ZLC ARTCC (Salt Lake)
Standard Operating Procedures
Controller Positions & Responsibilities
Version: 1.45

Controller Responsibilities

1. Each controller shall follow the VATSIM/VATUSA "Code of Conduct" and treat each controller member with respect and courtesy. And remember, "This is a hobby".

2. Each controller must comply with all published VATSIM/VATUSA policies as published.

3. Each controller must comply with all published ZLC ARTCC Policies and Procedures while controlling at any control position within ZLC ARTCC.

Minimum Log On Requirements

1. Each controller will log on to a control position for a period of no less than 1 hour (60 minutes). This provides a consistent controlling experience for the pilots and other controllers. A standard position control time slot is two hours (120 minutes).

Initial Log On to a positon

1. Each controller, before taking a position, must log on as an observer for that position, using their "controller initials". For example: SLC_BS_TWR for Bob Smith.

2. Each controller will then contact the current controllers via private chat or TEAMSPEAK that they are ready to assume the control position.

3. The current controller(s) will brief the new controller and bring them up to speed on traffic, flight conditions, etc to ensure a smooth transition between controllers.

Leaving/Sign Off from the position

1. Whenever possible, notify all controllers and pilots, at least 10 minutes before you plan to log off the network. Use the "request break" command in VRC.

2. Brief your replacement and transfer all aircraft under you control before signing off

Clearance Delivery (DEL)

Serves one function, the issuance of an initial clearance to pilots into the ATC system. Verification of the flight plan data is paramount to successfully completing the duties of this position. Delivery does not act as a controller, in that they do not direct the movement of any aircraft on the ground ***OR*** in the air and they ***do not*** issue any vectors, initial turns or headings. After a departure clearance is given and read back correctly by the pilot, the pilot should be informed to contact the appropriate Ground controller or next highest position that is online.

Ground (GND)

Responsible for the safe, expeditious coordination of all traffic moving on the ground at the airport. This includes all taxiways and parking areas, but ***excludes all runways***. Responsibility for the runways falls upon the tower controller. The crossing of ANY runways must be coordinated with TWR.

Local Control-Tower (TWR)

Responsible for the airspace 5NM surrounding the controlled airport. The tower controller is also responsible for all runways on the field. Coordinates with GND on any aircraft crossing any runway(s). Responsible for ATIS, keeping the ATIS current and direction of operations based on wind direction.

TRACON-Terminal Departure (DEP)

Responsible for the flow of traffic departing the airfield and the surrounding area. Airspace corresponding to TRACON-Departure within Salt Lake Center varies from a 15 NM radius at Twin Falls up to a 40 NM radius at Salt Lake City International. Each TRACON terminal facility's boundaries are specified by LOAs and are displayed in the current Salt Lake Center sector file.

TRACON-Terminal Approach (APP)

Responsible for the appropriate routing and spacing of incoming traffic to their respective destination. TRACON-Approach airspace is the same to that of Departure in that it encompasses a radius of between 15NM and 40nm around each respective airport.

En Route-Center (CTR)

Responsible for all other aircraft flying in ZLC ARTCC not under the direct control of another controller. This includes all originating and destination flights out of or into the ZLC ARTCC respectively and also all transitioning aircraft through our airspace.

CLEARANCE DELIVERY (DEL)

Clearance Delivery provides the pilot with the initial contact in the ATC system. The smoothness in which the pilot experiences the rest of their flight will be dependent on the proper ATC clearance being provided by this position. It is imperative that the DEL controller be familiar with ***ALL*** departure procedures and en route cruise procedures for the route the pilot has filed including the LOAs with other ARTCC facilities. After verifying the flight plan and issuing a departure clearance with the appropriate departure procedure and receiving a CORRECT and FULL read back of the aircraft clearance, the DEL controller will transfer communications of the aircraft to the next controller online in ascending order, which are Ground (GND), Tower (TWR), TRACON-Departure (DEP) and Center (CTR).

CLEARANCE DELIVERY (DEL)

All aircraft departing a tower-controlled facility shall be assigned an initial interim or transition altitude dictated by the next-highest level controller (i.e. Tower, TRACON, or Center). For tower facilities that do not lie directly underneath Salt Lake TRACON (Approach/Departure) airspace, this will normally be 12,000 ft MSL.

For tower facilities that lie directly underneath the Salt Lake TRACON, this will normally be 10,000 ft MSL. It is very important that each LOA corresponding to the specific tower facility be followed exactly. Do not issue any initial heading(s). The initial heading will be issued by the tower controller prior to the takeoff clearance and not by clearance delivery or even ground. You may utilize different altitude assignments only when coordinated with the other ATC personnel at both Tower and TRACON positions at your corresponding geographic location.

Clearances shall be provided promptly and concisely. When an pilot files a flight plan, review the flight plan immediately, preferably BEFORE the pilot even calls for clearance. Check for the correct altitude for the direction of flight, correct routing and read any comments the pilot has included. This proactive work will prevent a lot of "Clearance on Request, Standby". The words "Clearance on Request" should always be the exception and ***not*** the rule. If utilizing voice, read the clearance to the pilot slowly and accurately without too much pause. The proper order for a clearance can be easily remembered as **C.R.A.F.T.** If an RNAV SID is being filed by the pilot, then **C.R.F.T.** is in order.

- **C = Clearance Limit**, i.e. "(A/C call sign), You are cleared to Los Angeles International…"
- **R = Route of Flight**, i.e. "as filed" " ***OR*** "via Fairfield Six Departure, Delta transition, then as filed…" ***OR*** "via revised routing **SEVYR ONE** Departure, Coaldale transition, then as filed…" ***OR*** "via the **EDETH ONE** RNAV departure BERYL transition then as filed…"
- **A = Altitude**, i.e. "climb and maintain one zero (10,000) thousand, expect flight level three two zero 10 minutes after departure" ***OR*** "maintain one zero (10,000) thousand; expect flight level tree three zero at Fairfield VOR."
  (This 'A' section is eliminated when the SID is an RNAV)
- **F = Frequency**, i.e. "departure frequency one two four point tree zero" ***OR*** "contact Salt Lake Center one tree three point six zero leaving fife thousand (5,000)"
- **T = Transponder**, i.e. "squawk 0501"

Clearance limits must include the furthest point available for clearance, usually the destination airport. Routes should be reviewed carefully. Indicating the departure airport in the clearance is not required, although it may be included. Normal practice at ZLC does NOT include the departure airport. If the aircraft's flight plan lists a departure procedure (DP), ensure that it is the appropriate departure procedure (DP) for the assigned runway(s) in use. See figures **3A** & **3B**.

CLEARANCE DELIVERY (DEL)

Routes, if not amended, can easily be issued "as filed", but if any amendments need to be made, include them in the clearance. For example, if an aircraft departing KSLC includes the FFU6 departure *(which is a southbound-only departure)* and the runways in use are northbound, provide clear instructions within the necessary routing modifications as to how the aircraft shall depart. This amendment can be stated as, "Cleared to San Francisco airport via revised routing, SEVYR ONE Departure, Milford transition, then as filed" ***OR*** "Cleared to San Francisco airport as filed, **except** change route to read SEVYR ONE departure, Milford transition...."

Altitude should always be provided to the highest available altitude and as permitted by the LOA (Letter of Agreement). Understand ALL current LOAs. The appropriate final cruise altitude for direction of flight is the responsibility of the Center (CTR) controller.

Departure frequencies should always be included in a clearance, regardless of whether a facility is online or not. The pilot should always expect a handoff, regardless of whether it actually happens or not. In cases where an aircraft will be departing an uncontrolled airport, the pilot should be informed to "contact Salt Lake Center one tree tree point six zero (133.60)" *(or any other frequency if additional Center positions are active).*

Discreet beacon *(squawk)* codes should be assigned to all aircraft in communication with ATC. These discrete codes never end with two zeros (00). Codes are specifically assigned by each LOA (Letter of Agreement) for each facility.

Examples of proper clearances:

- To CAL2117: "Cardinal twenty-one seventeen, cleared to Missoula airport via radar vectors to Twin Falls, then as filed; climb and maintain one-zero thousand; expect flight level tree-one-zero one-zero minutes after departure; departure frequency one two four point tree zero; squawk two zero two seven."

- To MTN042: "Mountain zero forty-two, cleared to Salt Lake City airport from Boise airport; via depart south, expect radar vectors to Burley, then as filed; climb and maintain one two thousand; expect flight level two niner zero fife minutes after departure; departure frequency one two six point niner zero; squawk two seven zero one."

- To UPS2107: "UPS twenty-one zero seven, cleared to Salt Lake City airport from Cedar City airport as filed; maintain one four (14,000) thousand; expect one seven (17,000) thousand fife (5) minutes after departure; contact Salt Lake Center one tree tree point six zero (133.60) leaving seven (7,000) thousand; squawk three two zero fife; clearance void if not off by one tree tree zero; if not off by one tree tree zero, advise Salt Lake Center on this frequency not later than one tree four zero of intentions; time one tree one zero Zulu."

CLEARANCE DELIVERY (DEL)

- To DAL321: "Delta tree twenty-one, cleared to Denver airport as filed, except change route to read Salt Lake Niner Departure, Myton transition; climb and maintain flight level two tree zero; departure frequency one two four point tree zero; squawk four six zero six."

Clearance Delivery is a vital function provided to each pilot. A controller with a solid knowledge of clearances and preferred routes will in effect create the beginning of a professional and enjoyable flight for the pilot.

> ***NOTE:*** *VFR departures are handled distinctly, in that, utilization of an approved VFR corridor is required (such as Barn, I-15 or I-80 transitions) and utilization of VFR altitudes (even/odd-thousands + 500 feet) is recommended. For VFR specific instructions at Salt Lake City see, "VFR Procedures" of this manual*

GROUND (GND)

Ground control is responsible for all taxi instructions and runway assignments in conjunction with tower. If Clearance Delivery is not logged on, Ground is also responsible for Clearance Delivery *(see immediately above.)*

Ground at Salt Lake City is controlled by two controllers. Ground is responsible for all aircraft movement areas at Salt Lake City airport. When Ground at Salt Lake City is divided between two controllers, utilize the following configurations:

- **SLC_W_GND (133.65):**
  Responsible for Ground Control on all aircraft movement areas between Runways 16R/34L and 16L/34R, including all taxiways, north/south cargo ramps, and the main commercial ramp/terminal area (Default Position).

- **SLC_E_GND (121.90):**
  Responsible for Ground Control on all aircraft movement areas east of Runway 17/35, including all taxiways and the Military & General Aviation ramps.

> ***NOTE:*** *Salt Lake Tower controls all surface area between runways 16L/34R and 17/35.*

Ground should only be split into East/West areas if:

a) Traffic volumes or special events create a need for two ground controllers

b) There are not other controller positions available such as Clearance Delivery that would also help reduce the load on the Ground Controller

c) The split is coordinated with Clearance Delivery, Ground, or Tower controllers presently logged on. Ground Control may also be split at the discretion of Salt Lake City ARTCC management or Instructors as required. See figure **3C**

GROUND (GND)

Ground control directs all ground traffic to one of the active runways. Each aircraft is given a route from their current position to the assigned runway. At Salt Lake City, the inner taxiways *(taxiways **B**ravo, **E**cho, and **G**olf)* are typically used for departing aircraft while outer taxiways *(**A**lpha, **F**oxtrot and **H**otel)* are for arriving aircraft. All other taxiways should be used in the best manner to expedite the flow of traffic around the airport in either direction.

GROUND (GND)

Utilize best judgment at other airports for taxi procedures. Aircraft should ***NEVER*** come nose to nose on the same taxiway at the same time. In instances where there are few aircraft on the ground, pilot-discretion taxis can be granted allowing the pilot the freedom to choose which taxiway is best in their opinion. When the airport is busy, taxi routes should always be given by the controller. An example would be, "*Callsign*, taxi to runway tree four left via Echo, Bravo, Bravo Two." The clearance need not include the terminology "hold short," unless deemed necessary *(such as a newbie pilot to verify compliance).* All aircraft are required to remain on and monitor the ground control frequency during taxi. It is not necessary for the ground controller to coordinate with the tower controller regarding the runway to which an aircraft is taxiing.

The tower controller is responsible for the runways and therefore if an aircraft must cross a runway, coordination between the ground and tower controller is mandatory. If an aircraft is provided a pilot-discretion clearance to taxi to runway one seven, the aircraft is authorized to cross any and all runways to the specific runway. Aircraft will not hold short of runways during a discretion taxi unless specifically told to do so.

Ground control shall actively monitor the progress of an aircraft taxiing to a runway. Once the ground controller can assume the aircraft can safely taxi to the active runway, communications shall be transferred to the tower controller. A prudent clearance would be the following, "*Callsign*, when holding short runway one six right (16R), contact tower one one niner point zero fife (119.05)" or "*Callsign*, monitor Tower one one niner point zero fife (119.05)". To maintain an efficient flow, any given aircraft should never have to inform the ground controller that it is holding short of a runway, unless extremely heavy traffic prevails at the airport.

Active runways are not selected by the Ground controller, but rather by the Tower controller. Active runways at KSLC are either 34L/34R/35 ***OR*** 16L/16R/17. This does not mean Tower determines the specific runway for each departure.

On the contrary, Ground determines which of the active runways is best-suited for each departure in order that coordination does not become a standard practice for each departure. It is recommended Ground follow a simple pattern so that efficiency becomes a natural process. Here is the scenario for KSLC and similar patterns should be utilized at other airports within the ZLC ARTCC sector. This is a guideline, not the rule:

GROUND (GND)

- **Southbound Runways in use 16L/16R/17**: Northbound and westbound departures assigned to Runway 16R. Southbound and eastbound departures assigned to Runway 16L. All military and general aviation aircraft assigned to Runway 17.

- **Northbound Runways in use 34L/34R/35**: Southbound and westbound departures assigned runway 34L. Northbound and eastbound departures assigned runway 34R. All military and general aviation aircraft assigned runway 35.

  NOTE: *For further clarification of runway use, all commercial aircraft (airlines, cargo) will use runways 16L/16R or34L/34R. All military and general aviation aircraft will use runways 17/35. Runways 14/32 should never be used.*

When multiple aircraft are taxiing for departure, advise the aircraft of their corresponding sequence in the lineup and what type of aircraft they should be following to the runway. For example, "*Callsign*, taxi to runway tree four left via Echo, Bravo, Bravo Two. Number two behind a Delta seven sixty-seven". This provides pilots a visual reference of their respective sequencing.

Likewise, arriving aircraft should be given taxi instructions to their destination. At Salt Lake City, general aviation hangars and services are on the east side of the field, east of runways 17/35. The Utah Air National Guard facilities are located in the same vicinity. The commercial airline terminal is located almost dead center in the field between the 16/34 runways respectively. The main cargo facilities are located at the threshold ends of both runways 16L/34R. After receiving an aircraft from the Tower controller, ask the aircraft for their desired parking area and give them directions using the same standards as discussed above with departing aircraft. Ground controllers should become familiar with specific airline gate areas and provide taxi instructions to specific terminals without the necessity of inquiring about desired parking locations. (See Figure XXX)

Pilots and aircrews not familiar with the airfield or who do not have an accurate taxi chart may request "Progressive Taxi" instructions. This may also be the case for those pilots who have not requested a Progressive Taxi", but their current course will cause a disruption to the flow of traffic. In these cases, pilots should be given taxi directions in small increments using simple English. For example, "*Callsign*, turn left at the next taxiway, then go two taxiways and turn right on taxiway XXXX". This provides exact taxi instructions and will ensure the smooth movement of aircraft on the ground.

LOCAL CONTROL–TOWER (TWR)

Local Tower control is responsible for the management of traffic flow onto and off of the runways and therefore is ultimately responsible for runway selection at their respective airport. When lower positions are not available, both Ground and Clearance Delivery responsibilities fall on the shoulders of the Tower controller.

LOCAL CONTROL–TOWER (TWR)

Within ZLC ARTCC airspace, there are 18 local control facilities. See figure **3D** for a listing including their radio pronunciation and Callsign(s) to be used.

The runway design at Salt Lake City is somewhat unique in the fact that it provides almost identical runway options. The main use runways, the 16's and 34's, are both approximately 12,000 by 150 feet with available ILS approaches to both runways from both directions. This gives the Tower controller flexibility in coordinating the incoming and outgoing traffic and the ability to switch runway assignments mid-flow without affecting operations greatly.

LOCAL CONTROL–TOWER (TWR)

On the general aviation side of the field runways 17/35 parallel the main runways in their north/south direction favoring winds. Runways 14/32 are off centered to compensate for the on shore winds created from the Great Salt Lake and the effect of such on smaller aircraft but should not be used in normal operations.

The Tower controller should choose the active runways based on two criterion:

1. Wind direction

2. Calm-wind runways

Therefore, use "the runway(s) most nearly aligned with the wind when 10 knots or more or the 'calm wind' runway when less than 10 knots" (7110.65S paragraph 2-6-5). Further, "the wind as calm when the wind velocity is 3 knots or less" (as per 7110.65S paragraph 2-6-5). The calm wind runways at KSLC are 34L, 34R, and 35. .

Intersection departures can be used as a procedure to more efficiently depart traffic. Commuter and propeller aircraft primarily use intersection departures, however smaller jets may request an intersection departure. Intersection departures are only conducted during daylight hours.

Both 16/34 runways and the 17/35 runways can accommodate intersection departures. Aircraft that will be using the full length of the runway can be taxied into position and hold, while conducting an intersection departure as long as both aircraft are aware of each other.
For example:

> *"Delta nine sixty-eight, runway tree four left full length, taxi into position and hold, traffic a Dash eight departing from an intersection down field" or;*
> *"Horizon twenty-one twenty, runway tree four left intersection departure approved from alpha four, taxi into position and hold, traffic Boeing seven twenty-seven will be holding in position at full length".*

LOCAL CONTROL–TOWER (TWR)

Use of runways 17/35 at Salt Lake City should be reserved for general aviation and military traffic, however, during very busy periods they can also be used for commercial aircraft. This runway is situated a great distance from the terminal. While long enough to accommodate commercial aircraft, the taxi afterwards would be long.

The same applies for general aviation aircraft. Runways 17/35 should be used as it is closest to the general aviation side of the field. General aviation and military aircraft that wish to make closed traffic pattern work should be assigned to runways 17/35 for such operations and remain on the east side of the field. Approaches to runways 14/32 at Salt Lake City are not allowed.

Local control at Salt Lake City is provided by two controllers. For simplicity and due to normal traffic volume on VATSIM, typically only one Tower controller is utilized for normal operations at Salt Lake City. This controller (referred to as SLC_E_TWR) uses the frequency 119.050 and corresponding voice channel and is responsible for the management of traffic flow onto and off of all runways at Salt Lake City.

During special events such as fly-ins, training sessions, high traffic loads, or other specially designated times, dividing Tower control between two Tower controllers may be required. When deemed necessary, Tower at Salt Lake City may be divided between two controllers, SLC_W_TWR and SLC_E_TWR, as depicted in Figure 3C-Salt Lake City Surface Control Areas on page XX.

Tower should only be split if the following criterion is met:

a) traffic volumes or special events create a need for two Tower controllers
b) there are not other controller positions available such as Ground or Clearance Delivery that would also help reduce the load on the Tower Controller
c) the split is coordinated with any & all Ground, Tower, or Approach controllers presently logged on.
d) Tower may also be split at the discretion of Salt Lake City ARTCC management or Instructors as required.

Even though Approach is responsible for the alignment of the aircraft, the Tower controller must remember to coordinate with the Approach controller to ensure that appropriate runways are being utilized. Also remember at Salt Lake City, when using runways 34R and 35 that flight paths merge outside the outer marker and extra attention should be given to aircraft in the area.

Tower controller is not to "tag up" any aircraft that will be departing. Once Tower issues the takeoff clearance for departing aircraft, a communication transfer to the Departure or Center controller should be made ***immediately*** upon aircraft liftoff from the runway. The words "Radar Contact" should ***never*** be heard from the Tower controller nor is a radar handoff performed to the Departure controller in our VATSIM environment.

LOCAL CONTROL–TOWER (TWR)

However, Approach will initiate a radar handoff of all arrivals to the Tower controller. Once the Tower controller accepts this handoff, the Approach controller will complete the communications transfer to the Tower.

After visual confirmation by the Tower controller that the aircraft has landed, instruct the pilot to exit left or right and transfer communications of the aircraft to the Ground controller. The aircraft should be informed to contact ground before the plane ever comes to a full stop off the runway. Remind them to "Squawk standby" upon clearing the active runway. However, ensure the aircraft is actually clear of the runway before passing the aircraft to the Ground controller. The ground controller will then move the aircraft to its desired parking area.

Missed approaches will be conducted as published in the instrument approach procedure (IAP) for each runway in use. As soon as an IFR aircraft indicates "Missed Approach", Tower shall clear aircraft to 10,000 feet MSL and initiate a radar handoff to the Departure controller, or if Departure is not available, the Center controller. This is the ***ONLY*** time Tower will perform a radar handoff ("tag up") to Departure or Center. Once the appropriate controller accepts the radar handoff, perform a communications transfer. The aircraft is treated as if it were a departure.

VFR aircraft declaring a missed approach shall follow the following procedure.
*(**NOTE:** VFR aircraft will remain under Tower control)*

1. Runway 17: Enter left-hand closed traffic pattern climbing no higher than 6000 feet MSL.
2. Runway 35: Enter right-hand closed traffic pattern climbing no higher than 6500 feet MSL.

TRACON - TERMINAL DEPARTURE (DEP)

Departure is at airports throughout ZLC ARTCC that have a approach control service. This controller is normally the same physical person as the approach controller, but will be referred to as "Departure (DEP)". Departure is responsible for the outbound aircraft within approach control boundaries as depicted in the appropriate ZLC ARTCC sector files. At Salt Lake City, the airspace and its altitude strata are depicted in the figure **3E**.

At other approach control facilities, the lateral confines of each respective facility's airspace are explained in their respective LOAs. Departure controllers must remember that departing aircraft are not allowed to leave approach airspace without a successful handoff to the Center controller.

Salt Lake City has a complex altitude stratum. When dealing with a departure, first radar identify the aircraft by either:

1) Verifying squawk/beacon code on the aircraft to its reported position (also considered an "auto-acquisition")

TRACON - TERMINAL DEPARTURE (DEP)

2) Verifying shallow turns by the aircraft.

Once radar identification has been established, the aircraft shall be informed, "*Callsign*, Radar contact" and then successively provided the aircraft's position relative to a nearby NAVAID or airport. An example would be "*Callsign*, Radar contact 5 miles north Wasatch VORTAC." Once the aircraft has been *radar identified*, this information becomes grand-fathered by each successive controller in the chain all the way to the destination airport. It is entirely possible (and actually likely in real world) that an aircraft will only be told "radar contact" once during a trans-continental flight from Seattle to Miami.

As part of radar identification, Departure shall verify mode C altitude information for each departure aircraft. This is accomplished by the pilot checking in on the frequency and providing altitude information such as, "Departure, Delta one ninety-one with you out of six thousand for one zero thousand." The controller is responsible to validate the stated altitude with the altitude reported on the radar readout in addition to the assigned altitude. If a pilot skips this process and simply states, "Departure, Delta one ninety-one with you off Salt Lake City", the departure controller shall request valid mode C information from the pilot such as, "Delta one ninety-one, say altitude leaving and verify climbing to assigned altitude one zero thousand".

Departing aircraft must be maneuvered and climbed through arriving aircraft airspace through fairly simple standard procedures. The easiest way to complete this procedure is to have one or two set standard departure procedures (DPs). The departure procedures (DPs) will provide standard routing for aircraft and therefore arrivals can easily be managed in the same airspace.

For example, at Salt Lake City, when northbound runways are in use, the SEVYR ONE Departure becomes a critical southbound departure procedure (DP). In this scenario, aircraft will depart runway 34L heading westbound climbing to 10,000 ft MSL. Simultaneously, an aircraft may be arriving on the BEARR FOUR or BRIGHAM CITY THREE arrival directly over the outbound aircraft at 11,000 ft MSL or higher.

Departure shall handoff aircraft and performs a communication transfer to the Center controller no later than the Approach/Center lateral boundary or upon the aircraft nearing his assigned departure altitude. If unable to complete a successful handoff to the Center controller within 5nm of the Approach/Center lateral boundary or 3,000 ft of the assigned altitude, the aircraft will have to hold position or maneuver to stay *within* approach airspace until a successful handoff can be made. If necessary, a holding pattern can be issued. There is no rule that a handoff procedure cannot begin early. When an aircraft is no longer needed on the departure frequency, a handoff procedure should begin.

If there is no Center controller, clear the aircraft to an appropriate cruise altitude and simultaneously terminate radar service and provide authorization for a frequency change. An example would be, "Continental eight ninety, Salt Lake Center is not on line, radar services terminated, climb and maintain flight level two niner zero, change to advisory frequency 122.80 approved, have a good flight".

TRACON - TERMINAL DEPARTURE (DEP)

Departing aircraft should be cleared to the highest available altitude in departure's airspace prior to a radar handoff to the Center controller (assuming the aircraft wants higher) and as soon as possible, so as to not make an aircraft perform a step-climb. This altitude must correspond to the limits expressed in each Center/Approach LOA. Departure may ***not*** issue altitudes above the LOA-specified altitudes without coordination with the Center controller. Remember to begin the handoff process to the Center controller long before the aircraft actually reaches the upper altitude limit so as to prevent the aircraft from having to perform a step-climb, a hold or stop climbing.

Departure aircraft that are not already established on course shall be provided a vector so as to depart approach airspace on a course to intercept their cleared route. Also, at Salt Lake City, departures shall be routed via a specific departure gate as stated in the Approach/Center LOA. At Salt Lake City, utilize Figures **3A** & **3B** for departure gates to ensure aircraft depart on valid routes.

All aircraft cannot "proceed on course" or "resume own navigation" until after passing the minimum vectoring altitude (MVA) for their respective route of flight. The lateral boundaries of MVAs are depicted in each sector file in the "IAP" section, entitled "~MVAs." The altitudes that correspond to each MVA are enabled via the "NDB" and "NDB labels" on the view options.

These altitudes are depicted as a 3-digit number, in hundreds of feet. Aircraft shall never be provided vectors below the MVA for the respective area in which they are transiting. **There is no exception to this rule!** The best scenario is for the Clearance Delivery controller to issue a clearance with an appropriate departure procedure (DP) for their respective airport. Also, remember at Salt Lake City departure procedures (DPs) are graphical, whereas most airports other than Salt Lake City contain textual departure procedures (DPs).

Direct departures to destinations are not altogether banned, but should only be authorized on a very limited basis. An example of this type of flight plan is an aircraft with the words "GPS DIRECT" in its corresponding route. Only authorize "GPS DIRECT" routes when the destination Center controller authorizes such a flight or when the destination Center facility is offline and therefore do not have the opportunity to refuse the clearance. Ideally, clear aircraft via NAVAIDs that service a STAR at the destination airport (i.e. EKR or CHE for KDEN). Even better, Departure should encourage an aircraft to utilize a departure procedure (DP), SID/RNAV and/or a STAR, when feasible, but only when necessary to guarantee separation. In addition, Departure should assist Clearance Delivery, when able, to ensure all aircraft utilize a valid flight plan and a valid departure procedure (DP), SID/RNAV for the aircraft type.

Missed approaches at Salt Lake City: All arriving aircraft shall remain "tracked" by Salt Lake Tower. In the event of a missed approach, Salt Lake Tower will immediately climb the aircraft to 10,000 feet MSL and initiate a radar handoff to Departure/Center. Once the pilot on a missed approach contacts Departure/Center, it is ***not*** necessary to re-issue "Radar contact" since radar identification was successively transferred to Tower and back to Departure.

TRACON - TERMINAL DEPARTURE (DEP)

Approach is tasked with the smooth flow of traffic into the terminal area. This position is also responsible for Departure. In addition Approach is responsible to perform Tower, Ground, and Clearance Delivery responsibilities when those respective functions are not manned.

Approach's airspace is always defined within the LOA for each respective facility. Salt Lake City's airspace is depicted in figure **3E**. The outer-perimeter boundaries of each approach control can be viewed within the current ZLC's sector file by enabling ARTCC Low Altitude Boundaries.

Alignment for appropriate runways should coincide with surface winds at the time and follow the guidelines as discussed in the Tower Control section of this manual. Approach control shall step down or gradually descend aircraft through the terminal area to the respective arrival runway's final approach course.

Altitude deserves special attention in the Salt Lake Terminal Area. It should be noted that descending an aircraft too early or providing an incorrect vector will likely result in the creation of a new crater in the side of a mountain. There are mountain ranges with varied terrain clearance altitudes forming almost a "U" shape around Salt Lake City International.

In order to provide assistance to controllers at ZLC, the sector file contains lateral areas called Minimum Vectoring Altitudes (MVAs). The MVA lateral boundaries are viewable by enabling "~MVAs" in the "IAP" list in the respective VRC sector file. In addition, the altitudes that pertain to each MVA area are viewable by enabling "NDBs" and "NDB Names" *(Do not enable NDB frequencies).* The altitudes themselves are represented in hundreds of feet. No aircraft shall be vectored below the MVA within the lateral confines of the MVA in which it is flying.

Controllers should provide a maximum 30-degree localizer intercept angle, preferably less. The aircraft should also be at an altitude *below* the glideslope at the intercept point. Aircraft shall be vectored to intercept the localizer *at least* 2nm outside the approach gate. The approach gate is defined as 1nm outside the final approach fix (FAF) ***or*** 1nm outside the outer marker ***and*** is never less than 5nm from the threshold of the runway (7110.65S). For example, for the ILS Runway 34R approach at Salt Lake City, this point is 8.5 miles from the runway threshold (FAF is 5.5 miles out + 1.0 mile to approach gate + 2.0 miles). The only time an aircraft can be vectored inside the approach gate is by pilot request, and even in this situation the aircraft cannot be vectored inside the FAF.

Speed restrictions shall only be utilized when:

a) traffic requires spacing from other traffic

b) an aircraft blatantly exceeds normal approach speeds

TRACON - TERMINAL DEPARTURE (DEP)

Remember that indicated airspeed (IAS) is the speed within the cockpit, not the groundspeed that is viewable on the scope. "Normal" approach speeds are:

1. Never greater than 300 knots indicated airspeed (IAS) within approach airspace
2. Never greater than 250 knots IAS below 10000 feet MSL
3. Never greater than 220 knots IAS once established on localizer
4. Most turbojet aircraft utilize 180 knots IAS during at and inside 10-mile final
5. Most turbojet aircraft utilize 160 knots IAS during at and inside 5-mile final

When feasible, aircraft may be provided visual approach procedures to the airport. Provide this alternative approach:

1. Upon pilot request
2. When the visual approach will provide an operational advantage.

It is mandatory that a pilot state "airport in sight" or "runway in sight" ***prior*** to the approach controller clearing the aircraft for a visual approach.

Salt Lake Approach has an LOA with Salt Lake Center that is procedure intensive. Pay attention to both the differences and similarities in the "Landing North" and "Landing South" configurations. Also, note these diagrams are intended for aircraft filing an airspeed of 230+ knots. Center shall ensure arrivals will arrive through specific "gates" at specific altitudes. Approach shall then vector aircraft for the appropriate approach procedure whether instrument or visual. See Figures **3F** & **3G** for depictions of both Arrival and Departure gates/routes.

While all IFR aircraft should be brought in on an IAP, VFR aircraft shall be provided visual approaches to runway 17/35 at Salt Lake City. Simultaneous approaches for IFR aircraft are only authorized on runways 16L/16R or 34L/34R. As long as VFR aircraft maintain patterns on the east side of the airport, they are no factor with instrument approaches to runways 16L/16R/34L/34R. For complete VFR guidelines see "VFR Procedures" in this manual.

Approach control shall coordinate all arrivals with the Tower controller by indicating the assigned runway. As a visual aide for the Tower controller, Approach controllers are encouraged to use the "scratchpad" area of the Flight Strip to indicate the assigned runway. For instance, if a flight is assigned runway 34R, enter "34R" into the scratchpad. This fulfills the requirement to coordinate with the Tower controller.

TRACON - TERMINAL APPROACH (APP)

In addition, Approach may indicate the type of IFR approach the pilot is executing in the scratchpad with a different technique. For instance, if a flight is assigned an ILS approach for runway 34R, enter "I4R" into the scratchpad. For a visual approach, use a "V" in place of the "I", for example: "V35" for a visual approach to runway 35. This information will flash in the aircraft data tag.

TRACON - TERMINAL APPROACH (APP)

At Approach-controlled fields only (i.e. KSLC, KBOI, KBIL, KTWF and KMSO), Approach shall initiate a ***radar handoff*** to the Tower for all arrivals early enough to allow for a transfer of aircraft communications to the Tower controller ***at least*** 5nm from the airport, but usually not greater than 10nm.

During times of heavy traffic loads, Salt Lake Approach can be divided into two sectors: Salt Lake Approach North (SLC_N_APP) on frequency 126.25 and Salt Lake Approach South (SLC_S_APP) on frequency 124.30. Two controllers are required to be logged in as Approach controllers in order to divide the airspace into two sectors. When this situation presents itself, it is important that coordination between the two approach sectors, as well as all other surrounding Tower and Center controllers be maintained and the team does not break down. The division of these two airspace areas is further defined in the Salt Lake Center/Salt Lake ATC LOA.

EN ROUTE – CENTER (CTR)

The Center controller is responsible for the overall flow of traffic throughout the entire ZLC ARTCC control area. In addition, other duties include providing Clearance Delivery for all aircraft within the sector that are departing uncontrolled airports and the sequencing of aircraft for Approach control facilities and other ARTCCs when necessary. For traffic operating within the boundaries of the ZLC ARTCC control area, radio contact must be maintained at all times with the appropriate controller. In addition, the Center controller may be responsible for Approach/Departure, Tower, Ground, and Clearance Delivery for controlled airports when those respective positions are not manned.

Salt Lake Center is divided into four specialty areas (or "sectors"): "Butte" Sector (SLC_A_CTR) frequency 132.40, "Billings" Sector (SLC_B_CTR) frequency 127.75, "Bryce Canyon" Sector (SLC_C_CTR) frequency 133.60, and the "Winnemucca" Sector (SLC_D_CTR) frequency 132.25. Each area's respective lateral limits are displayed in figure **3H**.

During times of heavy traffic loads, Salt Lake Center can be divided into two, three, or four sectors. When two sectors are active, they are divided into Salt Lake Center "North" Sector (SLC_AB_CTR) frequency 127.75 and Salt Lake Center "South" Sector (SLC_CD_CTR) frequency 133.60. When three sectors are to be utilized they are divided into Salt Lake Center "North" Sector (SLC_AB_CTR) frequency 127.75, Salt Lake Center "Bryce Canyon" Sector (SLC_C_CTR) frequency 133.60 and Salt Lake Center "Winnemucca" Sector (SLC_D_CTR) frequency 132.25.

When four sectors are to be utilized they are divided into Salt Lake Center "Butte" Sector (SLC_A_CTR) frequency 132.40, Salt Lake Center "Billings" Sector (SLC_B_CTR) frequency 127.75, Salt Lake Center "Bryce Canyon" Sector (SLC_C_CTR) frequency 133.60, and Salt Lake Center "Winnemucca" Sector (SLC_D_CTR) frequency 132.25. Two or more controllers are required to be logged in as center controllers in order to divide the sector into two, three, or four divisions. When this situation presents itself, it is important that coordination between the center sectors, as well as all other surrounding controllers be maintained and the team does not break down.

EN ROUTE – CENTER (CTR)

The Center controller shall handoff all inbound aircraft to Approach ***no less than*** 10 NM, but preferably 20 to 25 NM from the Approach lateral boundary. Communication transfer shall occur immediately thereafter. Considering latency involved in the VATSIM network, this is an imperative operation.

Center Arrivals & Departures

Center operations are complex and to simplify procedures there are LOAs between Center and Approach facilities. S alt Lake City is the most complex. It is imperative that aircraft flow through the appropriate departure/arrival gates as depicted in the Salt Lake Center/Salt Lake ARTCC LOA, and figures **3F** & **3G**. Any exceptions shall be coordinated prior to transiting to lateral approach/center boundary. No aircraft are allowed to enter Approach airspace directly from the east due to terrain.

Aircraft not filing an appropriate STAR shall be given instructions to enter via an approved arrival gate as dictated by the LOA. Examples of direct routes to enter via an appropriate gate are the following, including phraseology:

- From the North - OGD VOR (115.70,) "Cleared to Salt Lake City airport via direct Ogden VOR, cross two zero miles north Ogden VOR at and maintain one fife, fifteen thousand (or lower depending on N/S operations) Salt Lake altimeter xx.xx."

- From the West - TCH VOR (116.80,) "Cleared to Salt Lake City airport via direct Wasatch VORTAC, cross two zero miles west Wasatch VORTAC at and maintain one four, fourteen thousand (or lower depending on N/S operations), Salt Lake altimeter xx.xx."

- From the south – FFU VOR (116.60,) "Cleared to Salt Lake city airport via direct Fairfield VORTAC, cross four zero south of Fairfield VORTAC at and maintain one seven, seventeen thousand (or lower depending on N/S operations), Salt Lake altimeter xx.xx."

At all other Approach control facilities (excluding Salt Lake City), the Center controller shall provide clearance to aircraft to descend to altitudes as dictated by the respective LOA and shall provide the destination airport's local altimeter.

EN ROUTE – CENTER (CTR)

Interaction with Surrounding Centers

Center controllers shall be familiar with all LOA (letters of agreement) with surrounding ARTCC facilities (Edmonton, Winnipeg, Minneapolis, Denver, Los Angeles, Oakland and Seattle). Using the restrictions and procedures outlined in these letters, Center controllers shall facilitate the smooth transition of aircraft, both arriving and departing, into the ZLC ARTCC. Handoffs to neighboring centers shall be conducted as outlined in these documents.

Other Center Responsibilities

Center controllers should also have a fair working knowledge of the high and low altitude airways transgressing ZLC ARTCC and maintain the ability to vector aircraft onto those routes. Center controller should memorize or have at their fingertips the identifier, names and frequencies of all VORs within ZLC ARTCC airspace.

The Center controller shall provide ATC-assisted approach services to all airports within ZLC ARTCC airspace unless another Approach controller is online and able to provide assistance at a designated airport such as Billings, Boise, Missoula, Salt Lake City and Twin Falls.

Contingent on workload, the Center controller may provide ATC-assisted landing and taxi services at all controlled airports throughout ZLC ARTCC airspace, unless another approach controller (or lower post) is online and able to provide assistance at a designated airport such as Billings, Boise, Missoula, Salt Lake City and Twin Falls.

If a controller decides to terminate radar services, the controller shall provide weather information at the satellite airport and notice of cancellation of radar services including that the airport is uncontrolled.

Increased simulation speeds are authorized on a case by case basis and are determined by the Center controller on duty. Pilots requesting 2x or 4x-simulation speed may be authorized to do such if safe and will not affect other traffic. Center must reduce aircraft to 1x-simulation speed prior to initiating any handoff, unless coordinated with the next ARTCC controller.

Radar range on VRC should be set to 400 NM and two visibility centers set by entering ".vis1 BVL" and ".vis2 BIL" into the radar control program being used. This will provide good coverage for the ZLC ARTCC control area.

Responsibilities of ZLC ARTCC (Salt Lake) Management Team

The Air Traffic Manager (ATM), Deputy Air Traffic Manager (DATM) and the Training Administrator (TA) will:

1. Continually work to improve the program at ZLC ARTCC (Salt Lake)

2. Observe and monitor the performance of the staff and controllers at ZLC ARTCC (Salt Lake) to identify and suggest ways and ideas to improve our program

3. Periodically observe and monitor the controllers of ZLC ARTCC (Salt Lake) on line for accepted procedures, phraseology and techniques. If a controller is deemed to be in need of additional training because of operational errors, the Training Administrator will be notified in writing and a plan for improvement for the controller will be outlined and put into effect. An OTS may be required before the controller can return to unmonitored controlling.

Figure 3 A

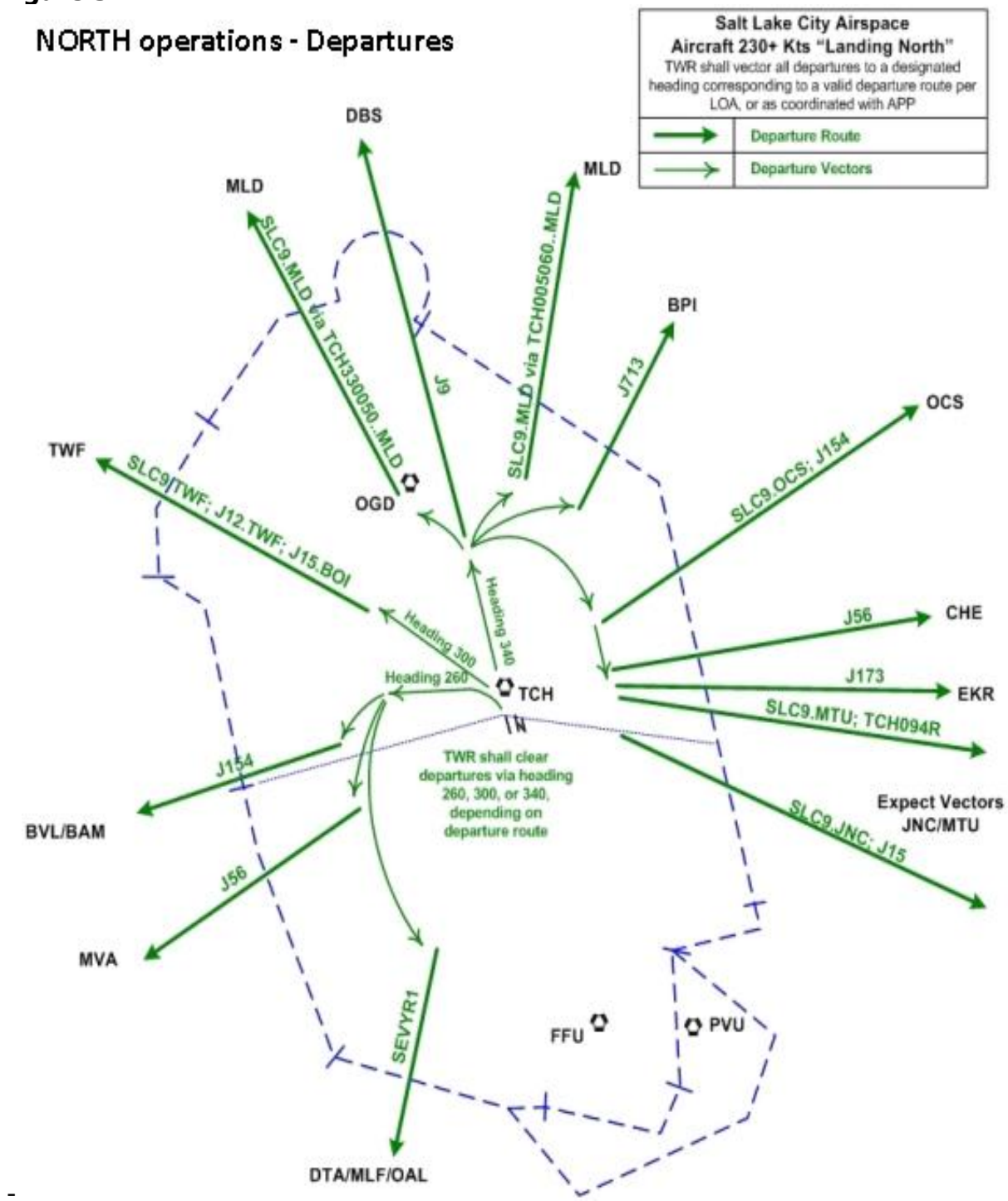

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Figure – 3B – SOUTH Operations Departures

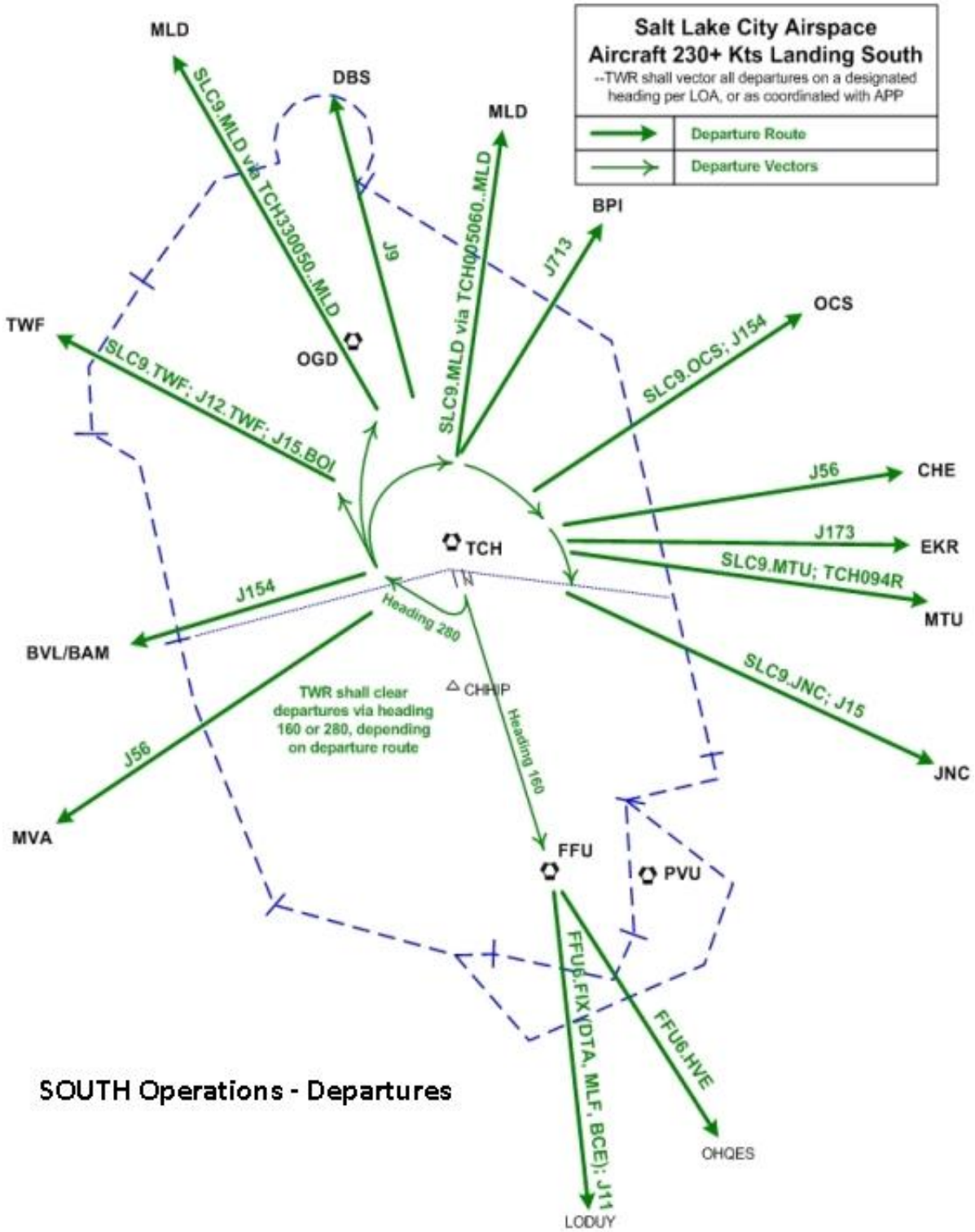

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Figure 3 C – Ground & Tower Control Areas

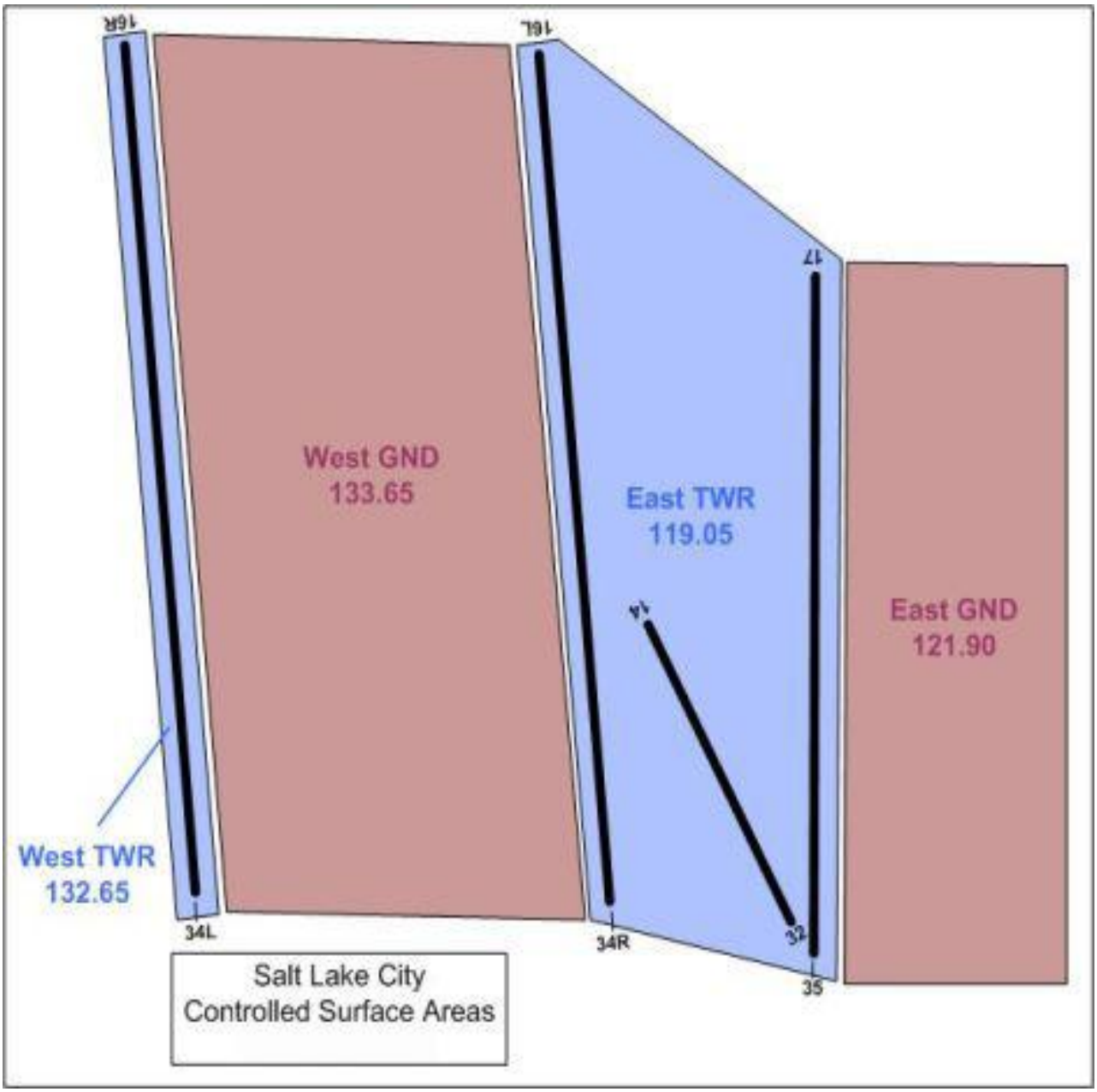

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Figure 3 D: Local Control Facilities & Callsign

Airport	ICAO	Class Airspace	Facility Name	Callsign
Billings Logan International	KBIL	**C**	Billings Tower	BIL_TWR
Boise Air Terminal	KBOI	**C**	Boise Tower	BOI_TWR
Bozeman Gallatin	KBZN	**D**	Bozeman Tower	BZN_TWR
Glacier Park/Kalispell	KGPI	**D**	Glacier Tower	FCA_TWR
Great Falls International	KGTF	**D**	Great Falls Tower	GTF_TWR
Hailey/Friedman (Sun Valley)	KSUN	**D**	Hailey Tower	SUN_TWR
Helena Regional	KHLN	**D**	Helena Tower	HLN_TWR
Hill AFB	KHIF	**D**	Hill Tower	HIF_TWR
Idaho Falls Regional	KIDA	**D**	Idaho Falls Tower	IDA_TWR
Jackson Hole	KJAC	**D**	Jackson Tower	JAC_TWR
Magic Valley Regional (Twin Falls)	KTWF	**D**	Twin Falls Tower	TWF_TWR
Missoula International	KMSO	**D**	Missoula Tower	MSO_TWR
Mountain Home AFB	KMUO	**D**	Mountain Home Tower	MUO_TWR
Ogden Hinckley	KOGD	**D**	Ogden Tower	OGD_TWR
Pocatello Regional	KPIH	**D**	Pocatello Tower	PIH_TWR
Provo Muni	KPVU	**D**	Provo Tower	PVU_TWR
Salt Lake City International	KSLC	**B**	Salt Lake Tower	SLC_TWR

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Figure 3 E – Salt Lake Approach/Departure Altitude Strata

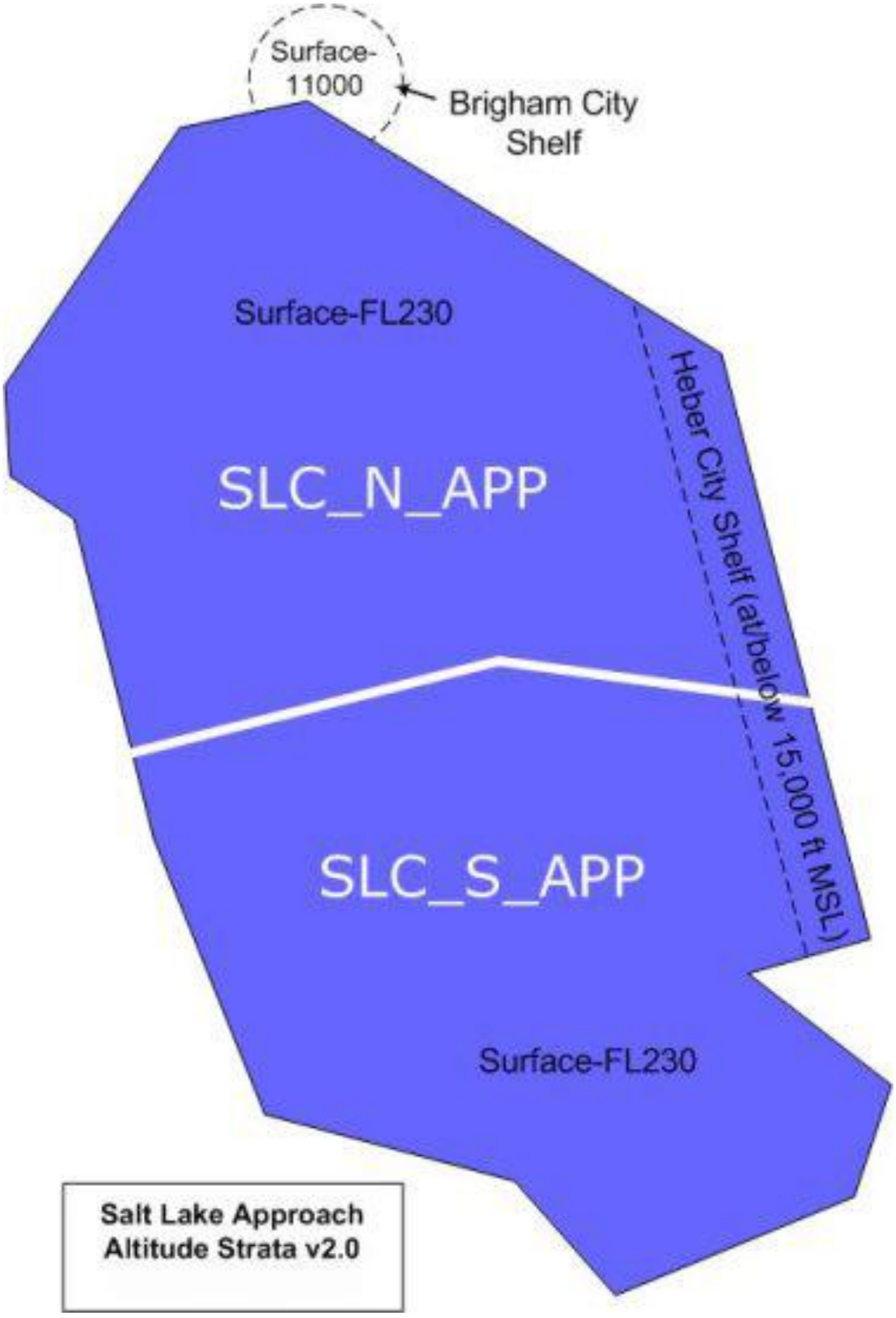

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Figure 3 F – Approach/Departure Gates-Landing NORTH

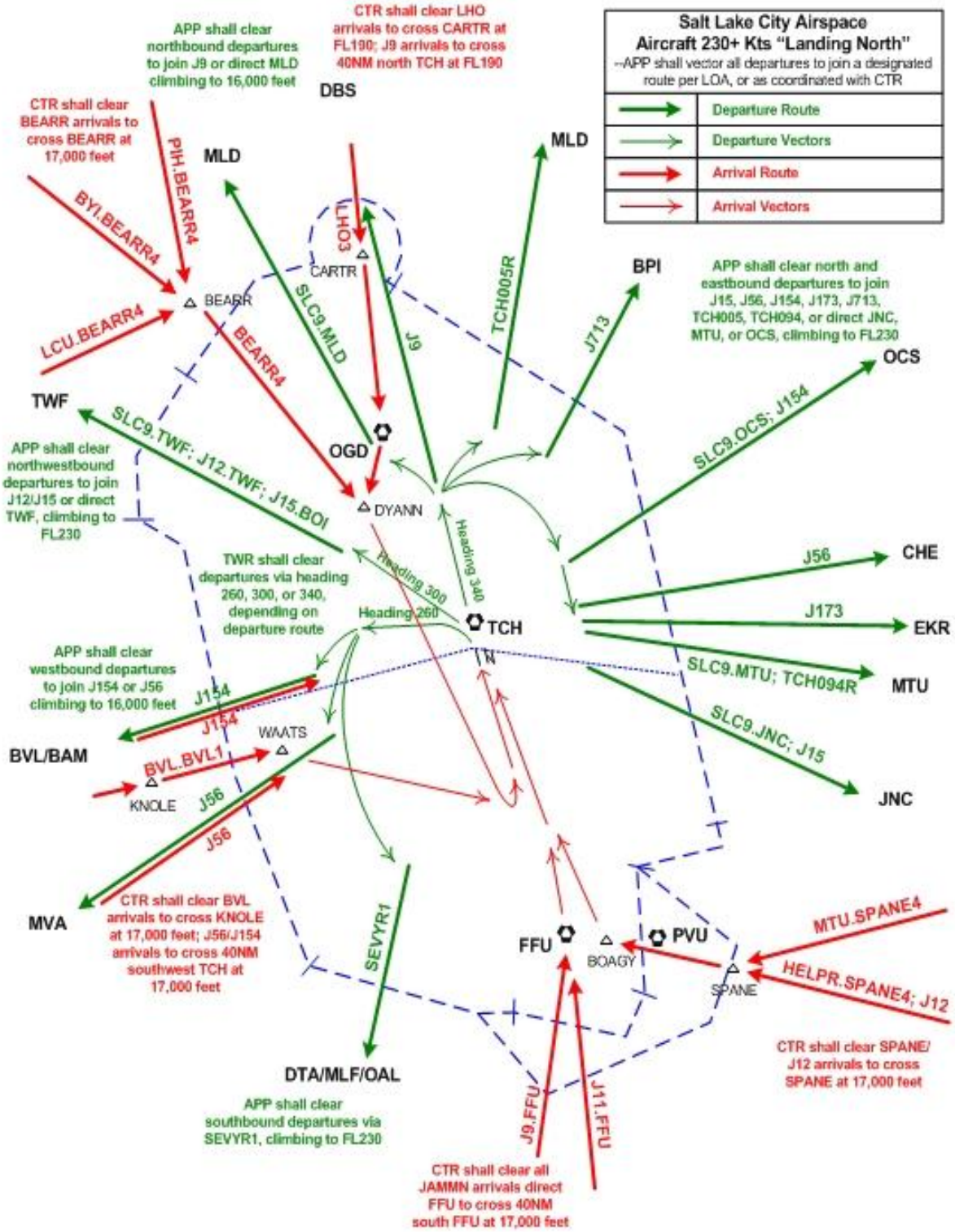

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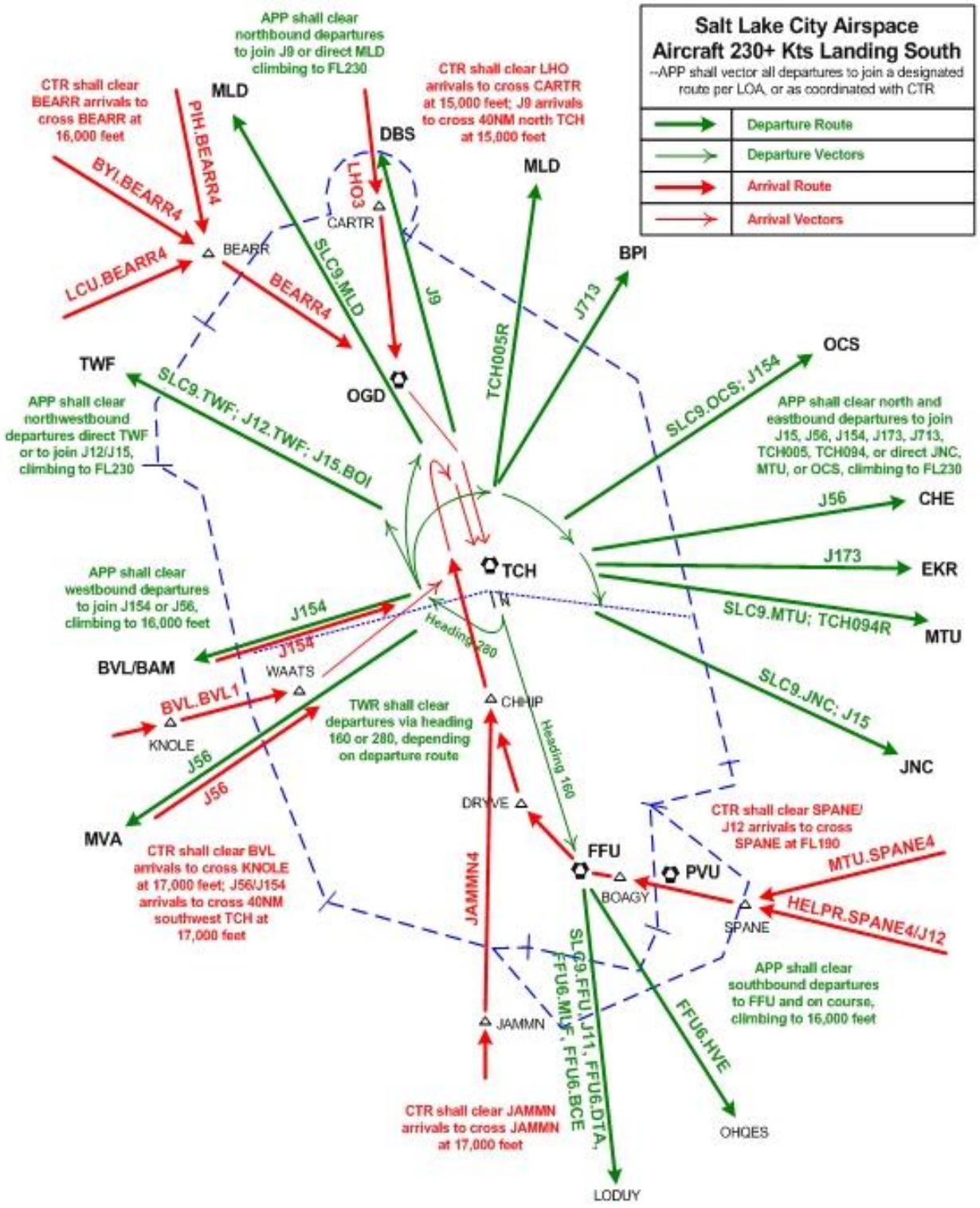
Figure 3 G – Approach/Departure Gates- Landing SOUTH



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