PROCEDURAL LEG TYPES
SID, STARS, APPROACH TRANSITIONS, MISSED APPROACHES

Standard Instrument Departures (SID), Standard Terminal Arrival Routes (STAR), and approaches consist of procedural legs that begin and end at prescribed locations or conditions. A procedural leg has two parts: a leg path and a leg terminator. The path of these legs can be flown along a heading, a course, a great circle path, or even a constant arc. The termination of a leg can occur at a specific geographic fix, at a VOR radial crossing, or when the aircraft attains a certain altitude. The FMS with SCN 60X will fly the different procedural leg types as defined in ARINC 424, of which airport departures and arrivals are comprised.

The following make up the twenty-three leg types that are currently in use:

- Heading to Altitude (VA)
- Heading to a DME Distance (VD)
- Heading to a Next Leg Intercept (VI)
- Heading to a Manual Termination (VM)
- Heading to a Radial Termination (VR)
- Course to an Altitude (CA)
- Course to a DME Distance (CD)
- Course to a Next Leg Intercept (CI)
- Course to a Radial Termination (CR)
- Course to a Fix (CF)
- Tracking Between Two Fixes (TF)
- Direct to a Fix (DF)
- Course from a Fix to an Altitude (FA)
- Course from a Fix to an Along Track Distance (FC)
- Course from a Fix to a DME Distance (FD)
- Course from a Fix to a Manual Termination (FM)
- Constant DME Arc to a Fix (AF)
- Hold to a Fix (HF)
- Hold to an Altitude (HA)
- Hold to a Manual Termination (HM)
- Initial Fix (IF)
- Procedure Turn to Intercept (PI)
The following illustrates the Seattle airport (KSEA), Runway 34L, using the SUMMA SIX departure with the Lakeview (LKV) transition as shown in the Flight and Departure section of this manual. Listed with each screen is the exact procedural leg type used to navigate this departure. Remaining procedural leg types not used in this departure follow with an appropriate example of each.

COURSE TO ALTITUDE (CA)

The aircraft will fly runway course 341° until reaching 833 feet.

HEADING TO RADIAL (VR)

The aircraft will turn right to a heading of 70° until crossing the PAE 139° radial.
SUMMA SIX DEPARTURE (SUMMA.SUMMA)

SEATTLE Departure (R)
Rwy 34 NORTH | Rwy 16 SOUTH
119.2 | 120.4

Apt Elev 433′
Trans level FL180
Trans alt: 1800′
RADAR and DME required.

DO SEA [NBEZUG]
N47 34.1 W122 18.6

SEATTLE
R1 11.8 SEA
N47 36.1 W122 18.6

D11 SEA [NEVIG]
N47 51.1 W122 18.6

OLYMPIA
R1 115.4 OLY
N46 39.3 W122 34.1

SUMMA
N46 37.1 W121 59.3

BAKER CITY
R1 115.3 BKE
N44 55.4 W117 48.5

LAKEVIEW
R1 112.0 LKV
N42 29.6 W120 30.4

This SID requires take-off minimums (for standard minimums, refer to airport chart): Rwy 15L/C Standard (or lower than standard, if authorized). Rwy 34G/R Standard (or lower than standard, if authorized) with a minimum climb gradient of 570′ per NM to 4000′.

Gnd speed KT
75 100 150 200 250 300

370ts per NM
713 930 1422 1900 2373 2850

Cross departure end of runways at or above 18′ AGL.

INITIAL CLIMB

RWY
15L/C
Intercept and proceed via SEA R-161, at D11 SEA turn LEFT to a 130° heading to intercept and proceed via SEA R-145 to SUMMA.

34G/R
Intercept and proceed via SEA S-381, at DO SEA turn RIGHT to a 070° heading, cross PSE R-139, then turn RIGHT to a 165° heading to intercept and proceed via SEA R-145 to SUMMA.

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HEADING TO INTERCEPT (VI)

The aircraft will turn right to 165° HDG until intercepting course 146° inbound to SUMMA.

COURSE TO FIX (CF)

The aircraft will turn left, intercept, and fly 146° course to SUMMA intersection.
TRACK TO FIX (TF)

After SUMMA, the aircraft will fly a TRACK to FIX LEG of 147° initially from SUMMA to LKV VOR.
HEADING TO DME DISTANCE (VD)

The VD leg is a heading to intercept DUG 10nm ARC which is defined by the leg IZOSI to DUG 320° radial.

ARC TO FIX (AF)

Upon intercepting the DUG 10 DME ARC, the aircraft will arc right to follow the 10 DME ARC to the terminator of DUG R-320.

FIX TO DME DISTANCE (FD)

From the DUG VOR, the aircraft will track outbound on 051° course 10nm to IAF of IZMIR. The aircraft will then turn left and follow the 10 DME ARC to the terminator, DUG R-345.
PROCEDURE TURN TO INTERCEPT (PI)

After arriving at SHUTR, the aircraft will turn to 030° then to 075° followed by a turn left to 255° at the correct time/distance interval to intercept 210° course inbound.
INITIAL FIX (IF)

IZUTU, defined by the TUS 288° radial at 26nm, is designated “Initial Fix” for NDB DME or GPS Rwy 6R approach at KRYN. The aircraft will fly direct from TUS VOR to IZUTU. The difference between the FMS course of 289° and the TUS VOR radial of 288° is attributed to the VOR declination of 12°E and the FMS magnetic variation of 11°E.
COURSE TO RADIAL (CR)

On the Missed Approach from the ILS RWY 13R the aircraft will climb out the 130° localizer course to intercept the 075° radial from SEA and then on to the 101° radial of SEA.
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COURSE TO INTERCEPT (CI)

From EEN the Initial Approach Fix (IAF), on a course of 333° through SAFAD, the aircraft will intercept the Localizer course of 050° for the LOC DME Rwy 5 approach.
FIX TO MANUAL TERMINATION (FM)

FMS missed approach guidance to aircraft on the Bermuda Islands ILS DME Rwy 30 will terminate on a course of 293° from BDA VOR and expect vectors.
FIX TO A DISTANCE ON COURSE (FC)

The aircraft will fly a course of 125° from JIPSY to (+7.5) DME that is the lead-in RADIAL for the ILS intercept. The aircraft will then turn left to 88° HDG at (+7.5).
DIRECT TO FIX (DF)

During the missed approach when the FMS reaches 2849FT, the FMS will proceed direct to CURGA.
HEADING TO ALTITUDE (VA)
On the missed approach, the FMS will command a right climbing turn on a heading of 003 to an altitude of 6100' and then direct YDL. The difference in heading is due to the FMS magnetic variation model.
HELENA TWO DEPARTURE (HLN2, HLN) (PILOT NAV)
(RWYS 5, 9, 27)

TAKE-OFF
RWys 5 and 9: Turn LEFT, Thence
Rwy 27L Turn RIGHT, Thence
DEPARTURE
Continue climb northwesbound via Helena
R-31B to 8000', then climbing RIGHT turn
direct Helena VORTAC.

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COURSE FROM FIX TO ALTITUDE (FA)

Following takeoff, the aircraft will turn and follow the 318° course from the HLN VOR to 8000'.

Course from Fix to Altitude

![Course from Fix to Altitude Diagram]
COURSE TO DME DISTANCE (CD)

After takeoff, the aircraft will follow the 191° course of ALG VOR no farther than 9 DME.
HEADING TO MANUAL TERMINATION (VM)

Upon crossing MAVVA intersection, the aircraft will turn to a heading of 075° until manually terminated.

![Diagram showing heading change](image.png)
HF HA and HM LEGS
HOLD TO FIX
HOLD TO ALTITUDE
HOLD TO MANUAL TERMINATION

The HF leg – Hold to a fix – will result in one orbit of the hold. It will sequence legs and exit after one circuit. This type of hold is frequently used in an approach where a holding pattern is used in lieu of a procedure turn.

The HA leg – Hold to Altitude – is provided for a climb in the holding pattern. On reaching the terminating altitude, the system will cross the holding fix then sequence legs to proceed on course to the next waypoint in the flightplan.

The HM leg – Hold to a manual termination does exactly as the name implies. Leg sequencing requires pilot’s intervention.

**NOTE:** SCN 601 requires manual insertion of any holding pattern used in a procedure and is not capable of flying a HF or HA leg.