JEPP'S BRIEFING

The Chart Clinic – Thirtieth in a Series

By James E. Terpstra
Sr. Corporate Vice President, Jeppesen

Communications — it's probably the most important thing we have between pilot and controller. Whether it's via voice or some of the new digital technology, there still is the need for pilot and controller to be on the same wavelength. STARs really represent part of that communication — once you have accepted clearance for a STAR, you have just communicated with the controller what route you will be flying, what altitudes, and what airspeeds on some STARs.

When the repetitive complex departure clearances by controllers turned into SIDs in the late 70s, the idea caught on quite quickly. Eventually, most of the major airports in the US developed standard departures with graphics for printed publication. The idea seemed so good that the standard arrival clearances also started being published in text and graphic form. To develop an acronym similar to SIDs, the FAA named the new procedures Standard Terminal Arrival Routes and came up with the name STARs. The name has stuck ever since (contrary to SIDs becoming DPs in the US.)

The principal difference between SIDs (DPs) and STARs is that the DPs start at the airport pavement and connect to the enroute structure. STARs on the other hand, go the opposite direction and start in the enroute structure but don't make it down to pavement; they end at a point where an instrument approach procedure takes you the rest of the way to the ground.

Heading and Border Data

Each STAR has a reverse-type block in the upper right corner of the chart to indicate its status as a standard arrival chart. In the top center of the chart, the index number is shown with the revision date plus the effective date. The effective date is included only if the chart isn't effective when it first gets into your hands. The index number for STARs is 10-2 followed by letter suffixes for the succeeding STARs. For example, the second STAR at Stockholm is 10-2A and the third chart is 10-2B. By using the index number of 10-2, the STARs are sequenced in the manual after the area charts and before the SID charts.

The heading includes the ATIS frequency when one is available. At Stockholm, the ATIS can be received on 119.0 MHz.

In the US, Canada, and many other countries, the common altitude for changing to the standard altimeter setting of 29.92 inches of mercury (or 1013.2 hectopascals or millibars) when climbing to the high altitude structure is 18,000 feet. When descending from high altitude, the altimeter should be changed to the local altimeter setting when passing through FL180. In most countries throughout the world, however, the change to or from the standard altimeter setting is not done at the same altitude all the time. As an example, at Stockholm the flight level where you change your altimeter setting to the local altimeter setting is specified by ATC each time you arrive at Stockholm. This information is shown just below the ATIS frequency with the words: TRANS LEVEL: BY ATC. When departing from Stockholm, the altimeter should be set to the standard altimeter setting when passing through 5,000 feet. This means that altimeter readings when flying above 5,000 feet will actually be flight levels, not feet. This is common for Europe, but very different for pilots used to flying in the United States and Canada.

Look at the minimum altitude for the holding pattern at Eltok Intersection. Inside the holding pattern symbol, the letters "FL" precede the numbers "100." With a minimum altitude specified as a flight level instead of an altitude, you can assume the transition level will be at FL100 or lower.

Speed Limit

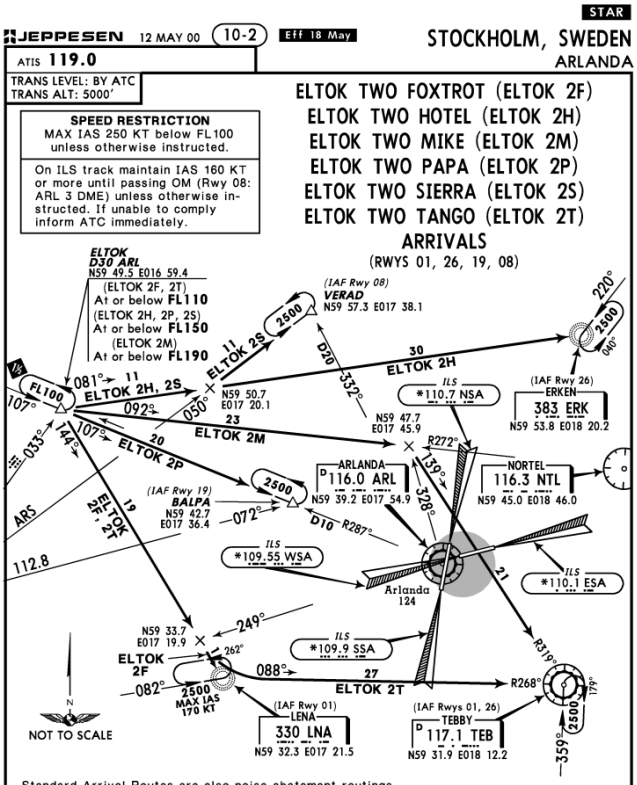
In many countries, there is a standard speed limit of 250 knots IAS below 10,000 feet for the entire country. But, in most countries, that standard does not exist for all locations. In Sweden, there is a speed limit of 250 knots when arriving in Stockholm. This speed restriction is shown in the plan view portion of the STAR chart. In addition to the 250 knot speed restriction, there is a speed restriction to maintain at least 160 knots IAS on the ILS track until passing the outer marker (when using ILS Rwy 08, the 160-knot speed minimum should be used up to the ARL 3 DME fix since ILS Rwy 08 does not have an OM). For both the maximum and minimum speed limits, these can be changed by ATC. For the minimum speed limit, if you are flying in an airplane that can't go as fast as 160 knots IAS, you must inform ATC immediately.

What's In a Name?

The international naming standard for STARs states that they will be given a name that is the same as the first fix on the STAR. In the US, typically there are enroute transitions before the STAR itself. So the STAR name is usually the same as the last fix on the enroute transitions where they come together to begin the body of the STAR.

At Arlanda Airport in Stockholm, Sweden, the Eltok Two STAR begins to the west of the airport and splits into a number of routes designed to go to initial approach fixes on approaches into the airport. In the US, these separate routes would be considered runway transitions from the STAR, but at Stockholm, each route has a unique name to distinguish it from the other routes. Each of these routes uses a phonetic letter of the alphabet.

If you plan to use the STAR to transition to the ILS Rwy 01 approach, you would file for and receive a clearance for the Eltok Two Tango Arrival. Eltok Two Tango proceeds from the Eltok Intersection and follows a course of 144° toward the Lena (LNA) NDB. The route from the Eltok Intersection shows the route identi-



STAR	RWY	ROUTING	ALTITUDE
ELTOK 2F ❶	01	On 144° bearing to LNA NDB for radar vectoring to final approach.	Cross Eltok Int at or below **FL110.**
ELTOK 2H	26	On 081° bearing to ERK NDB for radar vectoring to final approach.	Cross Eltok Int at or below **FL150.**
ELTOK 2M ❷	01	Intercept NTL R-272 inbound, at ARL R-328 turn RIGHT, intercept TEB R-319 inbound to TEB VORDME for radar vectoring to final approach.	Cross Eltok Int at or below **FL190.**
ELTOK 2P	19	Intercept ARL R-287 inbound to Balpa Int for radar vectoring to final approach.	Cross Eltok Int at or below **FL150.**
ELTOK 2S	08	On 081° bearing towards ERK NDB, intercept ARS R-050 to Verad Int for radar vectoring to final approach.	
ELTOK 2T ❸	26	On 144° bearing towards LNA NDB, at ARL R-249 turn LEFT, intercept TEB R-268 inbound to TEB VORDME for radar vectoring to final approach.	Cross Eltok Int at or below **FL110.**

❶ Normally Prop and Turboprop traffic.
❷ Normally Jet traffic.
❸ Normally Prop and Turboprop traffic when Rwy 01 is used for departure.

CHANGES: STARs renumbered.

fiers of Eltok 2F and Eltok 2T adjacent to the flight track. After turning left at the 249° radial, the STAR goes to the Tebby VOR. Above the VOR facility box, there is a note that states that Tebby is the IAF for Runways 01 and 26.

At the bottom of the page, detailed information in text form is provided. The narrative information has a ballflag number 1 under the title, pointing to the note at the very bottom which states that the Eltok Two Tango Arrival is normally for piston and turboprop airplanes.

In the text, the routing is specified as following the 144 bearing toward the LNA NDB. At the ARL 249° radial, you should turn left and intercept the TEB 268° radial inbound to the TEB VOR\DME. When you are close to the TEB VOR, you can expect radar vectors to the final approach. If you look at the ILS Rwy 01 approach, you will notice there are no specified routes from the TEB VOR — so what do you do if you have a communication failure? It's a question with no specific answer.

In the ELTOK 2T text, notice it states "at ARL R-249 turn LEFT..." In computer talk, this means the fix formed by the 249° radial is a fly-over fix. ATC expects you to fly over the radial and then begin the turn. If this were a GPS approach, a circle would be around the fix to indicate its fly-over status. The fix formed by the 249° radial and the 144° bearing is included in the GPS and FMS databases with the identifier of D249S. On the Jeppesen charts, the database identifiers are gradually being added to the SID and STAR charts. They are being depicted within brackets to indicate they are computer navigation fixes.

Altitude Assignments

Many STARs include altitude restrictions. At Stockholm, there are three different altitude assignments at the Eltok Intersection depending on which route is followed after Eltok. For the Eltok Two Tango Arrival, the altitude over Eltok is a maximum altitude of FL110. Sometimes the altitudes are "hard" altitudes specified as "at" altitudes, and sometimes the altitudes are minimum altitudes and are specified as "at or above" altitudes. These differences in how the altitudes are stated means you need to pay close attention to how the words are written.

On the Eltok Two Tango Arrival, the last fix is the Tebby VOR. If a clearance for the approach hasn't been received by the time you are at Tebby, there is a holding pattern south of the VOR. Inside the holding pattern symbol, the number "2500" is included. This is another piece of altitude information. The minimum altitude for holding south of Tebby is 2,500 feet (notice the altitude is feet, not FL; therefore you would have been given the local altimeter setting by the time you reached Tebby for holding).

Noise Abatement

At the bottom of the plan view, there are words that state this STAR is designed for noise abatement. If the routes are strictly adhered to, there will be no unnecessary noise disturbance. In the US, many SIDs and STARs are also designed for noise abatement purposes, but those words are not included on US charts.

This concludes the Chart Clinic series of articles. It has been a pleasure writing the articles and receiving all the feedback many of you have given. Your responses tell me you all have a sincere desire to learn as much as possible about the airspace system in which we fly and to understand how that information is shown on charts. Thank you.

James E. Terpstra is senior corporate vice president, aviation affairs at Jeppesen. His ratings include ATP, single and multi-engine, airplane and instrument flight instructor. His 6,000+ hours include 3,200 instructing.
For comments, please Email: JimTerps@jeppesen.com