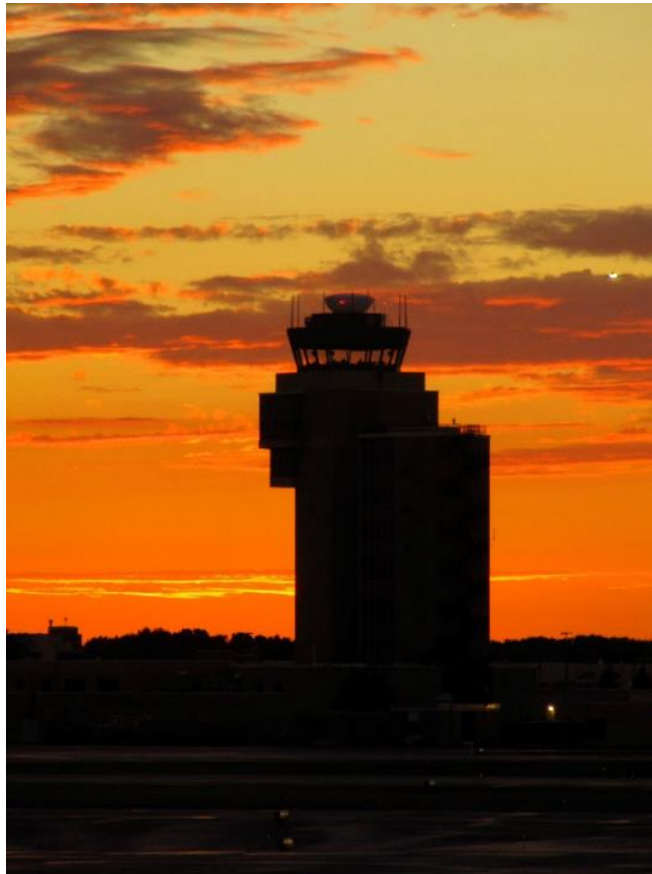


**ORDER**

**M98 TRACON  
7110.26**

**MINNEAPOLIS TRACON  
STANDARD OPERATING PROCEDURES**



July 28, 2024

**VATUSA MINNEAPOLIS ARTCC  
VIRTUAL AIR TRAFFIC SIMULATION NETWORK**

**FOR SIMULATION USE ONLY**



## VIRTUAL AIR TRAFFIC SIMULATION NETWORK

UNITED STATES DIVISION

Minneapolis ATCT

**M98**  
**7110.26**

Effective date:  
July 28, 2024

**SUBJ:** Minneapolis TRACON Standard Operating Procedures

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This order prescribes standard operating procedures for use by Air Traffic Control Specialists at Minneapolis TRACON on the VATSIM network. Controllers are required to be familiar with the provisions of this order that pertain to their operational responsibilities and to exercise their best judgment if they encounter situations not covered by it.

It is emphasized that information contained herein is designed and specifically for use in a virtual controlling environment. It is not applicable, nor should be referenced for live operations in the National Airspace System (NAS). The procedures contained within this order document how the positions are to be operated and, in conjunction with FAA Orders 7110.10, 7110.65, and 7210.3, will be the basis for performance evaluations, training, and certification.

A handwritten signature in black ink, appearing to read "Dhruv Kalra".

Dhruv Kalra  
Air Traffic Manager  
VATSIM Minneapolis ARTCC

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## Chapter 1. General Information

**1-1. Purpose of This Order.** This order establishes standard operating procedures for the VATSIM Minneapolis ATCT, and supplements FAA JO 7110.65, Air Traffic Control.

**1-2. Audience.** All VATSIM Minneapolis ARTCC personnel.

**1-3. Where Can I Find This Order?** You can find this order on the Documents page of the vZMP website.

**1-4. What This Order Cancels.** MSP/M98 Order 7110.26F CHG 2, eff. Jan 19, 2024.

**1-5. Software Utilization.** ZMP has standardized the Consolidated Radar Client (CRC) as its operating software of choice for all control positions. Any references to software in this and other Facility Orders are written with CRC in mind. Controllers utilizing alternative VATSIM radar clients must consult with the ZMP Engineering/AeroNav Unit regarding the applicability of software settings to their client of choice.

**1-6. Global Ratings.** All positions of operation outlined within this order must be staffed in compliance with VATSIM Global Controller Administration Policy (GCAP).

- a. Minneapolis-St. Paul International (KMSP) is designated by GCAP as a **TIER I** facility, and all controllers staffing MSP ATCT and M98 TRACON positions must either possess or be in training for the appropriate rating and/or facility endorsements.
- b. M98 Satellite Tower positions are designated as **UNRESTRICTED** facilities. Any controller holding a Tower Controller Rating (S2) must be allowed to staff Tower Cab positions at the following:
  - (1) St. Paul Downtown-Holman Field (KSTP)
  - (2) Minneapolis Flying Cloud (KFCM)
  - (3) Anoka County-Blaine (KANE)
  - (4) Minneapolis Crystal (KMIC)

**1-7. Emergencies.** Controllers must reference VATSIM CoC and CoR policies regarding emergencies at all times, and have the right to request the termination of an emergency should it interfere with operations. Non-compliant pilots should be referred to a VATSIM supervisor IAW the CoC.

**1-8. Delegated Airspace.** Delegated airspace is defined throughout the order and depicted in Appendices A, B, and C.

- a. Altitudes are shown in hundreds of feet MSL.

**EXAMPLE-**

*Floor-Ceiling: 90-170*

*Ceiling: 100*

*Floor 70*

*At and below: 70*

- b. Delegated airspace diagrams depict IFR altitudes, unless noted.
- c. For VFR operations, each TRACON position is delegated VFR altitudes to the base of overlying airspace and down to 500 feet above Tower airspace.

**EXAMPLE -**

*On a Runway 30/35 configuration, over MSP Airport, Satellite is delegated 5,000 feet with VFR altitudes of 5,500 feet and 4,500 feet.*

- d. The underlying position must ensure appropriate separation from the overlying airspace within Class B boundaries.
- e. Each position is responsible to ensure wake turbulence separation from super and heavy jets when vectoring VFR aircraft less than 1,000 feet below overlying airspace.

**1-9. Distance Between Parallel Runways.** The distance between the centerlines of Runways 12L/30R and 12R/30L is 3,380 feet.

**1-10. Prohibited Operations: Runway 12/35 Configuration.** Due to increased concerns about go-around procedures, the Land Runway 12 and 35–Depart Runway 12 configuration is prohibited.

## Chapter 2. M98 Operating Positions and Duties

### 2-1. M98 TRACON Positions

<i>Position Name</i>	<i>Frequency</i>	<i>STARS ID</i>	<i>Callsign</i>
North Departure	125.750	D	MSP_D_DEP
<b>South Departure</b>	<b>124.700</b>	<b>R</b>	<b>MSP_R_DEP</b>
East Departure	132.975	L	MSP_L_DEP
North Feeder	126.350	I	MSP_I_APP
<b>South Feeder</b>	<b>135.475</b>	<b>H</b>	<b>MSP_H_APP</b>
<b>North Final/Arrival</b>	<b>119.300</b>	<b>N</b>	<b>MSP_N_APP</b>
South Final/Arrival	126.950	S	MSP_S_APP
17/35 West Final/Arrival	118.725	J	MSP_J_APP
<b>Flying Cloud Satellite</b>	<b>134.700</b>	<b>E</b>	<b>MSP_E_APP</b>
St. Paul Satellite	121.200	G	MSP_G_APP
Crystal Satellite	126.500	K	MSP_K_APP

#### **NOTE 1-**

*Bold in the above table indicates the primary combined frequency to be connected first.*

#### **NOTE 2-**

*In the case of a position split, M98 controllers must staff TRACON positions in the following order:*

1. South Feeder
2. South Departure
3. North Final/Arrival
4. South Final/Arrival
5. Further connections at CIC discretion

### 2-2. Departure Control (DR).

- a. Is responsible for controlling and separating IFR/VFR air traffic within that airspace depicted in facility directives.
- b. Provides appropriate altitude restrictions and ensures in-trail spacing as described in the MSP/M98/ZMP Letters of Agreement.
- c. Issues radar advisories to IFR/VFR aircraft as time and workload permit
- d. Performs inter/intrafacility coordination as required
- e. Initiates and accepts inter/intrafacility handoffs.
- f. Ensures STARS is functioning normally and is responsible for entries made therein.



**2-3. Satellite Control (SR).**

- a. Is responsible for controlling and separating IFR/VFR air traffic within that airspace depicted in facility directives.
- b. IFR/VFR clearances and restrictions as appropriate.
- c. Issues radar advisories to IFR/VFR aircraft as time and workload permit.
- d. Performs inter/intrafacility coordination as required.
- e. Initiates and accepts inter/intrafacility handoffs.
- f. Ensures STARS is functioning normally and is responsible for entries made therein
- g. Ensures aircraft landing in M98 airspace have current arrival information.

**2-4. Arrival Control (AR).**

- a. Is responsible for controlling and separating IFR/VFR air traffic within that airspace depicted in facility directives.
- b. Provides vectors and sequencing to IFR/VFR aircraft landing at MSP.
- c. Issues radar advisories to IFR/VFR aircraft as time and workload permit.
- d. Utilizes proper approach aids for runways in use.
- e. Issues approach clearances to aircraft landing MSP.
- f. Performs inter/intrafacility coordination as required.
- g. Initiates and accepts inter/intrafacility handoffs.
- h. Issues weather information and RVR values as required.
- i. Ensures STARS is functioning normally and is responsible for entries made therein.

**2-5. Feeder Control (FR).**

- a.** Is responsible for controlling and separating IFR/VFR air traffic within that airspace depicted in facility directives
- b.** Assigns runways to arrival aircraft and establishes sequences for handoff to the appropriate Arrival Controller.
- c.** Initiates crossover traffic.
- d.** Issues radar advisories to IFR/VFR aircraft as time and workload permit.
- e.** Performs inter/intrafacility coordination as required.
- f.** Initiates and accepts inter/intrafacility handoffs.
- g.** Issues weather and airport information as required.
- h.** Ensures the STARS is functioning normally and is responsible for entries made therein.

### Chapter 3. M98 General Operating Procedures

**3-1. Control for Turns.** A receiving controller who has communications with an aircraft, for which a handoff has been accepted, may turn that aircraft within the previous controller's airspace under the following conditions:

- a. The turn must not exceed 30 degrees from the heading assigned by the previous control position.
- b. The turns may only be made if the aircraft remains within the airspace belonging to the control position from which the handoff was made.

**3-2. Pre-Arranged Coordination Procedures (P-ACPs).** Prearranged coordination procedures ("look and go") are authorized under the following conditions:

- a. P-ACPs are authorized only within M98 airspace.
- b. In the event P-ACPs are not practicable, standard point-out procedures must be applied
- c. P-ACPs are authorized for use by the Arrival Controller to descend through Departure airspace to 6,000 feet in Area F on a 30/17 configuration only. Departure and Satellite Controllers must notify the Arrival Controller of any non-STARS tracked targets within Area F.
- d. P-ACPs are authorized for use by departure positions D, R, and L, and satellite positions E, G, and K. Departure and Satellite controllers may climb tracked aircraft through Feeder airspace, North/South Arrival airspace (6,000-7,000 feet) over-the-top of MSP, and through Runway 35 Arrival airspace.
- e. Satellite may transit tracked MSP departures at/assigned 4,000 feet through Departure airspace that is adjacent to the dispersal area and between 10 and 15 miles of MSP.
- f. Feeder/Arrival Control must:
  - (1) Point out non-tracked and primary IFR and VFR targets to the appropriate Departure Position.
  - (2) Point out aircraft with invalid or inoperative Mode C altitude readout to the appropriate Departure position.

### 3-3. Automated Point Outs (APO).

- a. APO is authorized between all positions when the following conditions are met:
- (1) The aircraft will not transit the ACDA.
  - (2) Scratchpad #1 indicates either:
    - (a) The first letter of the departure gate (as indicated below) through which the aircraft will exit M98 airspace followed by the two-digit requested altitude in thousands of feet if other than the aircraft's present altitude

E – EAU	R – RST
D – DLL	F – FAR
N – ODI	A – ABR
B – BRD/DLH	O – ONL/FOD

#### **EXAMPLE-**

*“B12” indicates BRD/DLH as the departure fix and the aircraft is assigned 12,000 feet.*

- (b) The three letter departure gate.
  - (c) The arrival airport.
  - (3) The assigned altitude field (field 7) indicates the requested altitude if other than the aircraft's present altitude, unless that information is conveyed in scratchpad #1.
  - (4) Aircraft whose scratchpad indicates landing at STC or MKT are considered to be descending to 4,000 feet. Any altitude other than 4,000 feet must be displayed in the assigned altitude field.
- b. APO is authorized between Arrival Control and Satellite Control to descend to 3,000 feet within the lateral confines of the ACDA when the following conditions are met:
- (1) The aircraft is tagged for an approach to MSP.
  - (2) The aircraft is within 20NM of the runway and on a heading not greater than 90° from the final approach course.
  - (3) The aircraft will not fly through the final and will not turn away from the final approach course.
- c. The controller who initiates an APO is responsible for removing APO specific datablock information prior to initiating a handoff to another M98 position or switching the aircraft to a tower. If the controller receiving an APO elects to take radar on the aircraft, he or she is responsible for removing APO specific datablock information.

**3-4. Concurrent Approaches at MSP and SGS.** The SGS Localizer Runway 34 and RNAV (GPS) Runway 34 approaches may be conducted concurrently with MSP ILS Runway 30L/R approaches only under the following conditions:

- a. SGS Runway 34 traffic must be pointed out to Arrival Control prior to being cleared for the approach.
- b. SGS Runway 34 LOC traffic must be at 2500' MSL and established on the localizer by 5 NM prior to HINZZ.
- c. SGS Runway 34 RNAV (GPS) traffic must be at 2500' MSL and established on the FAC by 5NM prior to AVBAF.
- d. Arrival Control must ensure aircraft maintain 4000 feet to AABEZ/SAMMZ when protecting for traffic on the SGS localizer/FAC.
- e. SGS traffic must be issued missed approach instructions that include 2500 feet as the initial missed approach altitude.
- f. Approach Control must keep the 30R traffic on their frequency until the aircrafts' paths have crossed.

**3-5. MSP Runway 35 and FCM RNAV Runway 28L/28R Simultaneous Approaches.** The FCM RNAV Runway 28L and 28R approach and the MSP Runway 35 instrument approach may be conducted simultaneously under the following conditions:

- a. FCM RNAV Runway 28L/28R approaches must be pointed out to Arrival Control and Local Control.
- b. FCM RNAV Runway 28L/28R traffic must be at 3,000 feet MSL or lower and established on the approach by FGT.
- c. Arrival Control must ensure Runway 35 instrument approach aircraft are established on the final approach course and cross ROZEE at 4,000 feet.
- d. These procedures do not preclude the use of other sequencing and separation techniques.

## Chapter 4. Arrivals

### 4-1. General.

- a. Arrival Control has control for descent of aircraft in Feeder Control airspace.
- b. STARS scratch pad entries for MSP approaches are located in Appendix G.

**4-2. Approach Control Descent Area.** The Approach Control Descent Area (ACDA) is that airspace designated for descending arrival aircraft to the Minneapolis-St. Paul International Airport (MSP), excluding Tower delegated airspace. Airspace and altitude designations are depicted in Appendix A.

- a. **Runways 30 and 12.** The ACDA area must be divided into north and south sectors. North Arrival will control the area north of the 12L/30R localizer. South Arrival will control the area south of the 12R/30L localizer.
- b. **Runway 35.** Delegated airspace for Runway 35 Arrival Controller in concert with the parallel runways is depicted in Appendix A.
- c. **Runways 4, 22, 17, and 35.** The ACDA must be divided into north and south sectors. North Arrival will control the area west of the localizer. South Arrival will control the area east of the localizer.
- d. **Land Runway 35-Depart 12s.** The ACDA must be divided into north and south sectors.
  - (1) North Arrival must control the area west of the localizer, including NITZR/TRGET and BLUEM/DELZY traffic.
  - (2) South Arrival must control the area east of the localizer.
- e. **ACDA Shelves.** ACDA Shelves, as depicted in Appendix A, are delegated to Arrival Control at 6,000 feet.
- f. **Area R.** During heavy traffic periods or unusual situations, the CIC has the authority to coordinate possession of Area R as depicted in Appendix A.
- g. **Area F.** On a 30/17 configuration only, the Arrival Controller may descend to 6,000' in Area F as depicted in Appendix A using P-ACP (look and go).

**4-3. Feeder Airspace.** Feeder Airspace is comprised of near-gate and far-gate routes. Ingress routes and Ingress route altitudes are depicted in Appendix A.

### 4-4. Feeder/Arrival Control.

- a. Feeder Control must advise the Arrival Coordinator and Departure Control of any non-STARS tracked target or of any previously tagged target that goes into coast. The Arrival Coordinator must advise any other concerned positions of the non-STARS tracked target.

- b. Feeder/Arrival Control must handoff to the appropriate Feeder/Arrival Controller as follows:
- (1) **Runways 4/22.**
    - (a) Near Gates assigned 8,000 feet.
    - (b) Far Gates assigned 9,000 feet.
  - (2) **Runway 17.** BAINY will be worked straight in by 17 Arrival Controller.
    - (a) KKILR and MUSCL assigned 8,000 feet.
    - (b) TORGY, NITZR and BLUEM assigned 9,000 feet.
  - (3) **Runway 12s and Runway 12s–Depart 17.**
    - (a) Near Gates assigned 7,000 feet.
    - (b) Far Gates assigned 8,000 feet.
  - (4) **Runway 35.** NITZR and BLUEM will be worked straight in by 35 Arrival Controller.
    - (a) TORGY assigned 8,000 feet.
    - (b) BAINY assigned 9,000 feet.
    - (c) KKILR and MUSCL assigned 9,000 feet.
  - (5) **Runway 30s.**
    - (a) Near Gates assigned 7,000 feet.
    - (b) Far Gates assigned 8,000 feet.
  - (6) **Runway 30s – Depart 17.**
    - (a) KKILLR and MUSCL assigned 7,000 feet.
    - (b) NITZR and BLUEM assigned 9,000 feet.
    - (c) Far Gates assigned 8,000 feet.
  - (7) **Land Runway 30s and 35.** NITZR and BLUEM will be worked straight in by 35 Arrival Controller.
    - (a) KKILR and MUSCL assigned 7,000 feet.
    - (b) KKILR and MUSCL to 35 Arrival assigned 9,000 feet.
    - (c) Far Gates assigned 8,000 feet.
    - (d) NITZR and BLUEM handed off to South Arrival assigned 7,000 feet.

- (8) **Land Runway 35 – Depart 12s.** NITZR and BLUEM will be worked straight in by 35 Arrival Controller.
- (a) TORGY assigned 8,000 feet.
  - (b) BAINY assigned 9,000 feet.
  - (c) KKILR and MUSCL assigned 8,000 feet.
- c. The Feeder position may be divided into north and south sectors and normally assigned traffic as follows:
- (1) Runways 12 and Runway 12s–Depart 17: North Feeder is assigned BAINY, MUSCL and KKILR. South Feeder is assigned NITZR, BLUEM and TORGY.
  - (2) Runways 30 and Runway 30s–Depart 17: North Feeder is assigned BAINY, MUSCL and KKILR. South Feeder is assigned NITZR, BLUEM and TORGY.
  - (3) Runways 4/22: North Feeder is assigned BAINY and TORGY. South Feeder is assigned MUSCL, KKILR, NITZR and BLUEM.
  - (4) Runway 30s and Landing 35: North Feeder is assigned BAINY, MUSCL and KKILR. South Feeder is assigned TORGY.
  - (5) Runway 35 (including Land 35-Depart 12s): North Feeder is assigned BAINY and TORGY. South Feeder is assigned MUSCL and KKILR.
  - (6) Runway 17: North feeder is assigned TORGY. South Feeder is assigned MUSCL, KKILR, NITZR and BLUEM.

**NOTE-**

*The North and South Feeder boundaries are the Runway 30L/12R or Runway 4/22 localizers, as appropriate for the configuration in use.*

**NOTE-**

*Individual arrival gates may be reassigned to another Feeder position to balance workload.*

- d. Feeder Control must provide an evenly distributed flow of traffic to Arrival positions.



**4-5. Arrival Crossover Traffic.**

- a. Crossover traffic may be initiated by the Feeder controllers.
- b. Crossover traffic must be transferred to Arrival Control on the downwind heading for the runway in use.
- c. Near Gate Crossovers
  - (1) Near Gate Crossovers must be coordinated with the appropriate ACDA controller(s).

**NOTE-**

*KKILR arrivals landing Runway 30L are not considered a Near Gate Crossover for coordination purposes*

- (2) Near Gate Crossovers on an OPD STAR must be handed off to the arrival controller whose airspace the aircraft will enter first.

**EXAMPLE-**

*A BAINY Arrival aircraft on the OPD STAR going to Runway 12R must be handed off to the 'N' Controller*

- (3) Near Gate Crossovers that are assigned a heading should be assigned 9,000 feet and handed off to the appropriate controller for the runway assignment.

**NOTE-**

*The assigned heading should aim for the 25-mile range ring to avoid conflicts with the OPD traffic in the ACDA.*

**EXAMPLE-**

*A KKILR arrival aircraft going to Runway 30L is handed off to the 'S' Controller at 9,000' and heading 220°*

- d. Far Gate Crossovers:

**NOTE-**

*KKILR arrivals landing Runway 12R are not considered a Far Gate Crossover for coordination purposes.*

- (1) Far Gate crossovers must be handed off to the appropriate Feeder Control position and communication transferred as soon as practicable but not later than 15 NM from MSP.
- (2) The receiving controller has control for speed on contact, and control for turns within the 15-mile range ring and remain in the confines of Feeder airspace.
- (3) Aircraft that are not descending via the RNAV STAR must be coordinated with the receiving feeder controller.

**4-6. Runway 30L RNAV (RNP) Y Approach Restrictions.** When MSP is on a 30/17 runway configuration the Runway 30L RNAV (RNP) Y approach must not be issued without coordination with MSP Tower due to descents into the Runway 17 departure corridor.

**4-7. Visual and Instrument Approaches.** The procedures contained in this section must be utilized during periods of moderate to heavy traffic on final approach. Due to traffic fluctuations at other times, there may be insufficient traffic to apply these SOPs. During these periods, good controller judgment must be exercised and proper coordination accomplished.

**a. Parallel Visual Approach Turn-on Procedures.**

- (1) Arrival controllers must designate “LOW” and “HIGH” turn-on altitudes and “sides” for approach aircraft.
- (2) “Low-Side” aircraft must be level at the designated “low-side” altitude prior to 3 NM from the associated localizer.
- (3) Aircraft must remain at least 3 NM from the associated extended final approach course and turn-on altitudes must be maintained until aircraft have acknowledged a visual approach clearance.
- (4) The “high-side” controller is responsible for separation from “low” turn-on altitude aircraft.
- (5) To the extent possible, aircraft conducting a visual approach should not join final side-by-side with an aircraft on an approach to the parallel runway.

**NOTE –**

*This applies to all visual approaches, including when conducting a visual approach to one runway and an instrument approach (ILS, RNAV, etc.) to the parallel runway.*

- (6) To the extent possible, do not allow an aircraft to pass another aircraft on approach to the parallel runway, when outside the Final Approach Fix.
- (7) When able, intercept the finals at less than a 30° intercept.

**NOTE –**

*5., 6., and 7. are considered best practices and do not supersede the provisions of JO 7110.65.*

**b. Simultaneous Dependent Approaches.**

- (1) Arrival controllers must designate “LOW” and “HIGH” turn-on altitudes for approach aircraft.
- (2) Aircraft assigned to "LOW" turn-on altitudes must be level at the designated altitude prior to 3 NM from the associated localizer.
- (3) Altitude separation must be maintained until aircraft are established on parallel final approach courses and required lateral separation is attained.

**4-8. Noise.**

- a.** Vector arriving aircraft at or above 4,000 feet MSL until intercepting the glidepath unless a particular situation dictates otherwise
- b.** Runway 17 should not be used for arrivals from the north by any type of aircraft except when weather or operational conditions may require its use.

## Chapter 5. Departures

**5-1. General.** Departure Control must coordinate with the appropriate Arrival or Feeder Control position before vectoring all non-STARS tracked targets through the ingress routes.

**5-2. Departure Configurations.** Departure configurations are depicted in Appendix B.

**5-3. Noise.** Runway 35 should not be used for departures to the north by any type of aircraft except when weather or operational conditions may require its use.

## Chapter 6. Satellite

### 6-1. General.

- a. The M98 TRACON has control over IFR aircraft and VFR aircraft requesting services arriving and departing satellite airports around the Minneapolis/St. Paul Metropolitan Area:

<i>Airport ID</i>	<i>Location</i>	<i>Towered</i>	<i>IAP</i>
10D	Winsted, MN		
21D	Lake Elmo, MN		Yes
25D	Forest Lake, MN		
7Y7	ARS Sport Strip (Belle Plaine, MN)		
KANE	Anoka County/Blaine, MN	Yes	Yes
KCFE	Buffalo, MN		Yes
KFBL	Faribault, MN		Yes
KFCM	Flying Cloud (Eden Prairie, MN)	Yes	Yes
KLVN	Airlake (Lakeville, MN)		Yes
KMGG	Maple Lake, MN		Yes
KMIC	Crystal, MN	Yes	Yes
KOEO	Osceola, WI		Yes
KRGK	Red Wing, MN		Yes
KRNH	New Richmond, WI		Yes
KSGS	South St. Paul, MN		Yes
KSTP	St. Paul Downtown-Holman Field	Yes	Yes
KSYN	Stanton, MN		

- b. When MSP is making instrument approaches to Runway 22, STP Satellite Control must coordinate all STP IFR approaches or departures with the Arrival Controller.
- c. Satellite Control may transition VFR aircraft through the ACDA without coordination provided the aircraft remains beneath the Class B airspace and is tagged with the reported altitude (if Mode C is not available).
- d. Satellite specific scratch pad entries are depicted in Appendix G.

**6-2. Airspace.** Satellite airspace must be divided into three sectors as depicted in Appendix C.

**6-3. STP Runway 14 Departures.** STP Runway 14 departures must be restricted to 2,500 feet and assigned headings no greater than 080°.

**6-4. STP Shelf.** During periods of time when both MIC Satellite and STP Satellite positions are open, and MSP is landing Runway 12L/R, Satellite airspace is modified as depicted in Appendix A, Runway 12 and 12/17 STP Shelf.

**6-5. ACDA Entry Procedures.** Traffic landing MSP and worked by Satellite should be handed off to Arrival Control on a heading that ensures the aircraft will enter the ACDA and at the low or high turn-on altitude in use for the assigned runway.

- a. 5,000 feet or above to the “high” side.
- b. 4,000 feet to the “low” side.

## Chapter 7. Runway 17-22 Configuration

**7-1. Weather Criteria.** Weather must be 1400 and 4 or greater.

**7-2. Delegated Airspace.** Delegated airspace is depicted in Appendices A and B.

**7-3. LAHSO Procedures.** LAHSO is authorized for Runway 22 landing traffic to hold short of Taxiway KILO for Runway 17 arrivals and departures. Available distance is 8,550 feet For aircraft unable to LAHSO:

- a. The position that initially works an aircraft unable to LAHSO must coordinate with other positions as required, and advise the appropriate Arrival controller that the aircraft is unable to LAHSO.
- b. The aircraft should be assigned Runway 17. If traffic conditions do not permit these aircraft to use Runway 17, they should be assigned Runway 22 as follows:
  - (1) A sequence (gap) must be coordinated with the Runway 17 arrival controller, and advise the Runway 22 Arrival controller of the sequence (gap).
  - (2) The Runway 22 Arrival Controller should provide 2-mile spacing at the runway threshold with the preceding Runway 17 arrival.
  - (3) The Runway 17 Arrival Controller should provide 2-mile spacing at the runway threshold with the preceding Runway 22 arrival.

**NOTE-**

*The use of ghost targets for Runway 17 and Runway 22 aircraft that are part of the non-LAHSO sequence may be coordinated.*

**7-4. Converging Runway Display Aid (CRDA) Procedures.**

- a. CRDA procedures must be applied when LAHSO is not used.
- b. Ghost targets must be displayed on the Runway 22 final approach course at all times and may be displayed on the Runway 17 final approach course at the controller's discretion.
- c. Runway 17 arrival spacing should provide 6 miles spacing at touchdown. This spacing is not required when there is no traffic landing Runway 22.
- d. Runway 22 arrival spacing should provide 6 miles spacing at touchdown. Upon reaching the final approach fix, Runway 22 traffic should be within ½ NM (ahead or behind) of the middle of the gap between ghost targets.

## 7-5. Position Responsibilities

### a. Arrivals:

- (1) Runway 22 is normally a left-traffic flow.
- (2) Runway 17 is normally a right-traffic flow.
- (3) Runway 22 arrivals should be assigned North Local frequency 123.95, if split.
- (4) Runway 17 arrivals should be assigned West Local frequency 123.67, if split.

### b. Feeder:

- (1) Normal Feeder/Arrival Gate Assignments:
  - (a) KKILR and MUSCL – North Feeder.
  - (b) BLUEM and NITZER – South Feeder.
  - (c) BAINY – South Arrival.
  - (d) TORGY – South Feeder.

### **NOTE-**

*South Feeder is delegated the BLUEM and NITZR ingress route airspace to the 10-mile range ring.*

### (2) Feeder Handoff Procedures:

- (a) South Feeder should handoff to Runway 17 Arrival TORGY traffic at 8,000 feet. and BLUEM/NITZR traffic at 9,000 feet.
- (b) North Feeder should handoff MUSCL traffic to Runway 22 Arrival at 8,000 feet.
- (c) North Feeder should handoff TORGY, BLUEM, and NITZR traffic to Runway 22 Arrival at 9,000 feet.
- (d) TORGY, BLUEM and NITZR aircraft assigned Runway 22 are far-gate crossovers. Normally, South Feeder should hand off these aircraft to North Feeder as follows:
  - I. NITZR: Depart SAVVG heading 020°. Jets at 11,000 feet. Turboprops at 9,000 feet.
  - II. DELZY: Depart SAVVG heading 020°. Jets at 10,000 feet. Turboprops at 9,000 feet.
  - III. TORGY: Depart HDEEE heading 090°. Jets at 11,000 feet. Turboprops at 9,000 feet.



- IV. If an aircraft needs to be taken off an RNAV STAR, issue a heading that will place the aircraft within 10 NM of MSP Airport.
  - i. NITZR: Jets at 11,000 feet.
  - ii. BLUEM: Jets at 10,000 feet.
  - iii. TORGY: Jets at 11,000 feet.
- (e) Communication transfer, control for turns/speed, and strip movement must be accomplished in accordance with the SOP.
- c. Satellite:
  - (1) STP satellite must coordinate with M98 to organize the flow of traffic to/from STP that will affect the MSP Runway 22 final.
  - (2) All MIC IFR arrivals that will operate east of MIC Airport, and Runway 06 and 14 departures must be coordinated with M98.

## Chapter 8. Equipment and TMU

**8-1. Obstructions.** Except where noted, these obstructions are depicted on video maps and the Minimum Vectoring Altitude chart/map. (See Appendix E)

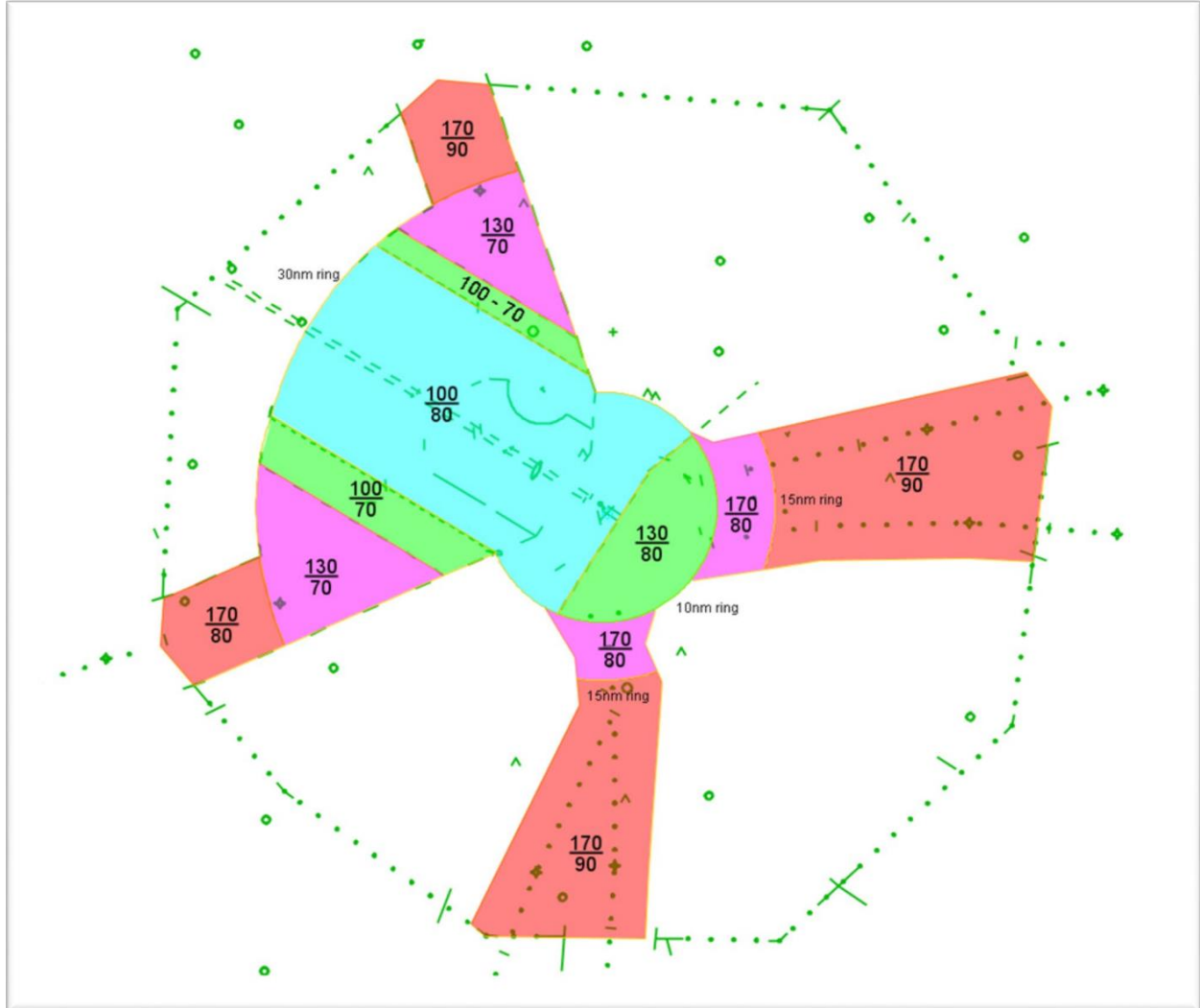
\*Not depicted on video maps.

- a. Big Lake Tower: MSP 323036; 2454 feet.
- b. Nowthen Tower: MSP 343028; 2048 feet.
- c. Arden Hills/Shoreview Antennas: MSP 018011; 2438 feet.
- d. St. Paul Tower: MSP 013007; 1539 feet.\*
- e. Meriden Tower: MSP 184051; 1830 feet.\*
- f. Rosemont Tower: MSP 144014; 1753 feet.
- g. IDS Building: MSP 338005; 1743 feet.

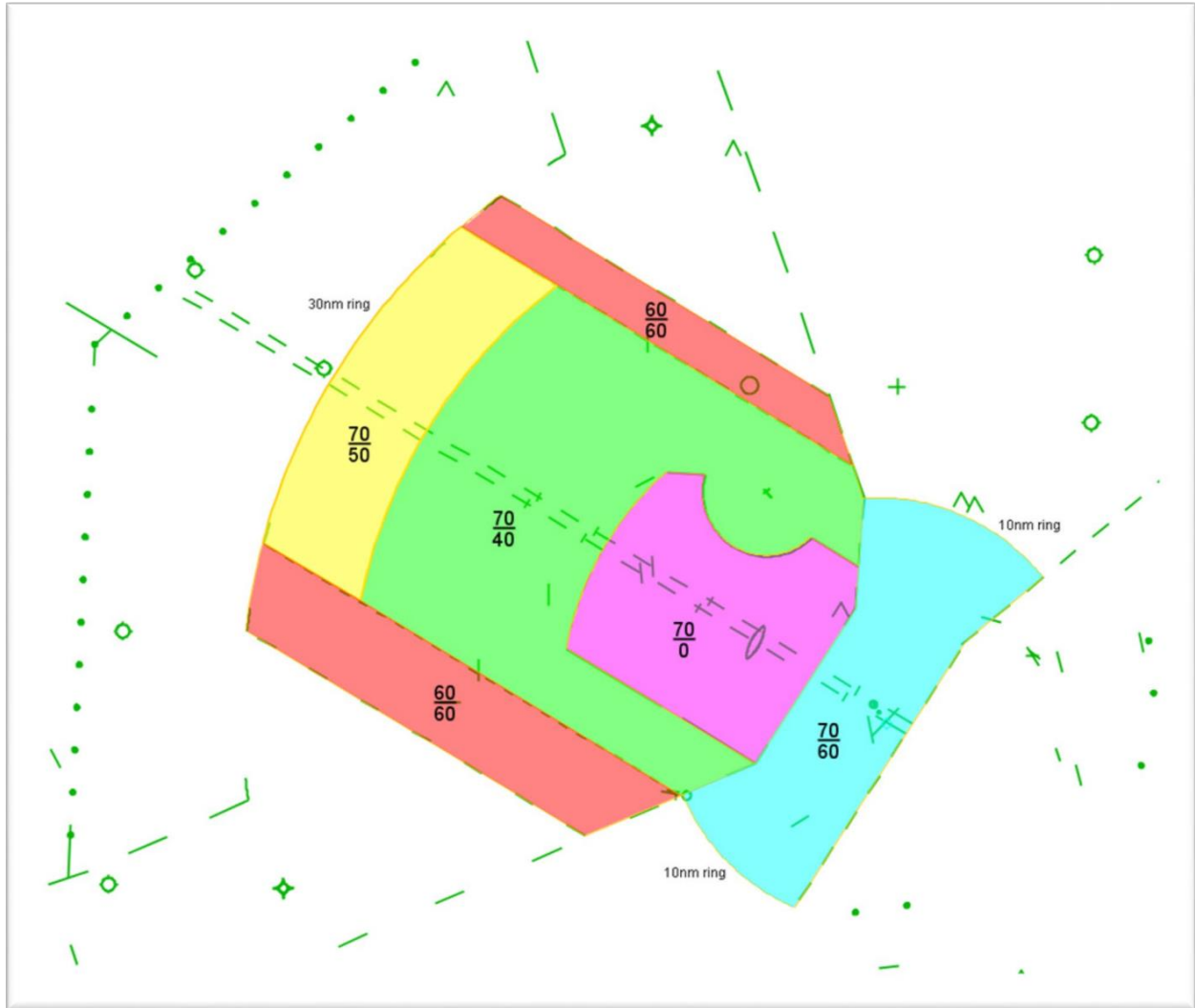
**8-2. Traffic Management Unit.** ZMP TMU will be utilized during periods of heavy traffic, severe weather, or any other situations requiring the presence of a Traffic Management Specialist/Coordinator. Traffic Management duties must be limited to those personnel who have completed the VATUSA National Traffic Flow Management Course and are appropriately briefed and certified to act in a Traffic Management role.

### Appendix A. Delegated Airspace Diagrams

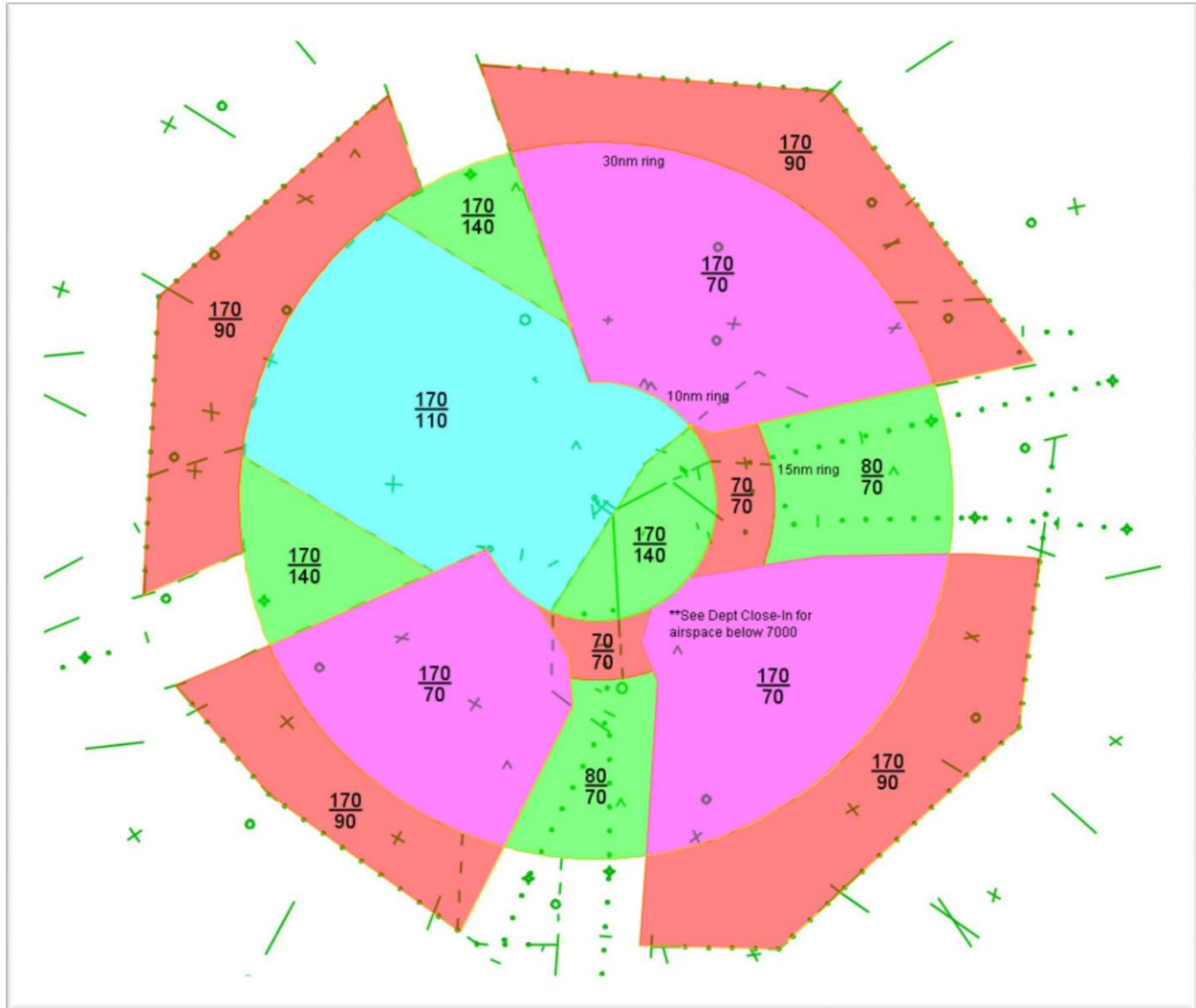
#### RUNWAY 12 FEEDER



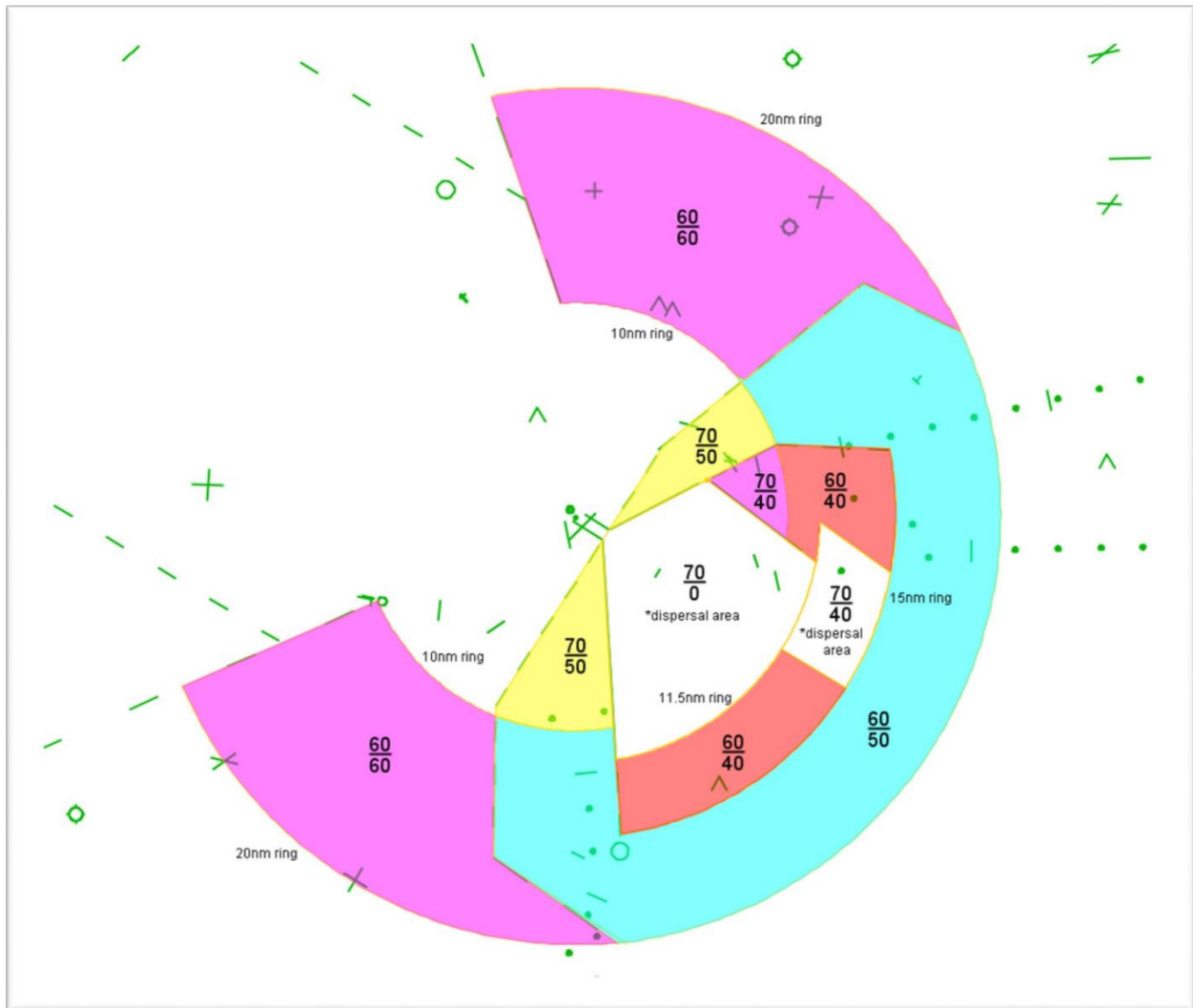
### RUNWAY 12 ACDA



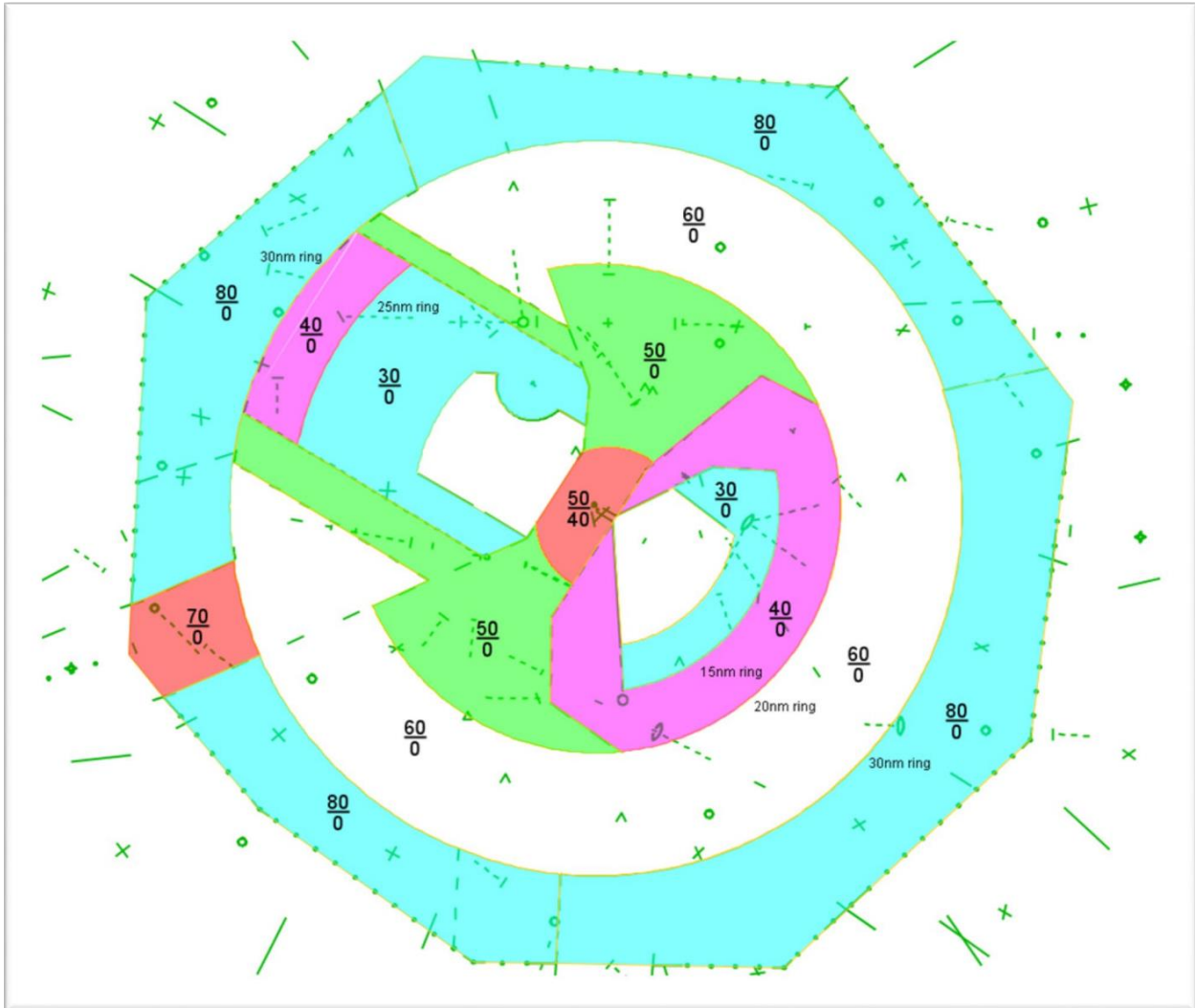
### RUNWAY 12 DEPARTURE



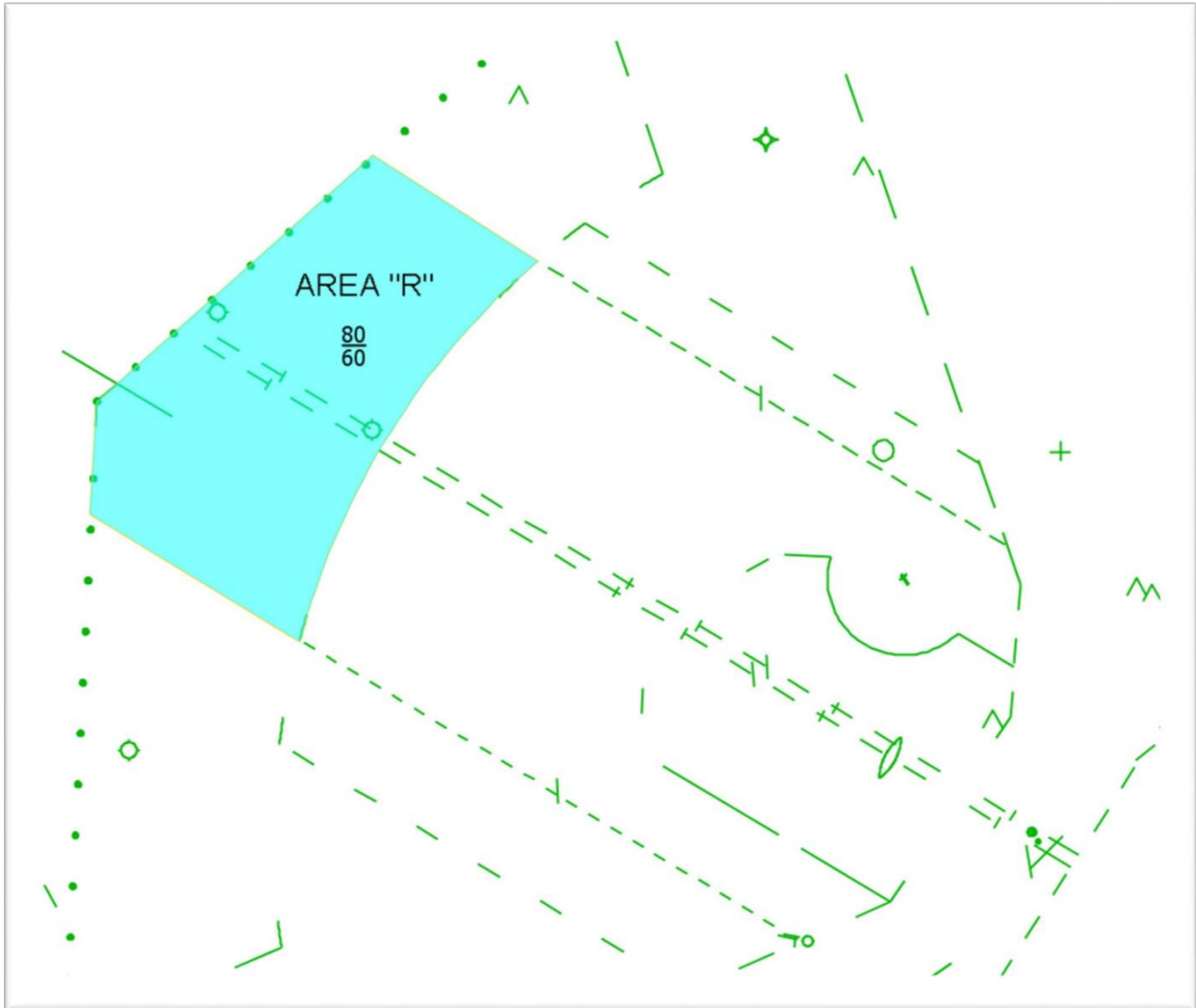
### RUNWAY 12 DEPARTURE CLOSE IN



# RUNWAY 12 SATELLITE

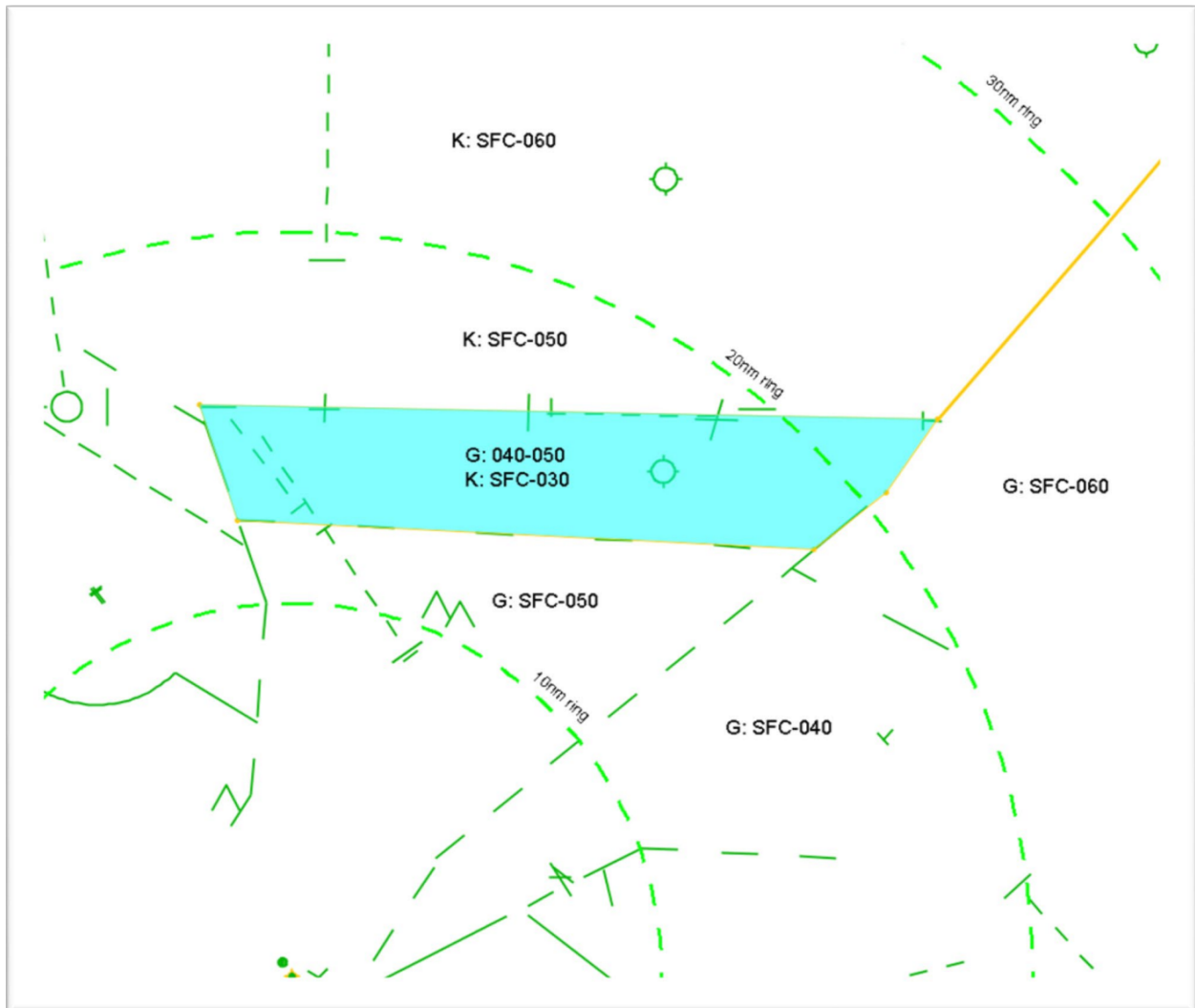


RUNWAY 12 and 12-17  
AREA 'R'

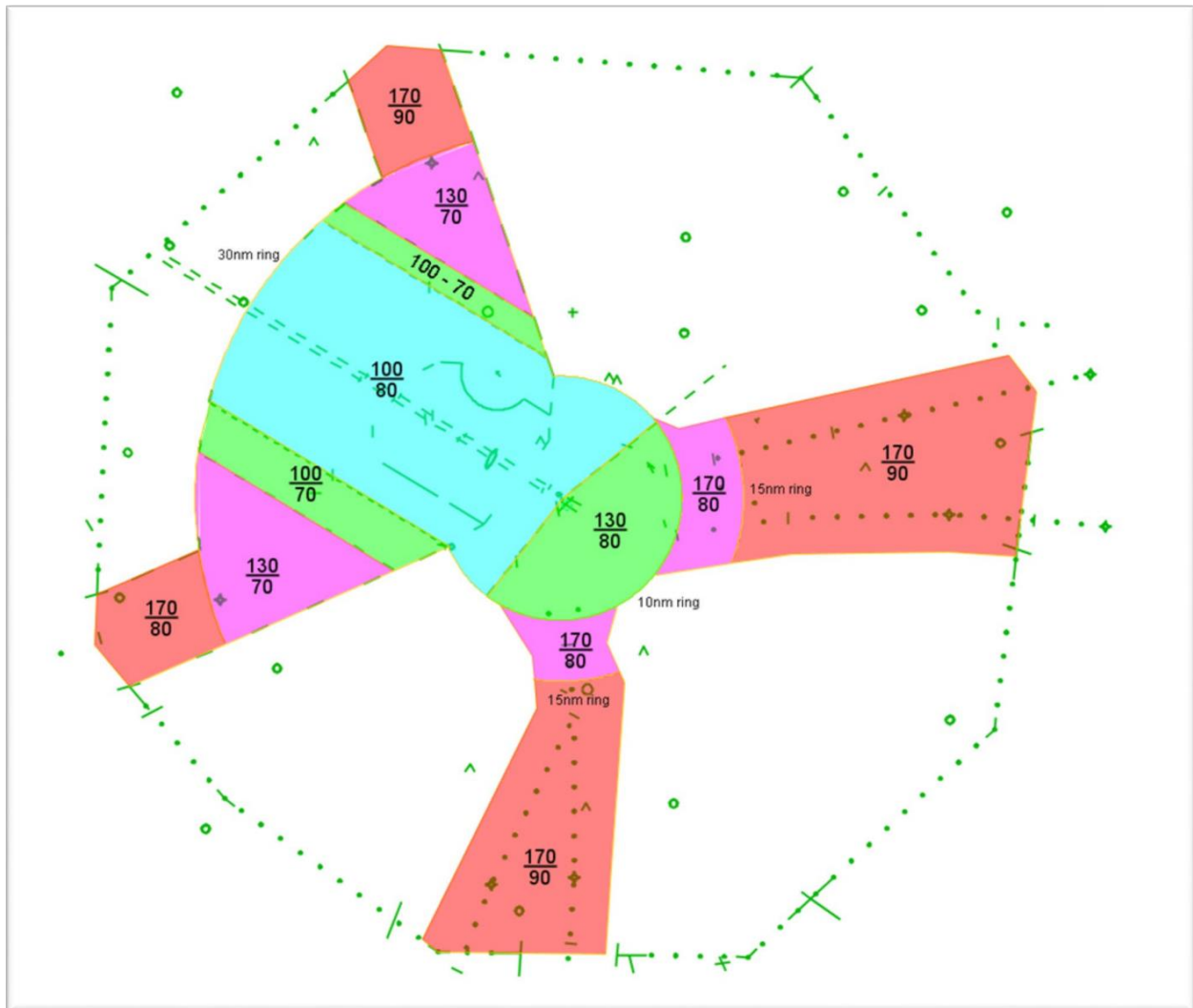




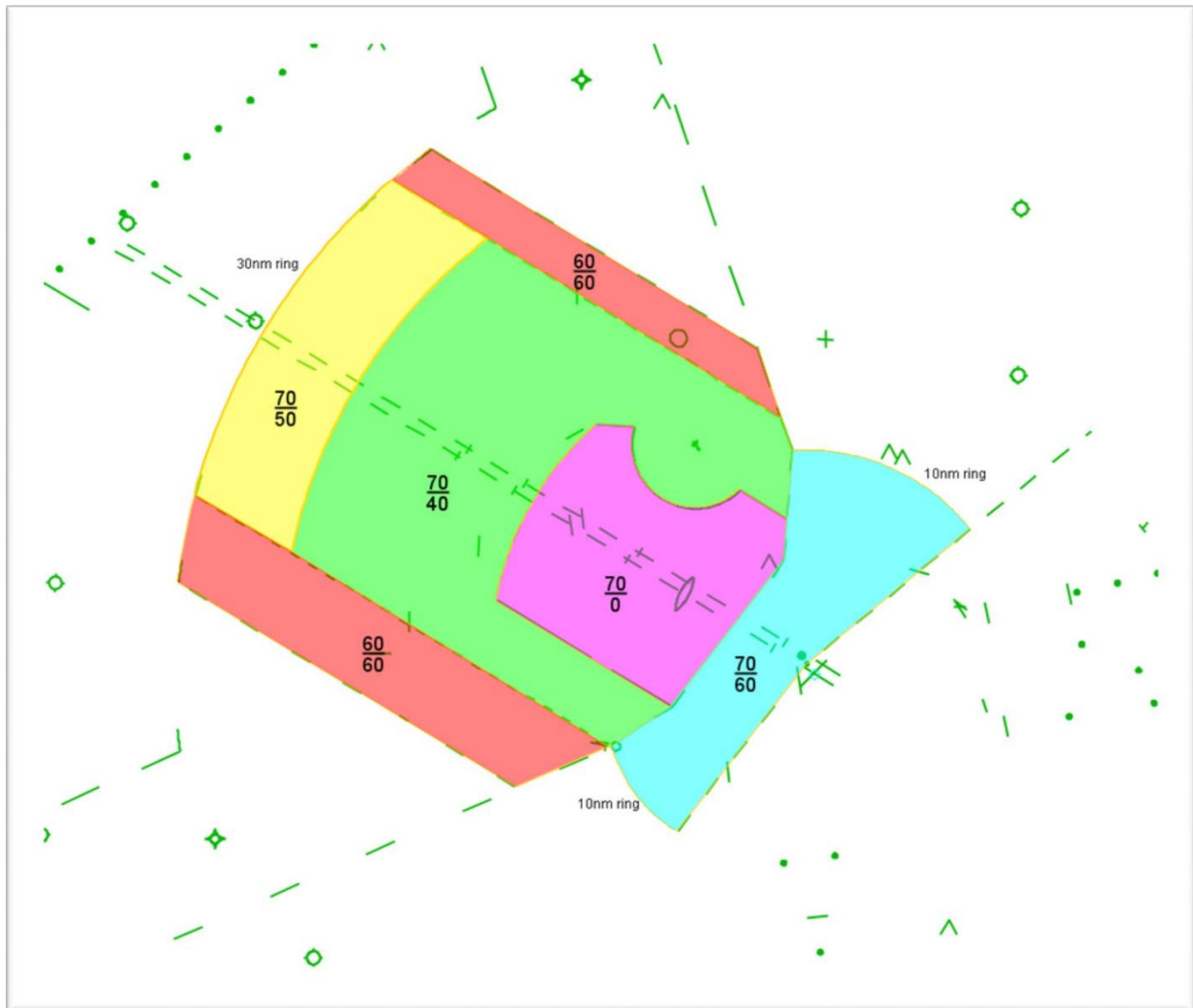
### RUNWAY 12 and 12-17 STP Shelf



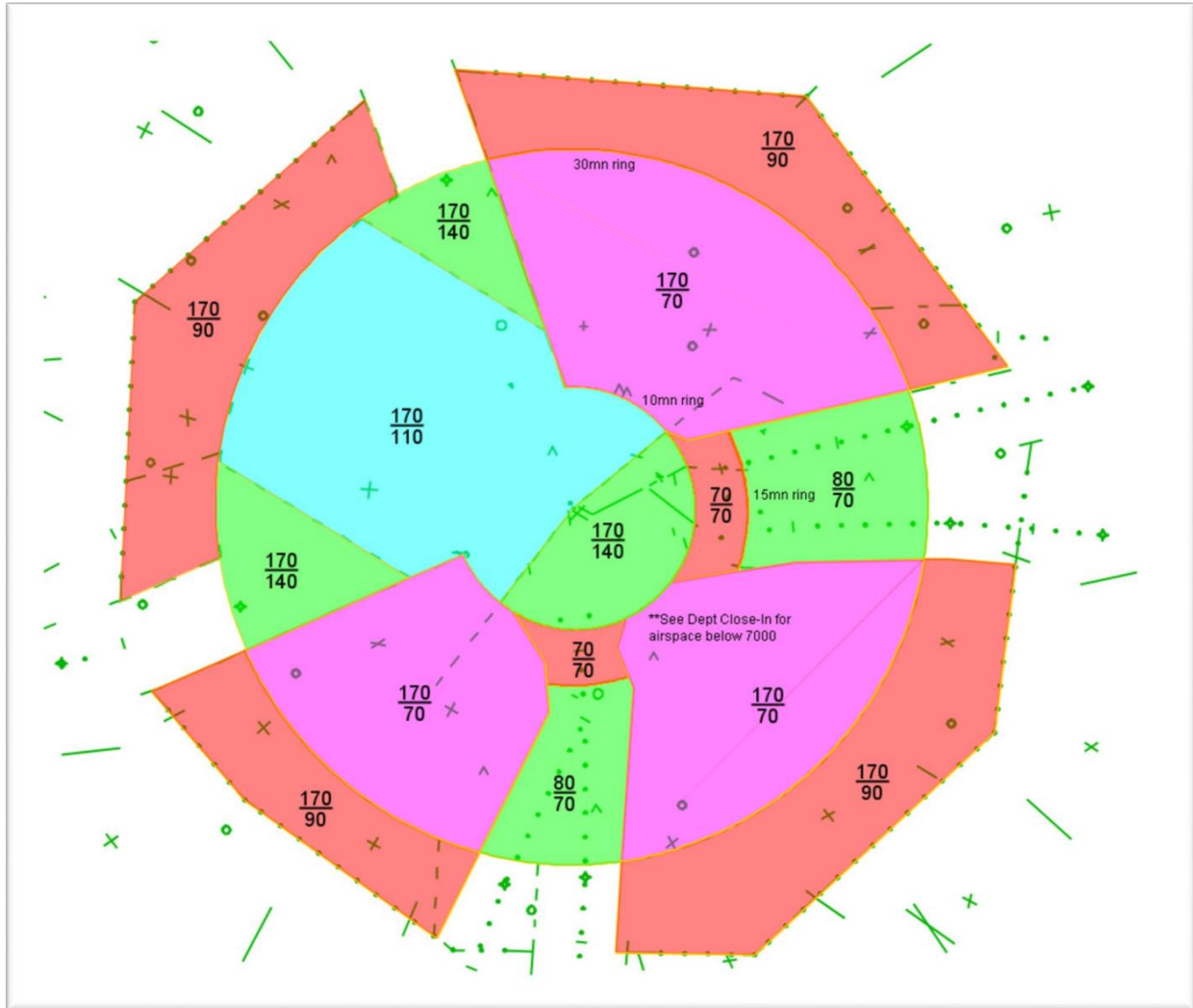
### LAND 12s – DEPART 12s and 17 FEEDER



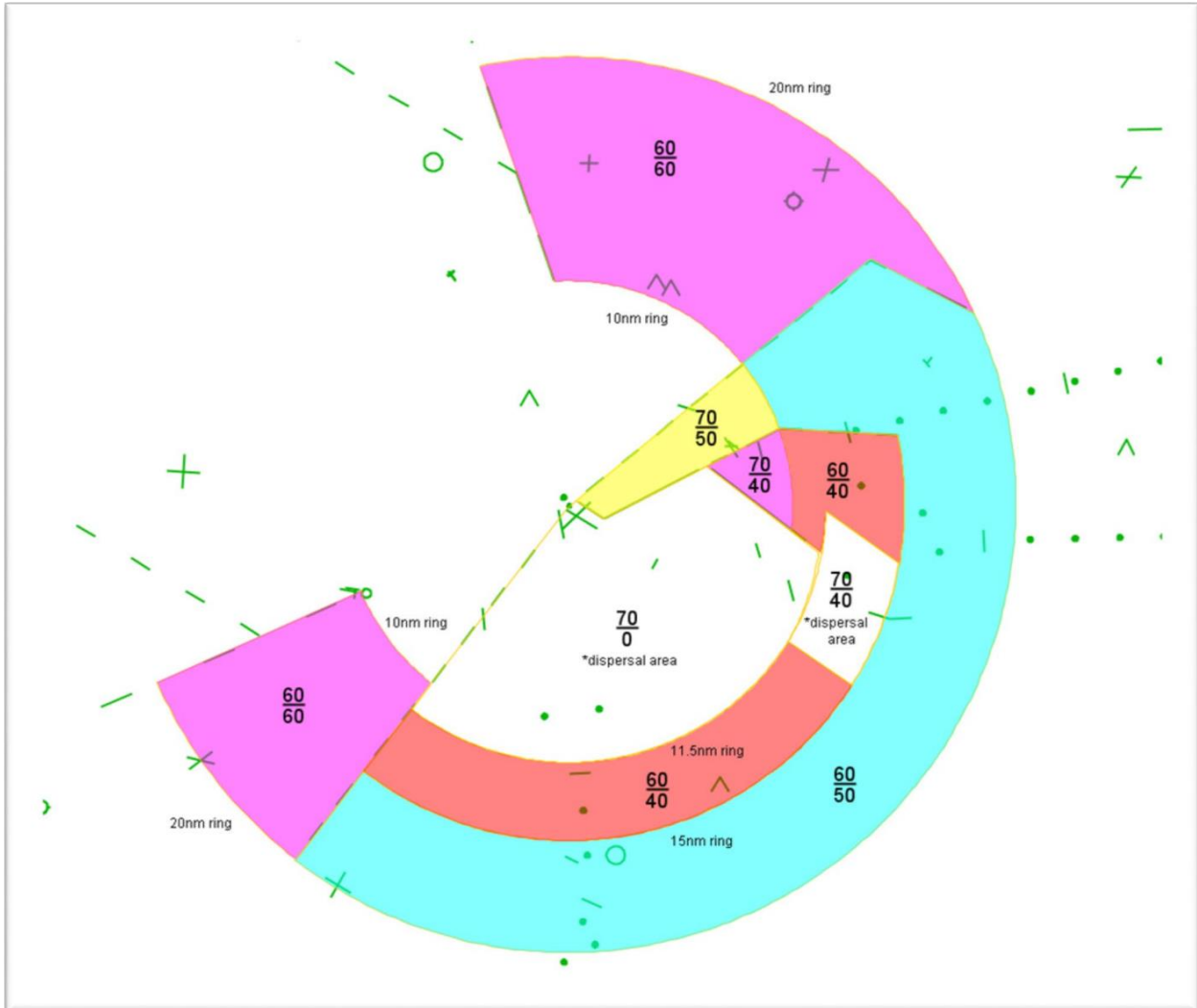
### LAND 12 – DEPART 12s and 17 ACDA



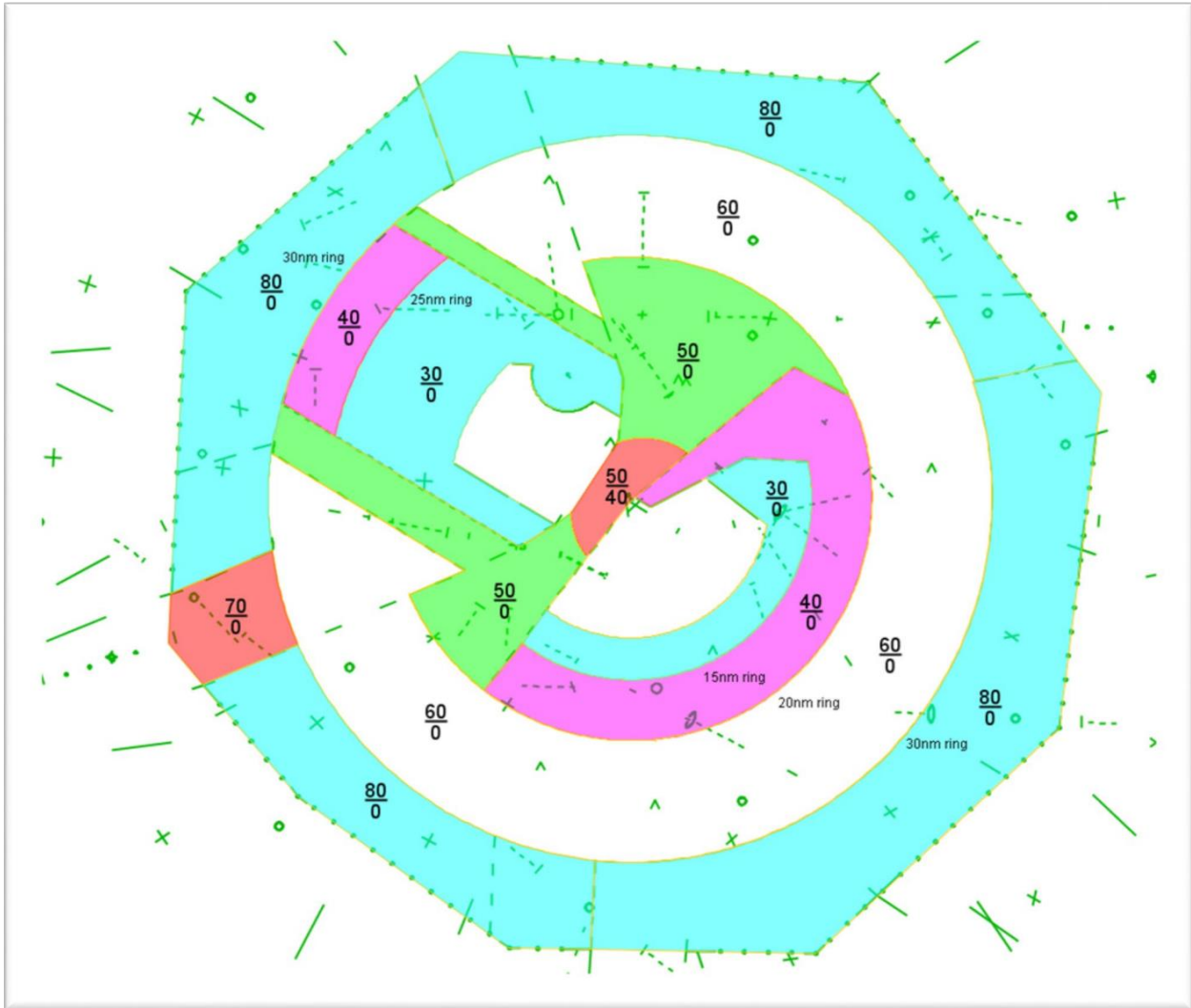
### LAND 12s – DEPART 12s and 17 DEPARTURE



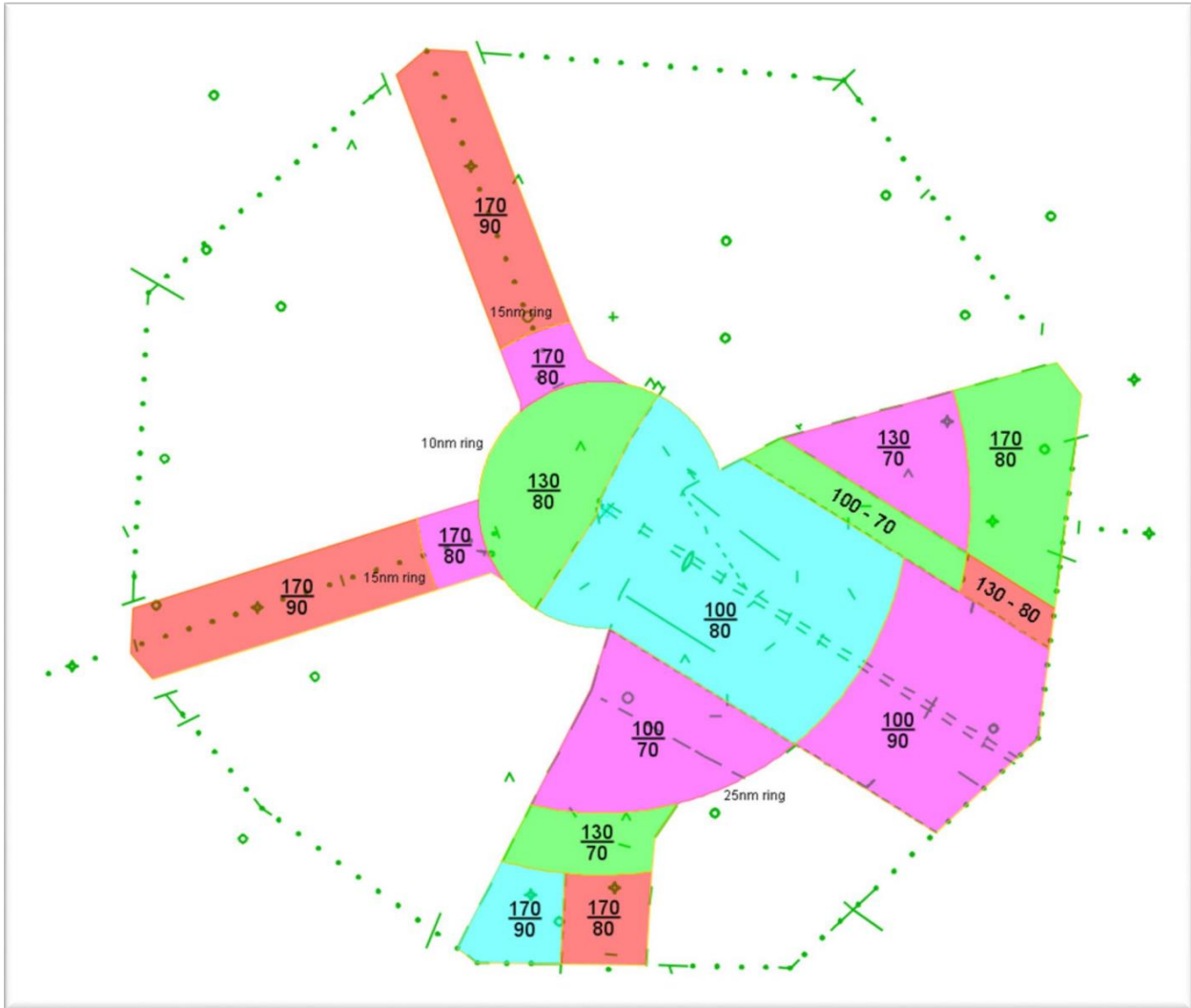
### LAND 12s – DEPART 12s and 17 DEPARTURE CLOSE IN



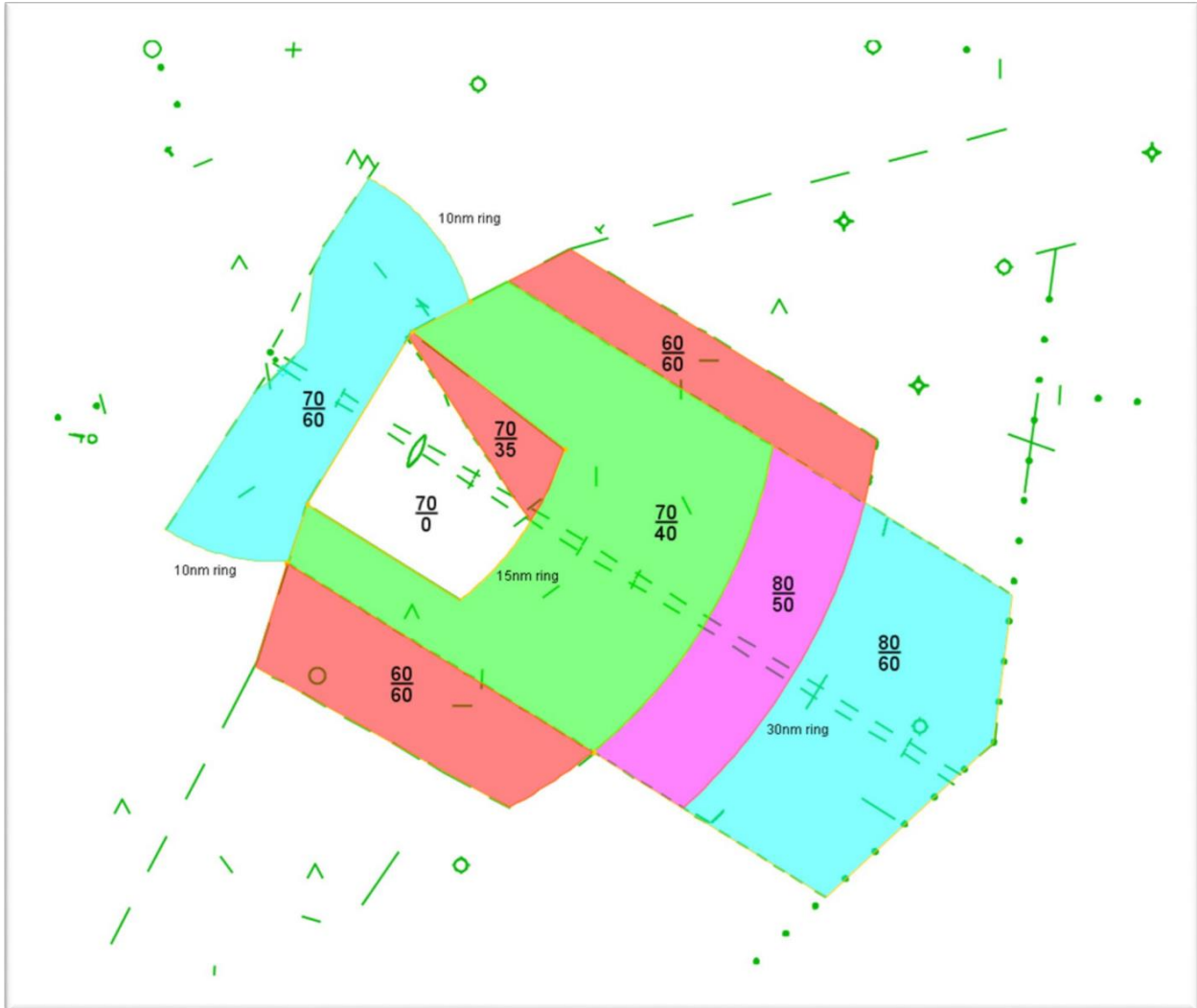
### LAND 12s – DEPART 12s and 17 SATELLITE



### RUNWAY 30 FEEDER

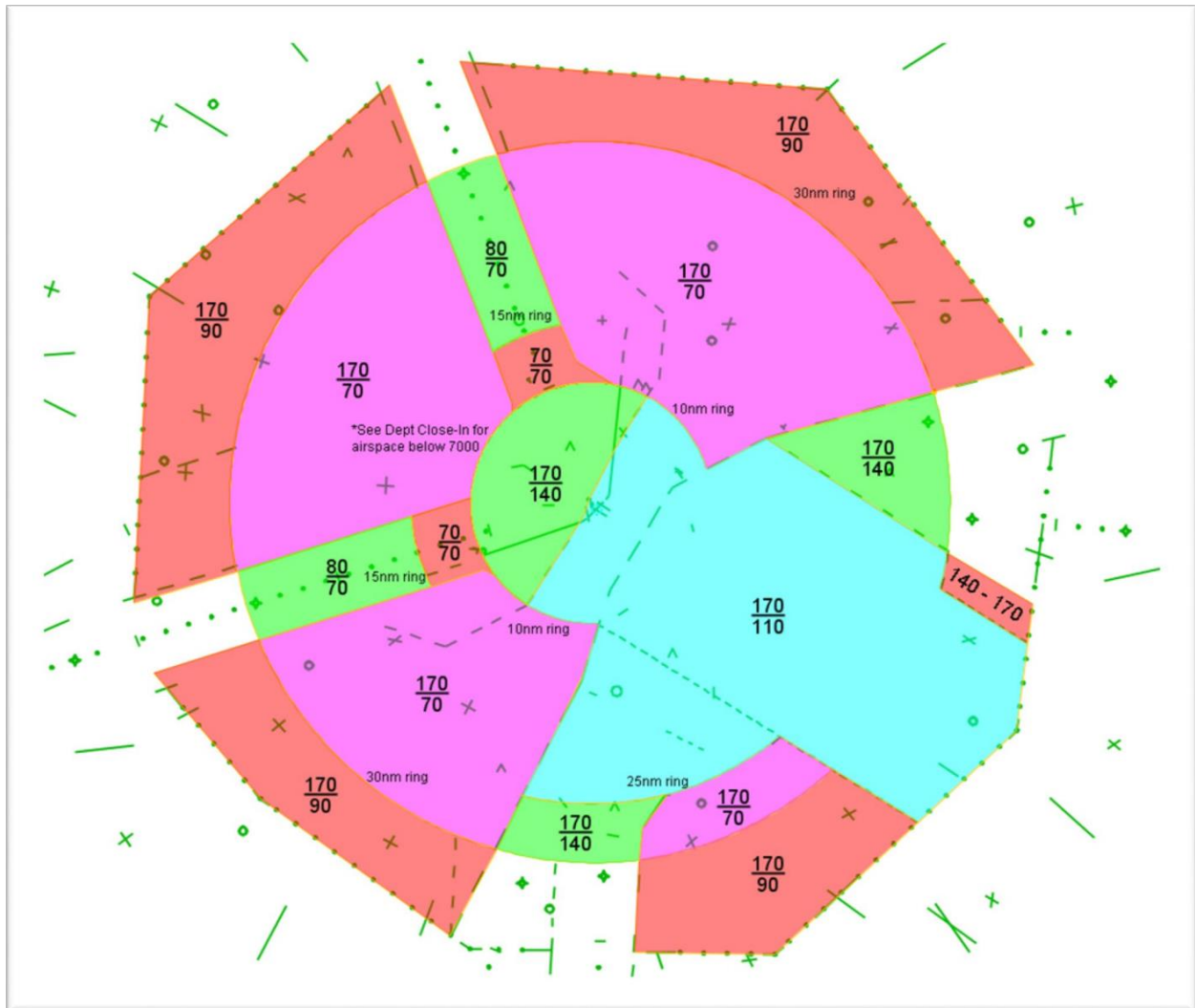


### RUNWAY 30 ACDA

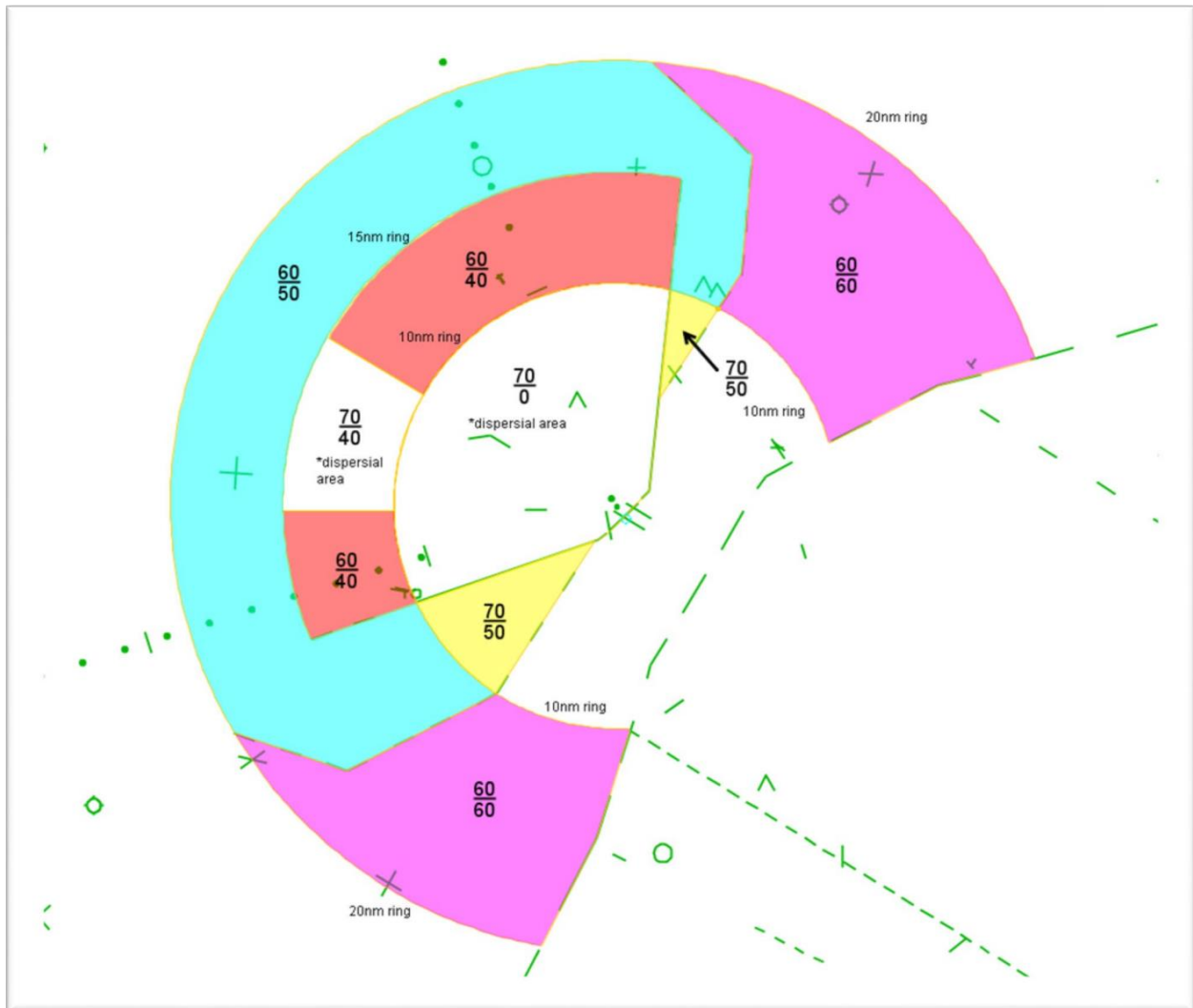




# RUNWAY 30 DEPARTURE

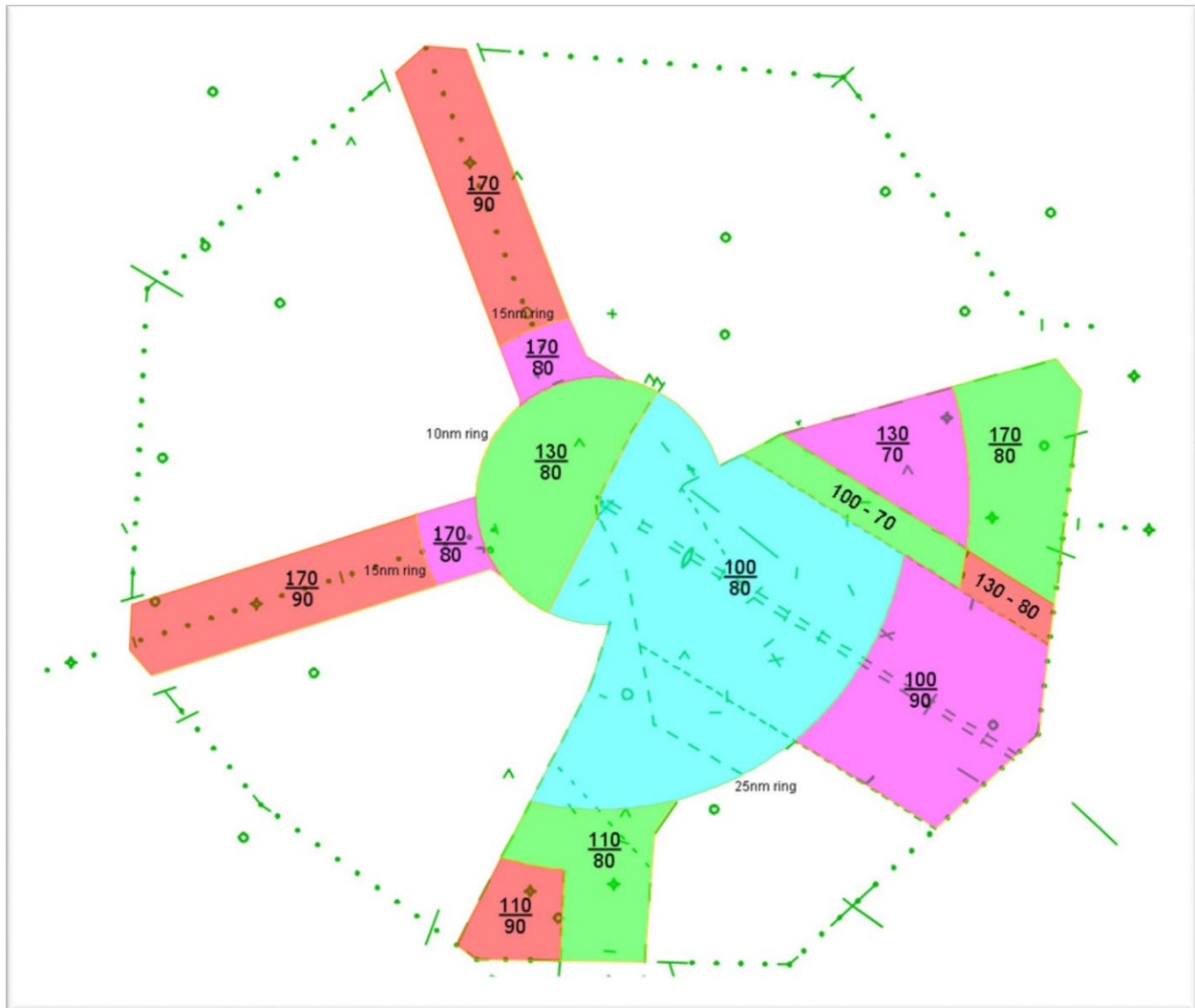


### RUNWAY 30 DEPARTURE CLOSE IN

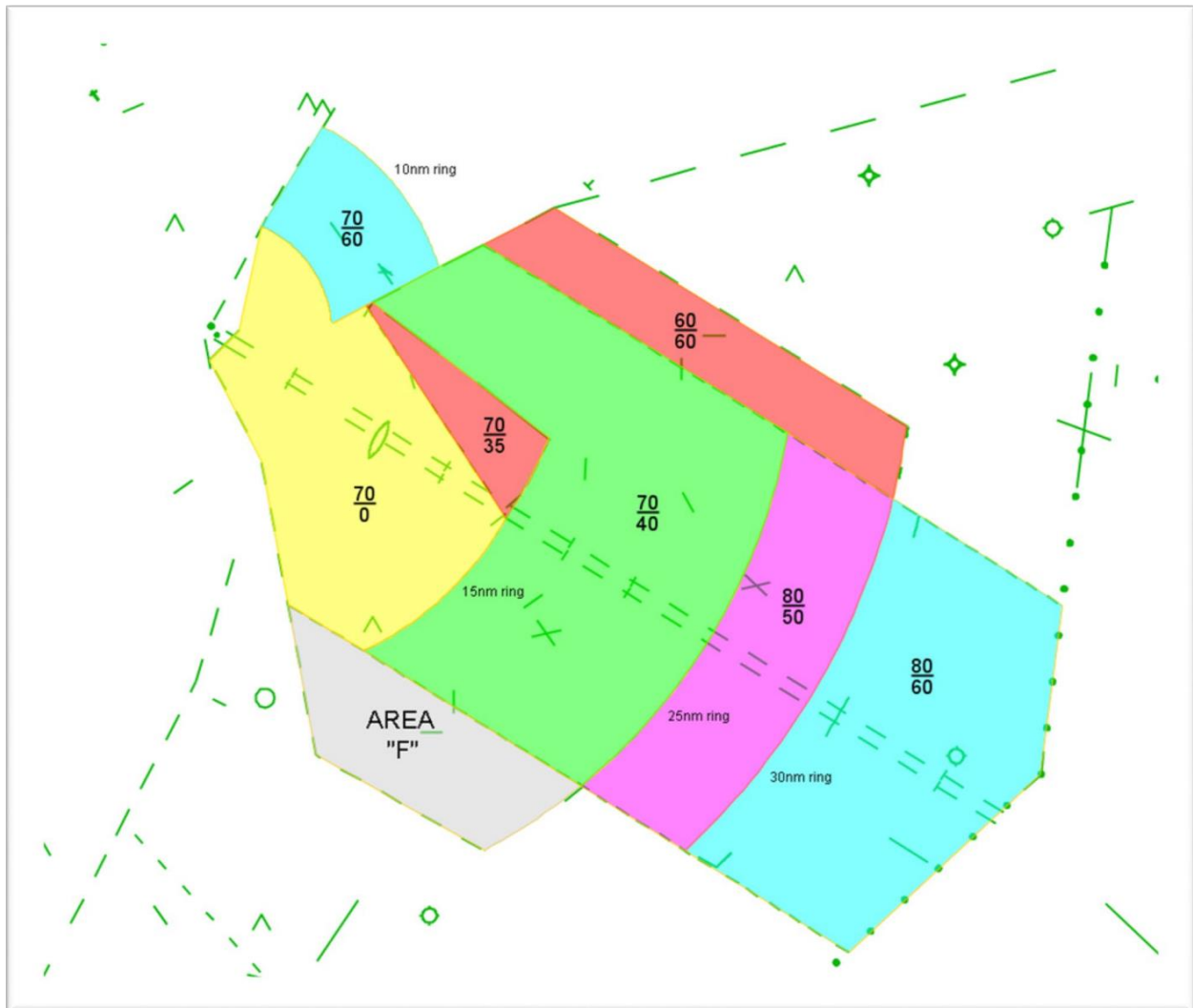




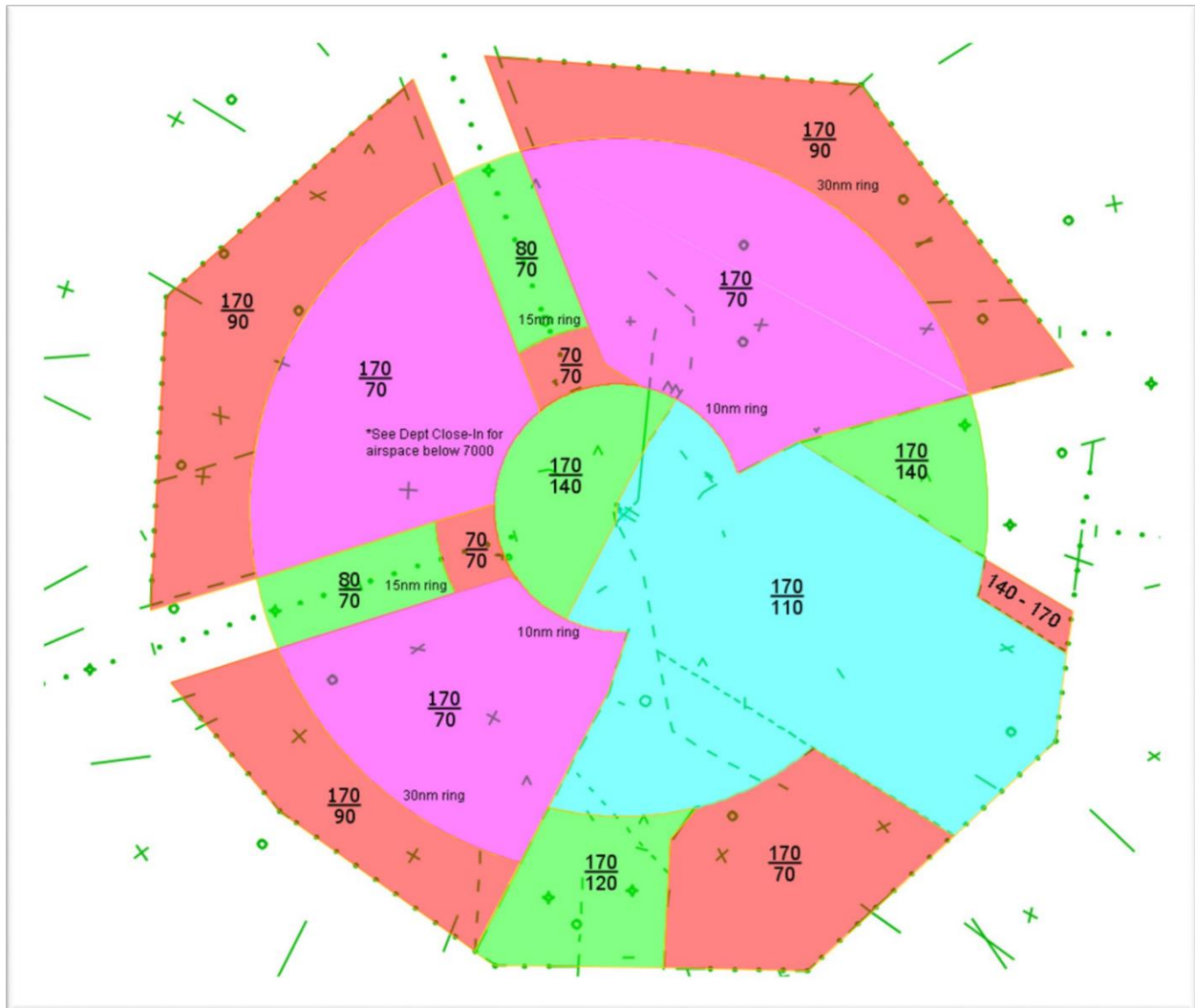
### LAND 30s – DEPART 30s and 17 FEEDER



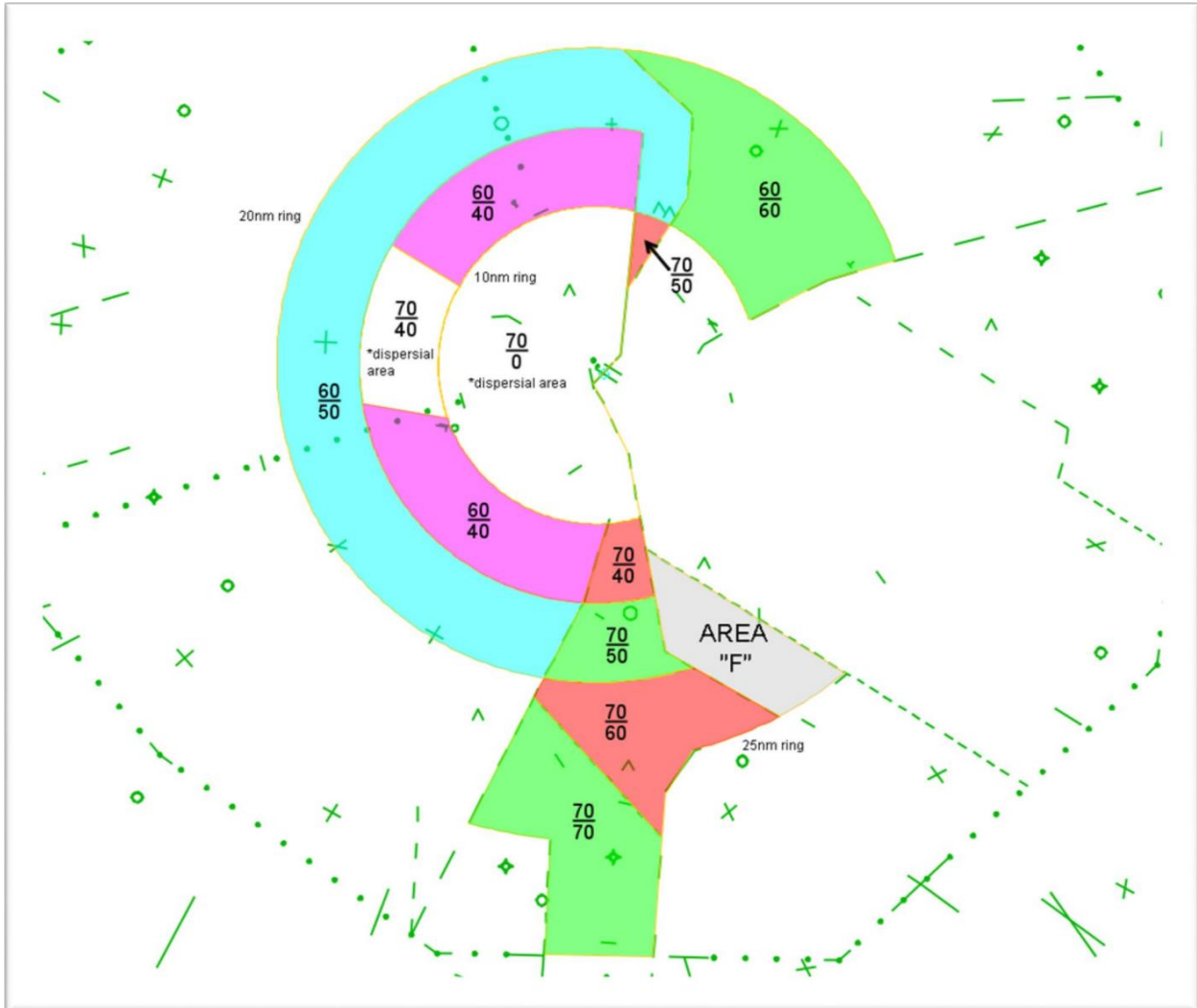
### LAND 30s – DEPART 30s and 17 ACDA



### LAND 30s – DEPART 30s and 17 DEPARTURE

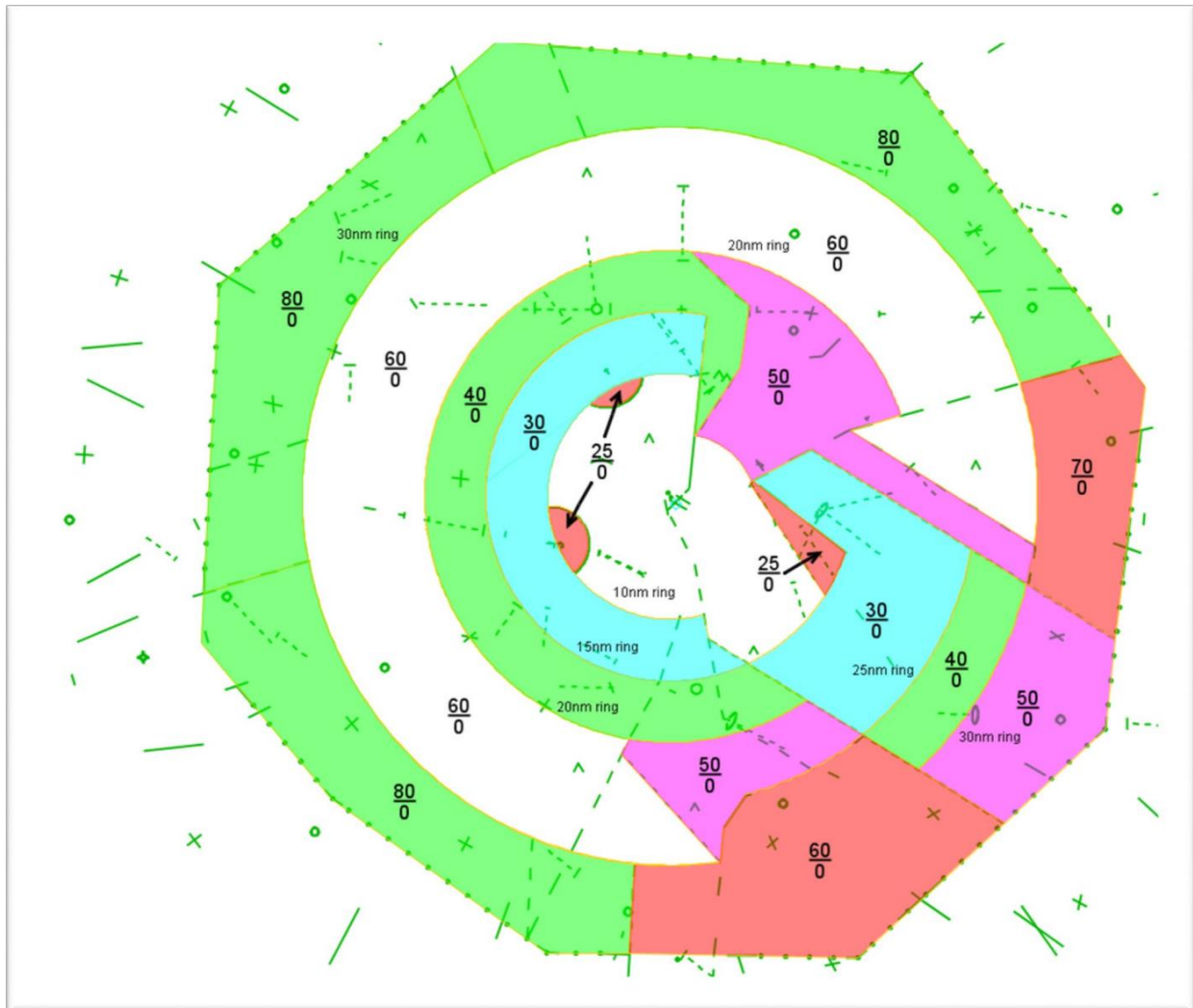


### LAND 30s – DEPART 30s and 17 DEPARTURE CLOSE IN





### LAND 30s – DEPART 30s and 17 SATELLITE

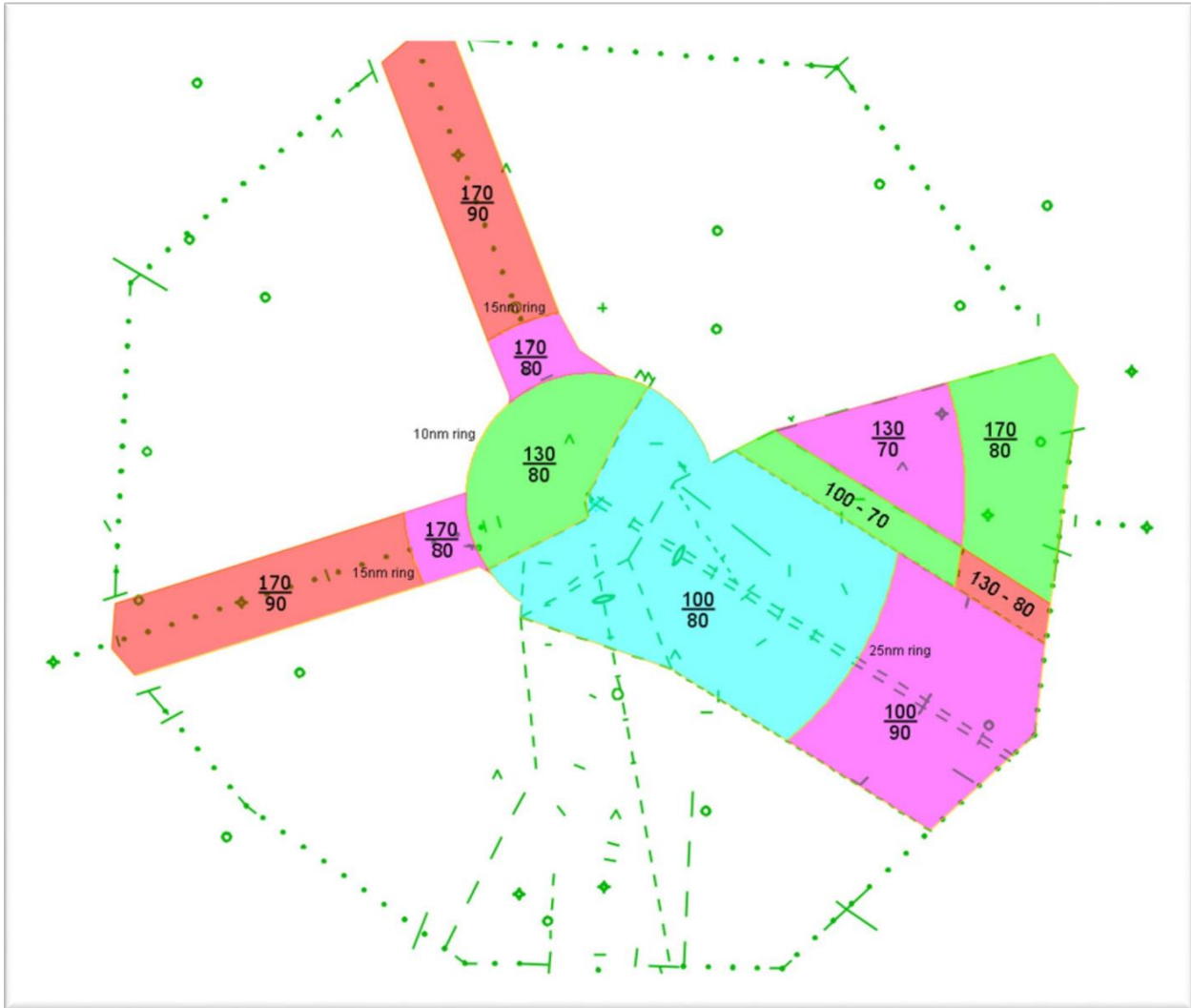




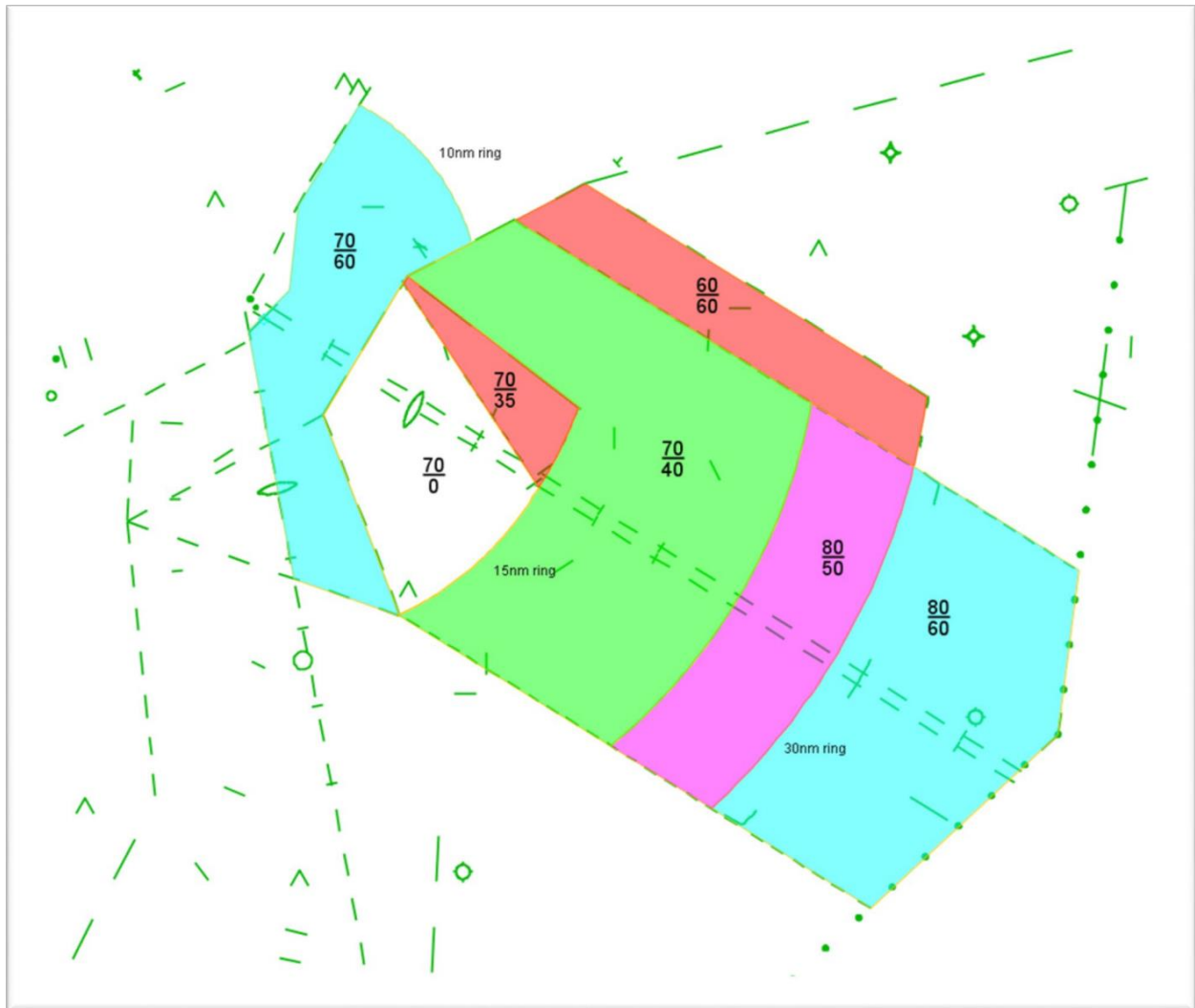
LAND 30s – DEPART 30s and 17  
AREA F



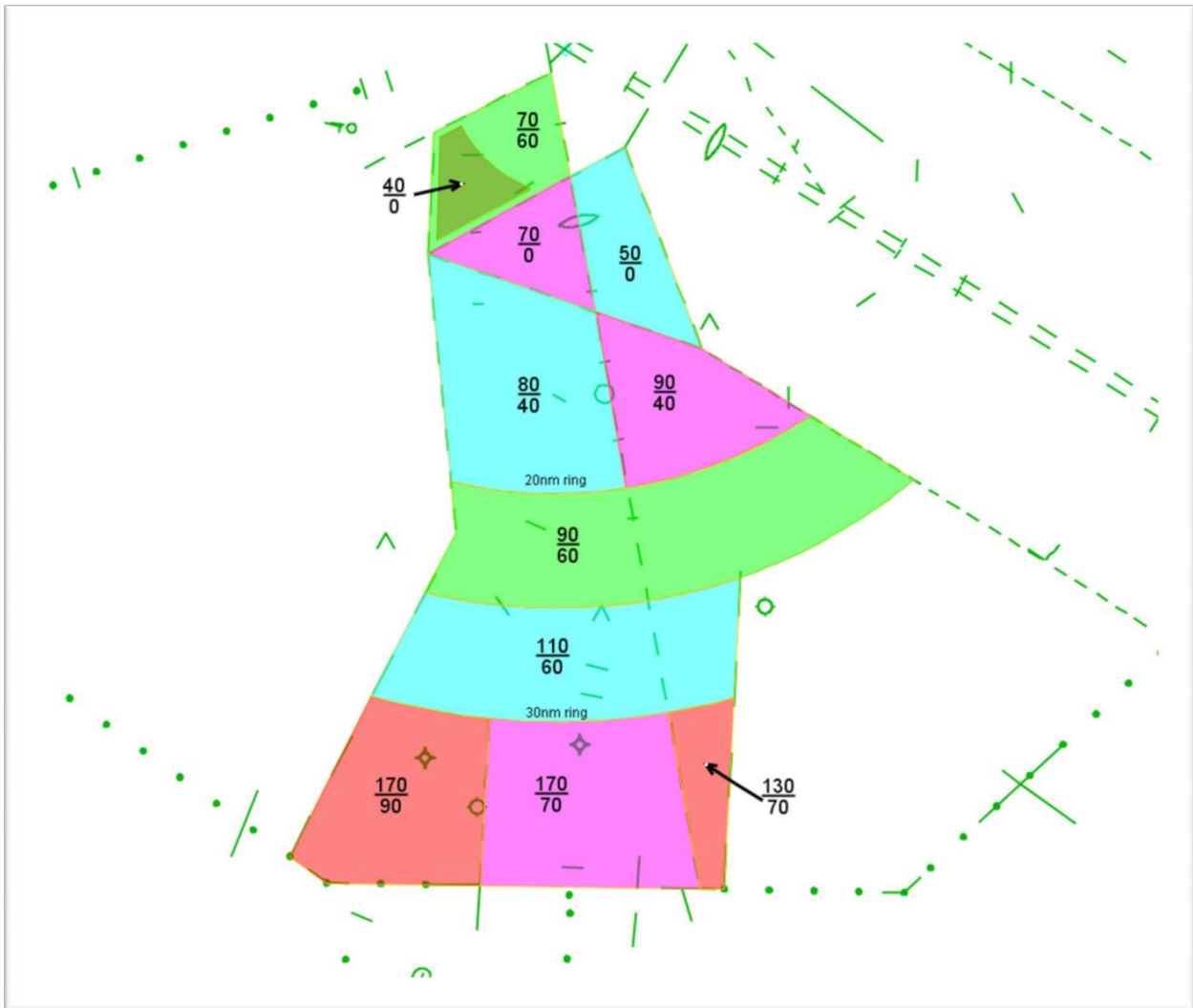
### LAND 30s and 35 – DEPART 30s FEEDER



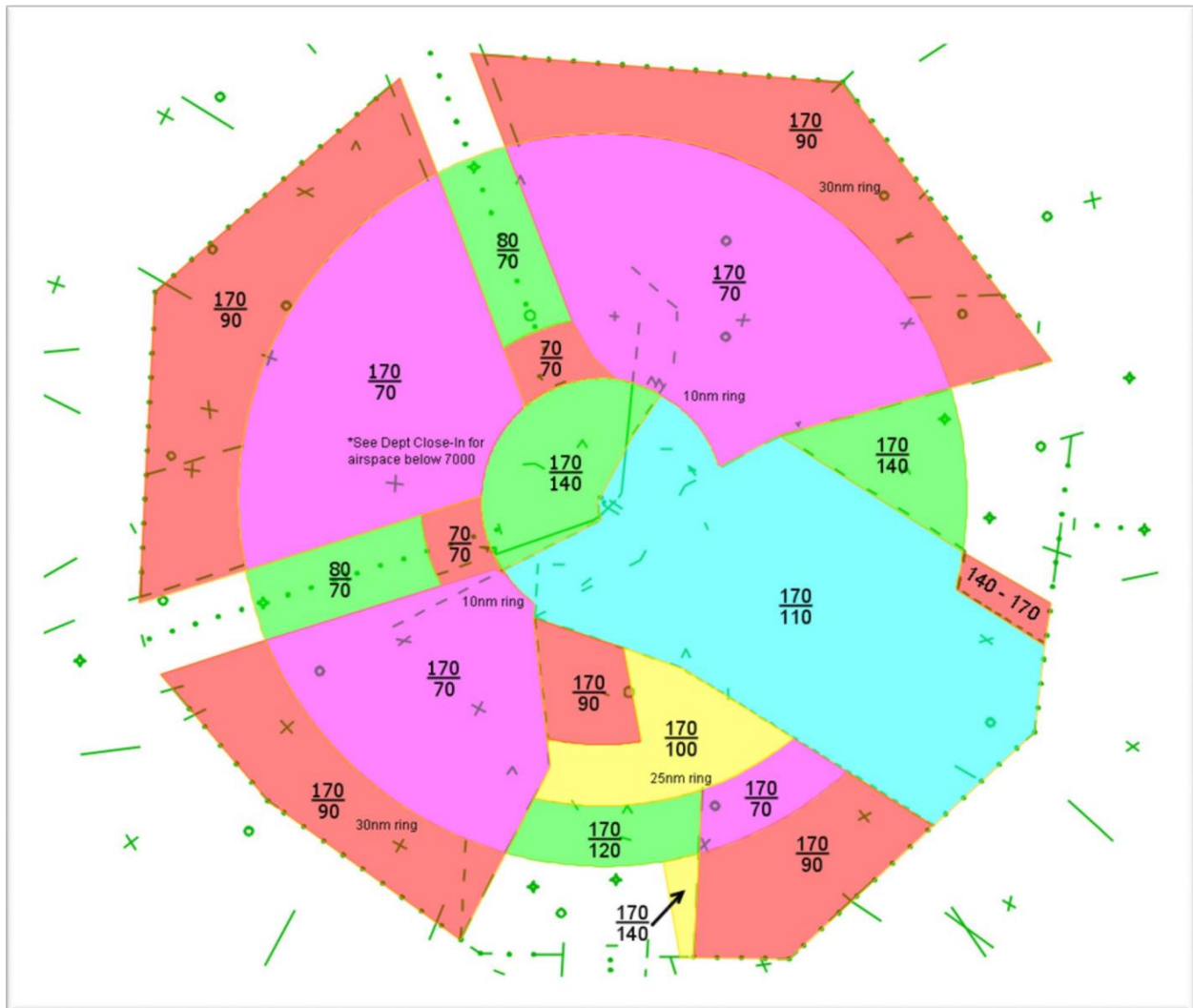
### LAND 30s and 35 – DEPART 30s 30s ACDA



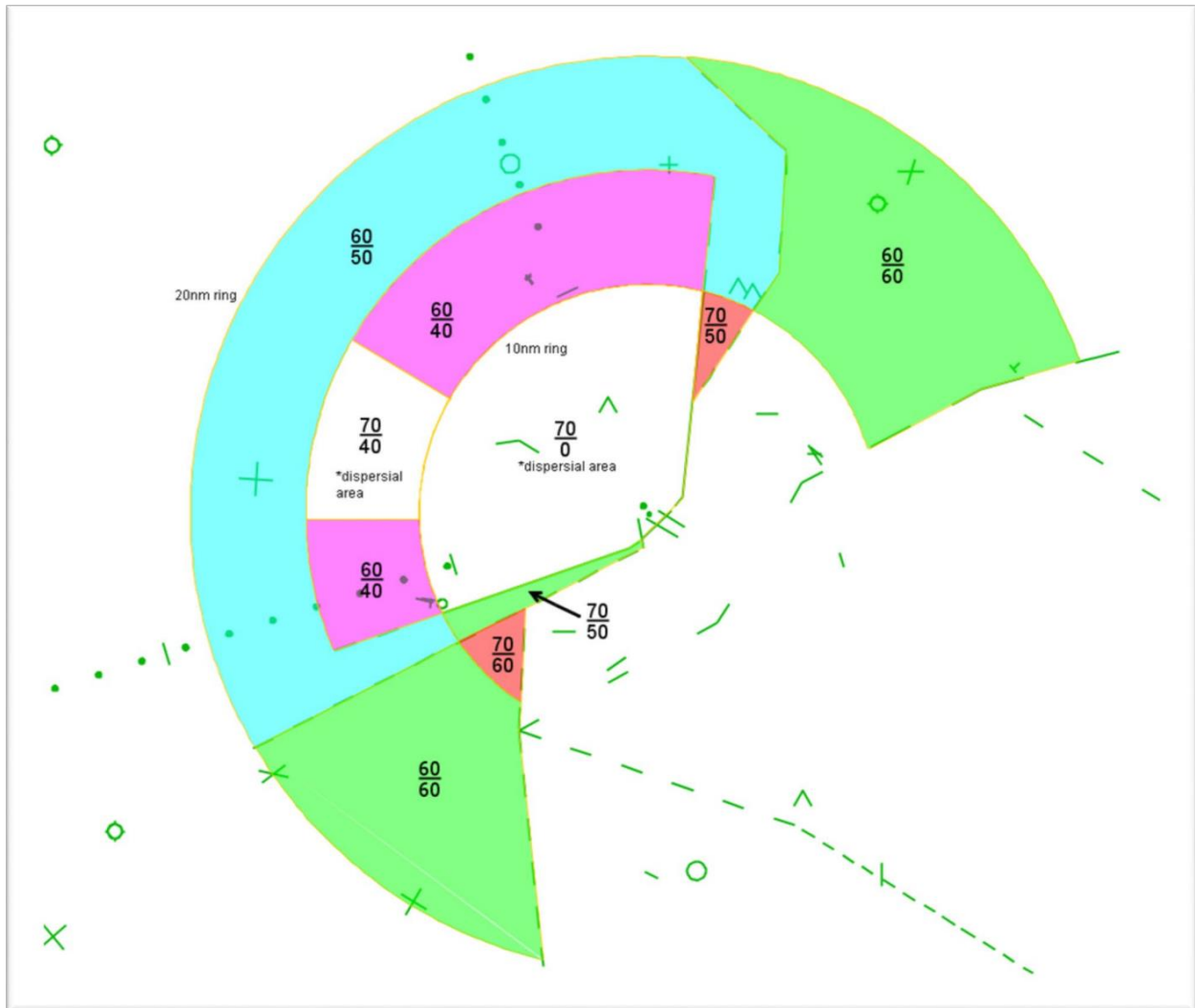
### LAND 30s and 35 – DEPART 30s 35 ACDA



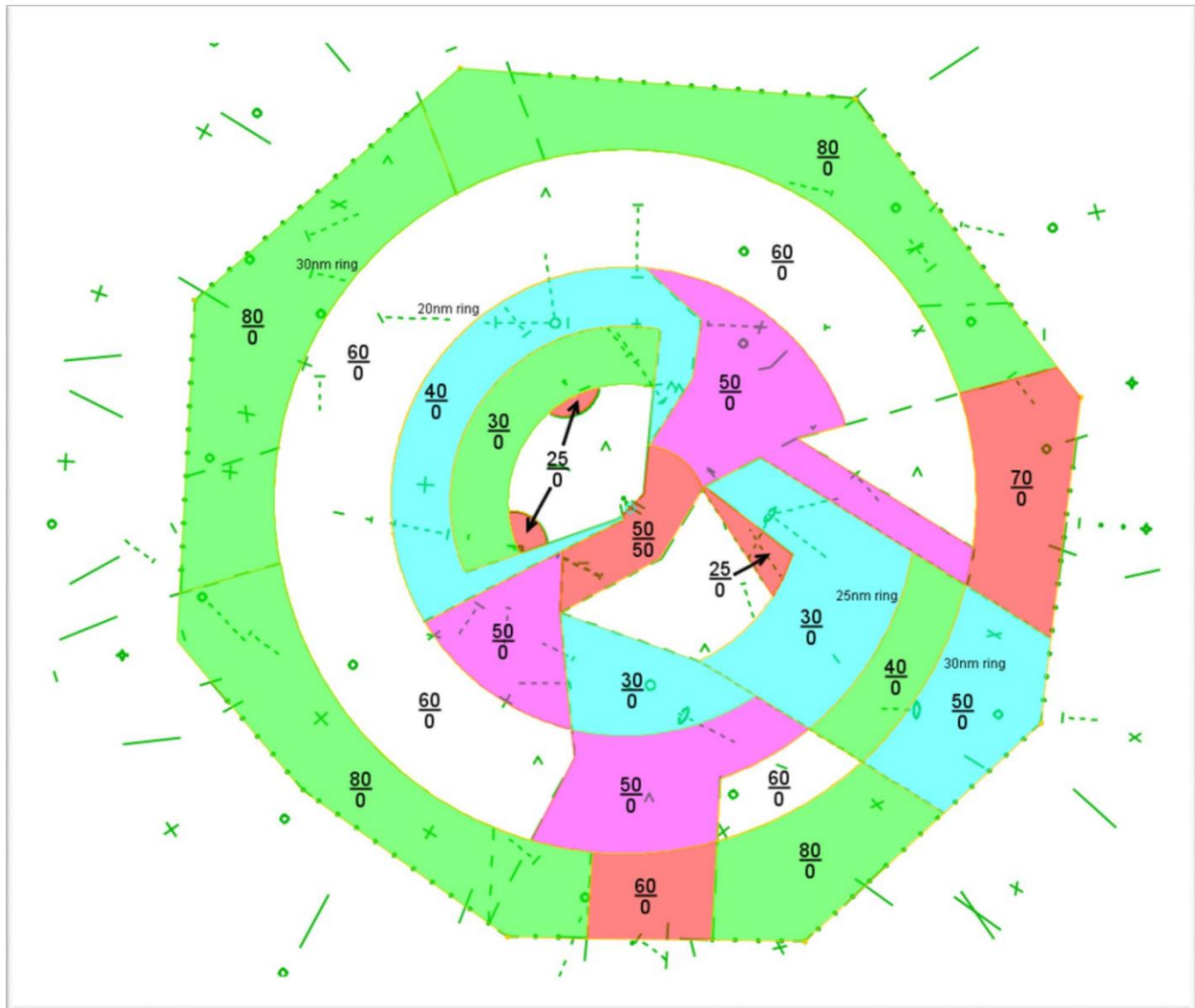
### LAND 30s and 35 – DEPART 30s DEPARTURE



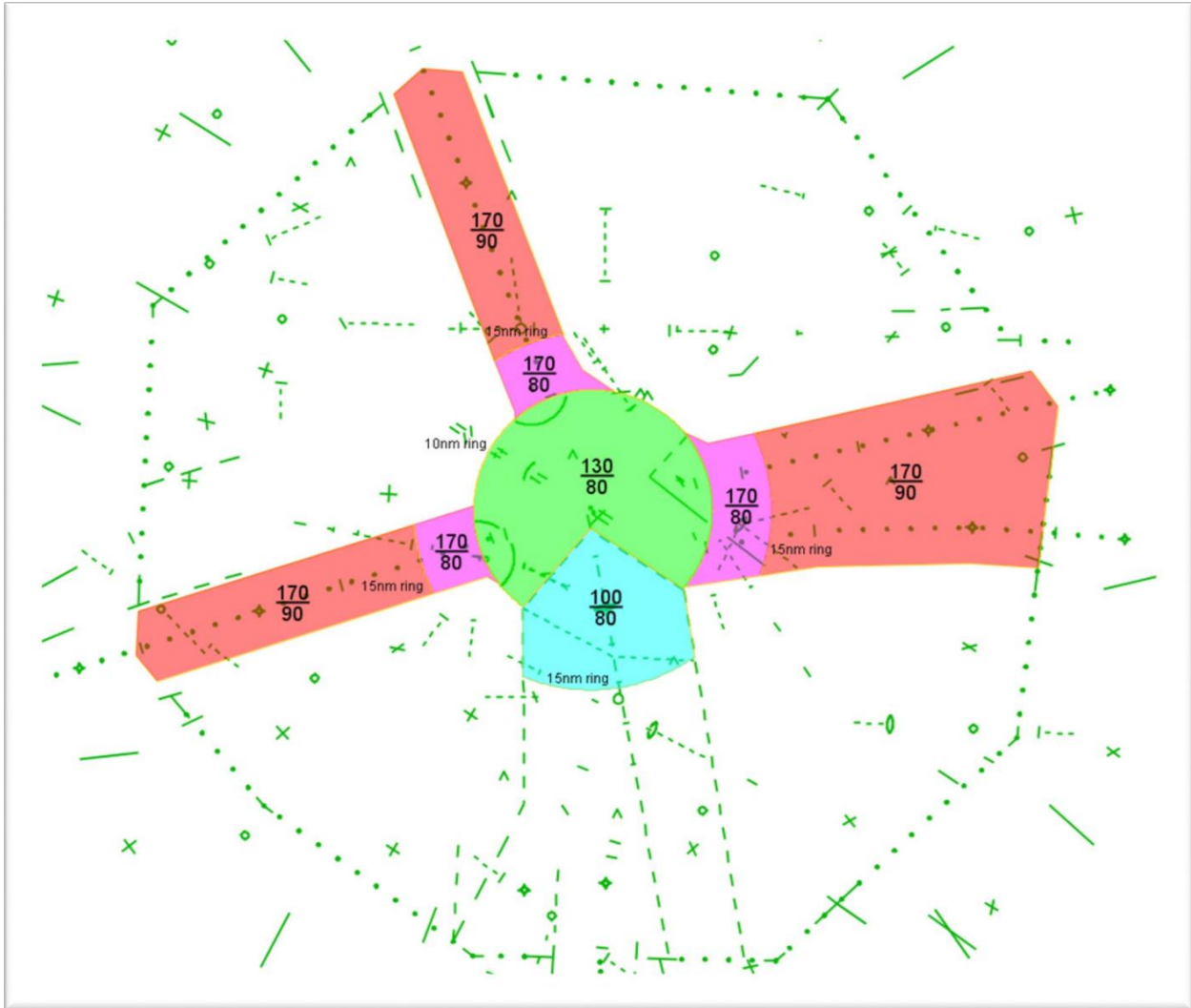
### LAND 30s and 35 – DEPART 30s DEPARTURE CLOSE IN



### LAND 30s and 35 – DEPART 30s SATELLITE

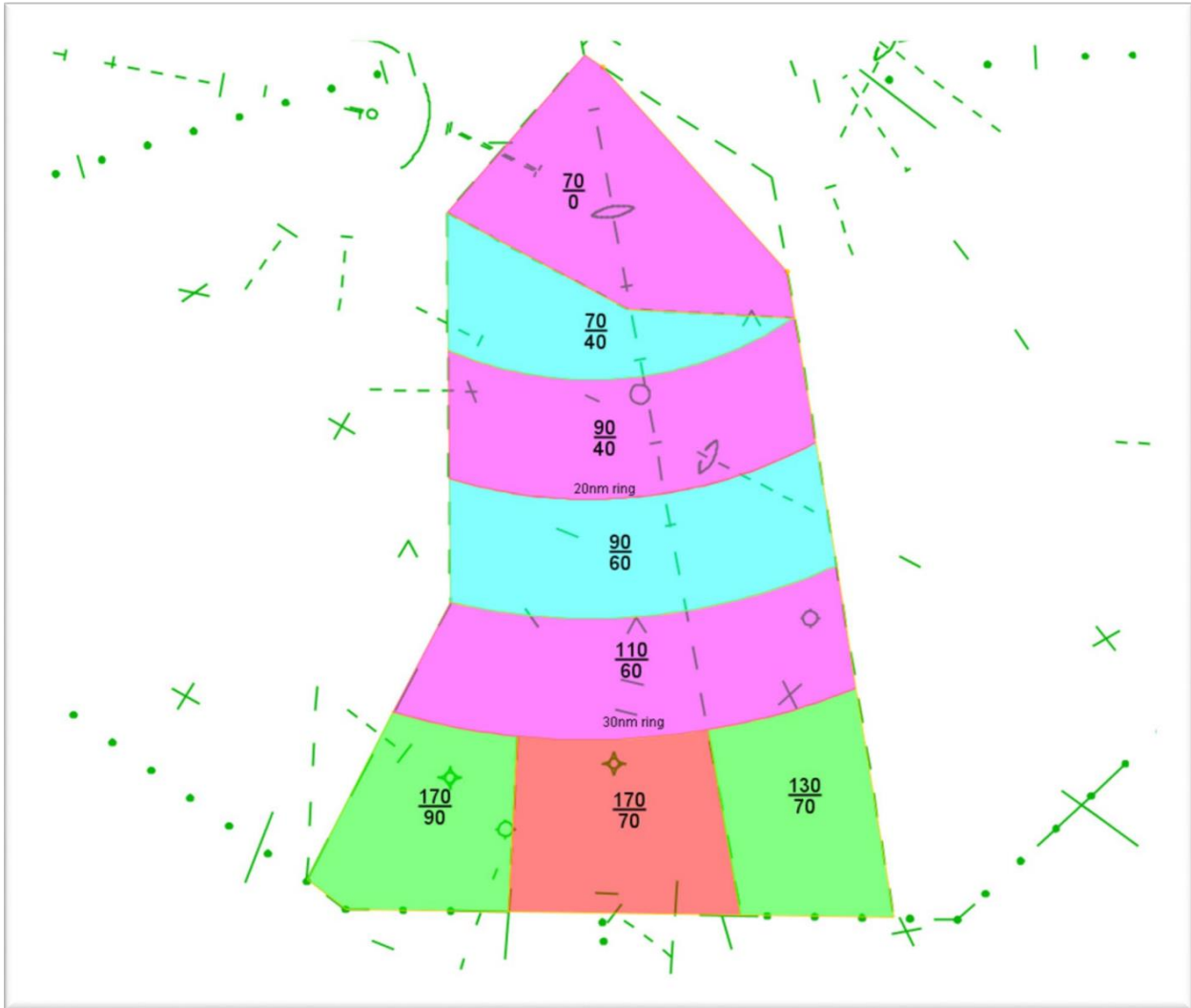


### LAND 35 – DEPART 35, 30 or 4 FEEDER

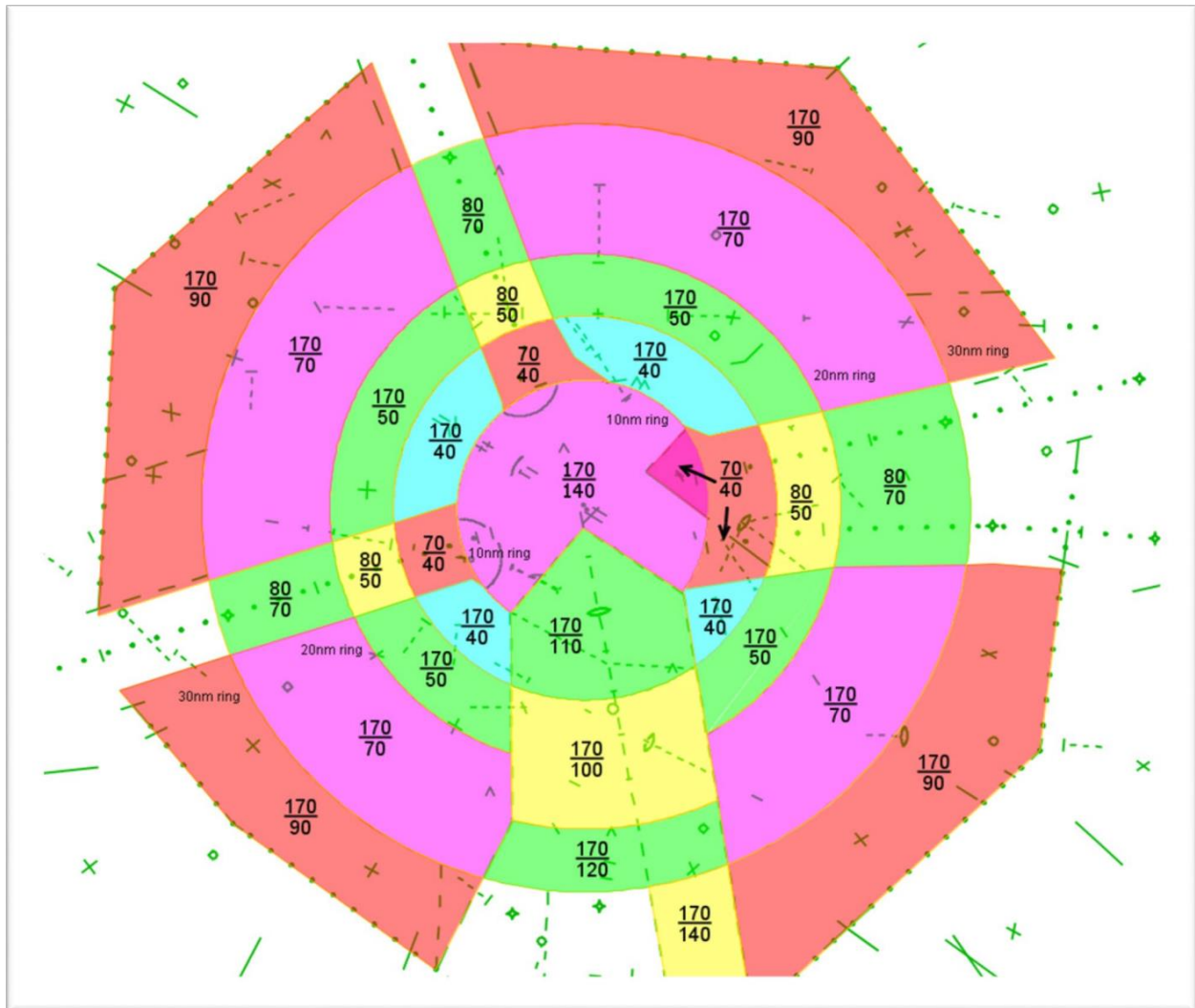




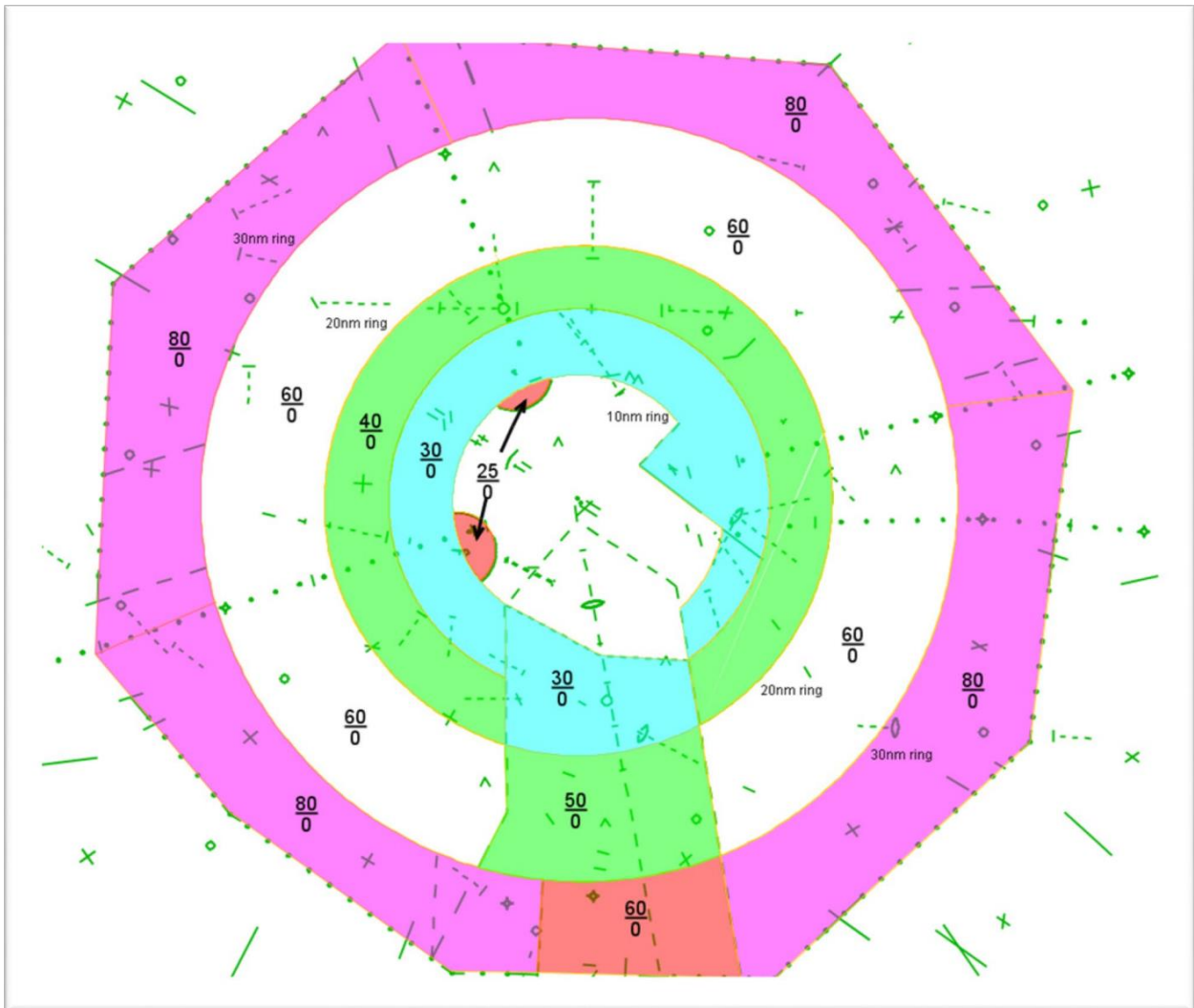
### LAND 35 – DEPART 35, 30, or 4 ACDA



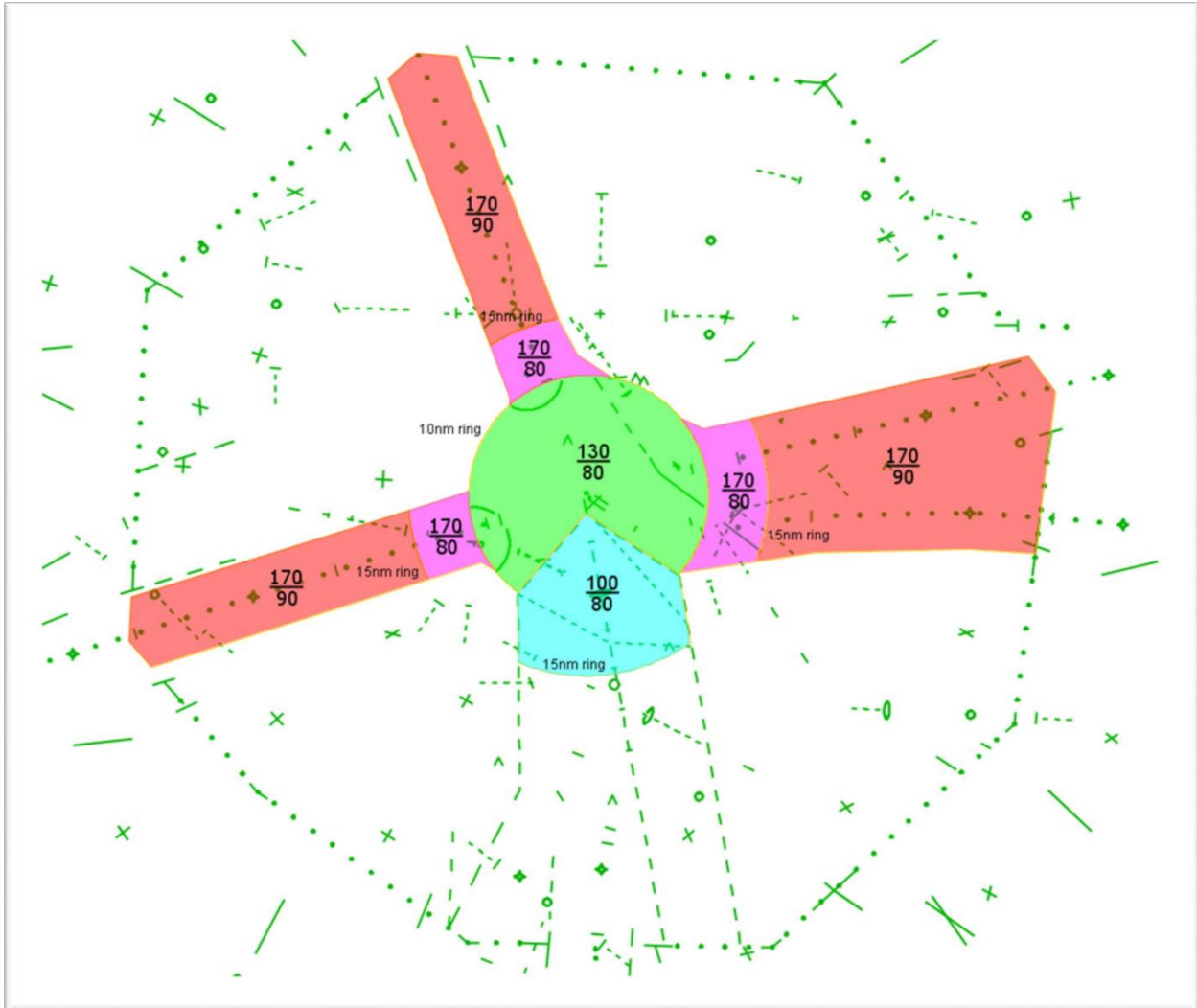
### LAND 35 – DEPART 35, 30, or 4 DEPARTURE



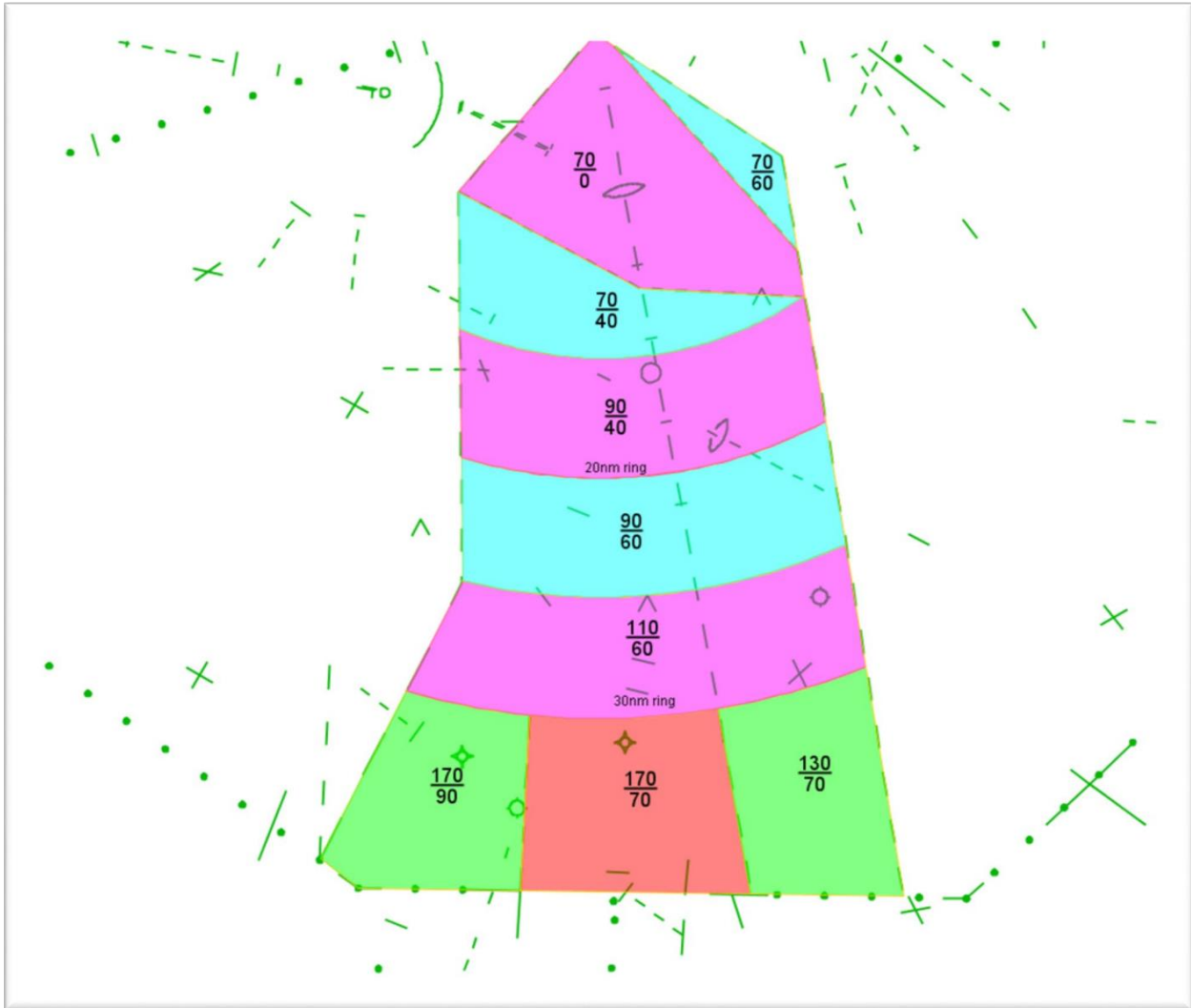
### LAND 35 – DEPART 35, 30, or 4 SATELLITE



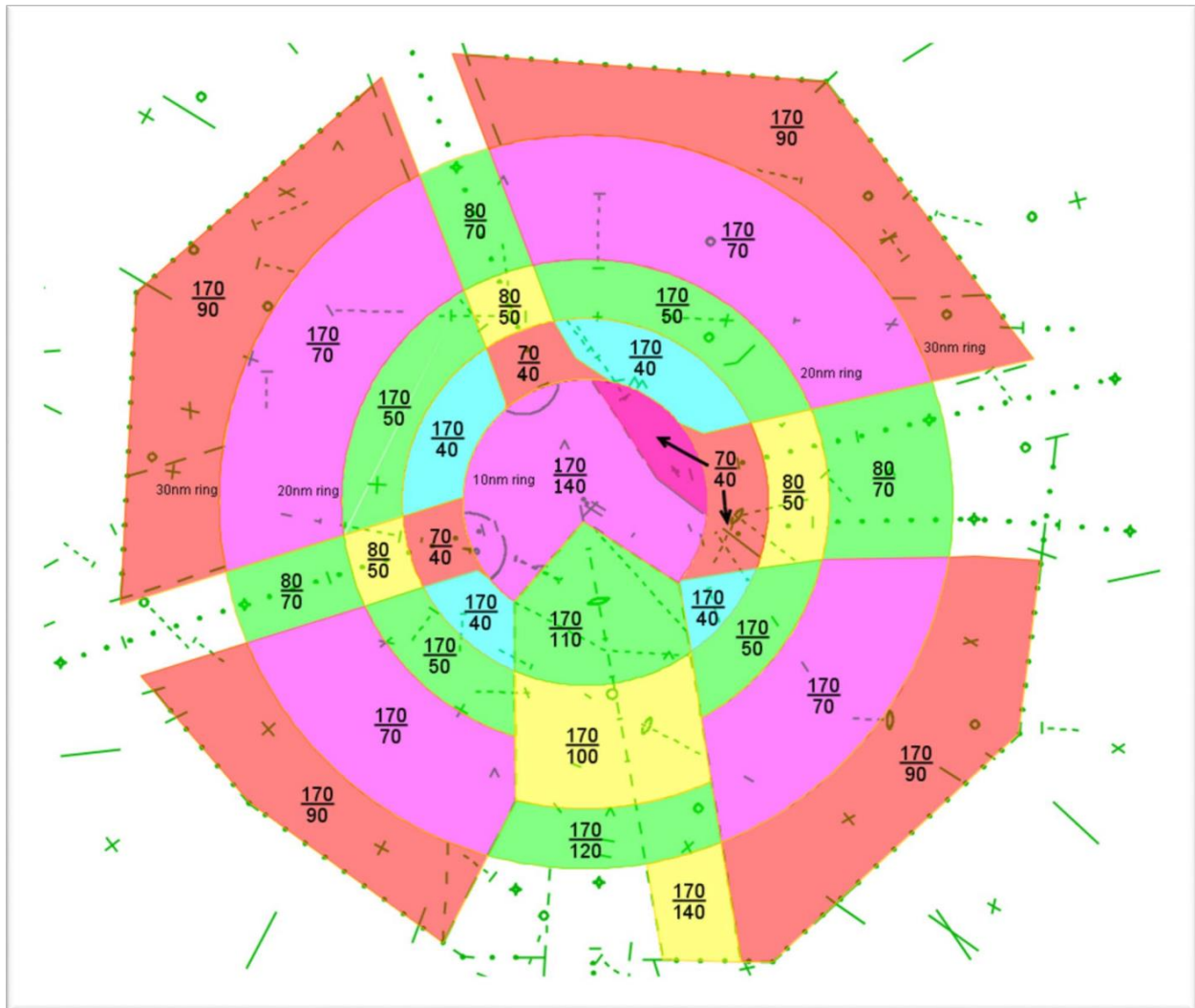
### LAND 35 – DEPART 12 FEEDER



### LAND 35 – DEPART 12 ACDA

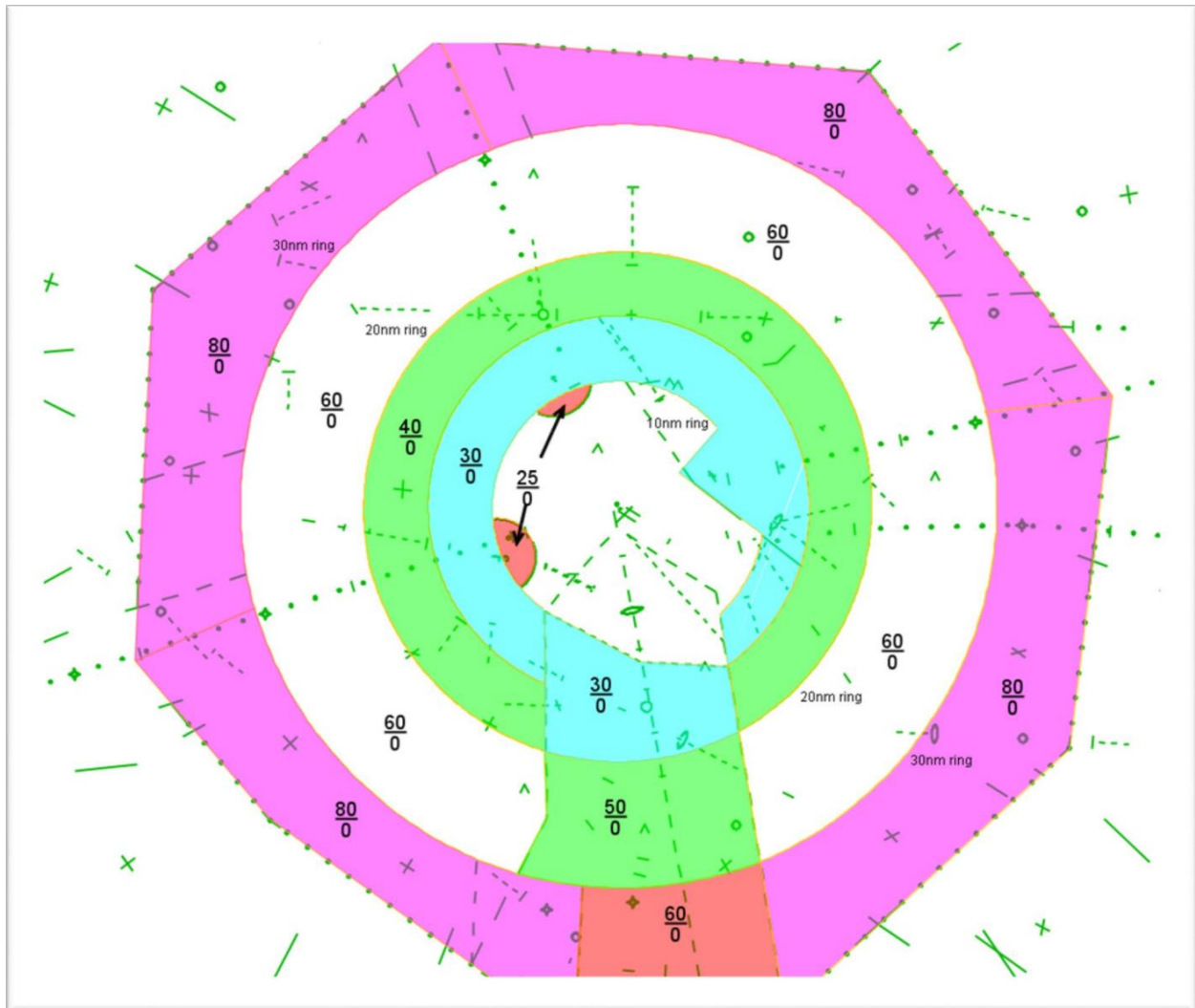


### LAND 35 – DEPART 12 DEPARTURE

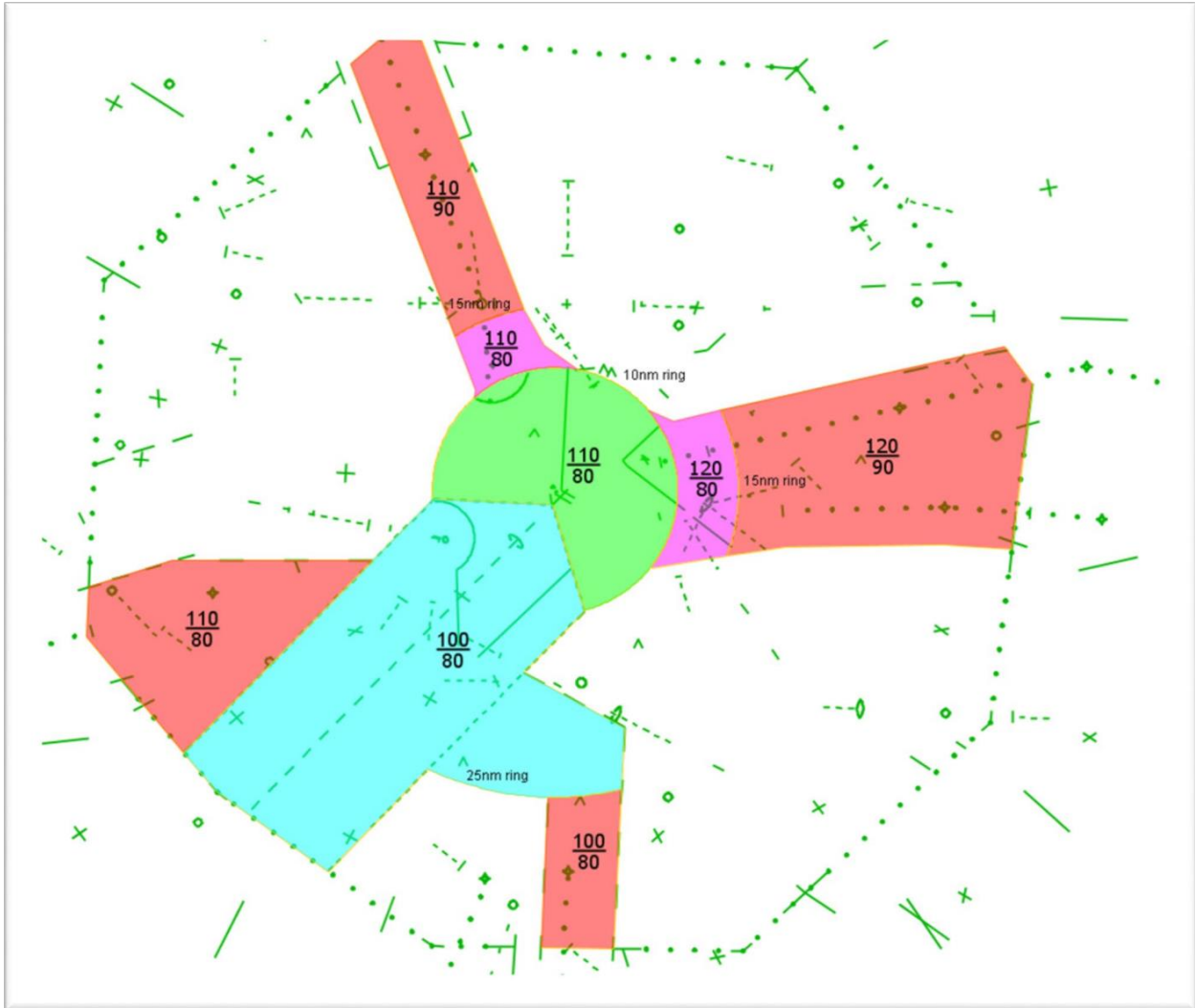




### LAND 35 – DEPART 12 SATELLITE

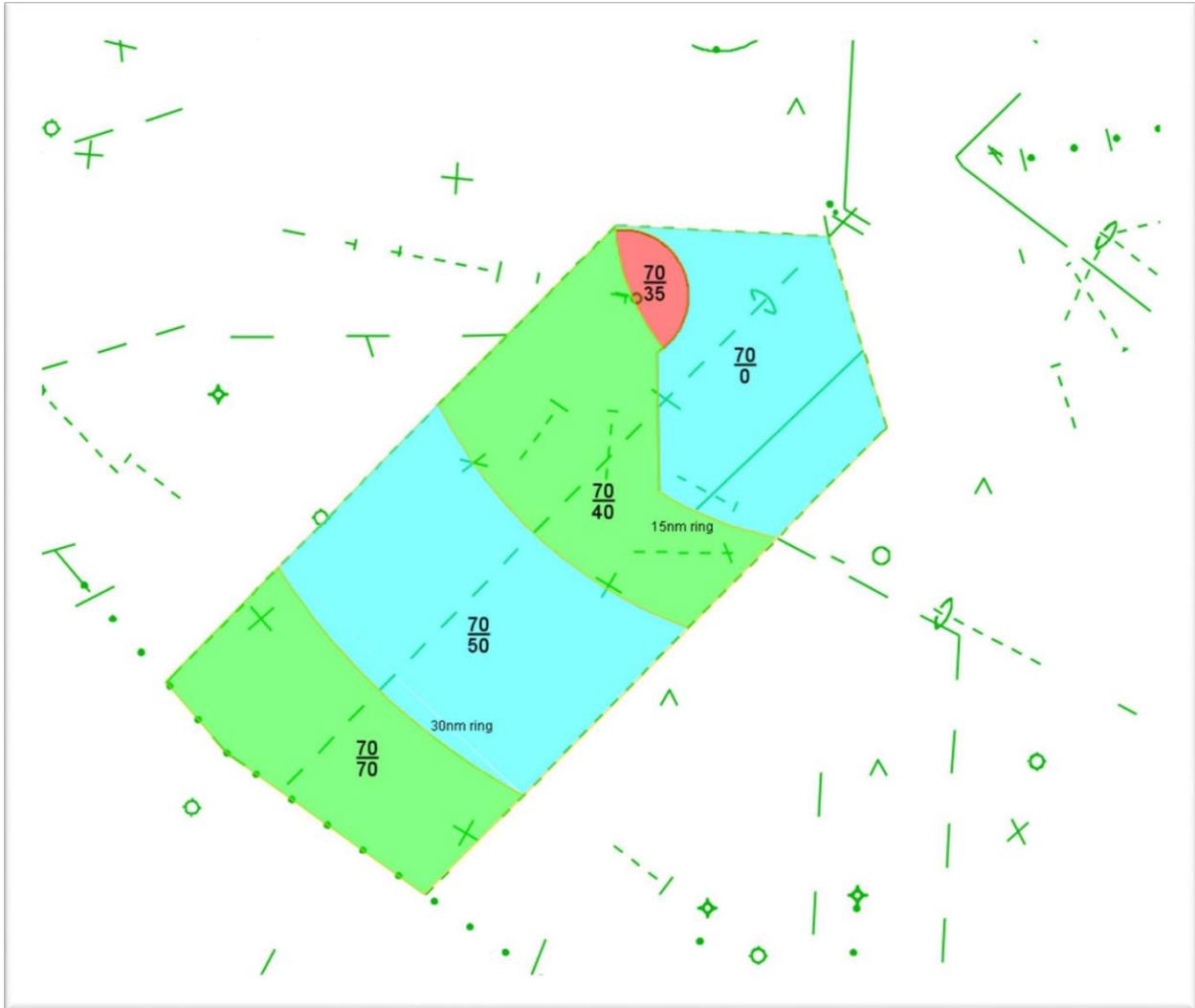


### RUNWAY 4 FEEDER

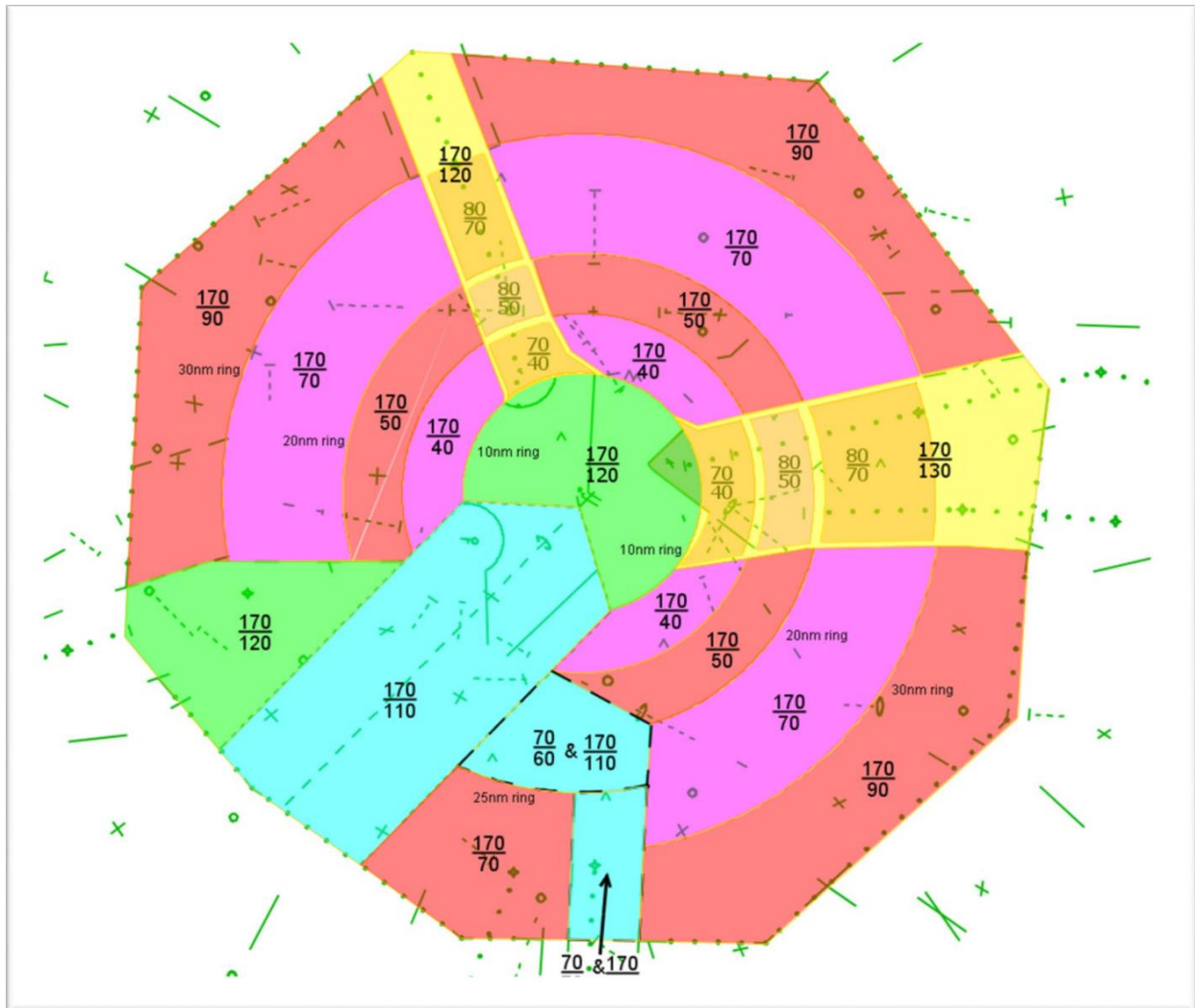




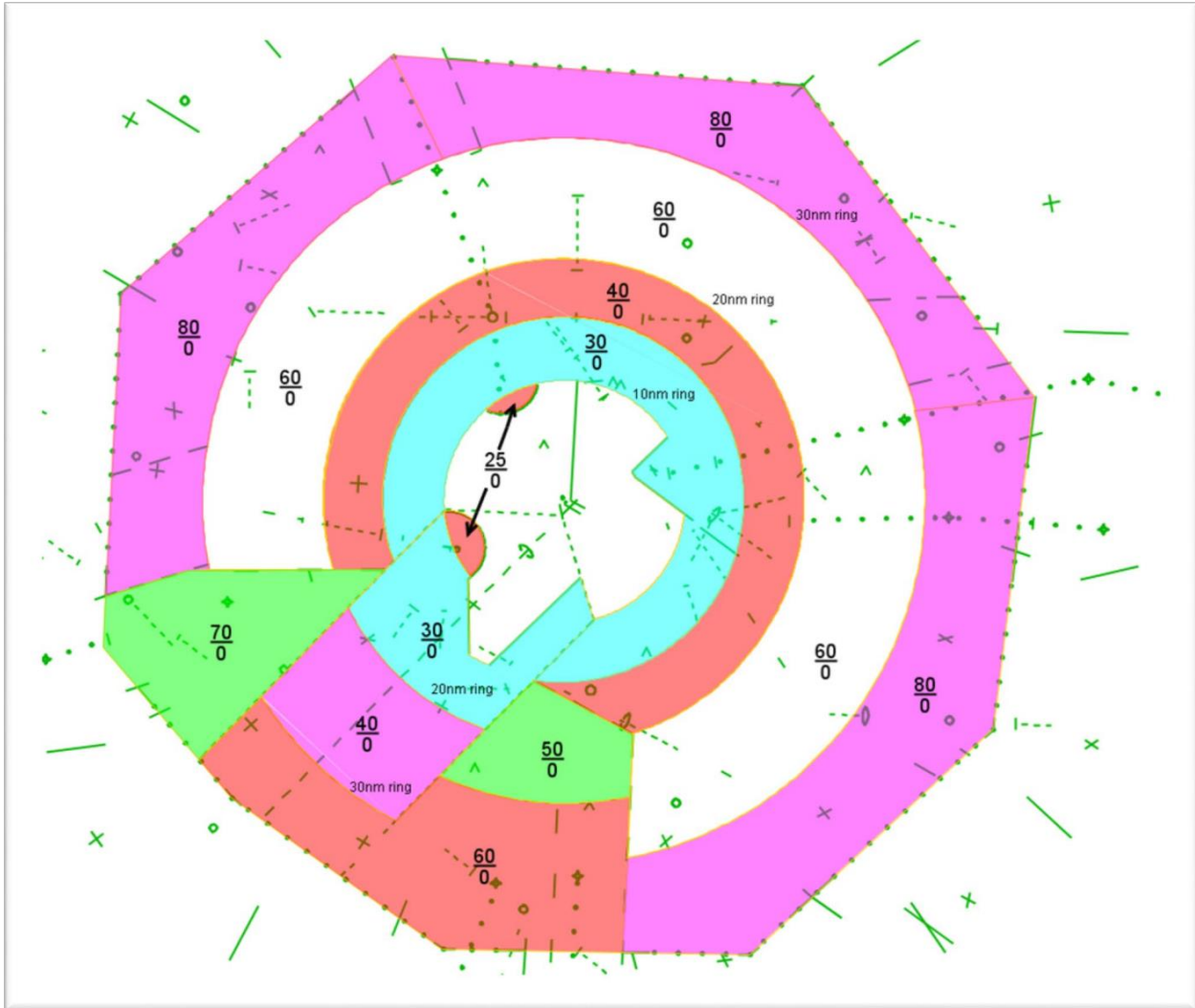
### RUNWAY 4 ACDA



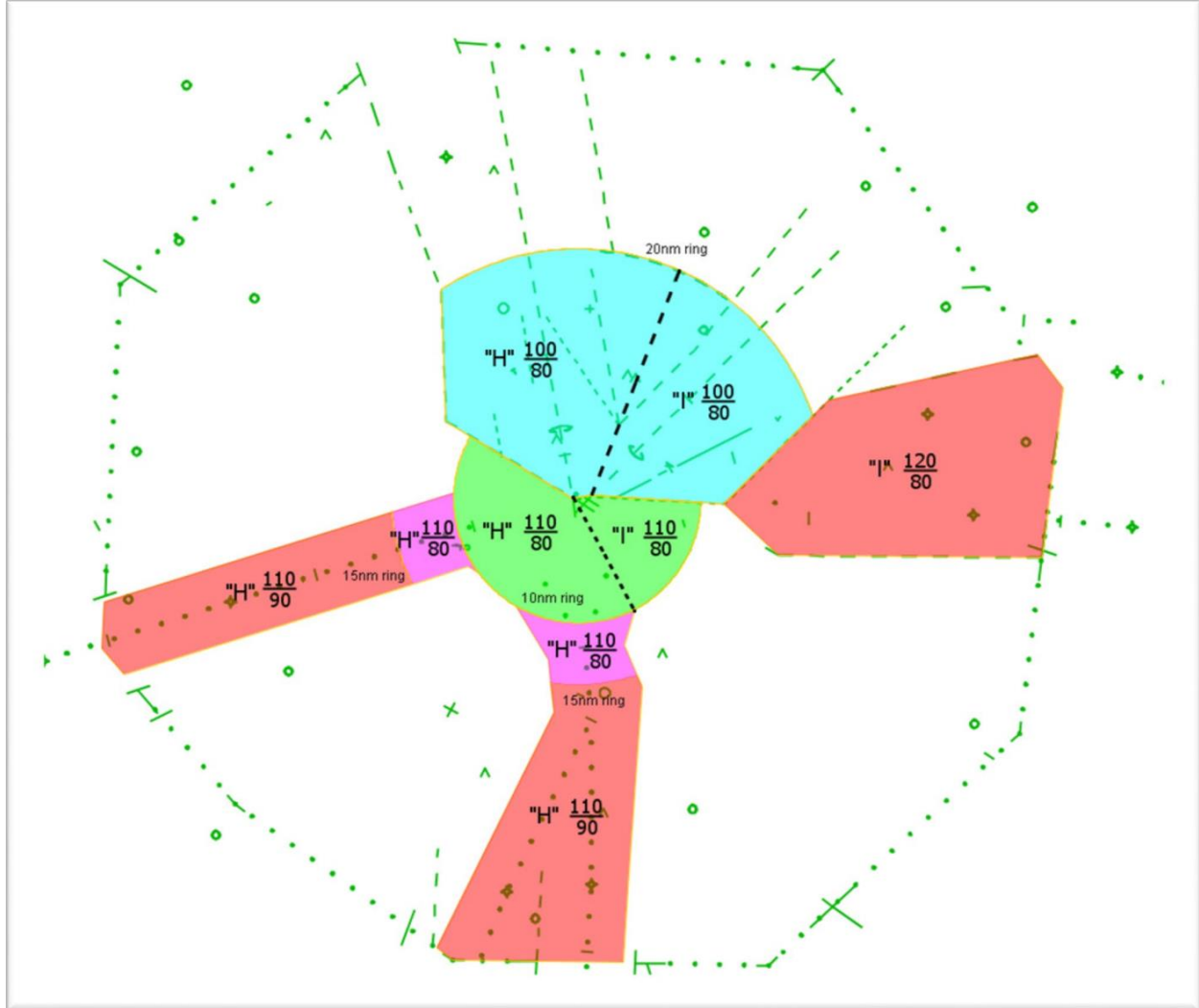
### LAND 4 – DEPART 4, 12, 30, or 35 DEPARTURE



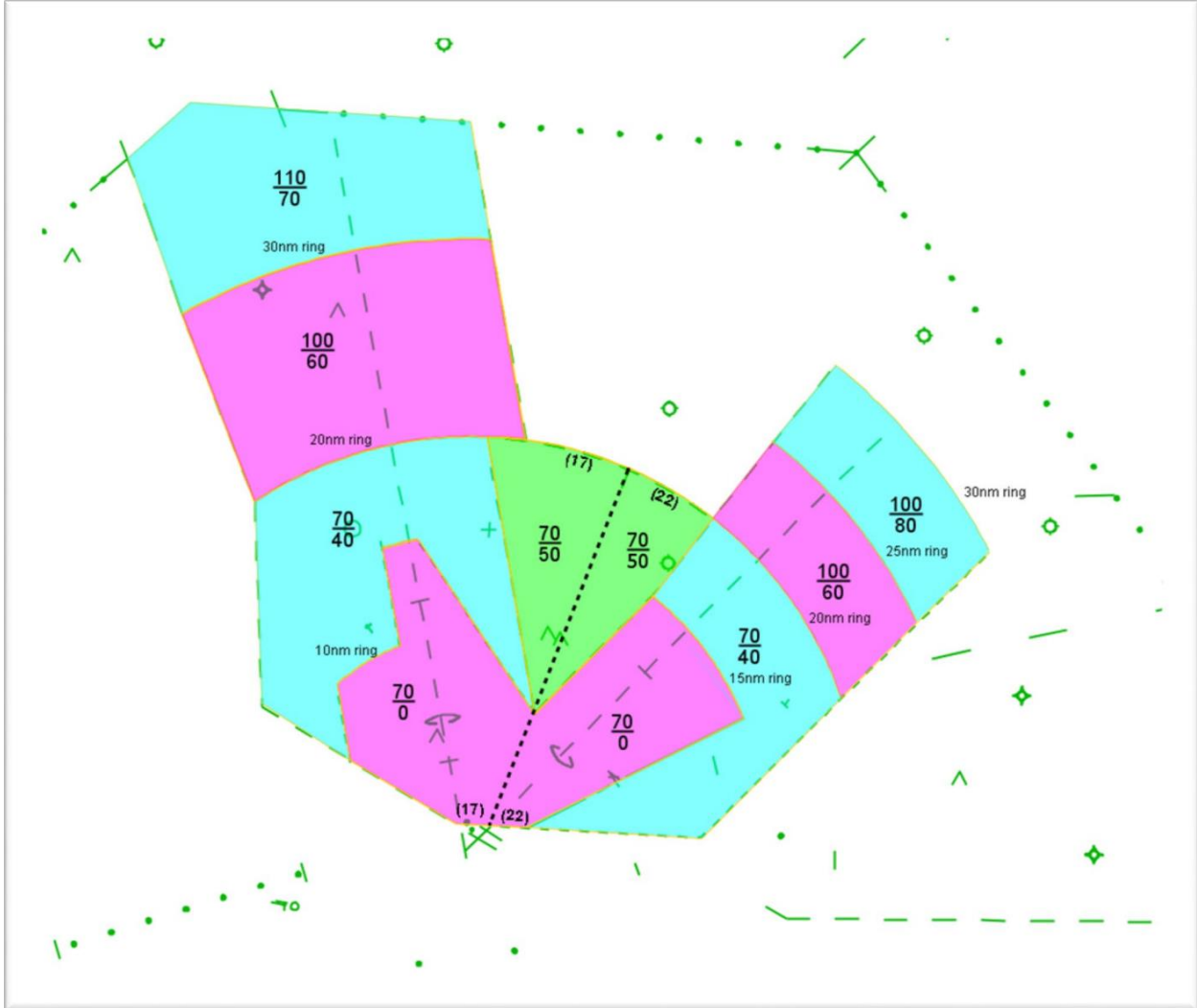
### LAND 4 – DEPART 4, 12, 30, or 35 SATELLITE



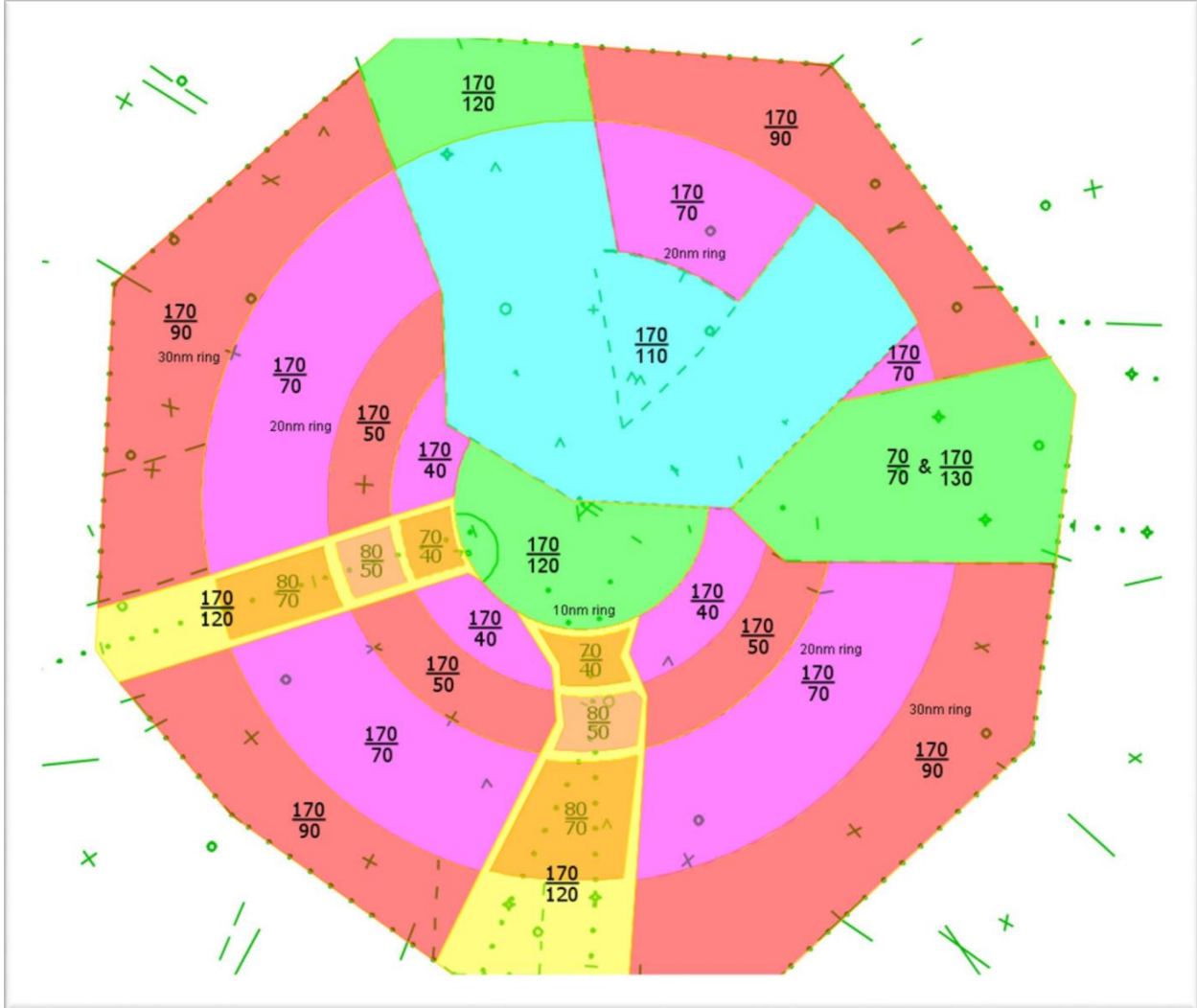
LAND 17 and 22  
DEPART 17, 22, 12L/R  
FEEDER



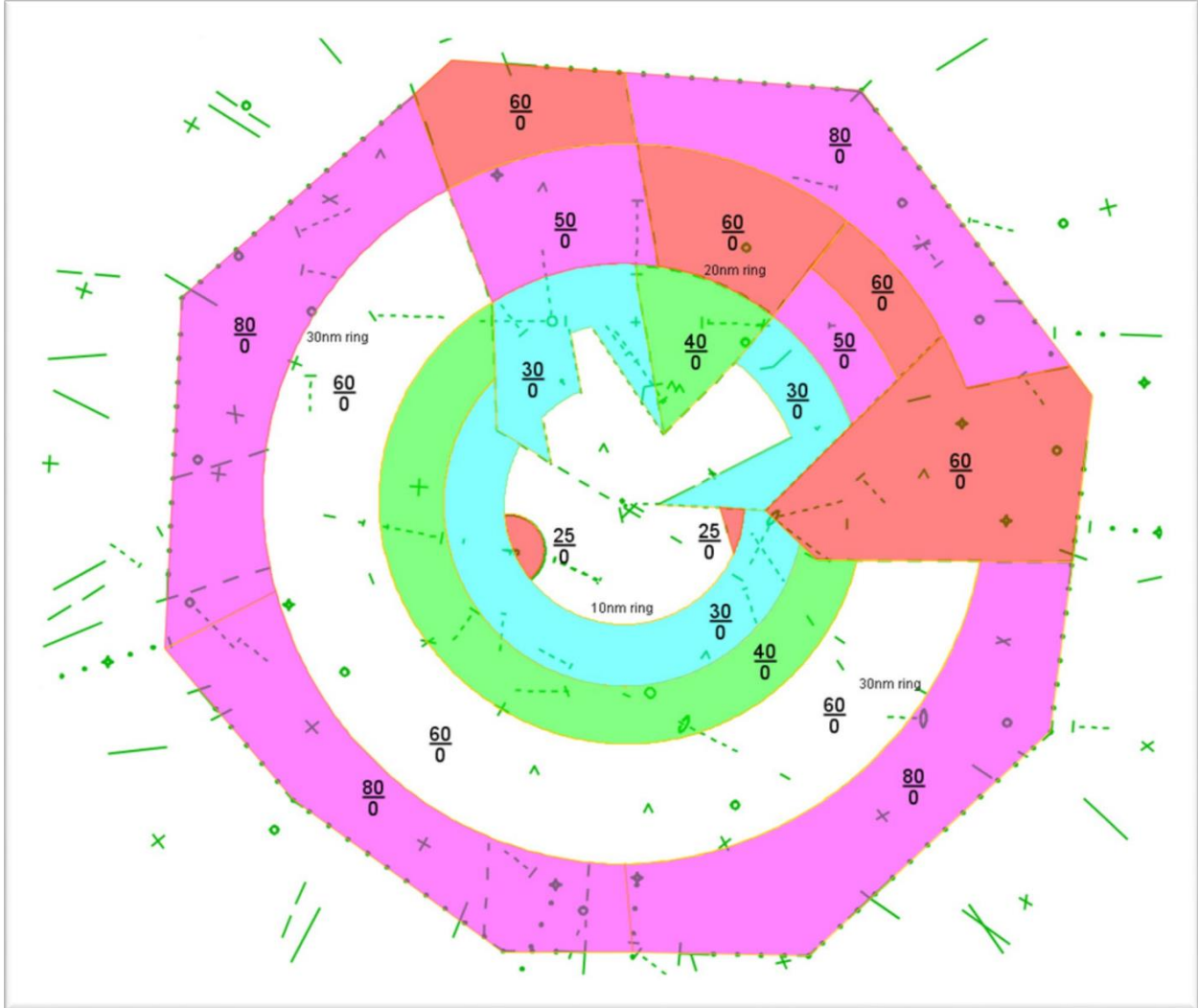
LAND 17 and 22  
DEPART 17, 22, 12L/R  
ACDA



LAND 17 and 22  
DEPART 17, 22, 12L/R  
DEPARTURE

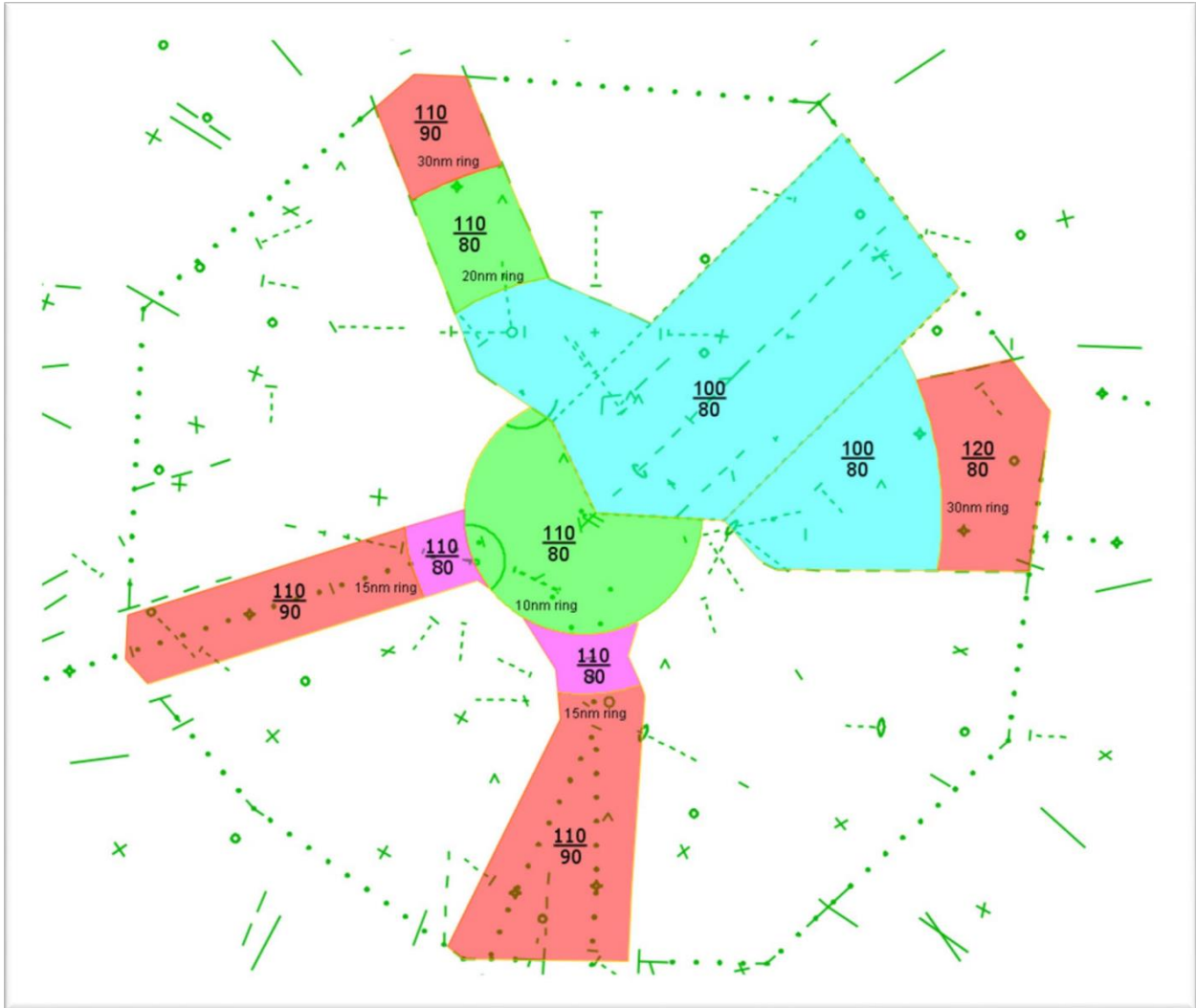


**LAND 17 and 22  
DEPART 17, 22, 12L/R  
SATELLITE**



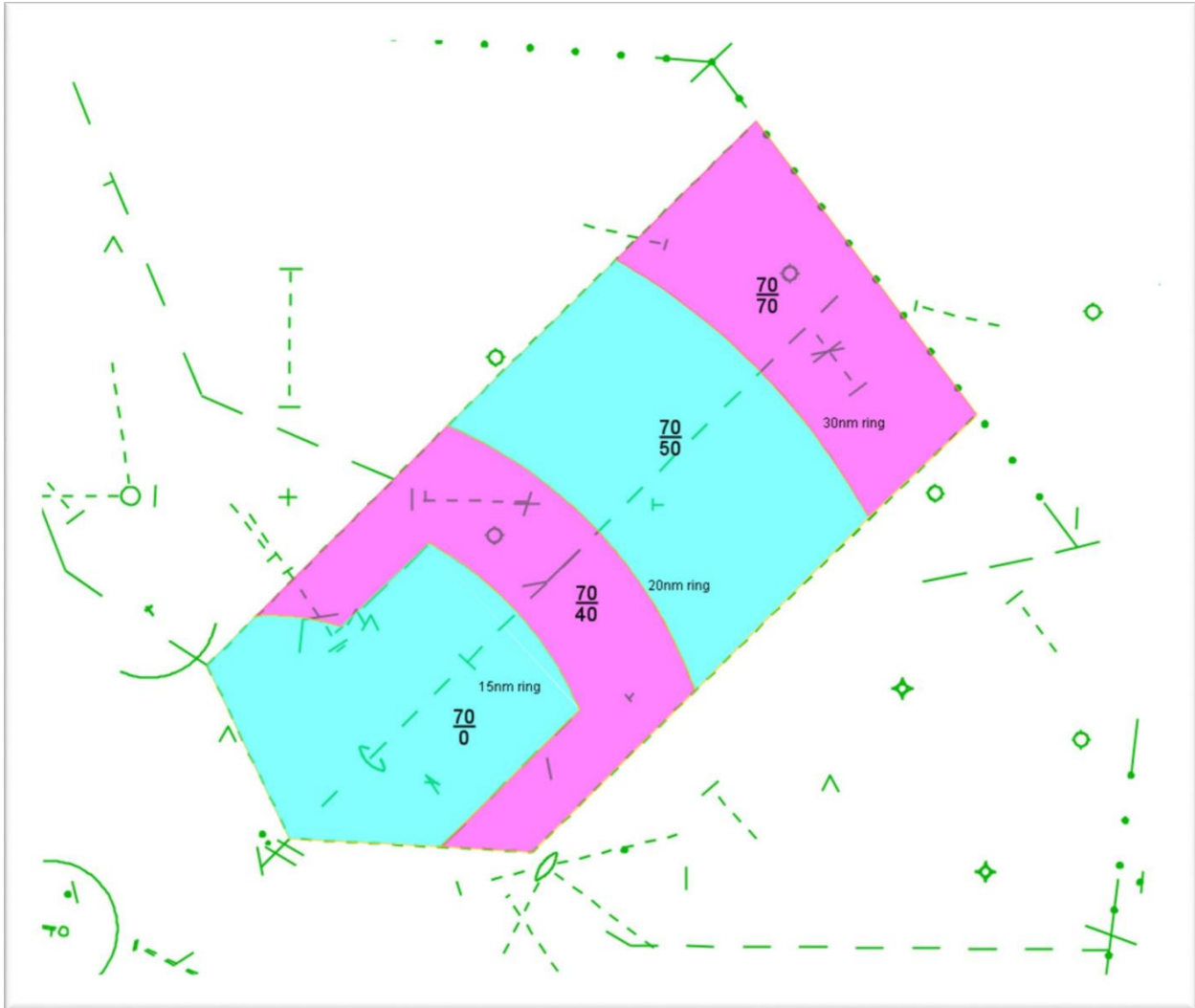


### RUNWAY 22 FEEDER

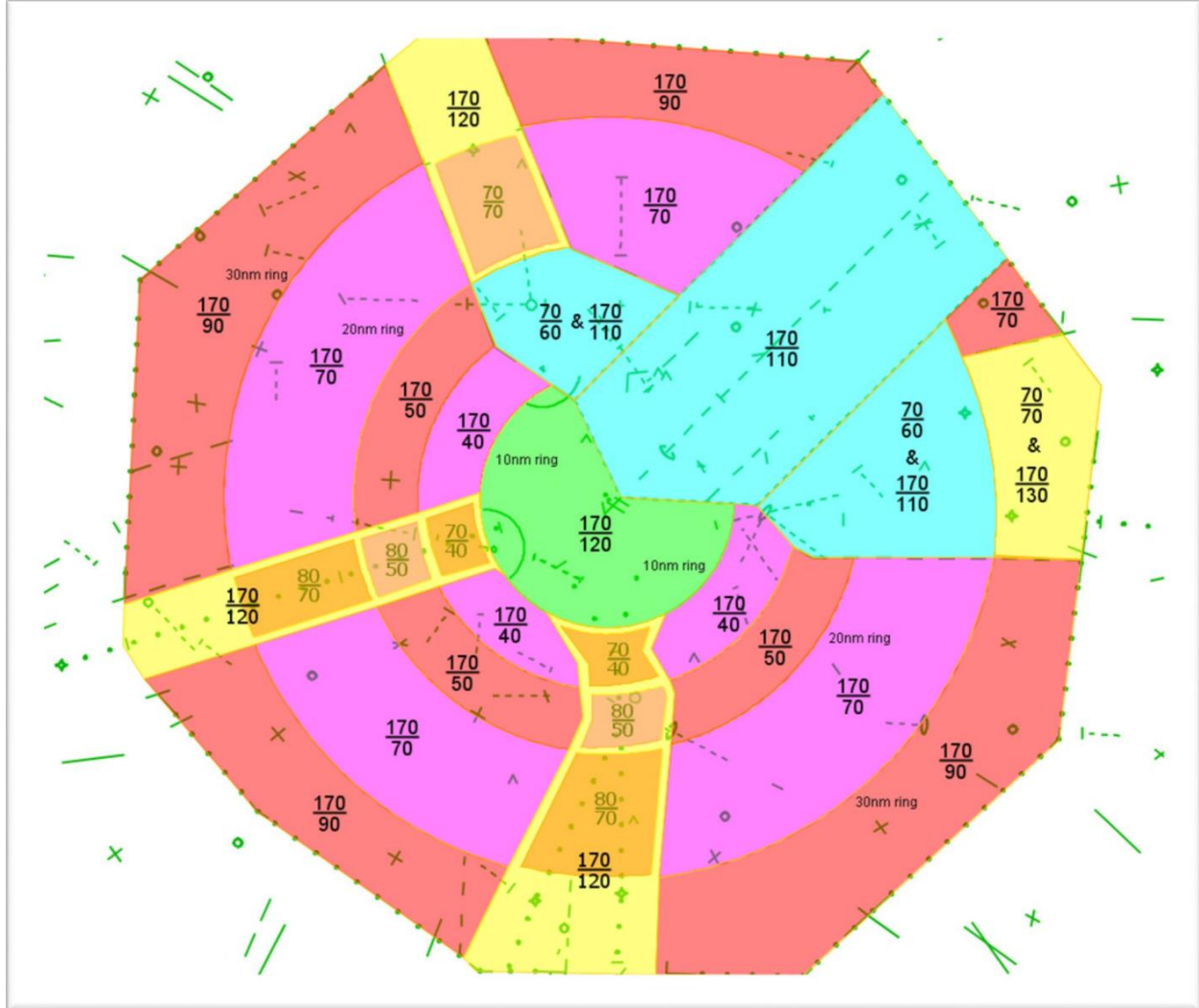




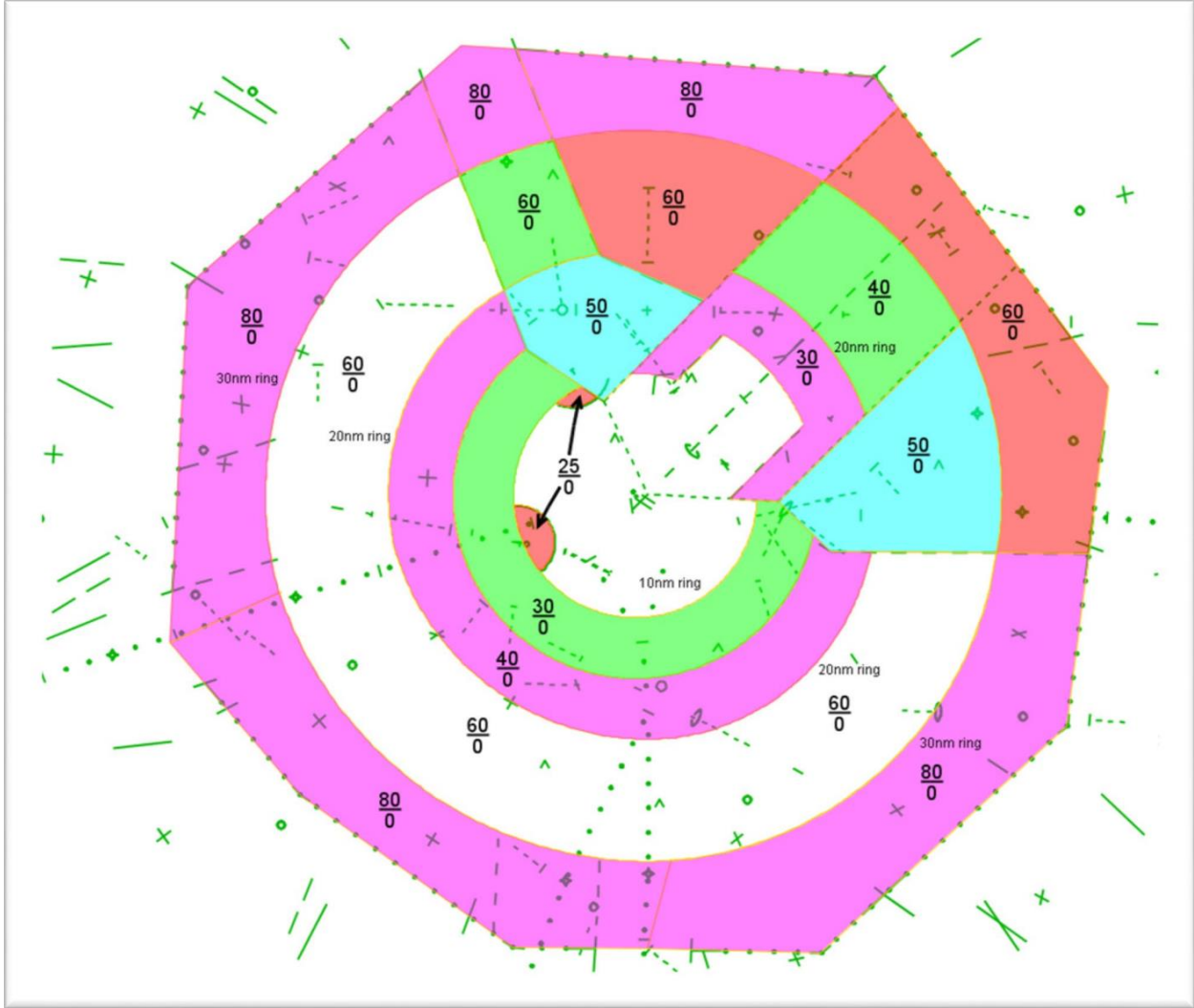
### RUNWAY 22 ACDA



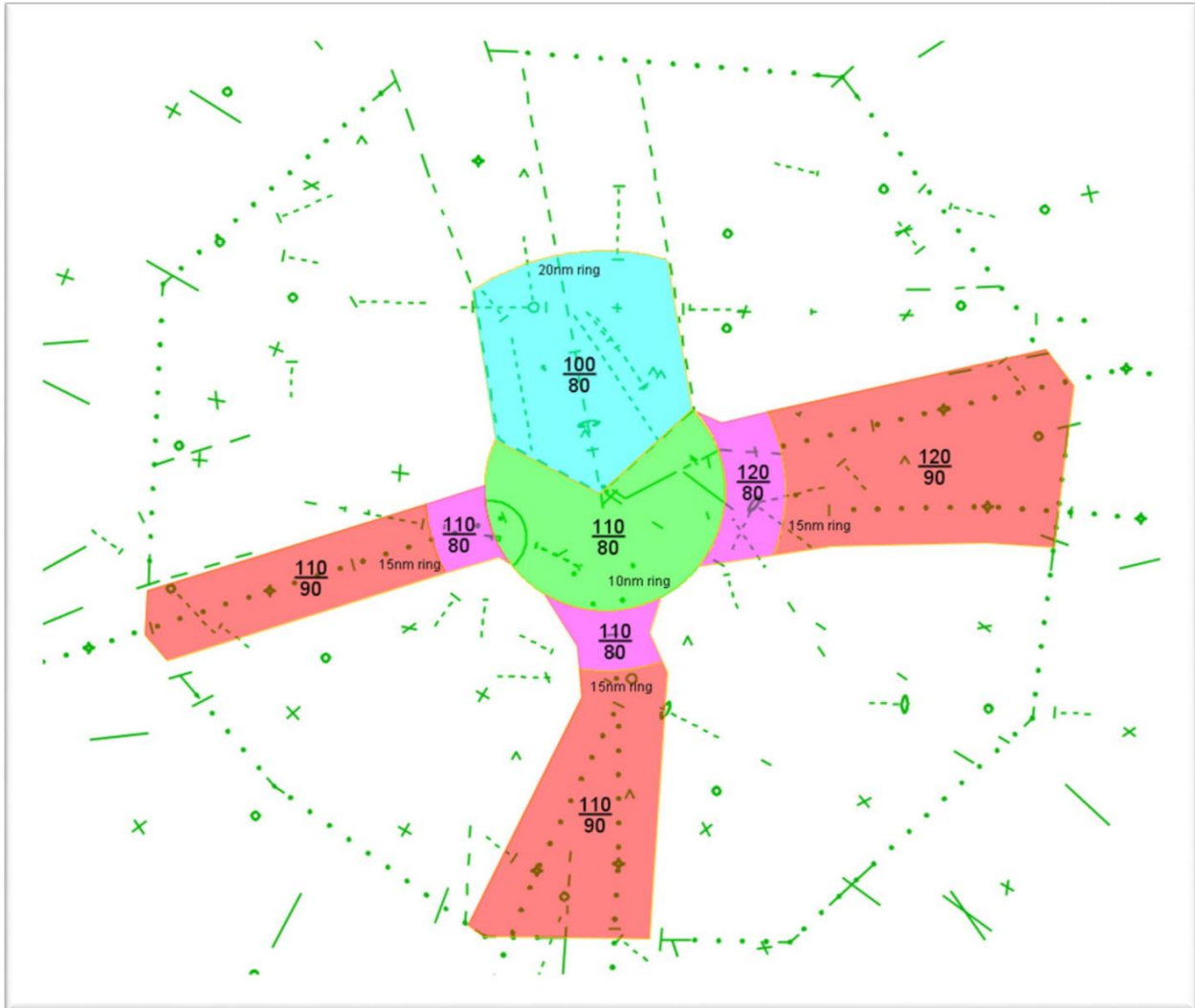
**LAND 22**  
**DEPART 22, 12, 17, or 30**  
**DEPARTURE**



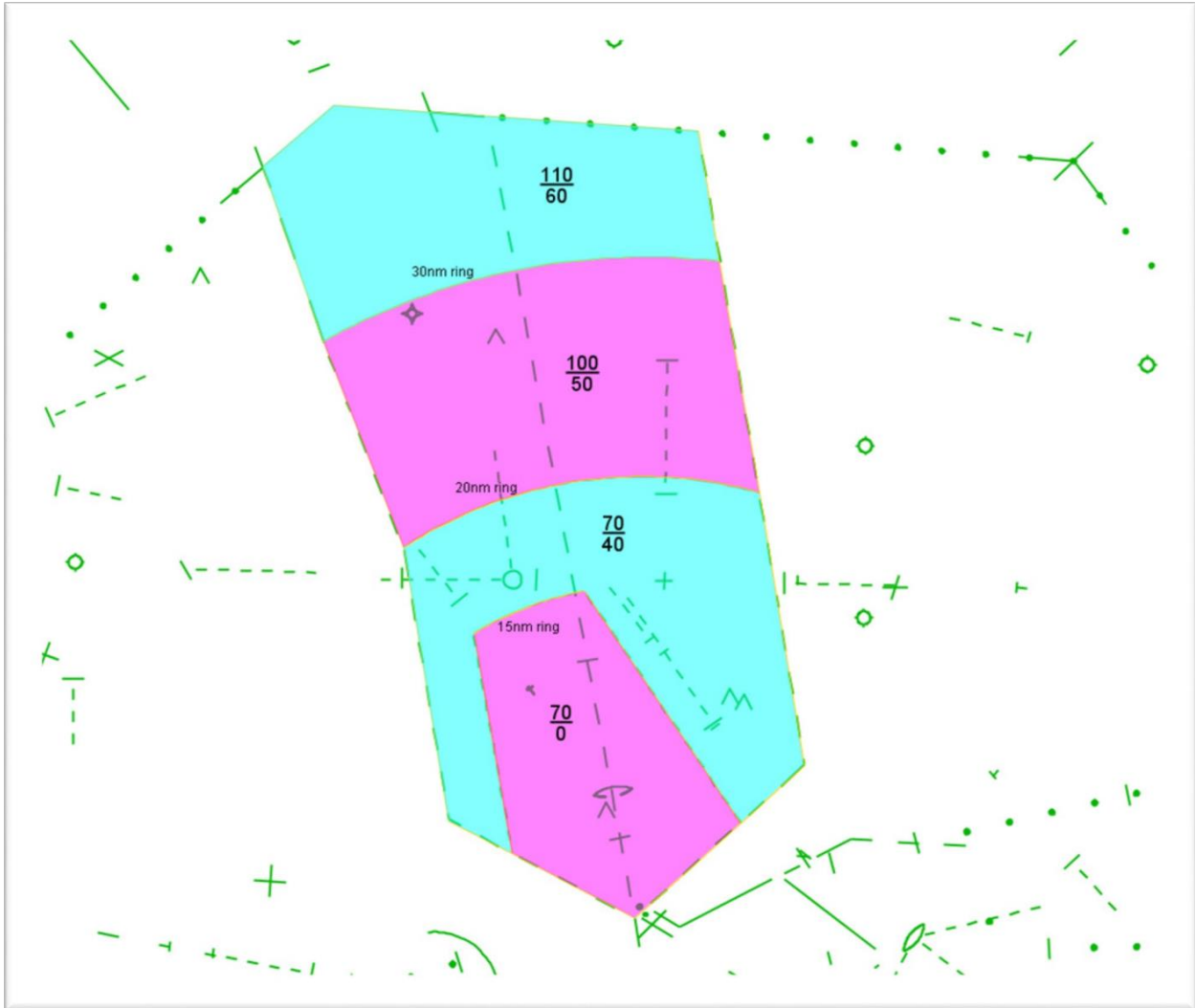
**LAND 22**  
**DEPART 22, 12, 17, or 30**  
**SATELLITE**



### LAND 17 – DEPART 12s, 22, or 17 FEEDER



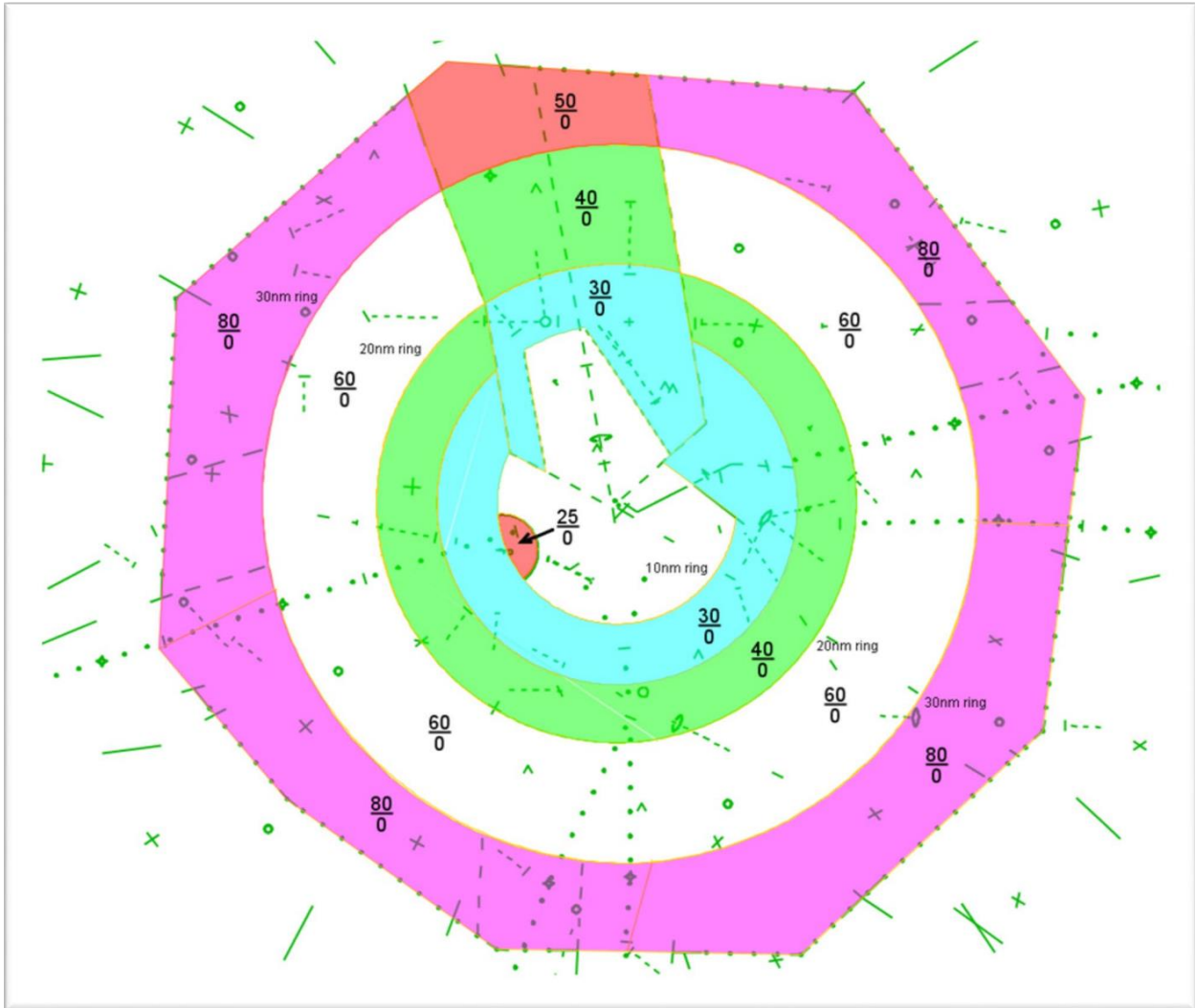
LAND 17 – DEPART 12s, 22, or 17  
ACDA





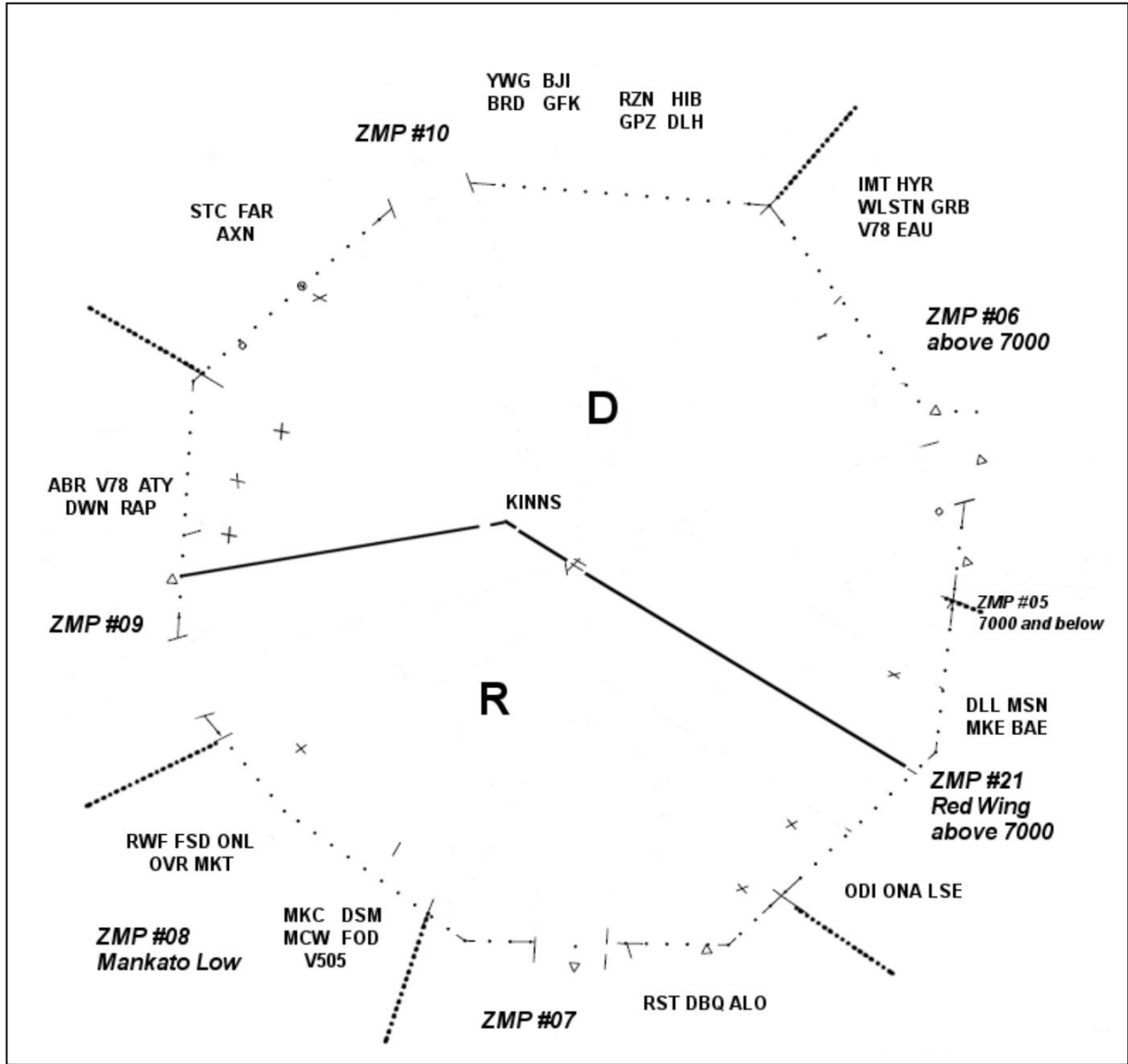


### LAND 17 – DEPART 12s, 22, or 17 SATELLITE



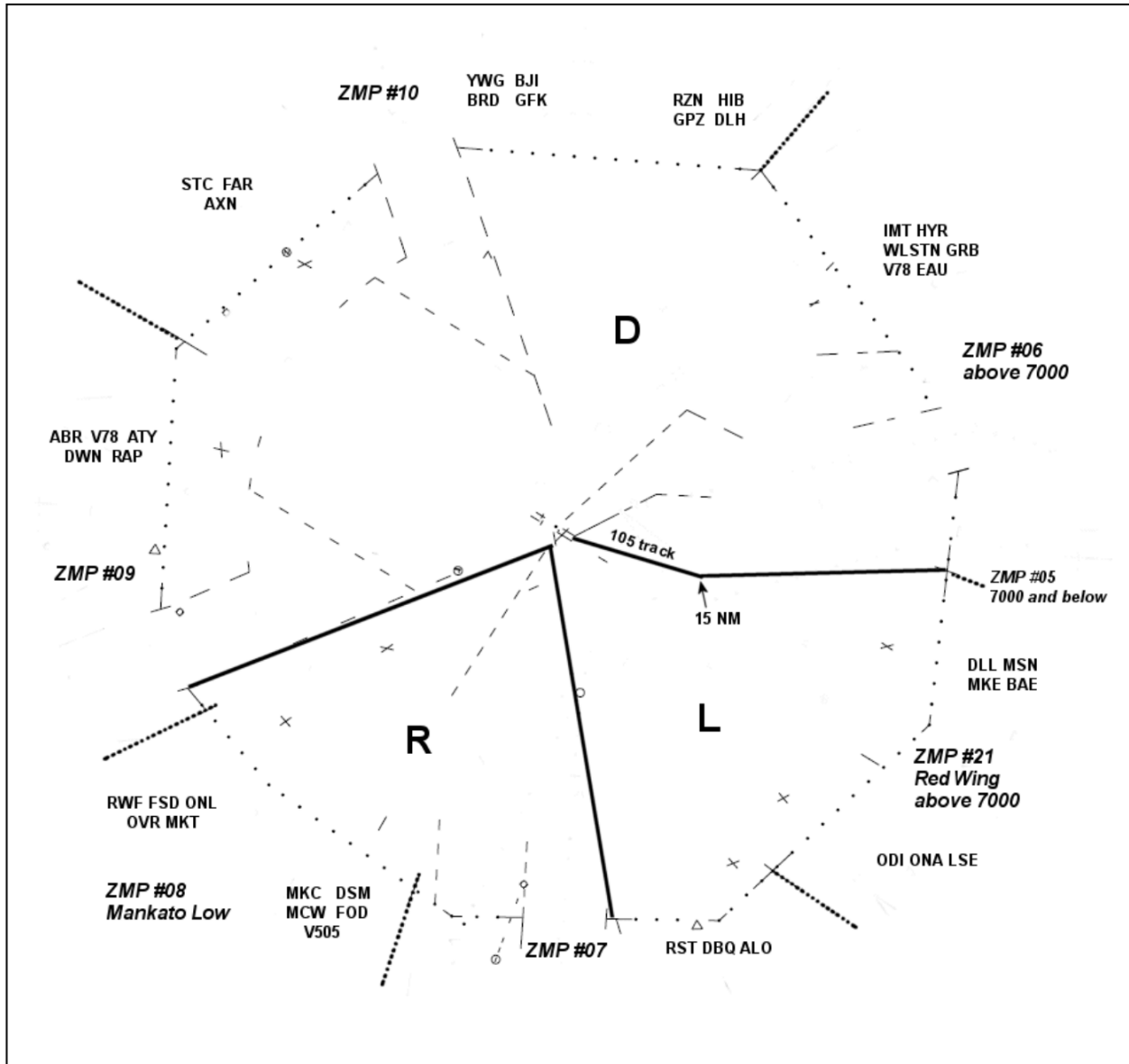
### Appendix B. Departure Configurations

Land and Depart 12s  
Land and Depart 30s  
Land 30s and 35 – Depart 30s  
Land 30s – Depart 30s and 17

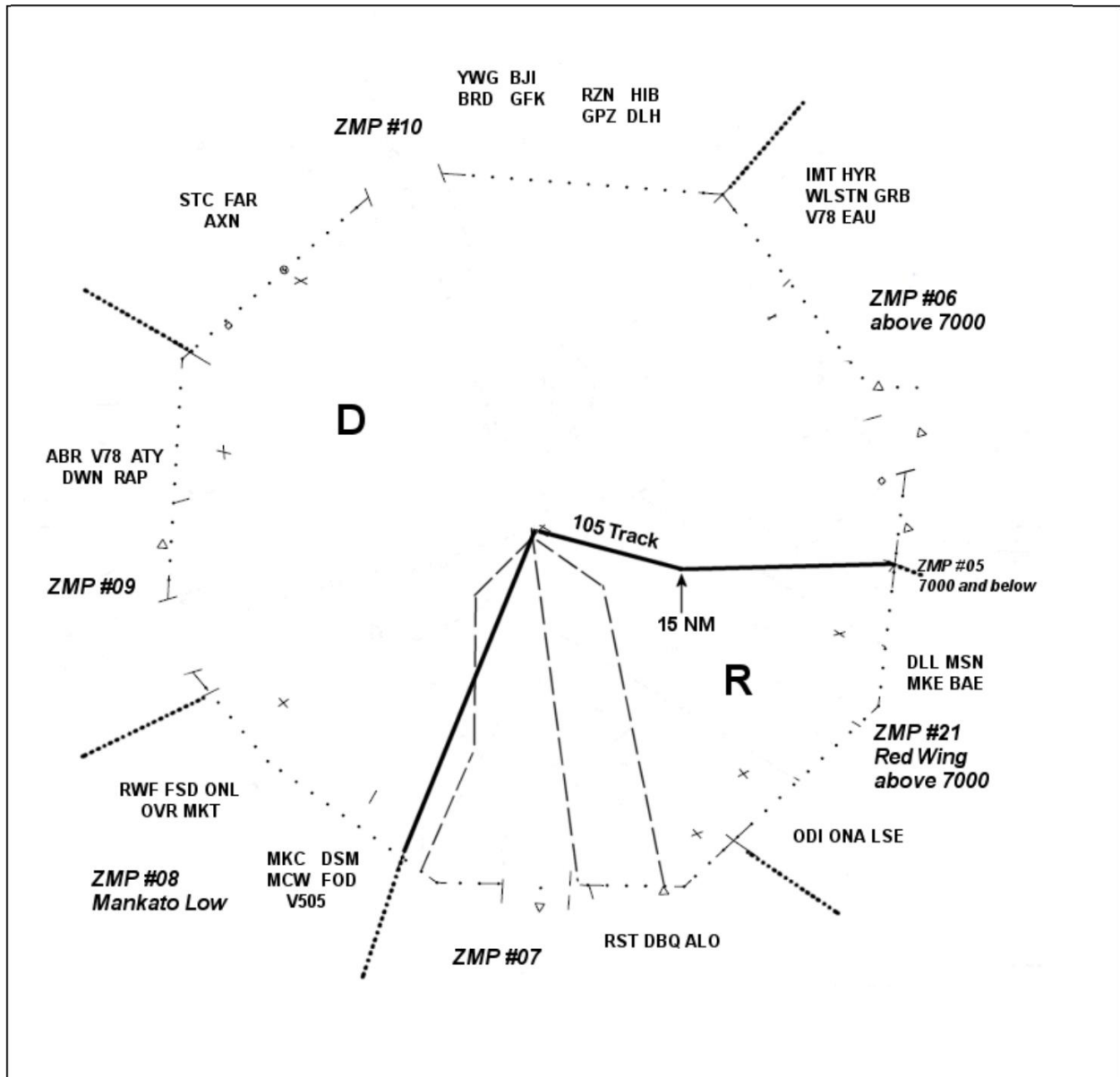




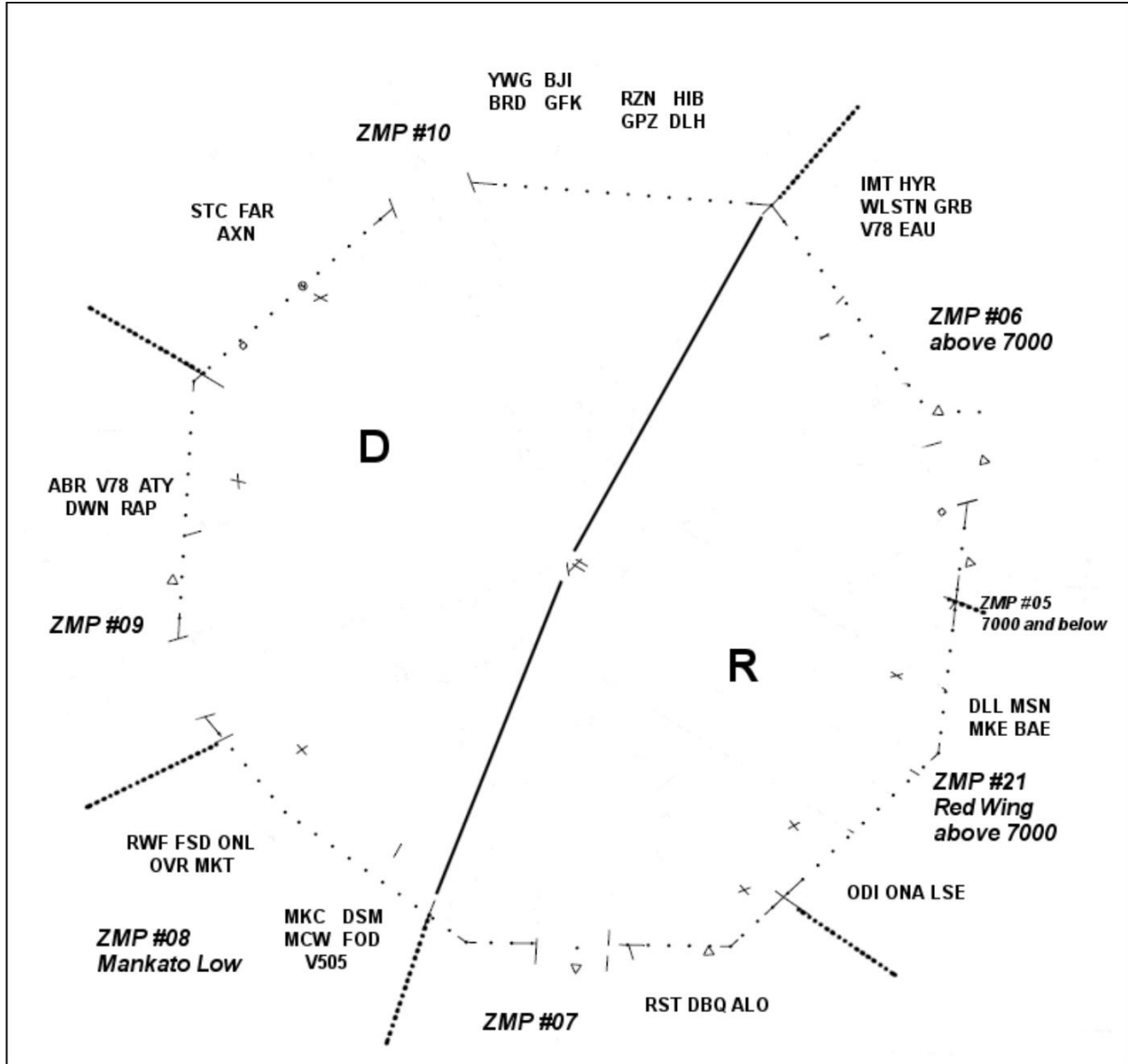
**Land 12s – Depart 12s and 17  
Three Departure Split**



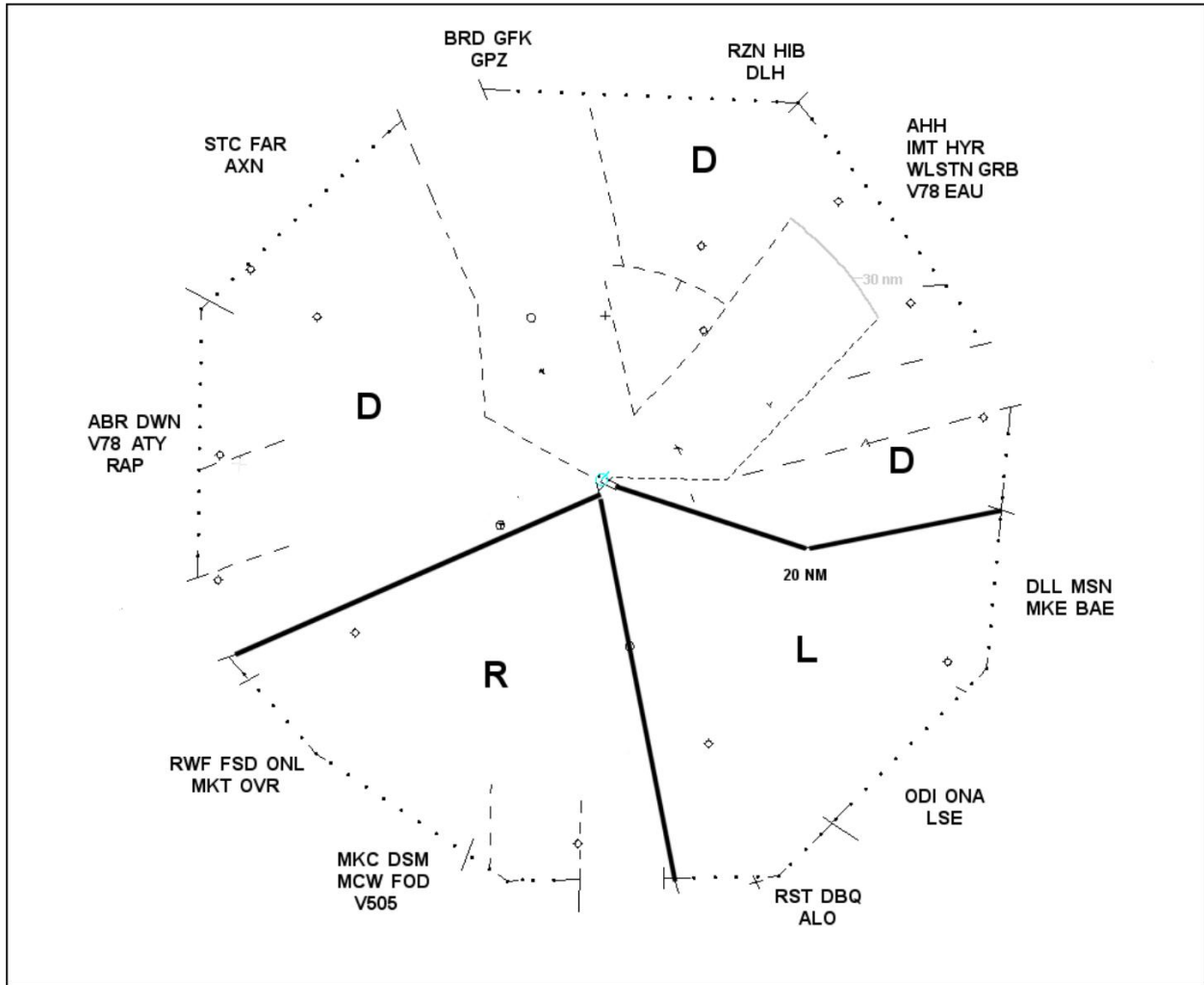
Land 35 – Depart 12  
(Configuration #3)



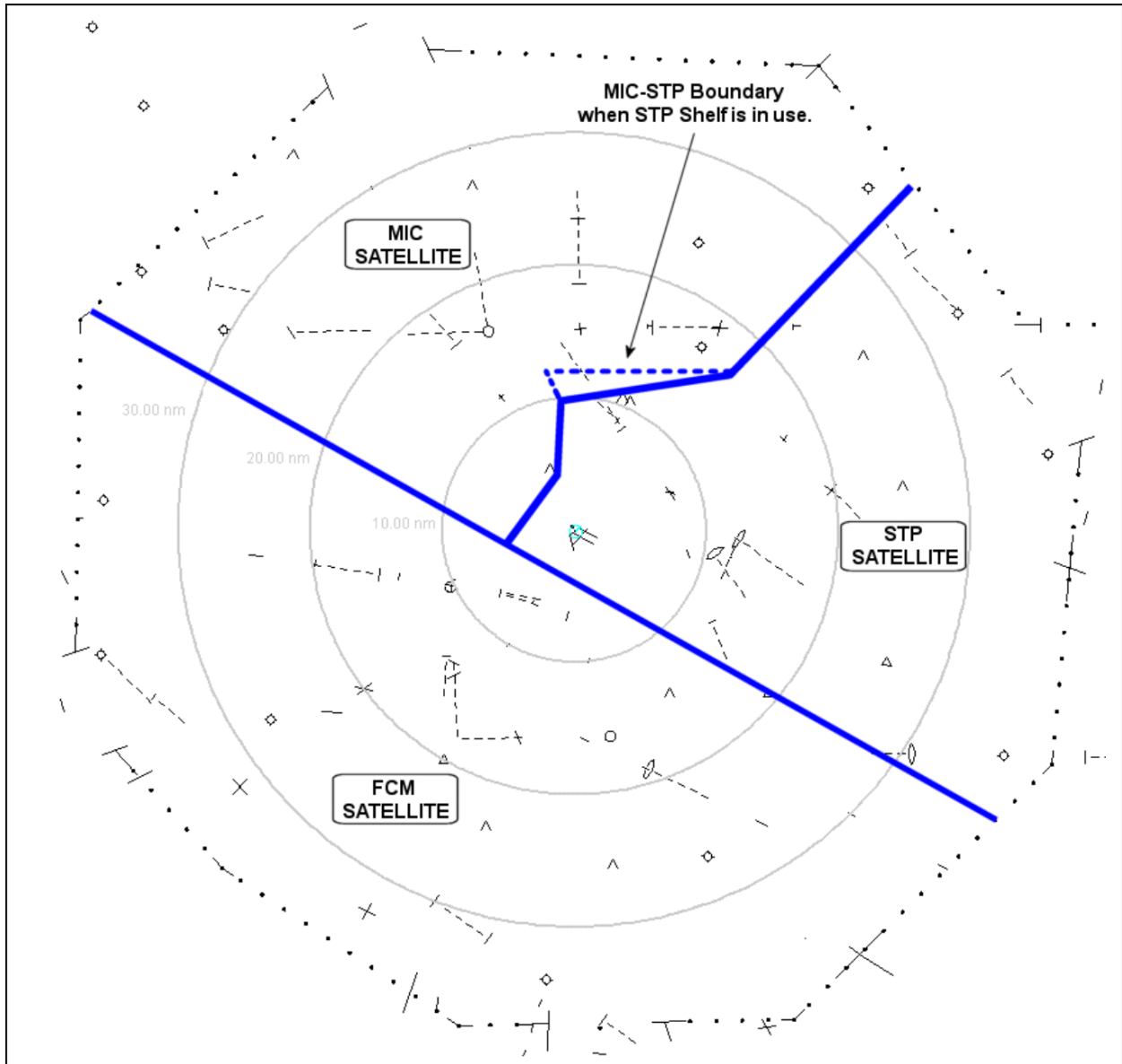
Land 35 – Depart 35, 30, 4  
Land 17 – Depart 17  
Land 22 – Depart Any  
Land 4 – Depart Any



**Land 17 and 22**  
**Depart 17, 22, 12L/R**

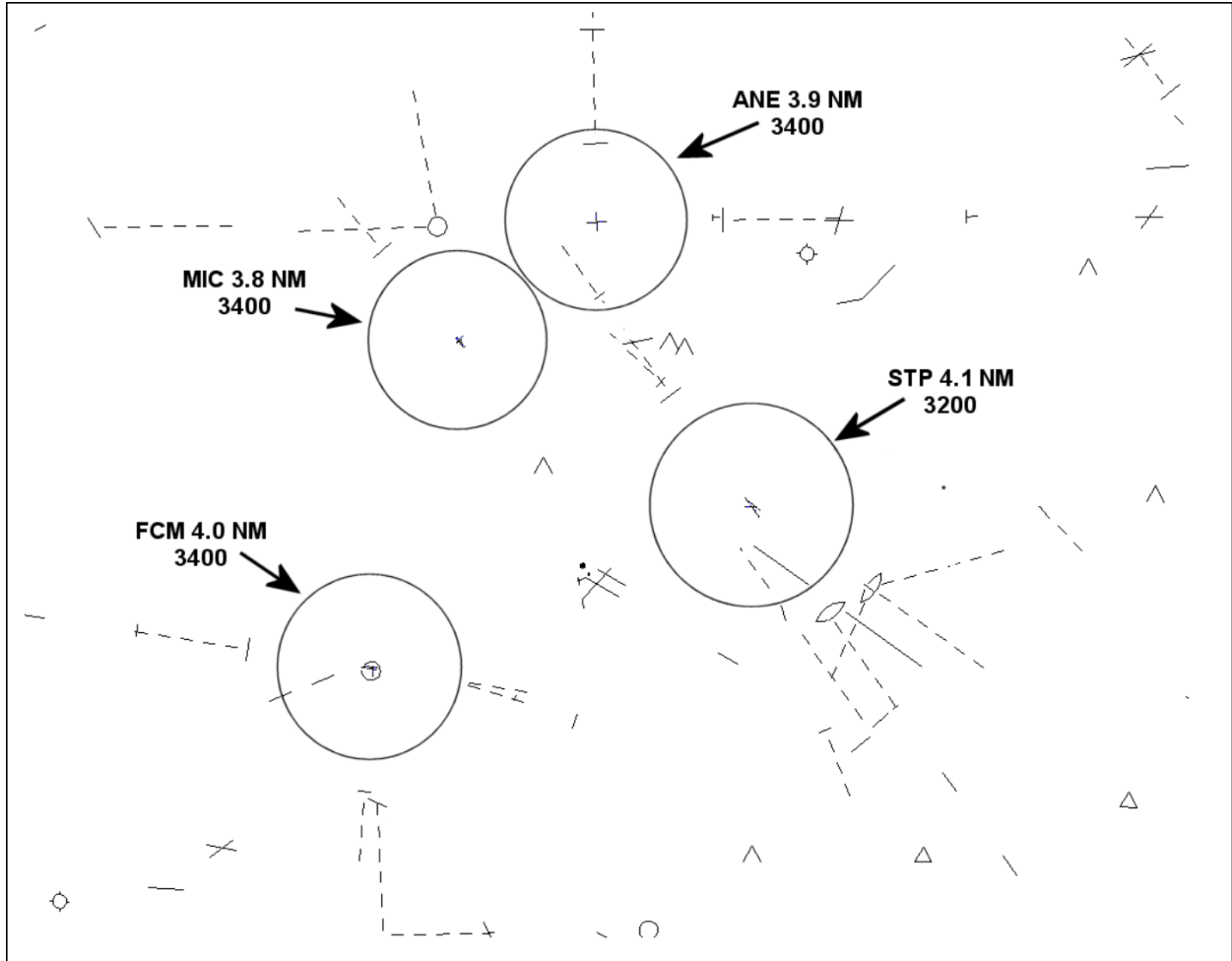


### Appendix C. Satellite Airspace Split



### Class D Airspace Dimensions

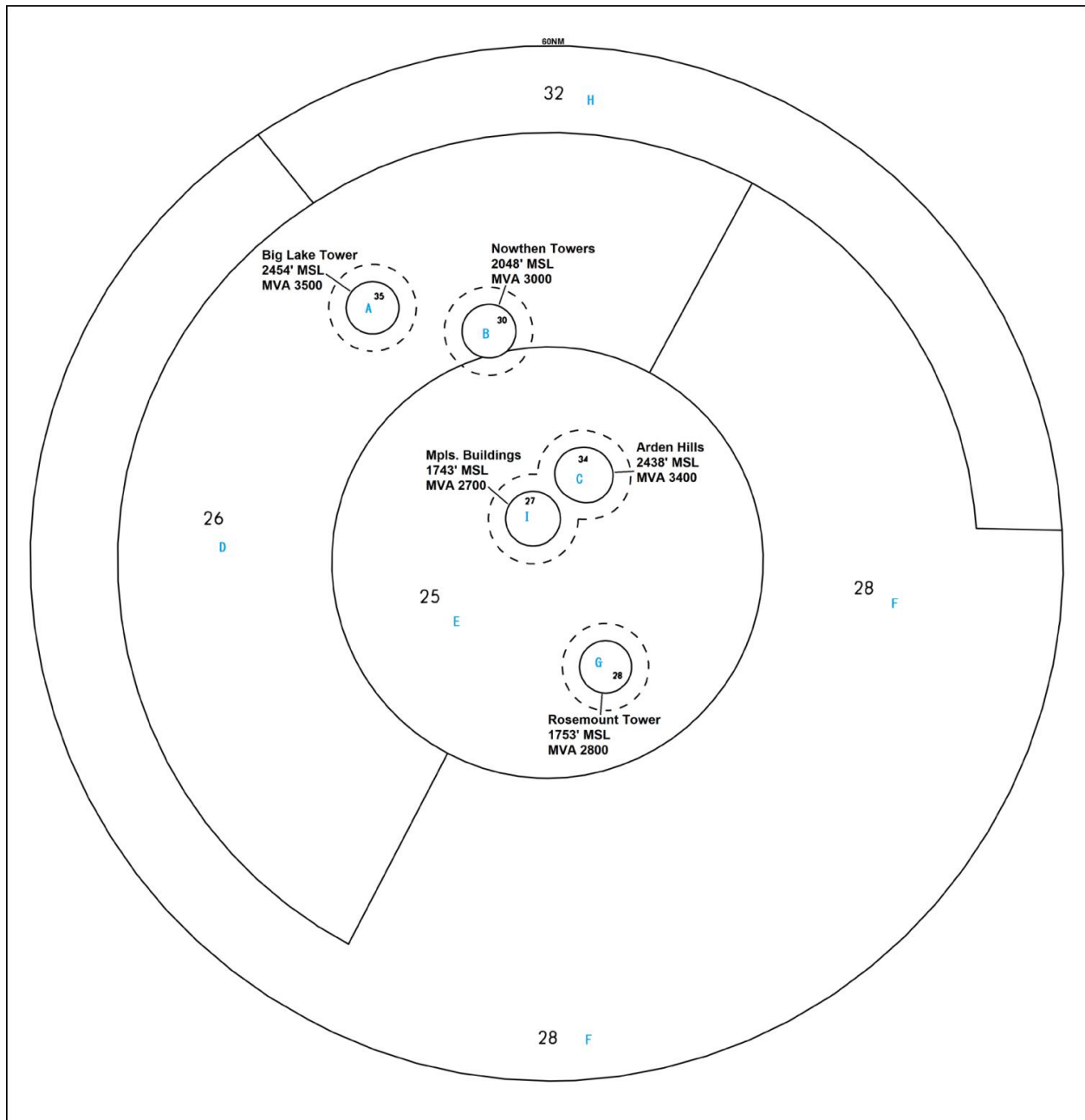
(Ceiling in Feet MSL)



### Appendix D. Position Relief Briefing Checklists

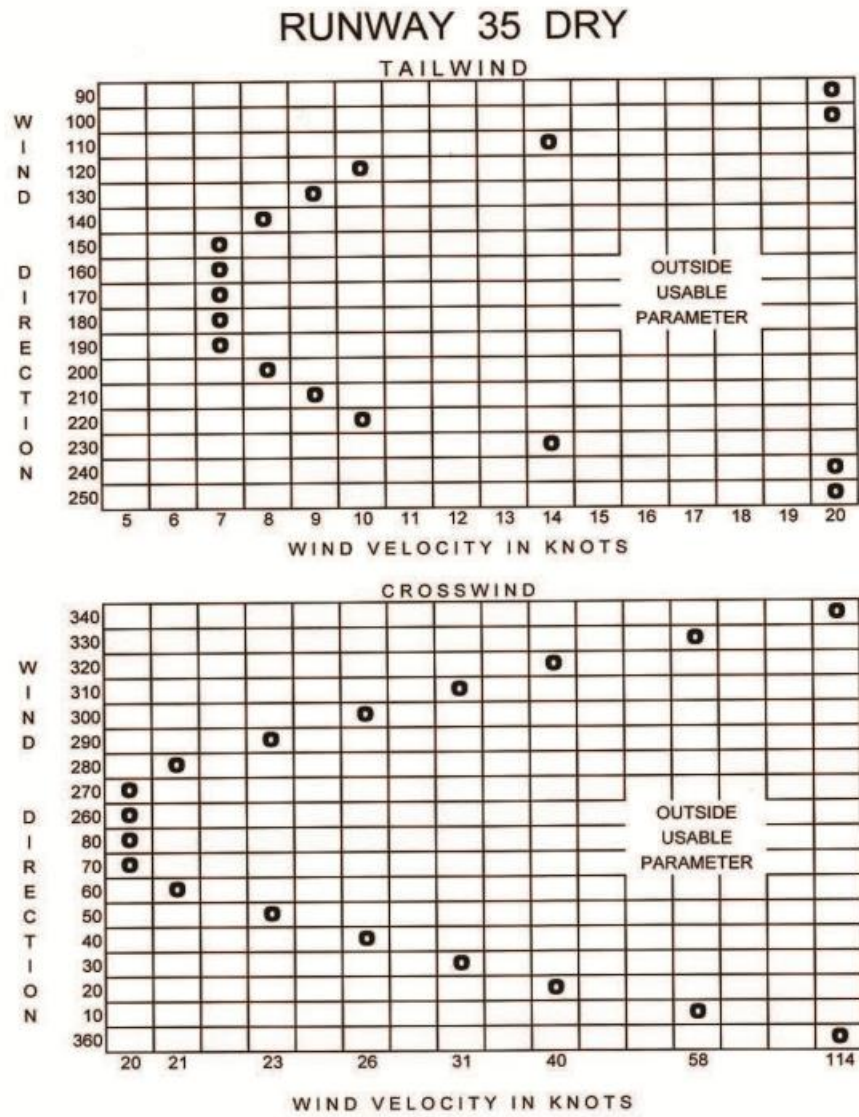
M98 CHECKLIST	RUNWAY CHANGE CHECKLIST
<p><b><u>SELF-BRIEF ITEMS (#1-8 via IDS)</u></b></p> <ol style="list-style-type: none"> <li>1. TRACON SIAs</li> <li>2. PIREPs</li> <li>3. Urgent PIREPs</li> <li>4. NOTAMs</li> <li>5. Forecast</li> <li>6. SIGMETs</li> <li>7. Special Ops</li> <li>8. Tower SIA</li> </ol> <p><b><u>VERBAL BRIEFING</u></b></p> <ol style="list-style-type: none"> <li>1. Pertinent items not in IDS</li> <li>2. Position/Airspace configuration</li> <li>3. Coordination agreements</li> <li>4. Traffic</li> <li>5. Special activity aircraft</li> <li>6. Point-outs</li> <li>7. Remaining traffic</li> </ol>	<ol style="list-style-type: none"> <li>1. As instructed by the TRACON CIC, coordinate with Tower and all TRACON positions the last arrival and departure on the current runway and the first arrival on new runway. Coordinate with Departure and Satellite positions to establish resolution of conflicting traffic situations in new ACDA airspace during transition.</li> <li>2. Advise Arrival Controllers when the new ACDA is available.</li> <li>3. Coordinate with Tower and all TRACON positions to begin departing on new runway.</li> <li>4. When changing from a parallel runway configuration to a parallel and 17/35 runway configuration, coordinate with Departure and Satellite positions to obtain/release airspace.</li> <li>5. When changing to 30/17, remind Feeder and Arrival, if staffed, of 8,000 ft. airspace base.</li> </ol>

### Appendix E. MVA Chart and Obstruction Data



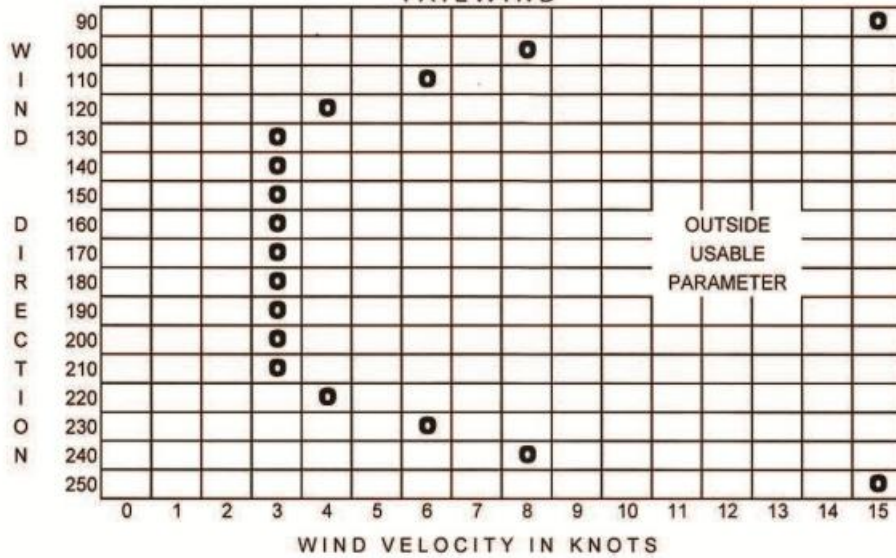


### Appendix F. Runway Use Wind Charts

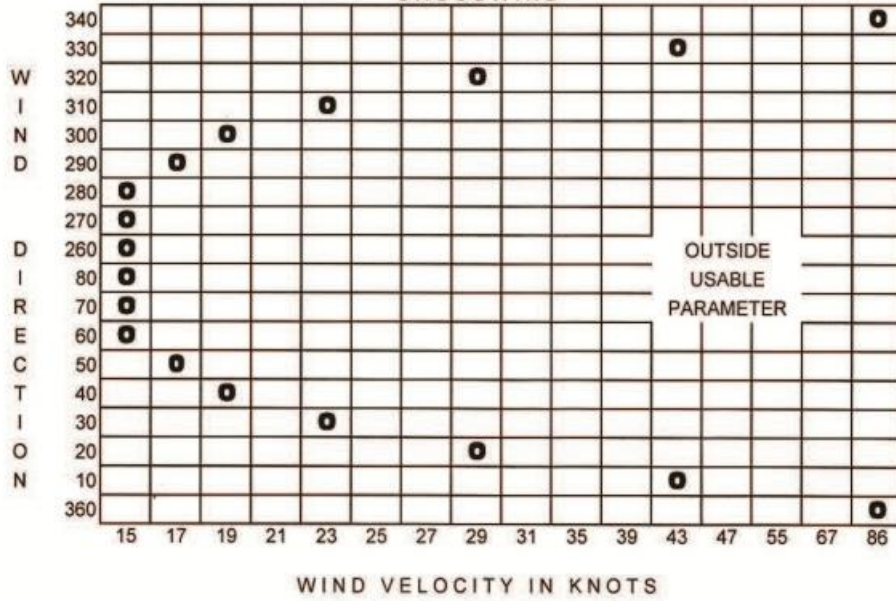


# RUNWAY 35 WET

## TAILWIND

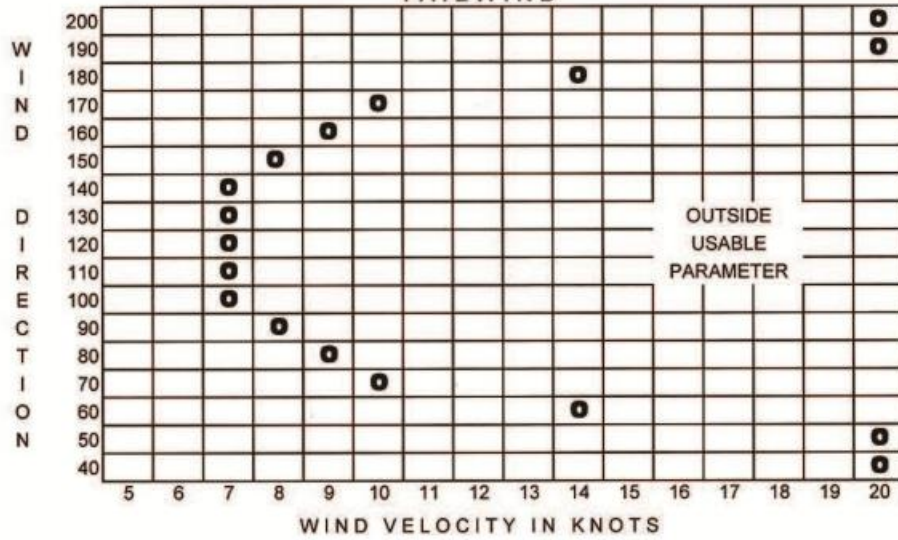


## CROSSWIND

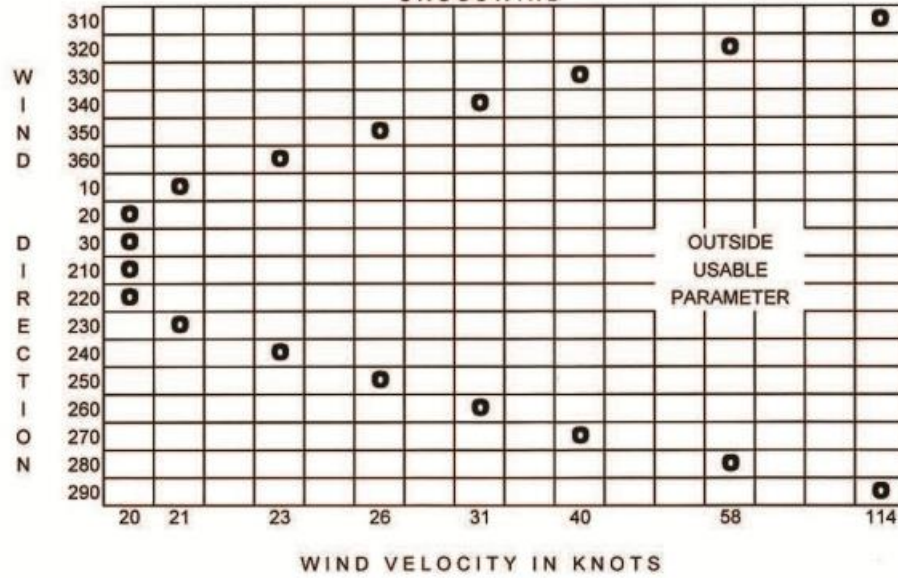


# RUNWAY 30 DRY

## TAILWIND



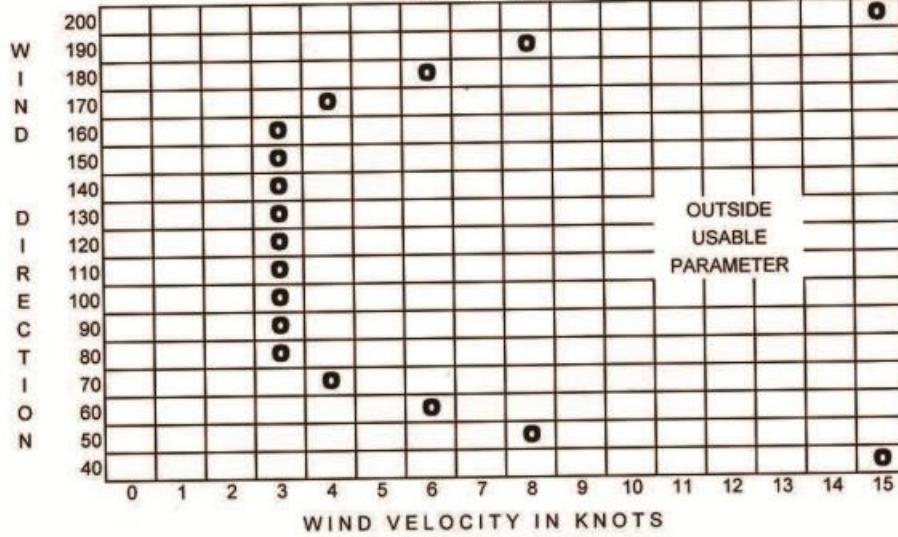
## CROSSWIND



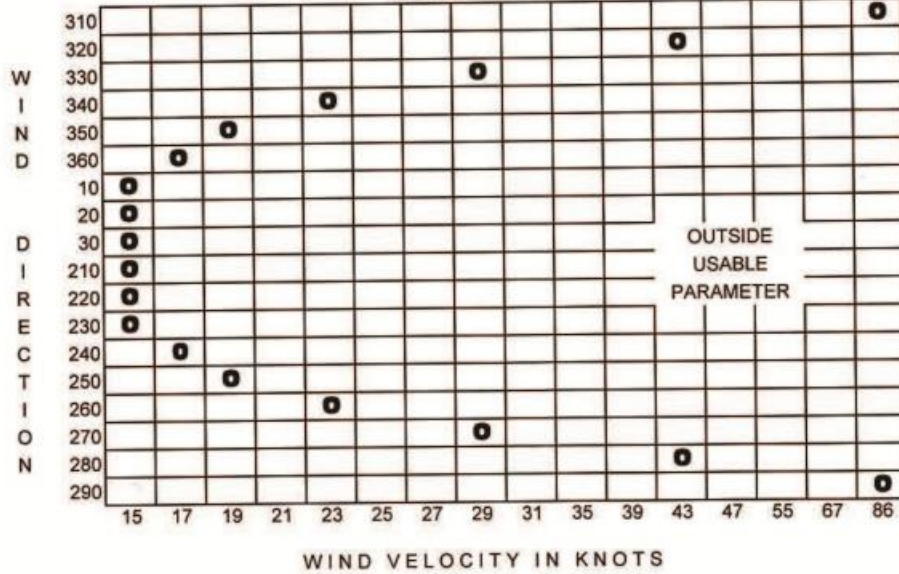


# RUNWAY 30 WET

## TAILWIND

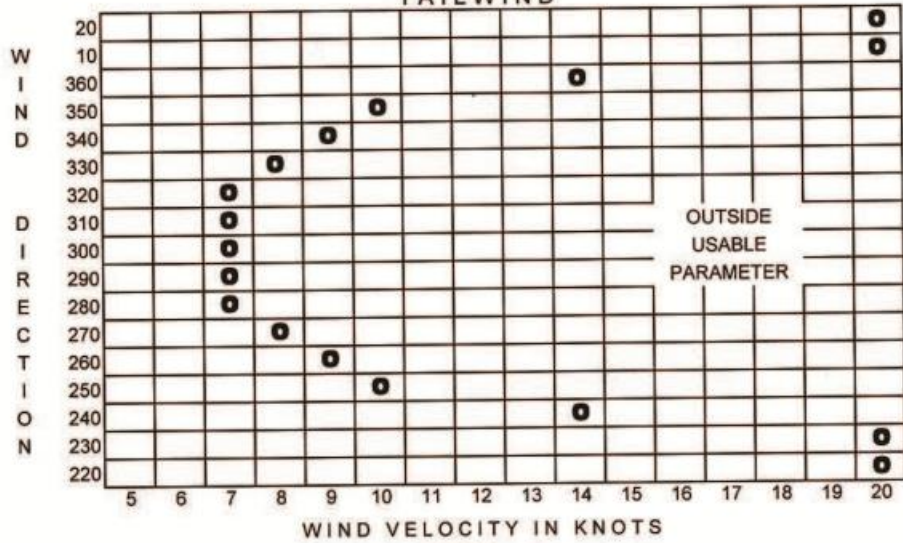


## CROSSWIND

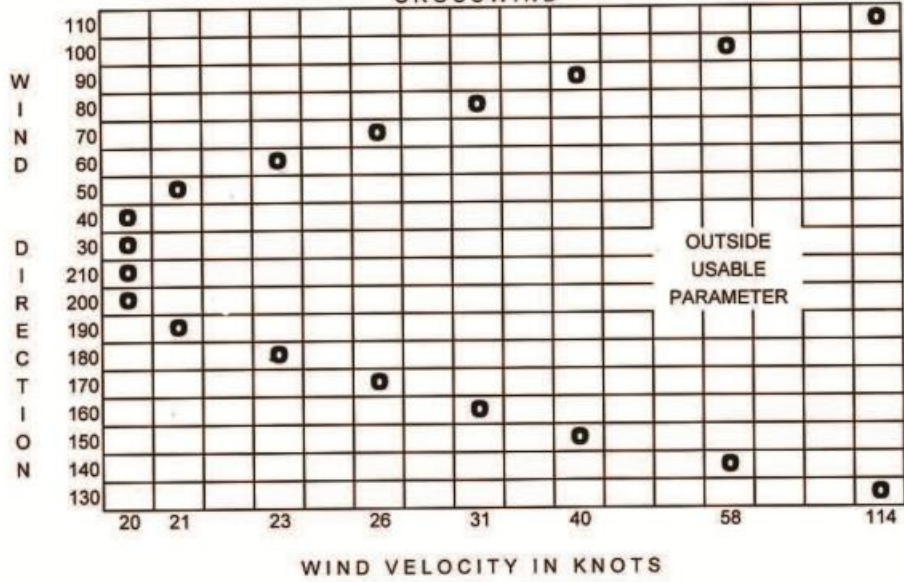


# RUNWAY 12 DRY

## TAILWIND

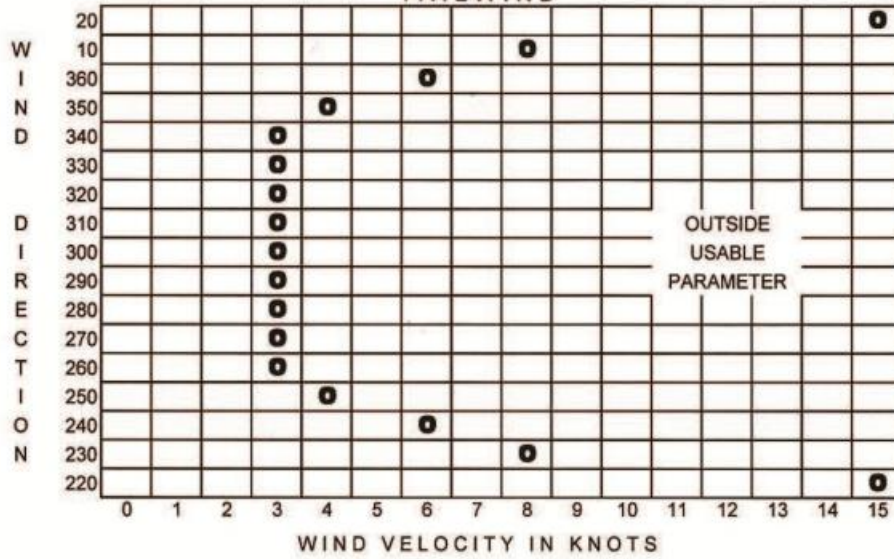


## CROSSWIND

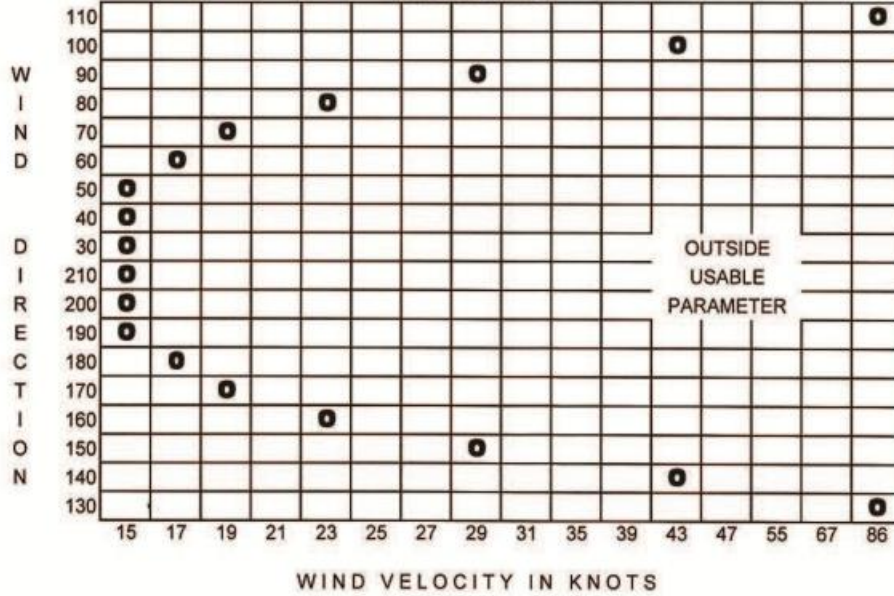


# RUNWAY 12 WET

## TAILWIND



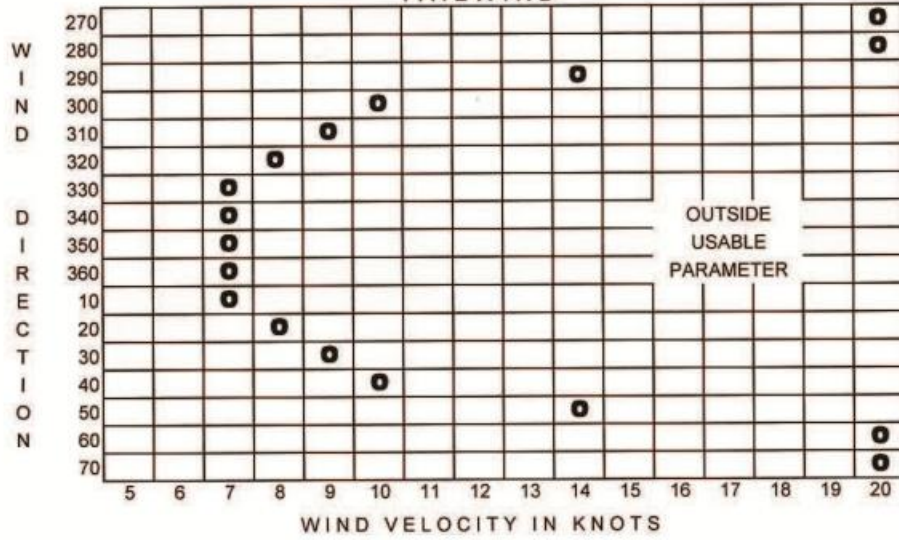
## CROSSWIND



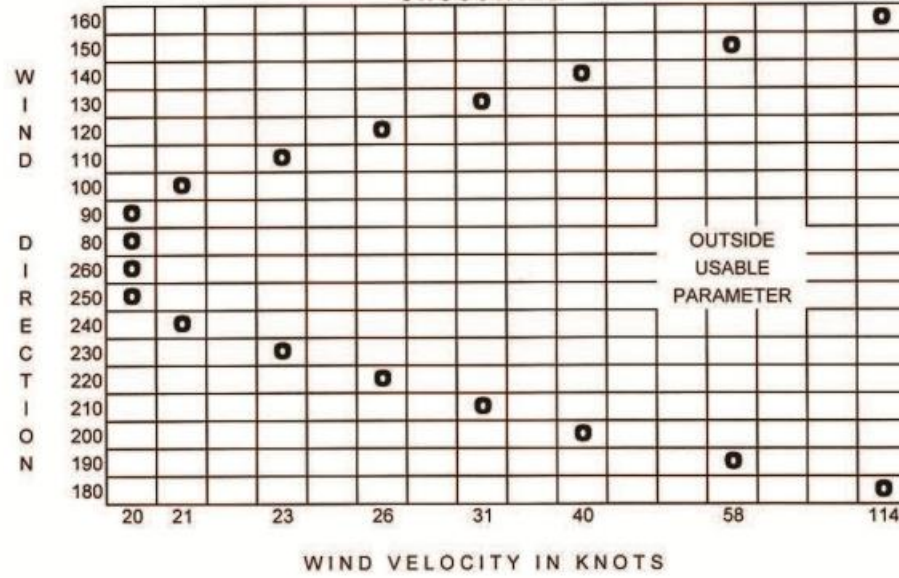


# RUNWAY 17 DRY

## TAILWIND

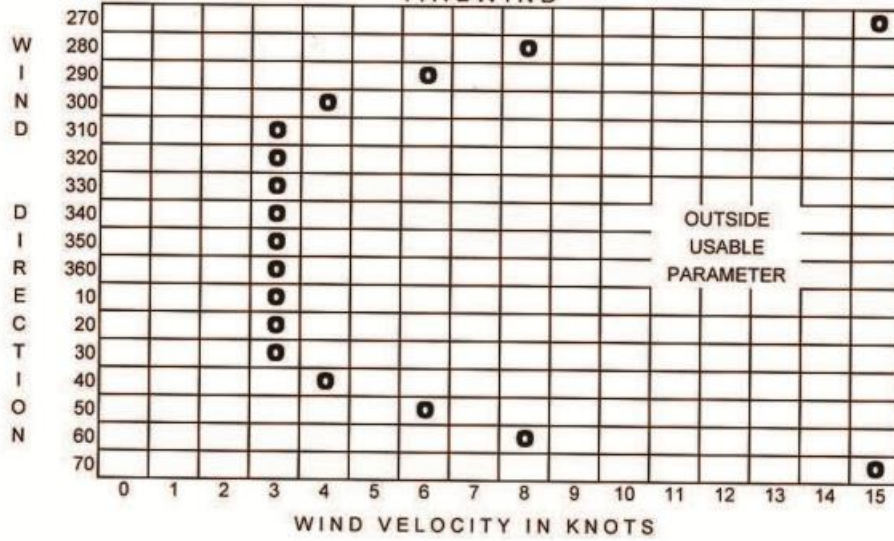


## CROSSWIND

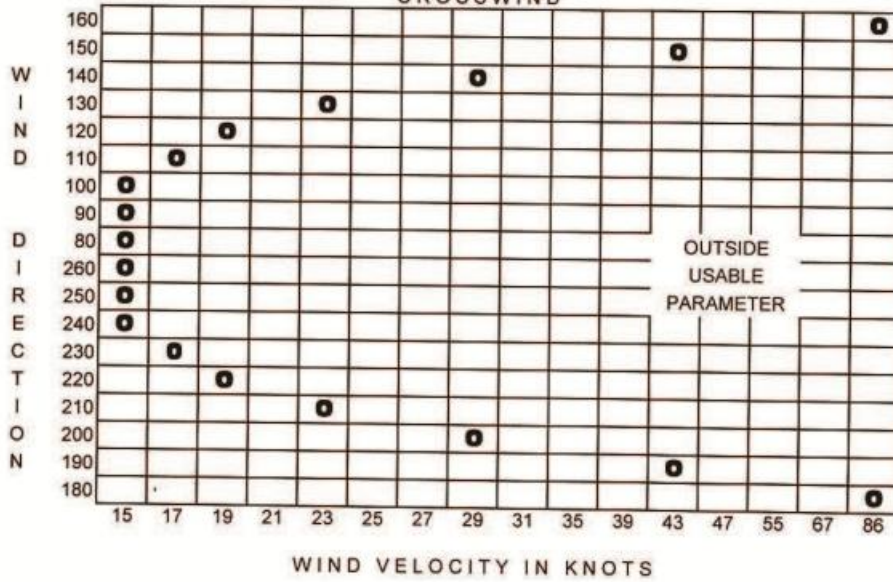


# RUNWAY 17 WET

## TAILWIND



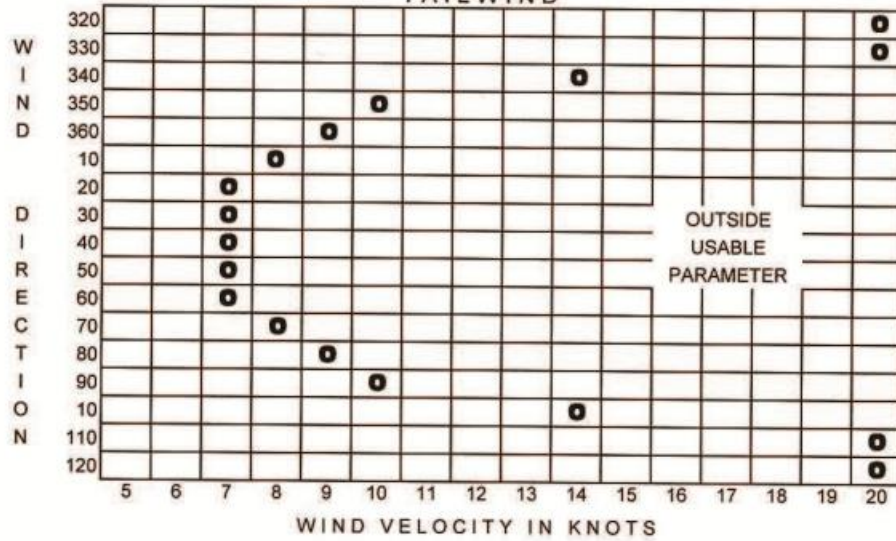
## CROSSWIND



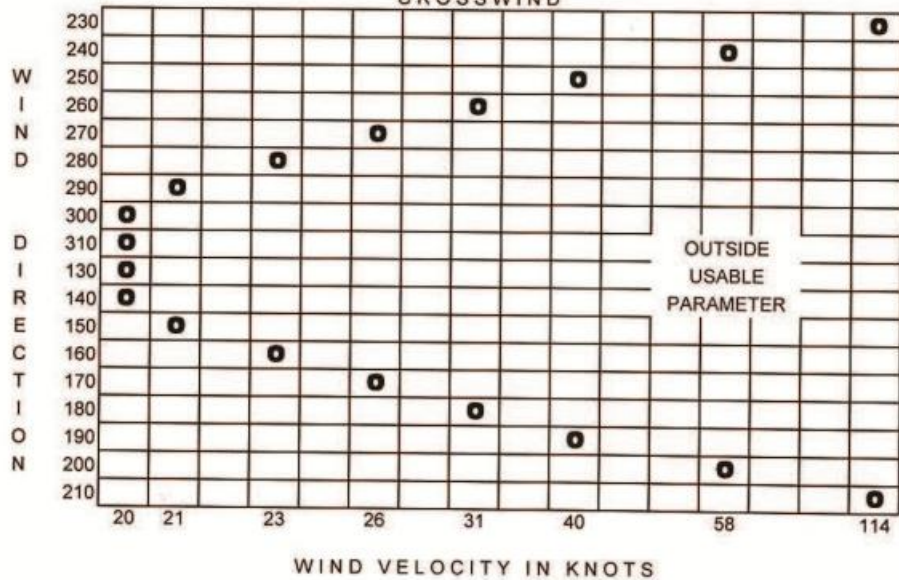


# RUNWAY 22 DRY

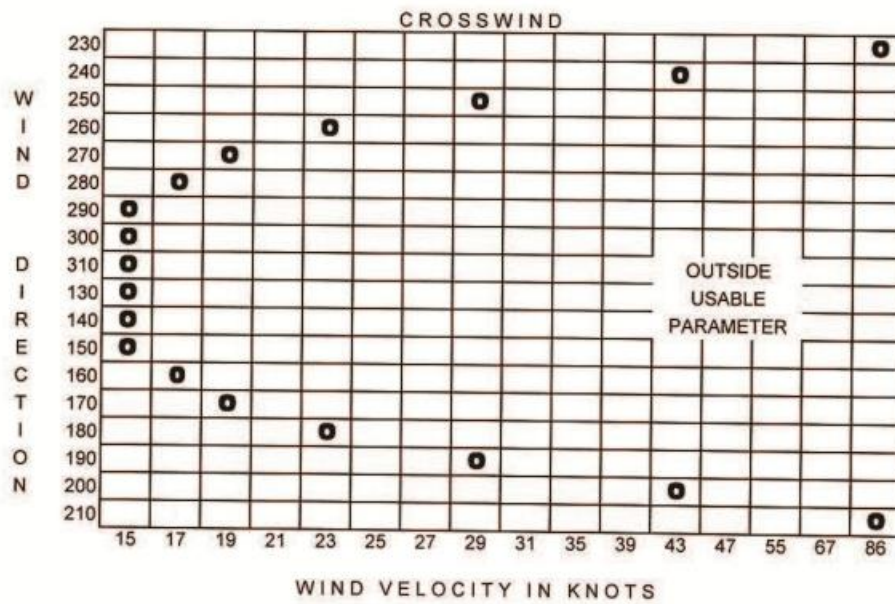
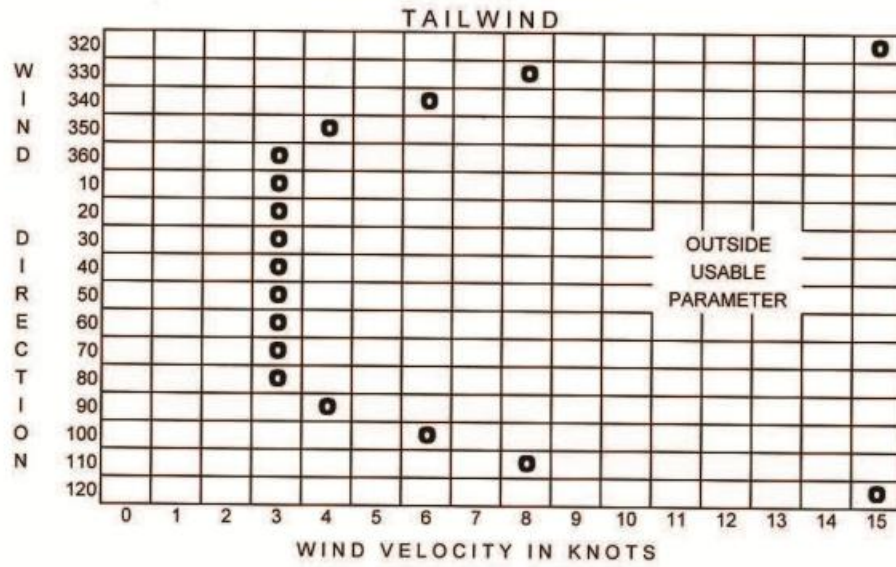
## TAILWIND



## CROSSWIND

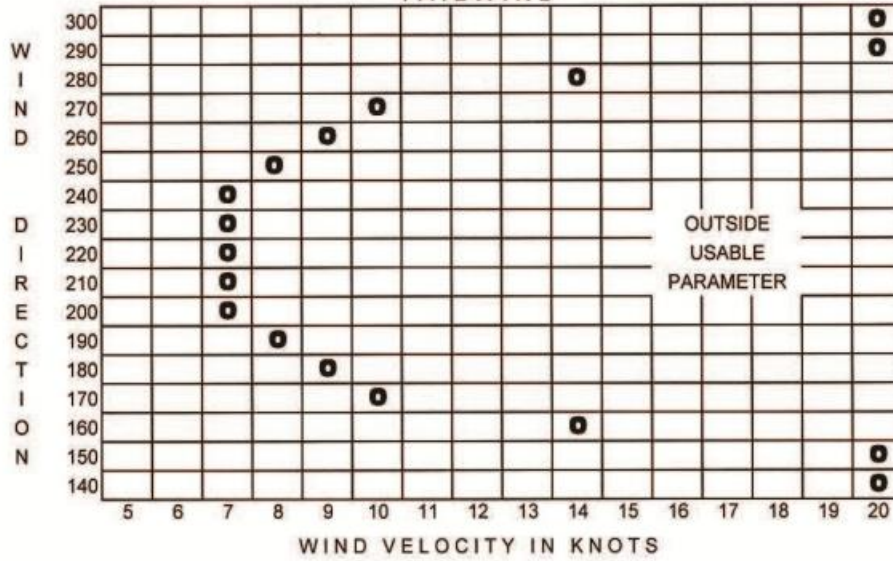


# RUNWAY 22 WET

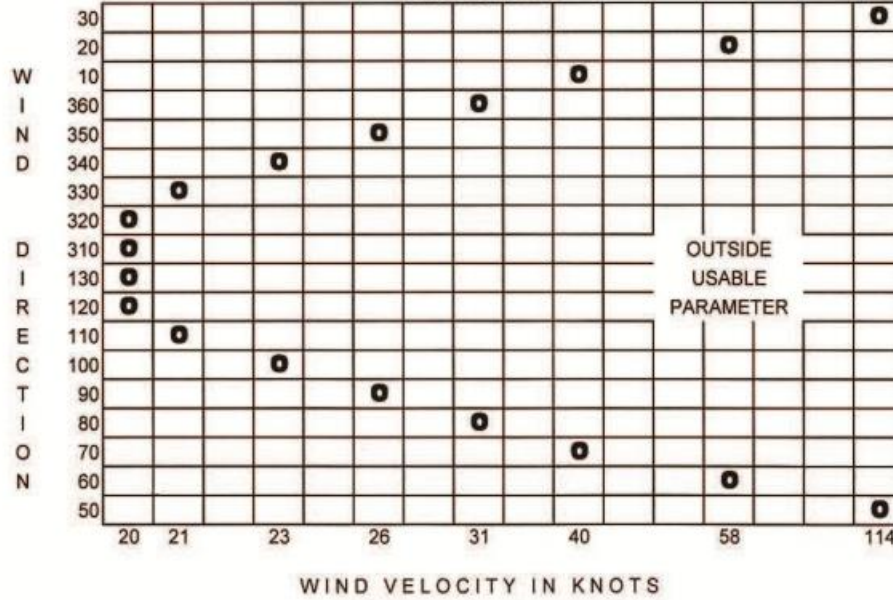


# RUNWAY 4 DRY

## TAILWIND



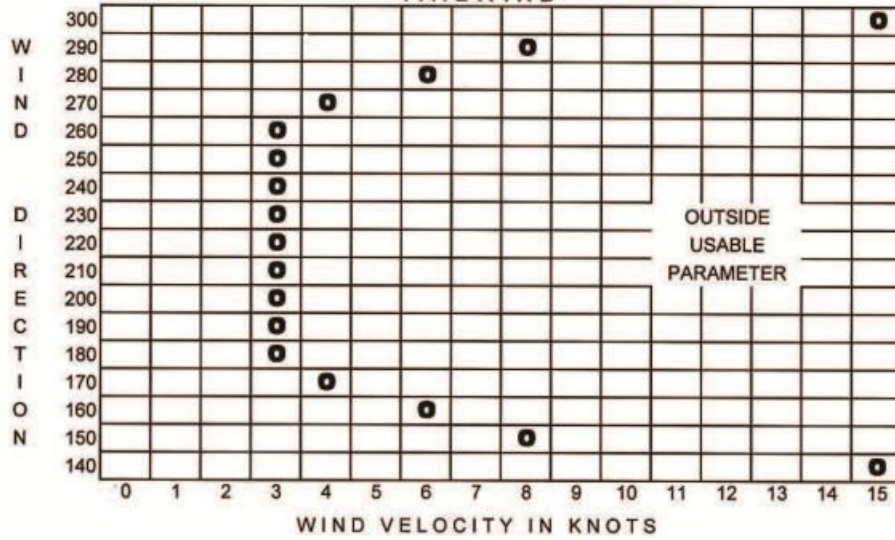
## CROSSWIND



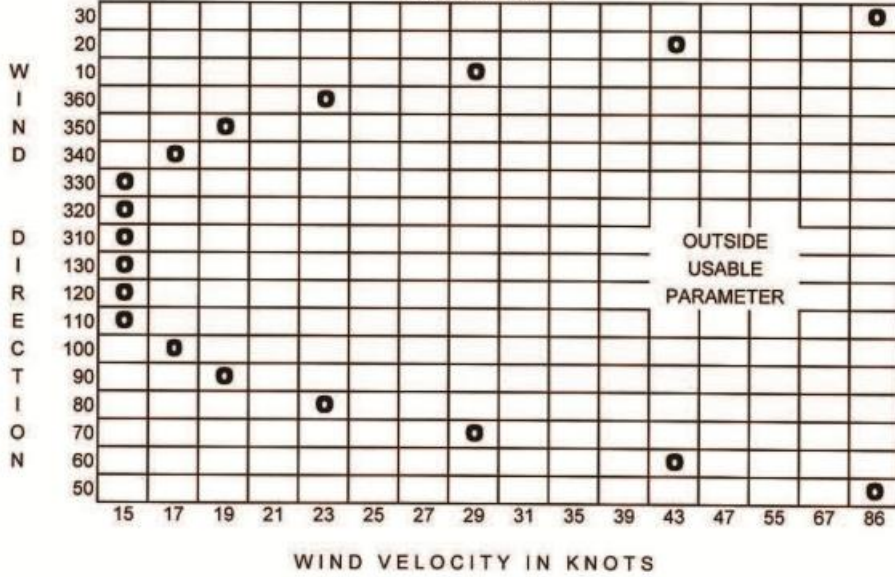


# RUNWAY 4 WET

## TAILWIND



## CROSSWIND



## Appendix G. Scratch Pad Entries

### MSP Arrivals

For aircraft executing a visual approach, instrument approach, and for VFR arrival aircraft, use the following scratch pad entries:

RUNWAY	RNAV(GPS)	RNAV(RNP)	ILS/LOC	VISUAL
12L	ZL1	YL1	12L	VL1
12R	ZR1	YR1	12R	VR1
30L	ZL3	YL3	30L	VL3
30R	ZR3	YR3	30R	VR3
17			L17	V17
35	Z35	Y35	I35	V35
4	G04		L04	V04
22	G22		L22	V22

### Visual Separation

When an aircraft has been cleared for a visual approach, and the pilot has assumed responsibility for separation from the preceding aircraft, the letters “VV” must be entered as follows:

<b>MSP Arrivals</b>	
Runways 12L and 30R	<b>VVN</b>
Runways 12R and 30L	<b>VVS</b>
Runway 4	<b>VV4</b>
Runway 22	<b>VV2</b>
Runway 35	<b>VV5</b>
Runway 17	<b>VV7</b>
<b>Satellite Arrivals</b>	
All Satellite Airports	<b>+VV</b>

**Satellite Airports**

- 1) Scratch Pad 1 must have airport of intended landing for IFR or VFR aircraft.

*Example-*

*LVN, 21D, SGS*

- 2) Scratch Pad must indicate the Instrument Approach for IFR and VFR aircraft.
- 3) For aircraft inbound to the M98 towered satellite airports, the following scratch pad entries must be used:

## Minneapolis Flying Cloud (KFCM)

1. FCM/FCZ – Visual Approach, full stop.
2. FFF – Instrument approach (10R or 36), full stop.
3. FFP – Practice instrument approach (10R or 36), standard missed approach.
4. FRF – RNAV (GPS) 28R, full stop.
5. FLF – RNAV (GPS) 28L/10L, full stop.
6. FRP – RNAV (GPS) 28R, standard missed approach.
7. FLP – RNAV (GPS) 28L/10L, standard missed approach.

## St. Paul Downtown Holman Field (KSTP)

1. STP/STZ – Full stop inbound on a Visual Approach.
2. SSI – Full stop ILS Runway 32 or ILS Runway 14 Approach.
3. S32 – Practice ILS Runway 32 Approach.
4. S14 – Practice ILS Runway 14 Approach.
5. SGP – Full stop RNAV (GPS) Runway 32 or 14 Approach.
6. SG4 – Practice RNAV (GPS) Runway 14 Approach.
7. SG3 – Practice RNAV (GPS) Runway 32 Approach
8. SSN – Full stop NDB Runway 31 Approach.
9. S31 – Practice NDB Runway 31 Approach.

## Anoka County-Blaine (KANE)

1. ANE – Visual approach full stop.
2. ANZ – Visual approach (over MSP) full stop.
3. AAA – Instrument approach full stop.
4. AAP – Practice instrument approach with standard missed approach.

## Minneapolis Crystal (KMIC)

1. MIC/MIZ – Visual approach
2. MMM – VOR/GPS A full stop.
3. MMA – VOR/GPS A missed approach
4. MMG – GPS Runway 14L full stop.
5. MGA – GPS Runway 14L missed approach
6. GEP – Holding at Gopher VORTAC

- 4) Aircraft landing airports other than those listed above shall have the following entered into Scratch Pad 2:

<b>1<sup>st</sup> Character – TYPE of APPROACH</b>	<b>2<sup>nd</sup> Character – Full Stop or Missed Approach</b>
<b>I</b> = ILS	<b>F</b> = Full Stop
<b>G</b> = RNAV (GPS)	<b>M</b> = Missed Approach
<b>L</b> = Localizer	
<b>N</b> = NDB	<b>2<sup>nd</sup> and 3<sup>rd</sup> Character:</b> <b>PM</b> = Published Missed
<b>V</b> = VOR	

**Example** – N12345 requesting ILS 30 to a Published Missed at LVN: STARS entry will be `<+IPM, slew, enter>`.

### Other Approved Entries

Air Work	<b>A/W</b>
Holding	<b>HLD</b>
Photo Flight	<b>PIX</b>
Holding at GEP	<b>GEP</b>
Holding at FGT	<b>FGT</b>
Tour	<b>2ER</b>