IFALPA
The Global Voice of Pilots

Air Traffic Services
Briefing Leaflet

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The RNAV Visual

IFALPA is strongly opposed to the current implementation of RNAV Visual approaches.

The concept of RNAV Visual approaches has merit but ICAO has yet to define Standards and Recommended Practices for this type of approach. Until these standards are established, there continues to be a lack of global harmonization in how these approaches are designed, approved, implemented, trained, and flown.

The Federation considers that, in their present form, these approaches are basically an attempted work-around of the ICAO requirements for PBN approaches, and that the lack of worldwide harmonization of these procedures represents a serious safety issue.

IFALPA recommends that pilots should request a different type of approach from ATC if offered an RNAV Visual; however, acknowledging that these procedures are flown on a daily basis, this Briefing Leaflet is provided to better inform the crews who choose to fly them.

RNAV Visual approaches were introduced through the US FAA to increase arrival rates by combining predictable flight paths with the benefits of a visual approach (reduced controller workload). The FAA also indicates that these approaches are designed to reduce the number of unstablized approaches by being more predictable to the pilot, thus improving energy management. Interestingly, these approaches have often had the opposite effect by increasing pilot workload during this final phase of a flight causing pilots to “fall behind” the aircraft and end up with too much energy and not enough time within the published track to achieve stabilized approach criteria.

The first approaches of this type were published in the USA (Atlanta- KATL, Las Vegas- KLAS, Boston- KBOS, etc.), but others have been implemented in various regions of the world. For example, there are four at Tel-Aviv LLBG/TLV, as well as one at Bordeaux LFBD/BOD.

An RNAV Visual Approach is comprised of a flight path requiring an FMS and use of ground based, space based or onboard navigation aids, followed by a visual track to landing.

These are very specific procedures which require the operator to obtain Civil Aviation Authority approval before its pilots can fly an RNAV Visual. And, pilots must be trained before flying one of these approaches. Because these RNAV Visual approaches are quite demanding, pilots should apply a high level of preparation and vigilance when flying them.

Fight Path

The general concept is based on maintaining a lateral flight path flown via RNAV waypoints, followed by a visual final approach segment. The published flight path must be maintained throughout the entire approach to touchdown. Additionally, the waypoints on the approach are typically "**fly by**" waypoints that require the turn to be started *prior* to the waypoint to intercept the subsequent track. If the crew delays the turn until over the waypoint ("**fly over**" waypoint), the aircraft will fly outside of the published track. If you find yourself unsure about waypoint symbology, an appropriate review of your chart provider's symbology legend may be helpful.

Altitude Control

A typical RNAV Visual approach depicts "at or above" altitudes at various waypoints along the flight path. This may require the pilot to calculate the desired descent rates between waypoints (increases pilot workload). Also, the pilot must report to ATC that the airport or preceding traffic is in sight in order to be given clearance for the RNAV Visual.

Traffic Separation

On all RNAV Visuals reviewed it remained unclear as to who holds responsibility for traffic separation throughout the approach. Therefore, if flying these approaches, the responsibility for traffic separation needs to be clarified with ATC.

Workload Management

Pilot workload increases substantially because the crew must maintain the "at or above" altitudes, observe any speed restrictions, maintain sight of the preceding aircraft or airport, maintain the published lateral flight path, and fly a stabilized approach. Consequently, this type of approach can be significantly more demanding than the relatively routine "radar vectors" to final.

Glide Path

Per the FAA, all RNAV Visual approaches in the US must have a visual (VASI, PAPI) or electronic (ILS) vertical guidance system. All of the RNAV Visual approaches reviewed from other regions of the world have PAPI's available for vertical guidance; however, it is not certain if this is a design requirement or coincidence. If the RNAV Visual approach that you are intending to fly has no vertical guidance whatsoever, plan accordingly.

Potential for Confusion

RNAV Visual Chart Naming: Pilots should be keenly aware that RNAV Visual approaches do not follow the ICAO standard for approach designation (ILS Z, VOR A, RNAV GPS Y, ILS 23L, etc.). Most of the RNAV Visual approaches in the US are named using a "RNAV Visual Rwy XX" convention that appears like this: "RNAV Visual Rwy 19R". Bordeaux (BOD) uses this as well, however, Tel Aviv (TLV) tends to use the five letter identifier of the waypoint at which the pilot must be in visual sight of the surrounding terrain, followed by the remaining nomenclature: "Visual Rwy XX", e.g. "KEREN Visual Rwy 26". Because other types of approaches (non-visual) may appear very similar both in name, as well as appearance, pilots must be certain that the correct approach has been selected.

FMS Database and the RNAV Visual: The name of the RNAV Visual approach in the FMS database may also be confusing for similar reasons, and due to the limited number of characters allowed by FMS software, the approach name will usually be in an abbreviated form from what appears on the actual chart.

Jeppesen's FMS approach identifier appears as such: "R18L –V". If the V has already been used for a different approach, S will be utilized, e.g. "R18L-S". But other database providers may use a different naming convention. This, too, challenges the crew to identify the correct approach to be entered in the FMS when preparing the arrival, be it for an Instrument approach or a Visual RNAV. Additionally, the tracks should always be checked against the NAV display for accuracy, including speed and altitude constraints.

Approach Minimums

The only published minimums are the ceiling and visibility that are required to fly the approach. There is no DA or DH. Obstacle clearance is to be maintained visually by the flight crew.

Missed Approach

In the U.S., RNAV visual approaches will not have published missed approach procedures. You must prepare your action plan if you decide to discontinue the approach for whatever reason. The RNAV visual charts at Bordeaux and Tel Aviv do have published missed approach procedures.

Other Points

To further complicate matters, although these approaches are not circling approaches, some do require several turns while flying visually to final. Without ICAO Standards, what remains uncertain is whether or not these turns should be considered circling manoeuvres with the associated maximum speed and bank angle restrictions in order to preserve obstacle clearance. Or, is obstacle clearance assured by precisely flying the published track? On some RNAV Visuals such as ATL Rwy 26R, 210 knots is required until BAMBU which necessitates that the pilot make two turns from POORS at a speed that exceeds the maximum circling speeds for Category C and D (PANS-OPS), as well as Category C,D and E (TERPS).

Some approach charts indicate whether the approach was designed to ICAO PANS OPS provisions or TERPS standards. But this is inconsistently notated. It may be useful to note that there are differences between the two. These two charts show the Circling differences.

Note: TERPS is the FAA standard for approach design and provides a smaller circling radius than ICAO PANS-OPS primarily due to slower circling speeds.

Example: A Cat C aircraft has a PANS-OPS max speed and bank of 180kts/20degrees which results in a circling area radius of 4.2 NM. That same aircraft under TERPS is restricted to 145kts/20degrees which results in a 2.68NM radius - nearly a 1.5 NM difference.

PANS-OPS

Acft Cat	Min Vis	MOC/HAA	Max Speed/AOB	2 x Radius + Straight = CAR*
A	1.0 NM	295/ 394 ft.	100 KIAS/20º	1.38+.3 = 1.68 NM
B	1.5 NM	295/ 492 ft.	135 KIAS/20º	2.26+.4 = 2.66 NM
C	2.0 NM	394/ 591 ft.	180 KIAS/20º	3.70+.5 = 4.20 NM
D	2.5 NM	394/ 689 ft.	205 KIAS/20º	4.68+.6 = 5.28 NM
E	3.5 NM	492/ 787 ft.	240 KIAS/20º	6.24+.7 = 6.94 NM

At 2000'MSL, ISA+15 and 25KTS of added wind. NOTE: Visibility is presented in nautical miles.

TERPS

Acft Cat	Min Vis	ROC/HAA	Max Speed/AOB	OEA Radius+Straight = CAR*
A	1.0 SM	300/ 350 ft.	90 KIAS/25º	.88+.4 = 1.30 NM min
B	1.0 SM	300/ 450 ft.	120 KIAS/25º	1.31+.4 = 1.71 NM
C	1 ½ SM	300/ 450 ft.	145 KIAS/20º	2.18+.5 = 2.68 NM
D	2.0 SM	300/ 550 ft.	165 KIAS/20º	2.89+.6 = 3.49 NM
E	2.0 SM	300/ 550 ft.	200 KIAS/22º	3.65+.7 = 4.35 NM

With Change #21 and later, these figures are based on 1000'MSL, ISA Standard and 25KTS of added wind. Visibility is in statute miles. OEA= obstacle evaluated area, *CAR= circling area radius in nautical miles.

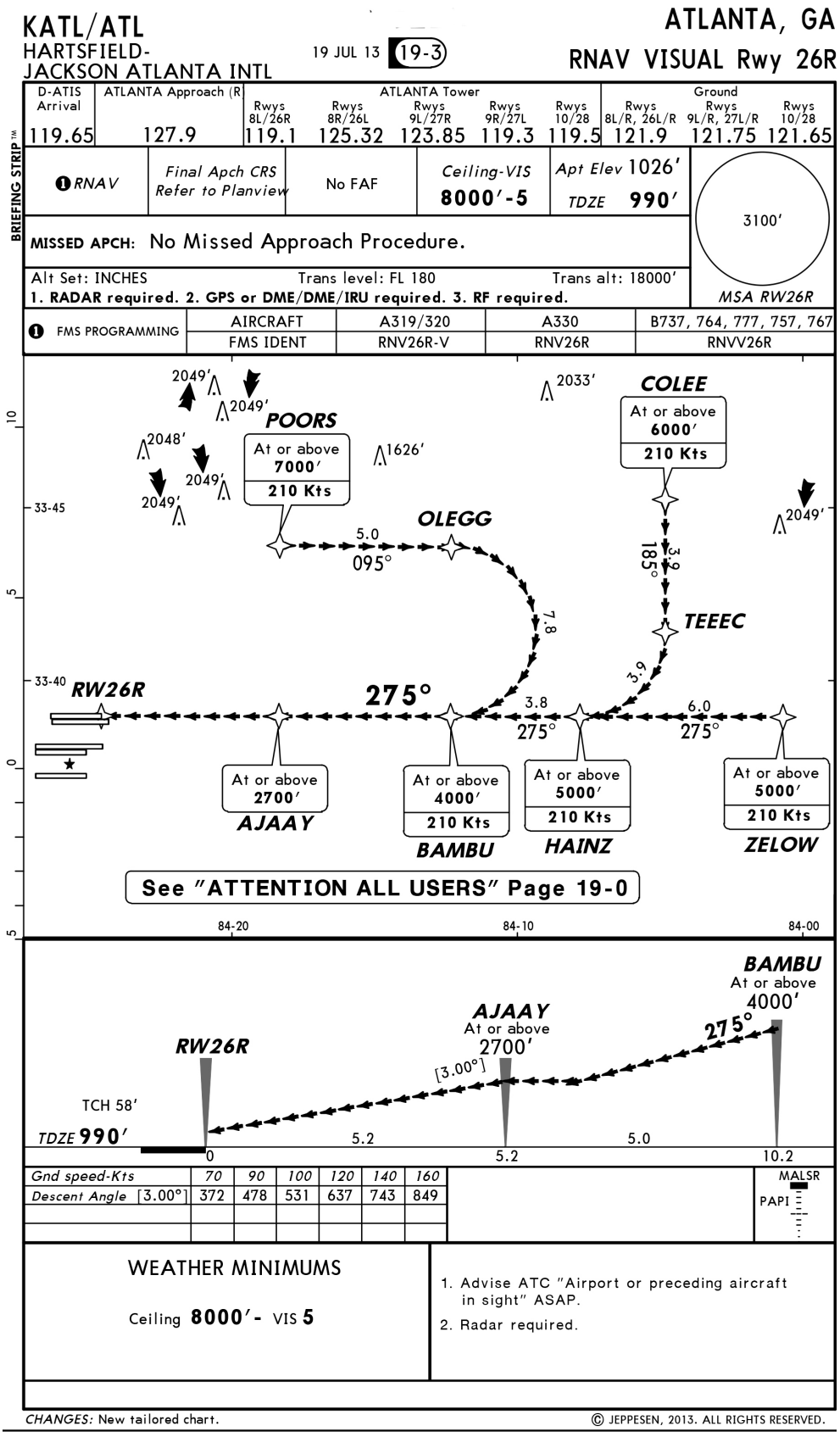
Conclusion

So you want to fly an RNAV Visual?

- Remember, ATC can suggest this approach, but you may decline it. ATC cannot require the crew to accept the approach.
- Your airline is required to be CAA approved for RNAV Visual approaches. Note that it is possible for an airline to be authorized to fly RNAV approaches, but not authorized to fly RNAV Visual approaches.
- If your airline is not approved, you should not have the RNAV Visual charts, however, reports indicate that some crews have had these approaches included in their onboard chart library even though neither they nor their airline was authorized.
- The crew must be trained for this type of approach.
- Flying an RNAV Visual is really flying two simultaneous approaches; an Instrument Approach and a Visual Approach. Why? Because you must navigate via FMS to maintain the published track to touchdown while, at the same time, flying a visual approach which requires keeping sight of the terrain, airport and/or preceding aircraft.
- Unless a specific RNAV Visual approach is very familiar to you, planning for the approach should begin early.
- Thoroughly plan, brief and prepare to program the approach prior to receiving clearance for it.
- If necessary, plan the decent rates to meet any altitude restrictions.
- Although most of these approaches are to runways with PAPI or VASI, there is no other vertical guidance provided. Plan accordingly.
- Obstacle clearance during the visual part of the approach is your responsibility. Although this is not written anywhere; you are talking to tower and flying visually to landing.
- If your aircraft strays beyond the published track, lateral obstacle clearance could be compromised. Therefore, it is important to ensure that the aircraft automation and the approach you have been given clearance for are properly coordinated and selected.
- Repeat: Make sure that the approach you have selected in the FMS is the one that you have been cleared for.
- Have your energy stabilized from the beginning of the approach procedure.
- Excellent CRM will be invaluable throughout all phases of this approach.

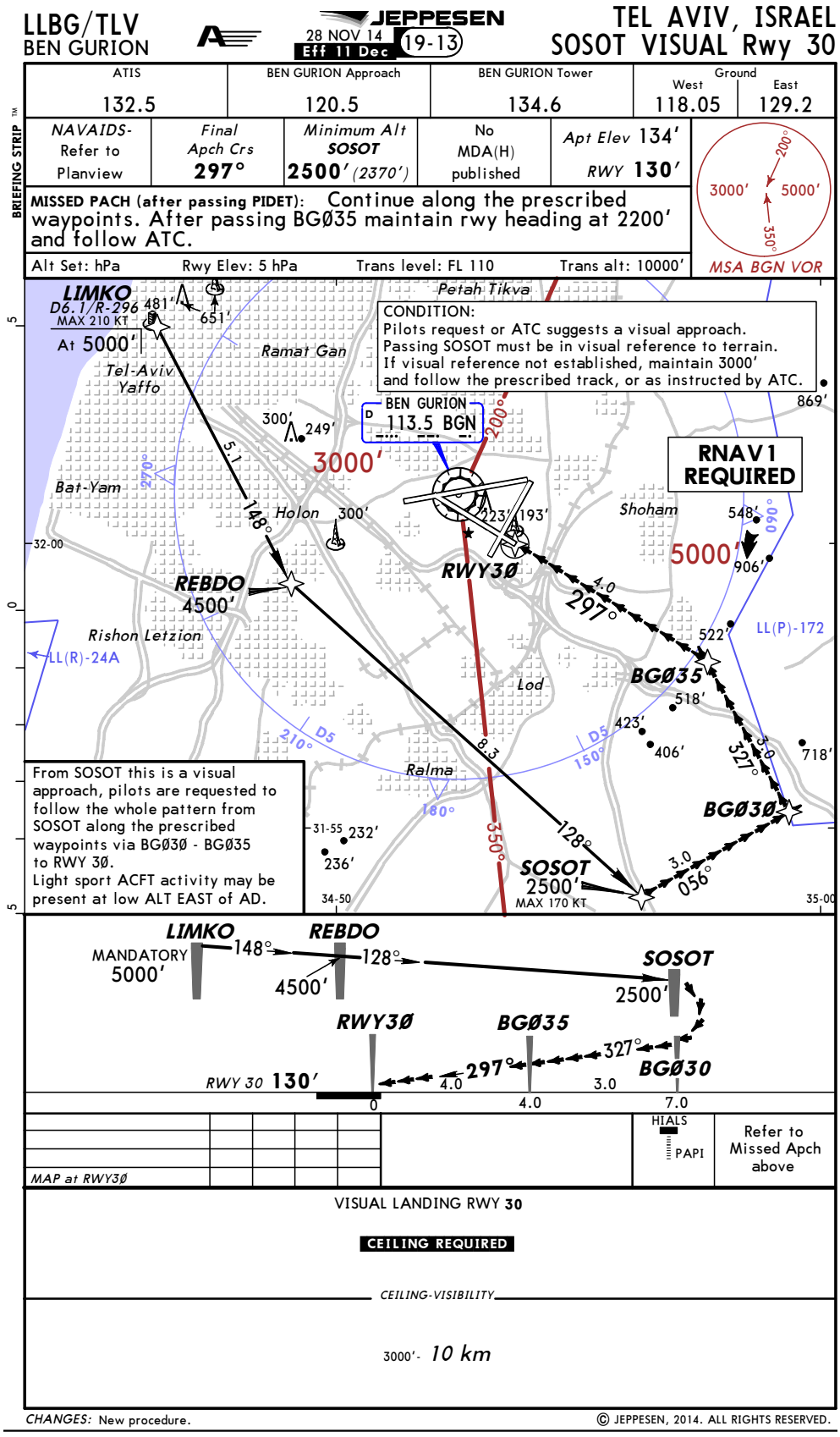
The RNAV Visual charts on the following pages are provided for you to “chair fly” and recognize the challenges that each presents.

For example only - NOT to be used for navigation



The visibility required for this Visual approach is 5 miles. However, all of the visual track waypoints, including AJAAY are more than 5 miles from the airport and the Rwy 26R threshold. So, if the actual visibility is right at 5 miles, the pilot will not see the airport until passing AJAAY. Assuming the pilot does not have the preceding aircraft in sight, what is "visual" about this approach?

For example only - NOT to be used for navigation



This chart and the one below it are the same RNAV Visual approach published by two different companies. Both correctly display the waypoints as "fly by" waypoints which require the turn be started prior to the waypoint to intercept the subsequent track. However, the angular presentation on the chart above may lead the pilot to start each turn late, i.e when passing over the actual waypoint.

For example only - NOT to be used for navigation

Effective 11-DEC-2014
04-DEC-2014

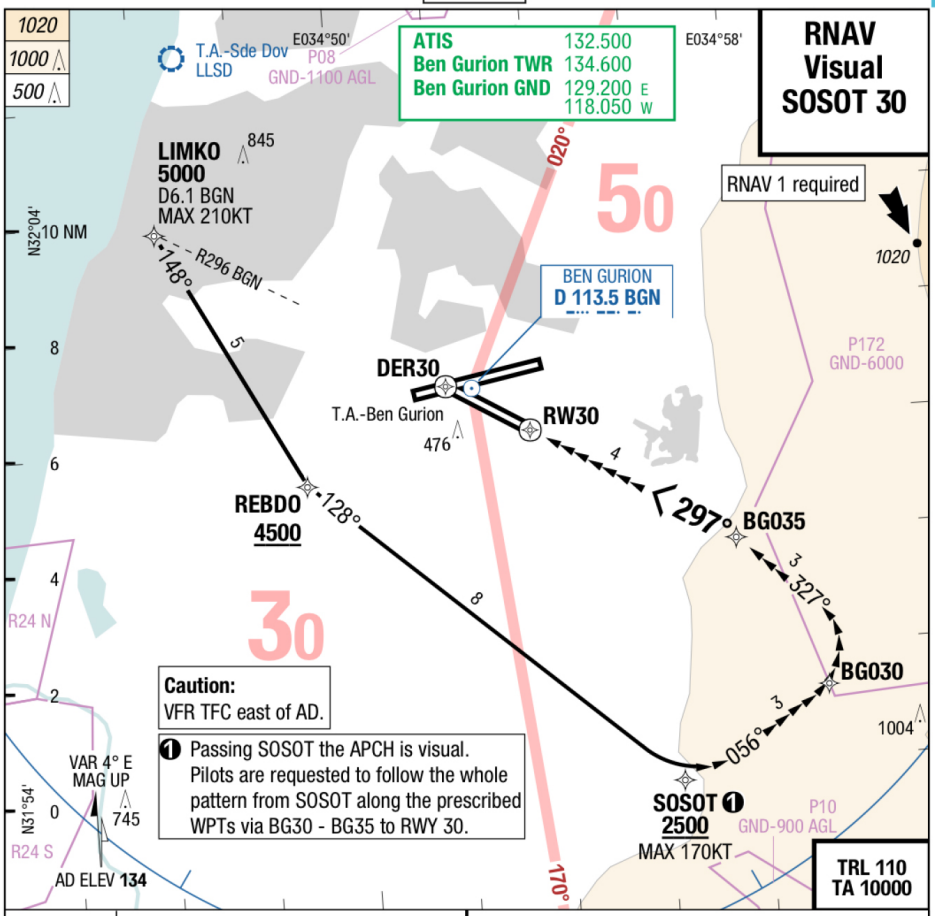
Israel **Tel Aviv** Ben Gurion

TLV-LLBG

7-160

RNAV Visual SOSOT 30

VAC



ROUTE DESCRIPTION:
LIMKO - REBDO - SOSOT - BG030 - BG035 - RW30.
Light ACFT activity at low level east of AD.

CONDITIONS:
- Pilots request or ATC suggests a Visual APCH.

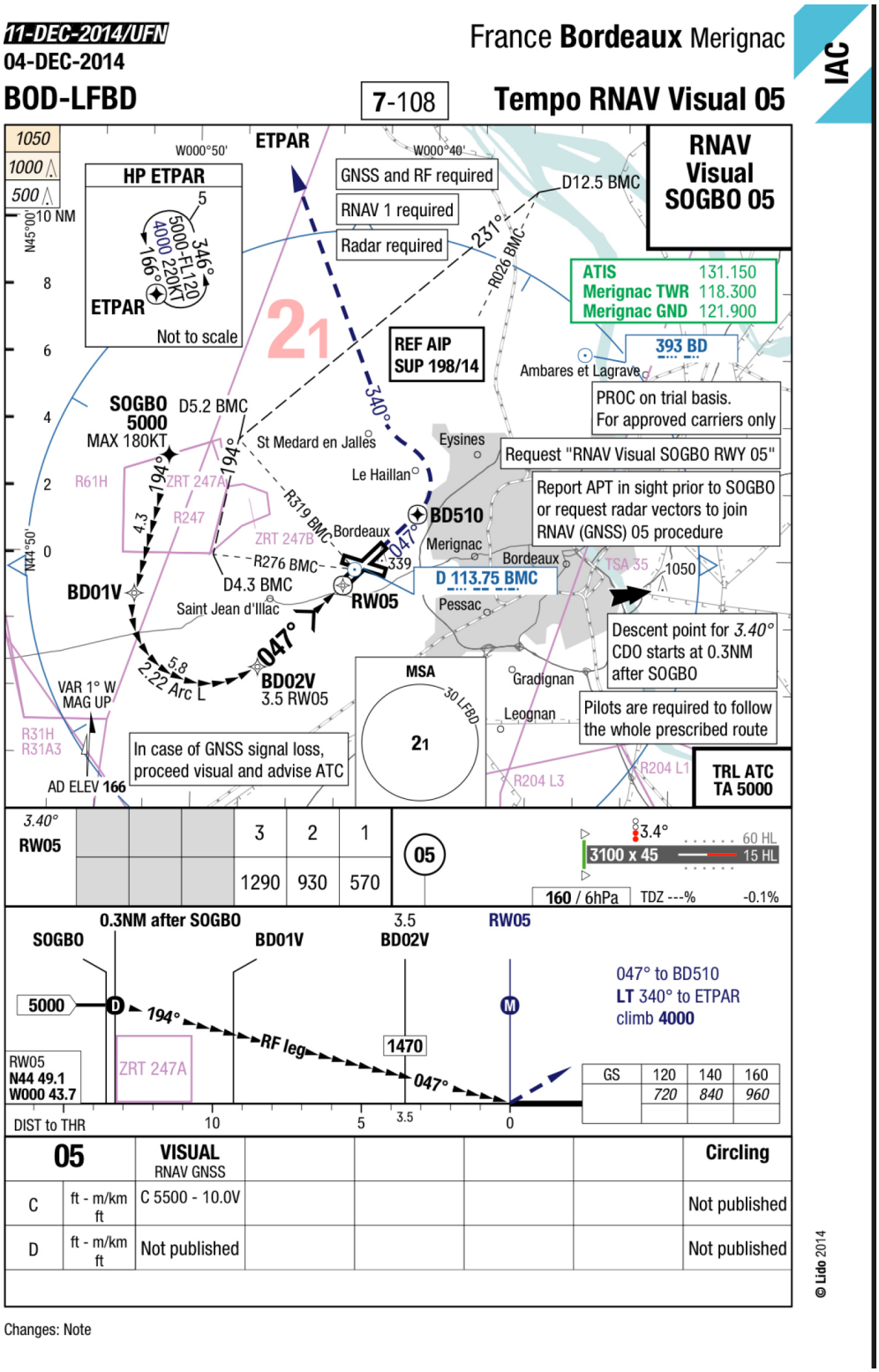
- Passing SOSOT must be in visual reference to terrain. If visual reference not established, maintain **3000** and follow prescribed track, or as instructed by ATC.

Missed Approach:
continue along the prescribed WPTs - after passing BG035 maintain RWY HDG at **2200.**

30		VISUAL RNAV					Circling TERPS
C	ft - m/km ft	C 3000 - 10.0V					Not published
D	ft - m/km ft	C 3000 - 10.0V					Not published

Changes: ALT, FREQ, Track, chart title, MIN, SUAs

For example only - NOT to be used for navigation



Changes: Note

This chart of the RNAV Visual SOGBO 05 is presented to show just how 'busy' a chart can be, and the challenges it places on the pilot to accurately review all of the information depicted.