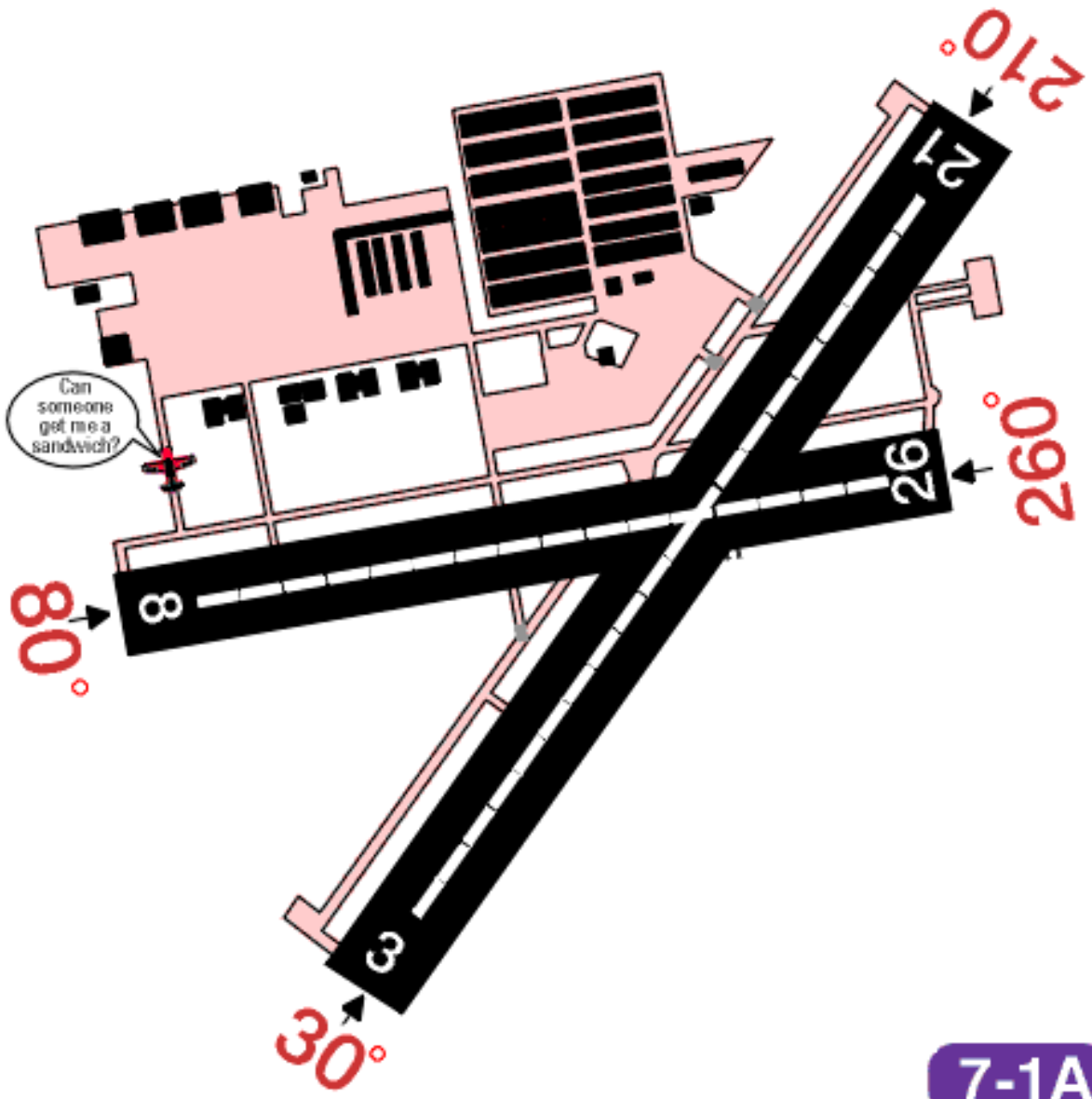
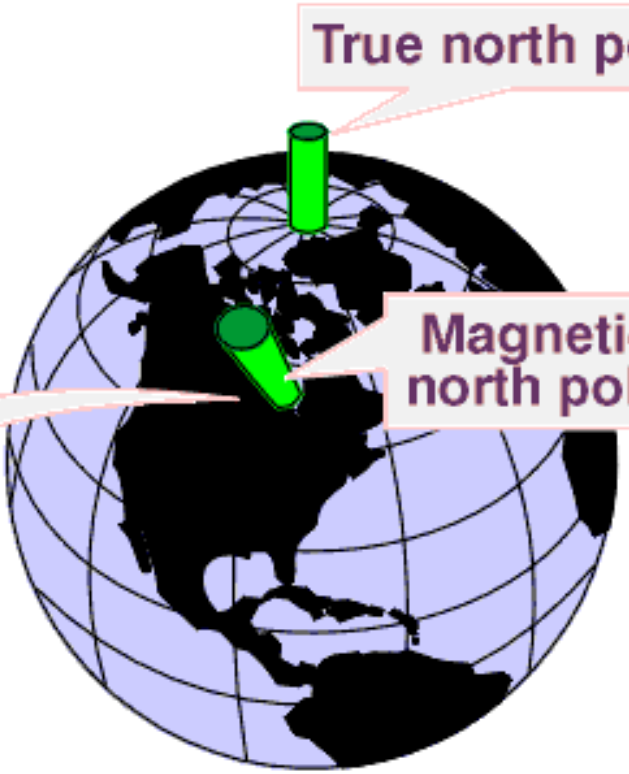
Airport Operations

THE AIRPORT LAYOUT



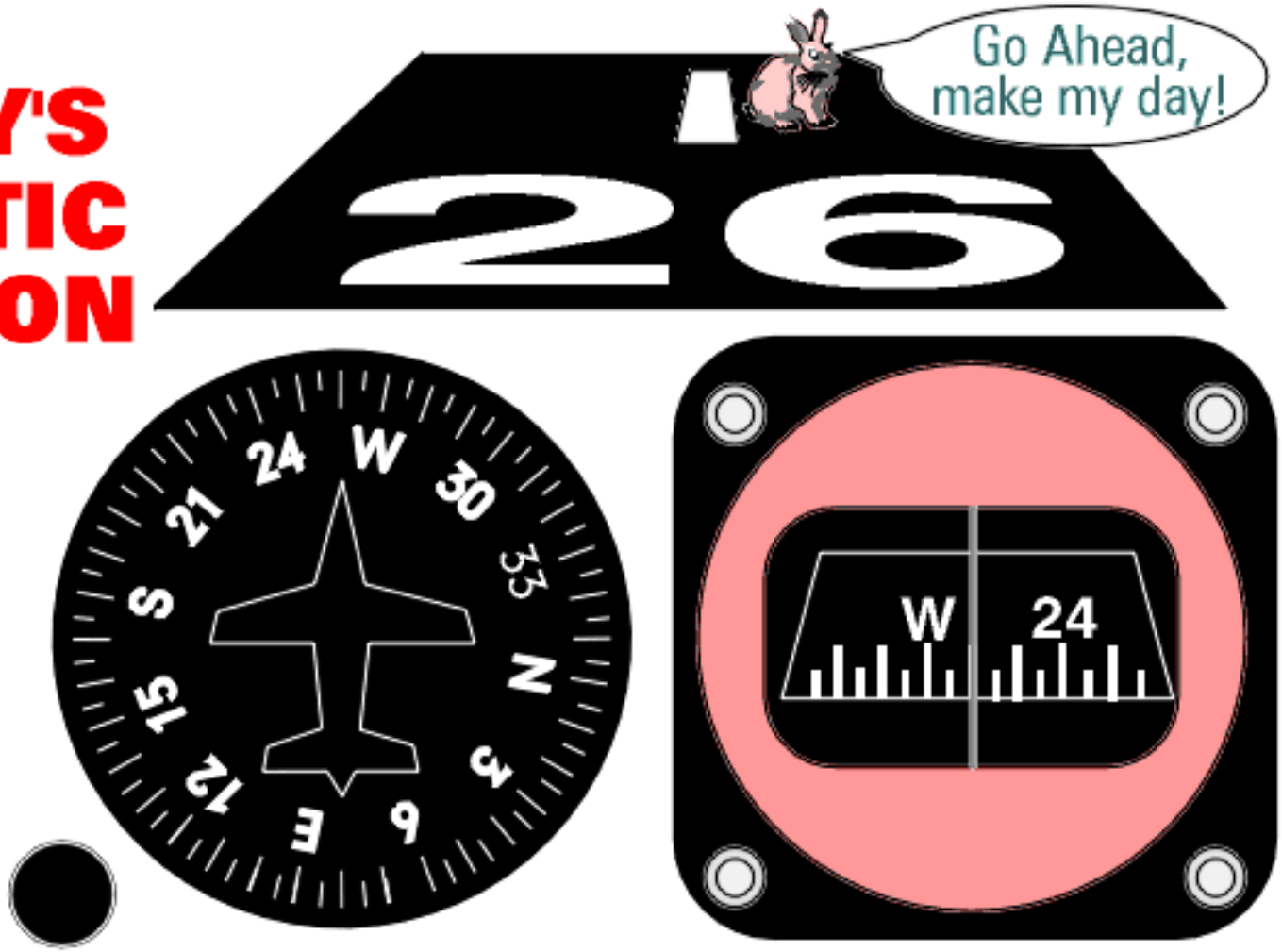
7-1A

THE AIRPORT LAYOUT



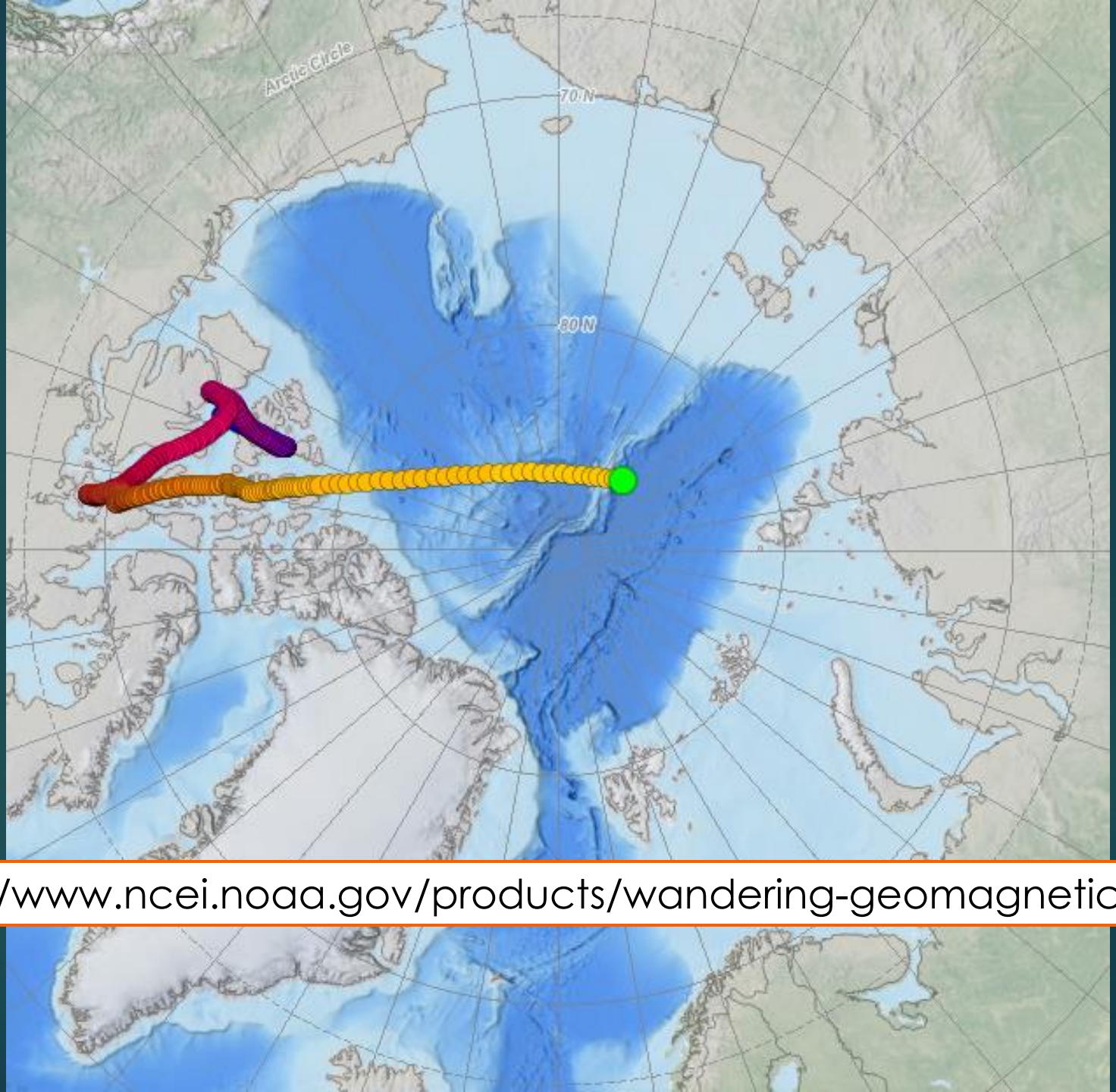
Runways numbers are angles with respect to the magnetic north pole (where the compass points) and not the true north pole (the earth's axis).

THE RUNWAY'S MAGNETIC DIRECTION



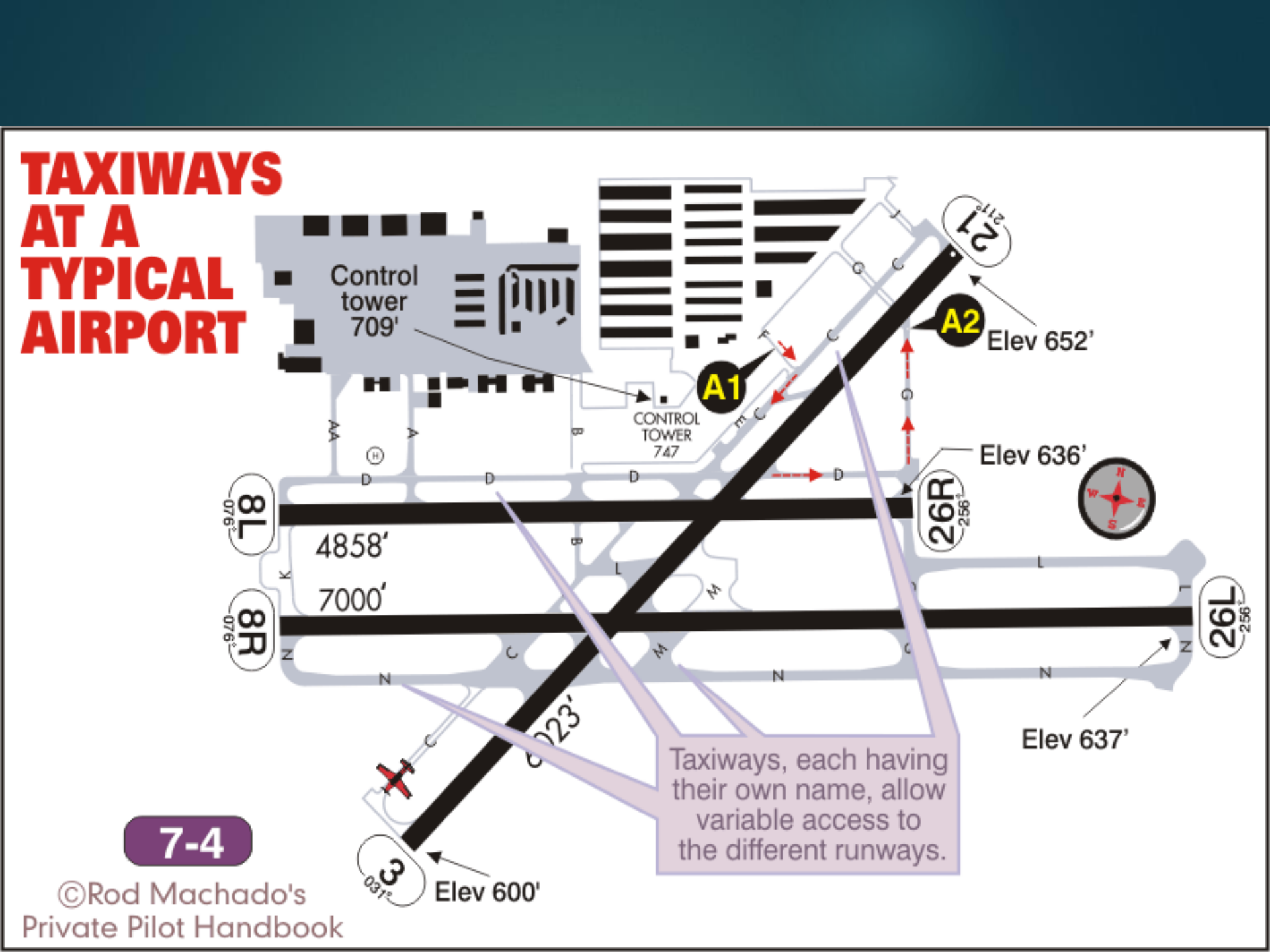
7-2

Both the heading indicator and the magnetic compass show the magnetic direction when pointed down the center of runway 26.



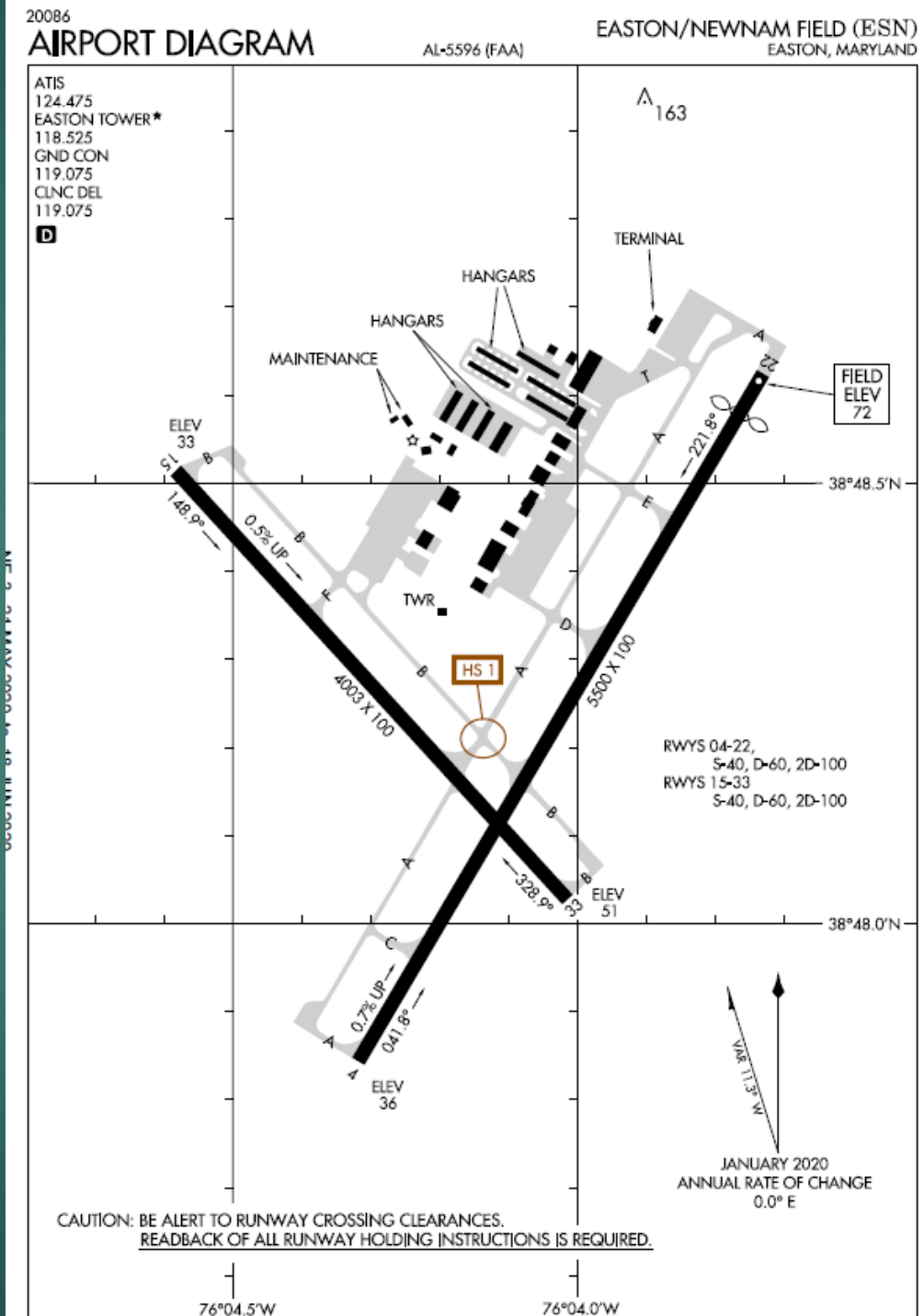
https://www.ncei.noaa.gov/products/wandering-geomagnetic-poles

TAXIWAYS AT A TYPICAL AIRPORT



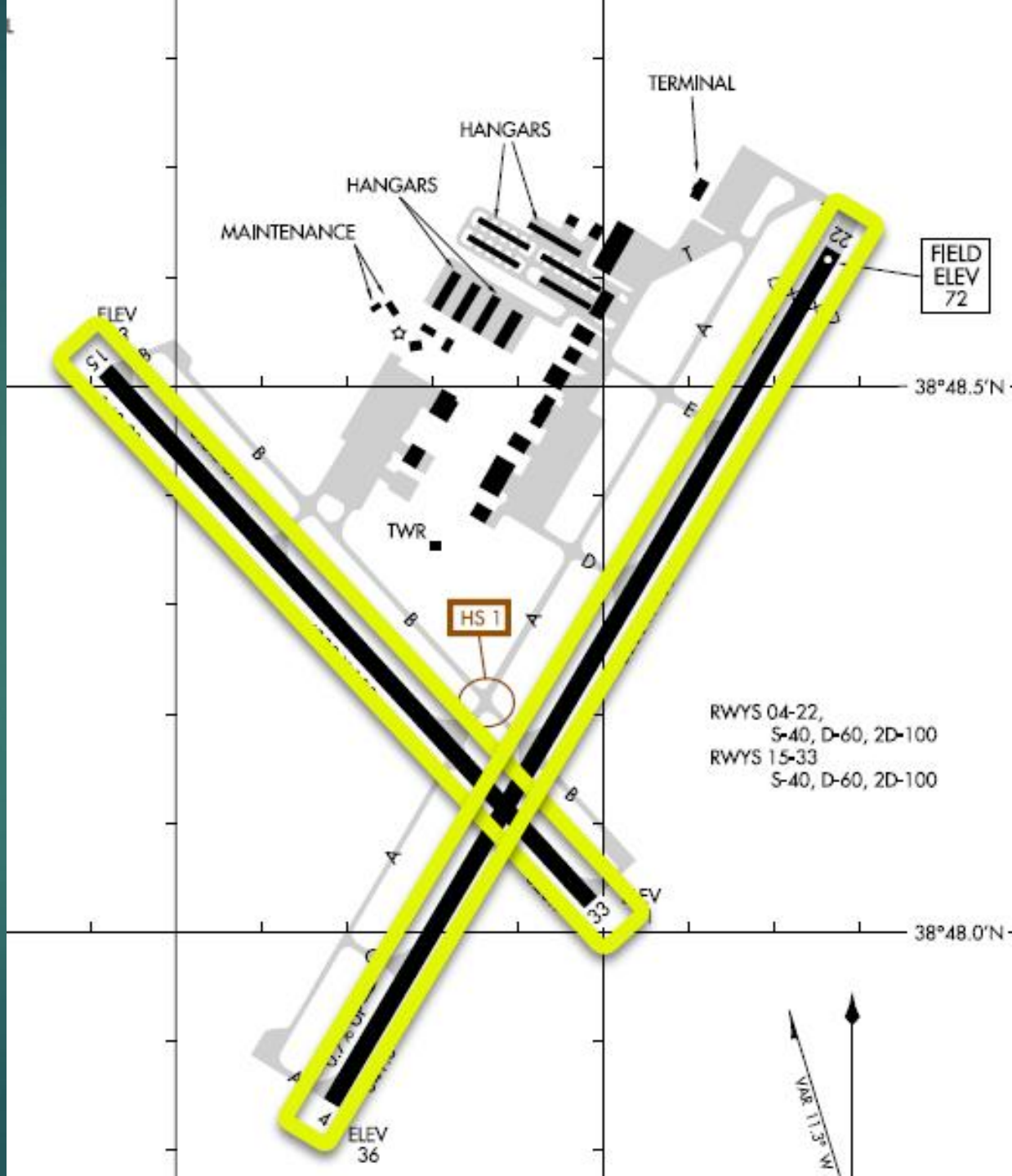
7-4

Airport diagram



Airport diagram

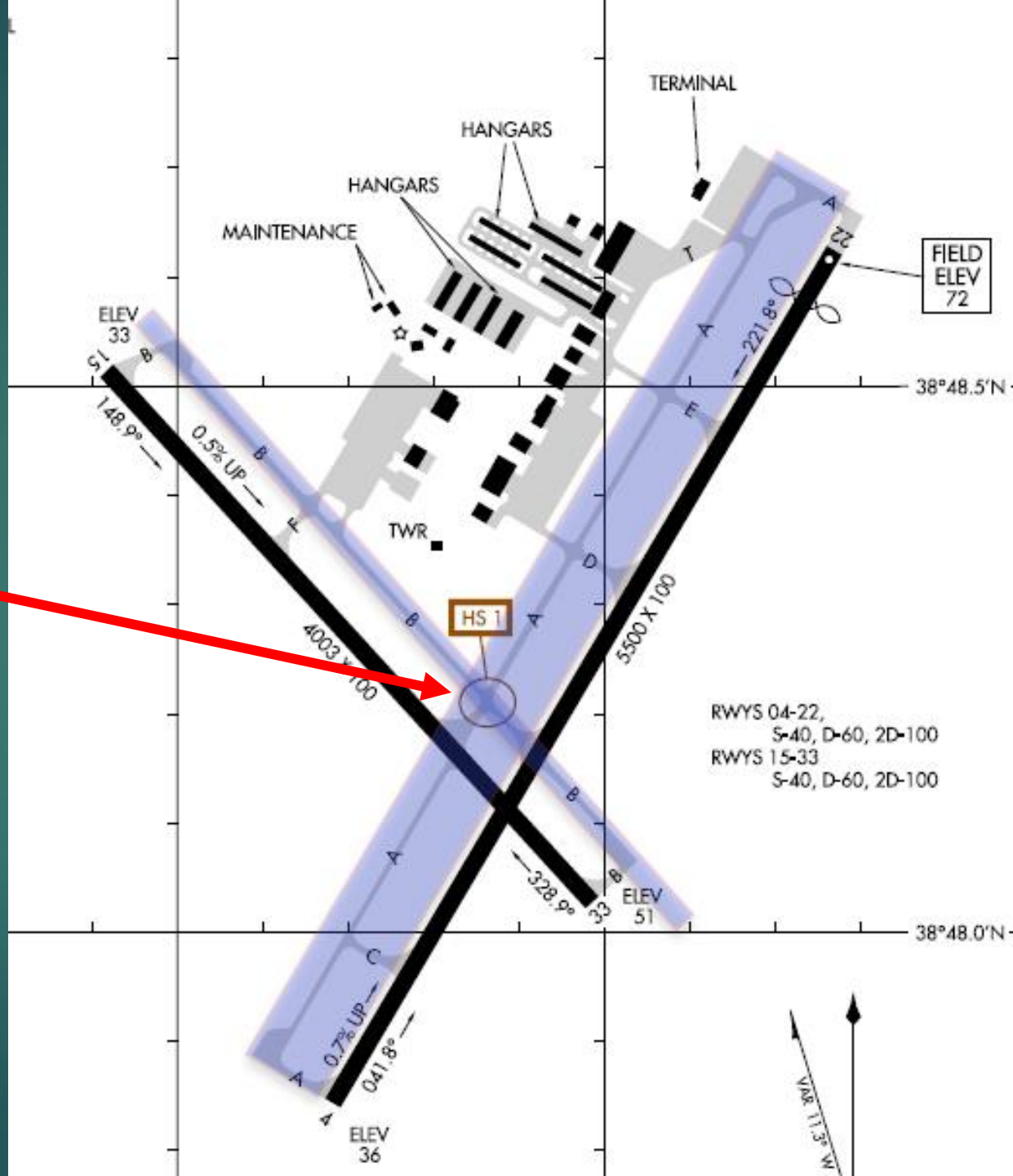
Runways



Airport diagram

Taxiways

Hot Spot

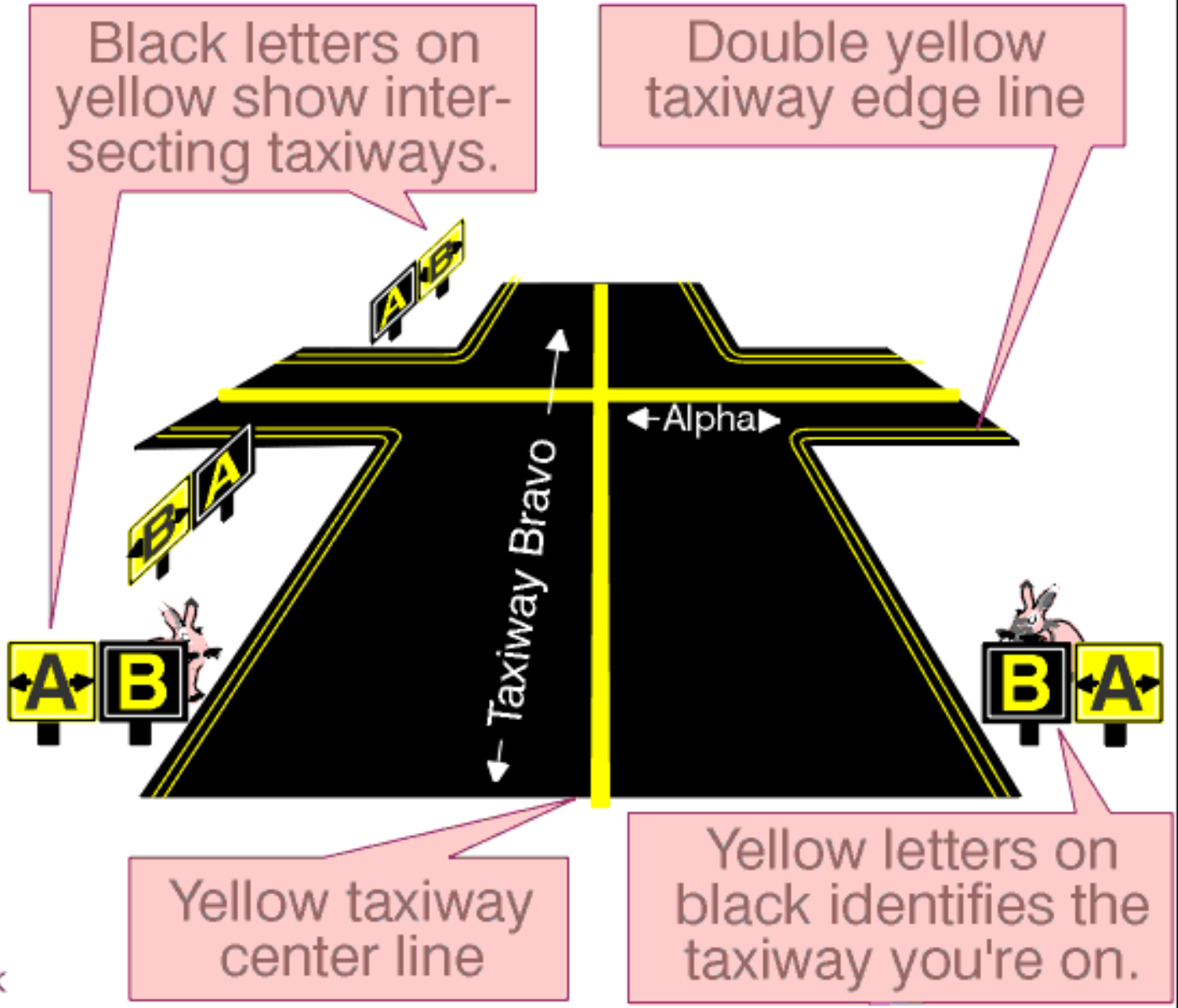


Airport Markings

Taxiways

TAXIWAY MARKINGS

All taxiway markings are in yellow.



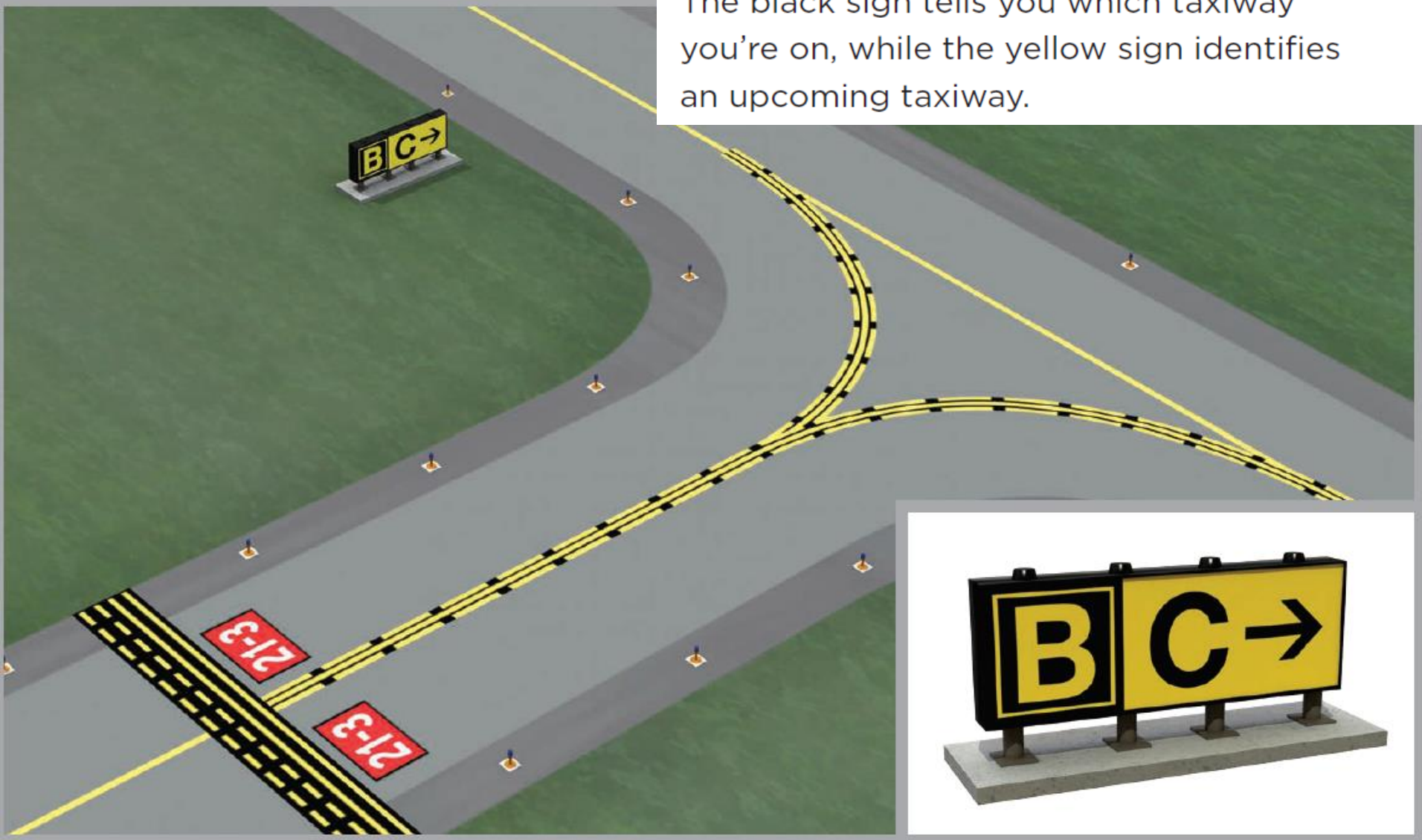
7-6

Taxiway Location Sign

Indicates the taxiway on which the aircraft is located. At larger airports, some taxiways have alphanumeric identifiers (e.g., A3, A4) and some have double-same designators (e.g., AA, BB).

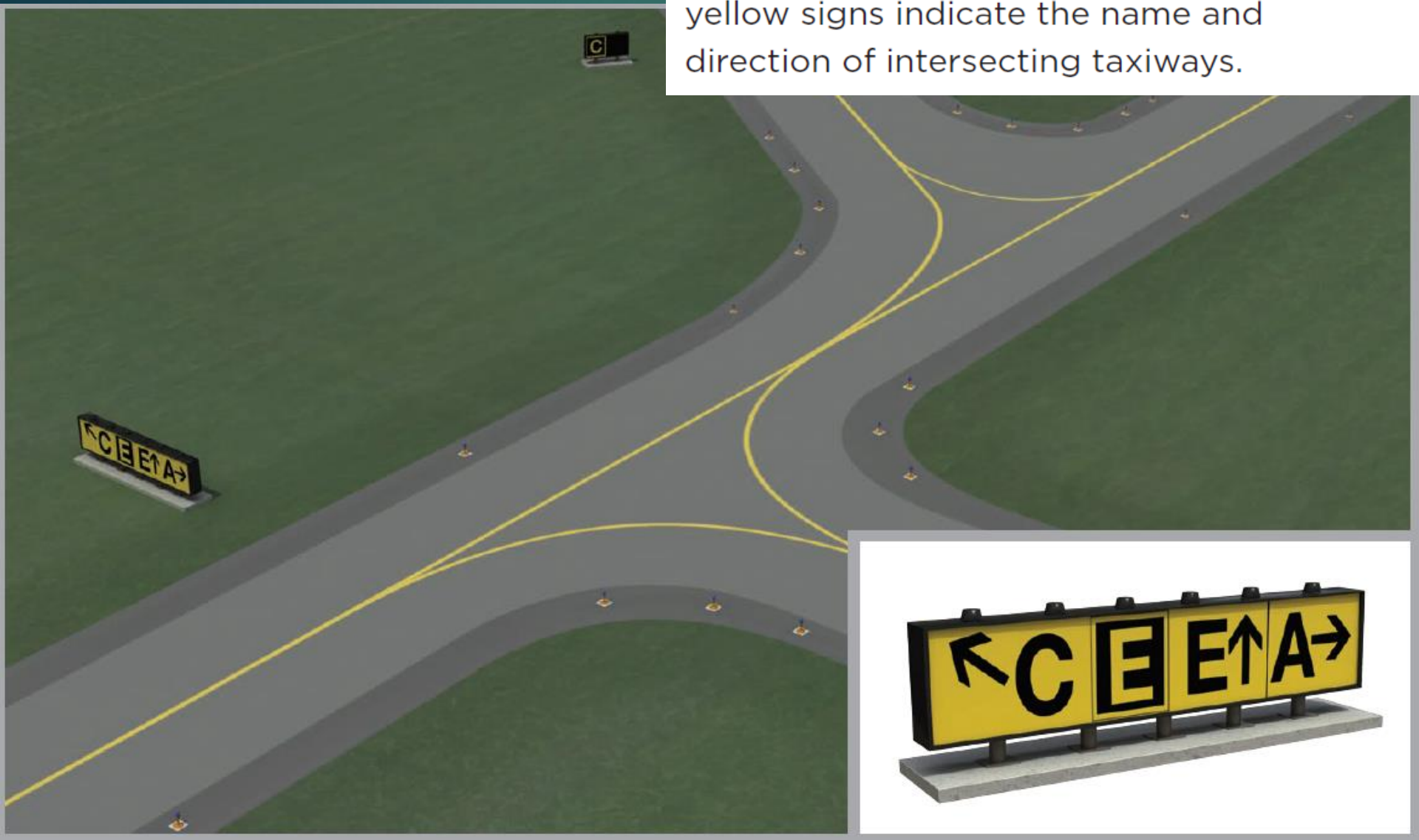
Taxiway Direction Sign (Collocated with Taxiway Location Sign)

In many cases, taxiway direction signs are placed next to taxiway location signs. The black sign tells you which taxiway you're on, while the yellow sign identifies an upcoming taxiway.



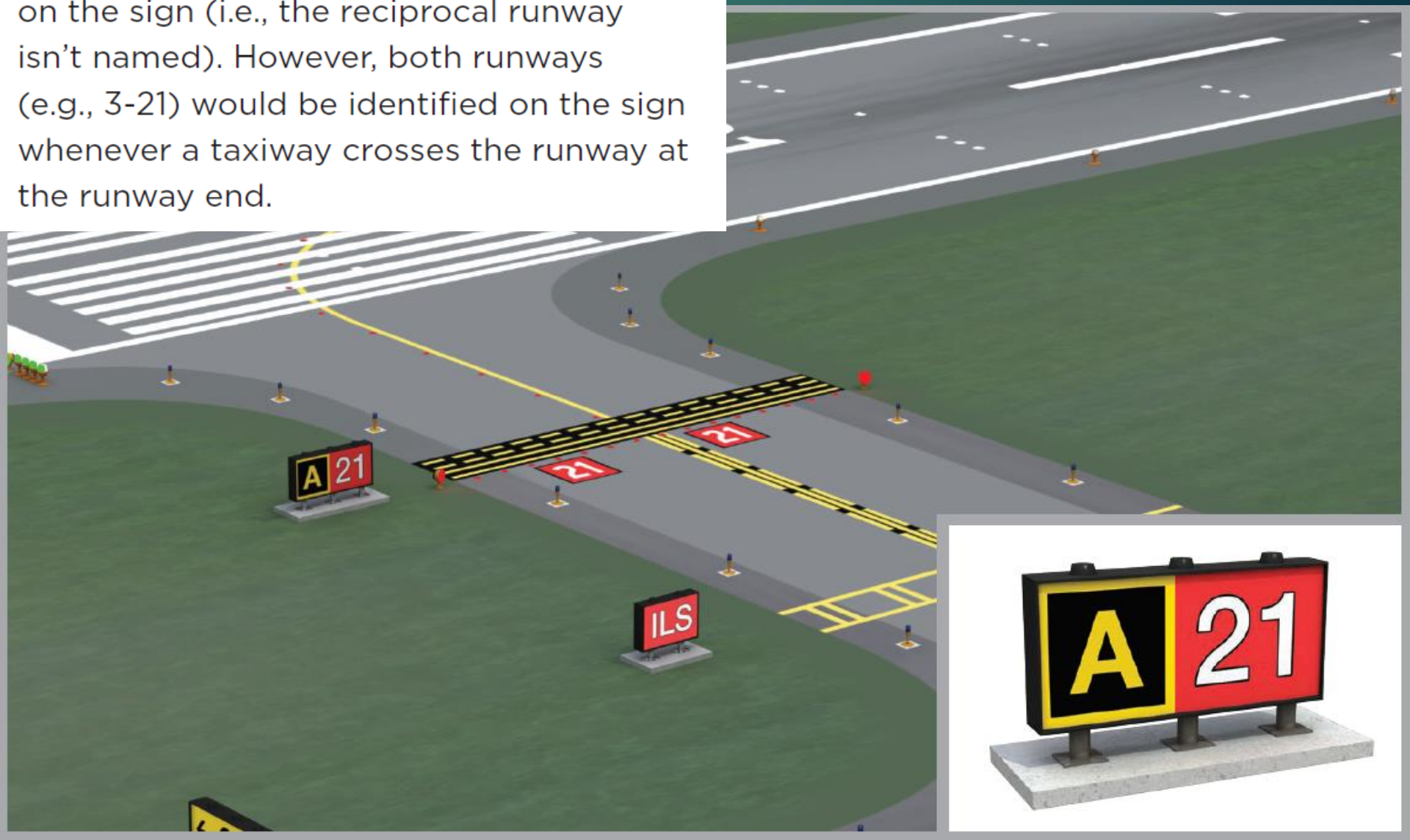
Multiple Taxiway Direction Signs (Collocated with Taxiway Location Sign)

Usually located next to or in an array with a taxiway location sign, these yellow signs indicate the name and direction of intersecting taxiways.



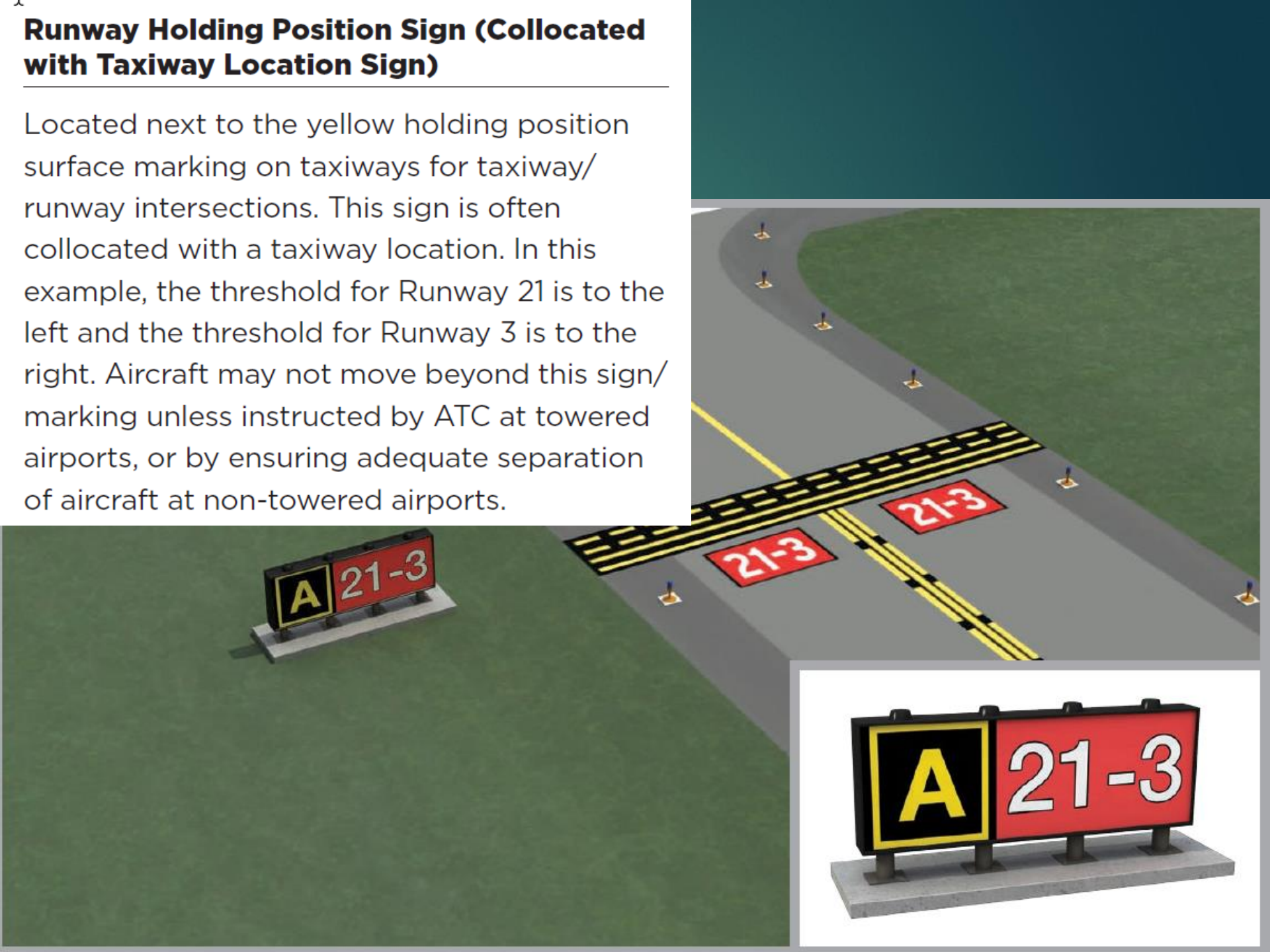
Runway Holding Position Sign at Takeoff End

Where a taxiway meets a runway at its takeoff end, only that runway is identified on the sign (i.e., the reciprocal runway isn't named). However, both runways (e.g., 3-21) would be identified on the sign whenever a taxiway crosses the runway at the runway end.



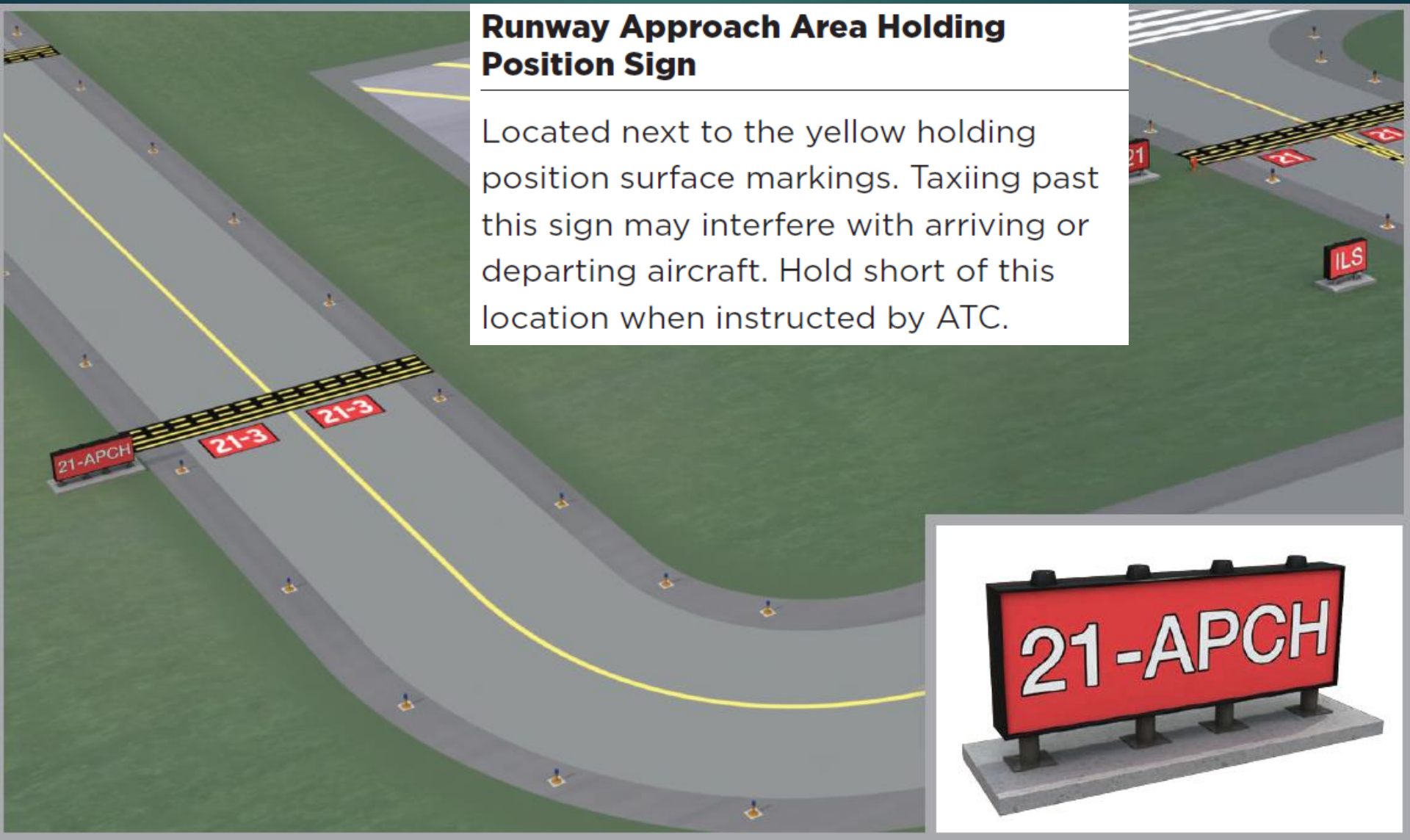
Runway Holding Position Sign (Collocated with Taxiway Location Sign)

Located next to the yellow holding position surface marking on taxiways for taxiway/runway intersections. This sign is often collocated with a taxiway location. In this example, the threshold for Runway 21 is to the left and the threshold for Runway 3 is to the right. Aircraft may not move beyond this sign/marking unless instructed by ATC at towered airports, or by ensuring adequate separation of aircraft at non-towered airports.



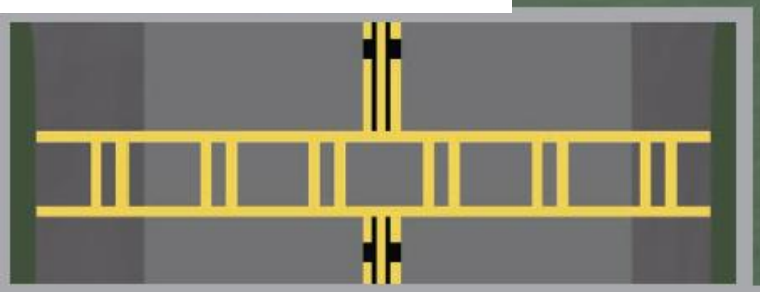
Runway Approach Area Holding Position Sign

Located next to the yellow holding position surface markings. Taxiing past this sign may interfere with arriving or departing aircraft. Hold short of this location when instructed by ATC.



Holding Position Marking for ILS

Typically collocated with the red and white ILS Critical Area Holding Position sign, this surface marking indicates the boundary of the ILS critical area. Aircraft taxiing beyond this point may interfere with the ILS signal. Hold short of this location when instructed by ATC.



ILS Critical Area Holding Position Sign

Located next to the yellow surface-painted ILS critical area marking. Aircraft taxiing beyond this point may interfere with the ILS signal. Hold short of this location when instructed by ATC.

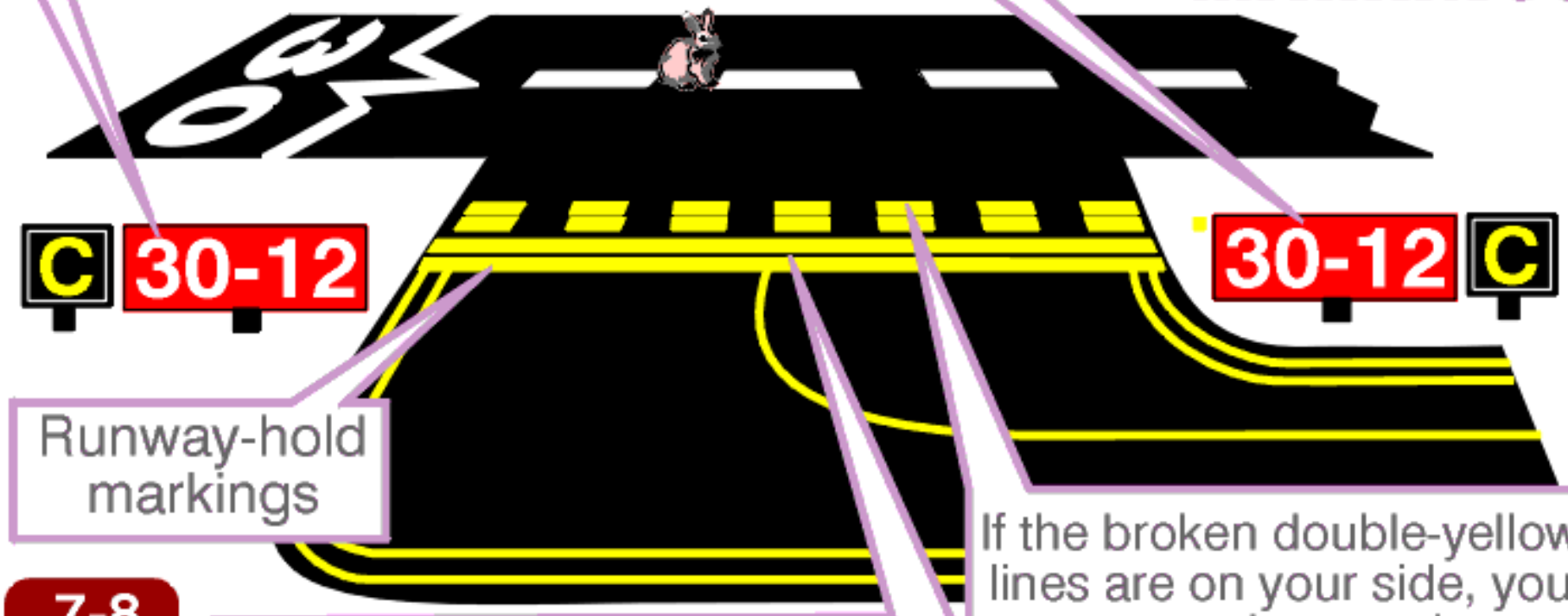
Ref. AIM Para. 2-3-8-b-3; 4-3-18-a-8

No Entry Sign

Prohibits an aircraft from entering an area, such as a one-way taxiway or the intersection of a road intended for vehicles.

Runways

RUNWAY MARKINGS



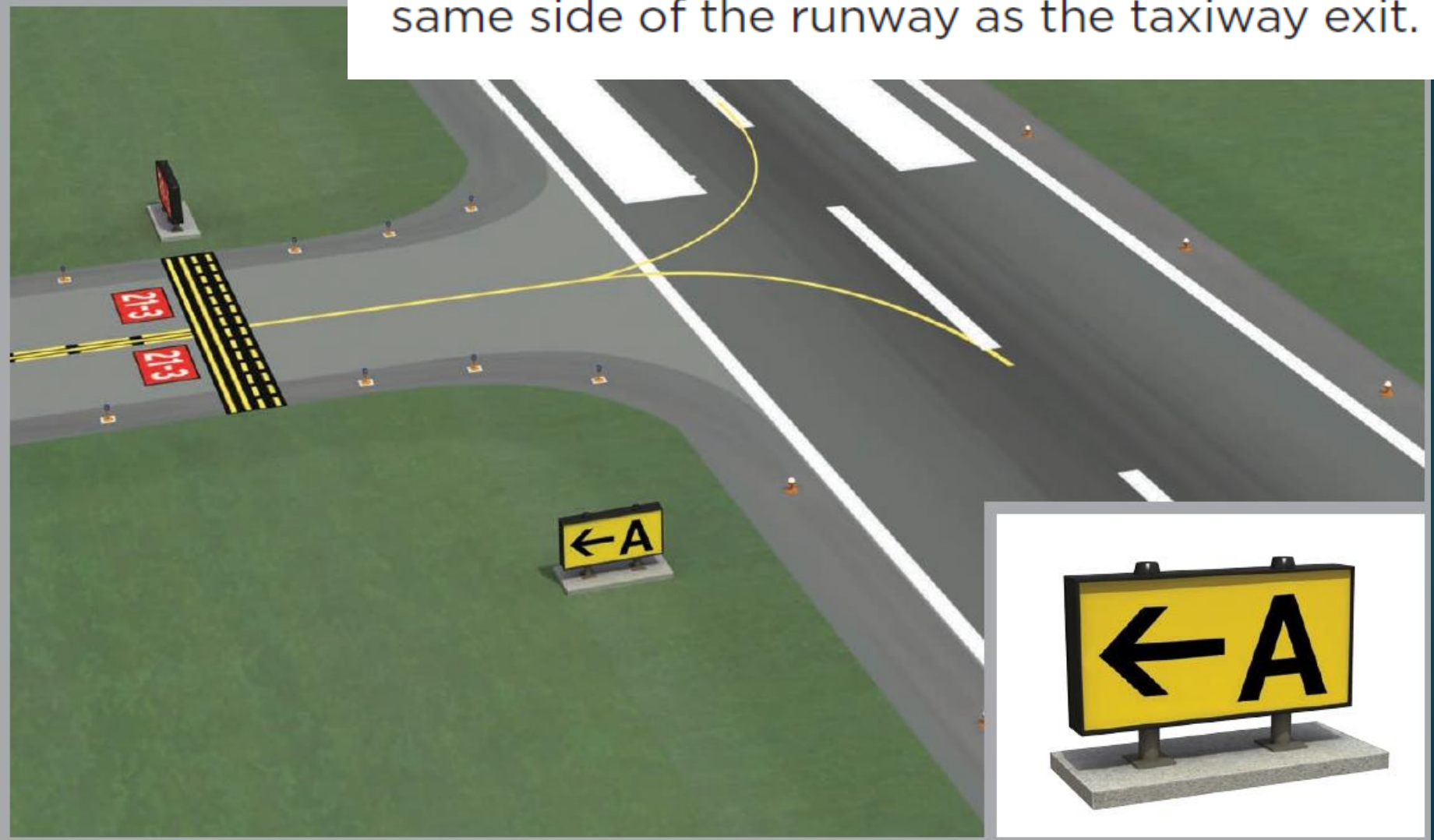
7-8

Runway Markings

Runway markings vary with the size and type of runway, but they are always white.

Direction Sign for Runway Exit

Indicates a taxiway exit from a runway. Located just prior to the intersection on the same side of the runway as the taxiway exit.



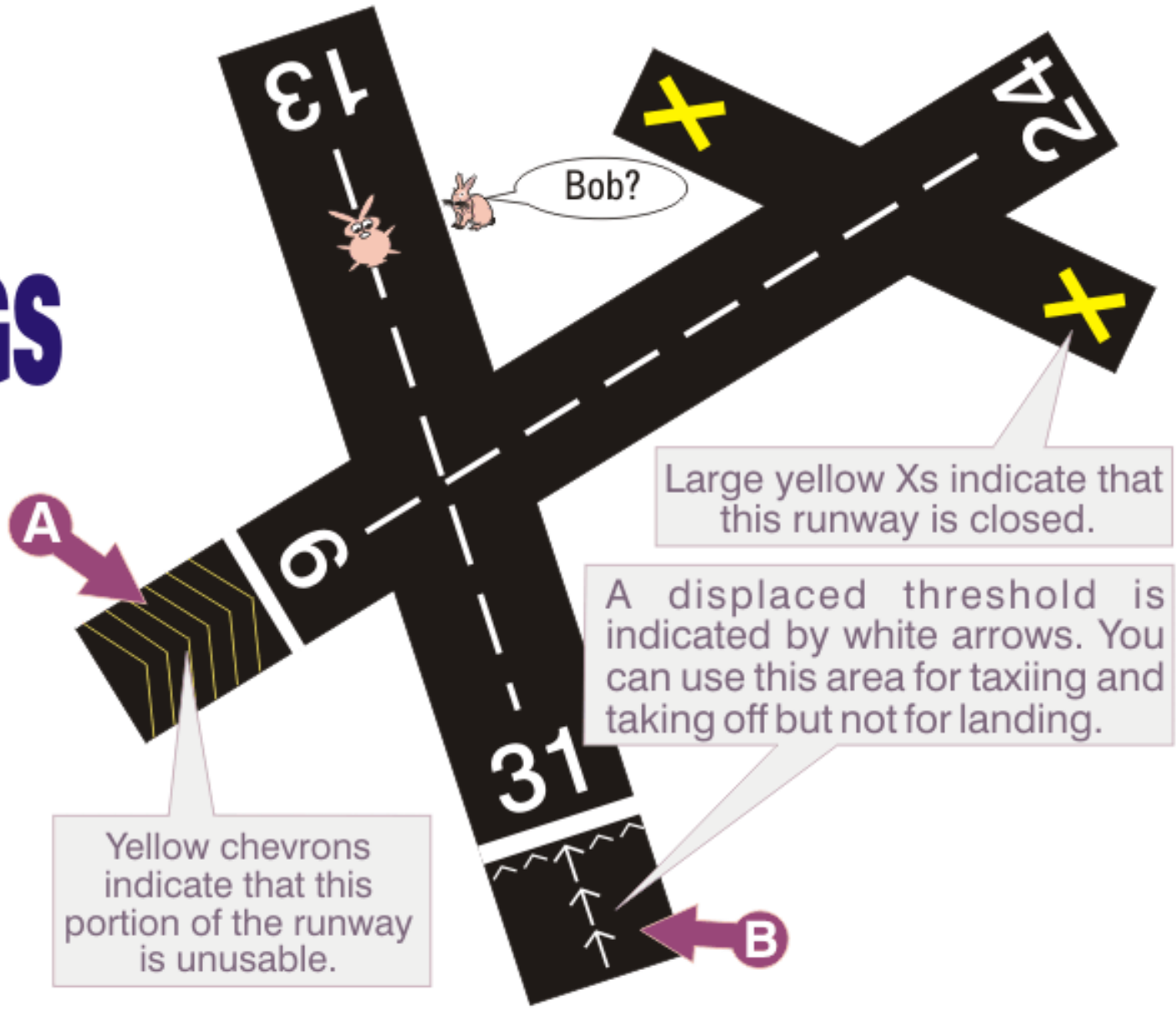
Runway Location Sign

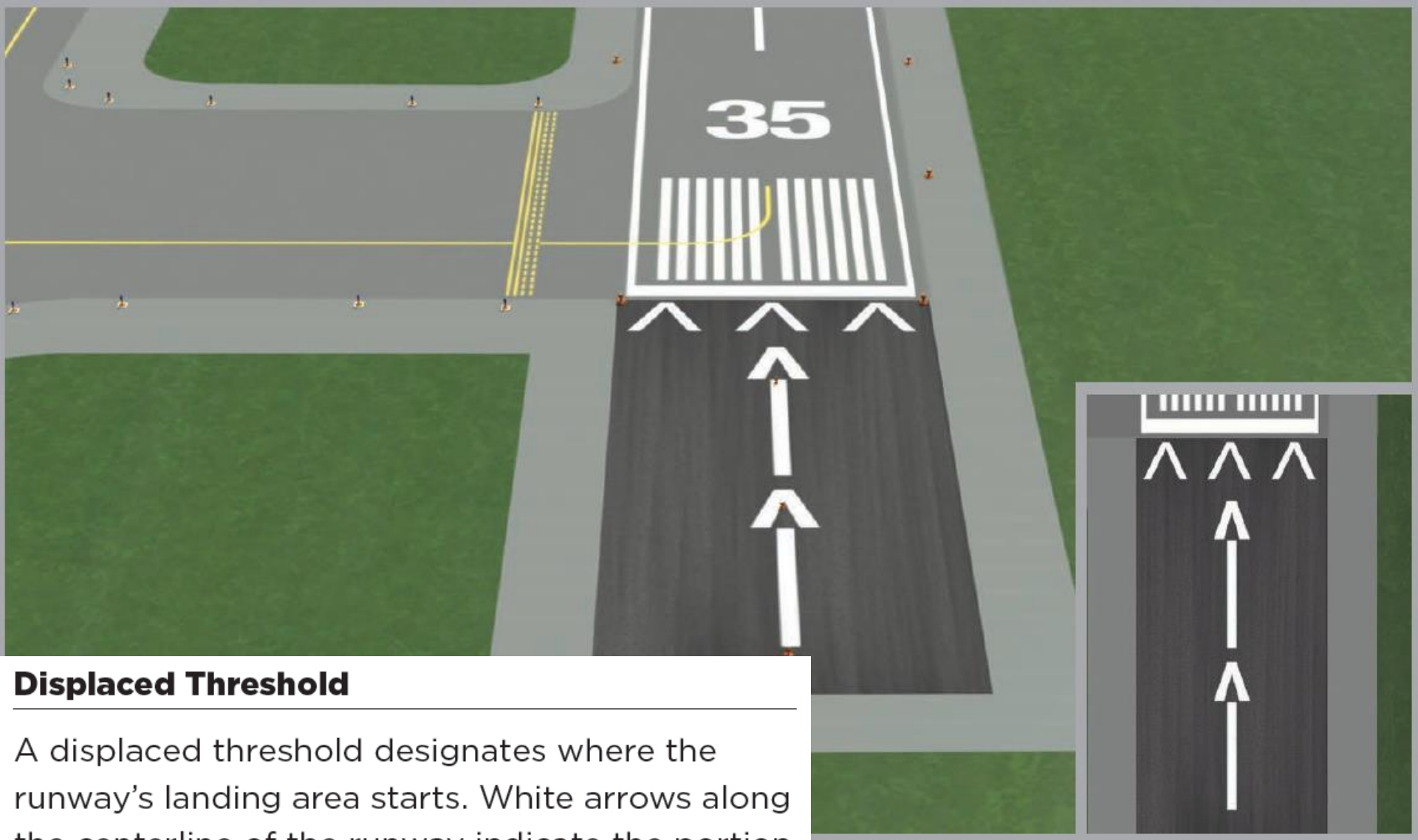
Identifies the runway on which the aircraft is located.

Runway Distance Remaining Sign

Indicates the distance of runway remaining in thousands of feet. In this example, 3,000 feet remain on the landing runway. These are usually seen at larger airports.

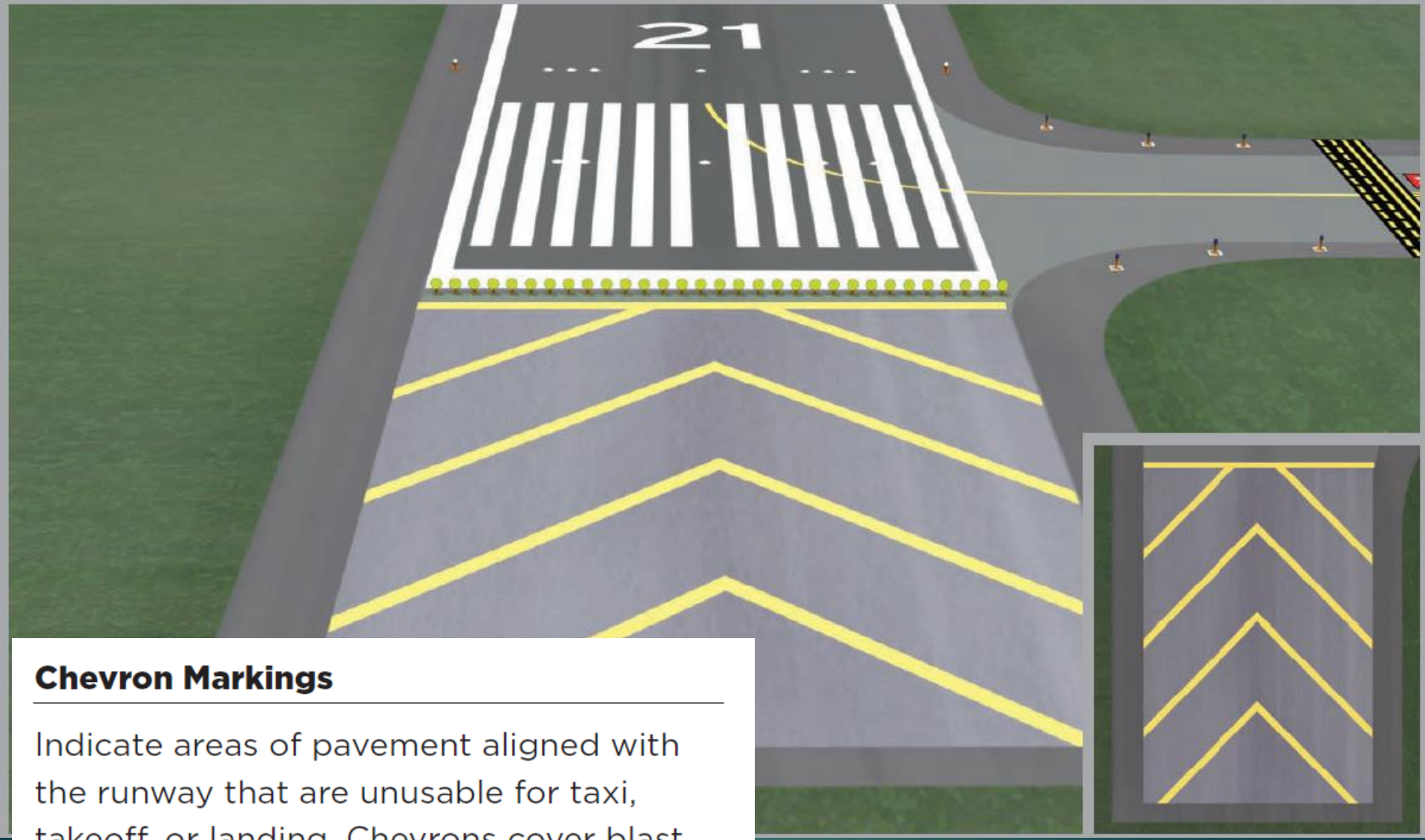
RUNWAY SURFACE MARKINGS





Displaced Threshold

A displaced threshold designates where the runway's landing area starts. White arrows along the centerline of the runway indicate the portion between the beginning of the runway and the displaced threshold. This portion is available for takeoffs in both directions and landings from the opposite direction.

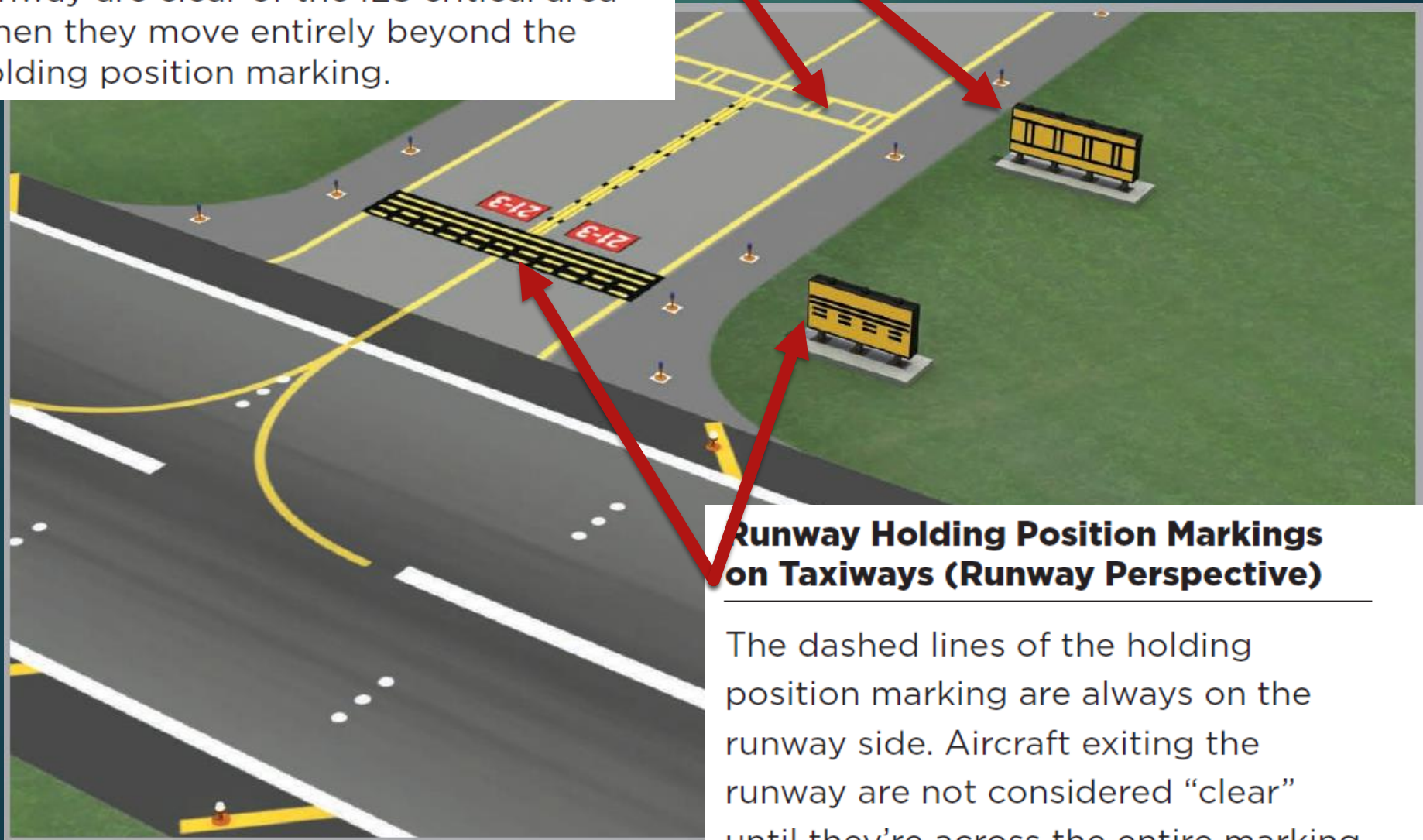


Chevron Markings

Indicate areas of pavement aligned with the runway that are unusable for taxi, takeoff, or landing. Chevrons cover blast pads or stopways, which are constructed to protect areas from erosion caused by jet blast and to provide extra stopping distance for aircraft (stopways).

ILS Critical Area Boundary Sign

Positioned in conjunction with the ILS holding position markings, but seen only when taxiing or driving away from the runway. Aircraft or vehicles exiting the runway are clear of the ILS critical area when they move entirely beyond the holding position marking.

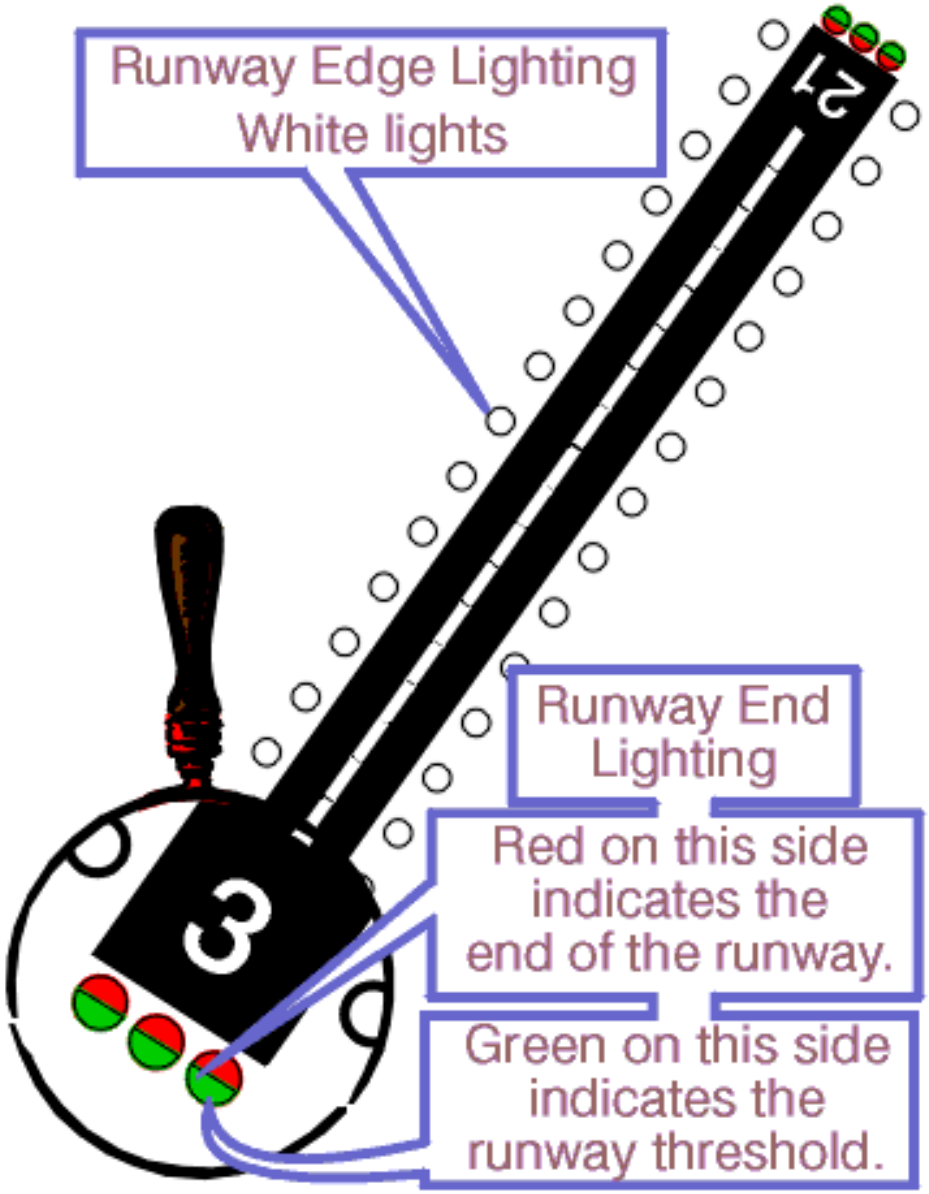


Runway Holding Position Markings on Taxiways (Runway Perspective)

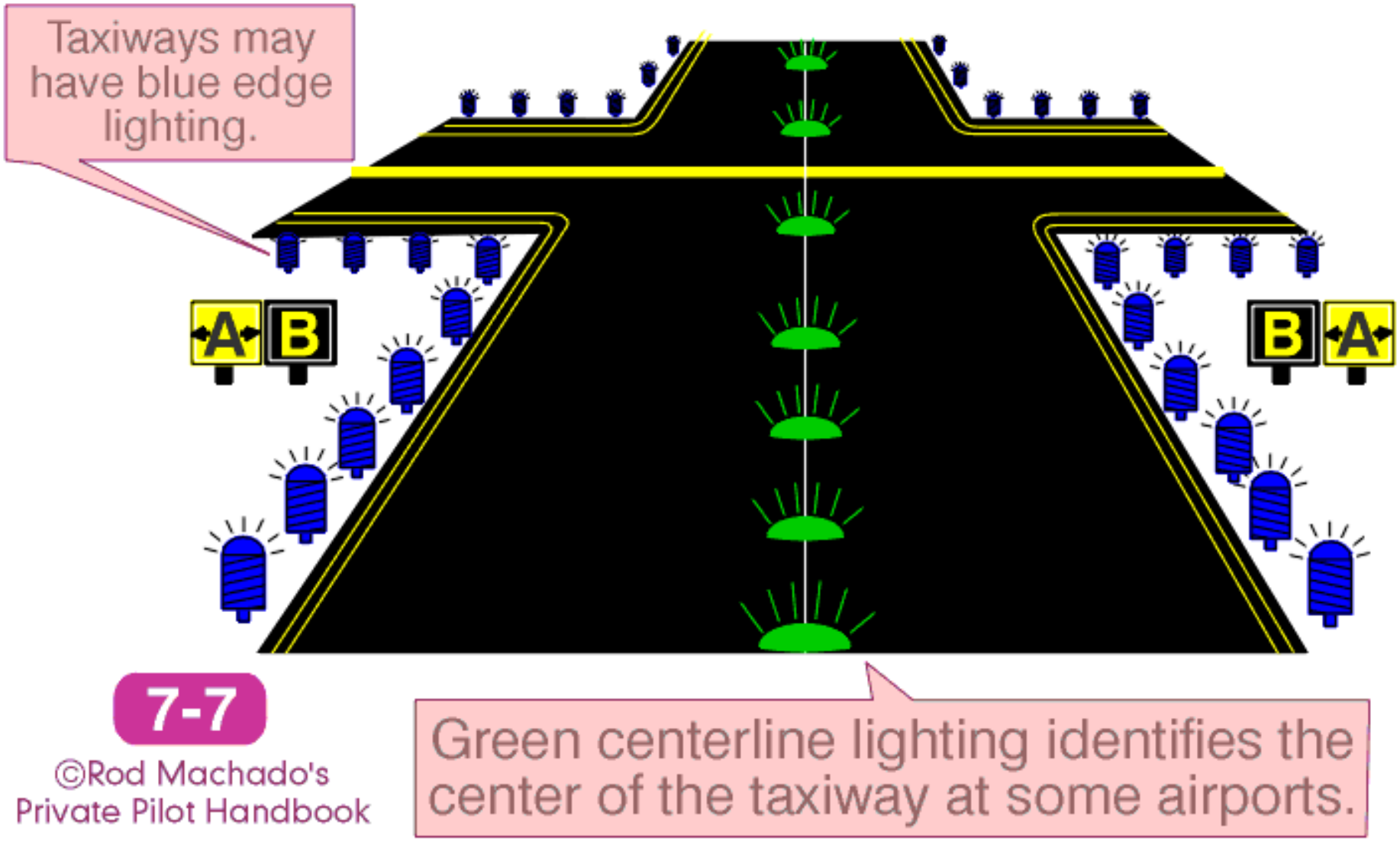
The dashed lines of the holding position marking are always on the runway side. Aircraft exiting the runway are not considered “clear” until they’re across the entire marking

Airport Lighting

BASIC RUNWAY LIGHTING



TAXIWAY LIGHTING



Airport Beacons

Civilian Airports

green + white

Military Airports

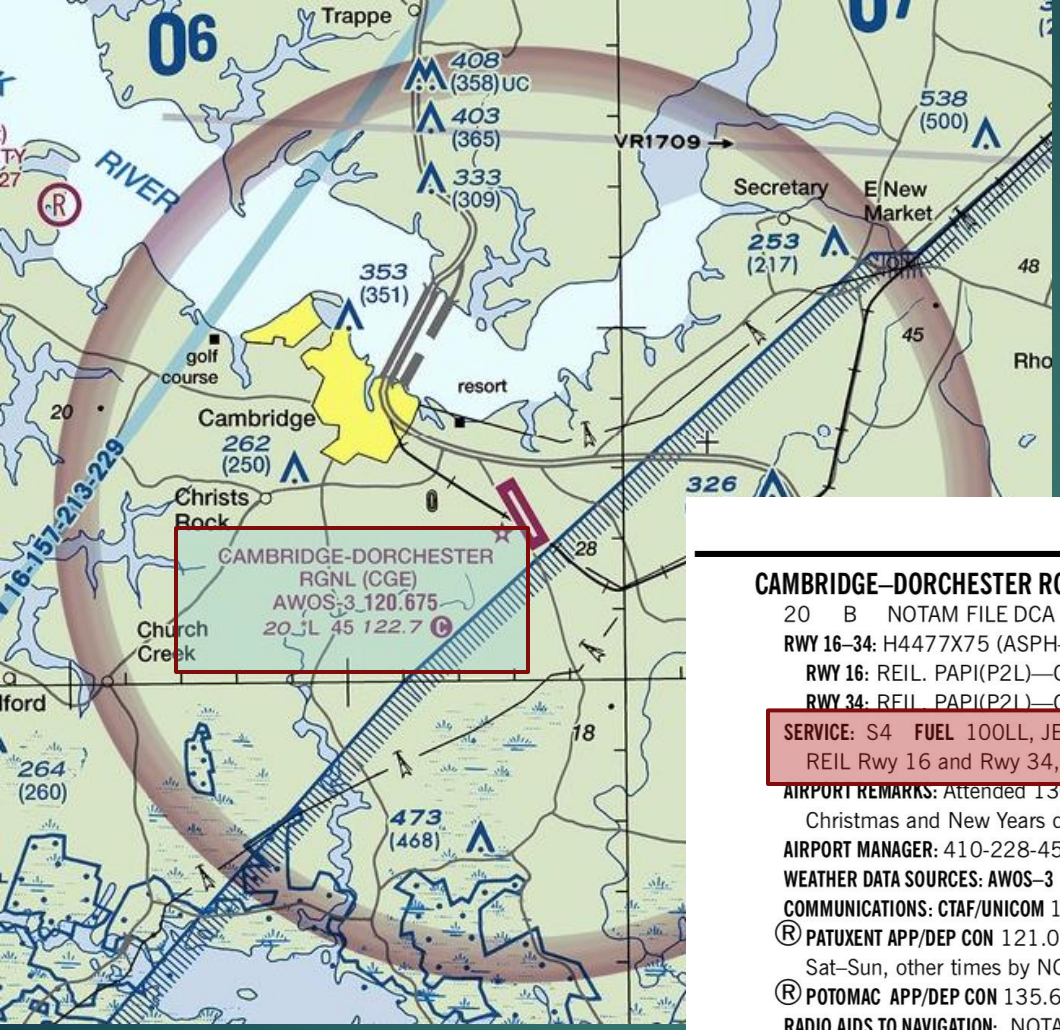
white + white + green

Heliport

Green + yellow + white

Pilot Controlled Runway Lighting

TURNER (9U0) 1 NE UTC–7(–6DT) N48°51.25′ W108°24.54′ **BILLINGS**
3049 B S4 **FUEL** 100LL **L-9C**
RWY 06-24: H3600X60 (ASPH) S-4 MIRL
RWY 06: Road. **RWY 24:** PAPI(P2L)—GA 3.0° TCH 38′. Antenna.
RWY 10-28: 2680X90 (TURF)
RWY 10: Fence. **RWY 28:** Fence.
AIRPORT REMARKS: Attended dawn–dusk Mon–Fri. Rwy 10–28 marked with white cones full length thlds marked with red cones. MIRL Rwy 06–24 and PAPI Rwy 24 opr dusk–0500Z‡, after 0500Z‡ ACTIVATE MIRL Rwy 06–24 and PAPI Rwy 24—CTAF.
COMMUNICATIONS: CTAF 122.9
GREAT FALLS FSS (GTF) TF 1–800–WX–BRIEF. NOTAM FILE GTF.
RADIO AIDS TO NAVIGATION: NOTAM FILE HVR.
HAVRE (L) VORW/DME 111.8 HVR Chan 55 N48°32.43′ W109°46.20′ 054° 57.3 NM to fld. 2580/16E.



CAMBRIDGE–DORCHESTER RGNL (CGE)(KCGE) 3 SE UTC–5(–4DT) N38°32.36′ W76°01.82′ WASHINGTO
20 B NOTAM FILE DCA L–34F, 36I,
IA

RWY 16–34: H4477X75 (ASPH–GRVD) S–14 MIRL
RWY 16: REIL. PAPI(P2L)—GA 3.5° TCH 46′. Trees.
RWY 34: REIL. PAPI(P2L)—GA 3.25° TCH 35′. Road.

SERVICE: S4 **FUEL** 100LL, JET A **LGT** ACTIVATE MIRL Rwy 16–34, REIL Rwy 16 and Rwy 34, and PAPI Rwy 16 and Rwy 34—121.9.

AIRPORT REMARKS: Attended 1300–2200Z‡. Unattended Thanksgiving, Christmas and New Years day.

AIRPORT MANAGER: 410-228-4571

WEATHER DATA SOURCES: AWOS–3 120.675 (410) 228–7559.

COMMUNICATIONS: CTAF/UNICOM 122.7

Ⓡ **PATUXENT APP/DEP CON** 121.0 (1200–0400Z‡ Mon–Fri, 1300–2300Z‡ Sat–Sun, other times by NOTAM, other times ctc)

Ⓡ **POTOMAC APP/DEP CON** 135.625 135.629

RADIO AIDS TO NAVIGATION: NOTAM FILE DCA.

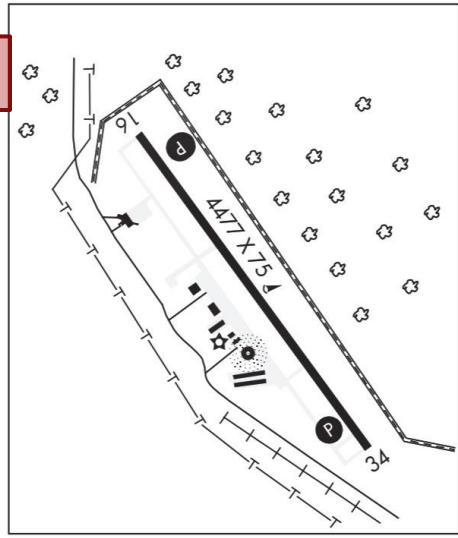
PATUXENT (L) VORTAC 117.6 PXT Chan 123 N38°17.27′ W76°24.01′ 059° 23.1 NM to fld. 18/10W.

VOR unusable:
023° byd 10 NM blo 2,500′
024°–174° byd 11 NM blo 2,500′
175°–239° byd 10 NM blo 5,000′
240°–347°
348°–022° byd 11 NM blo 2,500′

TACAN/DME portion unusable:
150°–155° byd 25 NM blo 2,500′
155°–237° byd 11 NM blo 2,500′

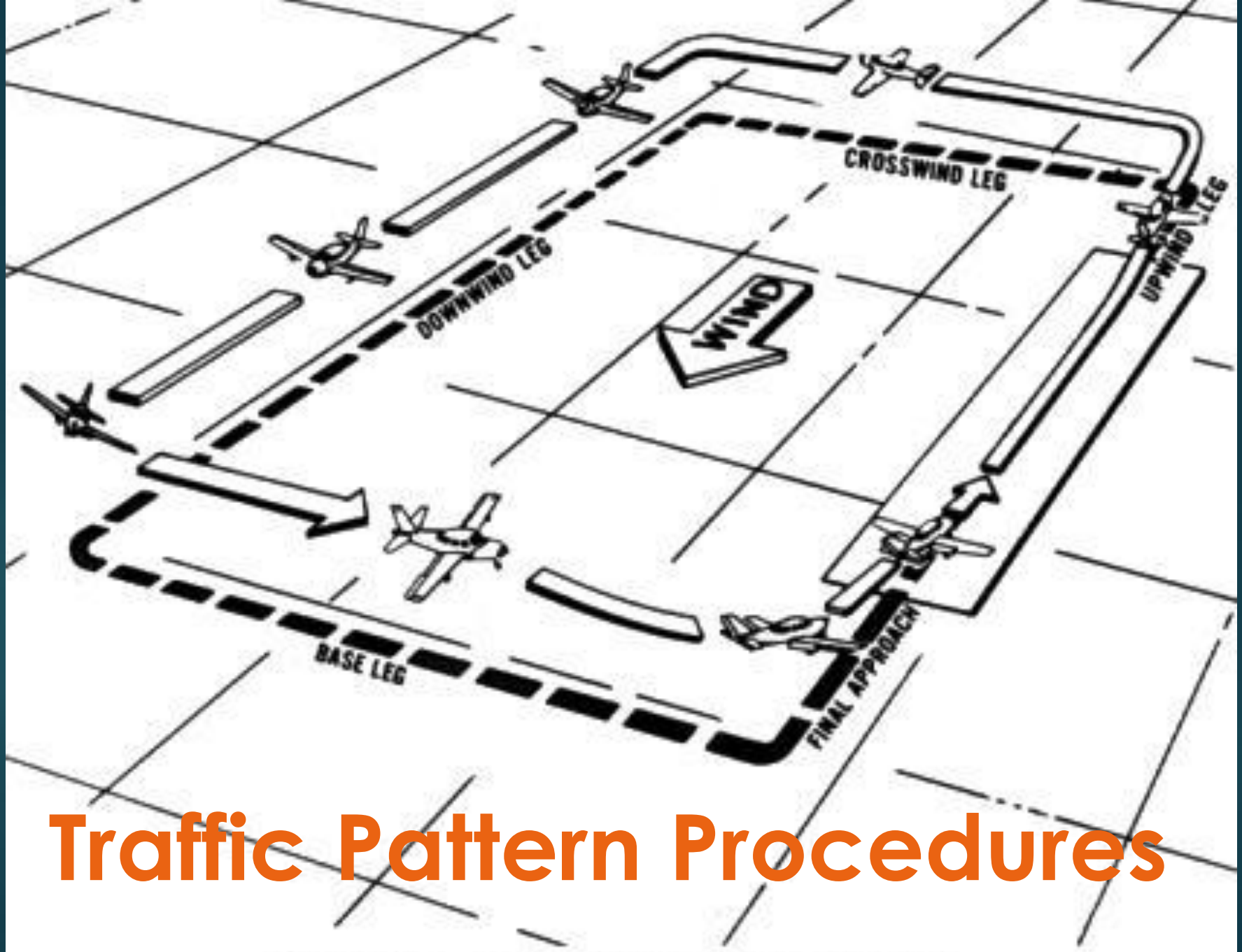
NDB (MHW) 355 CGE N38°32.23′ W76°01.83′ at fld. 20/10W.

COMM/NAV/WEATHER REMARKS: For Clnc Del when NHK Apch is clsd ctc Potomac Apch at 866–640–4124.



CARROLL CO RGNL/JACK B POAGE FLD (See WESTMINSTER on page 115)

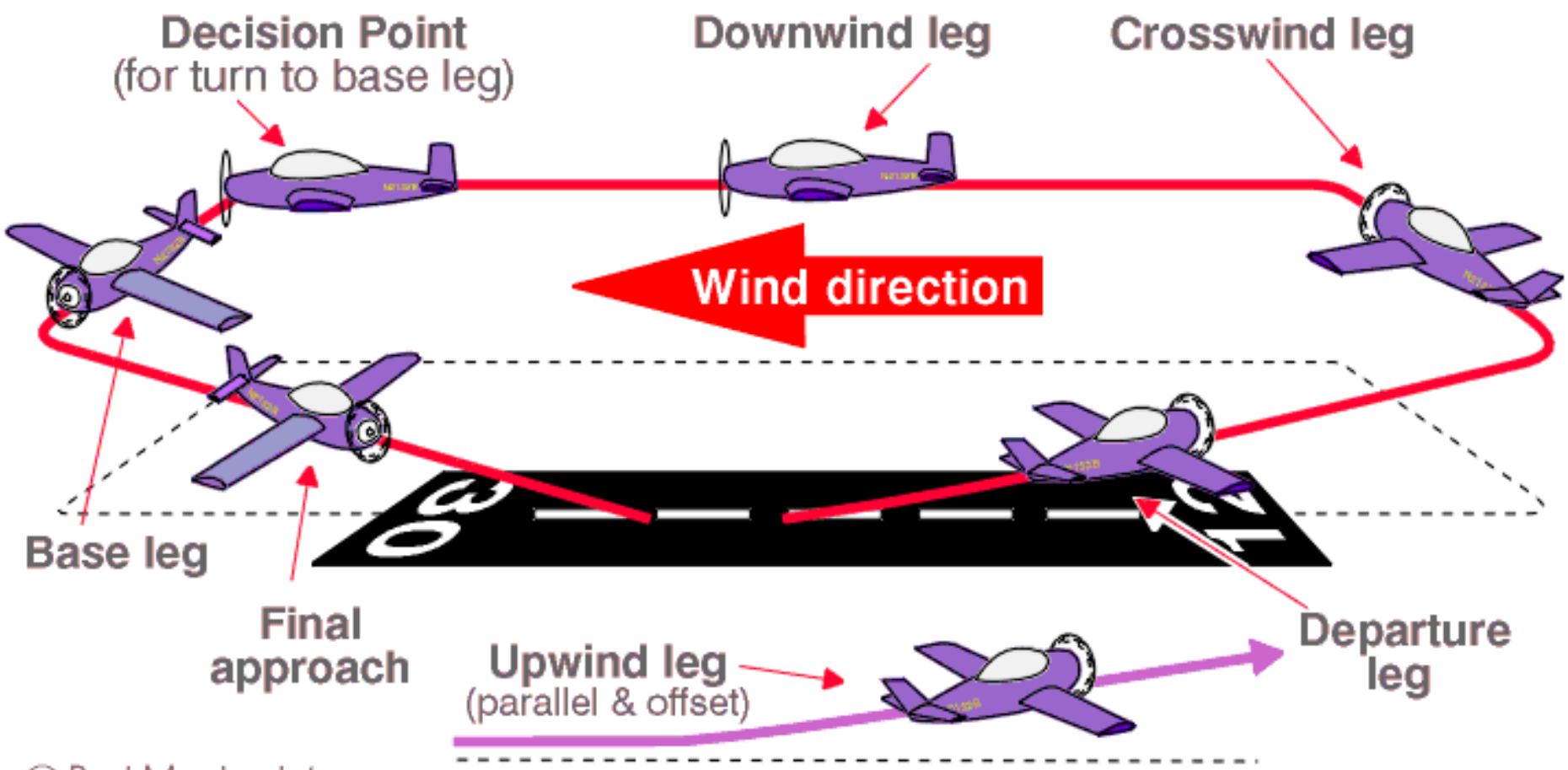
Cambridge (CGE)



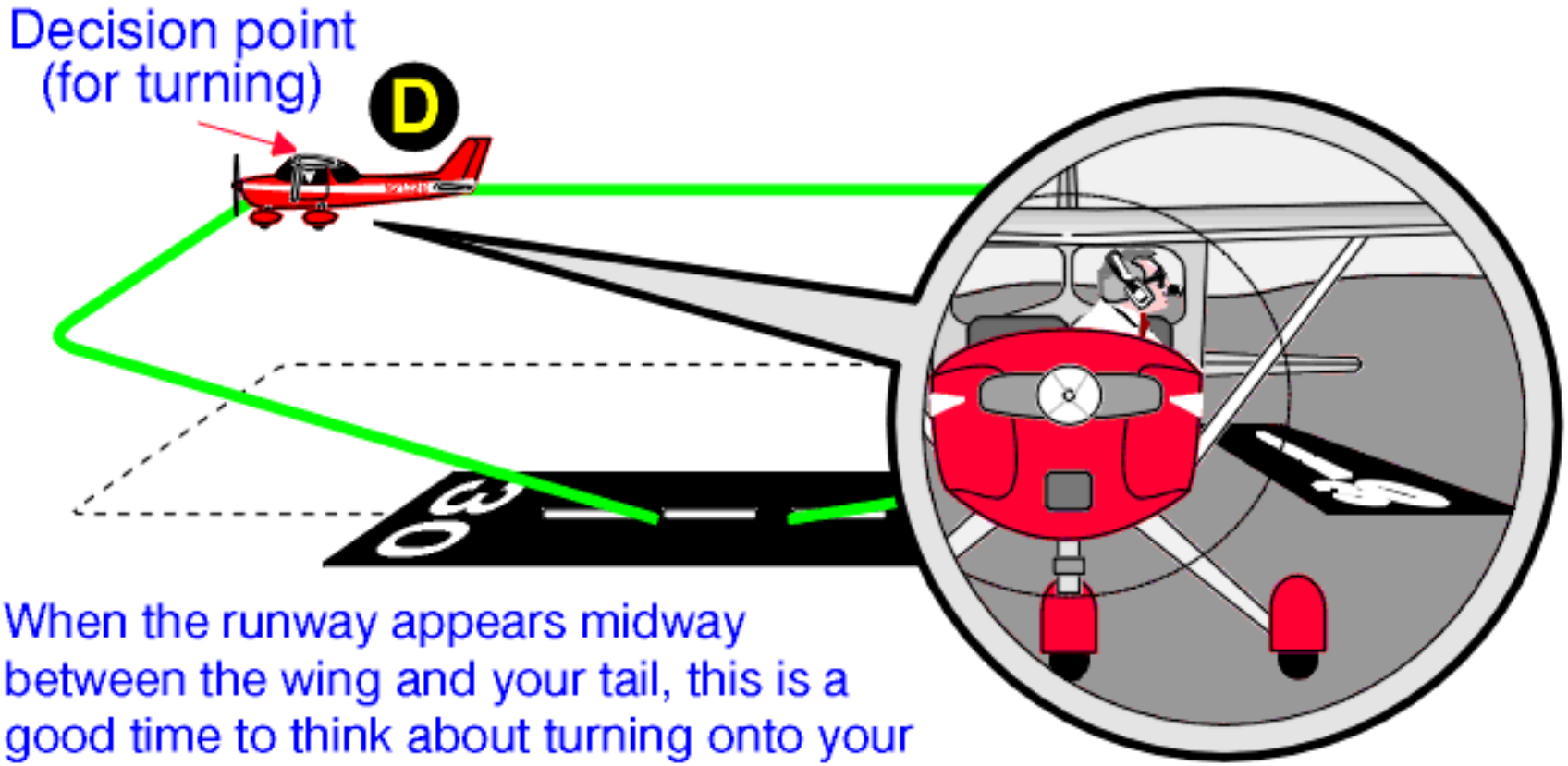
Traffic Pattern Procedures

Figure 7–2 Basic Rectangular Traffic Pattern

THE TRAFFIC PATTERN

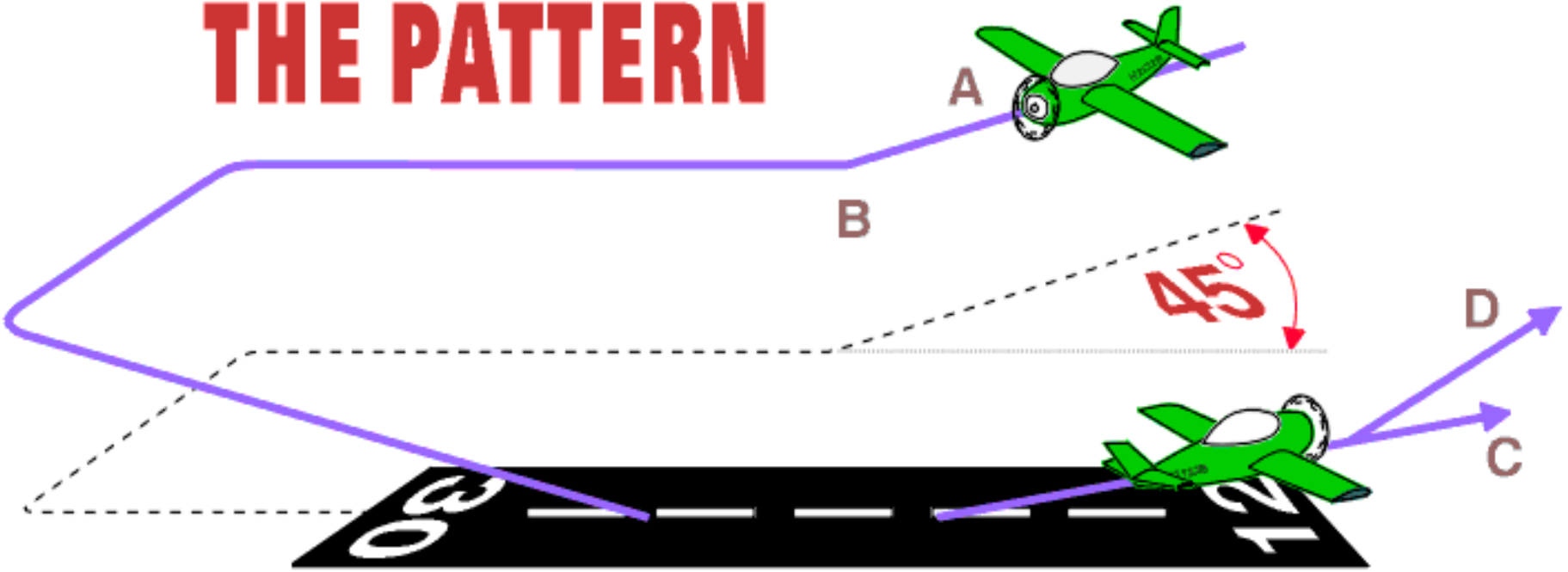


THE TRAFFIC PATTERN



When the runway appears midway between the wing and your tail, this is a good time to think about turning onto your base leg.

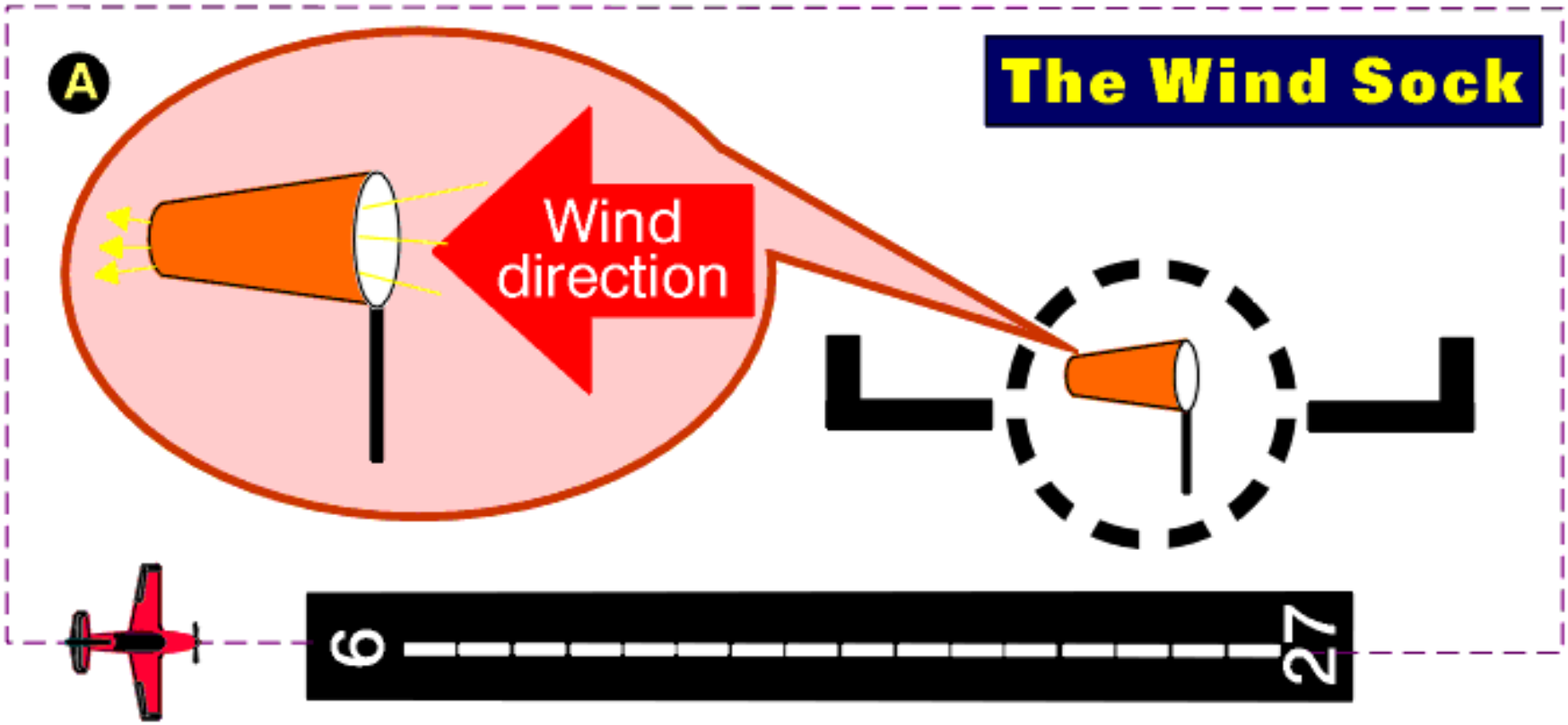
ENTERING & DEPARTING THE PATTERN



Enter the traffic pattern at a 45 degree angle (A) to the downwind leg about midfield (B). When departing an airport, make either a straight out (C) or a 45 degree turn in the direction of the pattern (D) when reaching pattern altitude.

Wind & Traffic Pattern Directional Indicators

LANDING & WIND DIRECTION INDICATOR

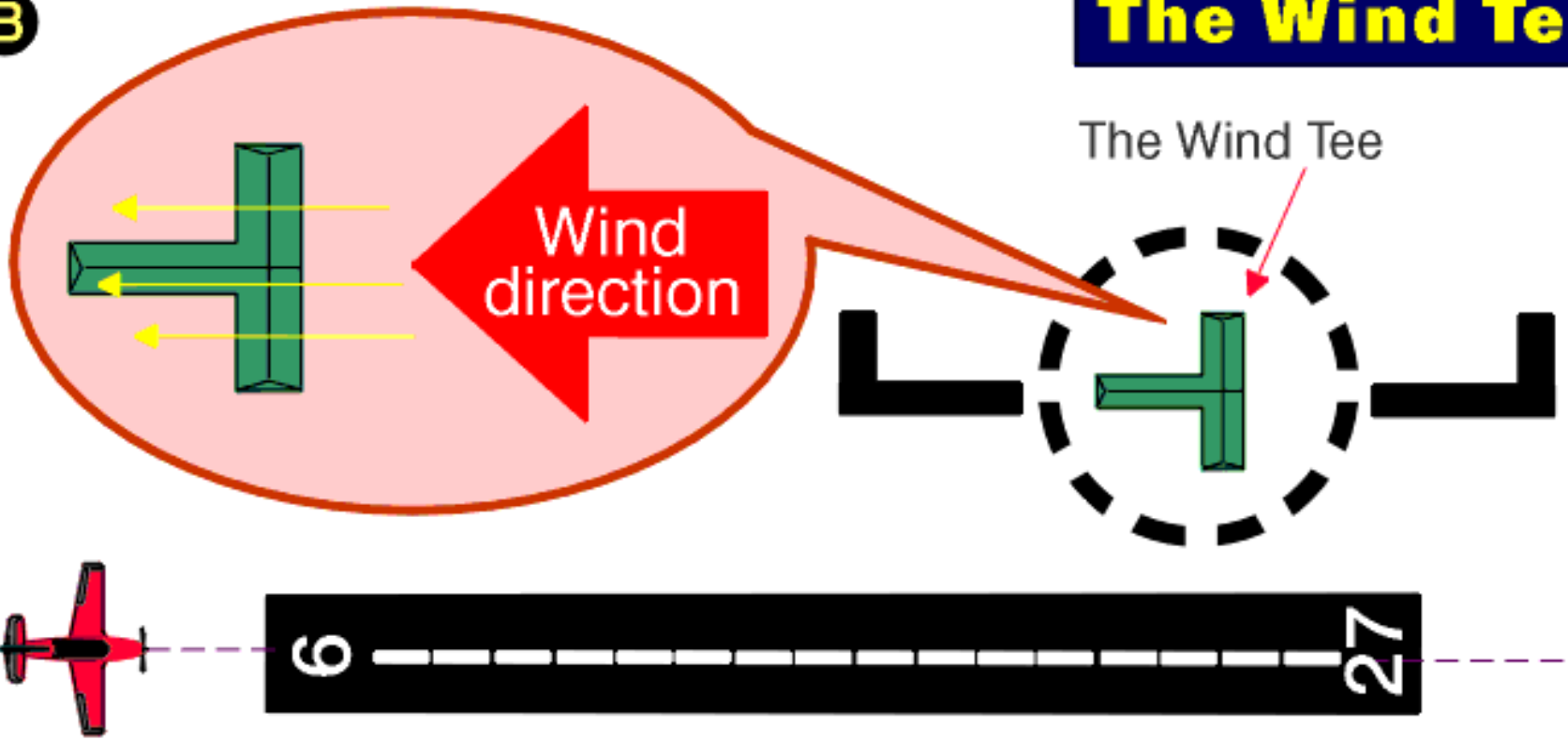


The wind cone (or wind sock) aligns itself parallel to the wind. The small end or opening points downwind and the big end (the opening) is upwind. To decide on wind direction, simply look at which way the small end points. This is the direction the wind is blowing. You'll land into the wind.

7-24A

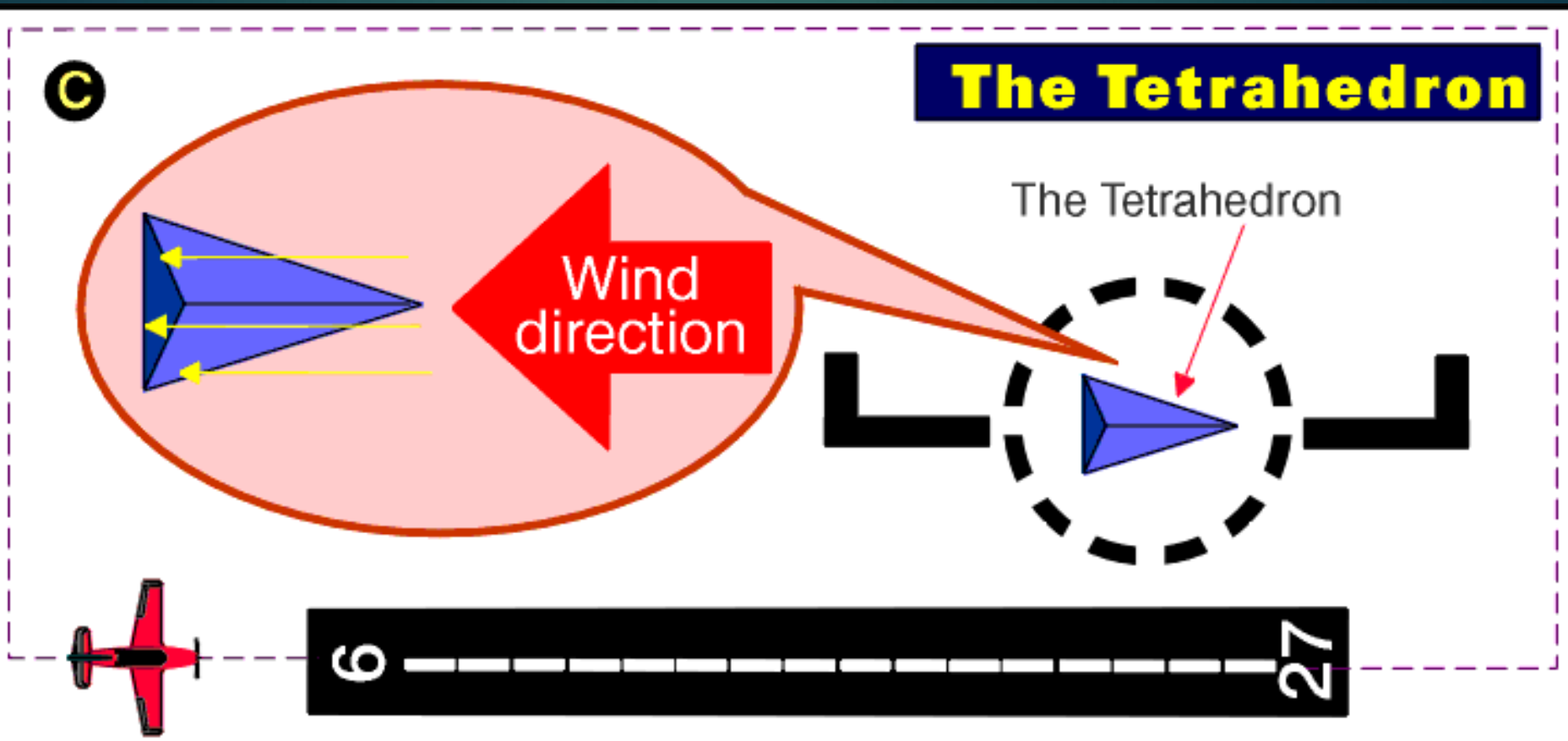
B

The Wind Tee



The wind tee is free to rotate into the wind. Think of its shape as an airplane that points in the direction you should land (into the wind). The wind tee may be manually rotated by airport personnel to identify the proper landing direction. It may also be tethered, unattended and completely inaccurate! Use caution when using it to assess landing direction.

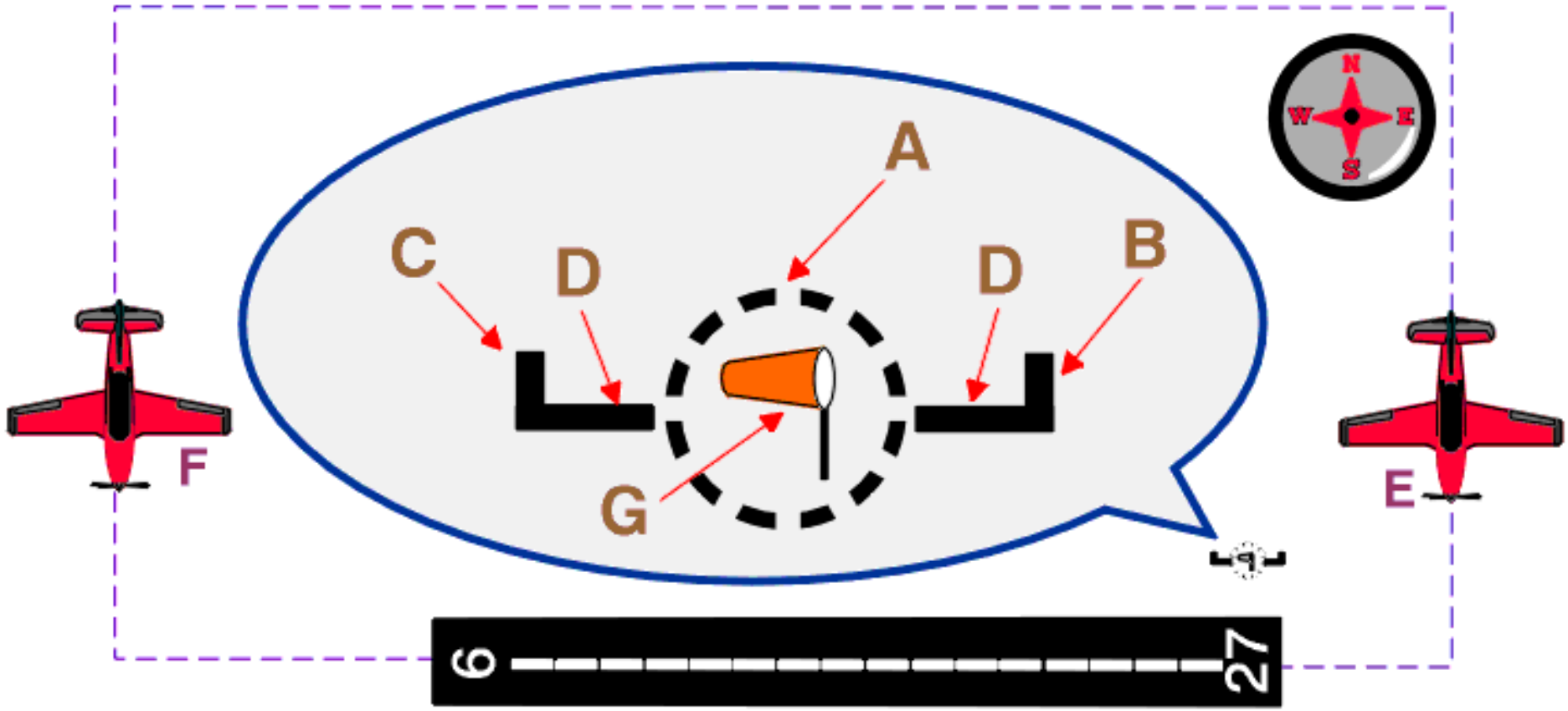
6XS2 | Copyright by Luscombe Acres Owner-Dean Johnson | 2011-04-10 | Airport-Data.com



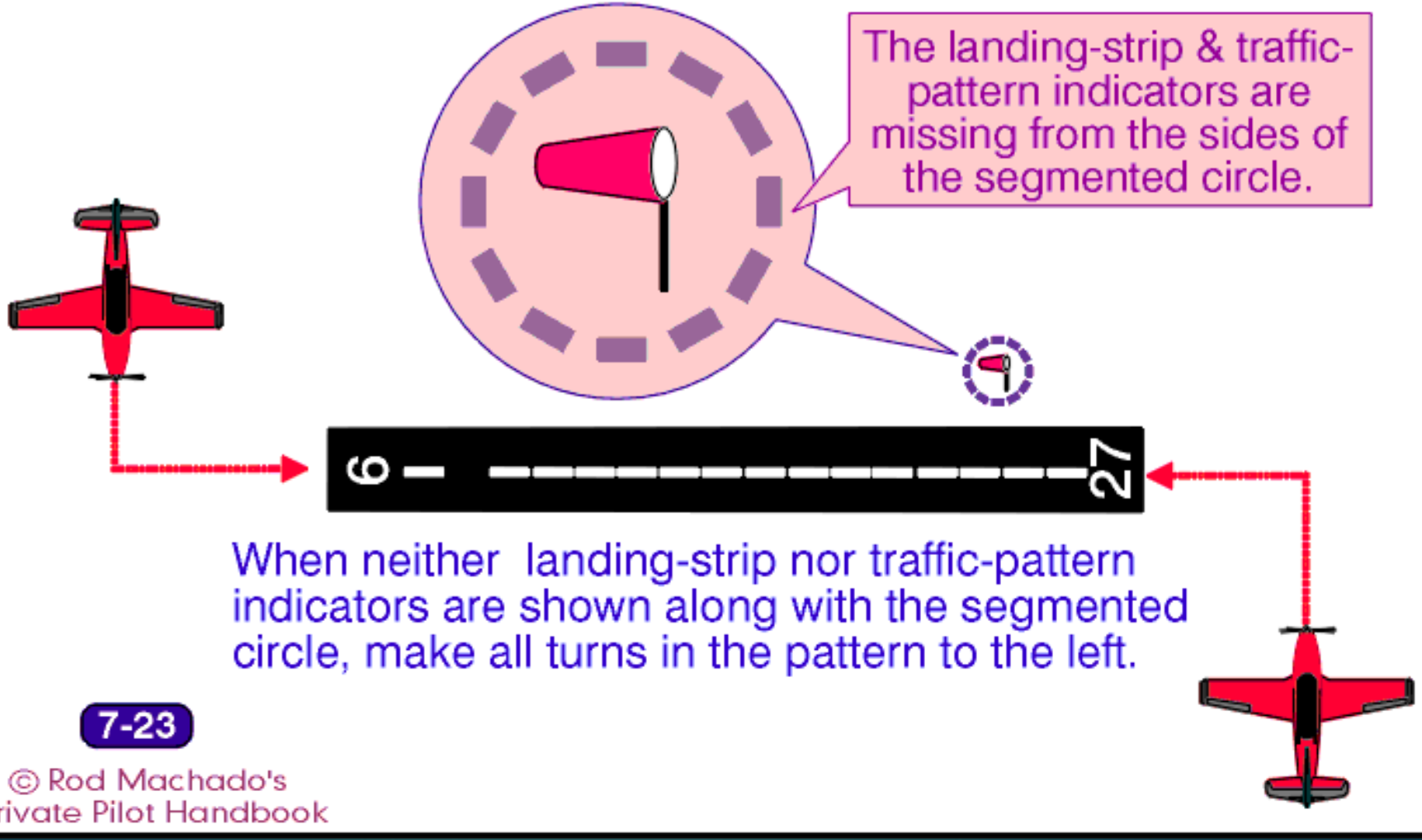
The tetrahedron points in the direction you should land (or it is manually pointed in the direction you should land). It is mounted on a swivel and can pivot, and like the wind tee, its reliability is questionable during light winds.

The Segmented Circle

THE SEGMENTED CIRCLE

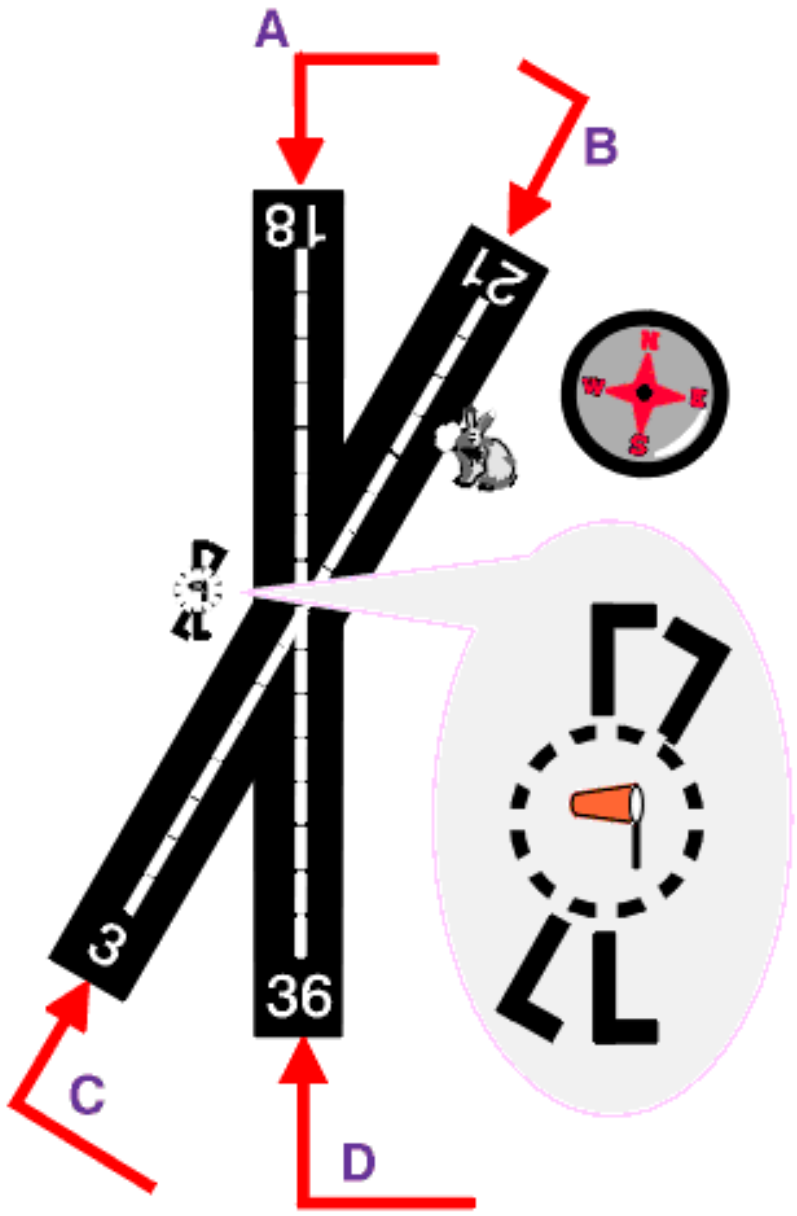


THE SEGMENTED CIRCLE
(indicating standard, left-hand traffic)



TRAFFIC PATTERN INDICATORS (Multiple Runways)

The landing strip & traffic pattern indicator informs the pilot that the pattern for:
Runway 18 (A), is left traffic,
Runway 21 (B,) is right traffic,
Runway 3 (C), is right traffic and
Runway 36 (D), is right traffic.



FORT MEADE(ODENTON)

TIPTON (FME)(KFME) 1 SW UTC–5(–4DT) N39°05.12′ W76°45.56′

WASHINGTON
COPTER
L–29E, 34F, 36I, A
IAP

150 B TPA—1000(850) NOTAM FILE FME

~~**RWY 10–28:** H3000X75 (ASPH) MIRL 1.2% up E~~

RWY 10: REIL. PAPI(P2L)—GA 4.0° TCH 51′. Trees. Rgt tfc.

RWY 28: REIL. PAPI(P2L)—GA 4.0° TCH 57′. Trees.

SERVICE: S2 **FUEL** 100LL, JET A+ **LGT** ACTIVATE REIL Rwy 10 and Rwy 28; MIRL Rwy 10–28—CTAF.

AIRPORT REMARKS: Attended 1330–2300Z‡. 24 hr self svc 100LL avbl with credit card. 24 hr self svc Jet A+ avbl with credit card. Deer on rwys and twys. Be alert for numerous BWI turbojet arrivals/departures in the area. Fly tfc pattern south of the fld to avoid BWI Class B Airspace. Remain clear of BWI Class B Airspace until clnc is obtained. PAEW adjacent all twys and Rwy 10–28 indef. PAPI Rwy 10 unusable 8° left and right of course. Rwy 28 PAPI unusable 5° left (trees) and 8° right of course.

AIRPORT MANAGER: 410-222-6815

WEATHER DATA SOURCES: AWOS–3 123.925.

COMMUNICATIONS: CTAF/UNICOM 123.05

Ⓡ **POTOMAC APP/DEP CON** 119.7

RADIO AIDS TO NAVIGATION: NOTAM FILE BWI.

BALTIMORE (L) VORTAC 115.1 BAL Chan 98 N39°10.26′ W76°39.68′ 233° 6.9 NM to fld. 150/11W.

TACAN AZIMUTH & DME unusable:
133°–155° byd 20 NM blo 10,000′
300°–349° byd 35 NM

TACAN DME unusable:
133°–155° byd 36 NM

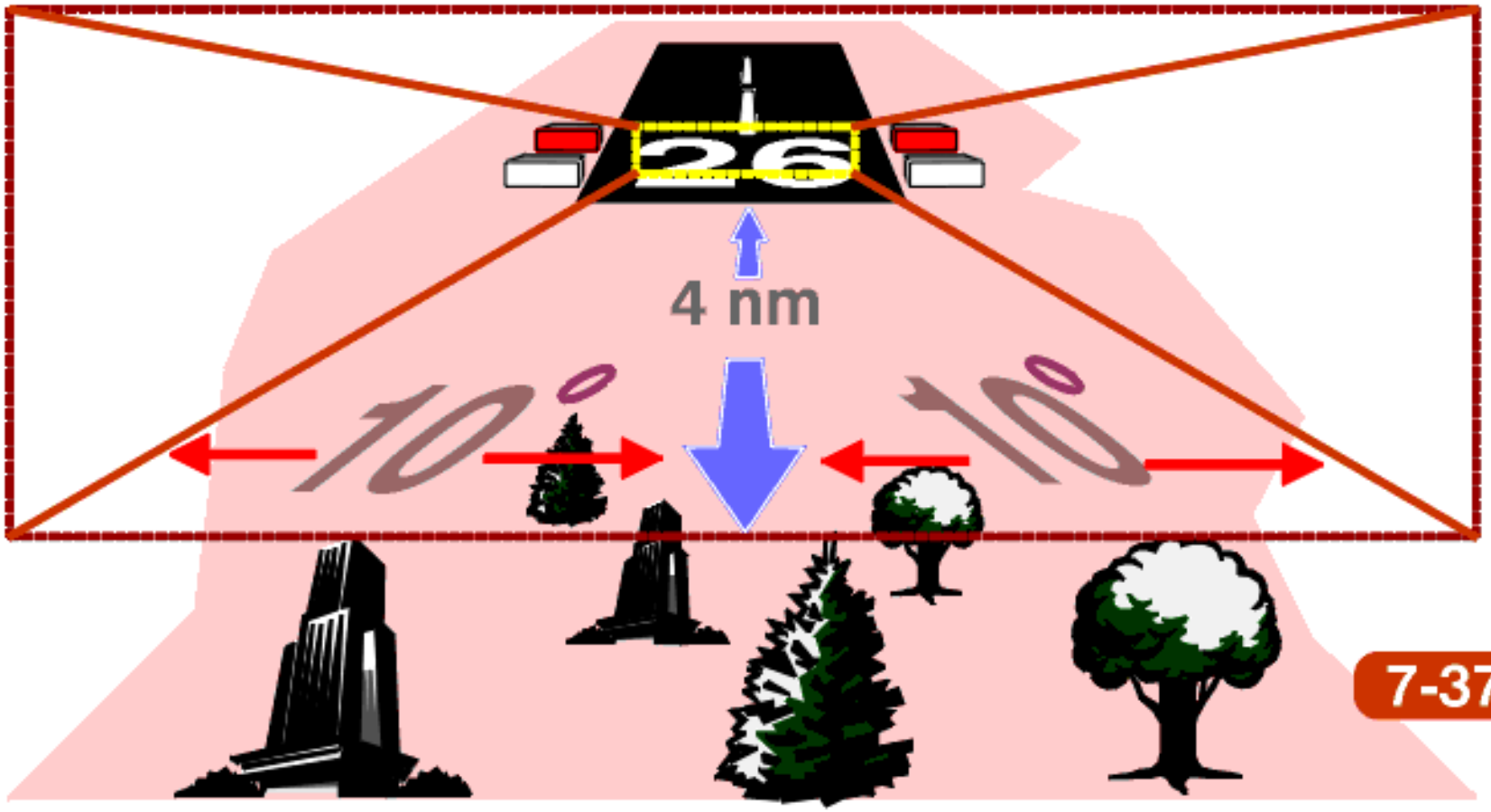
VOR unusable:
133°–155° byd 20 NM blo 10,000′
197°–217° byd 17 NM
282°–292°

TACAN AZIMUTH unusable:
029°–042° byd 30 NM
180°–190° byd 17 NM

COMM/NAV/WEATHER REMARKS: For Clnc Del ctc Potomac Apch at 866–429–5882.

Approach Indicating Systems

VASI PROTECTED AREA



7-37

The VASI provides you with obstacle clearance for plus or minus 10 degrees either side of the runway centerline for 4 nautical miles.

THE 2-BAR VASI
(Visual Approach Slope Indicator)

A *red over red* indication on the VASI means you're below glide path. Think, "red over red, you'll soon conk your head."

A *red over white* indication on the VASI means you're on the proper glide path. Think, "red over white, you'll be all right."

A *white over white* indication on the VASI means that you're above the proper glide path. Think, "white over white you'll soon be out of sight."

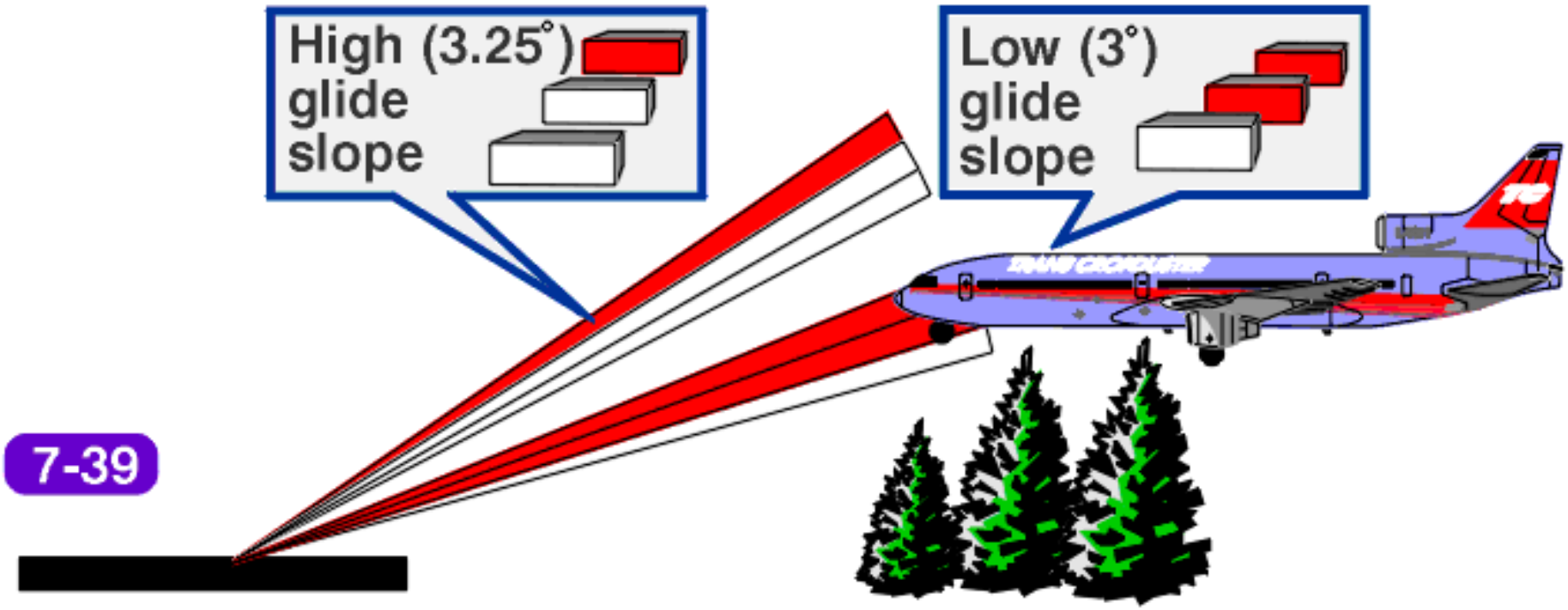
VASI in Flight

THE 3-BAR VASI
(Visual Approach Slope Indicator)

Smaller aircraft use the lower glide path giving them a 3 degree glide slope.

Larger aircraft use the higher glide path giving them a 3.25 degree (or higher) glide slope.

THE 3-BAR VASI



When flying the lower glide slope (he should be on the upper one), the captain of this airliner is on glide path while the rest of his long-bodied airplane is below glide slope. This is why many large aircraft use the high glide slope for landing.

PAPI
Precision Approach Path Indicator

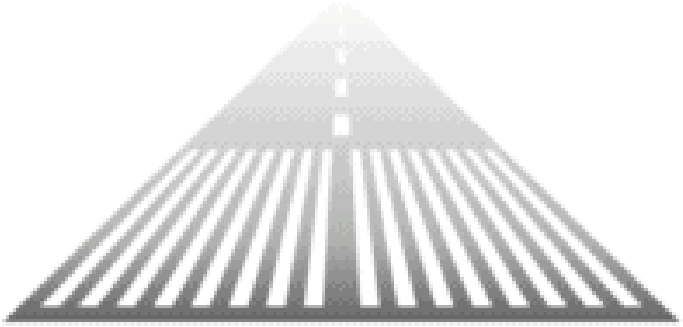
Below A 2.5 Degree Glide Path

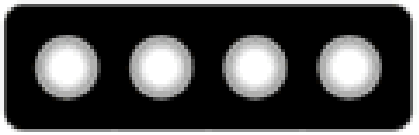
On A 3 Degree Glide Path

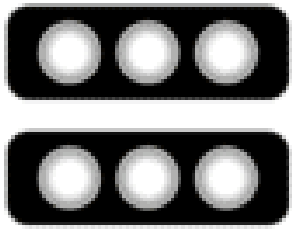
Above A 3.5 Degree Glide Path

PAPI VASI

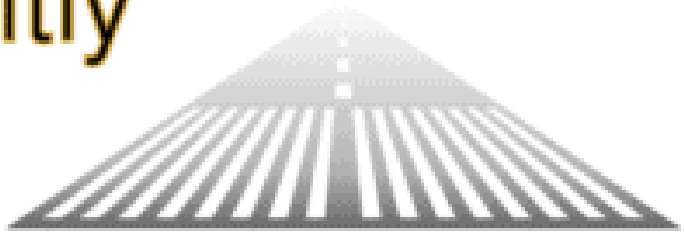
1. Too high

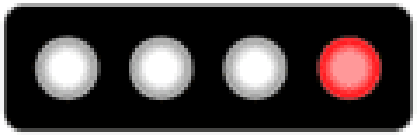


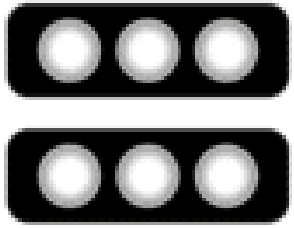




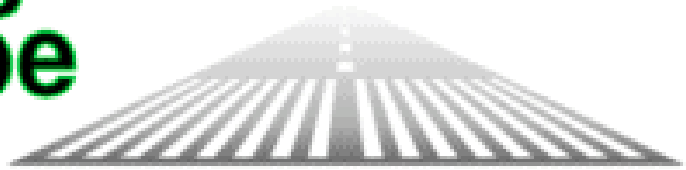
2. Slightly high

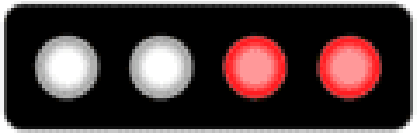


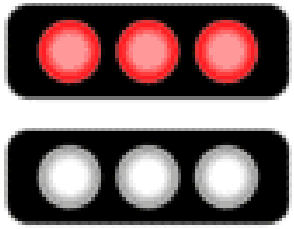




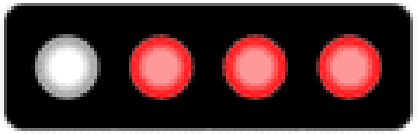
3. On glide slope

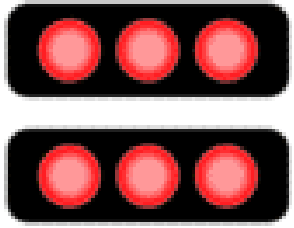






4. Slightly low





VASI in Flight

Right of Way

- When weather conditions permit, regardless of whether an operation is conducted under IFR or VFR, vigilance shall be maintained by each person operating an aircraft so as to **see-and-avoid** other aircraft

- When a rule of this section gives another aircraft the right-of-way, the pilot shall give way to that aircraft and may not pass over, under, or ahead of it unless well clear

Right of Way Rules

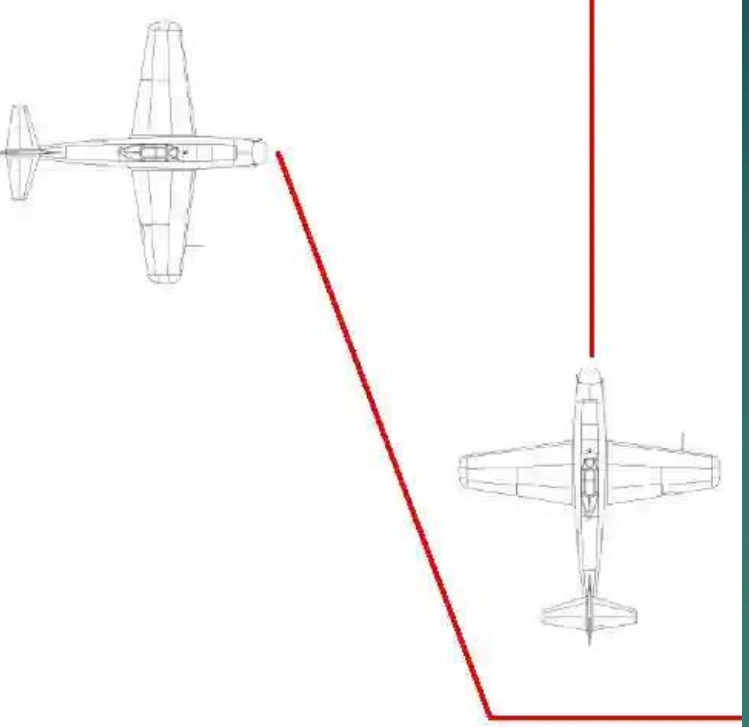
- When aircraft of the same category are converging at approximately the same altitude, the aircraft to the others right has the right of way

- If the aircraft are of different categories, refer to the "BIG R" (BGAAR) list for right of way precedence

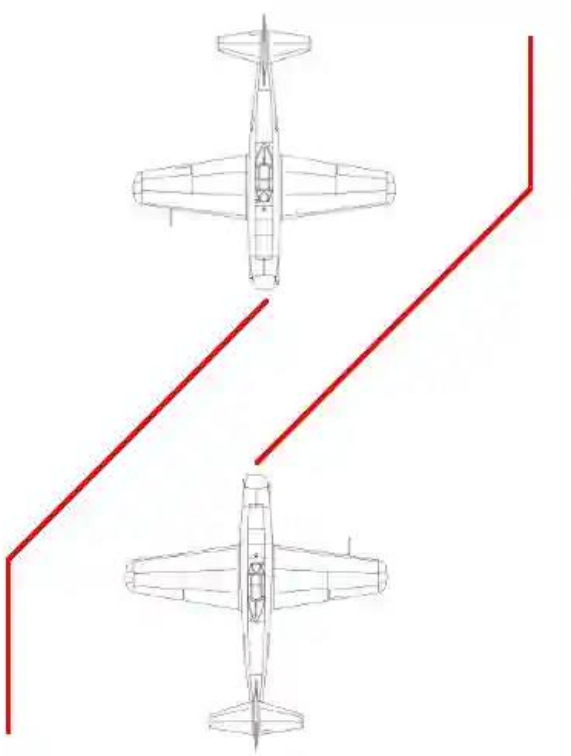
  - **B**alloons
  - **G**liders
  - **A**irship
  - **A**irplanes/**R**otorcraft

Right of Way Rules

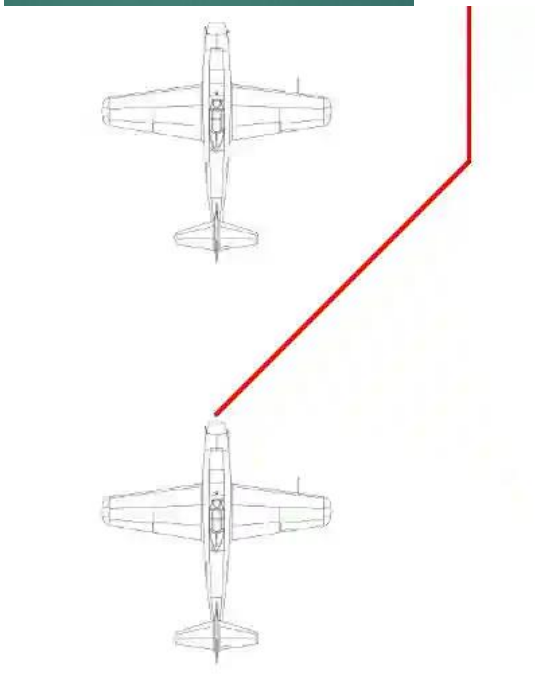
- When approaching head-on each pilot shall alter course to the right
- An aircraft being overtaken has the right of way. The pilot of an overtaking aircraft shall alter course to the right to pass well clear
- An aircraft towing or refueling other aircraft has the right-of-way over all other engine-driven aircraft
- An aircraft in distress has the right-of-way over all other traffic



An aircraft that is being overtaken has the right of way.



- When aircraft of the same category are converging at approximately the same altitude, the aircraft to the others right has the right of way



- When approaching head-on or near head-on each pilot shall alter course to the right

Right of Way when Landing

- Aircraft, while on final to land or while landing have the right of way
- This does not mean a landing aircraft can force a plane that just landed and is rolling out towards a taxiway to hasten its exit. The plane on final should go around
- When two or more aircraft are on final approach, the lowest aircraft has the right of way
- This rule is not to be taken advantage of to cut in front of or overtake another aircraft

Next Session: Feb 19

- Quiz: Flight Instruments
- Presentation: Aviation Charts
- Reading:
  - Machado Chapter 10
  - Pilot's Handbook Chapter 16
  - FAA Chart User Guide