

JEPP'S BRIEFING



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It's been called the bird's eye view. It's been called God's view. It is also known as the over view. There probably have been many other names used to describe the plan view. It is the view from high above and is the only portion of the chart that is to scale. It probably can be considered the part of the chart that gives the best overall orientation for the approach procedure.

Terrain

On the Bozeman, Montana ILS Rwy 12 approach chart, the large areas shown in brown represent terrain information. In the early 1990s, Jeppesen began depicting terrain in a brown color on all the approach charts that met the criteria of a terrain-critical airport. In order for terrain to be depicted on the approach chart, there must be terrain within the plan view that is at least 4,000 feet above the airport or terrain that reaches 2,000 feet above the airport and is within six miles of the airport. If there is terrain on any one approach chart for an airport that qualifies for terrain, then all the approach charts for that airport will have the terrain depicted even though one of the charts might not otherwise qualify.

It is interesting to note that the terrain is depicted in brown, and not green. Green was formerly used to depict terrain on the area charts when terrain was first introduced on the area charts in 1975. When it was decided to depict the terrain on approach charts, a study was made and the first prototype terrain approach charts were given to a number of pilots. The first charts were printed with green terrain and another set were printed with brown terrain.

The pilots in the testing program were first given the charts in both green and brown and were asked if they preferred the green terrain or the brown terrain. The majority said they preferred green (which was our first preference.) Then the pilots were given the same set of charts to be flown in the simulator. There were flight instructors who gave many clearances to simulate ATC vectors that came close to the terrain.

After the simulator tests, the evaluation pilots were then asked again if they preferred the green or the brown. What we discovered was an amazing change. The

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large majority of pilots chose the brown over the green even though they had chosen the green before the simulator ride. The evaluators asked why brown instead of green and why they changed their minds. Comments came back "Green is too pastoral. Brown scares me." "The brown colored terrain is serious."

As a result of the tests, the terrain is now depicted in brown. Once it has been established that the terrain will be depicted on a chart, the first contour level is the first 1,000 level above the airport elevation. At Bozeman, since the airport elevation is 4,474 feet, the first contour level is 5,000 feet. The terrain contours are spaced at 1,000-foot intervals. Each contour is labeled with the MSL value. The areas between the contour lines are printed in brown with increasing levels of color intensity as the elevations change so the darkest color of brown is the highest level.

Note on the ILS approach chart for Bozeman that the highest elevation in the plan view is 7,133 feet. This peak is less than 4,000 feet above the airport elevation, but the chart has contours on it. Because the VOR Rwy 12 approach chart at Bozeman has an elevation of 9,650 feet in the plan view and it is considerably higher than 4,000 feet above the airport, it qualifies for contours. Therefore, all approach charts into Bozeman then get the colored terrain contours.

Other Details on the Plan View

The longitude for the plan view area is included on the bottom edge of the plan view and the latitude is provided on the left edge. Before the mid 1970s, Jeppesen charts included city patterns, major highways, and railroad tracks. They were dropped after a Jeppesen seminar when it was decided the charts were primarily IFR and not VFR. The congestion was reduced and now only large rivers and bodies of water are included in the plan view. Additionally, reference points such as towers, tall buildings, antennas, and other objects are included with their elevations for orientation to the area over which the instrument approach is conducted. Minimum altitudes of the instrument approach provide prescribed clearances of terrain and structures beneath the flight path.

Procedure Turn

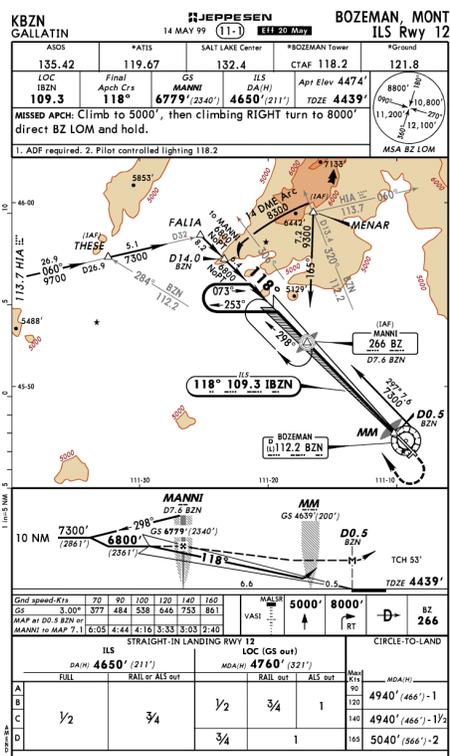
A procedure turn is depicted on Jeppesen approach charts with the outbound and inbound headings at 45 degree angles to the approach course. At Bozeman, after tracking the localizer outbound from MANNI, the heading away from the localizer is 253° and the heading used to intercept the localizer course inbound at the completion of the turn is 073°. The procedure turn is prescribed when it is necessary to reverse direction to establish the aircraft inbound on an intermediate or final approach course. It is a required maneuver, except under the following conditions:

1. The symbol "NoPT" is shown.
2. Radar vectoring is provided.
3. A one-minute holding pattern is published in lieu of a procedure turn.
4. A teardrop course reversal is depicted.
5. The procedure turn is not authorized.

The altitude prescribed for the procedure turn is a minimum altitude until the aircraft is established on the inbound course. The maneuvering must be completed within the distance specified in the profile view and on the same side as the procedure turn symbol.

Although 45° turns are provided on the approach chart for the procedure turn, the point at which the turn may be started and the type and rate of turn are left to the discretion of the pilot. When a procedure turn is depicted, there are various options. In addition to the procedure turn, the race track pattern or the teardrop procedure turn can be substituted. However, when a holding pattern or teardrop procedure turn is depicted, the holding pattern or the teardrop course reversal must be flown as shown on the chart.

There are a number of ways to transition to the ILS approach. If flying from the Bozeman VOR, the feeder route to the outer



marker is 297°, the minimum altitude is 7,300 feet, and the distance is 7.6 nautical miles. The depiction of this outbound track is a bit unusual. It is *offset* to the side of the localizer to better depict all the relevant information. At Bozeman, when flying from the VOR, it is required to fly a course reversal at the LOM. Since the procedure turn is shown with the heavy line used to depict the procedure turn, it is the primary course reversal. The holding pattern at the LOM is shown with a light line. The light line for the holding pattern indicates it is for the missed approach, not the primary course reversal.

There are a couple of routes that can be flown into Bozeman that don't require a course reversal. At the left of the plan view, the route from the Whitehall VOR (HIA) passes the THESE intersection and then proceeds to the FALIA intersection which is on the localizer. From FALIA, the letters NoPT are adjacent to the localizer. The letters NoPT stand for no procedure turn. NoPT is actually regulatory which means you must fly a straight-in approach from FALIA. If you need to make a course reversal because of excessive altitude, you must inform ATC since they are planning their spacing with other aircraft based on you proceeding straight in over the LOM.

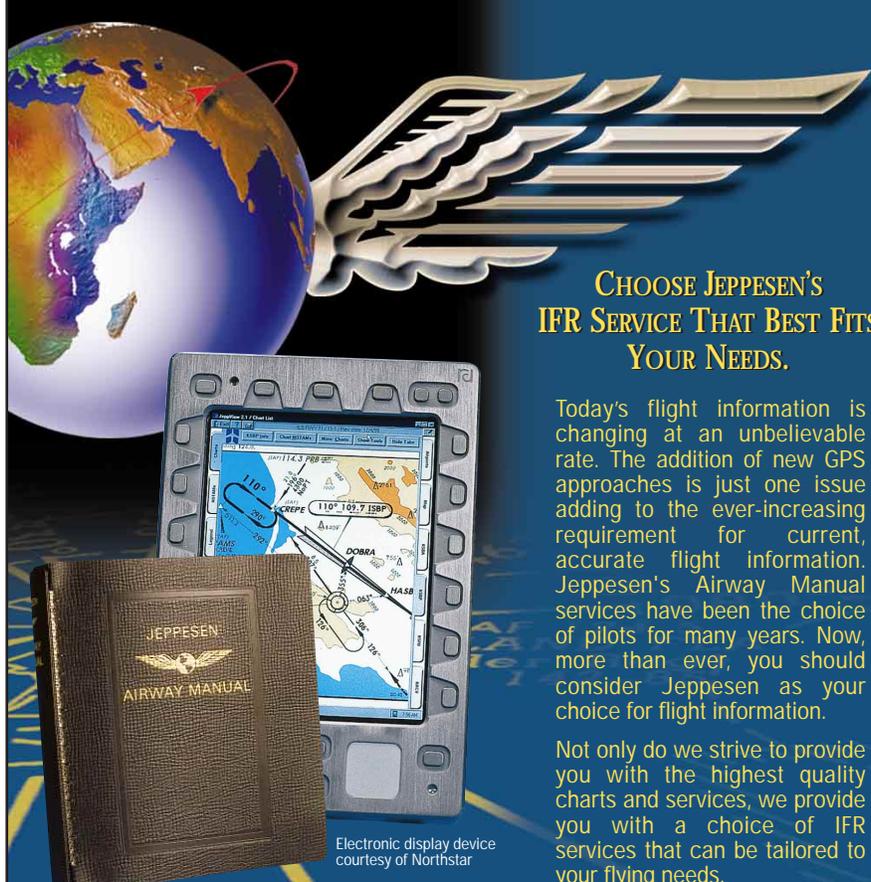
The THESE intersection is on V-343 so when flying to Bozeman on V343, no procedure turn is authorized (or required) from THESE. When approaching Bozeman from the northwest on V-365 (BZN 320° radial), you have a couple of options. If you have DME, you could fly the 14 DME arc to intercept the localizer. The minimum altitude on the DME arc is 8,300 feet which would be flown until intercepting the localizer. The lead-in radial (BZN 306°) was originally established by the FAA as the point where you would change your VHF navaid tuning from the BZN VOR to the IBZN localizer. If you have two nav receivers, that requirement doesn't really exist, but it is a good indicator to tell you that you are about to intercept the localizer.

What is the value of the 14.0 DME fix on the localizer? If you look closely, that is the end of the DME arc and the beginning of the segment on the localizer when flying from the DME arc. The altitude of 6,800 feet from 14.0 DME shows that you can descend to 6,800 feet after flying the DME arc and intercepting the localizer.

Can you begin your descent at the lead-in radial? Not really, since the FARs state that you can't descend to the next altitude until established on the next approach procedure course.

When approaching from the northwest on V-365 without a DME, you could begin your

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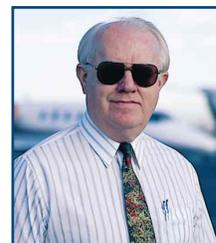
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approach at the MENAR intersection which is on V-365. At the MENAR intersection, you would proceed direct to the MANNI LOM at 9,300 feet or higher. Since the letters NoPT are not included on the feeder route from MANNI, you would be required to fly the procedure turn (or other course reversal) at MANNI.

In the next article, we will discuss the approach segments.



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