS exam for the Denver S1 Major Ground rating will be administered on the Sweatbox server by an Instructor/Mentor.

4.8.1 Prerequisite Qualifications:
- S1 Rating
- Minimum 20 hours controlling as an S1
- Passing score on KDEN Major Ground Exam
- Student has had solo for 10 days and logged 10 hours on the position.

4.8.2 OTS Evaluation
- Student will run through the S1 OTS file and will be graded using the Denver Ground Major Standards Rubric
   - Sweatbox File (OTS) DENGC
- Student will be advised of PASS or FAIL score from OTS evaluation
- Upon passing score from OTS exam, student will be issued the S1 Major Ground endorsement for KDEN

4.8.3 Completion Standards
- This module will be considered complete assuming that the student has completed all aspects of the Major Certification Rubric to a satisfactory level.
- Upon completion of this module, the student will be awarded a Denver Ground Major Certification.

4.8.4 Exceptions
- This module may be combined with the S2 Major Certification in one session for transferring or visiting controllers. Two sessions are only required if the student does the Denver Ground Major Certification when they were not qualified to do the Major Tower Certification at the time.

5 S1 to S2

5.1 Local Control Basic Class D / C Operations

Student will mainly focus on departures during this standard. This session will take place on the Sweatbox server and should consist of no more than three sessions. This should be an application of material learned on the Academy course, along with reviewing deficiencies.

Timeframe: 3-5 sessions, 4-5 hours
Airfield: KAPA, KCOS and KBJC

5.1.1 Prerequisite Qualifications:
- S1 Rating
- Student must have completed the S2 Academy Course and Passed the Final Exam

5.1.2 Prerequisite Reading:
- KAPA, KBJC and KCOS ATCT SOPs
- VATUSA S2 CBTs (Block 3: Local Control)

5.1.3 Introduction to Basic Local Control
The student will be introduced to basic local control concepts at KAPA, KBJC and KCOS. Student is instructed that while this training is taking place at KAPA, KBJC and KCOS, the concepts learned can be applied to any Class D / C field.
- Airspace (types, ceilings, floors, and the "-minus" notations on section charts)
- Traffic pattern legs
- VFR outbound traffic
- Traffic pattern departures
- IFR Departure Release
- Rolling releases (KDEN only)
- Handoff to departure
- Landing / Takeoff clearances and what they mean
- Intersection departures
- Land and Hold Short (LAHSO), Line Up and Wait (LUAW) and runway crossings
- Same runway separation
- Wake turbulence

5.1.4 Sweatbox
- Student will run through two separate situations files on Sweatbox: one for KAPA and one for KCOS and will continue practicing with them until proficiency is demonstrated
    - APALC1: KAPA - IFR / VFR with a mix of correct, incorrect, and incomplete VFR flight plans
    - APALC2: KAPA - IFR / VFR with a mix of correct, incorrect, and incomplete VFR flight plans
    - APALC3: KAPA - IFR / VFR with a mix of correct, incorrect, and incomplete VFR flight plans

- BJCLC1: KBJC - IFR / VFR with a mix of correct, incorrect, and incomplete VFR flight plana
- COSLC1: KCOS - IFR / VFR with a mix of correct, incorrect, and incomplete VFR flight plans

5.1.5 Completion Standards
- This standard will be considered complete once the student is able to apply all applicable knowledge from the academy S2 course and control departures with little error.

5.2 Local Control Advanced Class D / C Ops.

Student will focus on arrivals and VFR pattern procedures during this. This session will take place on the Sweatbox server.

Timeframe: 1-2 sessions, 2-3 hours
Airfields: KAPA, KBJC and KCOS

5.2.1   Prerequisite Qualifications:
-

5.2.2   Introduction to Advanced Local Control
Student will be introduced to advanced local control concepts at KAPA, KBJC and KCOS. Student is instructed that while this training is only taking place at KAPA, KBJC and KCOS, the concepts can be applied to any Class D / C field.
- VFR in the pattern, including pattern entry phraseology
  - Legs of the pattern in order
- Landing Clearances:
  - Touch and Go
  - Stop and Go
  - Short Approach
  - Low Approach
  - Full Stop
  - Cleared for the Option
  - Unavailable Options
- Transitiended upwind / crosswind / downwind
  - 360s
  - 270s
  - Crossing over the field
  - Breaking planes out of the pattern
  - S-turns
  - Sidestep / Runway changes
- IFR releasesoning VFR aircraft
- Traffic point-outs (using non-radar phraseology), "follow"
- Separation and sequencing techniques
- Ext from Class D fields
- Pop-up IFR clearances in the pattern
- IFR missed approach procedures/instructions
- VFR practice approach and missed approach procedure
- Military Procedures
  - Overhead maneuver
  - Simulated flameout
  - High Key Departure
  - Unrestricted Climb

- o "Check gear down"
- ● Helicopter Operations
  - o Departure from active runway
  - o Departure from movement area (other than active runway)
  - o Departure from non-movement area
  - o Arrival to active runway
  - o Arrival to movement area (other than the active runway)
  - o Arrival to non-movement area

5.2.3 SweatBox
- ● Student will run through two separate situation files on SweatBox: one for KAPA and one for KCOS and will continue practicing with them until proficiency is demonstrated
  - o APALC1: KAPA - IFR / VFR with a mix of correct, incorrect, and incomplete VFR flight plans
  - o APALC2: KAPA - IFR / VFR with a mix of correct, incorrect, and incomplete VFR flight plans
  - o APALC3: KAPA - IFR / VFR with a mix of correct, incorrect, and incomplete VFR flight plans
  - o BJCLC1: KBJC - IFR / VFR with a mix of correct, incorrect, and incomplete VFR flight plana
  - o COSLC1: KCOS - IFR / VFR with a mix of correct, incorrect, and incomplete VFR flight plans
- ● A debrief will be conducted on the topics and material that were covered in the training session and any questions will be answered
- ● New reading material for all Class C / D operations will be assigned.
- ● Training notes updated

5.2.4 Completion Standards
- ● For this standard to be considered complete, the student must be able to control arrivals and departures, both IFR and VFR mixed at or above normal daily traffic flow.

5.3 Class C Tower Solo Certification

Once the student has completed the previous standard, they may be cleared for a solo certification at the training staff discretion.

Timeframe: Minimum 1 hour, Ideal 2-5 hours
Airfield: KCOS

5.3.1 Prerequisite Qualifications:
- S1 Rating

5.3.2 Solo Certification
- Only valid for 30 days
- May be extended up to times, to a maximum of 90 days, with Training Administrator approval.

5.4 S2 OTS

5.4.1 Prerequisite Qualifications
- Recommendation for OTS from Mentor/Instructor
- VATUSA S2 Academy Course Completed and Passed

5.4.2 OTS Elements
- All Line items for the S2 OTS are outlined in the S2 Rating Review form, not available to students. The student will be briefed online items to be satisfactory in.
- The OTS should be conducted on the live network upon the instructors wish. Sweatbox is an option if need be.
- Potential Airports: KAPA, KCOS, KGJT, KBJC, KPUB; at the instructor's discretion. Student will be notified a minimum of one hour prior to the session of OTS airport to allow sufficient time to review SOP.

5.4.3 Completion Standards
- For this standard to be considered complete, the student must get a satisfactory rating on all line items.
- At completion the OTS, the student must be awarded an S2 rating. If unsatisfactory, remedial training must be completed prior to the next OTS.

5.5 Tier 2 Complex Procedures Aspen

Student will focus on arrivals and VFR pattern procedures during this standard. This session will take place on the Sweatbox server.

Timeframe: 1-2 sessions, 1-2 hours
Airfields: KASE

5.5.1 Prerequisite Qualifications:
- S2 rating complete

5.5.2 Introduction to Advanced Local Control
Student will be introduced to advanced local control concepts at KASE.
- VFR in the pattern, including pattern entry phraseology
  - Legs of the pattern in order
- WRAP Procedure
- Landing Clearances:
  - Touch and Go
  - Stop and Go
  - Short Approach
  - Low Approach
  - Full Stop
  - Cleared for the Option
  - Unavailable Options
- Transitiended upwind / crosswind / downwind
  - 360s
  - 270s
  - Crossing over the field
  - Breaking planes out of the pattern
  - S-turns
  - Sidestep / Runway changes
- IFR releasesoning VFR aircraft
- Traffic point-outs (using non-radar phraseology), "follow"
- Separation and sequencing techniques
- Ext from Class D fields
- Pop-up IFR clearances in the pattern
- IFR missed approach procedures/instructions
- VFR practice approach and missed approach procedure
- Military Procedures
  - Overhead maneuver
  - Simulated flameout
  - High Key Departure
  - Unrestricted Climb
  - "Check gear down"

- Helicopter Operations
    - Departure from active runway
    - Departure from movement area (other than active runway)
    - Departure from non-movement area
    - Arrival to active runway
    - Arrival to movement area (other than the active runway)
    - Arrival to non-movement area

5.5.3 SweatBox
- Student will run through two separate situation files on SweatBox: one for KAPA and one for KCOS and will continue practicing with them until proficiency is demonstrated
    - ASELC1: KASE - IFR / VFR with a mix of correct, incorrect, and incomplete VFR flight plans
- A debrief will be conducted on the topics and material that were covered in the training session and any questions will be answered
- New reading material for all Class C / D operations will be assigned.
- Training notes updated

5.5.4 Completion Standards
- For this section to be considered complete, the student will have been able to control all aspects of Aspen Tower without any assistance from the instructor or mentor.
- The student will be awarded an S2 Tier 2 ASE certification if all aspects are complete to a satisfactory level.

5.6 Tier 2 Complex Terrain Eagle FCT

Student will focus on arrivals and VFR pattern procedures during this. This session will take place on the Sweatbox server.

Timeframe: 1-2 sessions, 2-3 hours
Airfields: KEGE

5.6.1   Prerequisite Qualifications:
● S2 rating complete

5.6.2   Introduction to Advanced Local Control
Student will be introduced to advanced local control concepts at KEGE.
● VFR in the pattern, including pattern entry phraseology
  ○ Legs of the pattern in order
● Landing Clearances:
  ○ Touch and Go
  ○ Stop and Go
  ○ Short Approach
  ○ Low Approach
  ○ Full Stop
  ○ Cleared for the Option
  ○ Unavailable Options
● Transitiended upwind / crosswind / downwind
  ○ 360s
  ○ 270s
  ○ Crossing over the field
  ○ Breaking planes out of the pattern
  ○ S-turns
  ○ Sidestep / Runway changes
● IFR releasesoning VFR aircraft
● Traffic point-outs (using non-radar phraseology), "follow"
● Separation and sequencing techniques
● Ext from Class D fields
● Pop-up IFR clearances in the pattern
● IFR missed approach procedures/instructions
● VFR practice approach and missed approach procedure
● Military Procedures
  ○ Overhead maneuver
  ○ Simulated flameout
  ○ High Key Departure
  ○ Unrestricted Climb
  ○ "Check gear down"
● Helicopter Operations

- o Departure from active runway
- o Departure from movement area (other than active runway)
- o Departure from non-movement area
- o Arrival to active runway
- o Arrival to movement area (other than the active runway)
- o Arrival to non-movement area

5.6.3 SweatBox
- Student will run through two separate situation files on SweatBox: one for KAPA and one for KCOS and will continue practicing with them until proficiency is demonstrated
  - o EGELC1: KEGE - IFR / VFR with a mix of correct, incorrect, and incomplete VFR flight plans
- A debrief will be conducted on the topics and material that were covered in the training session and any questions will be answered
- New reading material for all Class C / D operations will be assigned.
- Training notes updated

5.6.4 Completion Standards
- For this section to be considered complete, the student will have been able to control all aspects of Eagle Tower without any assistance from the instructor or mentor.
- The student will be awarded an S2 Tier 2 EGE certification if all aspects are complete to a satisfactory level.

5.7 Local Control Class B Operations

Student starts training at KDEN. At least two sessions are to be conducted here: at least one session on Sweatbox and one session on the live network. An OTS exam and/or checkout by an instructor or Mentor is required prior to being able to control solo at KDEN, regardless of one's rating.

Timeframe: 2-4 sessions, 5+ hours
Airfield: KDEN

5.7.1 Prerequisite Qualifications
- S2 Rating
- ASE/EGE Tier 2 certifications

5.7.2 Prerequisite Reading
- KDEN ATCT SOP
- D01 / DEN Letter of Agreement (LOA)
- All other ZDV LOAs (Specifically focus on required routes)
- KDEN airport chart
- VATUSA ZDV Block 2 KDEN LC CBT

5.7.3 Local Control Procedures at KDEN
Student is introduced to local control concepts at KDEN:
- Denver Class B airspace layout
- Denver tower delegated airspace
- In-the-air Class B clearances
- Rolling releases

5.7.4 Sweatbox
- Students will run through two separate situation files for KDEN on SweatBox and will continue practicing with them until proficiency is demonstrated:
  - DENLC-N: IFR/VFR with complete and correct flight plans
  - DENLC-s: IFR/VFR with a mix of correct, incorrect and incomplete VFR flight plans
- Student shall conduct at least four hours of training on the live network under the supervision of a Mentor / Instructor
- A debrief will be conducted on the topics and material that were covered in the training session and any questions will be answered
- Training notes updated
- Upon completion of this standard, the student will be assigned the ZDV S2 Major Tower exam
  - The exam is untimed and open book. It is highly encouraged that you take your time, research, and review each question thoroughly

5.7.5 Completion Standards
- For this to be considered complete, the student must be able to control KDEN at an above normal traffic level to a sufficient standard deemed by the mentor/instructor.

- The Major Certification Rubric should be referenced by the mentor/instructor to deem a sufficient standard.
- Upon Completion this standard, the student will be awarded a solo endorsement expiring 30 days from the date of issuance.

5.8   Major Tower Checkout

A major checkout for the KDEN Major Tower Endorsement will be administered live on the network or in a sweatbox environment by an instructor or mentor. It may be conducted during an event assuming that a mentor or instructor is monitoring throughout.

Timeframe: 2 hours minimum

5.8.1   Prerequisite Qualifications:
- S2 Rating
- 10 days held with the solo certification
- 10 or more hours recorded on DEN_TWR

5.8.2   OTS Evaluation
- Student will be graded using the S2 Denver Tower Major Certification Rubric.

5.8.3   Exceptions
- The Denver Tower Certification may be combined with the Denver Ground Major Certification either by two separate sessions or by controlling top down at the tower level as prescribed in the Denver Tower Major Certification Rubric in one session. Either way, it should be conducted at an above normal traffic level.

6 S2 to S3

6.1 Approach/Departure Basic Class C Ops.

Student will begin initial approach / departure training at KCPR. A minimum of four sessions shall be conducted on the Sweatbox server.

Timeframe: 4+ sessions, 6+ hours
Focus TRACON: KCOS

6.1.1 Prerequisite Qualifications:
- S2 Rating
- 20+ combined hours on Class D, C or B local control positions
- Passing Score on VATUSA Academy Approach Control Exam (Certificate)

6.1.2 Prerequisite Reading:
- Casper TRACON SOP

6.1.3 Basic Radar Theory
Student will be introduced to basic Class C TRACON concepts at KCPR. Student will mainly focus approaches and departures during this.
- Airspace Classes and aircraft entry requirements
  - Class D
  - Class C
  - Class B
  - Class A
- Aircraft equipment suffixes and meaning to Radar Controllers
- Cruising Altitudes
  - IFR Cruising Altitudes
  - VFR Cruising Altitudes
  - RVSM
- Airspace layouts and chart reading
  - Sectional
  - Terminal Area Chart (TAC)
  - Standard Instrument Departures (SID)
- Instrument Departure Procedures
  - RNAV
  - RNAV Hybrid
  - Radar Vectored
  - Obstacle Departure Procedure (ODP)
- Separation requirements in Class C / D / E
  - VFR / VFR
  - VFR / IFR
  - IFR / IFR
- Obstruction / Obstacle avoidance

- ○ Minimum Enroute Altitude (MEA)
- ○ Minimum Vectoring Altitude (MVA)
- ○ Minimum Obstruction Clearance Altitude (MOCA)
- ○ Minimum IFR Altitude (MIA)
- ● Merging target procedures and safety alerts
  - ○ Visual separation
  - ○ Traffic calls
  - ○ Traffic alert
  - ○ Terrain / obstruction alerts
- ● Radar Identification
  - ○ Primary target
  - ○ Secondary target
- ● VFR Procedures
  - ○ VFR departures
  - ○ Flight following
  - ○ Transitions
- ● ATC Coordination
  - ○ Point-Outs
  - ○ APREQ
  - ○ Handoffs

6.1.4 SweatBox

- ● Student will run through two separate situation files for KCOS on Sweatbox and will continue practicing with them until proficiency is demonstrated:
  - ○ CPRTC1: KCPR file for safety alerts.
  - ○ CPRTC2: KCPR file only departures.
  - ○ CPRTC3: KCPR file only approaches.
  - ○ CPRTC4: KCPR Combo file.
- ● A debrief will be conducted on the topics and material that were covered in the training session and any questions will be answered
- ● Training notes updated
- ● Upon completion, the student will be assigned the VATUSA S3 exam
  - ○ Exam is untimed and open book. It is highly encouraged that you take your time, research, and review each question thoroughly

6.1.5 Completion Standards

- ● For this to be complete, all aspects must be gone over in detail to the student, and the student must understand the aspects prior to going onto Sweatbox.

6.2   App/Dep Advanced Class C Operations

Student will be introduced to advanced Class C TRACON concepts at KCOS focusing on both arrivals and departures. Student is instructed that while the sessions conducted during 12 and 13 will focus on the Colorado Springs TRACON, the concepts learned can be applied at any Class C TRACON.

Timeframe: 4+ sessions, 6+ hours
Focus TRACON: KPUB

6.2.1   Prerequisite Qualifications:
- KCPR files complete

6.2.2   Advanced Radar Theory
- Airspace splits and chart reading
    - STARs
    - IAP
- RNAV vs Non-RNAV STARs
- Precision vs Non-Precision Approaches
    - VOR / DME
    - NDB
    - TACAN
    - ILS
    - Localizer / Localizer Back Course
    - RNAV / RNP / GPS
    - Visual
- Reading Instrument Approach Procedures (IAP)
    - Parts of an IAP
        - Notes
        - Plan view
        - Profile view
        - Minimums
    - Minimum Safe Altitude (MSA)
    - Aircraft Approach Categories
    - Initial Approach Fix (IAF)
    - Intermediate Fix (IF)
    - Final Approach Fix (FAF)
    - Missed Approach Point (MAP)
    - Procedure Turns
    - Holding Patterns
- Sequencing Techniques
    - Vectoring
    - Speed Restrictions
- Cancellation of Radar Services
    - VFR

- ○ IFR
- Vectoring Methods
  - ○ Direction and heading to turn to
  - ○ Direction and number of Degrees to turn
  - ○ Heading to fly after a fix
- Area vs Non-Area Navigation
  - ○ Aircraft equipment suffixes / capabilities
- The PTAC Acronym
  - ○ **P** - Position
  - ○ **T** - Turn
  - ○ **A** - Altitude
  - ○ **C** - Clearance
- Vectoring to the final approach course
  - ○ Vectors through the localizer
  - ○ Traffic pattern like; 90 degree turns
- Visual Approaches
  - ○ Can only be issued to IFR aircraft operating in visual conditions and clear of clouds
  - ○ Pilot must report the field in sight or preceding aircraft going to that airport in sight
- Uncontrolled field operations
  - ○ One-In-One-Out Rule
  - ○ IFR Releases
    - ■ Clearance Void Time (if applicable)
  - ○ IFR Arrivals
    - ■ Approach selection
    - ■ Visual approaches
    - ■ Traffic advisories
  - ○ IFR Cancellation
    - ■ In the air
    - ■ On the ground
- Holding
  - ○ Standard holding pattern (turns / minutes)
  - ○ Published holds
  - ○ Clearance limits
    - ■ Holding fix / waypoint
    - ■ Cardinal direction of hold, or as published
    - ■ Radial, course, bearing, airway
    - ■ Leg lengths in minutes (if necessary)
    - ■ Direction of turns if non-standard
    - ■ Expect Further Clearance Time (EFC)
- Pop-up IFR Clearances
- VFR Flight following
  - ○ Traffic advisories
  - ○ Terminating VFR services

- IFR to VFR-On-Top
- Practice VFR approaches
  - Separation services / requirements
  - Missed approaches

6.2.3 SweatBox
- Student will run through two separate situation files for KCOS on Sweatbox and will continue practicing with them until proficiency is demonstrated:
  - PUBTC1: Intro to uncontrolled operations at 1V6
  - PUBTC2: Combo file
  - PUBTC3: Combo file
- A debrief will be conducted on the topics and material that were covered in the training session and any questions will be answered
- Training notes updated

6.2.4 Completion Standards
- For this to be complete, the student must understand and demonstrate all aspects within this conceptually and in a sweatbox environment.

6.3 App / Dep Class C TRACON Solo Certification

Once the student has completed the previous standard, they may be cleared for a solo certification at the training staff discretion.

Timeframe: 5+ Hours
Focus TRACON: KCOS

6.3.1 Prerequisite Qualifications:
- KCPR/KPUB Files complete

6.3.2 Solo Certification
- Only valid for 30 days
- May be extended up to times, to a maximum of 90 days, with Training Administrator approval.

6.4   S3 OTS

For the S3 OTS, traffic must be conducted at or above a daily traffic level at a field chosen by the instructor. It should be noted that a student who has done more than 50% of their training with one instructor shall not conduct an OTS on the same student. It needs to be conducted by another instructor.

Timeframe: 2 hours, 1 Session
Focus TRACON: Any at Instructor Discretion

6.4.1 Prerequisite Qualifications
- OTS Recommendation from a mentor/instructor
- S3 Test Completed

6.4.2 Completion Standards
- Completion Standards for the S3 Rating are outlined in the S3 Rating Review Form only visible to instructors and mentors.
- Potential Airports: KCOS, KGJT, KPUB; at the instructor's discretion. Student will be notified a minimum of one hour prior to the session of OTS airport to allow sufficient time to review SOP.

6.5 Tier 2 Complex Procedures Aspen TRACAB

Timeframe: 2+ hours, 1+ sessions
Focus TRACON: ASE

6.5.1 Prerequisite Qualifications
- S3 Rating

6.5.2 Prerequisite Reading:
- ASE TRACON SOP

6.5.3 SweatBox
- Student will run through one file for ASE on Sweatbox and will continue practicing with them until proficiency is demonstrated:
  - ASETC1: ASE Departures and Arrivals
- The session should be focused on Departure Airspace and procedures for Aspen.

6.5.4 Completion Standards
- For this to be considered complete, the student must be able to independently control the departure sector of ASE without assistance with event level traffic.

6.6 Tier 2 Complex Terrain Junction Radar

Timeframe: 2+ hours, 2+ sessions
Focus TRACON: D01 - GJT Sector

6.6.1 Prerequisite Qualifications
- S3 Rating

6.6.2 Prerequisite Reading:
- D01 TRACON SOP

6.6.3 SweatBox
- Student will run through one file for D01 on Sweatbox and will continue practicing with them until proficiency is demonstrated:
  - D01 Arr Dep: D01, GJT sector Departures and Arrivals.
- The session should be focused on Departure Airspace and procedures for Grand Junction.

6.6.4 Completion Standards
- For this to be considered complete, the student must be able to independently control the departure sector of D01 without assistance with event level traffic.

6.7   App/Dep D01 TRACON Dep Procedures

Student will be introduced to departure concepts in a Class B TRACON environment. The D01 require significant work and practice, however, training will begin with KDEN departures and then layer on more complex scenarios with each.

Timeframe: 2+ hours, 2+ sessions
Focus TRACON: D01

6.7.1   Prerequisite Qualifications
- S3 Rating
- S3 Tier 2 certifications
- Denver Tower Endorsement

6.7.2   Prerequisite Reading:
- D01 TRACON SOP

6.7.3   SweatBox
- Student will run through one file for D01 on Sweatbox and will continue practicing with them until proficiency is demonstrated:
    - D01 Arr Dep: D01 Departures and Arrivals with Satellites.
- The session should be focused on Departure Airspace and procedures for Denver and Satellite Airports.

6.7.4   Completion Standards
- For this to be considered complete, the student must be able to independently control the departure sector of D01 without assistance with event level traffic.

6.8   App / Dep D01 Arrival Procedures

Student will be introduced to arrival concepts in a Class B TRACON environment. The Finals Box should be taught separately to the feeder routes.

Timeframe: 3+ hours, 3+ sessions
Focus TRACON: D01

6.8.1   Prerequisite Qualifications:

6.8.2   SweatBox
- Student will run through two separate situation files for D01 on Sweatbox and will continue practicing with them until proficiency is demonstrated:
    - D01 Arr Dep: IFR KDEN departures and arrivals including satellites, "top down"
    - D01 Dual Final: Finals Box Practice.
        - Recommend VIV or IVI ILS/Visual Procedures Practice.
- A debrief will be conducted on the topics and material that were covered in the training session and any questions will be answered

6.8.3 Completion Standards
- For this to be considered complete, the student must be able to independently control the feeder sector of D01 without assistance with event level traffic. This is to include controlling a daily to above daily level of traffic for all arrival sectors, and event level traffic for the feeder and finals box.

6.9 App / Dep D01 Live Monitoring

Student will connect to the live network under the supervision of a Mentor / Instructor. The student shall put in at least 10 hours of controlling time at the TRACON, although more time is encouraged.

Timeframe: 10+ hours
Focus TRACON: D01

6.9.1 Prerequisite Qualifications:
- Passing score on the S3 D01 Major Facility Rating exam

Upon completion of this, a solo cert may be awarded at the discretion of the mentor/instructor.

6.10 App / Dep D01 OTS Exam

An OTS exam for the D01 Major rating will be administered live on the network by an instructor.

Timeframe: 1 Session, 3 Hours
Focus TRACON: D01

6.10.1 Prerequisite Qualifications:
- S3 Rating

6.10.2 Checkout Evaluation
- The student must be given a file with departures and arrivals into Denver, and Satellite departures and arrivals. The student will control top down to demonstrate the knowledge of airspace.

6.10.3 Completion Standards
- For this to be considered complete, the student must get a satisfactory rating on all aspects outlined in the Denver Approach Major Certification Standards Rubric located in the Training Academy Drive.

7   S3 to C1

7.1 Sequencing Practice

When a student expresses interest in beginning C1 training, they will be issued the ZDV C1 Knowledge exam. This exam will test the student's ability to use their resources. All answers to questions in this exam can be found in the documentation on either VATUSA or ZDV websites. **Due to the requirement by GCAP to provide "top down" services as a Center, the student must be S3 Tier 1 certified to begin C1 training.**

To gain experience in sequencing arrivals into a busy airport, the ZDV Sweatbox files for Areas 1, 2, 3,4, and South files must be ran until a satisfactory completion deemed by the mentor/instructor for the student to be put up for an OTS.

7.2 Enroute - Live Monitoring Denver Center

Timeframe: 10+ hours

7.2.1   Prerequisite Qualifications:
- S3 Rating
- Passing score on C1 VATUSA Academy Exam

7.2.2   Prerequisite Reading:
- ZDV SOP
- ZDV LOAs

7.2.3   Enroute Concepts:
- IFR uncontrolled (Continuation)
- MIA
- Routing shortcuts
- Separation (Enroute spacing)
    - Speed
    - Vectors
- Holding
- Weather deviations and hazardous weather advisories
- IAS < FL240, Mach Number > FL240

7.2.4   Live Monitoring
- Upon completion, the student will be assigned the VATUSA C1 exam
    - Exam is untimed and open book. It is highly encouraged that you take your time, research, and review each question thoroughly.

- ○ Once competency is determined by the instructor may solo cert may be awarded.

7.3 Enroute OTS Denver Center

An OTS exam for the C1 rating will be administered live on the network by an instructor. A supervisor will announce the OTS and the student will be graded using the OTS rubric.

Timeframe: 1 session, 2-3 hours

7.3.1   Prerequisite Qualifications:
- ● S3 Rating with D01 Major Endorsement
- ●
7.3.2   OTS Evaluation
- ● The student will be on the live network for all the OTS. The student must do all the work by themselves for this OTS.
7.3.3   Completion Standards
- ● Completion Standards for this are outlined in the C1 Rating Review Form which is available to instructors.