

WSSS/SIN
CHANGI **JEPPESSEN**
29 JUL 16 (10-1P)**SINGAPORE, SINGAPORE**
AIRPORT BRIEFING**FLIGHT AND GROUND PROCEDURES****1. LOW VISIBILITY PROCEDURES (LVP) FOR CATEGORY II ILS OPERATIONS****1.1 INTRODUCTION**

- 1.1.1 Category II ILS approaches will be made available at Singapore Changi Airport to authorized flights during prolonged periods of low visibility, except during thunderstorms. RVR minima for Cat II ILS operations is limited to 1148' (350m) due to Rwy and Twy light spacing requirements on the airfield.

1.2 AUTHORIZATION FOR CATEGORY II ILS APPROACHES

- 1.2.1 Operators who wish to conduct Category II ILS operations at Singapore Changi Airport must have obtained operational approval from the relevant State of Operator and be authorized by the Civil Aviation Authority of Singapore.

1.3 CATEGORY II ILS RUNWAYS

- 1.3.1 At Singapore Changi Airport, Category II ILS approaches are available only on RWY 02L and RWY 20C, which are also equipped with precision approach Category II lighting system. When required, pilots making Category II ILS approaches to Singapore Changi Airport should refer to the procedures in the Instrument Approach Charts and the Precision Approach Terrain Charts for RWY 02L and RWY 20C.

1.4 INITIATION OF CATEGORY II ILS OPERATIONS

- 1.4.1 Preparations will be made to implement LVP for Category II ILS operations at Singapore Changi Airport during prolonged period of low visibility, except during thunderstorms, when the RVR drops below 2625' (800m).
- 1.4.2 Availability of the Category II ILS approaches will be made known through NOTAM and ATIS broadcasts as well as air traffic control radio communications.
- 1.4.3 During LVP operations, aircraft will not be cleared for Category II ILS approach if any of the ILS or approach/runway lights fall below Category II requirements. Aircraft will not be cleared for landing if the Touchdown Zone RVR is unserviceable.

1.5 ILS SENSITIVE AREAS

- 1.5.1 Upon landing, pilots shall report to Changi Tower once the aircraft has cleared the runway and has passed the ILS sensitive areas demarcated by alternate yellow and green lights along the centerlines of Rapid Exit Taxiways and Cross Taxiways.

1.6 TERMINATION OF LVP FOR CATEGORY II ILS OPERATIONS

- 1.6.1 LVP for Category II ILS operations will be terminated when RVR has improved above 2625' (800m). Termination of LVP for Category II ILS operations will be made known through NOTAM and ATIS broadcasts as well as air traffic control radio communications.

1.7 OPERATIONS OF FLIGHTS NOT AUTHORIZED FOR CATEGORY II ILS OPERATIONS

- 1.7.1 During Category II ILS operations, if the RVR is 1804' (550m) or above, flights not authorized for Category II ILS operations may continue to make approaches and land. Airlines planning to operate flights not authorized for Category II ILS operations into Changi shall monitor the METAR to ascertain the RVR values when launching their flights and be prepared to divert if the RVR is below 1804' (550m).

2. RUNWAY UTILIZATION**2.1 RUNWAY-IN-USE**

- 2.1.1 The runway-in-use (Departure/Arrival) is selected by Aerodrome Control as the optimum for general purposes and to maximize runway utilization. If the assigned runway is unsuitable for a particular operation, the pilot can obtain permission from ATC to use another runway but should anticipate delay.

2.2 DEPARTURES

- 2.2.1 Pilots should arrange their taxi such that they are ready to depart without delay on reaching the runway holding point. As standard ICAO wake turbulence separation is being applied, pilots are to advise ATC early if more time is needed for the aircraft to be ready for departure. When informed, ATC will be able to make changes in the departure sequence, if necessary, to minimize delays to other succeeding departures.

WSSS/SIN
CHANGI **JEPPESSEN**
29 JUL 16 **(10-1P1)****SINGAPORE, SINGAPORE**
AIRPORT BRIEFING

2.2.2 Pilots should complete cockpit checks prior to line-up for departure and keep any checks on the runway to a minimum.

2.2.3 Conditional line-up clearance may be used by ATC to facilitate an expeditious flow of traffic. On receipt of line-up clearance, pilots should taxi into position promptly without delay. Unless given instruction to line-up and wait, pilots should be ready and prepared to depart without stopping. On receipt of take-off clearance, pilots to commence take-off roll without delay.

2.3 CLEARANCE FOR IMMEDIATE TAKE-OFF

2.3.1 A pilot receiving the ATC instruction 'cleared for immediate take-off' is required to act as follows:

- (a) if waiting clear of the runway, taxi immediately on to it and begin take-off run immediately without stopping the aircraft;
- (b) if already lined-up on the runway, take-off without delay;
- (c) if unable to comply with the instruction, inform ATC immediately.

2.4 ARRIVALS - MINIMUM RUNWAY OCCUPANCY TIME

2.4.1 Arriving aircraft upon landing are reminded that it is imperative to vacate the runway as quickly as practicable to enable ATC to apply minimum spacing on final approach and minimize the occurrence of "go-arounds".

2.4.2 To ensure minimum Runway Occupancy Time (ROT) and reduce missed approaches due to occupied runway, pilots should vacate the runway via the first available exit taxiway corresponding to operational requirements, or as instructed by ATC. If an exit taxiway other than the first available exit taxiway is required, pilots shall advise the Tower Controller on first contact.

2.4.3 To enhance planning, pilots can make reference to the Landing Exit Distance (LED), the distance from threshold to the furthest edge of the exit taxiway:

RWY	TWY Exits	LED
20R	① ② W6, ① ② W7, W8	5423' 1655m, 6965' 2123m, 10,043' 3061m
20C	① ② E6, ① ② E7, E8	6391' 1948m, 7844' 2391m, 10,341' 3152m
02L	① ② W5, ① ② W4, ② W3	6450' 1966m, 8173' 2491m, 9436' 2876m
02C	① ② E5, ① ② E4, ② E3	6742' 2055m, 8415' 2565m, 10,719' 3267m

① Recommended exit taxiways. ② Rapid Exit Taxiway (RET) and maximum design ground speed for the exit taxiway is 50 KT.

2.4.4 Pilots can expect initial taxi instructions from the Runway Controller before clearing the exit taxiway. Aircraft vacating the runway-in-use should not stop on the exit taxiway until the entire aircraft has passed the runway holding point.

2.4.5 Between 0830 - 1030 daily estimated delays of 15 minutes can be expected for arrivals into Changi Airport.

2.5 LAND AFTER PROCEDURES

2.5.1 Normally, only one aircraft is permitted to land or take-off on the runway-in-use at any one time. However, when the traffic sequence is two successive landing aircraft, the second aircraft may be allowed to land before the first aircraft has cleared the runway-in-use provided:

- (a) the runway is long enough;
- (b) during daylight hours;
- (c) the second aircraft will be able to see the first aircraft clearly and continuously until it is clear of the runway;
- (d) the second aircraft has been warned.

2.5.2 ATC will provide this warning in the landing clearance as shown in para 2.7.

2.5.3 Responsibility for ensuring adequate separation between the two aircraft rests with the pilot of the second aircraft.

2.6 SPECIAL LANDING PROCEDURES

2.6.1 Special landing procedures may be in force at Singapore Changi Airport in conditions shown as follows:

- (a) When the runway-in-use is temporarily occupied by other traffic, landing clearance may be issued to an arriving aircraft provided that at the time the aircraft crosses the threshold of the runway-in-use

WSSS/SIN
CHANGI **JEPPESSEN**
24 MAR 17 (10-1P2)**SINGAPORE, SINGAPORE**
AIRPORT BRIEFING

the following separation distances will exist:

- i) Landing following landing - The preceding landing aircraft will be clear of the runway-in-use or will be at least 8202' (2500m) from the threshold of the runway-in-use.
- ii) Landing following departure - The departing aircraft will be airborne and at least 8202' (2500m) from the threshold of the runway-in-use, or if not airborne, will be at least 8202' (2500m) from the threshold of the runway-in-use.

2.6.2 These procedures will be used only under the following conditions:

- (a) during daylight hours;
- (b) visibility of at least 5km;
- (c) cloud ceiling of 1,500ft in the departure/missed approach area;
- (d) ATC is satisfied that the pilot of the next arriving aircraft will be able to observe continuously the relevant traffic;
- (e) no unfavourable surface wind conditions (including significant tailwind, windshear, turbulence, etc);
- (f) when the runway is dry and free of all precipitants such that there is no evidence that the braking action may be adversely affected.

2.7 PHRASEOLOGY

2.7.1 When issuing a landing clearance following the application of these procedures, ATC will issue the second aircraft with the following instructions:

...(call sign)...after the landing / departing...(Aircraft Type) Runway...
(Designator) cleared to land.

3. TOTAL RADIO FAILURE - SPECIAL PROCEDURES - SINGAPORE CHANGI AP - ARRIVALS

3.1 In VMC during daylight hours, if total radio communication failure occurs to an aircraft bound for Singapore Changi Airport, the pilot shall maintain VMC to land at the most suitable airfield and report to the appropriate air traffic control unit by the most expeditious means.

3.2 For IFR flights to Singapore Changi Airport, aircraft experiencing radio failure shall:

3.2.1 Proceed according to the last acknowledged clearance received from Singapore ATC, or

3.2.2 If no specific instructions or clearance has been received from Singapore ATC:

- a) Maintain the last assigned altitude or flight level and proceed via airway thereafter the appropriate STAR for Rwy 02L/02C to SAMKO Holding Area (SHA) except for the following STARS: KARTO 1A, BELVA 1A, MABAL 2A, and ELALO 1A shall proceed to SHA after SANAT.
- b) Commence descent from SHA at or as close as possible to the ETA as indicated on the flight plan.
- c) Carry out the appropriate instrument approach procedure from SHA to land on Rwy 02L/02C.

3.2.3 If unable to effect a landing on:

a) Rwy 02L

Carry out missed approach procedure to AKOMA (PU R-356/20DME). Leave AKOMA at 4,000' to NYLON Holding Area (NHA) and execute the appropriate instrument procedure from NHA to land on Rwy 20R or Rwy 20C, as appropriate.

b) Rwy 02C

Carry out missed approach procedure to NYLON Holding Area (NHA) and execute the appropriate instrument procedure from NHA to land on Rwy 20R or Rwy 20C, as appropriate.

c) Rwy 20R

Carry out missed approach procedure to SAMKO Holding Area (SHA) and execute the appropriate instrument procedure from SHA to land on Rwy 02L or Rwy 02C, as appropriate.

WSSS/SIN
CHANGI **JEPPESSEN**
24 MAR 17 (10-1P3)**SINGAPORE, SINGAPORE**
AIRPORT BRIEFING**d) Rwy 20C**

Carry out missed approach procedure to EXOMO (VTK R-158/22DME).
 Leave EXOMO at 4,000' to SAMKO Holding Area (SHA) and execute the
 appropriate instrument procedure from SHA to land on Rwy
 02L or Rwy 02C, as appropriate.

4. IDENTIFICATION OF RUNWAY-IN-USE

- 4.1 ATC will switch on the appropriate approach lights and the ILS serving the runway-in-use to assist the pilot in its identification. If the approach lights for the runway-in-use are sighted but the ILS frequency is not received, the pilot shall assume that the ILS is inoperative and shall proceed to land on the runway on which the approach lights have been sighted.
- 4.2 If unable to land within 30 minutes of EAT or ETA, if no EAT has been received and acknowledged, proceed to cross SAMKO Holding Area (SHA) at 4,000' then via A457 at FL200 if Kuala Lumpur is the nominated alternate or via B470 at FL 290 if Soekarno-Hatta is the nominated alternate or otherwise proceed at the planned flight level to other nominated alternate.

5. TOTAL RADIO FAILURE - SPECIAL PROCEDURES - SINGAPORE CHANGI AP - DEPARTURES

- 5.1 When an aircraft which has been cleared by ATC to an intermediate level experiences total radio communication failure immediately after departure from Singapore Changi Airport and it is deemed unsafe for it to continue to its destination, the pilot will set the aircraft transponder to Mode A/C Code 7600 and adhere to the procedures below.
- 5.2 When radio communication failure occurs immediately after the aircraft has departed on Rwy 02L/02C, the pilot shall proceed according to the following procedures:
- Proceed straight ahead to NYLON Holding Area (NHA) climbing to the last assigned altitude. At NHA, climb/descend to maintain 7,000'.
 - Hold at NHA for 4 minutes and leave NHA on track 203°. At 10 DME north of VTK, turn left for HOSBA Holding Area (HHA) to jettison fuel, maintaining 7,000'.
 - After fuel jettison, proceed to SAMKO Holding Area (SHA) via AWY G580 and SINJON DVOR. Maintain 7,000'. At SHA descend for an instrument approach on Rwy 02L/02C. Identify the runway-in-use in accordance with paragraph 4.
- 5.3 When radio communication failure occurs immediately after the aircraft has departed on Rwy 20R/20C, the pilot shall proceed according to the following procedures:
- Proceed straight ahead to SAMKO Holding Area (SHA) climbing to the last assigned altitude. At SHA climb/descend to maintain 7,000'.
 - Hold at SHA for 4 minutes. Leave SHA for HOSBA Holding Area (HHA) via SJ DVOR and Airway G580 to jettison fuel, maintaining 7,000'.
 - After fuel jettison, proceed to NHA via Airway W401. Maintain 7,000'. On crossing VTK 042R turn right to intercept VTK 023R. At NHA descend to carry out an instrument approach on Rwy 20R/20C.
- 5.4 ATC action is based on the assumption that the aircraft will take a minimum of 10 min to jettison fuel. An aircraft therefore should not leave earlier than 10 min after arrival at HOSBA Holding Area even if fuel jettison is completed at a shorter time or if jettisoning is not necessary or possible unless circumstances require an immediate return.
- 5.5 Alternatively, aircraft may jettison fuel between HOSBA and point 90 NM from SJ DVOR/DME on airway G580.

6. RNAV (GNSS) SID/STAR OPERATIONS

- 6.1 For RNAV (GNSS) SIDs and STARs operations, the aircraft shall be GNSS-equipped and the navigation systems shall meet ICAO RNP-1 standard of accuracy, or equivalent, such as JAA TGL 10 or FAA AC 90-96A Appendix 2 - Precision Area Navigation (P-RNAV).

WSSS/SIN **JEPPESEN**
10 FEB 17 **(10-1P4)****SINGAPORE, SINGAPORE**
CHANGI**7. AIRPORT COLLABORATIVE DECISION MAKING (A-CDM) - SINGAPORE CHANGI AIRPORT****7.1 Introduction**

Definition of commonly used terms in A-CDM

7.1.1 Target Off Block Time (TOBT) - The time an aircraft operator (AO) or ground handling agent (GHA) estimates that an aircraft will be ready, all doors closed, boarding bridge removed, pushback vehicle available and ready to start-up/pushback immediately upon receipt of clearance from ATC.

7.1.2 Target Start Up Approval Time (TSAT) - The time provided by ATC that an aircraft can expect start-up/pushback approval.

7.2 A-CDM start-up procedures

7.2.1 Pilot shall ensure aircraft is ready for pushback at TOBT.

7.2.2 Pilot to maintain communication with the AO/GHA as they are responsible for updating the TOBT. Notify the AO/GHA to update the TOBT if it is expected to differ by 5 minutes or more.

7.2.3 Pilot to contact Clearance Delivery and request for ATC clearance within 5 minutes of TOBT using following phraseology:

- Callsign
- Destination
- Proposed flight level and alternate level if any
- Parking position

7.2.3.1 Pilot shall only request for ATC clearance provided aircraft is ready to pushback at TOBT. Any updates to TOBT after receipt of ATC clearance will result in cancellation of clearance issued as the ATC clearance validity is based on the initial TOBT.

7.2.4 ATC will advise the pilot whether the proposed or other alternate flight level is available and an ATC clearance will be issued accordingly. If pre-departure coordination with an adjacent unit or centre is required the pilot will be instructed to standby.

7.2.5 ATC will update TSAT changes if any, during issuance of ATC clearances. Note that TSAT displayed on ADGS may not be final and can be revised due to en-route clearance restrictions, ground congestion or flow measures.

7.2.6 Pilot shall request for pushback from Ground Movement Control within 5 minutes of TSAT after obtaining ATC clearance, or as directed by ATC.

7.2.6.1 ATC may swap pushback sequence based on real-time readiness of aircrafts to maximise apron and runway capacity and reduce the overall delay to traffic as and when required.

7.2.6.2 At the end of pushback the departing aircraft must have all engines started and be ready to taxi immediately unless otherwise instructed by ATC.
Note: The first aircraft to taxi may not necessarily be the first aircraft to take-off as distances between aircraft stands and the departure rwy vary.

7.2.7 A flight issued with gate hold (TSAT ~~TOBT~~) but chooses to commence pushback before the assigned time will be allowed to do so subject to traffic. However, the flight should not expect an earlier departure time as the planned pre-departure sequence will be maintained.

7.2.8 If a flight is unable to pushback by TSAT + 5 minutes due to the aircraft being unready, ATC clearance and TSAT will be cancelled. Pilot must notify the AO/GHA to update the TOBT for a new TSAT before requesting for a new ATC clearance. This also applies to aircraft returning back to blocks after pushback.

7.2.8.1 ATC will inform the aircraft when a clearance is cancelled using the phraseology: '(Callsign of acft) your ATC clearance and TSAT is cancelled (reason). Update TOBT before requesting for new clearance'.

7.2.8.2 Flight may also have its ATC clearance cancelled if it develops a technical problem after pushback and is unable to taxi for prolonged duration.

7.2.9 Non-compliance of initial TSAT may result in an aircraft losing its existing position in the pre-departure sequence. Delay can be expected as a result of re-sequencing based on new TOBT input.

7.2.10 If delay in pusback is due to ground traffic movement or ATC clearance restrictions, the ATC clearance will remain valid even if it exceeds TSAT + 5 minutes. TOBT need not be updated for such situations.

7.2.11 In the event that A-CDM mode of operations need to be cancelled due to any reason, the termination will be communicated to relevant parties through email by the airport operator and a NOTAM will be issued by ATC. Pilot shall follow the non-CDM procedure (see 7.4).

7.3 A-CDM information via Aircraft Docking Guidance System (ADGS)

7.3.1 All contact stands in Singapore Changi Airport will have ADGS. The fundamental operation and usage of ADGS still remain the same for flight crew. Additional information which includes TOBT, TSAT and TOBT count-down timer will be displayed in local times as part of the improvements to support A-CDM operations.

WSSS/SIN**JEPPESEN**
10 FEB 17 **(10-1P5)****SINGAPORE, SINGAPORE**
CHANGI**7.4. Non-CDM mode of operations**

7.4.1 To non-CDM procedures are applicable for non-scheduled flights departing Changi Airport or when TOBT and TSAT references used in A-CDM mode of operations become unavailable due to system issues or maintenance.

7.4.2 If TOBT cannot be submitted or it is unavailable through different channels:

- Airport Operations Centre System (AOCS) A-CDM web based portal; or
- Gate Message Input Display (GMID) at boarding rooms;

- a. Pilots shall notify ATC when the aircraft is ready to pushback within 5 minutes.
- b. ATC will advise the pilot whether the proposed or alternate flight level is available and an ATC clearance will be issued accordingly. If pre-departure coordination with an adjacent unit or centre is required the pilot will be instructed to standby.
- c. Once flight level is accepted by the pilot and an ATC clearance issued, the aircraft must be pushed back within 5 minutes from the time the ATC clearance is accepted unless other ATC restrictions are imposed. The ATC clearance will be cancelled on expiry of the 5 minutes grace period. This also applies to situations when aircraft return to blocks after pushback or develop technical issues and is unable to continue taxi.
- d. Pilots who are ready to depart following the cancellation of an ATC clearance will adopt the procedures as if it is the first time they are ready to depart.

7.4.3 If TSAT is unavailable through different means stated below:

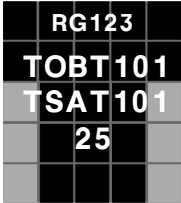

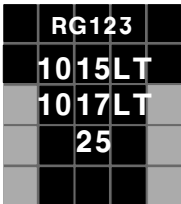
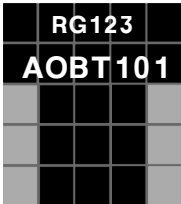
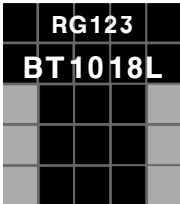
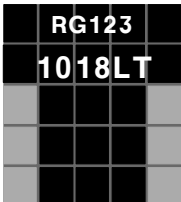
- AOCS A-CDM portal;
- GMID;
- ADGS at contact stands;
- Radio communication with GHA or AO;
- ATC - Upon issuance of ATC clearance (for flights parked at aircraft stands without ADGS);

- a. AO and GHA shall continue to submit TOBT and pilots shall request for ATC clearance 5 minutes within TOBT (see 7.2.3).
- b. ATC will revert to the gate hold procedures published on 10-9E chart and issue estimated pushback times accordingly.

AIRCRAFT DOCKING GUIDANCE SYSTEM (ADGS)

Description	Display on ADGS
Aircraft arrival to stand <ul style="list-style-type: none"> No change in existing functionality and display. 	
40 minutes prior to TOBT <ul style="list-style-type: none"> ADGS will display TOBT submitted by AO/GHA and a count down timer (2 digits) to TOBT in minutes. As ADGS can only display up to 7 characters per line, the displayed message will be scrolling. Timing displayed will be in Local Time (LT). TOBT timings will change instantly if there is an update done by AO/GHA. 	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Snapshot 1</p> </div> <div style="text-align: center;"> <p>Snapshot 2</p> </div> </div> <div style="text-align: center; margin-top: 20px;"> <p>Snapshot 3</p> </div>

WSSS/SIN**JEPPESEN**
7 APR 17 **(10-1P6)****SINGAPORE, SINGAPORE**
CHANGI**AIRCRAFT DOCKING GUIDANCE SYSTEM (ADGS)**

Description	Display on ADGS
<p>25 minutes prior to TOBT</p> <ul style="list-style-type: none"> • ADGS will display TSAT derived by PDS. • As ADGS can only display up to 7 characters per line, the displayed message will be scrolling. • TSAT timings may change as the PDS is continuously optimising push back times based on real time traffic conditions. 	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Snapshot 1</p>  </div> <div style="text-align: center;"> <p>Snapshot 2</p>  </div> </div> <div style="text-align: center; margin-top: 20px;"> <p>Snapshot 3</p>  </div>
<p>Aircraft departure from stand</p> <ul style="list-style-type: none"> • ADGS will display the actual off-block time (AOBT). • As ADGS can only display up to 7 characters per line, the displayed message will be scrolling. • TOBT, TSAT and TOBT countdown timer will be removed. • AOBT display will be removed 3 minutes after AOBT. 	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Snapshot 1</p>  </div> <div style="text-align: center;"> <p>Snapshot 2</p>  </div> </div> <div style="text-align: center; margin-top: 20px;"> <p>Snapshot 3</p>  </div>

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 **JEPPESEN**
7 APR 17 **(10-1P7)****SINGAPORE, SINGAPORE**
CHANGI**SIMULTANEOUS INDEPENDENT PARALLEL APPROACHES****1. Introduction**

- 1.1 Simultaneous independent parallel approaches will be implemented daily between 0000UTC and 1500UTC to optimize runway utilization and enhance air traffic efficiency.

2. Procedures for simultaneous independent parallel approaches

- 2.1 To ensure safe operations between aircraft on parallel approaches, Normal Operating Zones (NOZs) are established for each extended runway centerline and a No Transgression Zone (NTZ) is established between the NOZs.
- 2.2 ATC will vector arriving flights into Singapore Changi Airport from the final waypoint of the respective STARs to the respective NOZs.
- 2.3 Within the NOZ, ATC shall provide a minimum vertical separation of 1000' or 3NM surveillance separation between pairs of aircraft until both aircraft are established on the ILS Localizer course.
- 2.4 ATC is not required to provide separation between aircraft on adjacent ILS Localizers and will monitor aircraft for deviation from the approach path.
- 2.5 Aircraft can expect to maintain altitude 3500' till Glide Path Interception for Runway 20R / 02L and 2500' till Glide Path Interception for Runway 20C / 02C. This is to ensure the necessary vertical separation prior to establishing on the respective ILS Localizer course.
- 2.6 Aircraft can expect the following radiotelephony phraseology when intercepting the ILS:
- a. to intercept the Localizer before clearing for ILS
"TURN LEFT (RIGHT) HEADING (three digits) MAINTAIN (altitude) REPORT ESTABLISHED ON THE LOCALIZER RUNWAY (number) LEFT (CENTER / RIGHT)"
 followed by ...
"MAINTAIN (altitude), CLEARED FOR ILS APPROACH RUNWAY (number) LEFT (CENTER / RIGHT)"
 or
 - b. to intercept ILS
"TURN LEFT (RIGHT) HEADING (three digits) MAINTAIN (altitude) CLEARED FOR ILS APPROACH RUNWAY (number) LEFT (CENTER / RIGHT)"
- 2.7 Aircraft can expect to maintain speed 180KT at base turn or earlier till 8NM from touchdown.

3. Break-out maneuver

- 3.1 When an aircraft is observed to have not established on the appropriate Localizer course or deviated from its course towards the NTZ, ATC will instruct the aircraft to return immediately to the correct Localizer course with the following radiotelephony phraseology:
- "YOU HAVE CROSSED THE LOCALIZER, TURN LEFT (or RIGHT) IMMEDIATELY AND RETURN TO THE LOCALIZER"**
 or
"TURN LEFT (or RIGHT) TO RETURN TO LOCALIZER COURSE"
- 3.2 When ATC observed aircraft to be penetrating or will penetrate the NTZ, ATC will instruct the aircraft on the adjacent Localizer course to alter course to avoid the deviating aircraft with the following radiotelephony phraseology:
- "TRAFFIC ALERT, TURN LEFT (or RIGHT) IMMEDIATELY HEADING (degrees), CLIMB AND MAINTAIN (altitude)"**

4. Pilot notification and conditions for operations

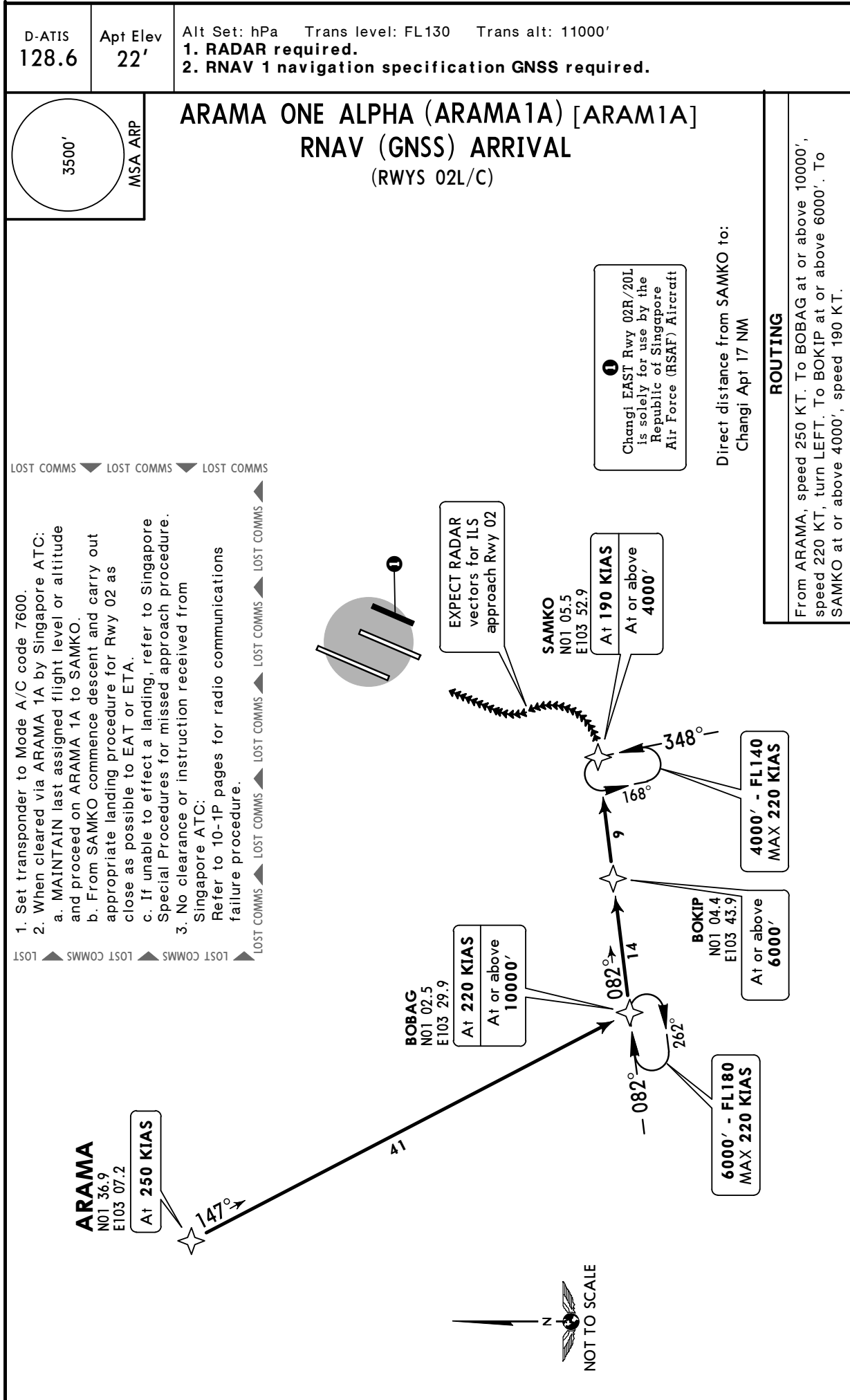
- 4.1 Simultaneous approaches to parallel runways operation will be broadcasted on ATIS during the active period.
- 4.2 Simultaneous approaches to the parallel runways will be suspended in the event of adverse weather or any other conditions that may affect the safe conduct of such approaches to the parallel runways.

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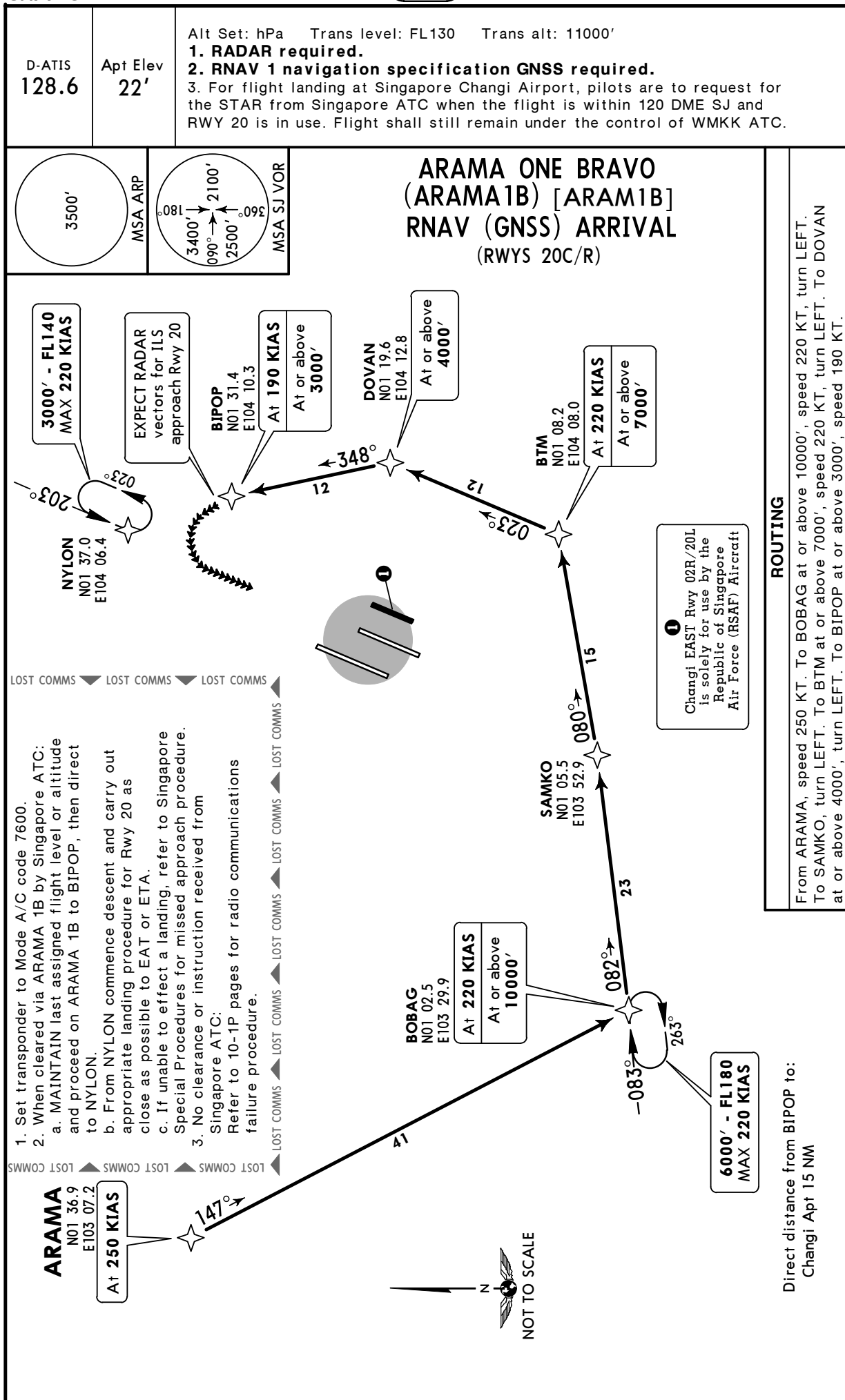
RNAV STAR



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RNAV STAR



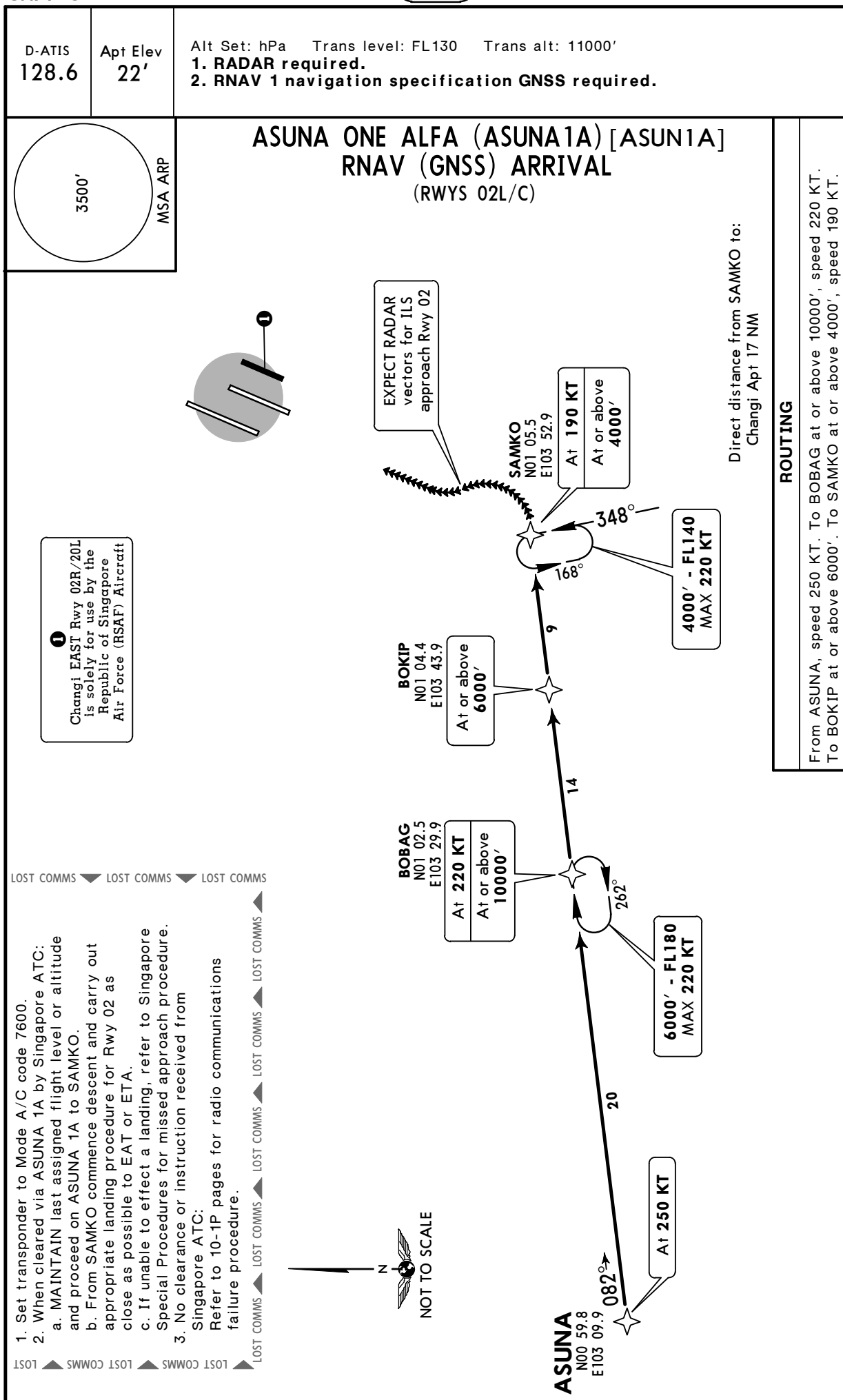
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Eff 23 Jul

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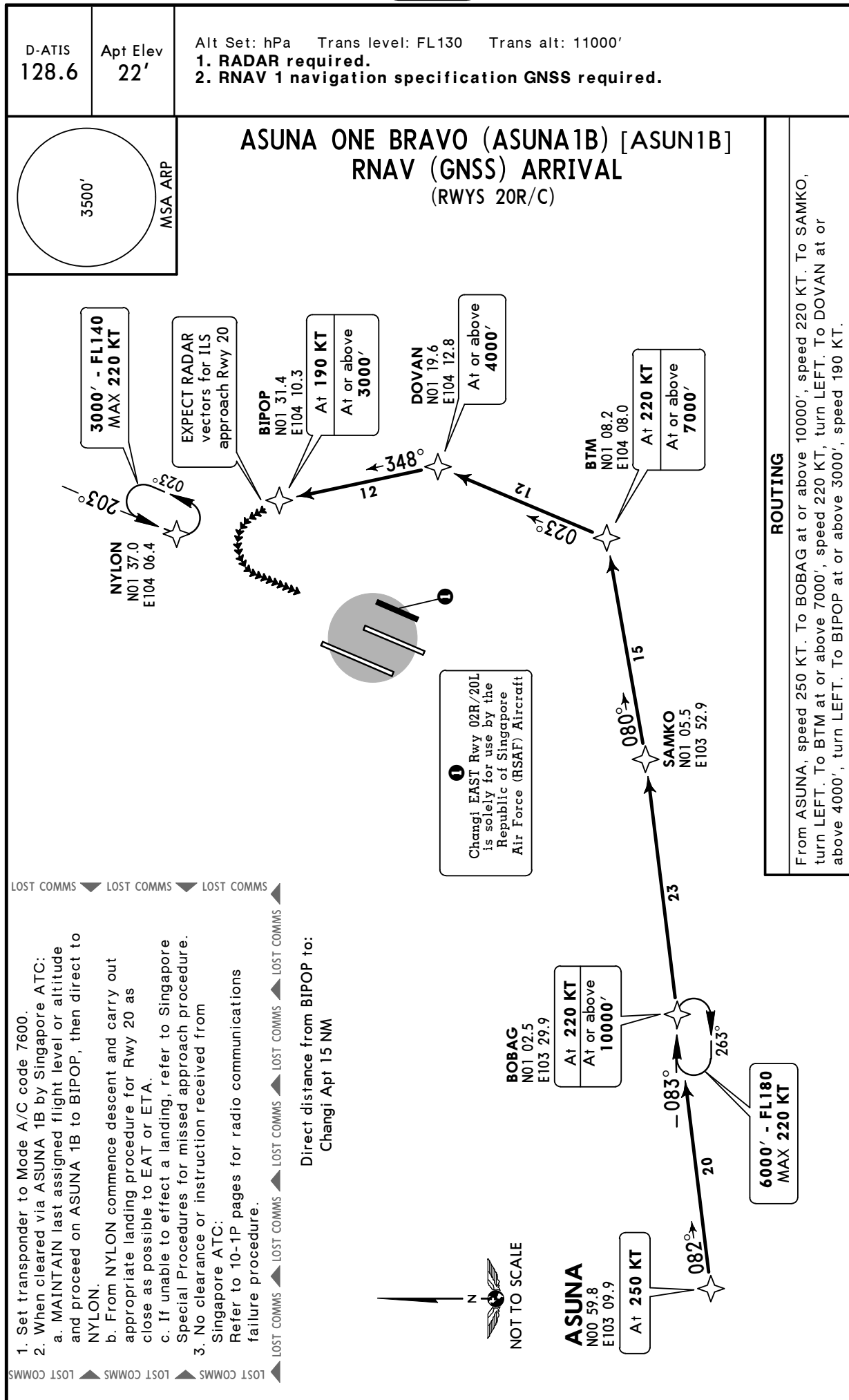
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RNAV STAR



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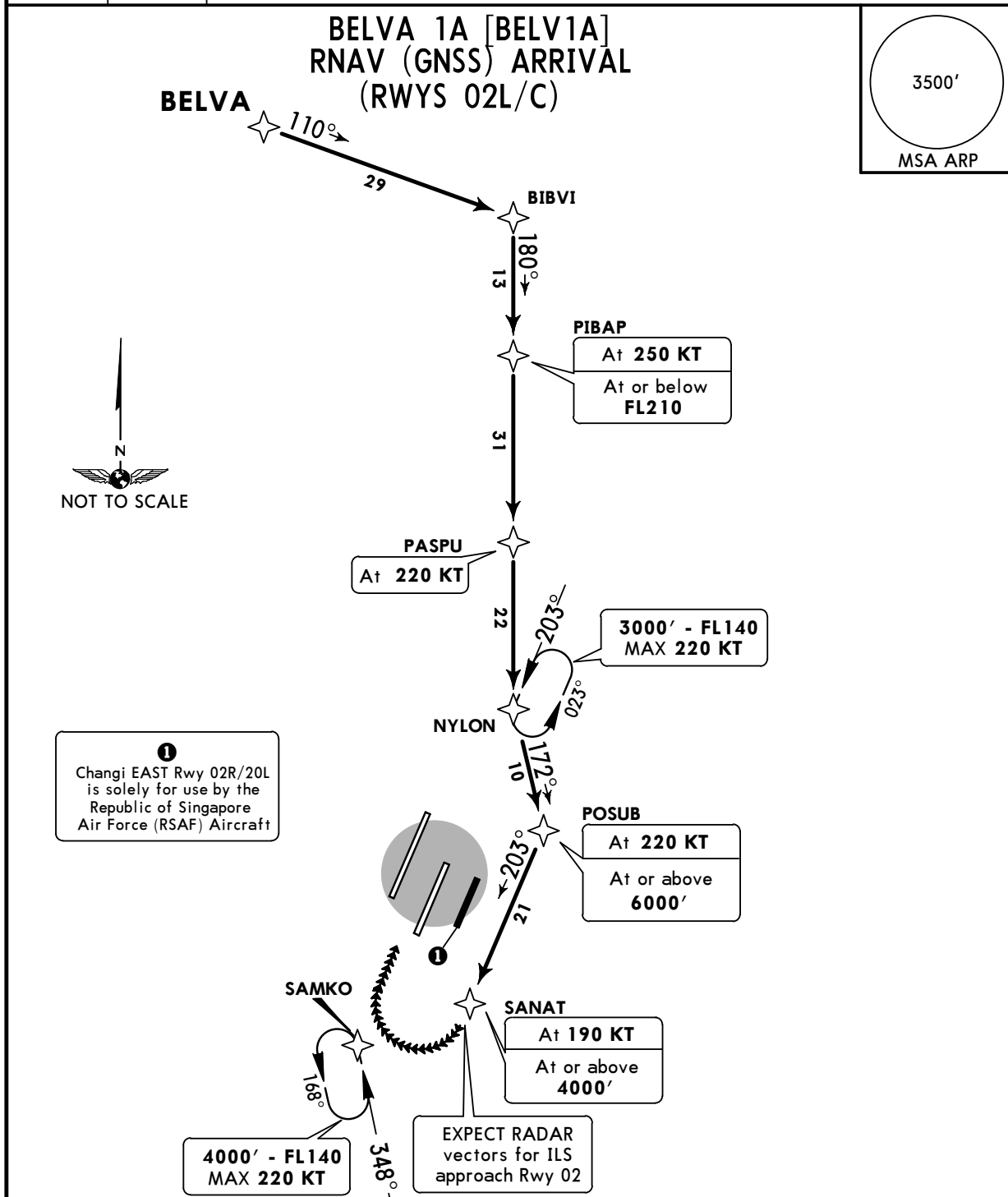
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RNAV STAR

D-ATIS
128.6

Apt Elev
22'

Alt Set: hPa Trans level: FL130 Trans alt: 11000'
1. RADAR required.
2. RNAV 1 navigation specification GNSS required.



LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼

1. Set transponder to Mode A/C code 7600.
2. When cleared via BELVA 1A by Singapore ATC:
 - a. MAINTAIN last assigned flight level or altitude and proceed on BELVA 1A to SANAT, then direct to SAMKO.
 - b. From SAMKO commence descent and carry out appropriate landing procedure for Rwy 02 as close as possible to EAT or ETA.
 - c. If unable to effect a landing, refer to Singapore Special Procedures for missed approach procedure.
3. No clearance or instruction received from Singapore ATC:
Refer to 10-1P pages for radio communications failure procedure.

ROUTING

From BELVA. To BIBVI, turn RIGHT. To PIBAP, at or below FL210, speed 250 KT. To PASPU, speed 220 KT. To NYLON, turn LEFT. To POSUB at or above 6000', speed 220 KT, turn RIGHT. To SANAT at or above 4000', speed 190 KT.

WSSS/SIN
CHANGI

JEPPESSEN

24 FEB 17

10-2E

Eff 2 Mar

SINGAPORE, SINGAPORE

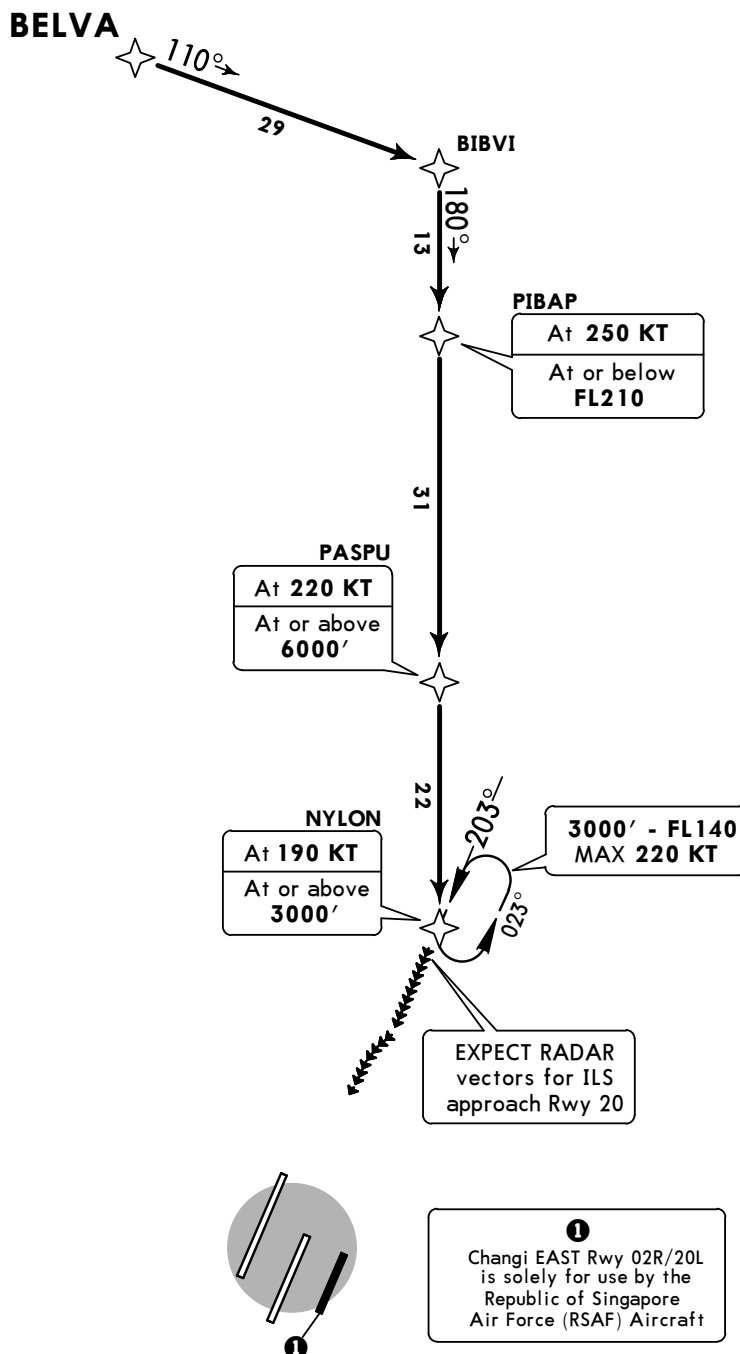
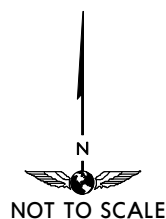
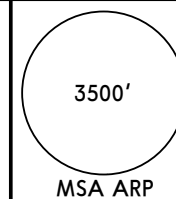
RNAV STAR

D-ATIS
128.6

Apt Elev
22'

Alt Set: hPa Trans level: FL130 Trans alt: 11000'
1. RADAR required.
2. RNAV 1 navigation specification GNSS required.

BELVA 1B [BELV1B]
RNAV (GNSS) ARRIVAL
(RWYS 20R/C)



LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼

1. Set transponder to Mode A/C code 7600.
2. When cleared via BELVA 1B by Singapore ATC:
 - a. MAINTAIN last assigned flight level or altitude and proceed on BELVA 1B to NYLON.
 - b. From NYLON commence descent and carry out appropriate landing procedure for Rwy 20 as close as possible to EAT or ETA.
 - c. If unable to effect a landing, refer to Singapore Special Procedures for missed approach procedure.
3. No clearance or instruction received from Singapore ATC:
Refer to 10-1P pages for radio communications failure procedure.

ROUTING

From BELVA. To BIBVI, turn RIGHT. To PIBAP at or below FL210, speed 250 KT. To PASPU, at or above 6000', speed 220 KT. To NYLON at or above 3000', speed 190 KT.

WSSS/SIN
CHANGI

JEPPESEN
7 APR 17 **(10-2E1)**

SINGAPORE, SINGAPORE

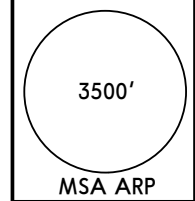
RNAV STAR

D-ATIS
128.6

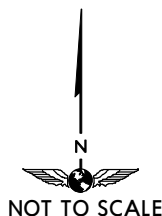
Apt Elev
22'

Alt Set: hPa Trans level: FL130 Trans alt: 11000'
1. RADAR required.
2. RNAV 1 navigation specification GNSS required.

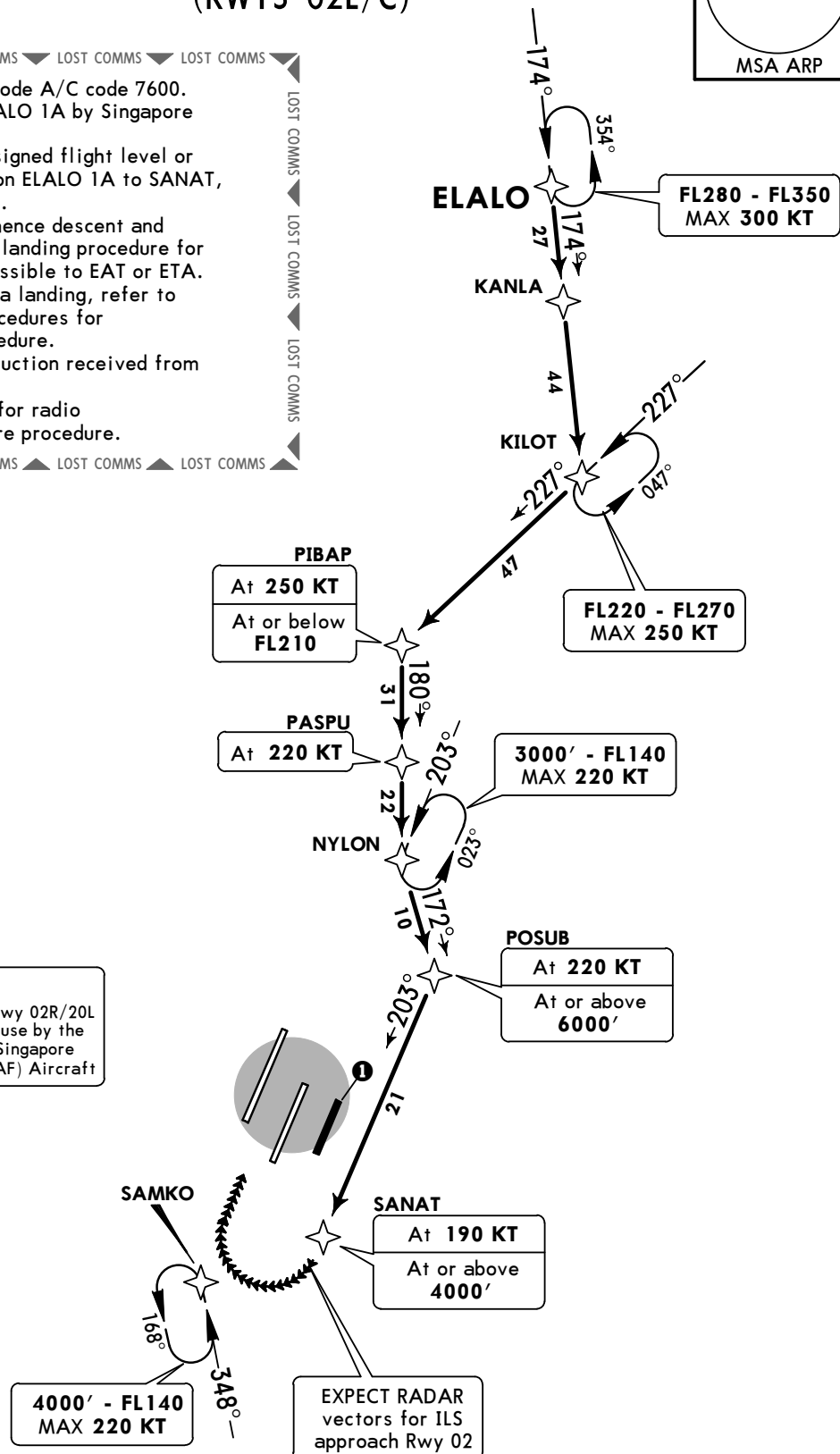
ELALO 1A [ELAL1A]
RNAV (GNSS) ARRIVAL
(RWYS 02L/C)



- ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼
1. Set transponder to Mode A/C code 7600.
 2. When cleared via ELALO 1A by Singapore ATC:
 - a. MAINTAIN last assigned flight level or altitude and proceed on ELALO 1A to SANAT, then direct to SAMKO.
 - b. From SAMKO commence descent and carry out appropriate landing procedure for Rwy 02 as close as possible to EAT or ETA.
 - c. If unable to effect a landing, refer to Singapore Special Procedures for missed approach procedure.
 3. No clearance or instruction received from Singapore ATC:
Refer to 10-1P pages for radio communications failure procedure.
- ▲ LOST COMMS ▲ LOST COMMS ▲ LOST COMMS ▲ LOST COMMS ▲



1
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ROUTING

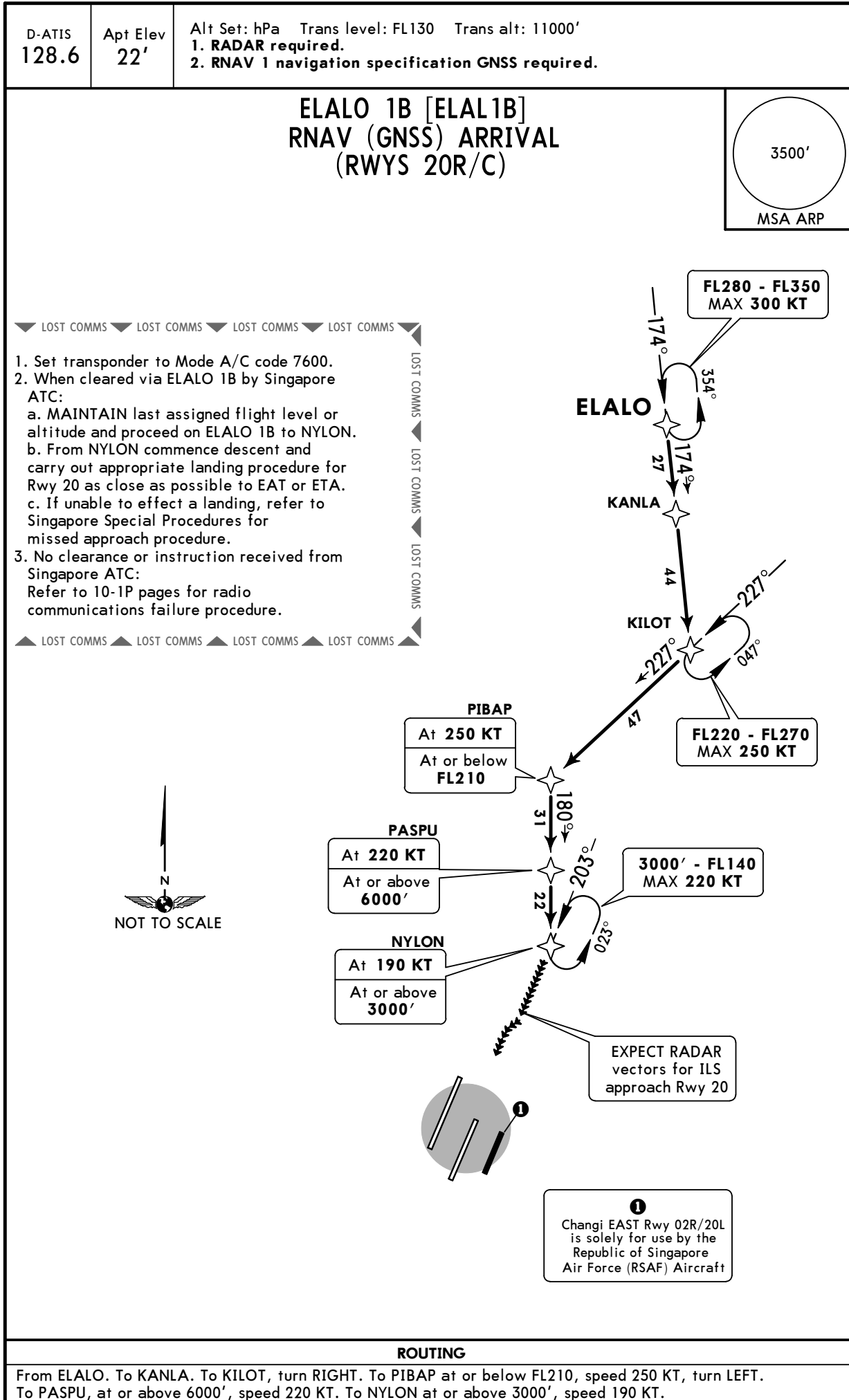
From ELALO. To KANLA. To KILOT, turn RIGHT. To PIBAP at or below FL210, speed 250 KT, turn LEFT. To PASPU, speed 220 KT. To NYLON, turn LEFT. To POSUB at or above 6000', speed 220 KT, turn RIGHT. To SANAT at or above 4000', speed 190 KT.

WSSS/SIN
CHANGI

JEPPESSEN
7 APR 17 **(10-2E2)**

SINGAPORE, SINGAPORE

RNAV STAR



WSSS/SIN
CHANGI

JEPPESEN
18 DEC 15 10-2F

SINGAPORE, SINGAPORE

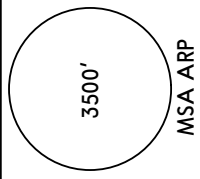
RNAV STAR

D-ATIS
128.6

Apt Elev
22'

Alt Set: hPa Trans level: FL130 Trans alt: 11000'

1. RADAR required.
2. RNAV 1 navigation specification GNSS required.



**KARTO ONE ALPHA (KARTO1A) [KART1A]
RNAV (GNSS) ARRIVAL
(RWYS 02L/C)**

LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼

1. Set transponder to Mode A/C code 7600.
2. When cleared via KARTO 1A by Singapore ATC:
 - a. MAINTAIN last assigned flight level or altitude and proceed on KARTO 1A to SANAT, then direct to SAMKO.
 - b. From SAMKO commence descent and carry out appropriate landing procedure for Rwy 02 as close as possible to EAT or ETA.
3. If unable to effect a landing, refer to Singapore Special Procedures for missed approach procedure.
3. No clearance or instruction received from Singapore ATC:
Refer to 10-1P pages for radio communications failure procedure.

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Refer to 10-1P pages for radio communications failure procedure.

failure procedure.

101

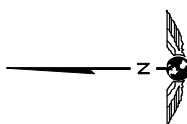
LOST COMMS	LOST COMMS	LOST COMMS	LOST COMMS
LOST COMMS	LOST COMMS	LOST COMMS	LOST COMMS

SWWOC ISO1 ▲ SWWOC ISO1 ▲ SWWOC ISO1

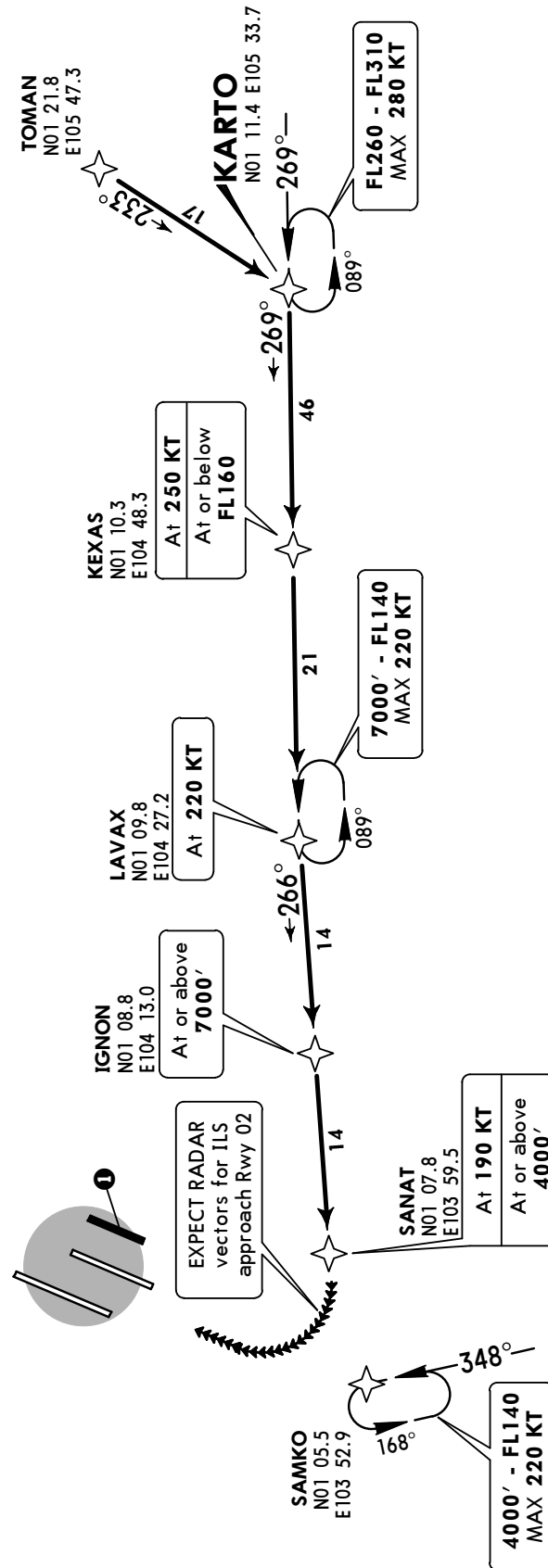
ROUTING

From TOMAN. To KARTO, turn RIGHT. To KEXAS at or below FL160, speed 250 KT. To LAVAX, speed 220 KT, turn LEFT. To IGNON at or above 7000'. To SANAT at or above 4000', speed 190 KT.

1 Changi EAST Rwy 02R/20L is solely for use by the Republic of Singapore Air Force (RSAF) Aircraft



NOT TO SCALE

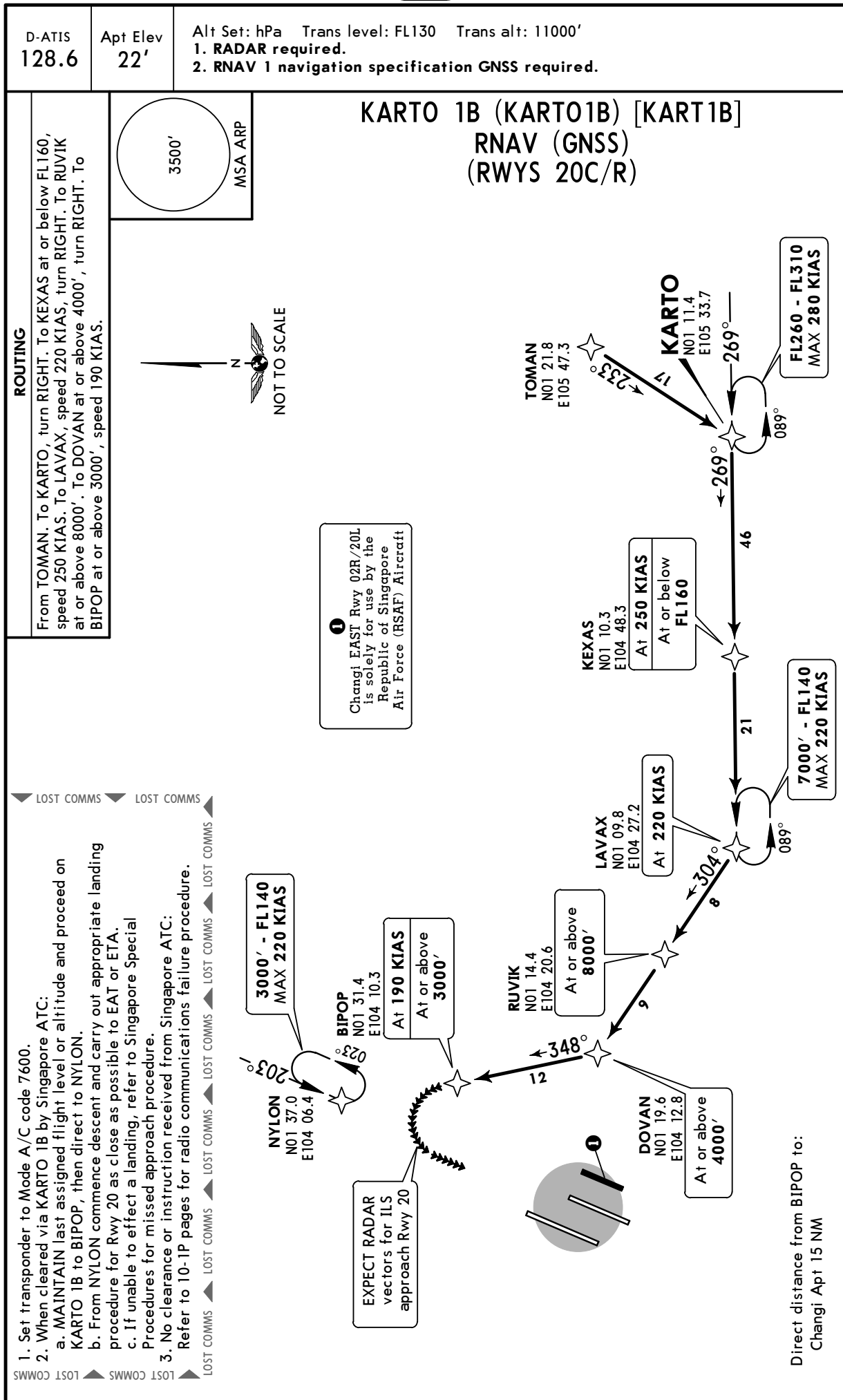


Direct distance from SANAT to:
Changi Apt 14 NM

WSSS/SIN
CHANGI

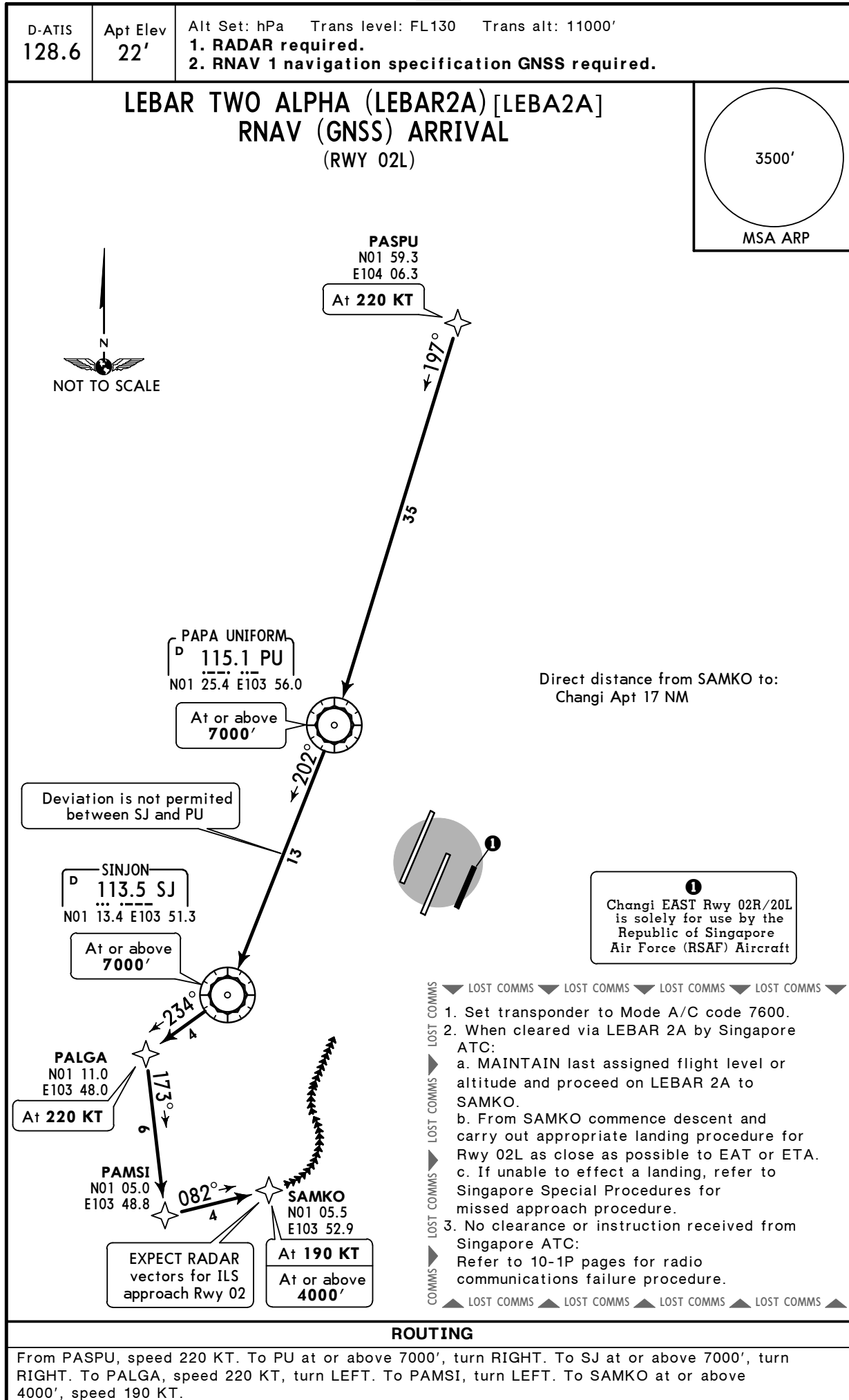
JEPPESSEN
18 DEC 15 **(10-2G)**

SINGAPORE, SINGAPORE
RNAV STAR



WSSS/SIN
CHANGI

JEPPESSEN SINGAPORE, SINGAPORE
17 JUL 15 **(10-2H)** **Eff 23 Jul** **RNAV STAR**



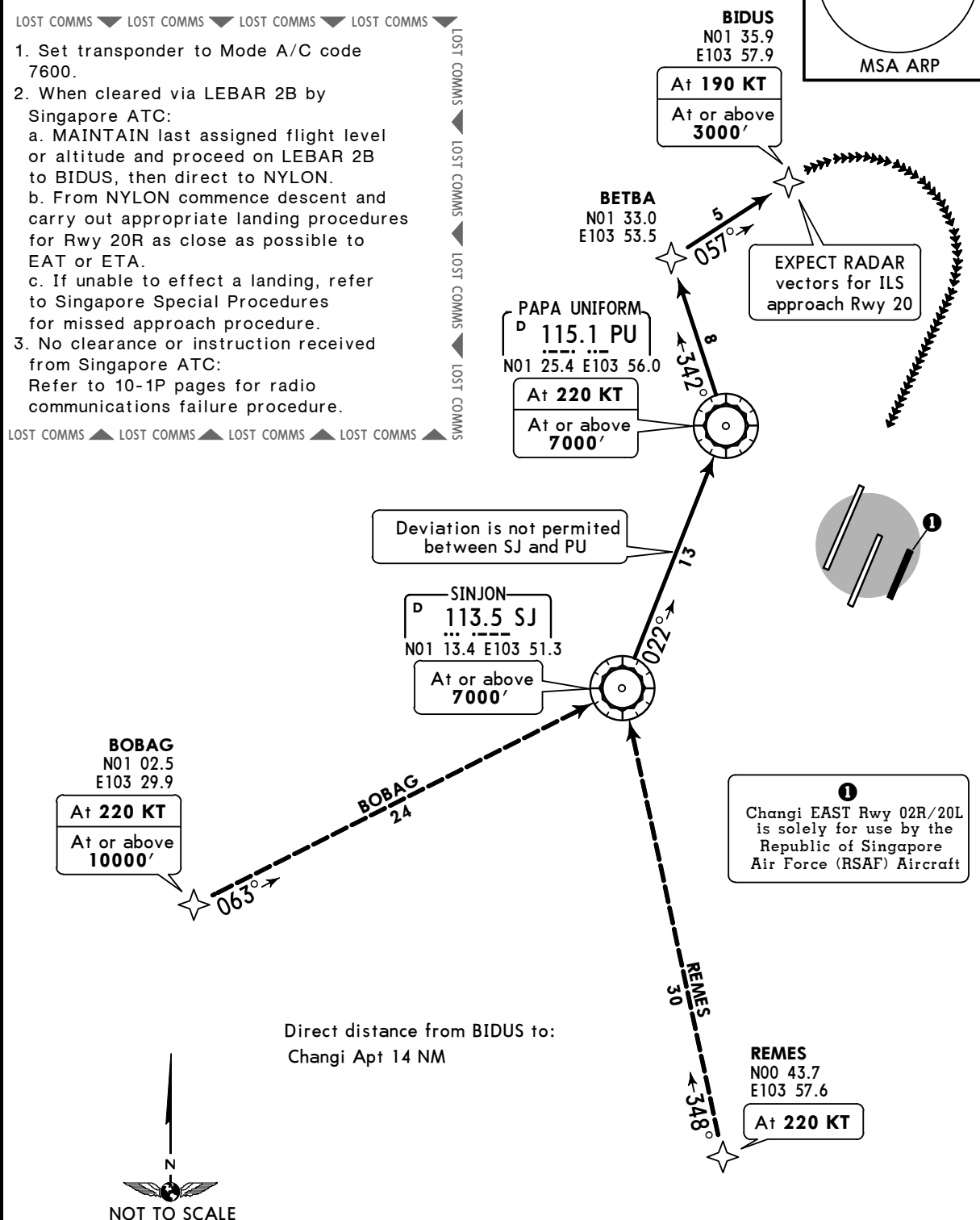
WSSS/SIN
CHANGI

JEPPESSEN SINGAPORE, SINGAPORE
17 JUL 15 **(10-2J)** **Eff 23 Jul** **RNAV STAR**

D-ATIS **128.6** Apt Elev **22'** Alt Set: hPa Trans level: FL130 Trans alt: 11000'
1. RADAR required.
2. RNAV 1 navigation specification GNSS required.

LEBAR TWO BRAVO (LEBAR2B) [LEBA2B]
RNAV (GNSS) ARRIVAL
(RWY 20R)

- LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼
1. Set transponder to Mode A/C code 7600.
 2. When cleared via LEBAR 2B by Singapore ATC:
 - a. MAINTAIN last assigned flight level or altitude and proceed on LEBAR 2B to BIDUS, then direct to NYLON.
 - b. From NYLON commence descent and carry out appropriate landing procedures for Rwy 20R as close as possible to EAT or ETA.
 - c. If unable to effect a landing, refer to Singapore Special Procedures for missed approach procedure.
 3. No clearance or instruction received from Singapore ATC:
Refer to 10-1P pages for radio communications failure procedure.
- LOST COMMS ▲ LOST COMMS ▲ LOST COMMS ▲ LOST COMMS ▲



TRANSITIONS

BOBAG	From BOBAG at or above 10000', speed 220 KT. To SJ at or above 7000', turn LEFT. To PU.
REMES	From REMES, speed 220 KT. To SJ at or above 7000', turn RIGHT. To PU.

ROUTING

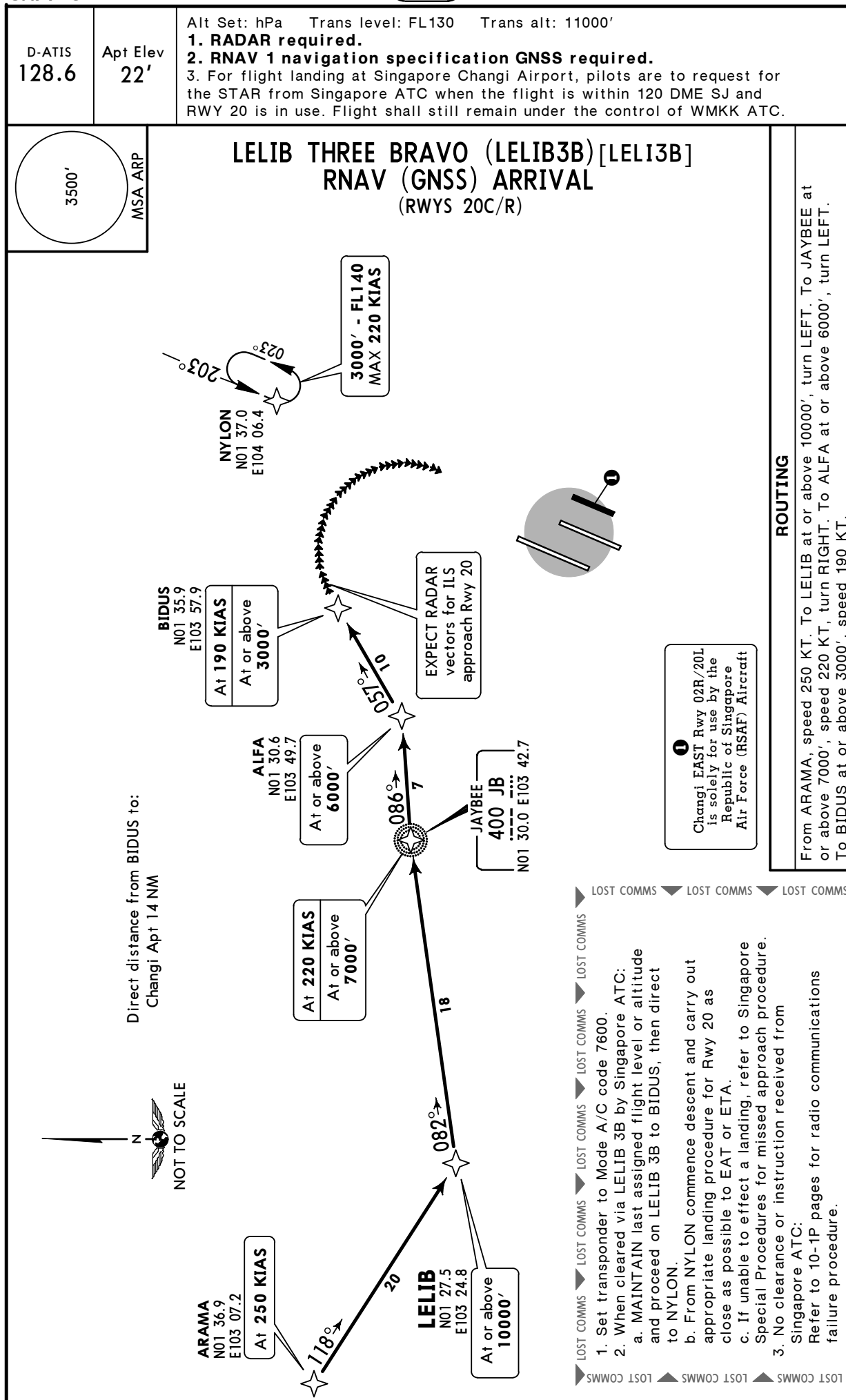
From PU, at or above 7000', speed 220 KT, turn LEFT. To BETBA, turn RIGHT. To BIDUS at or above 3000', speed 190 KT.

WSSS/SIN
CHANGI

JEPPesen
24 FEB 17 **(10-2J1)** **Eff 2 Mar**

SINGAPORE, SINGAPORE

RNAV STAR



WSSS/SIN
CHANGI

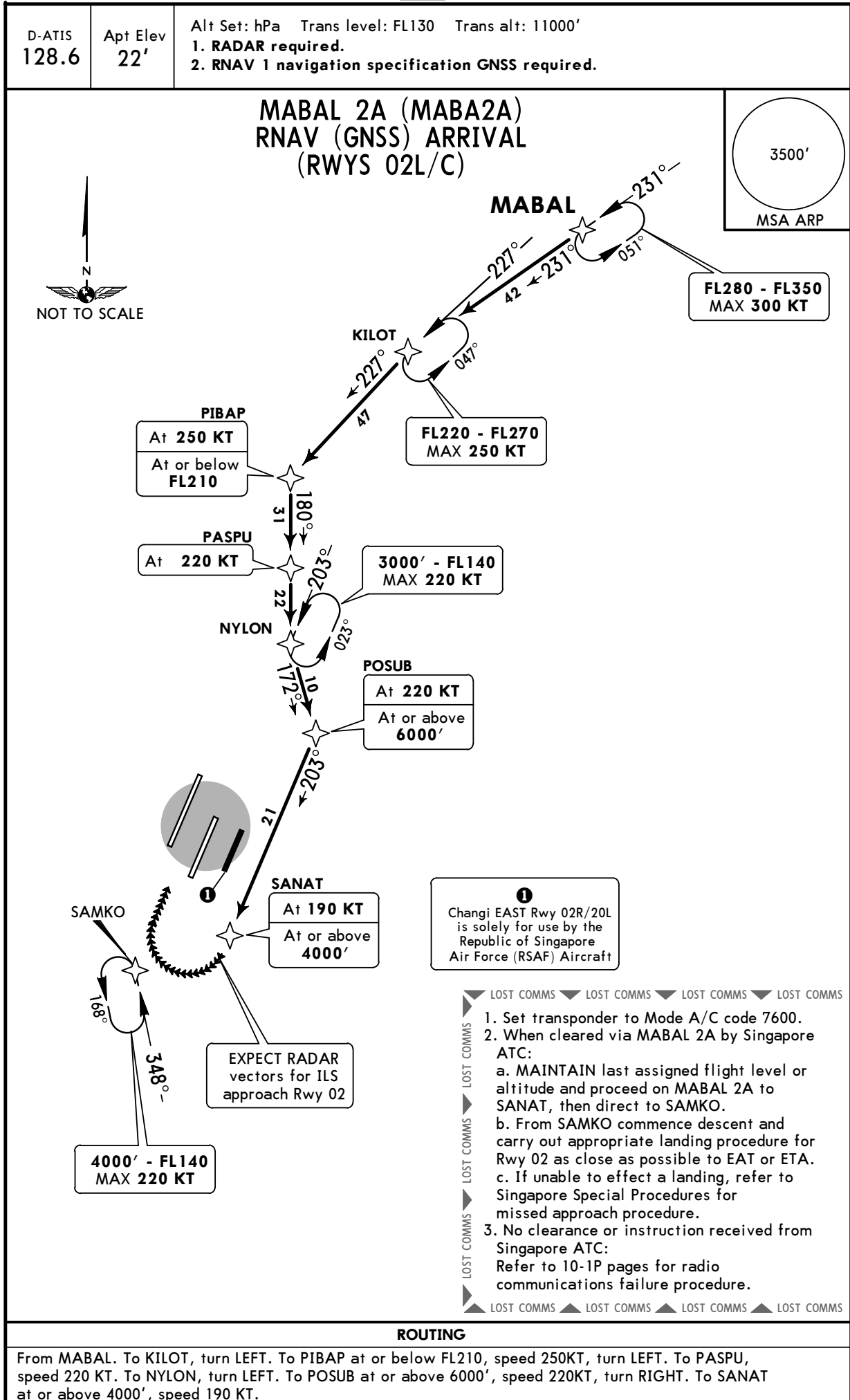
JEPPesen

24 FEB 17 **10-2J2**

Eff 2 Mar

SINGAPORE, SINGAPORE

RNAV STAR



WSSS/SIN
CHANGI

JEPPESEN

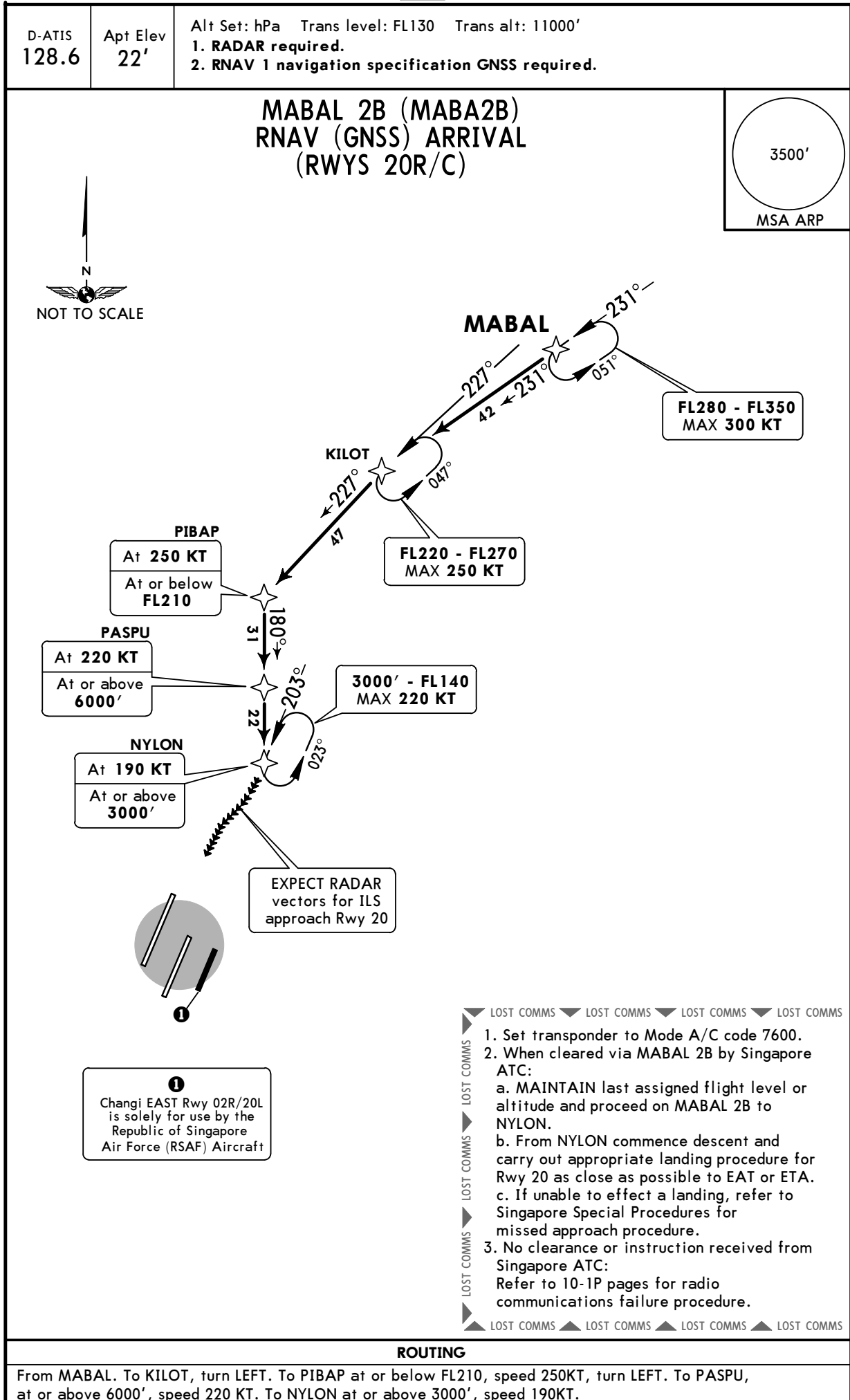
24 FEB 17

10-2K

Eff 2 Mar

SINGAPORE, SINGAPORE

RNAV STAR



WSSS/SIN
CHANGI

JEPPESSEN

24 FEB 17

10-2L

Eff 2 Mar

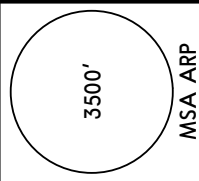
SINGAPORE, SINGAPORE

RNAV STAR

D-ATIS
128.6

Apt Elev
22'

Alt Set: hPa Trans level: FL130 Trans alt: 11000'
1. RADAR required.
2. RNAV 1 navigation specification GNSS required.



OBDOS ONE ALPHA (OBDOS1A) [OBDO1A]
RNAV (GNSS) ARRIVAL
(RWYS 02L/C)

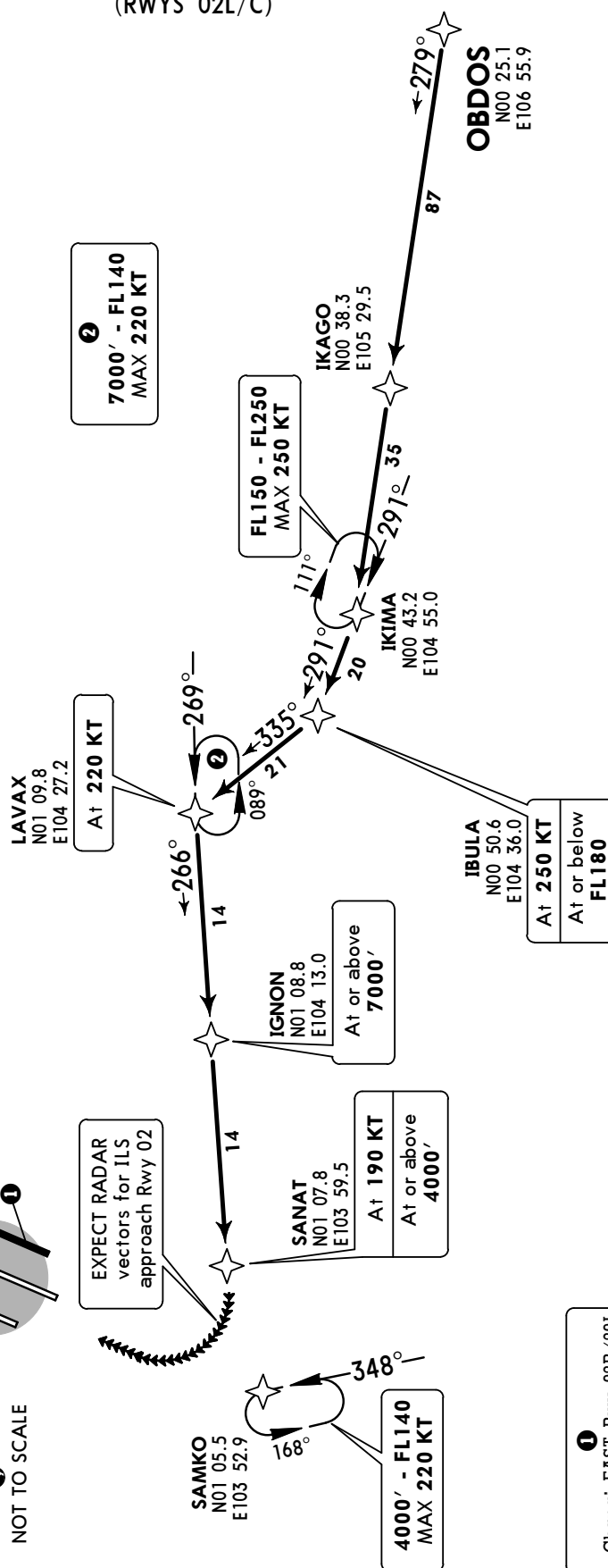
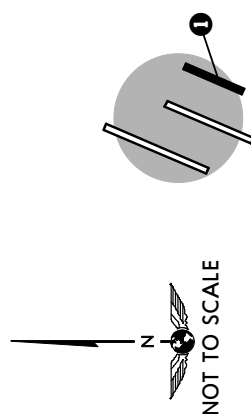
LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼

1. Set transponder to Mode A/C code 7600.
2. When cleared via OBDOS 1A by Singapore ATC:
 - a. MAINTAIN last assigned flight level or altitude and proceed on OBDOS 1A to SANAT, then direct to SAMKO.
 - b. From SAMKO commence descent and carry out appropriate landing procedure for Rwy 02 as close as possible to EAT or ETA.
 - c. If unable to effect a landing, refer to Singapore Special Procedures for missed approach procedure.
3. No clearance or instruction received from Singapore ATC:
Refer to 10-1P pages for radio communications failure procedure.

LOST COMMS ▲ LOST COMMS ▲ LOST COMMS ▲ LOST COMMS ▲ LOST COMMS ▲ LOST COMMS ▲ LOST COMMS ▲

ROUTING

From OBDOS. To IKAGO. To IKIMA, turn RIGHT. To IBULA at or below FL180, speed 250 KT, turn RIGHT. To LAVAX, speed 220 KT, turn LEFT. To IGNON at or above 7000'. To SANAT at or above 4000', speed 190 KT.



Direct distance from SANAT to:
Changi Apt 14 NM

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**WSSS/SIN
CHANGI**

JEPPESEN
18 DEC 15 (10-2N)

SINGAPORE, SINGAPORE

RNAV STAR

D-ATIS
128.6

Apt Elev
22'

Alt Set: hPa Trans level: FL130 Trans alt: 11000'

1. RADAR required.

2. RNAV 1 navigation specification GNSS required.

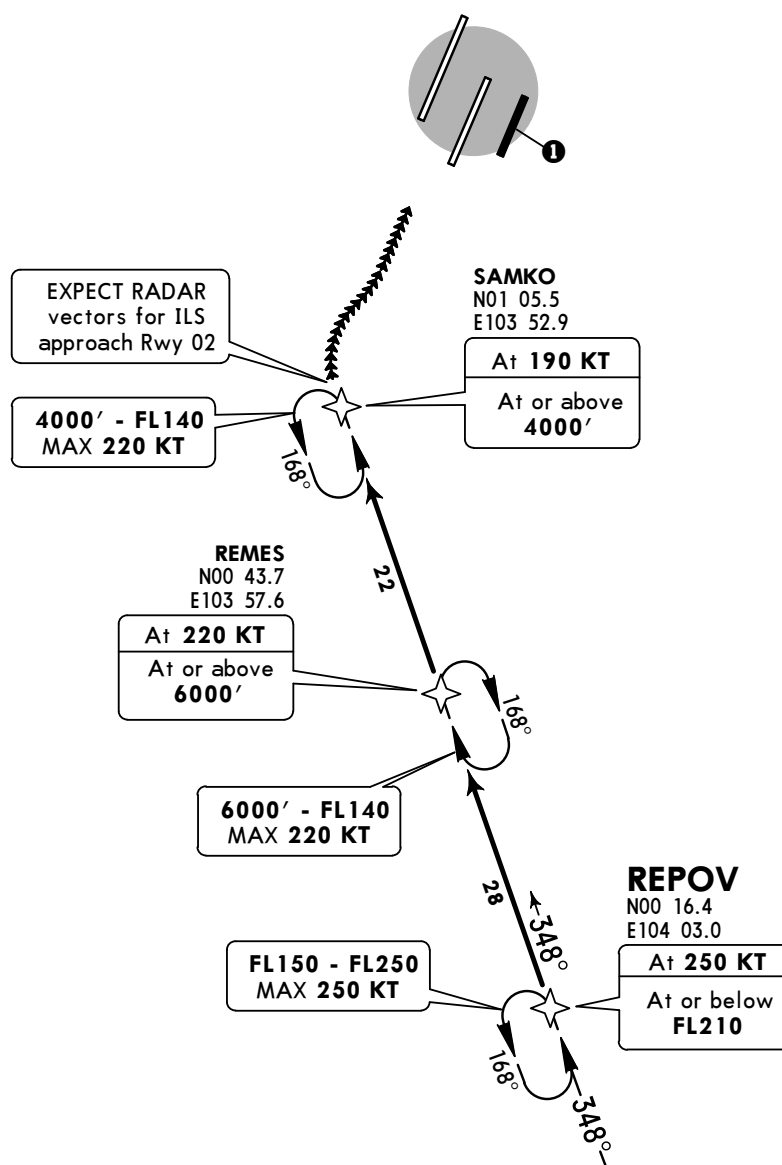
REPOV ONE ALPHA (REPOV1A)[REPO1A]
RNAV (GNSS) ARRIVAL
(RWYS 02L/C)

3500'

MSA ARP

1

NOT TO SCALE



LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼

1. Set transponder to Mode A/C code 7600.
2. When cleared via REPOV 1A by Singapore ATC:
 - a. MAINTAIN last assigned flight level or altitude and proceed on REPOV 1A to SAMKO.
 - b. From SAMKO commence descent and carry out appropriate landing procedure for Rwy 02 as close as possible to EAT or ETA.
 - c. If unable to effect a landing, refer to Singapore Special Procedures for missed approach procedure.
3. No clearance or instruction received from Singapore ATC:
Refer to 10-1P pages for radio communications failure procedure.

COMMS ▲ LOST COMMS ▲ LOST COMMS ▲ LOST COMMS ▲ LOST COMMS ▲

Changi EAST Rwy 02R/20L
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Air Force (RSAF) Aircraft

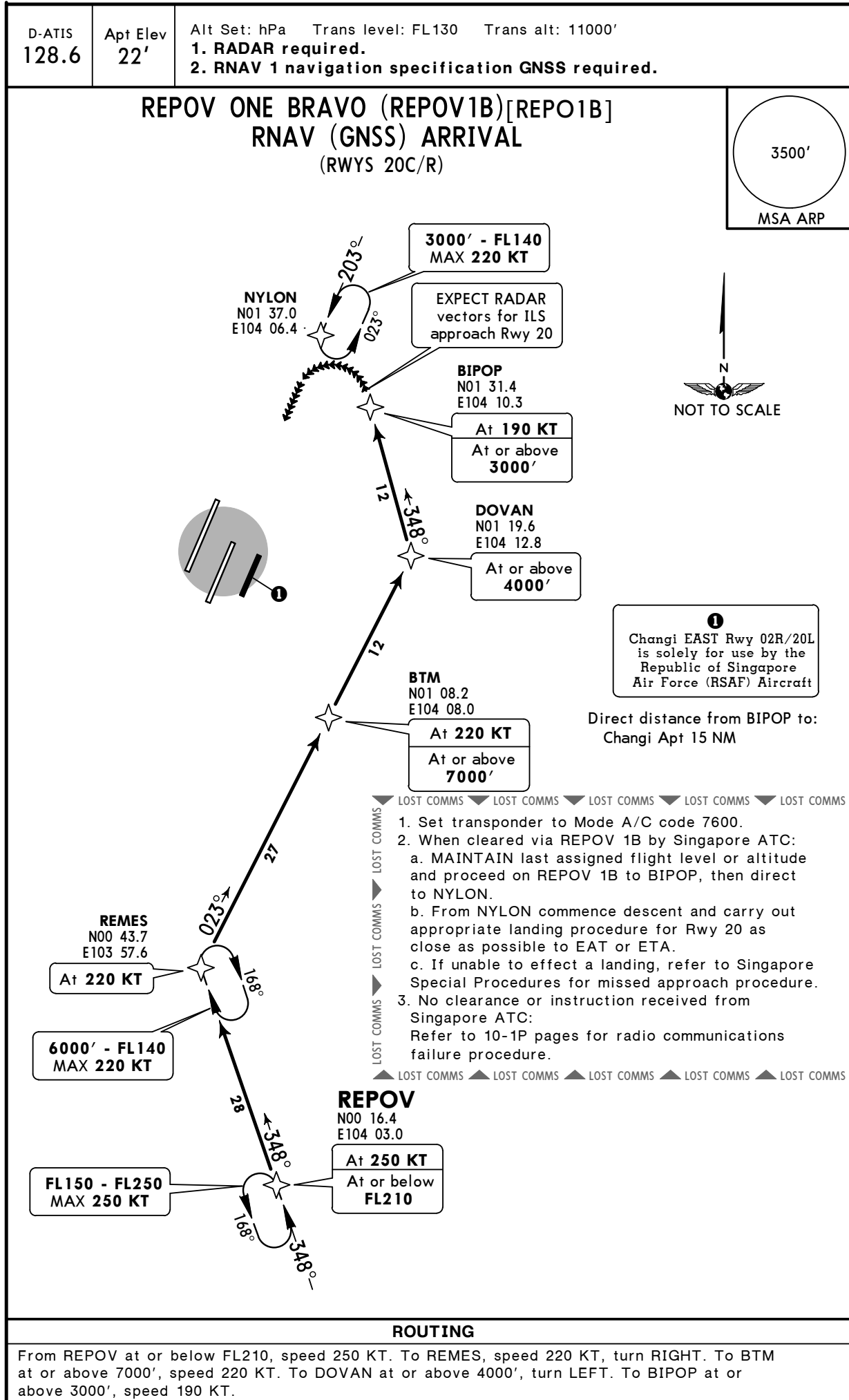
Direct distance from SAMKO to:
Changj Apt 17 NM

ROUTING

From REPOV at or below FL210, speed 250 KT. To REMES at or above 6000', speed 220 KT.
To SAMKO at or above 4000', speed 190 KT.

WSSS/SIN
CHANGI

JEPPESSEN SINGAPORE, SINGAPORE
17 JUL 15 **10-2P** **Eff 23 Jul** **RNAV STAR**


ROUTING

WSSS/SIN
CHANGI

JEPPesen
17 JUL 15 **(10-2Q)** Eff 23 Jul

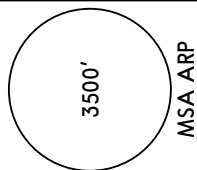
SINGAPORE, SINGAPORE

RNAV STAR

D-ATIS
128.6

Apt Elev
22'

Alt Set: hPa Trans level: FL130 Trans alt: 11000'
1. RADAR required.
2. RNAV 1 navigation specification GNSS required.



SURGA ONE ALPHA (SURGA1A) [SURG1A]
RNAV (GNSS) ARRIVAL
(RWYS 02L/C)

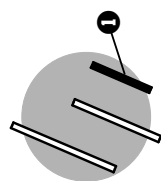
LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼

1. Set transponder to Mode A/C code 7600.
2. When cleared via SURGA 1A by Singapore ATC:
 - a. MAINTAIN last assigned flight level or altitude and proceed on SURGA 1A to SANAT, then direct to SAMKO.
 - b. From SAMKO commence descent and carry out appropriate landing procedure for Rwy 02 as close as possible to EAT or ETA.
 - c. If unable to effect a landing, refer to Singapore Special Procedures for missed approach procedure.
3. No clearance or instruction received from Singapore ATC:
Refer to 10-1P pages for radio communications failure procedure.

LOST COMMS ▲ LOST COMMS ▲ LOST COMMS ▲ LOST COMMS ▲ LOST COMMS ▲ LOST COMMS ▲

ROUTING

From SURGA. To IKAGO, turn LEFT. To IKIMA, turn RIGHT. To IBULA, at or below FL180, speed 250 KT, turn RIGHT. To LAVAX, speed 220 KT, turn LEFT. To IGNON at or above 7000'. To SANAT at or above 4000', speed 190 KT.



EXPECT RADAR
vectors for ILS
approach Rwy 02

LAVAX
N01 09.8
E104 27.2

At 220 KT

266°

14

269°

089° 21'

335°

20

291°

111°

279°

35

291°

320°

97

SAMKO
N01 05.5
E103 52.9

168°

348°

4000' - FL140
MAX 220 KT

At 190 KT
At or above 4000'

SANAT
N01 07.8
E103 59.5

At 250 KT
At or below FL180

IBULA
N00 50.6
E104 36.0

7000'

At or above 7000'

IGNON
N01 08.8
E104 13.0

FL150 - FL250
MAX 250 KT

7000' - FL140
MAX 220 KT

1
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Direct distance from SANAT to:
Changi Apt 14 NM



WSSS/SIN
CHANGI

JEPPESEN
24 FEB 17 (10-2S) E

SINGAPORE, SINGAPORE

RNAV STAR

ROUTING

From SURGA. To IKAGO, turn LEFT. To IKIMA, turn RIGHT. To IBULA at or below FL180, speed 250 KIAS, turn RIGHT. To LAVAX, speed 220 KIAS, turn LEFT. To RUVIK at or above 8000'. To DOVAN at or above 4000', turn RIGHT. To BIPOP at or above 3000', speed 190 KIAS.

ALTITUDE

Alt Set: hPa Trans level: FL130 Trans alt: 11000'

1. RADAR required.

2. RNAV 1 navigation specification GNSS required.

SURGA 1B (SURGA1B) [SURG1B]
RNAV (GNSS)
(RWYS 20C/R)

NOT TO SCALE

Changi EAST Rwy 02R/20L
 is solely for use by the
 Republic of Singapore
 Air Force (RSAF) Aircraft

3500'
MSA ARP

NYLON
 N01 37.0
 E104 06.4

BIPOP
 N01 31.4
 E104 10.3

At 190 KIAS
 At or above
3000'

DOVAN
 N01 19.6
 E104 12.8

**At or above
 4000'**

RUVIK
 N01 14.4
 E104 20.6

**At or above
 8000'**

LAVAX
 N01 09.8
 E104 27.2

At 220 KIAS

IBULA
 N00 50.6
 E104 36.0

At 250 KIAS
 At or below
FL180

IKIMA
 N00 43.2
 E104 55.0

IKAGO
 N00 38.3
 E105 29.5

SURGA
 S00 37.0
 E106 31.3

Direct distance from BIPOP to:
 Changi Apt 15 NM

1. Set transponder to Mode A/C code 7600.
2. When cleared via SURGA 1B by Singapore ATC:
 a. MAINTAIN last assigned flight level or altitude and proceed on SURGA 1B to BIPOP, then direct to NYLON.
 b. From NYLON commence descent and carry out appropriate landing procedure for Rwy 20 as close as possible to EAT or ETA.
 c. If unable to effect a landing, refer to Singapore Special Procedures for missed approach procedure.
3. No clearance or instruction received from Singapore ATC:
 Refer to 10-1P pages for radio communications failure procedure.

WSSS/SIN

 **JEPPESEN**
2 DEC 16 **10-3**

SINGAPORE, SINGAPORE

CHANGI

MINIMUM CLIMB GRADIENT CRITERIA

The Instrument Departure Procedures are only applicable for aircraft with all engines operating. It remains the responsibility of the operator to develop contingency procedures for the individual type of aircraft and to conduct the necessary examination of obstacles throughout the areas concerned in relation to the certificated performance of the individual aircraft type. It is also the responsibility of the operator to ensure that contingency procedures comply fully with the airplane performance requirements of Annex 6.

The specific routes to be followed are depicted in SID Charts pages. Altitude restrictions at fixes and/or DME specify ATC/airspace requirements.

Minimum net climb gradient specifies obstacle clearance requirements.

In the event that the minimum net climb gradient cannot be achieved, pilots shall inform ATC. ATC shall hold departures if pilots indicate that they are unable to meet the required net climb gradient.

RUNWAY 02L

When there are no reports of vessel movement along the northern shipping channel, or where the reported vessel height is less than 35m (115 ft) AMSL, the aircraft minimum net climb gradient shall be at 3.3%.

Where the reported vessel height is 35m (115 ft) AMSL or higher, ATC shall advise departing pilots of the vessel height. Pilots, on receipt of this information, shall apply the minimum net climb gradient in accordance with the table below.

Ht of Vessel (meters AMSL)	Gradient (%)	Minimum Crossing Altitude Over Vessel	
		meters	feet
35	3.4	44	142
40	3.9	49	158
50	4.8	59	191
60	5.8	69	224
70	6.8	79	257
80	7.8	89	290
90	8.8	99	322
100	9.7	109	355
110	10.7	119	388
120	11.7	129	421
130	12.7	139	454
140	13.7	149	486

After the aircraft has reached or passed the minimum crossing altitude over vessel, the minimum net climb gradient shall be 3.3%.

RUNWAY 02C

When there are no reports of vessel movement along the northern shipping channel, or where the reported vessel height is less than 70m (230 ft) AMSL, the aircraft minimum net climb gradient shall be at 3.3%.

Where the reported vessel height is 70m (230 ft) AMSL or higher, ATC shall advise pilots of the vessel height. Pilots, on receipt of this information, shall apply the minimum net climb gradient in accordance with the following table.

WSSS/SIN

 **JEPPESSEN**
2 DEC 16 **(10-3A)**

SINGAPORE, SINGAPORE

CHANGI

MINIMUM CLIMB GRADIENT CRITERIA

Ht of Vessel (meters AMSL)	Gradient (%)	Minimum Crossing Altitude Over Vessel	
		meters	feet
70	3.4	89	292
80	3.8	99	325
90	4.3	109	358
100	4.7	119	390
110	5.1	129	423
120	5.5	139	456
130	6.0	149	489
140	6.4	159	522

After the aircraft has reached or passed the minimum crossing altitude over vessel, the minimum net climb gradient shall be 3.3%.

RUNWAYS 20C AND 20R

All departures on Runway 20C shall be on a minimum net climb gradient of 7% until reaching or passing 2500 ft. Thereafter, the minimum net climb gradient shall be 3.3%.

All departures on Runway 20R shall be on a minimum net climb gradient of 6% until reaching or passing 2500 ft. Thereafter, the minimum net climb gradient shall be 3.3%.

Refer to Standard Instrument Departures for Runways 20C and 20R.

DETERMINATION OF CLIMB GRADIENT BY OPERATORS

The minimum net climb gradients specified above need not apply to operators who wish to calculate their own climb gradients based on actual lift-off point, provided the calculation ensures the following:

- The most penalizing obstacle is taken into account under both all-engines operating procedures as well as one-engine-out procedures; and
- The required minimum obstacle clearance (MOC) is met under all engines operating procedures.

For the above calculations, operators shall use the following information:

- a. The most penalizing obstacle is a tall vessel which is on the extended center line of the runway. (ATC shall advise pilots of the height of the tall vessel.)
- b. The required MOC is 0.8% of the distance (d) from the departure end of runway (DER) to the obstacle, in accordance with Volume II of ICAO Doc 8168: Procedures for Air Navigation Services Operations (PANS-OPS) where, in the case of Singapore Changi Airport, the DER is defined as the end of the clearway.
- c. The distance (d) for departure Runways 02L/02C is measured from the DER to the shipping channel north of Changi. The distance (d) for departure Runways 20C/20R is measured from the DER to the boundary of the restricted waters south of Changi wherein tall vessels of height above 49m (161 ft) AMSL are not permitted. The distance (d) for the various departure runways is as follows:

Departure Runway	Distance (d)
02L	1020m
02C	2360m
20C	9730m
20R	13100m

WSSS/SIN
CHANGI

JEPPESEN

4 NOV 16

10-3B

Eff 10 Nov

SINGAPORE, SINGAPORE

RNAV SID

Apt Elev
22'

Trans level: FL130 Trans alt: 11000'

1. **RADAR required.**2. **RNAV 1 Navigation Specification GNSS required.**

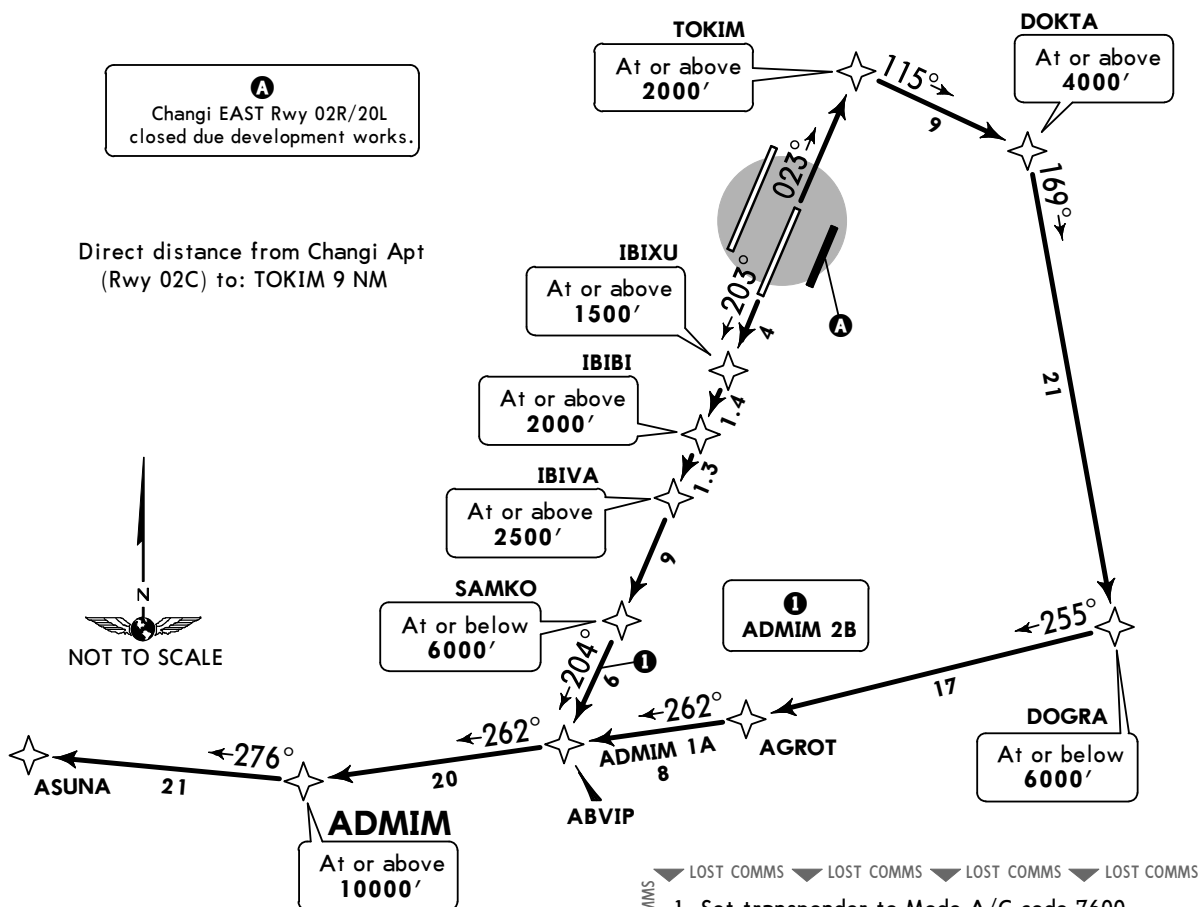
3. Aircraft unable to fly the SID profile shall inform ATC prior to departure and to EXPECT RADAR vectoring, if necessary.

4. Cruising levels will be issued after take-off by Singapore RADAR.

5. All SIDs include noise preferential routes.

3500'

MSA ARP

ADMIM 1A [ADMI1A], ADMIM 2B [ADMI2B]
RNAV (GNSS) DEPARTURES**SPEED:** SHALL NOT EXCEED 230 KIAS UNTIL PASSING 4000' AND
NOT EXCEED 250 KIAS UNTIL PASSING 10000'For minimum climb gradient criteria:
Rwy 02C: See 10-3 and 10-3A.Rwy 20C: Departures shall be on a
minimum net climb gradient of 7.0%
until reaching or passing 2500'.

Gnd speed-KT	75	100	150	200	250	300
7.0% V/V (fpm)	532	709	1063	1418	1772	2127

- LOST COMMS
- Set transponder to Mode A/C code 7600.
 - Communications failure occurs immediately after departure on:
Rwy 02C: Proceed straight ahead to Nylon Holding Area (NHA) climbing to the last assigned altitude. Thereafter refer to 10-1P pages for radio communications failure procedure.
Rwy 20C: Proceed straight ahead to Samko Holding Area (SHA) climbing to the last assigned altitude. Thereafter refer to 10-1P pages for radio communications failure procedure.
- LOST COMMS

Initial climb clearance **3000'** or as directed by ATC

SID	RWY	INITIAL CLIMB
ADMIM 1A	02C	To TOKIM on course 023° at or above 2000', turn RIGHT. To DOKTA at or above 4000', turn RIGHT. To DOGRA at or below 6000', turn RIGHT. To AGROT, turn RIGHT. To ADMIM at or above 10000', turn RIGHT. To ASUNA.
ADMIM 2B	20C	To IBIXU on course 203° at or above 1500'. To IBIBI at or above 2000'. To IBIVA at or above 2500'. To SAMKO at or below 6000', turn RIGHT. To ABVIP, turn RIGHT. To ADMIM at or above 10000', turn RIGHT. To ASUNA.

WSSS/SIN
CHANGI

JEPPESEN

4 NOV 16

(10-3C)

Eff 10 Nov

SINGAPORE, SINGAPORE

RNAV SID

Apt Elev
22'

Trans level: FL130 Trans alt: 11000'

1. **RADAR required.**2. **RNAV 1 Navigation Specification GNSS required.**

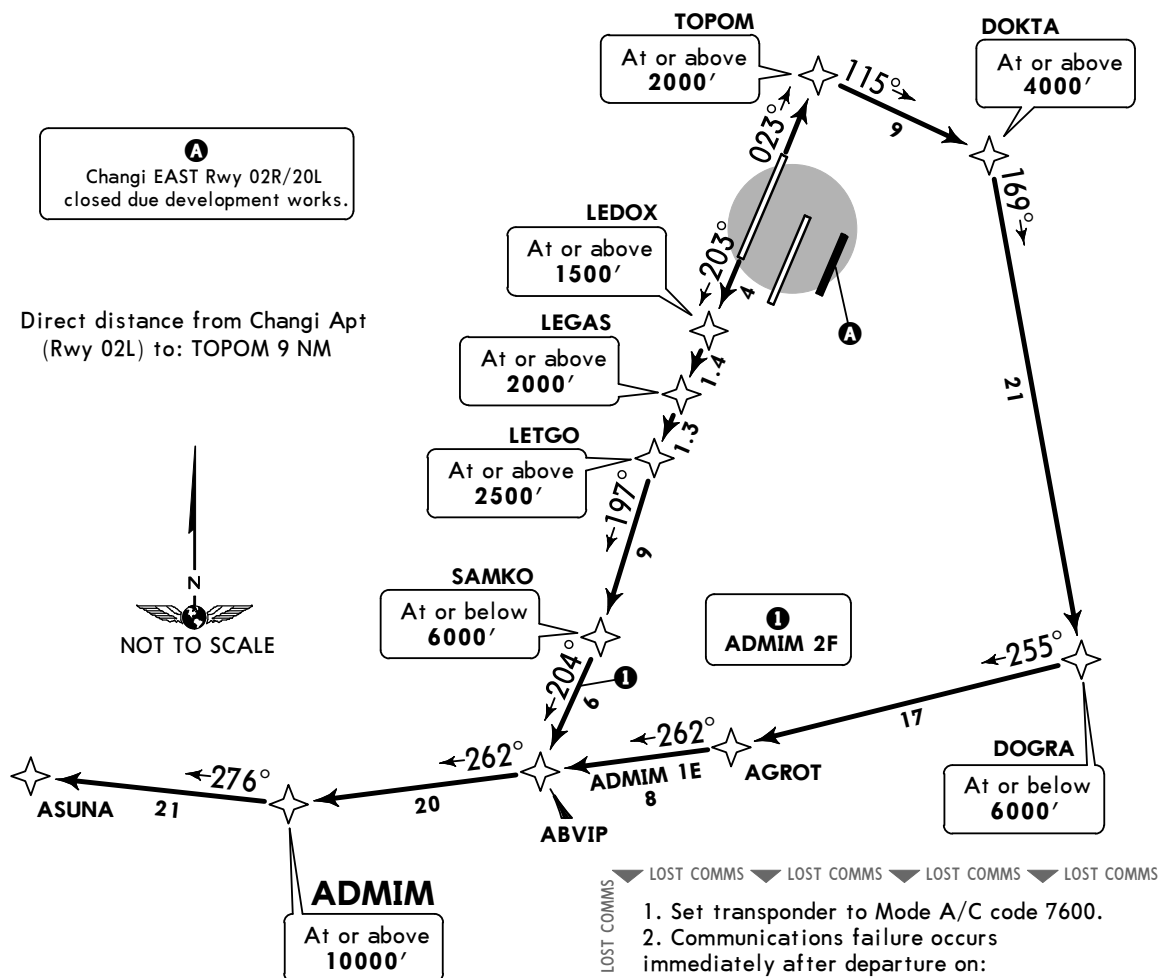
3. Aircraft unable to fly the SID profile shall inform ATC prior to departure and to EXPECT RADAR vectoring, if necessary.

4. Cruising levels will be issued after take-off by Singapore RADAR.

5. All SIDs include noise preferential routes.

3500'

MSA ARP

ADMIM 1E [ADMI1E], ADMIM 2F [ADMI2F]
RNAV (GNSS) DEPARTURES**SPEED:** SHALL NOT EXCEED 230 KIAS UNTIL PASSING 4000' AND
NOT EXCEED 250 KIAS UNTIL PASSING 10000'For minimum climb gradient criteria:
Rwy 02L: See 10-3 and 10-3A.Rwy 20R: Departures shall be on a
minimum net climb gradient of 6.0%
until reaching or passing 2500'.

Gnd speed-KT	75	100	150	200	250	300
6.0% V/V (fpm)	456	608	911	1215	1519	1823

- LOST COMMS
1. Set transponder to Mode A/C code 7600.
 2. Communications failure occurs immediately after departure on:
Rwy 02L: Proceed straight ahead to Nylon Holding Area (NHA) climbing to the last assigned altitude. Thereafter refer to 10-1P pages for radio communications failure procedure.
Rwy 20R: Proceed straight ahead to Samko Holding Area (SHA) climbing to the last assigned altitude. Thereafter refer to 10-1P pages for radio communications failure procedure.
- LOST COMMS

Initial climb clearance **3000'** or as directed by ATC

SID	RWY	INITIAL CLIMB
ADMIM 1E	02L	To TOPOM on course 023° at or above 2000', turn RIGHT. To DOKTA at or above 4000', turn RIGHT. To DOGRA at or below 6000', turn RIGHT. To AGROT, turn RIGHT. To ABVIP, turn RIGHT. To ADMIM at or above 10000', turn RIGHT. To ASUNA.
ADMIM 2F	20R	To LEDOX on course 203° at or above 1500'. To LEGAS at or above 2000'. To LETGO at or above 2500', turn LEFT. To SAMKO at or below 6000', turn RIGHT. To ABVIP, turn RIGHT. To ADMIM at or above 10000', turn RIGHT. To ASUNA.

WSSS/SIN
CHANGI

JEPPESSEN
4 NOV 16 **(10-3D)** Eff 10 Nov

SINGAPORE, SINGAPORE

RNAV SID

Apt Elev
22'

Trans level: FL130 Trans alt: 11000'

1. **RADAR required.**

2. **RNAV 1 Navigation Specification GNSS required.**

3. Aircraft unable to fly the SID profile shall inform ATC prior to departure and to EXPECT RADAR vectoring, if necessary.

4. On initial contact when requesting ATC, inform ATC of the flight level aircraft can cross ANITO.

5. Cruising levels will be issued after take-off by Singapore RADAR.

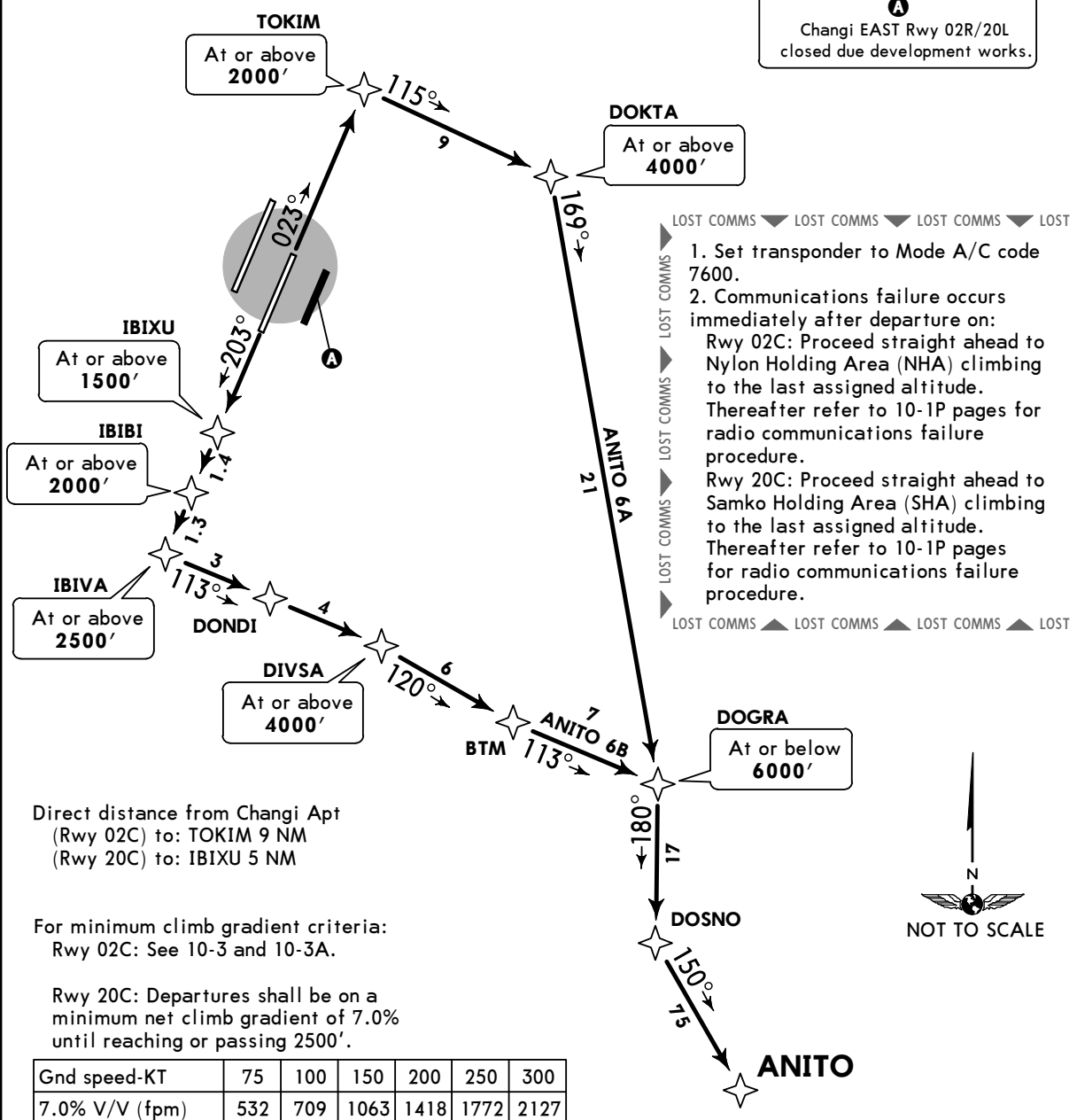
6. All SIDs include noise preferential routes.

3500'

MSA ARP

ANITO 6A [ANIT6A], ANITO 6B [ANIT6B]
RNAV (GNSS) DEPARTURES

SPEED: SHALL NOT EXCEED 230 KIAS UNTIL PASSING 4000' AND NOT EXCEED 250 KIAS UNTIL PASSING 10000'



Initial climb clearance **3000'** or as directed by ATC

SID	RWY	INITIAL CLIMB
ANITO 6A	02C	To TOKIM on course 023° at or above 2000', turn RIGHT. To DOKTA at or above 4000', turn RIGHT. To DOGRA at or below 6000', turn RIGHT. To DOSNO, turn LEFT. To ANITO.
ANITO 6B	20C	To IBIXU on course 203° at or above 1500'. To IBIBI at or above 2000'. To IBIVA at or above 2500', turn LEFT. To DONDII. To DIVSA at or above 4000', turn RIGHT. To BTM, turn LEFT. To DOGRA at or below 6000', turn RIGHT. To DOSNO, turn LEFT. To ANITO.

WSSS/SIN
CHANGI

JEPPESEN
4 NOV 16 **(10-3E)** **Eff 10 Nov**

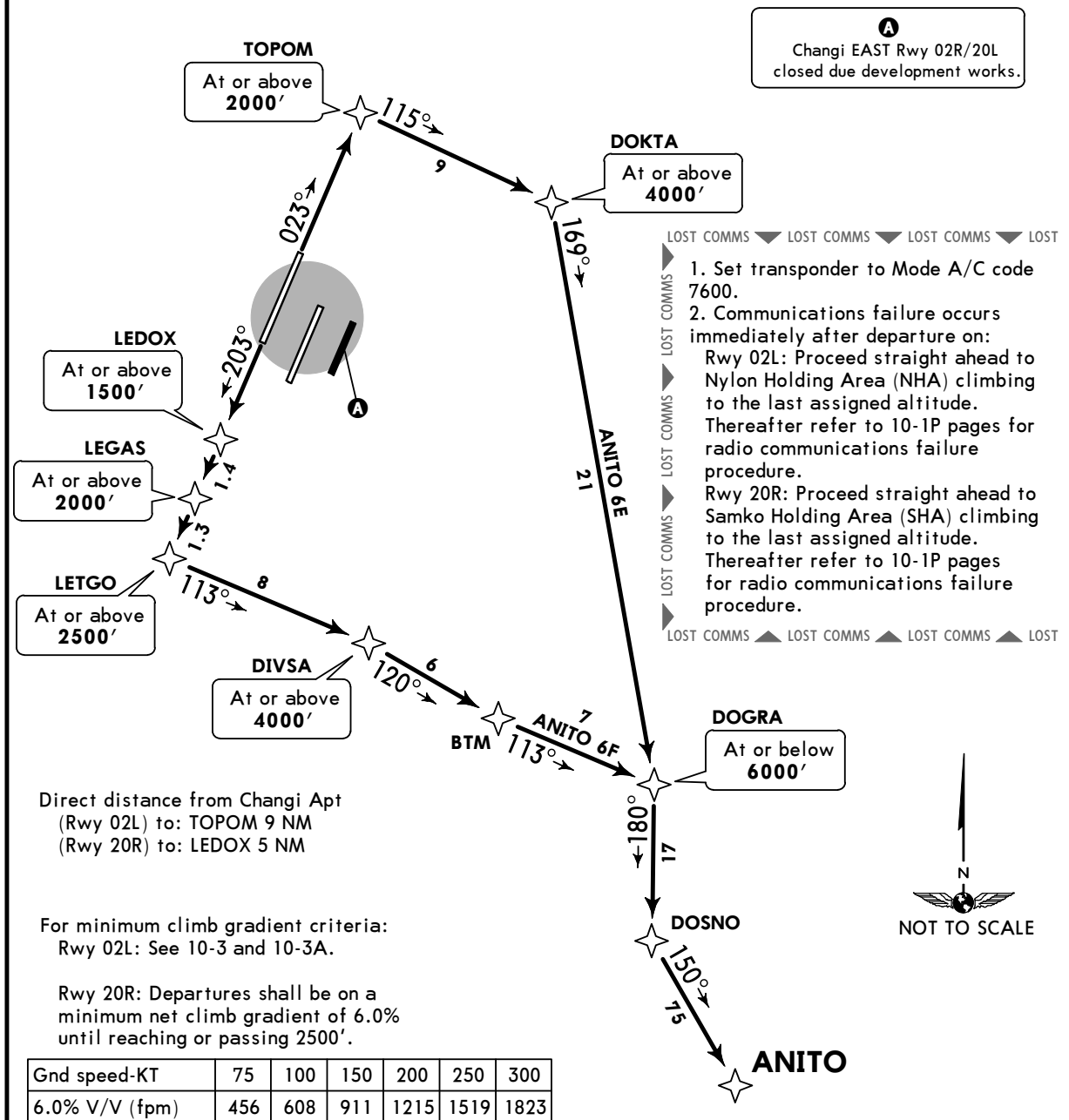
SINGAPORE, SINGAPORE

RNAV SID

<p>Apt Elev 22'</p>	<p>Trans level: FL130 Trans alt: 11000'</p> <ol style="list-style-type: none"> 1. RADAR required. 2. RNAV 1 Navigation Specification GNSS required. Aircraft unable to fly the SID profile shall inform ATC prior to departure and to EXPECT RADAR vectoring, if necessary. On initial contact when requesting ATC, inform ATC of the flight level aircraft can cross ANITO. Cruising levels will be issued after take-off by Singapore RADAR. All SIDs include noise preferential routes. 	<p>3500'</p> <p>MSA ARP</p>
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ANITO 6E [ANIT6E], ANITO 6F [ANIT6F] RNAV (GNSS) DEPARTURES

SPEED: SHALL NOT EXCEED 230 KIAS UNTIL PASSING 4000' AND NOT EXCEED 250 KIAS UNTIL PASSING 10000'



Initial climb clearance **3000'** or as directed by ATC

SID	RWY	INITIAL CLIMB
ANITO 6E	02L	To TOPOM on course 023° at or above 2000', turn RIGHT. To DOKTA at or above 4000', turn RIGHT. To DOGRA at or below 6000', turn RIGHT. To DOSNO, turn LEFT. To ANITO.
ANITO 6F	20R	To LEDOX on course 203° at or above 1500'. To LEGAS at or above 2000'. To LETGO at or above 2500', turn LEFT. To DIVSA at or above 4000', turn RIGHT. To BTM, turn LEFT. To DOGRA at or below 6000', turn RIGHT. To DOSNO, turn LEFT. To ANITO.

WSSS/SIN
CHANGI
JEPPESSEN
 4 NOV 16 **10-3F** **Eff 10 Nov**
SINGAPORE, SINGAPORE
RNAV SID

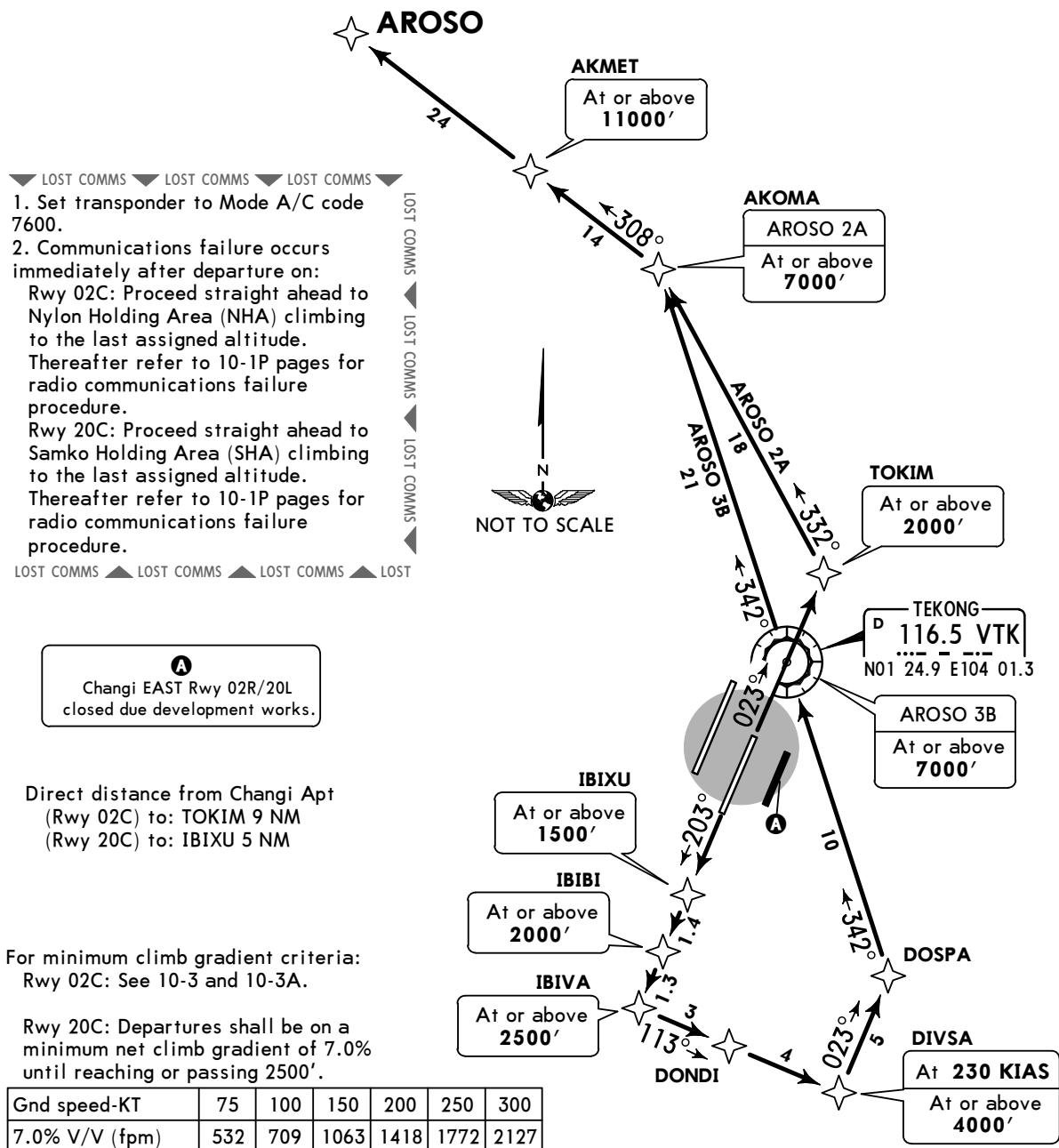
 Apt Elev
22'

Trans level: FL130 Trans alt: 11000'

1. RADAR required.**2. RNAV 1 Navigation Specification GNSS required.****3. Aircraft unable to fly the SID profile shall inform ATC prior to departure and to EXPECT RADAR vectoring, if necessary.****4. Cruising levels will be issued after take-off by Singapore RADAR.****5. All SIDs include noise preferential routes.**

3500'

MSA ARP

AROSO 2A [AROS2A], AROSO 3B [AROS3B]
RNAV (GNSS) DEPARTURES
SPEED: RWY 02C: SHALL NOT EXCEED 230 KIAS UNTIL PASSING 4000'
 AND NOT EXCEED 250 KIAS UNTIL PASSING 10000'
 RWY 20C: SHALL NOT EXCEED 230 KIAS UNTIL DIVSA
 AND NOT EXCEED 250 KIAS UNTIL PASSING 10000'

 Initial climb clearance **3000'** or as directed by ATC

SID	RWY	INITIAL CLIMB
AROSO 2A	02C	To TOKIM on course 023° at or above 2000', turn LEFT. To AKOMA at or above 7000', turn LEFT. To AKMET at or above 11000'. To AROSO.
AROSO 3B	20C	To IBIXU on course 203° at or above 1500'. To IBIBI at or above 2000'. To IBIVA at or above 2500', turn LEFT. To DOND1. To DIVSA at or above 4000', speed 230 KIAS, turn LEFT. To DOSPA, turn LEFT. To VTK VOR at or above 7000'. To AKOMA, turn LEFT. To AKMET at or above 11000'. To AROSO.

WSSS/SIN
CHANGIJEPPESEN
4 NOV 16 (10-3G)

Eff 10 Nov

SINGAPORE, SINGAPORE

RNAV SID

Apt Elev
22'

Trans level: FL130 Trans alt: 11000'

1. **RADAR required.**2. **RNAV 1 Navigation Specification GNSS required.**

3. Aircraft unable to fly the SID profile shall inform ATC prior to departure and to EXPECT RADAR vectoring, if necessary.

4. Cruising levels will be issued after take-off by Singapore RADAR.

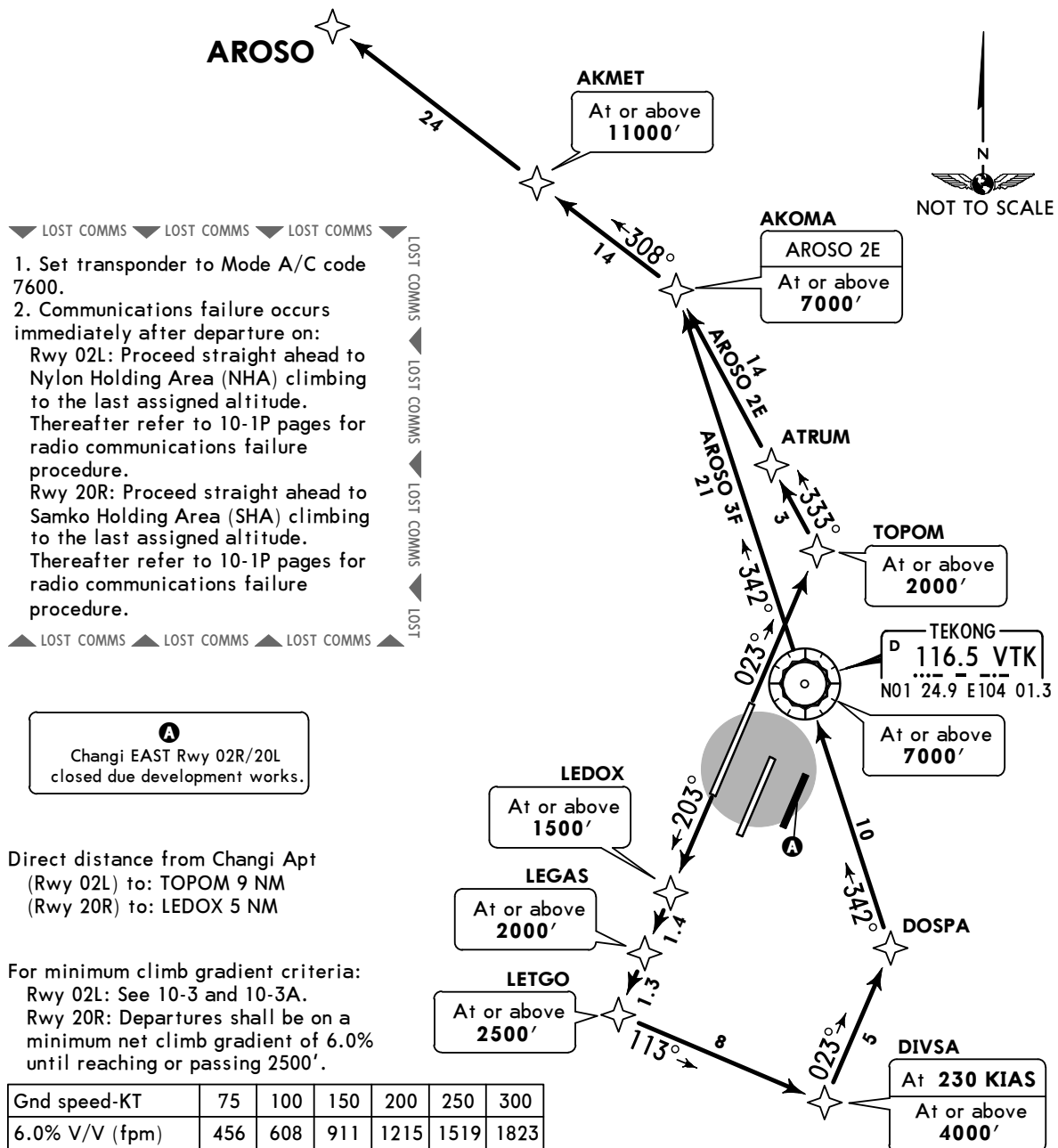
5. All SIDs include noise preferential routes.

3500'

MSA ARP

AROSO 2E [AROS2E], AROSO 3F [AROS3F]
RNAV (GNSS) DEPARTURES

SPEED: RWY 02L: SHALL NOT EXCEED 230 KIAS UNTIL PASSING 4000'
AND NOT EXCEED 250 KIAS UNTIL PASSING 10000'
RWY 20R: SHALL NOT EXCEED 230 KIAS UNTIL DIVSA
AND NOT EXCEED 250 KIAS UNTIL PASSING 10000'

Initial climb clearance **3000'** or as directed by ATC

SID	RWY	INITIAL CLIMB
AROSO 2E	02L	To TOPOM on course 023° at or above 2000', turn LEFT. To ATRUM. To AKOMA at or above 7000', turn LEFT. To AKMET at or above 11000'. To AROSO.
AROSO 3F	20R	To LEDOX on course 203° at or above 1500'. To LEGAS at or above 2000'. To LETGO at or above 2500', turn LEFT. To DIVSA at or above 4000', speed 230 KT, turn LEFT. To DOSPA, turn LEFT. To VTK VOR at or above 7000'. To AKOMA, turn LEFT. To AKMET at or above 11000'. To AROSO.

WSSS/SIN
CHANGI

JEPPESEN

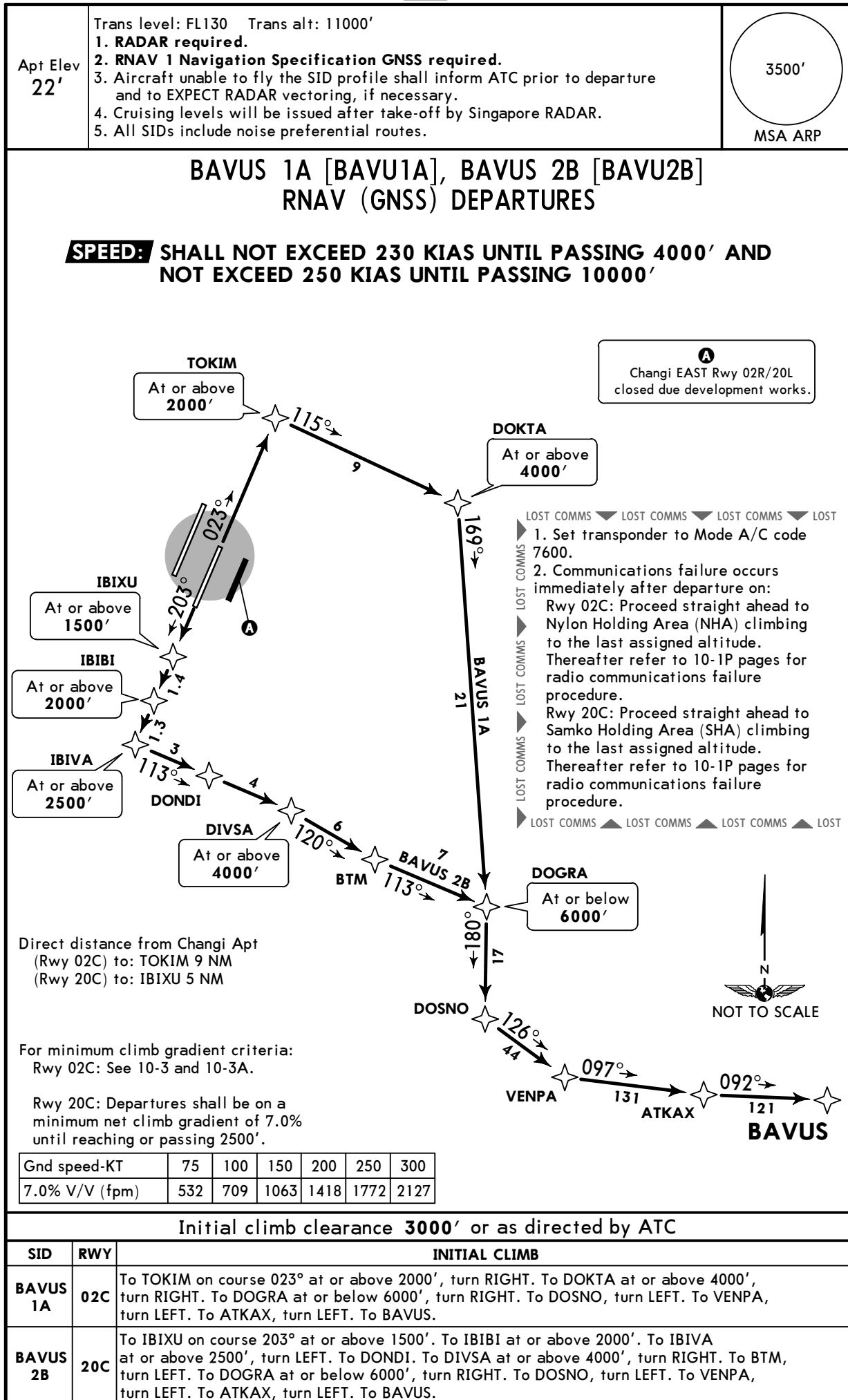
4 NOV 16

(10-3H)

Eff 10 Nov

SINGAPORE, SINGAPORE

RNAV SID



WSSS/SIN
CHANGI

4 NOV 16

(10-3J)

Eff 10 Nov

SINGAPORE, SINGAPORE

RNAV SID

Apt Elev
22'

Trans level: FL130 Trans alt: 11000'

1. **RADAR required.**2. **RNAV 1 Navigation Specification GNSS required.**

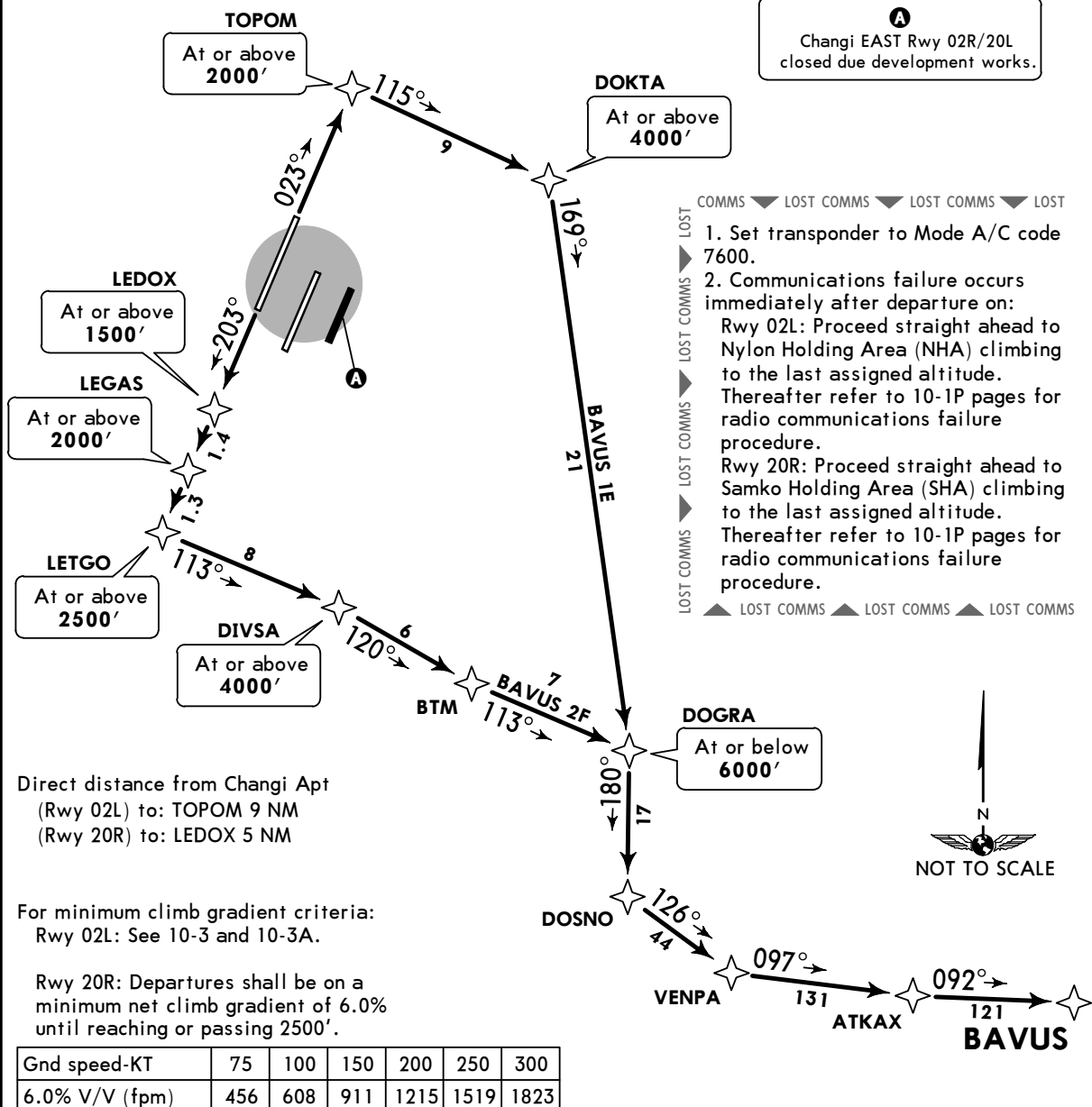
3. Aircraft unable to fly the SID profile shall inform ATC prior to departure and to EXPECT RADAR vectoring, if necessary.

4. Cruising levels will be issued after take-off by Singapore RADAR.

5. All SIDs include noise preferential routes.

3500'

MSA ARP

BAVUS 1E [BAVU1E], BAVUS 2F [BAVU2F]
RNAV (GNSS) DEPARTURES**SPEED:** SHALL NOT EXCEED 230 KIAS UNTIL PASSING 4000' AND
NOT EXCEED 250 KIAS UNTIL PASSING 10000'

Initial climb clearance 3000' or as directed by ATC

SID	RWY	INITIAL CLIMB
BAVUS 1E	02L	To TOPOM on course 023° at or above 2000', turn RIGHT. To DOKTA at or above 4000', turn RIGHT. To DOGRA at or below 6000', turn RIGHT. To DOSNO, turn LEFT. To VENPA, turn LEFT. To ATKAX, turn LEFT. To BAVUS.
BAVUS 2F	20R	To LEDON on course 203° at or above 1500'. To LEGAS at or above 2000'. To LETGO at or above 2500', turn LEFT. To DIVSA at or above 4000', turn RIGHT. To BTM, turn LEFT. To DOGRA at or below 6000', turn RIGHT. To DOSNO, turn LEFT. To VENPA, turn LEFT. To ATKAX, turn LEFT. To BAVUS.

WSSS/SIN
CHANGI

SINGAPORE, SINGAPORE

24 FEB 17

10-311

Eff 2 Mar**RNAV SID**

Apt Elev
22'

Trans level: FL130 Trans alt: 11000'

1. **RADAR required.**
2. **RNAV 1 Navigation Specification GNSS required.**
3. Aircraft unable to fly the SID profile shall inform ATC prior to departure and to EXPECT RADAR vectoring, if necessary.
4. Cruising levels will be issued after take-off by Singapore RADAR.
5. All SIDs include noise preferential routes.

3500'

MSA ARP

IDSEL 1A [IDSE1A], IDSEL 1B [IDSE1B]
RNAV (GNSS) DEPARTURES

SPEED: RWY 02C: SHALL NOT EXCEED 230 KT UNTIL PASSING 4000'
AND NOT EXCEED 250 KT UNTIL PASSING 10000'
RWY 20C: SHALL NOT EXCEED 230 KT UNTIL DIVSA
AND NOT EXCEED 250 KT UNTIL PASSING 10000'

For minimum climb gradient criteria:
Rwy 02C: See 10-3 and 10-3A.

Rwy 20C: Departures shall be on a minimum net climb gradient of 7.0% until reaching or passing 2500'.

Gnd speed-KT	75	100	150	200	250	300
7.0% V/V (fpm)	532	709	1063	1418	1772	2127

▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS

1. Set transponder to Mode A/C code 7600.

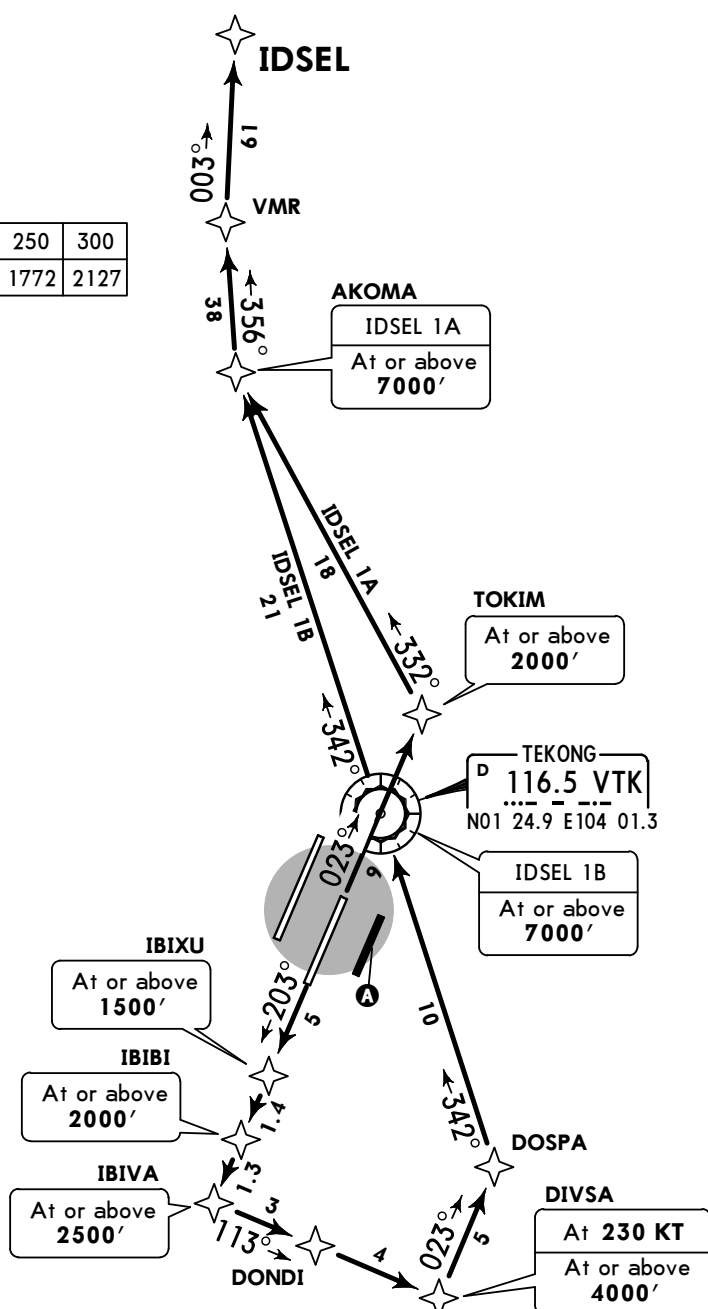
2. Communications failure occurs immediately after departure on:

Rwy 02C: Proceed straight ahead to Nylon Holding Area (NHA) climbing to the last assigned altitude. Thereafter refer to 10-1P pages for radio communications failure procedure.

Rwy 20C: Proceed straight ahead to Samko Holding Area (SHA) climbing to the last assigned altitude. Thereafter refer to 10-1P pages for radio communications failure procedure.

LOST COMMS ▲ LOST COMMS ▲ LOST COMMS ▲ LOST

Changi EAST Rwy 02R/20L
closed due development works.



Initial climb clearance 3000' or as directed by ATC

SID	RWY	INITIAL CLIMB
IDSEL 1A	02C	To TOKIM on course 023° at or above 2000', turn LEFT. To AKOMA at or above 7000', turn RIGHT. To VMR, turn RIGHT. To IDSEL.
IDSEL 1B	20C	To IBIXU on course 203° at or above 1500'. To IBIBI at or above 2000'. To IBIVA at or above 2500', turn LEFT. To DOND1. To DIVSA at or above 4000', speed 230 KT, turn LEFT. To DOSPA, turn LEFT. To VTK VOR at or above 7000'. To AKOMA, turn RIGHT. To VMR, turn RIGHT. To IDSEL.

CHANGES: New procedures at this airport.

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WSSS/SIN
CHANGI

JEPPESEN

24 FEB 17

10-3J2

Eff 2 Mar

SINGAPORE, SINGAPORE

RNAV SID

Apt Elev
22'

Trans level: FL130 Trans alt: 11000'

1. **RADAR required.**2. **RNAV 1 Navigation Specification GNSS required.**

3. Aircraft unable to fly the SID profile shall inform ATC prior to departure and to EXPECT RADAR vectoring, if necessary.

4. Cruising levels will be issued after take-off by Singapore RADAR.

5. All SIDs include noise preferential routes.

3500'

MSA ARP

IDSEL 1E [IDSE1E], IDSEL 1F [IDSE1F]
RNAV (GNSS) DEPARTURES

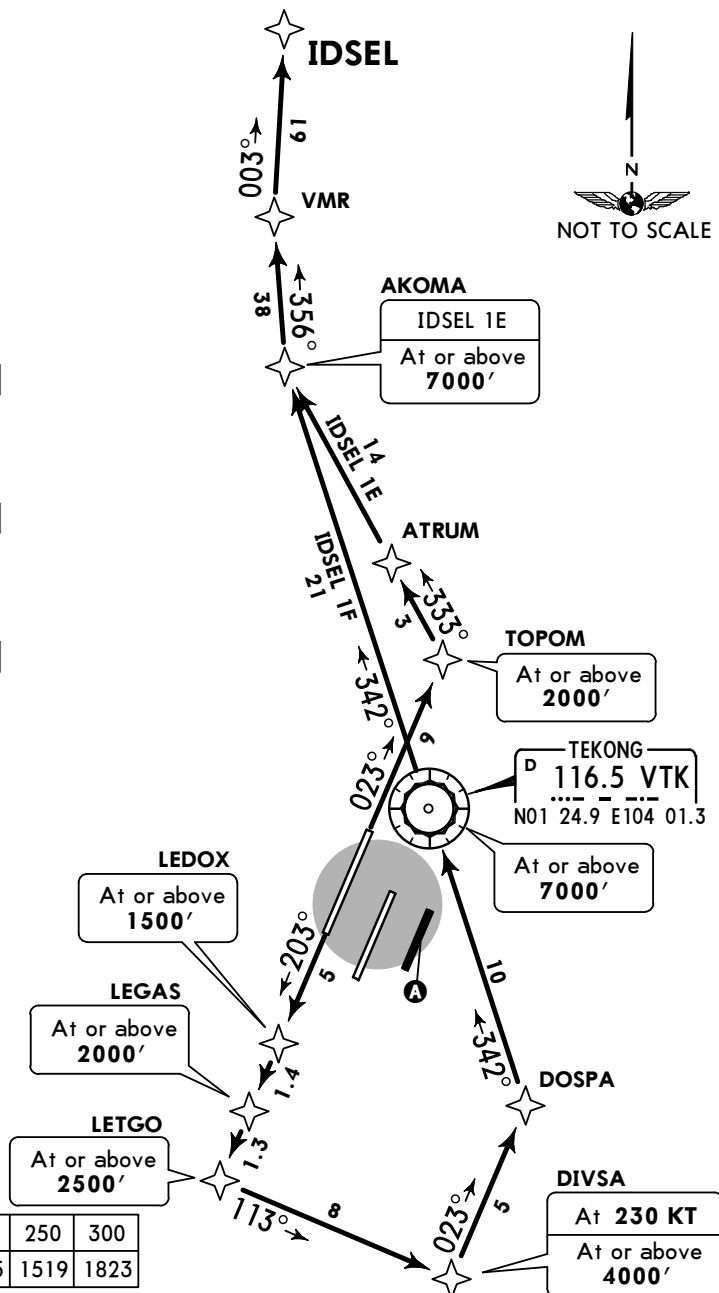
SPEED: RWY 02L: SHALL NOT EXCEED 230 KT UNTIL PASSING 4000'
AND NOT EXCEED 250 KT UNTIL PASSING 10000'
RWY 20R: SHALL NOT EXCEED 230 KT UNTIL DIVSA
AND NOT EXCEED 250 KT UNTIL PASSING 10000'

- ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼
1. Set transponder to Mode A/C code 7600.
2. Communications failure occurs immediately after departure on:
- Rwy 02L: Proceed straight ahead to Nylon Holding Area (NHA) climbing to the last assigned altitude. Thereafter refer to 10-1P pages for radio communications failure procedure.
- Rwy 20R: Proceed straight ahead to Samko Holding Area (SHA) climbing to the last assigned altitude. Thereafter refer to 10-1P pages for radio communications failure procedure.
- ▲ LOST COMMS ▲ LOST COMMS ▲ LOST COMMS ▲

A
Changi EAST Rwy 02R/20L
closed due development works.

For minimum climb gradient criteria:
Rwy 02L: See 10-3 and 10-3A.
Rwy 20R: Departures shall be on a minimum net climb gradient of 6.0% until reaching or passing 2500'.

Gnd speed-KT	75	100	150	200	250	300
6.0% V/V (fpm)	456	608	911	1215	1519	1823



Initial climb clearance 3000' or as directed by ATC

SID	RWY	INITIAL CLIMB
IDSEL 1E	02L	To TOPOM on course 023° at or above 2000', turn LEFT. To ATRUM. To AKOMA at or above 7000', turn RIGHT. To VMR, turn RIGHT. To IDSEL.
IDSEL 1F	20R	To LEDOX on course 203° at or above 1500'. To LEGAS at or above 2000'. To LETGO at or above 2500', turn LEFT. To DIVSA at or above 4000', speed 230 KT, turn LEFT. To DOSPA, turn LEFT. To VTK VOR at or above 7000'. To AKOMA, turn RIGHT. To VMR, turn RIGHT. To IDSEL.

WSSS/SIN
CHANGI

JEPPesen

4 NOV 16

(10-3K)

Eff 10 Nov

SINGAPORE, SINGAPORE

RNAV SID

Apt Elev
22'

Trans level: FL130 Trans alt: 11000'

1. **RADAR required.**2. **RNAV 1 Navigation Specification GNSS required.**

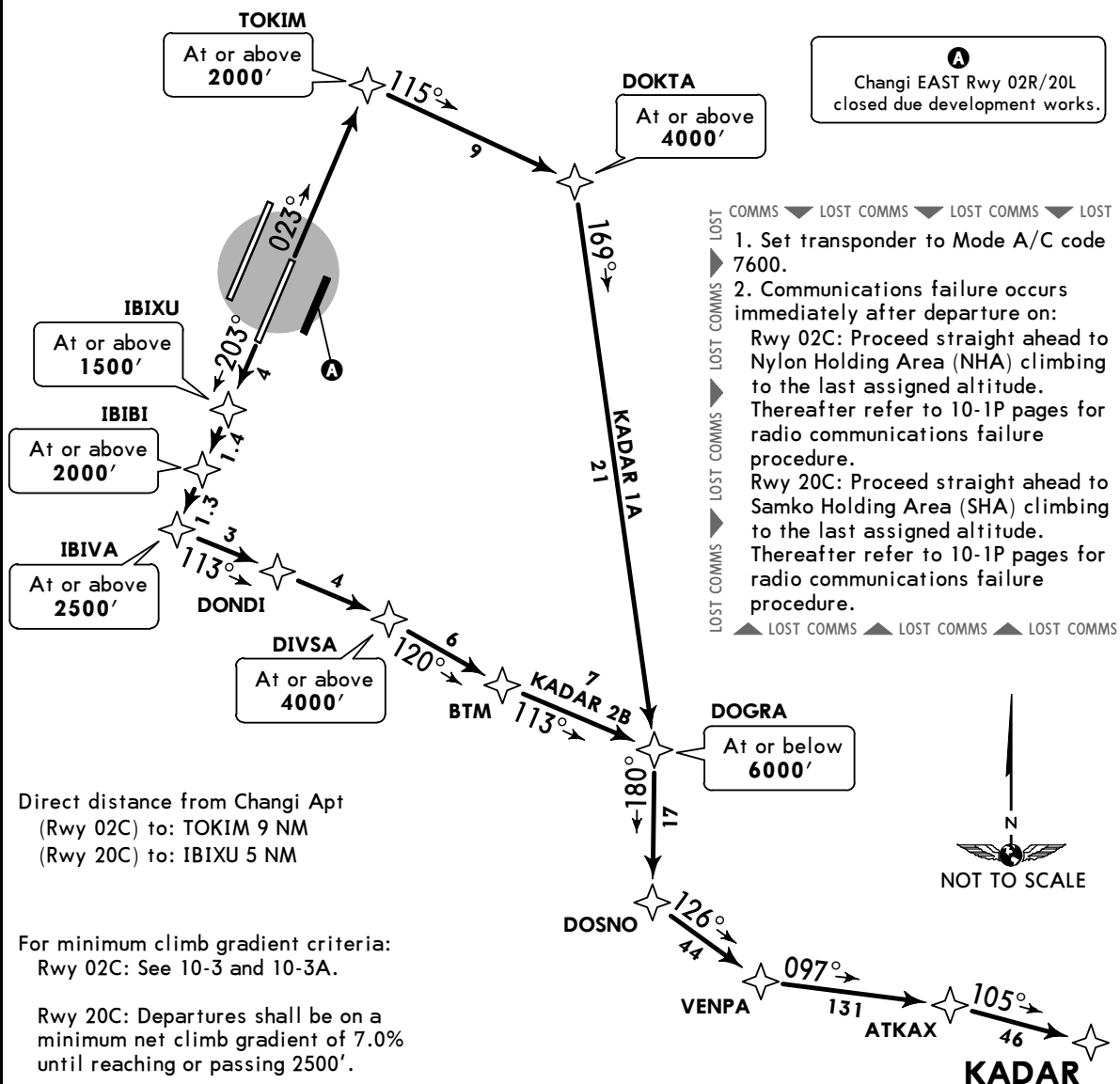
3. Aircraft unable to fly the SID profile shall inform ATC prior to departure and to EXPECT RADAR vectoring, if necessary.

4. Cruising levels will be issued after take-off by Singapore RADAR.

5. All SIDs include noise preferential routes.

3500'

MSA ARP

**KADAR 1A [KADA1A], KADAR 2B [KADA2B]
RNAV (GNSS) DEPARTURES****SPEED: SHALL NOT EXCEED 230 KIAS UNTIL PASSING 4000' AND
NOT EXCEED 250 KIAS UNTIL PASSING 10000'**Initial climb clearance **3000'** or as directed by ATC

SID	RWY	INITIAL CLIMB
KADAR 1A	02C	To TOKIM on course 023° at or above 2000', turn RIGHT. To DOKTA at or above 4000', turn RIGHT. To DOGRA at or below 6000', turn RIGHT. To DOSNO, turn LEFT. To VENPA, turn LEFT. To ATKAX, turn RIGHT. To KADAR.
KADAR 2B	20C	To IBIXU on course 203° at or above 1500'. To IBIBI at or above 2000'. To IBIVA at or above 2500', turn LEFT. To DOND1. To DIVSA at or above 4000', turn LEFT. To BTM, turn LEFT. To DOGRA at or below 6000', turn RIGHT. To DOSNO, turn LEFT. To VENPA, turn LEFT. To ATKAX, turn RIGHT. To KADAR.

WSSS/SIN
CHANGI

JEPPESSEN

4 NOV 16

10-3L

Eff 10 Nov

SINGAPORE, SINGAPORE

RNAV SID

Apt Elev
22'

Trans level: FL130 Trans alt: 11000'

1. **RADAR required.**2. **RNAV 1 Navigation Specification GNSS required.**

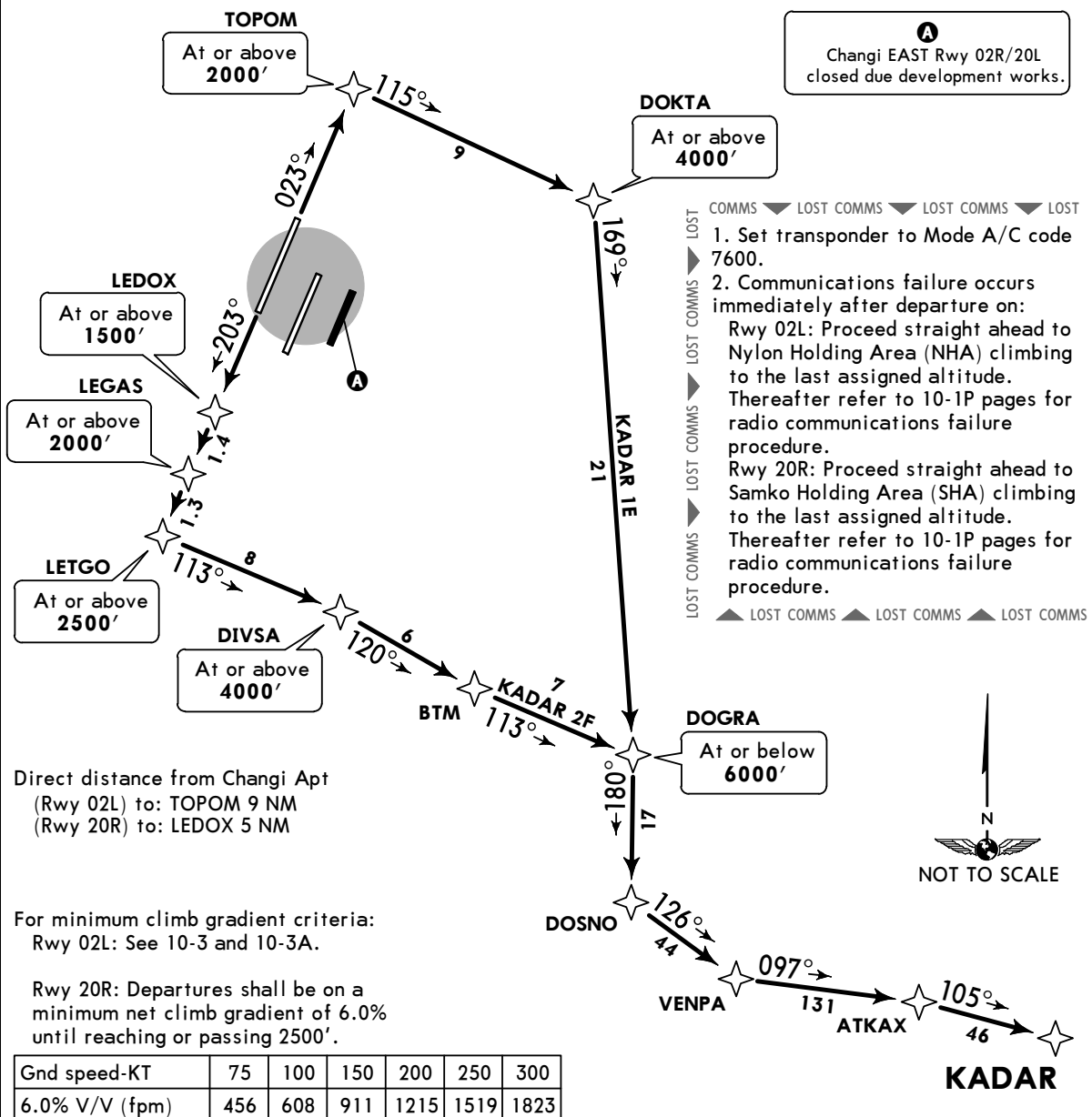
3. Aircraft unable to fly the SID profile shall inform ATC prior to departure and to EXPECT RADAR vectoring, if necessary.

4. Cruising levels will be issued after take-off by Singapore RADAR.

5. All SIDs include noise preferential routes.

3500'

MSA ARP

KADAR 1E [KADA1E], KADAR 2F [KADA2F]
RNAV (GNSS) DEPARTURES**SPEED:** SHALL NOT EXCEED 230 KIAS UNTIL PASSING 4000' AND
NOT EXCEED 250 KIAS UNTIL PASSING 10000'

Initial climb clearance 3000' or as directed by ATC

SID	RWY	INITIAL CLIMB
KADAR 1E	02L	To TOPOM on course 023° at or above 2000', turn RIGHT. To DOKTA at or above 4000', turn RIGHT. To DOGRA at or below 6000', turn RIGHT. To DOSNO, turn LEFT. To VENPA, turn LEFT. To ATKAX, turn RIGHT. To KADAR.
KADAR 2F	20R	To LEDOK on course 203° at or above 1500'. To LEGAS at or above 2000'. To LETGO at or above 2500', turn LEFT. To DIVSA at or above 4000', turn RIGHT. To BTM, turn LEFT. To DOGRA at or below 6000', turn RIGHT. To DOSNO, turn LEFT. To VENPA, turn LEFT. To ATKAX, turn RIGHT. To KADAR.

WSSS/SIN
CHANGIJEPPESSEN
4 NOV 16 (10-3M) Eff 10 Nov

SINGAPORE, SINGAPORE

RNAV SID

Apt Elev
22'

Trans level: FL130 Trans alt: 11000'

1. **RADAR required.**2. **RNAV 1 Navigation Specification GNSS required.**

3. Aircraft unable to fly the SID profile shall inform ATC prior to departure and to EXPECT RADAR vectoring, if necessary.

4. Cruising levels will be issued after take-off by Singapore RADAR.

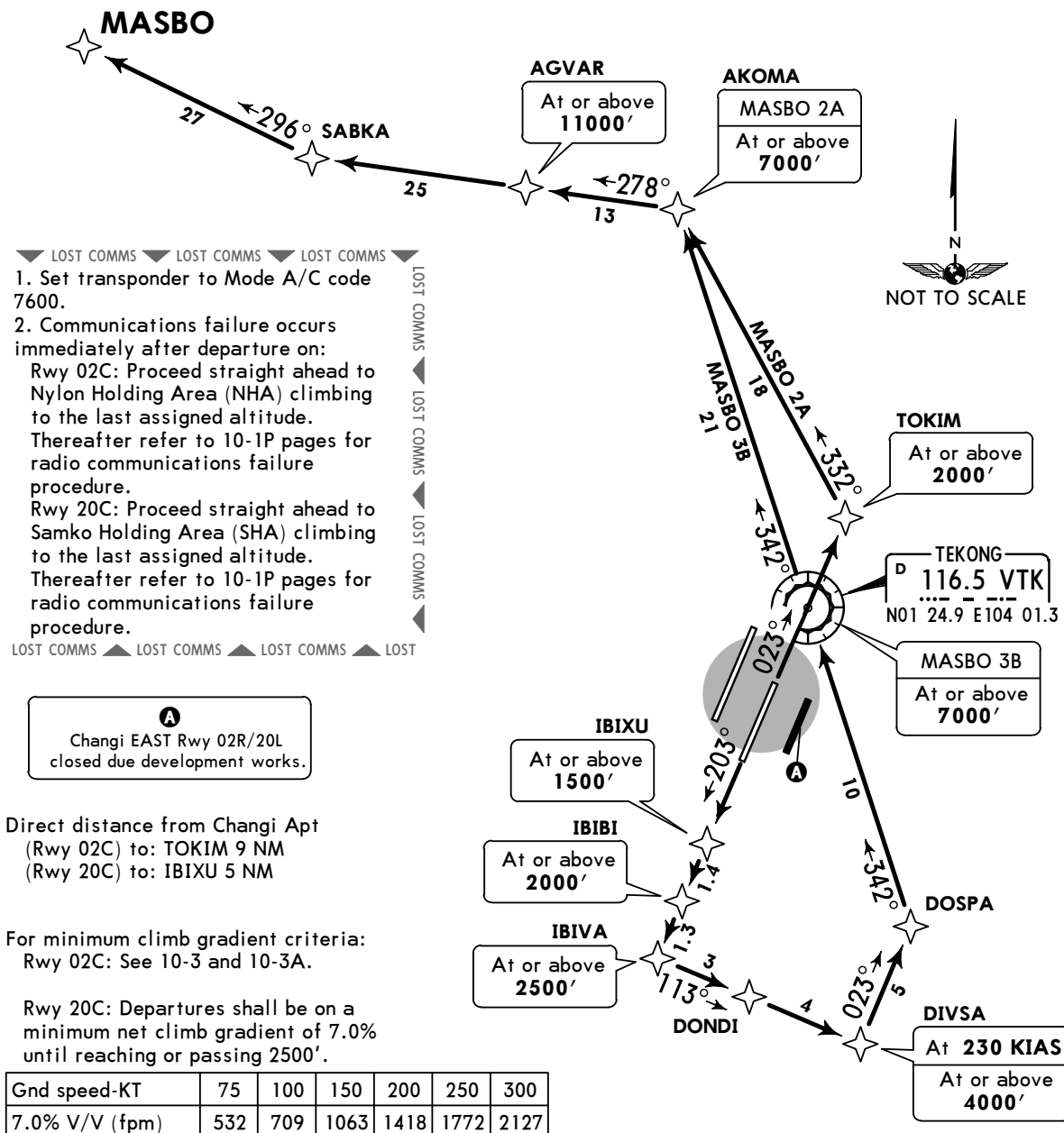
5. All SIDs include noise preferential routes.

3500'

MSA ARP

**MASBO 2A [MASB2A], MASBO 3B [MASB3B]
RNAV (GNSS) DEPARTURES**

SPEED: RWY 02C: SHALL NOT EXCEED 230 KIAS UNTIL PASSING 4000'
AND NOT EXCEED 250 KIAS UNTIL PASSING 10000'
RWY 20C: SHALL NOT EXCEED 230 KIAS UNTIL DIVSA
AND NOT EXCEED 250 KIAS UNTIL PASSING 10000'

Initial climb clearance **3000'** or as directed by ATC

SID	RWY	INITIAL CLIMB
MASBO 2A	02C	To TOKIM on course 023° at or above 2000', turn LEFT. To AKOMA at or above 7000', turn LEFT. To AGVAR at or above 11000'. To SABKA, turn RIGHT. To MASBO.
MASBO 3B	20C	To IBIXU on course 203° at or above 1500'. To IBIBI at or above 2000'. To IBIVA at or above 2500', turn LEFT. To DONDI. To DIVSA at or above 4000', speed 230 KIAS, turn LEFT. To DOSPA, turn LEFT. To VTK VOR at or above 7000'. To AKOMA, turn LEFT. To AGVAR at or above 11000'. To SABKA, turn RIGHT. To MASBO.

WSSS/SIN
CHANGIJEPPESEN
4 NOV 16 (10-3N) Eff 10 Nov

SINGAPORE, SINGAPORE

RNAV SID

Apt Elev
22'

Trans level: FL130 Trans alt: 11000'

1. **RADAR required.**2. **RNAV 1 Navigation Specification GNSS required.**

3. Aircraft unable to fly the SID profile shall inform ATC prior to departure and to EXPECT RADAR vectoring, if necessary.

4. Cruising levels will be issued after take-off by Singapore RADAR.

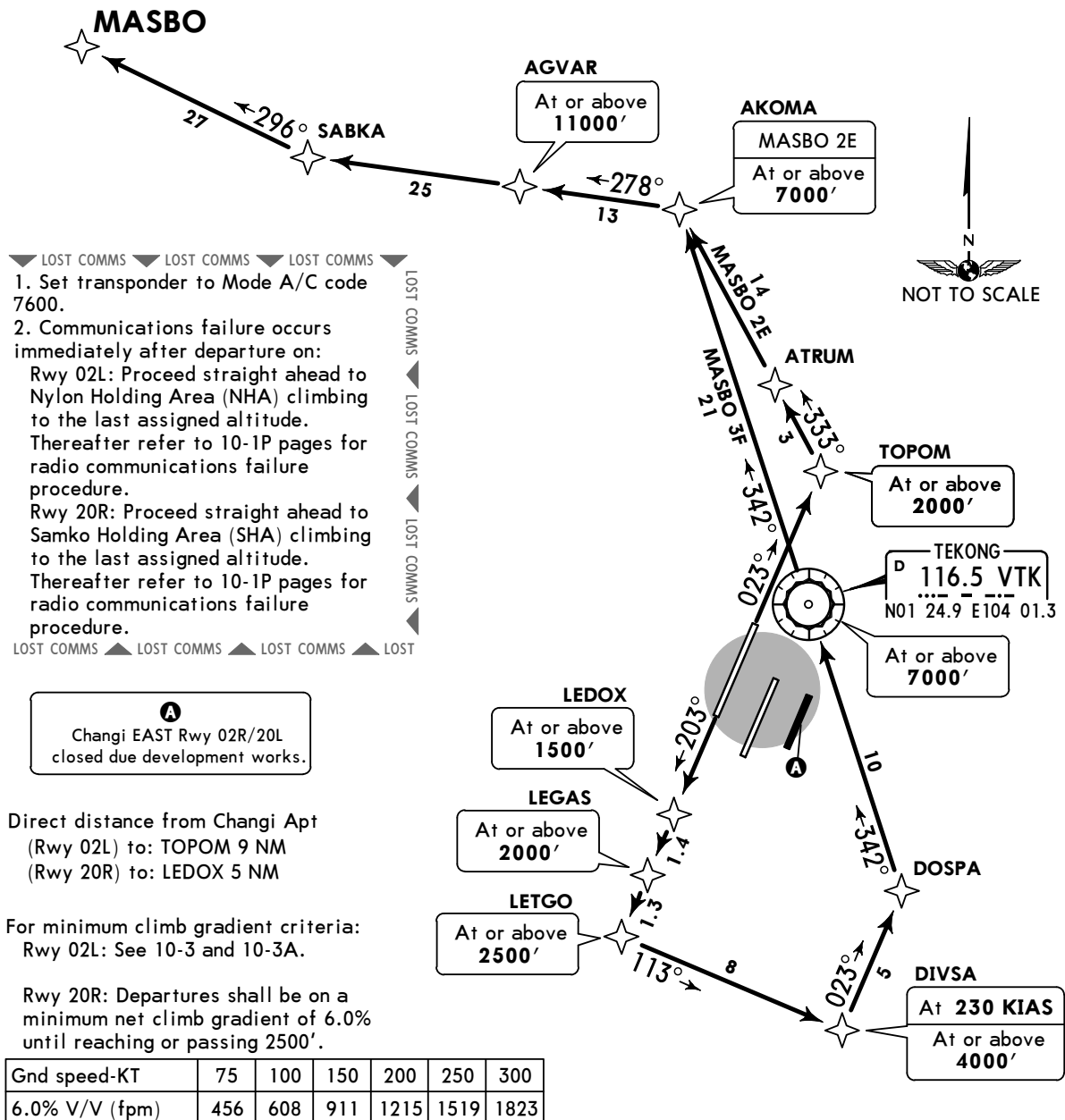
5. All SIDs include noise preferential routes.

3500'

MSA ARP

MASBO 2E [MASB2E], MASBO 3F [MASB3F]
RNAV (GNSS) DEPARTURES

SPEED: RWY 02L: SHALL NOT EXCEED 230 KIAS UNTIL PASSING 4000'
AND NOT EXCEED 250 KIAS UNTIL PASSING 10000'
RWY 20R: SHALL NOT EXCEED 230 KIAS UNTIL DIVSA
AND NOT EXCEED 250 KIAS UNTIL PASSING 10000'



Initial climb clearance 3000' or as directed by ATC

SID	RWY	INITIAL CLIMB
MASBO 2E	02L	To TOPOM on course 023° at or above 2000', turn LEFT. To ATRUM. To AKOMA at or above 7000', turn LEFT. To AGVAR at or above 11000'. To SABKA, turn RIGHT. To MASBO.
MASBO 3F	20R	To LEDUX on course 203° at or above 1500'. To LEGAS at or above 2000'. To LETGO at or above 2500', turn LEFT. To DIVSA at or above 4000', speed 230 KIAS, turn LEFT. To DOSPA, turn LEFT. To VTK VOR at or above 7000'. To AKOMA, turn LEFT. To AGVAR at or above 11000'. To SABKA, turn RIGHT. To MASBO.

WSSS/SIN
CHANGI

JEPPESEN

4 NOV 16

10-3P

Eff 10 Nov

SINGAPORE, SINGAPORE

RNAV SID

Apt Elev
22'

Trans level: FL130 Trans alt: 11000'

1. **RADAR required.**2. **RNAV 1 Navigation Specification GNSS required.**

3. Aircraft unable to fly the SID profile shall inform ATC prior to departure and to EXPECT RADAR vectoring, if necessary.

4. Cruising levels will be issued after take-off by Singapore RADAR.

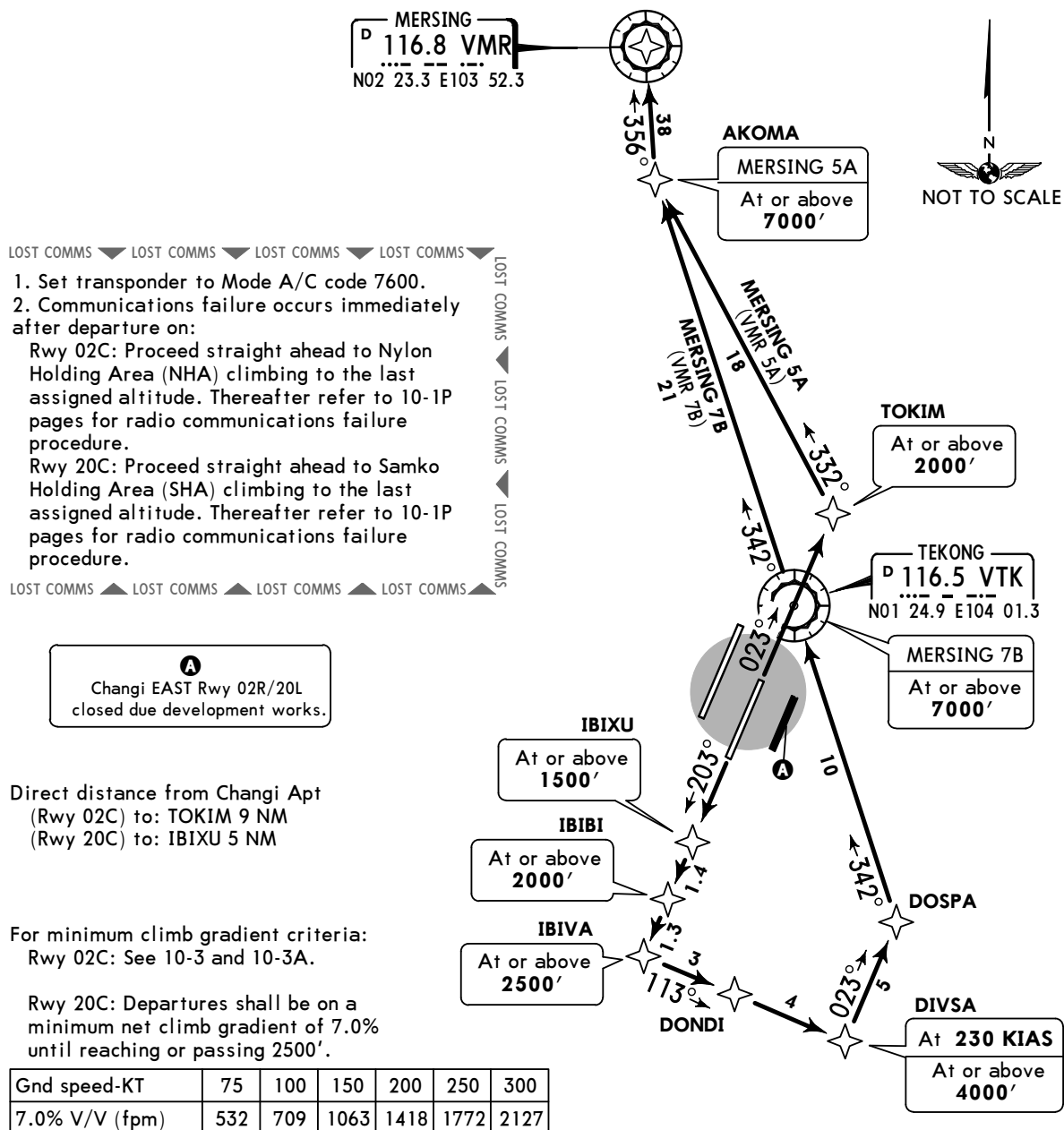
5. All SIDs include noise preferential routes.

3500'

MSA ARP

**MERSING 5A (VMR 5A), MERSING 7B (VMR 7B)
RNAV (GNSS) DEPARTURES**

SPEED: RWY 02C: SHALL NOT EXCEED 230 KIAS UNTIL PASSING 4000'
AND NOT EXCEED 250 KIAS UNTIL PASSING 10000'
RWY 20C: SHALL NOT EXCEED 230 KIAS UNTIL DIVSA
AND NOT EXCEED 250 KIAS UNTIL PASSING 10000'



Initial climb clearance 3000' or as directed by ATC

SID	RWY	INITIAL CLIMB
MERSING 5A	02C	To TOKIM on course 023° at or above 2000', turn LEFT. To AKOMA at or above 7000', turn RIGHT. To VMR VOR.
MERSING 7B	20C	To IBIXU on course 203° at or above 1500'. To IBIBI at or above 2000'. To IBIVA at or above 2500', turn LEFT. To DONDI at or above 4000', speed 230 KIAS, turn LEFT. To DOSPA, turn LEFT. To VTK VOR at or above 7000'. To AKOMA, turn RIGHT. To VMR VOR.

WSSS/SIN
CHANGI

JEPPESEN

4 NOV 16

(10-3Q)

Eff 10 Nov

SINGAPORE, SINGAPORE

RNAV SID

Apt Elev
22'

Trans level: FL130 Trans alt: 11000'

1. **RADAR required.**2. **RNAV 1 Navigation Specification GNSS required.**

3. Aircraft unable to fly the SID profile shall inform ATC prior to departure and to EXPECT RADAR vectoring, if necessary.

4. Cruising levels will be issued after take-off by Singapore RADAR.

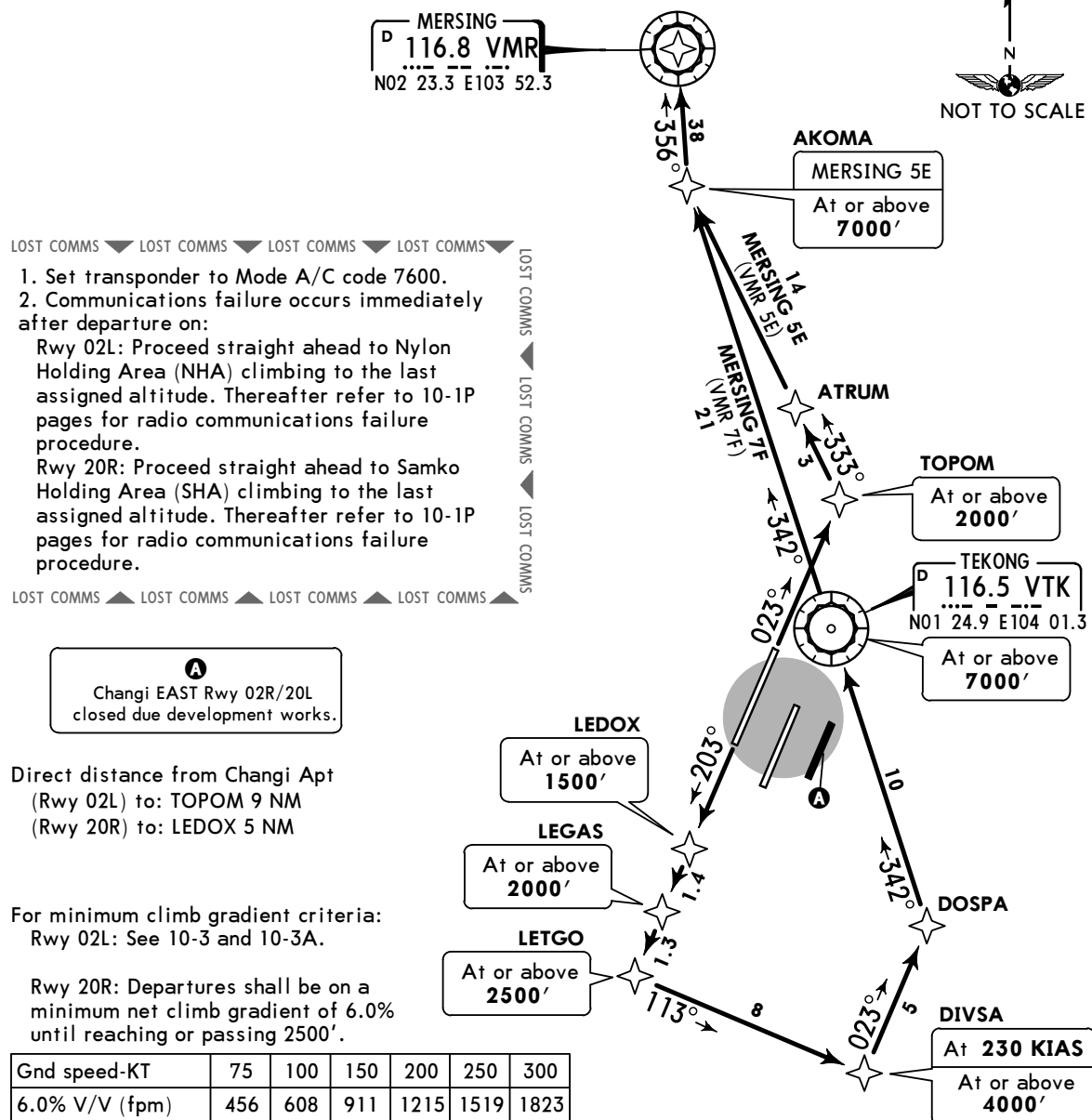
5. All SIDs include noise preferential routes.

3500'

MSA ARP

**MERSING 5E (VMR 5E), MERSING 7F (VMR 7F)
RNAV (GNSS) DEPARTURES**

SPEED: RWY 02L: SHALL NOT EXCEED 230 KIAS UNTIL PASSING 4000'
AND NOT EXCEED 250 KIAS UNTIL PASSING 10000'
RWY 20R: SHALL NOT EXCEED 230 KIAS UNTIL DIVSA
AND NOT EXCEED 250 KIAS UNTIL PASSING 10000'



Initial climb clearance 3000' or as directed by ATC

SID	RWY	INITIAL CLIMB
MERSING 5E	02L	To TOPOM on course 023° at or above 2000', turn LEFT. To ATRUM. To AKOMA at or above 7000', turn RIGHT. To VMR VOR.
MERSING 7F	20R	To LEDOX on course 203° at or above 1500'. To LEGAS at or above 2000'. To LETGO at or above 2500', turn LEFT. To DIVSA at or above 4000', speed 230 KIAS, turn LEFT. To DOSPA, turn LEFT. To VTK VOR at or above 7000'. To AKOMA, turn RIGHT. To VMR VOR.

WSSS/SIN
CHANGI

JEPPESEN

4 NOV 16

(10-3S)

Eff 10 Nov

SINGAPORE, SINGAPORE

RNAV SID

Apt Elev
22'

Trans level: FL130 Trans alt: 11000'

1. RADAR required.

2. RNAV 1 Navigation Specification GNSS required.

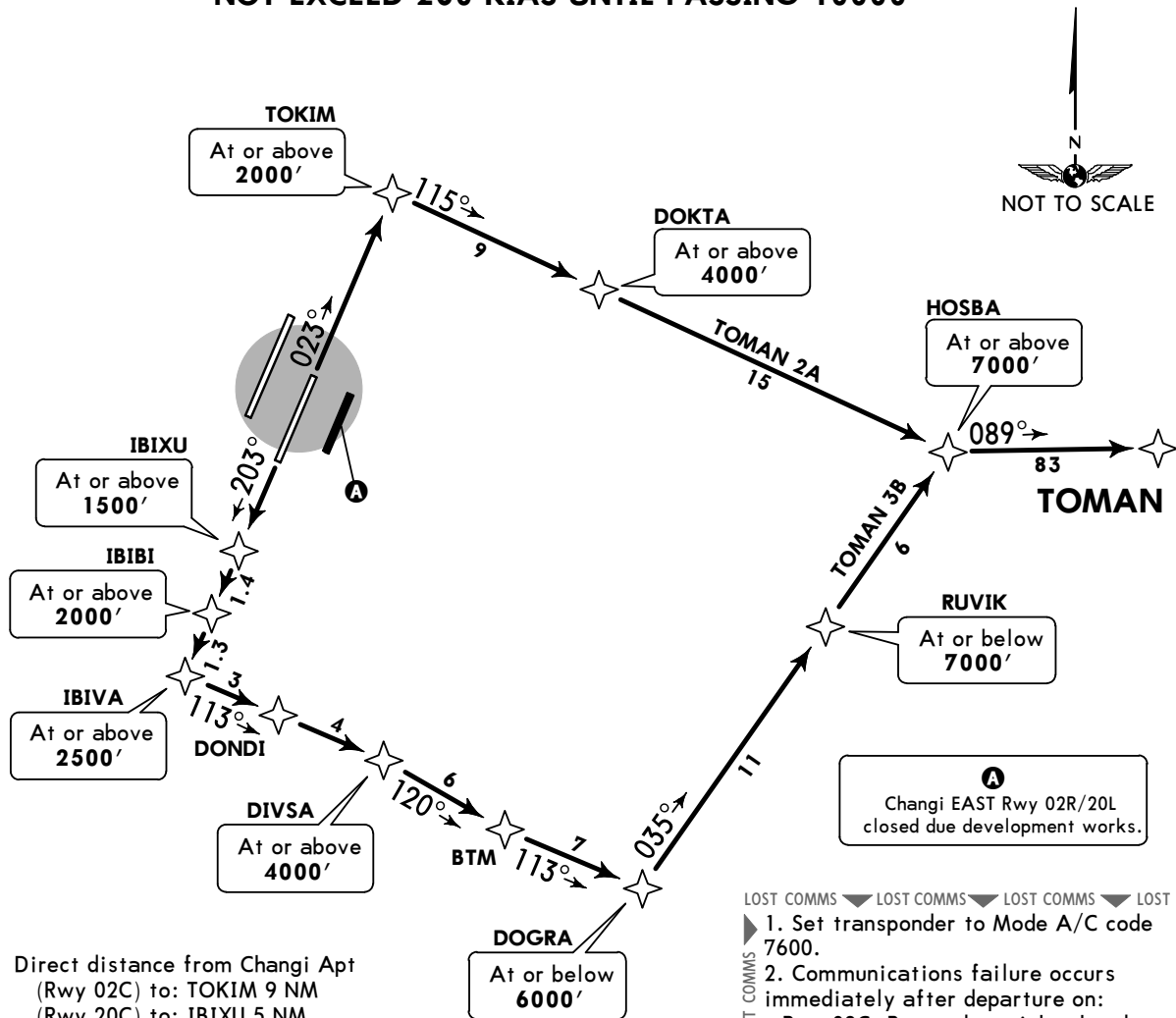
3. Aircraft unable to fly the SID profile shall inform ATC prior to departure and to EXPECT RADAR vectoring, if necessary.

4. Cruising levels will be issued after take-off by Singapore RADAR.

5. All SIDs include noise preferential routes.

3500'

MSA ARP

TOMAN 2A [TOMA2A], TOMAN 3B [TOMA3B]
RNAV (GNSS) DEPARTURES**SPEED:** SHALL NOT EXCEED 230 KIAS UNTIL PASSING 4000' AND
NOT EXCEED 250 KIAS UNTIL PASSING 10000'For minimum climb gradient criteria:
Rwy 02C: See 10-3 and 10-3A.Rwy 20C: Departures shall be on a
minimum net climb gradient of 7.0%
until reaching or passing 2500'.

Gnd speed-KT	75	100	150	200	250	300
7.0% V/V (fpm)	532	709	1063	1418	1772	2127

LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST
 1. Set transponder to Mode A/C code 7600.

LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST
 2. Communications failure occurs immediately after departure on:
 Rwy 02C: Proceed straight ahead to Nylon Holding Area (NHA) climbing to the last assigned altitude. Thereafter refer to 10-1P pages for radio communications failure procedure.
 Rwy 20C: Proceed straight ahead to Samko Holding Area (SHA) climbing to the last assigned altitude. Thereafter refer to 10-1P pages for radio communications failure procedure.

LOST COMMS ▲ LOST COMMS ▲ LOST COMMS ▲ LOST

Initial climb clearance 3000' or as directed by ATC

SID	RWY	INITIAL CLIMB
TOMAN 2A	02C	To TOKIM on course 023° at or above 2000', turn RIGHT. To DOKTA at or above 4000'. To HOSBA at or above 7000', turn LEFT. To TOMAN.
TOMAN 3B	20C	To IBIXU on course 203° at or above 1500'. To IBIBI at or above 2000'. To IBIVA at or above 2500', turn LEFT. To DONDI. To DIVSA at or above 4000', turn RIGHT. To BTM, turn LEFT. To DOGRA at or below 6000', turn LEFT. To RUVIK at or below 7000'. To HOSBA at or above 7000', turn RIGHT. To TOMAN.

WSSS/SIN
CHANGI

JEPPESEN

4 NOV 16

(10-3T)

Eff 10 Nov

SINGAPORE, SINGAPORE

RNAV SID

Apt Elev
22'

Trans level: FL130 Trans alt: 11000'

1. **RADAR required.**2. **RNAV 1 Navigation Specification GNSS required.**

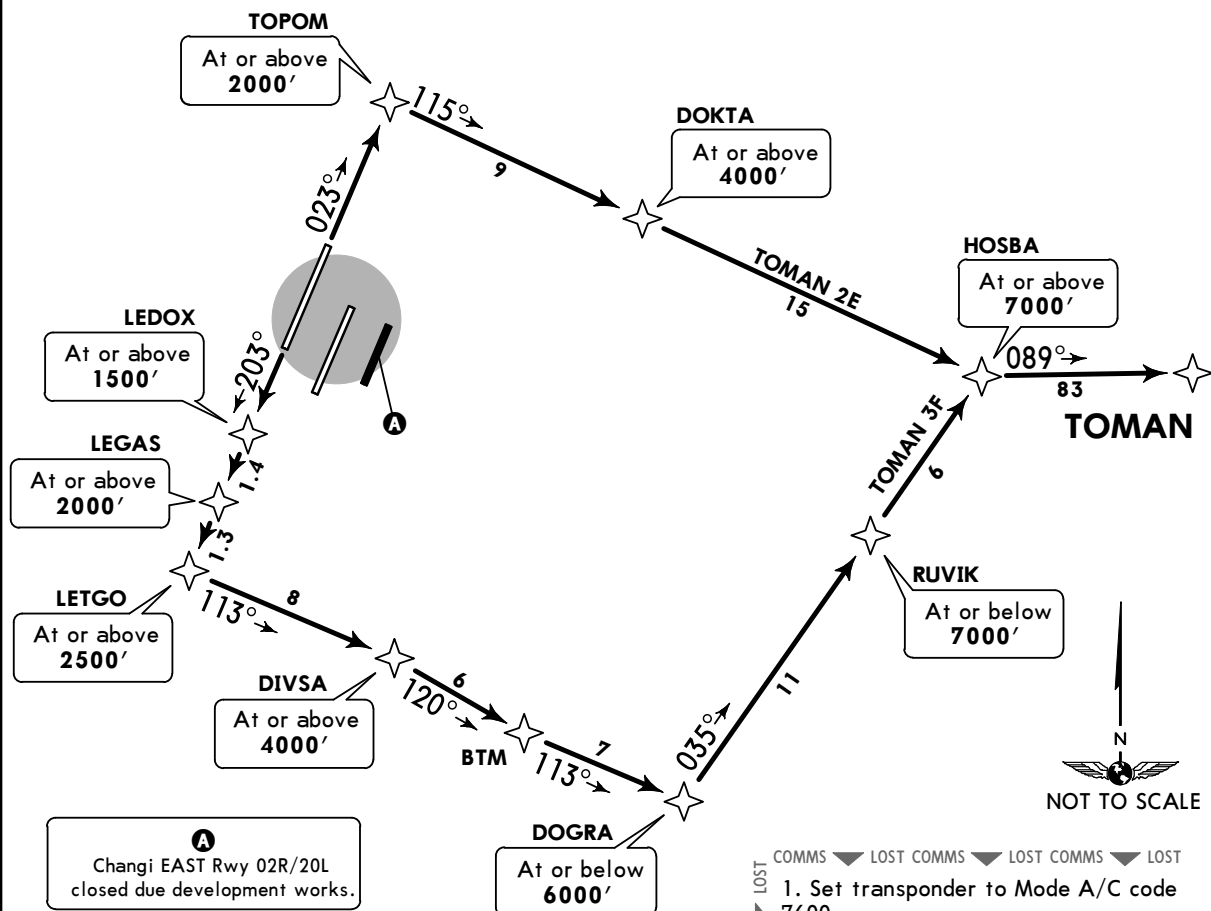
3. Aircraft unable to fly the SID profile shall inform ATC prior to departure and to EXPECT RADAR vectoring, if necessary.

4. Cruising levels will be issued after take-off by Singapore RADAR.

5. All SIDs include noise preferential routes.

3500'

MSA ARP

TOMAN 2E [TOMA2E], TOMAN 3F [TOMA3F]
RNAV (GNSS) DEPARTURES**SPEED:** SHALL NOT EXCEED 230 KIAS UNTIL PASSING 4000' AND
NOT EXCEED 250 KIAS UNTIL PASSING 10000'

Direct distance from Changi Apt
(Rwy 02L) to: TOPOM 9 NM
(Rwy 20R) to: LEDOX 5 NM

For minimum climb gradient criteria:
Rwy 02L: See 10-3 and 10-3A.

Rwy 20R: Departures shall be on a
minimum net climb gradient of 6.0%
until reaching or passing 2500'.

Gnd speed-KT	75	100	150	200	250	300
6.0% V/V (fpm)	456	608	911	1215	1519	1823

- COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST
1. Set transponder to Mode A/C code 7600.
 2. Communications failure occurs immediately after departure on:
Rwy 02L: Proceed straight ahead to Nylon Holding Area (NHA) climbing to the last assigned altitude. Thereafter refer to 10-1P pages for radio communications failure procedure.
Rwy 20R: Proceed straight ahead to Samko Holding Area (SHA) climbing to the last assigned altitude. Thereafter refer to 10-1P pages for radio communications failure procedure.
- LOST COMMS ▲ LOST COMMS ▲ LOST COMMS ▲

Initial climb clearance **3000'** or as directed by ATC

SID	RWY	INITIAL CLIMB
TOMAN 2E	02L	To TOPOM on course 023° at or above 2000', turn RIGHT. To DOKTA at or above 4000'. To HOSBA at or above 7000', turn LEFT. To TOMAN.
TOMAN 3F	20R	To LEDOX on course 203° at or above 1500'. To LEGAS at or above 2000'. To LETGO at or above 2500', turn LEFT. To DIVSA at or above 4000', turn RIGHT. To BTM, turn LEFT. To DOGRA at or below 6000', turn LEFT. To RUVIK at or below 7000'. To HOSBA at or above 7000', turn RIGHT. To TOMAN.

**WSSS/SIN
CHANGI**

JEPPESEN

4 NOV 16

10-3U

Eff 10 Nov

SINGAPORE, SINGAPORE

RNAV SID

Apt Elev
22'

Trans level: FL130 Trans alt: 11000'

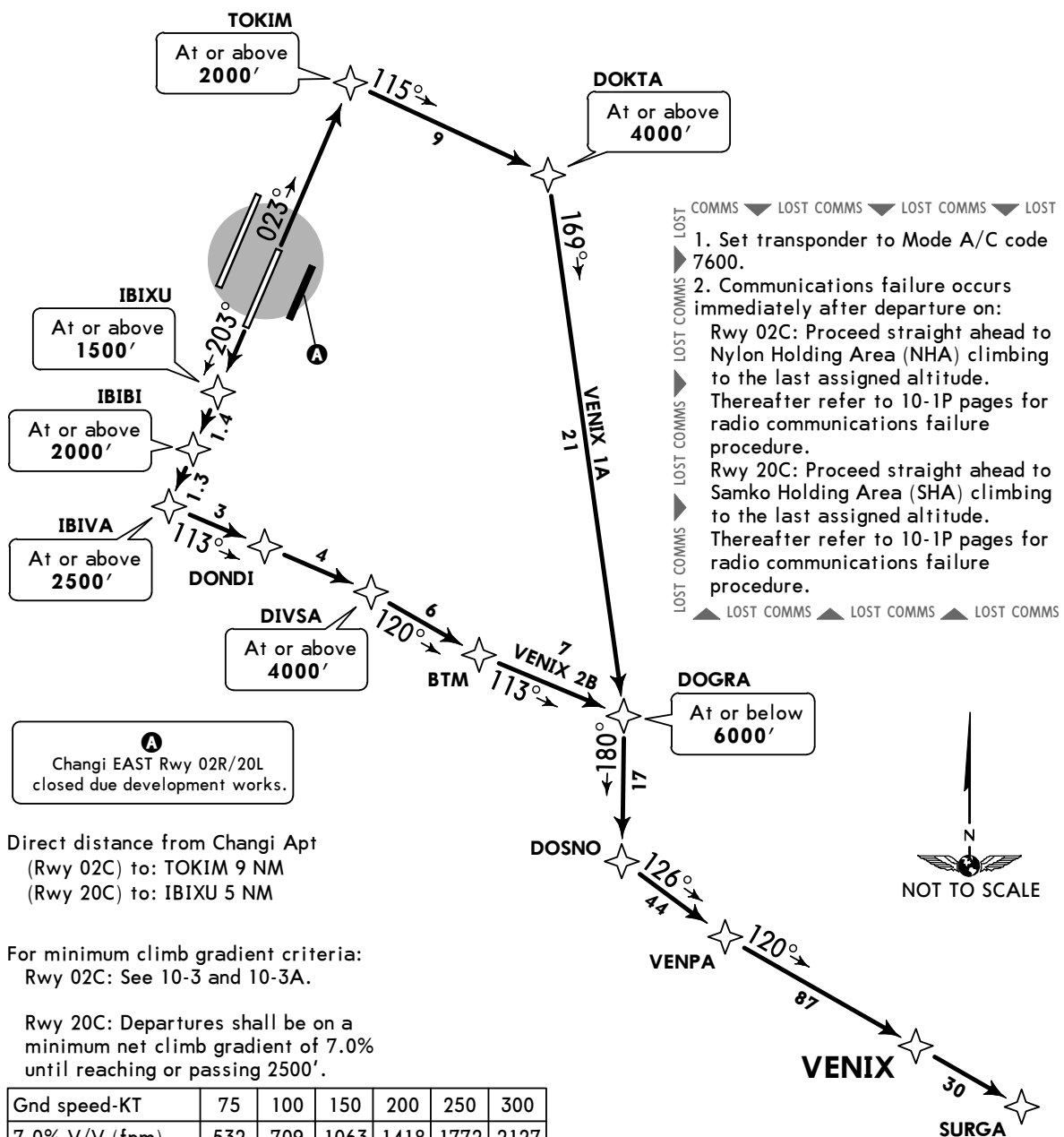
1. **RADAR required.**
2. **RNAV 1 Navigation Specification GNSS required.**
3. Aircraft unable to fly the SID profile shall inform ATC prior to departure and to EXPECT RADAR vectoring, if necessary.
4. Cruising levels will be issued after take-off by Singapore RADAR.
5. All SIDs include noise preferential routes.

3500'

MSA ARP

VENIX 1A [VENI1A], VENIX 2B [VENI2B] RNAV (GNSS) DEPARTURES

SPEED: SHALL NOT EXCEED 230 KIAS UNTIL PASSING 4000' AND NOT EXCEED 250 KIAS UNTIL PASSING 10000'

Initial climb clearance **3000'** or as directed by ATC

SID	RWY	INITIAL CLIMB
VENIX 1A	02C	To TOKIM on course 023° at or above 2000', turn RIGHT. To DOKTA at or above 4000', turn RIGHT. To DOGRA at or below 6000', turn RIGHT. To DOSNO, turn LEFT. To VENPA, turn LEFT. To VENIX. To SURGA.
VENIX 2B	20C	To IBIXU on course 203° at or above 1500'. To IBIBI at or above 2000'. To IBIVA at or above 2500', turn LEFT. To DONDI. To DIVSA at or above 4000', turn RIGHT. To BTM, turn LEFT. To DOGRA at or below 6000', turn RIGHT. To DOSNO, turn LEFT. To VENPA, turn LEFT. To VENIX. To SURGA.

CHANGES: VENIX 2B departure revised, Rwy 02R/20L closed.

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WSSS/SIN
CHANGI

JEPPESEN

4 NOV 16

(10-3V)

Eff 10 Nov

SINGAPORE, SINGAPORE

RNAV SID

Apt Elev
22'

Trans level: FL130 Trans alt: 11000'

1. **RADAR required.**2. **RNAV 1 Navigation Specification GNSS required.**

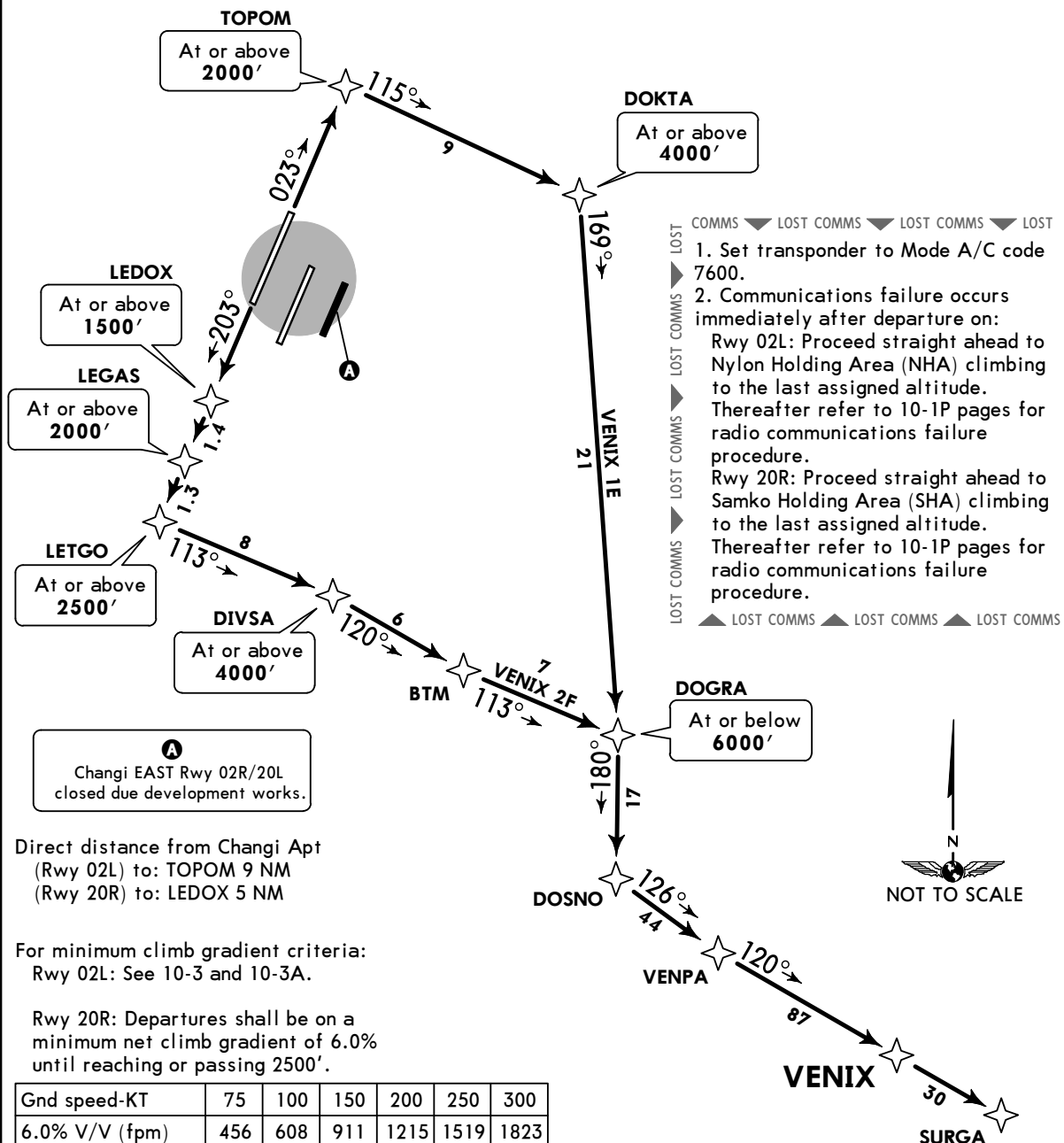
3. Aircraft unable to fly the SID profile shall inform ATC prior to departure and to EXPECT RADAR vectoring, if necessary.

4. Cruising levels will be issued after take-off by Singapore RADAR.

5. All SIDs include noise preferential routes.

3500'

MSA ARP

VENIX 1E [VENI1E], VENIX 2F [VENI2F]
RNAV (GNSS) DEPARTURES**SPEED:** SHALL NOT EXCEED 230 KIAS UNTIL PASSING 4000' AND
NOT EXCEED 250 KIAS UNTIL PASSING 10000'Initial climb clearance **3000'** or as directed by ATC

SID	RWY	INITIAL CLIMB
VENIX 1E	02L	To TOPOM on course 023° at or above 2000', turn RIGHT. To DOKTA at or above 4000', turn RIGHT. To DOGRA at or below 6000', turn RIGHT. To DOSNO, turn LEFT. To VENPA, turn LEFT. To VENIX. To SURGA.
VENIX 2F	20R	To LEDOX on course 203° at or above 1500'. To LEGAS at or above 2000'. To LETGO at or above 2500', turn LEFT. To DIVSA at or above 4000', turn RIGHT. To BTM, turn LEFT. To DOGRA at or below 6000', turn RIGHT. To DOSNO, turn LEFT. To VENPA, turn LEFT. To VENIX. To SURGA.

WSSS/SIN

 **JEPPESEN**
7 APR 17 (10-8)**SINGAPORE, SINGAPORE**
CHANGI**SINGAPORE CHANGI AIRPORT - WORKS SCHEDULE AND MOVEMENT
AREA RESTRICTIONS PERTAINING TO DIVERSION OF AIRSIDE
SERVICES AND SOIL IMPROVEMENT WORKS**

Runway 02L/20R and Runway 02C/20C will be closed between 1630 UTC and 2200 UTC nightly from 24 March 2017 to 28 October 2017 for works and maintenance as follows:

Month	Runway 02L/20R	Runway 02C/20C
March 2017	27 and 30.	24, 25, 26, 28, 29 and 31.
April 2017	3, 6, 10, 13, 17, 20, 24 and 27.	1, 2, 4, 5, 7, 8, 9, 11, 12, 14, 15, 16, 18, 19, 21, 22, 23, 25, 26, 28, 29 and 30.
May 2017	1, 4, 8, 11, 15, 18, 22, 25 and 29.	2, 3, 5, 6, 7, 9, 10, 12, 13, 14, 16, 17, 19, 20, 21, 23, 24, 26, 27, 28, 30 and 31.
June 2017	1, 5, 8, 12, 15, 19, 22, 26 and 29.	2, 3, 4, 6, 7, 9, 10, 11, 13, 14, 16, 17, 18, 20, 21, 23, 24, 25, 27, 28 and 30.
July 2017	3, 6, 10, 13, 17, 20, 24, 27 and 31	1, 2, 4, 5, 7, 8, 9, 11, 12, 14, 15, 16, 18, 19, 21, 22, 23, 25, 26, 28, 29 and 30.
August 2017	3, 7, 10, 14, 17, 21, 24, 28 and 31	1, 2, 4, 5, 6, 8, 9, 11, 12, 13, 15, 16, 18, 19, 20, 22, 23, 25, 26, 27, 29 and 30.
September 2017	4, 7, 11, 14, 18, 21, 25 and 28	1, 2, 3, 5, 6, 8, 9, 10, 12, 13, 15, 16, 17, 19, 20, 22, 23, 24, 26, 27, 29 and 30.
October 2017	2, 5, 9, 12, 16, 19, 23 and 26	1, 3, 4, 6, 7, 8, 10, 11, 13, 14, 15, 17, 18, 20, 21, 22, 24, 25, 27 and 28.

For Runway 02C/20C closure from 1630 UTC to 2200 UTC, Taxiway EP between Taxiway L9 and Taxiway E11 will also be closed due to work in progress.

Runway 02C/20C will be closed between 1630 UTC and 2200 UTC on the dates specified in paragraph 5.1. All aircraft operators operating during these periods are to plan to carry sufficient contingency fuel as only one runway will be available.

Any changes will be notified through NOTAM.

WSSS/SIN

Apt Elev **22'**
N01 21.6 E103 59.4

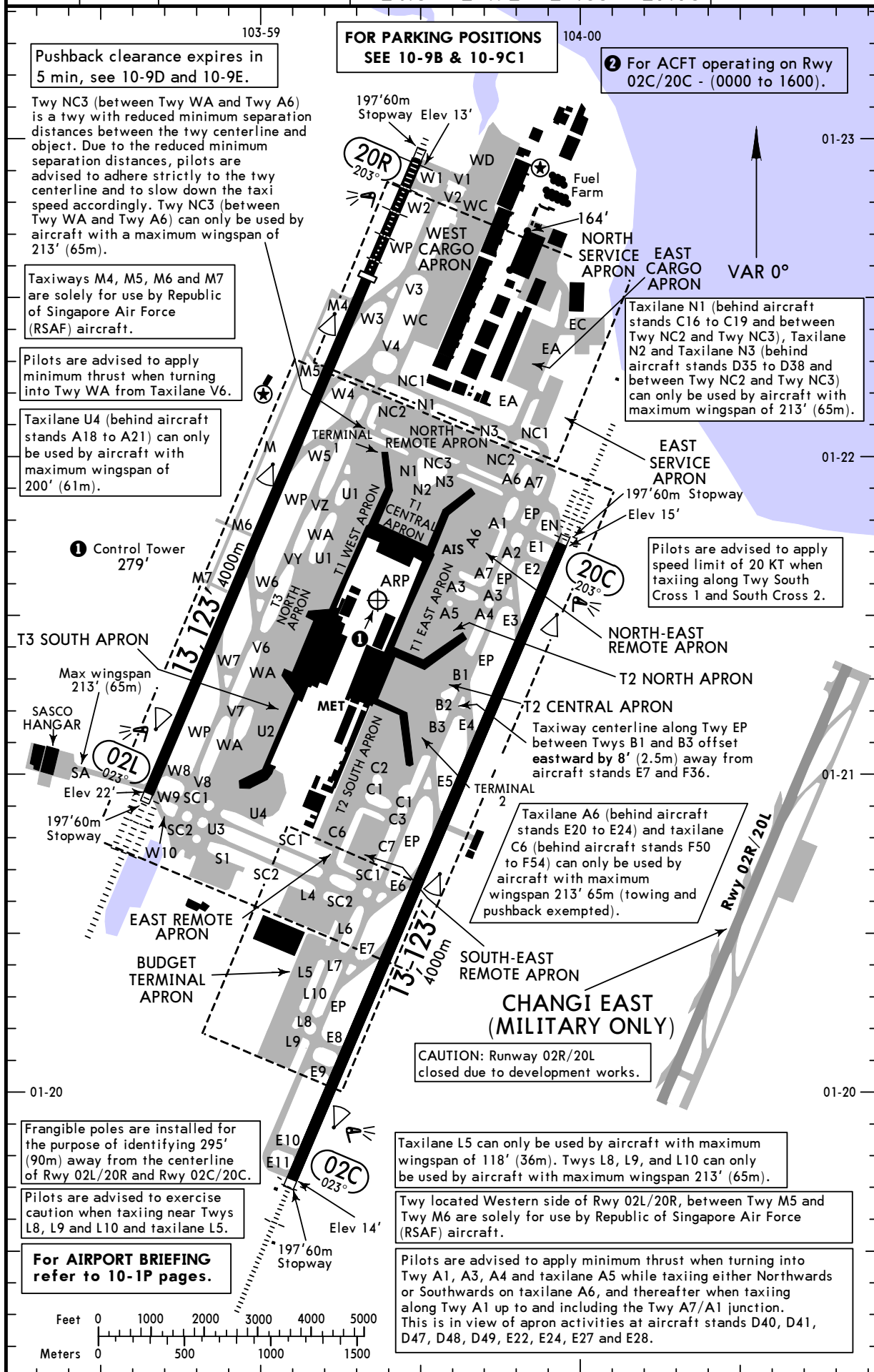
JEPPESSEN

2 DEC 16 (10-9)

SINGAPORE, SINGAPORE

CHANGI

D-ATIS	ACARS: D-ATIS	SINGAPORE Delivery (Cpt)	Ground				Tower
128.6		121.65	West of Terminal 3 124.3	*East of Terminal 2 121.72	*North of Terminal 1 121.85	Emergency 129.95	118.6 ② 118.25



CHANGES: Twy S1 added, twy WP extended, apron, note.

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WSSS/SIN **JEPPESEN**
2 DEC 16 (10-9A)**SINGAPORE, SINGAPORE**
CHANGI**GENERAL**

Due to close proximity of Paya Lebar and Seletar airports, correct approach is vital.

Maritime vessels of variable heights off Changi Apt.

Birds in vicinity of airport.

Low-level wind shear alert system.

Departures on Runway 20R are not permitted between 1600/2200 UTC. However, this restriction is not applicable when Runway 20C/02C is unavailable because of maintenance work or for other reasons.

Unless it is necessary for operational or safety reasons, when using engine reverse, arrivals on Runway 02L/20R between 1600/2200 UTC may not exceed idle reverse thrust.

To maximize runway utilization and minimize runway occupancy time, departing aircraft, when instructed to enter the runway, shall commence the maneuver without delay. Pilots are required to commence take-off roll as soon as take-off clearance is issued by ATC. Arriving aircraft upon landing shall vacate the runway as quickly as practicable to enable ATC to apply minimum spacing on final approach and minimize the occurrence of go-arounds.

ADDITIONAL RUNWAY INFORMATION

ADDITIONAL RUNWAY INFORMATION								USABLE LENGTHS		TAKE-OFF	WIDTH
RWY								LANDING BEYOND			
								Threshold	Glide Slope		
02L	HIRL CL ALSF-II TDZ REIL ① PAPI	RVR							11,995'3656m		197'
20R	HIRL CL HIALS REIL ① PAPI	RVR	10.696'3260m					9610'2929m			60m

① Angle 3.0°.

02C	HIRL CL ALSF-I REIL ② PAPI RVR		12,014'3662m		197'
20C	HIRL CL ALSF-II TDZ REIL ② PAPI-L RVR		12,012'3661m		60m

② Angle 3.0°.

DECLARED DISTANCES

Rwy Designator	Intersection Departures	TORA
20R	Not applicable W2 W3 W4 W5	13,123' 4000m 12,631' 3850m 10,007' 3050m 8,530' 2600m 7,054' 2150m
02L	Not applicable W8 W7 W6	13,123' 4000m 12,631' 3850m 10,007' 3050m 8,530' 2600m
20C	Not applicable E2 E3 E4 E5	13,123' 4000m 12,631' 3850m 11,237' 3425m 9,022' 2750m 7,382' 2250m
02C	Not applicable E10 E9 E8 E7 E6	13,123' 4000m 12,631' 3850m 10,974' 3345m 10,515' 3205m 8,383' 2555m 6,906' 2105m
02R	Not applicable	9,022' 2750m
20L	Not applicable	9,022' 2750m

Intersection departures are allowed subject to the following:

- (a) Initiated by pilot and approved by ATC, traffic permitting.
 (b) ATC is able to keep aircraft visual at all times.

TAKE-OFF

	AIR CARRIER (JAA)			AIR CARRIER (FAR 121)	
	LVP must be in Force			All Rwys	
	All Rwys RL & CL	All Rwys RCLM (DAY only) or RL	All Rwys RCLM (DAY only) or RL	CL & RCLM any RVR out, other two required	Adequate Vis Ref
A				2 Eng	TDZ RVR 175m
B	200m (150m)	250m	400m	3 & 4 Eng	MID RVR 175m
C					Rollout RVR 175m
D	250m (200m)	300m			RVR 500m VIS 400m

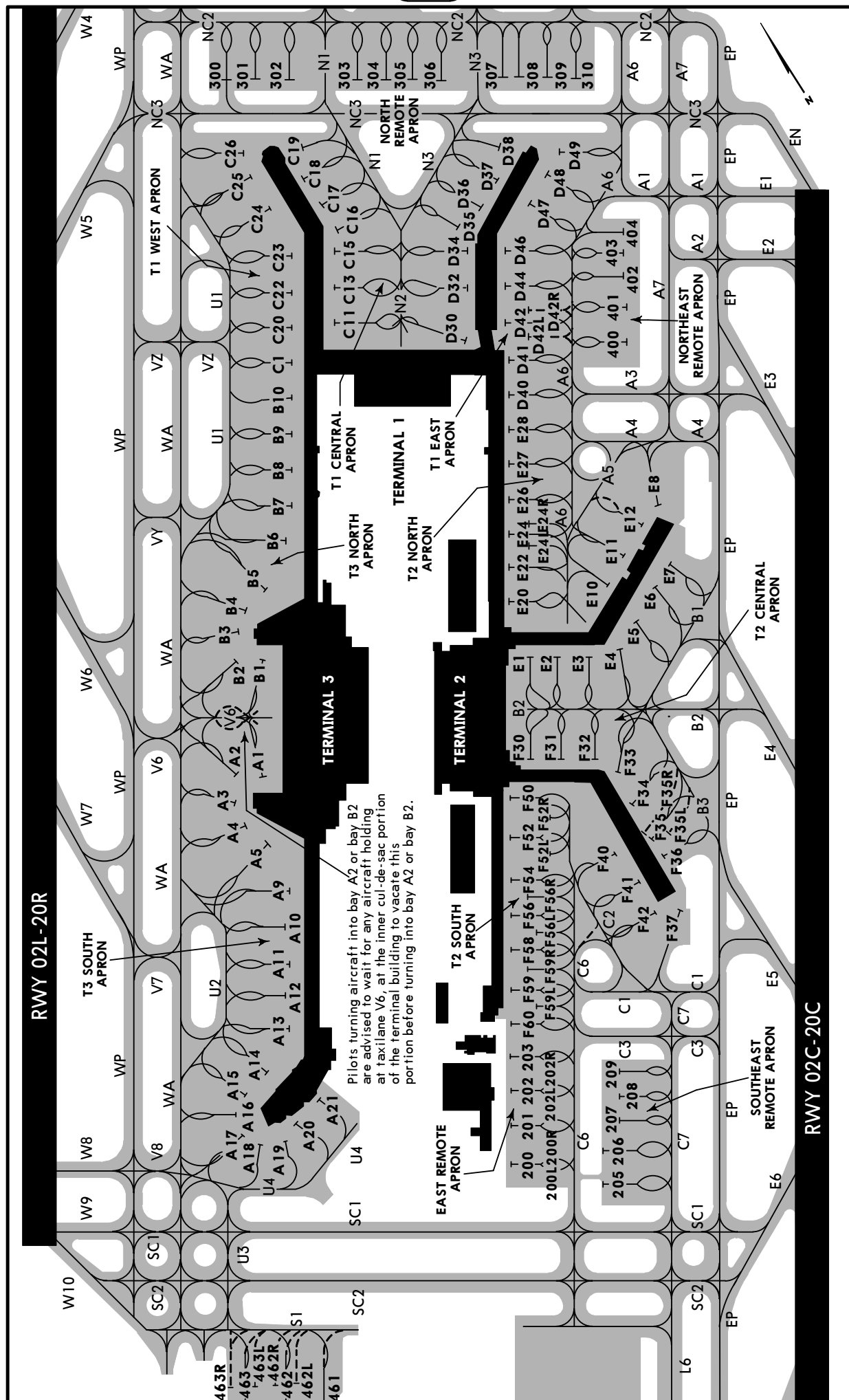
WSSS/SIN

16 DEC 16

10-9B

SINGAPORE, SINGAPORE

CHANGI



CHANGES: Parking stands F35L and F35R added.

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WSSS/SIN

 **JEPPESEN**
16 DEC 16 (10-9C)**SINGAPORE, SINGAPORE**
CHANGI**PARKING BAY COORDINATES**

BAY No.	COORDINATES	BAY No.	COORDINATES
T3 South Apron		T2 Central Apron	
A1, A2	N01 21.4 E103 59.1	E1	N01 21.3 E103 59.4
A3, A4	N01 21.3 E103 59.0	E2 thru E4	N01 21.3 E103 59.5
A5	N01 21.3 E103 59.1	E5	N01 21.3 E103 59.6
A9	N01 21.2 E103 59.1	E6, E7	N01 21.4 E103 59.6
A10	N01 21.2 E103 59.0	F30, F31	N01 21.2 E103 59.4
A11 thru A13	N01 21.1 E103 59.0	F32, F33	N01 21.2 E103 59.5
A14	N01 21.0 E103 59.0	F34 thru F36	N01 21.1 E103 59.5
A15 thru A17	N01 21.0 E103 58.9	T2 North Apron	
A18	N01 20.9 E103 58.9	E8	N01 21.5 E103 59.6
A19, A20	N01 20.9 E103 59.0	E10	N01 21.4 E103 59.5
A21	N01 21.0 E103 59.0	E11	N01 21.4 E103 59.6
461, 462L	N01 20.7 E103 58.9	E12	N01 21.5 E103 59.6
462, 462R, 463L	N01 20.7 E103 58.8	E20, E22	N01 21.4 E103 59.5
463, 463R	N01 20.7 E103 58.8	E24 thru E26	N01 21.5 E103 59.5
T3 North Apron		E27, E28	N01 21.6 E103 59.5
B1	N01 21.4 E103 59.1	T2 South Apron	
B2 thru B4	N01 21.5 E103 59.1	F37	N01 21.0 E103 59.4
B5 thru B7	N01 21.6 E103 59.2	F40, F41	N01 21.1 E103 59.4
B8 thru B10	N01 21.7 E103 59.3	F42	N01 21.0 E103 59.4
T1 West Apron		F50	N01 21.2 E103 59.4
C1, C20	N01 21.8 E103 59.3	F52L, F52R	N01 21.0 E103 59.3
C22	N01 21.9 E103 59.3	F52, F56R, F56L	N01 21.1 E103 59.3
C23	N01 21.9 E103 59.4	F54, F56	N01 21.1 E103 59.3
C24	N01 21.9 E103 59.5	F58, F59, F59R	N01 21.0 E103 59.3
C25	N01 22.0 E103 59.4	F59L, F60	N01 21.0 E103 59.3
C26	N01 22.0 E103 59.5	East Remote Apron	
T1 Central Apron		200, 200L, 200R	N01 20.8 E103 59.2
C11, C13	N01 21.8 E103 59.4	201	N01 20.8 E103 59.2
C15	N01 21.9 E103 59.4	202, 202L, 202R	N01 20.9 E103 59.2
C16, C17	N01 21.9 E103 59.5	203	N01 20.9 E103 59.2
C18	N01 22.0 E103 59.5	South-East Remote Apron	
C19	N01 22.1 E103 59.5	103, 104	N01 20.5 E103 59.2
D30	N01 21.7 E103 59.5	205	N01 20.7 E103 59.3
D32, D34	N01 21.8 E103 59.5	206 thru 208	N01 20.8 E103 59.3
D35 thru D38	N01 21.9 E103 59.7	209	N01 20.9 E103 59.3
T1 East Apron		North-East Remote Apron	
D40	N01 21.6 E103 59.5	400	N01 21.6 E103 59.7
D41, D42, D42L	N01 21.7 E103 59.6	401 thru 403	N01 21.7 E103 59.7
D42R, D44	N01 21.7 E103 59.6	404	N01 21.8 E103 59.7
D46	N01 21.8 E103 59.6	North Remote Apron	
D47, D48	N01 21.8 E103 59.8	300, 301	N01 22.1 E103 59.5
D49	N01 21.9 E103 59.8	302, 303	N01 22.1 E103 59.6
		304	N01 22.1 E103 59.7
		305, 306	N01 22.0 E103 59.7
		307 thru 309	N01 22.0 E103 59.8
		310	N01 22.0 E103 59.9

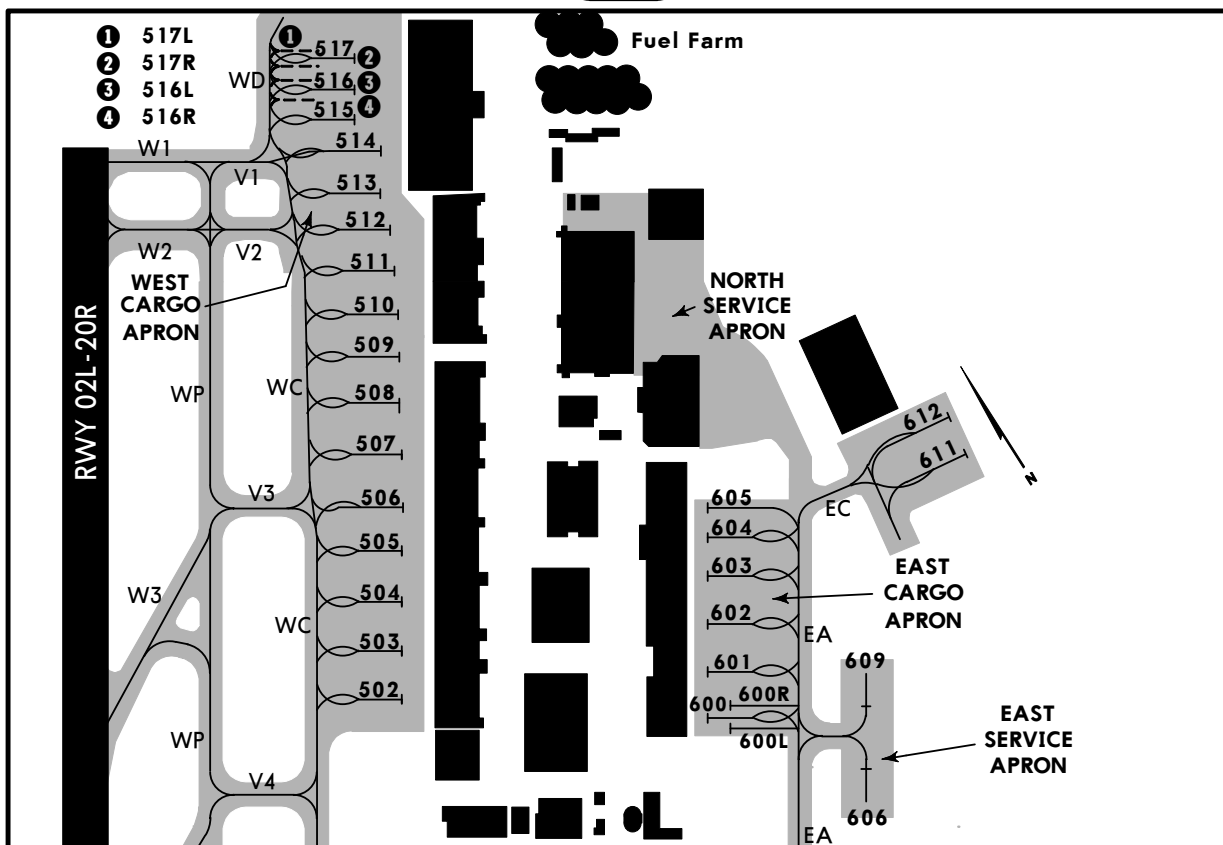
1 For Parking Positions see 10-9C1.

WSSS/SIN

10 MAR 17

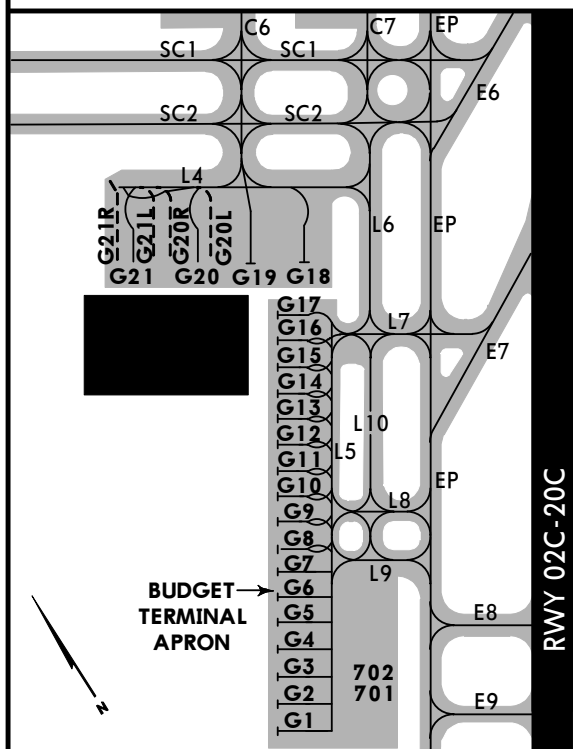
(10-9C1)

SINGAPORE, SINGAPORE
CHANGI



PARKING BAY COORDINATES

BAY No.	COORDINATES	BAY No.	COORDINATES
West Cargo Apron		East Cargo Apron	
502	N01 22.4 E103 59.5	517	N01 23.0 E103 59.8
503	N01 22.4 E103 59.6	517L, 517R	N01 23.0 E103 59.7
504	N01 22.5 E103 59.6	East Service Apron	
505, 506	N01 22.5 E103 59.6	600, 600L, 600R	N01 22.2 E103 59.8
507, 508	N01 22.6 E103 59.6	601, 602	N01 22.3 E103 59.8
509	N01 22.7 E103 59.6	603, 604, 605	N01 22.4 E103 59.9
510, 511	N01 22.7 E103 59.7	611, 612	N01 22.4 E104 00.0
512 thru 514	N01 22.8 E103 59.7	East Cargo Apron	
515	N01 22.9 E103 59.7	606	N01 22.2 E103 59.9
516L, 516, 516R	N01 22.9 E103 59.7	609	N01 22.2 E103 59.9



PARKING BAY COORDINATES

BAY No.	COORDINATES
Budget Terminal Apron	
701, 702	N01 20.1 E103 59.1
G1, G2	N01 20.1 E103 59.0
G3, G4	N01 20.2 E103 59.0
G5, G6	N01 20.2 E103 59.1
G7 thru G11	N01 20.3 E103 59.1
G12 thru G15	N01 20.4 E103 59.1
G16, G17	N01 20.5 E103 59.2
South-East Remote Apron	
G18, G19	N01 20.5 E103 59.2
G20, G20L, G20R	N01 20.6 E103 59.1
G21, G21L, G21R	N01 20.6 E103 59.1

WSSS/SIN **JEPPESEN**

10 MAR 17

10-9C2**SINGAPORE, SINGAPORE**
CHANGI

TAXIING GUIDANCE SYSTEM AT SINGAPORE CHANGI AIRPORT

The taxiing guidance system at Singapore Changi Airport consists of stop bars and selectable segments of green taxiway centerline lights. The system is designed to provide pilots with visual guidance while taxiing during night operations and during periods of low visibility. It is controlled by the Ground Movement Controller (GMC) at Changi Control Tower using the Airfield Lighting Control and Monitoring System (AGLCMS).

Route Selection and Priority

When a taxiing route is selected on the AGLCMS, corresponding segments of taxiway centerline lights on the maneuvering area are switched on automatically. When two or more routes are selected, the system will give priority to the first route and activate red stopbar lights across conflicting routes, as necessary. A segment of the centerline lights of the conflicting routes that cut across the first route will also be suppressed. The GMC has the option of overriding the taxiing route priority by selecting or deselecting the appropriate stopbar lights.

All taxiing guidance lights on taxiways leading to the runways terminate at the runway holding positions where, by default, red stopbar lights remain on unless deselected by the runway controller. When deselected, these stopbar lights will re-activate automatically after 50 seconds. Pilots shall not cross any lighted red stopbar lights.

Pilots shall enter/cross the runway or taxiway only when both the following conditions are met:

The crew have

- a. received positive ATC clearance to enter/cross the runway or taxiway, and
- b. observed that the red stopbar lights are turned off.

Information and Mandatory Signs/Markings

When following the directional guidance provided by the green taxiway centerline lights and red stopbar lights, pilots are advised to also navigate their taxi route with reference to information and mandatory signs/markings provided at the airport so as to maintain situational awareness of their whereabouts at all times.

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10-9C3

SINGAPORE, SINGAPORE
CHANGI

**ADVANCED- SURFACE MOVEMENT GUIDANCE
AND CONTROL SYSTEM
(A-SMGCS)- MULTILATERATION SYSTEM DEPLOYMENT
AT SINGAPORE CHANGI AIRPORT**

1 Introduction

- 1.1 The Multilateration System is a new surveillance system which is able to detect and identify all Mode S equipped aircraft and vehicles moving on the airport surface even during bad weather conditions such as heavy rain. It will integrate with the current radar-based ground surveillance system as a part of the Advanced- Surface Movement Guidance and Control System (A-SMGCS) at Singapore Changi Airport. This will enhance the efficiency and safety at the airport.

2 Carriage of Mode-S SSR Transponder

- 2.1 Carriage and operation of Mode-S transponder is required for all civil aircraft operating at Singapore Changi Airport. The Mode-S transponder shall comply, at least, to the requirements of Level 2 as prescribed in ICAO Annex 10 Volume IV (Amendment 77 or later) Standards and Recommended Practices.

3 Multilateration System Outline

- 3.1 The Multilateration System uses multiple receivers to pick up ``squitters`` transmitted by aircraft or vehicle Mode S transponders. It calculates the position of an aircraft or a vehicle by comparing the time its ``squitter`` arrives at each receiver.
- 3.2 The system will derive the identity of an aircraft by selectively interrogating its transponder to receive its assigned Mode A code or extracting its aircraft identification (that is, the ICAO callsign used in flight and inserted in the Flight Management System (FMS) or Transponder Control Panel), if available, from its squitter. For transponder equipped vehicles, the system will derive their respective identities from the unique Mode S addresses contained in their squitters.

4 Aircraft Requirements

- 4.1 The Multilateration System is essentially passive. It relies on aircraft transponders squittering at all times when moving on the airfield. At present, some aircraft checklist procedures instruct pilots to turn off the transponder shortly after leaving the runway on arrival and, not to switch it on until reaching the runway holding point for departure. This is in line with the requirement that Mode A/C transponders should not transmit on the ground, which does not apply to Mode S transmissions.
- 4.2 For the Multilateration System to work effectively, all aircraft Mode S transponders need to transmit Mode S squitters at all times when moving on the airfield, starting immediately prior to pushback, and for arrival aircraft until they are stationary at the aircraft stands. The Mode S transponders should not respond to All-Call interrogations, but should respond to addressed interrogations.

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30 APR 10

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10-9C4**SINGAPORE, SINGAPORE**
CHANGI

5 Procedures / Actions Required By Pilots

5.1 The Multilateration System needs to receive squitters and to acquire the Mode A code of a Mode S equipped aircraft at all times when it is on the ground. This is to enable detection and identification of the aircraft (from its Mode A code or ICAO callsign) as soon as it pushes back. Hence, the following actions from pilots are required.

5.2 Pre-Push back / Taxi

- a) Pilots will be required to enter an assigned Mode A code at start-up. This code will be either a discrete or non-discrete code (a conspicuity code, e.g. 1000).
- b) Pilots shall ensure that the aircraft transponder is operating (that is, XPNDR or the equivalent according to specific installation, AUTO if available, not OFF or STBY) and the assigned Mode A code is selected prior to the request for pushback or taxi, whichever is earlier.
- c) Whenever the aircraft is capable of reporting aircraft identification, the aircraft identification must also be entered prior to the request for pushback or taxi, whichever is earlier, through the FMS or the Transponder Control Panel. Flight crew must use the 3-letter ICAO designator of the operator, followed by flight identification number (for example, BAW123, SIA002).

5.3 After Landing

- a) Pilots shall ensure that the aircraft transponder is operating (that is, XPNDR or the equivalent according to specific installation, AUTO if available, not OFF or STBY) after landing, and continuously until the aircraft is stationary at the aircraft stand.
- b) Pilots shall ensure that the assigned Mode A code is not changed until the aircraft is stationary at the aircraft stand. (The system requires it for identification of the aircraft).

WSSS/SIN

 **JEPPESEN**
13 FEB 15 (10-9D)**SINGAPORE, SINGAPORE**
CHANGI**PROCEDURES FOR PUSH BACK AND ASSIGNMENT OF
FLIGHT LEVELS TO DEPARTING AIRCRAFT****GENERAL**

- a. Aircraft departing Singapore Changi Airport shall adhere to the procedures for push back and assignment of flight levels.
- b. Assignment of flight levels to departing aircraft is made on a first-come-first-served basis. Aircraft will normally be assigned the level requested unless an alternate level is offered after coordination with the adjacent ATC centers.
- c. Departing flights from Singapore requesting FL280 or FL320 on L759, M770, N571, N571/N877 or P628 will be cleared as follows:
 1. Aircraft departing Singapore will be cleared to FL280.
 2. Succeeding aircraft on the same route will be cleared to FL280 with 10 min longitudinal separation provided there is no closing speed with the preceding aircraft.
 3. Additional longitudinal separation as appropriate shall be provided by ATC for the faster aircraft following a slower aircraft on the same route.
 4. The first aircraft from either Singapore or Kuala Lumpur to be over GUNIP on N571 or N571/N877, the Kuala Lumpur/Bangkok FIR boundary on M770 or L759 and VPL on P628 can expect its requested flight level.
- d. To avoid confusion, pilots shall use the correct phraseology as detailed in **PROCEDURES** paragraph a. when ready for push back.

PROCEDURES

- a. The pilot shall notify ATC when the aircraft is ready to push back within 5 min using the following phraseology:
 - call sign
 - destination
 - proposed flight level and alternate level, if any
 - parking position
- b. On receipt of the 'ready to push back' call, ATC will advise the pilot whether the proposed flight level or other alternate flight level is available and an ATC clearance will be issued accordingly. If pre-departure coordination with an adjacent unit or center is required, the pilot will be instructed to standby.
- c. Once the flight level is accepted by the pilot and an ATC clearance issued, the aircraft must be pushed back within 5 minutes from the time the ATC clearance is accepted unless other ATC restrictions are imposed. The ATC clearance will be cancelled upon expiration of the 5 minute grace period.
- d. At the end of the push back, the departing aircraft must have all engines started and be ready to taxi immediately, unless otherwise instructed by ATC.

NOTE: The first aircraft to taxi may not necessarily be the first aircraft to take-off as distances between aircraft stands and the departure runway vary.

WSSS/SIN **JEPPesen**
13 FEB 15 **(10-9E)****SINGAPORE, SINGAPORE**
CHANGI**GATE HOLD PROCEDURES FOR DEPARTING AIRCRAFT**

- a. Whenever there are about five to seven departing aircraft at the Rwy holding point, subsequent push backs of departures will be regulated such that the Ground Movement Planner (GMP) on frequency 121.65 will start to issue pilots with Expected Pushback Time (EPT). The determination of EPT will take into account an aircraft's parking stand as well as taxi time to the Rwy-in-use holding point.
- b. When an EPT is issued, pilots will be instructed to either remain on GMP frequency or to monitor Singapore Ground Control (frequencies 124.3, 121.72 or 121.85). It should be noted that when instructed to monitor Singapore Ground frequencies, pilots shall not establish contact with the Singapore Ground Control, rather, pilots shall maintain a listening watch on the assigned Singapore Ground Control frequency and wait for pushback instruction. This is to prevent unnecessary frequency congestion.
- c. A flight issued with an EPT but chooses to commence pushback before the assigned time will be allowed to do so. However, the flight should not expect an earlier departure time as the planned departure sequences will be maintained.
- d. In a situation when a departing aircraft is occupying a gate that has been assigned to an arriving aircraft, the departing aircraft will be instructed by the GMP to contact Singapore Ground for pushback for the purpose of better gate utilization.
- e. To maximize runway utilization, departure sequence will be planned on the basis of increasing runway throughput so as to enhance overall efficiency.

DELAY IN PUSH BACK AND/OR TAXI DUE TO OTHER AIRCRAFT

Delays may be expected for the second aircraft to push back and to taxi when two or more aircraft are parked either adjacent to one another or close together. However, it will retain its ATC clearance even if the 5 minutes grace period allowed for under

PROCEDURES paragraph c. is exceeded.

DELAY IN TAKE-OFF DUE TO RESTRICTIONS IN THE ATC CLEARANCE

The ATC clearance may require an aircraft to arrive at a reporting point at a specific time and level or to depart a number of minutes behind a preceding traffic to establish longitudinal separation. Such a delay will not deprive a departing aircraft of its ATC clearance even though the 5 minutes grace period would have been exceeded.

DELAY DUE TO OVERFLIGHTS

These are flights operating through Singapore FIR without landing at Changi Airport. Depending on their positions, a departing aircraft requesting the same level may have to accept an alternate level or may have to delay its departure in order to establish the prescribed separation.

FLIGHTS EXEMPTED

The above procedures are not applicable to VIP, CASEVAC, SAR and other special tasks aircraft. ATC shall have full discretion in the conduct of such operations.

CANCELLATION OF ATC CLEARANCE/ OBTAINING A FRESH CLEARANCE

- a. A departing aircraft may have its ATC clearance cancelled under the following circumstances:
 1. on expiry of the 5 minutes grace period under **PROCEDURES** paragraph c., it is still unable to push back; or
 2. after pushing back, the pilot advises that it is returning to blocks; or
 3. it develops a technical problem and is unable to continue taxiing.
- b. ATC will inform the aircraft when a clearance is cancelled using the following phraseology: '(Call sign of aircraft) your ATC clearance is cancelled (reason)'.
- c. Pilots who are ready to depart following the cancellation of an ATC clearance will adopt the normal procedures as if it is the first time they are ready to depart.

GROUND MOVEMENT PLANNER ON VHF 121.65

The frequency shall be used for aircraft pre-flight checks and ATC clearances.

Pilot-in-command to make his initial call from the parked position of the frequency.

WSSS/SIN **JEPPESEN**
13 FEB 15 (10-9E1)**SINGAPORE, SINGAPORE**
CHANGI**GROUND MOVEMENT CONTROL ON 124.3, 121.85, AND 121.72**

- a. This frequency shall be used for aircraft start-up/push-back clearance.
- b. Unless otherwise instructed by ATC, the pilot-in-command shall prior to starting engines listen out on the Ground Movement Control frequency on 124.3, 121.85 or 121.72.
- c. The pilot-in-command shall:
 1. Request and obtain taxi instructions prior to taxiing;
Note: ATC clearance, including the assigned SSR code will normally be issued prior to push back. Pilot shall squawk the SSR code immediately when airborne.
 2. Change from Ground Movement Control frequency to the Runway Control frequency when instructed (118.6 or 118.25). It should be noted that when instructed to monitor Singapore Tower frequencies, pilots shall not establish contact with Singapore Tower; rather, pilots shall maintain a listening watch on the assigned Singapore Tower frequency and wait for instruction. This is to prevent unnecessary frequency congestion.
- d. Departing aircraft will be instructed when to change from 118.6 or 118.25 to Singapore Departure frequency 120.3.
- e. In the case of the aircraft having landed, the pilot-in-command shall change from 118.6 or 118.25 to 124.3, 121.85 or 121.72 immediately upon instructed by ATC after clearing the runway. He shall maintain watch on 124.3, 121.85 or 121.72 for taxiing and parking instructions until he arrives at his aircraft stand.

TAXIING

- a. Taxi clearance given by Ground Movement Control will relate to movement on the maneuvering area, but excluding the marshalling area.
- b. Aircraft taxiing on the maneuvering area will be regulated by ATC to avoid or reduce possible conflict and will be provided with traffic information and alerting service. ATC shall apply taxiing clearance limits whenever necessary.
- c. The taxiway routes to be used by aircraft after landing or when taxiing for departure will be specified by ATC. The issuance by ATC of a taxi route to an aircraft does not relieve the pilot-in-command of the responsibility to maintain separation with other aircraft on the maneuvering area or to comply with ATC directions intended to regulate aircraft on the maneuvering area.
- d. Pilots are reminded to always use minimum power when starting engines, when maneuvering within the apron area or when maneuvering from apron taxiways to other parts of the aerodrome. It is especially critical when commencing to taxi that break-away thrusts are kept to an absolute minimum and then be reduced to idle thrusts as soon as possible.

TAKE-OFF AND LANDING

- a. Departing aircraft will normally be directed by ATC to use the full length of the runway for take-off. On obtaining an ATC clearance the aircraft shall enter the runway via designated taxiways:
 - Rwy 02C - Twy E10 or E11
 - Rwy 02L - Twy W8, W9 OR W10
 - Rwy 20C - Twy E1, E2
 - Rwy 20R - Twy W1, W2
- b. The pilot-in-command shall not take-off or land without a clearance from Aerodrome Control.
- c. The pilot-in-command shall not run-up on the runway in use unless authorized by Aerodrome Control. Engines run-ups in the holding pan or taxiway holding point clear of the runway in use may be carried out subject to approval by Aerodrome Control.
- d. After landing, the pilot-in-command shall vacate the runway by the shortest suitable route and to contact Ground Control who will issue specific taxi route instructions to its assigned aircraft stand.
- e. Aircraft with radio communication failure shall vacate the runway and stop on the taxiway and watch for light signals from Aerodrome Control.

ARRIVING AIRCRAFT

The pilot-in-command of an arriving aircraft shall contact the appropriate Approach Control Unit 10 minutes before entering the CTR or ATZ.

WSSS/SIN

10 MAR 17



JEPPESEN

10-9F

SINGAPORE, SINGAPORE

CHANGI

PROCEDURES FOR START-UP AND PUSHBACK OF AIRCRAFT

1. Ground crew must ensure that the area behind an aircraft is clear of vehicles, equipment and other obstructions before the start-up or pushback of aircraft commences.
2. When the pilot is ready for start-up and pushback, he/she shall seek confirmation from the ground crew that there is no hazard to the aircraft starting up. The pilot shall then notify the Ground Movement Controller (Callsign: Singapore Ground) that the aircraft is ready for pushback. On being informed by Singapore Ground that pushback is approved, the pilot should coordinate with the ground crew for the start-up and pushback of the aircraft.
3. The following table describes the procedures for the pushback of aircraft from the various aircraft stands. When it becomes necessary to vary a procedure to expedite aircraft movements, Singapore Ground will issue specific instructions to the pilot.

APRON/ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
TERMINAL 3 - WEST APRON		
A1	<p>The aircraft shall be pushed back following the pushback line onto Taxilane V6 until its nosewheel is at the "EOP A1" position. The aircraft shall then be towed forward onto Taxilane V6 to face West until its nosewheel is at the "EOT A1, A2, B1, B2" position. The aircraft may breakaway from there. Engine start up is not permitted during standard pushback.</p> <p><u>Alternate Pushback Procedure (To Face North)</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane V6, following Taxilane V6 centreline onto TWY WA, to face North until the nose of the aircraft is behind the stopbar behind aircraft stand A2. The aircraft may breakaway from there.</p> <p>This alternate pushback procedure can only be exercised if the auxiliary power unit of aircraft is unserviceable.</p> <p><u>Alternate Pushback Procedure (To Face South)</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane V6, following Taxilane V6 centreline onto TWY WA, to face South until the nose of the aircraft is behind the stopbar behind aircraft stand B2. The aircraft may breakaway from there.</p> <p>This alternate pushback procedure can only be exercised if the auxiliary power unit of aircraft is unserviceable.</p>	<p>Standard pushback approved.</p> <p>Pushback approved, to face North on TWY WA.</p> <p>Pushback approved, to face South on TWY WA.</p>
A2	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane V6 to face West until its nosewheel is at the "EOP A2, B2" position. The aircraft shall then be towed forward until its nosewheel is at the "EOT A1, A2, B1, B2" position. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure (To Face North)</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto TWY WA, to face North until the nose of the aircraft is behind the stopbar behind aircraft stand A2. The aircraft may breakaway from there.</p> <p>This alternate pushback procedure can only be exercised if the auxiliary power unit of aircraft is unserviceable.</p> <p><u>Alternate Pushback Procedure (To Face South)</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto TWY WA, to face South until the nose of the aircraft is behind the stopbar behind aircraft stand B2. The aircraft may breakaway from there.</p> <p>This alternate pushback procedure can only be exercised if the auxiliary power unit of aircraft is unserviceable.</p>	<p>Standard pushback approved.</p> <p>Pushback approved, to face North on TWY WA.</p> <p>Pushback approved, to face South on TWY WA.</p>
A3	The aircraft (on idle thrust) shall be pushed back onto TWY WA to face North (or South) its nosewheel is at the intersection of the aircraft stand lead-in line and TWY WA centerline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
A4	The aircraft (on idle thrust) shall be pushed back following the pushback line onto TWY WA to face North (or South) until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY WA centerline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
A5, A9	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto TWY U2 to face North until the nose of the aircraft is behind the stopbar behind aircraft stand A10. The aircraft may breakaway from there.</p> <p>OR</p> <p>The aircraft (on idle thrust) shall be pushed back onto TWY U2 followed by TWY WA to face South until nose of the aircraft is behind the stopbar behind aircraft stand A4. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
A10	<p>The aircraft (on idle thrust) shall be pushed back onto TWY U2 to face North until the nose of the aircraft is behind the stopbar behind aircraft stand A10. The aircraft may breakaway from there.</p> <p>OR</p> <p>The aircraft (on idle thrust) shall be pushed back onto TWY U2 followed by TWY WA to face South until the nose of the aircraft is behind the stopbar behind aircraft stand A4. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>

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10 MAR 17

**JEPPesen****(10-9G)****SINGAPORE, SINGAPORE****CHANGI**

APRON/ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
A11	<p>The aircraft (on idle thrust) shall be pushed back onto TWY U2 to face North until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY U2 centerline. The aircraft shall then be towed forward until the nose of the aircraft is behind the stopbar behind aircraft stand A10. The aircraft may breakaway from there.</p> <p>OR</p> <p>The aircraft (on idle thrust) shall be pushed back onto TWY U2 to face South until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY U2 centerline. The aircraft shall then be towed forward until the nose of the aircraft is behind the stopbar behind aircraft stand A12. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
A12	<p>The aircraft (on idle thrust) shall be pushed back onto TWY U2 to face North until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY U2 centerline. The aircraft shall then be towed forward until the nose of the aircraft is behind the stopbar behind aircraft stand A10. The aircraft may breakaway from there.</p> <p>OR</p> <p>The aircraft (on idle thrust) shall be pushed back onto TWY U2 to face South until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY U2 centerline. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
A13, A14, A15	<p>The aircraft (on idle thrust) shall be pushed back onto TWY U2 followed by TWY WA to face North until the nose of the aircraft is behind the stopbar behind aircraft stand A16. The aircraft may breakaway from there.</p> <p>OR</p> <p>The aircraft (on idle thrust) shall be pushed back onto TWY U2 to face South until the nose of the aircraft is behind the stopbar behind aircraft stand A12. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
A16	The aircraft (on idle thrust) shall be pushed back onto TWY WA to face North (South) until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY WA centerline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
A17	<p>The aircraft (on idle thrust) shall be pushed back onto TWY V8 to face West until its nosewheel is at the "EOP A17" position behind aircraft stand A17. The aircraft may breakaway from there.</p> <p>OR</p> <p>The aircraft (on idle thrust) shall be pushed back onto TWY WA to face South until the nose of the aircraft is behind the stopbar behind aircraft stand A16. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face West.</p> <p>Pushback approved, to face South.</p>
A18	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane U4 to face West until the nose of the aircraft is behind the stopbar behind aircraft stand A18. The aircraft may breakaway from there.	Standard pushback approved.
A19	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane U4 to face West until its nosewheel is at the "EOP A19" position behind aircraft stand A19. The aircraft may breakaway from there.	Standard pushback approved.
A20	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane U4 to face West until its nosewheel is at the "EOP A20" position behind aircraft stand A20. The aircraft may breakaway from there.	Standard pushback approved.
A21	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane U4 until its nosewheel is at the "EOP A21" position. The aircraft shall then be towed forward to face West until the nose of the aircraft is behind the stopbar behind aircraft stand A18. The aircraft may breakaway from there.	Standard pushback approved.

WSSS/SIN

10 MAR 17



JEPPESEN

10-9H

SINGAPORE, SINGAPORE

CHANGI

APRON/ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
SOUTH APRON		
461	The aircraft (on idle thrust) shall be pushed back onto taxiway S1 to face west until its nosewheel is at EOP position. The aircraft may break away from there. There shall be no simultaneous aircraft pushback from aircraft stands 462, 462L, 462R, 463, 463L and 463R.	Pushback approved to face West.
462	The aircraft (on idle thrust) shall be pushed back onto taxiway S1 to face west until its nosewheel is at the intersection of the aircraft stand pushback line and taxiway S1 centreline. The aircraft may breakaway from there. There shall be no simultaneous aircraft pushback from aircraft stands 461, 462L, 462R, 463, 463L and 463R.	Pushback approved to face West.
462L	The aircraft (on idle thrust) shall be pushed back onto taxiway S1 to face west until its nosewheel is at the intersection of the aircraft stand pushback line and taxiway S1 centreline. The aircraft may breakaway from there. There shall be no simultaneous aircraft pushback from aircraft stands 461, 462, 462R, 463, 463L and 463R.	Pushback approved to face West.
462R	The aircraft (on idle thrust) shall be pushed back onto taxiway S1 to face west until its nosewheel is at the intersection of the aircraft stand pushback line and taxiway S1 centreline. The aircraft may breakaway from there. There shall be no simultaneous aircraft pushback from aircraft stands 461, 462, 462L, 463, 463L and 463R.	Pushback approved to face West.
463	The aircraft (on idle thrust) shall be pushed back onto taxiway S1 to face west until its nosewheel is at the intersection of the aircraft stand pushback line and taxiway S1 centreline. The aircraft may break away from there. There shall be no simultaneous aircraft pushback from aircraft stands 461, 462, 462L, 462R, 463L and 463R.	Pushback approved to face West.
463L	The aircraft (on idle thrust) shall be pushed back onto taxiway S1 to face west until its nosewheel is at the intersection of the aircraft stand pushback line and taxiway S1 centreline. The aircraft may break away from there. There shall be no simultaneous aircraft pushback from aircraft stands 461, 462, 462L, 462R, 463 and 463R.	Pushback approved to face West.
463R	The aircraft (on idle thrust) shall be pushed back onto taxiway S1 to face west until the nose of the aircraft is behind the stop bar behind aircraft stand 463L. The aircraft may breakaway from there. There shall be no simultaneous aircraft pushback from aircraft stands 461, 462, 462L, 462R, 463 and 463L.	Pushback approved to face West.
TERMINAL 3 - WEST APRON		
B1	<p>The aircraft shall be pushed back following the pushback line until its nosewheel at the "EOP B1" position. The aircraft shall then be towed forward onto Taxilane V6 to face West until its nosewheel is at the "EOT A1, A2, B1, B2" position. The aircraft may breakaway from there. Engine start up is not permitted during standard pushback.</p> <p><u>Alternate Pushback Procedure (To Face North)</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane V6, following Taxilane V6 centreline onto TWY WA, to face North until the nose of the aircraft is behind the stopbar behind aircraft stand A2. The aircraft may breakaway from there. This alternate pushback procedure can only be exercised if the auxiliary power unit of aircraft is unserviceable.</p> <p><u>Alternate Pushback Procedure (To Face South)</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane V6, following Taxilane V6 centreline onto TWY WA, to face South until the nose of the aircraft is behind the stopbar behind aircraft stand B2. The aircraft may breakaway from there. This alternate pushback procedure can only be exercised if the auxiliary power unit of aircraft is unserviceable.</p>	<p>Standard pushback approved.</p> <p>Pushback approved, to face North on TWY WA.</p> <p>Pushback approved, to face South on TWY WA.</p>
B2	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane V6 to face West until its nosewheel is at the "EOP A2, B2" position. The aircraft shall then be towed forward until its nosewheel is at the "EOT A1, A2, B1, B2" position. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure (To Face North)</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto TWY WA to face North until the nose of the aircraft is behind the stopbar behind aircraft stand A2. The aircraft may breakaway from there. This alternate pushback procedure can only be exercised if the auxiliary power unit of aircraft is unserviceable.</p> <p><u>Alternate Pushback Procedure (To Face South)</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto TWY WA to face South until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY WA centerline. The aircraft may breakaway from there. This alternate pushback procedure can only be exercised if the auxiliary power unit of aircraft is unserviceable.</p>	<p>Standard pushback approved.</p> <p>Pushback approved, to face North on TWY WA.</p> <p>Pushback approved, to face South on TWY WA.</p>

WSSS/SIN

10 MAR 17

**JEPPESEN**

10-9J

SINGAPORE, SINGAPORE**CHANGI**

APRON/ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
TERMINAL 3 - WEST APRON		
B3	The aircraft (on idle thrust) shall be pushed back onto TWY WA to face North (or South) until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY WA centerline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
B4	The aircraft (on idle thrust) shall be pushed back following the pushback line onto TWY WA to face North (or South) until its nosewheel is at the intersection of the aircraft stand pushback line and TWY WA centreline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
B5, B6	The aircraft (on idle thrust) shall be pushed back onto TWY U1 to face North following TWY U1 centreline onto TWY WA until the nose of the aircraft is behind the stopbar behind aircraft stand B4. The aircraft may breakaway from there. OR The aircraft (on idle thrust) shall be pushed back following the pushback line onto TWY U1 to face South until the nose of the aircraft is behind the stopbar behind aircraft stand B7. The aircraft may breakaway from there.	Pushback approved, to face North. Pushback approved, to face South.
B7	The aircraft (on idle thrust) shall be pushed back onto TWY U1 to face North following TWY U1 centreline onto TWY WA until the nose of the aircraft is behind the stopbar behind aircraft stand B4. The aircraft may breakaway from there. OR The aircraft (on idle thrust) shall be pushed back onto TWY U1 to face South until the nose of the aircraft is behind the stopbar behind aircraft stand B7. The aircraft may breakaway from there.	Pushback approved, to face North. Pushback approved, to face South.
B8	The aircraft (on idle thrust) shall be pushed back onto TWY U1 to face North until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY U1 centerline. The aircraft shall then be towed forward until its nosewheel is at the intersection of aircraft stand B9 lead-in line and TWY U1 centreline. The aircraft may breakaway from there. OR The aircraft (on idle thrust) shall be pushed back onto TWY U1 to face South until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY U1 centerline. The aircraft may breakaway from there.	Pushback approved, to face North. Pushback approved, to face South.
B9, B10	The aircraft (on idle thrust) shall be pushed back onto TWY U1 to face North (or South) until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY U1 centerline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
MARS REMOTE		
G18, G19	The aircraft (on idle thrust) shall be pushed back onto Taxilane L4 centerline to face East until the nose of aircraft is behind the stopbar on Taxilane L4. The aircraft may breakaway from there.	Pushback approved, to face East on Taxilane L4.
G20, G20R, G20L	The aircraft (on idle thrust) shall be pushed back onto Taxilane L4 centerline to face East until its nosewheel is at the intersection of the aircraft stand pushback line and centerline of Taxilane L4. The aircraft may breakaway from there.	Pushback approved, to face East on Taxilane L4.
G21, G21R	The aircraft (on idle thrust) shall be pushed back to face East until its nosewheel is at the "EOP" position. The aircraft shall then be towed forward until its nosewheel is at the "EOT" position on Taxilane L4 centerline. The aircraft may breakaway from there.	Standard pushback approved
G21L	The aircraft (on idle thrust) shall be pushed back onto Taxilane L4 centerline to face East until its nosewheel is at the intersection of the aircraft stand pushback line and centerline of Taxilane L4. The aircraft shall then be towed forward along the centerline of Taxilane L4 until its nosewheel is at the "EOT" position. The aircraft may breakaway from there.	Pushback approved, to face East on Taxilane L4.
EAST REMOTE APRON		
200	The aircraft (on idle thrust) shall be pushed back onto TWY C6 to face North until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane C6 centerline. The aircraft shall then be towed forward until its nosewheel is at the intersection of aircraft stand 201 lead-in line and Taxilane C6 centreline. The aircraft may breakaway from there. OR The aircraft (on idle thrust) shall be pushed back onto TWY C6 to face South until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane C6 centerline. The aircraft may breakaway from there.	Pushback approved, to face North. Pushback approved, to face South.

WSSS/SIN

10 MAR 17

**JEPPesen**

10-9K

SINGAPORE, SINGAPORE**CHANGI**

APRON/ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
200L	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C6 to face North until its nosewheel is at the intersection of the aircraft stand pushback line and Taxilane C6 centreline. The aircraft shall then be towed forward until its nosewheel is abeam aircraft stand 200. The aircraft may breakaway from there.</p> <p>OR</p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C6 to face South until its nosewheel is at the intersection of the aircraft stand pushback line and Taxilane C6 centreline. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
200R	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C6 to face North (or South) until its nosewheel is at the intersection of the aircraft stand pushback line and Taxilane C6 centreline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
201	The aircraft (on idle thrust) shall be pushed back onto Taxilane C6 to face North (or South) until the nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane C6 centreline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
202	<p>The aircraft (on idle thrust) shall be pushed back onto Taxilane C6 to face North until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane C6 centreline. The aircraft may breakaway from there.</p> <p>OR</p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane C6 to face South until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane C6 centreline. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
202L, 202R	The aircraft (on idle thrust) shall be pushed back onto Taxilane C6 to face North (or South) until its nosewheel is at the intersection of the aircraft stand pushback line Taxilane C6 centreline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
203	<p>The aircraft (on idle thrust) shall be pushed back onto Taxilane C6 to face North until the nose of the aircraft is behind the stopbar behind aircraft stand 203. The aircraft may breakaway from there.</p> <p>OR</p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane C6 to face South until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane C6 centreline. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
<u>SOUTH-EAST REMOTE APRON</u>		
205	<p>The aircraft (on idle thrust) shall be pushed back onto TWY C7 to face North until the nosewheel is at the intersection of the aircraft stand lead-in line and TWY C7 centreline. The aircraft shall then be towed forward until its nosewheel is at the intersection of aircraft stand 206 lead-in line and TWY C7 centreline. The aircraft may breakaway from there.</p> <p>OR</p> <p>The aircraft (on idle thrust) shall be pushed back onto TWY C7 to face South until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY C7 centreline. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
206, 207, 208	The aircraft (on idle thrust) shall be pushed back onto TWY C7 to face North (or South) until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY C7 centreline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
209	<p>The aircraft (on idle thrust) shall be pushed back onto TWY C7 to face North until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY C7 centreline. The aircraft may breakaway from there.</p> <p>OR</p> <p>The aircraft (on idle thrust) shall be pushed back onto TWY C7 to face South until the nosewheel is at the intersection of the aircraft stand lead-in line and TWY C7 centreline. The aircraft shall then be towed forward until its nosewheel is at the intersection of aircraft stand 208 lead-in line and TWY C7 centreline. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
<u>NORTH REMOTE APRON</u>		
300	<p>The aircraft (on idle thrust) shall be pushed back onto TWY NC2 to face East until the nosewheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft shall then be towed forward until its nosewheel is at the intersection of aircraft stand 301 lead-in line and TWY NC2 centreline. The aircraft may breakaway from there.</p> <p>OR</p> <p>The aircraft (on idle thrust) shall be pushed back onto TWY NC2 to face West until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face East.</p> <p>Pushback approved, to face West.</p>

WSSS/SIN

10 MAR 17

**JEPPesen**

10-9L

SINGAPORE, SINGAPORE**CHANGI**

APRON/ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
301	The aircraft (on idle thrust) shall be pushed back onto TWY NC2 to face East (or West) until the nosewheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft may breakaway from there.	Pushback approved, to face East (or West).
302	The aircraft (on idle thrust) shall be pushed back onto TWY NC2 to face East until the nosewheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft may breakaway from there. OR The aircraft (on idle thrust) shall be pushed back onto TWY NC2 to face West until the nosewheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft shall then be towed forward until the nosewheel is at the intersection of aircraft stand 301 lead-in line and TWY NC2 centreline. The aircraft may breakaway from there.	Pushback approved, to face East. Pushback approved, to face West.
303	The aircraft (on idle thrust) shall be pushed back onto TWY NC2 to face East until the nosewheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft shall then be towed forward until the nosewheel is at the intersection of aircraft stand 304 lead-in line and TWY NC2 centreline. The aircraft may breakaway from there. OR The aircraft (on idle thrust) shall be pushed back onto TWY NC2 to face West until the nosewheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft may breakaway from there.	Pushback approved, to face East. Pushback approved, to face West.
304, 305	The aircraft (on idle thrust) shall be pushed back onto TWY NC2 to face East (or West) until the nosewheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft may breakaway from there.	Pushback approved, to face East (or West).
306	The aircraft (on idle thrust) shall be pushed back onto TWY NC2 to face East until the nosewheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft may breakaway from there. OR The aircraft (on idle thrust) shall be pushed back onto TWY NC2 to face West until the nosewheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft shall then be towed forward until the nosewheel is at the intersection of aircraft stand 305 lead-in line and TWY NC2 centreline. The aircraft may breakaway from there.	Pushback approved, to face East. Pushback approved, to face West.
307, 308	The aircraft (on idle thrust) shall be pushed back onto TWY NC2 to face East until the nosewheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft shall then be towed forward until the nose of aircraft is behind the stopbar behind aircraft stand 309. The aircraft may breakaway from there. OR The aircraft (on idle thrust) shall be pushed back onto TWY NC2 to face West until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft may breakaway from there.	Pushback approved, to face East. Pushback approved, to face West.
309	The aircraft (on idle thrust) shall be pushed back onto TWY NC2 to face East until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft may breakaway from there. OR The aircraft (on idle thrust) shall be pushed back onto TWY NC2 to face West until the nosewheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft shall then be towed forward until the nose of aircraft is behind the stopbar behind aircraft stand 307. The aircraft may breakaway from there.	Pushback approved, to face East. Pushback approved, to face West.
310	The aircraft (on idle thrust) shall be pushed back onto TWY NC2 to face East until the nose of the aircraft is behind the stopbar behind aircraft stand 309. The aircraft may breakaway from there. OR The aircraft (on idle thrust) shall be pushed back onto TWY NC2 to face West until the nosewheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft shall then be towed forward until the nose of aircraft is behind the stopbar behind aircraft stand 307. The aircraft may breakaway from there.	Pushback approved, to face East. Pushback approved, to face West.
<u>NORTH-EAST REMOTE APRON</u>		
400, 401, 402, 403, 404	The aircraft (on idle thrust) shall be pushed back onto Taxilane A6 to face North (or South) until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane A6 centerline.	Pushback approved, to face North (or South).

WSSS/SIN


JEPPesen
10 MAR 17 (10-9L1)
SINGAPORE, SINGAPORE
CHANGI

APRON/ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
TERMINAL 1 - WEST APRON		
C1, C20, C22	The aircraft (on idle thrust) shall be pushed back onto Twy U1 to face North (South) until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY U1 centreline. The aircraft may break away from there.	Pushback approved, to face North (South).
C23	The aircraft (on idle thrust) shall be pushed back onto TWY U1 to face North until the nose of the aircraft is behind the stopbar line behind the aircraft stand C22. The aircraft may break away from there. OR The aircraft (on idle thrust) shall be pushed back onto Twy U1 to face South until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY U1 centreline. The aircraft may break away from there.	Pushback approved, to face North. Pushback approved, to face South.
C24, C25	The aircraft (on idle thrust) shall be pushed back onto Twy U1 to face North (or South) until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY U1 centreline. The aircraft may break away from there.	Pushback approved, to face North (or South).
C26	The aircraft (on idle thrust) shall be pushed back onto TWY WA to face North until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY WA centreline. The aircraft may breakaway from there. OR The aircraft (on idle thrust) shall be pushed back onto TWY WA to face South until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY WA centreline. The aircraft shall then be towed forward until its nosewheel is at the "EOT 26" position behind aircraft stand C26. The aircraft may breakaway from there.	Pushback approved, to face North. Pushback approved, to face South.
TERMINAL 1 - CENTRAL APRON		
D30	The aircraft (on idle thrust) shall be pushed back following the pushback line to face North until the nosewheel is at the "EOP 20" position. The aircraft shall then be towed forward onto Taxilane N2 until its nosewheel is at the "EOT 22A" position. The aircraft may breakaway from there.	Standard pushback approved.
D32	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane N2 to face North until the nosewheel is at the "EOP 22" position. The aircraft shall then be towed forward until its nosewheel is at the "EOT 22A" position. The aircraft may breakaway from there. <u>Alternate Pushback Procedure</u> The aircraft (on idle thrust) shall be pushed back onto Taxilane N2 to face South followed by Taxilane N3 until the nose of the aircraft is behind the stopbar line behind the aircraft stand D35. The aircraft may break away from there. <u>Alternate Pushback Procedure</u> The aircraft (on idle thrust) shall be pushed back onto Taxilane N2 to face South followed by Taxilane N1 until the nose of the aircraft is behind the stopbar line behind aircraft stand C16. The aircraft may break away from there.	Standard pushback approved. Pushback approved, to face South on Taxilane N3. Pushback approved, to face South on Taxilane N1.
D34	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane N2 to face North until the nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane N2 centerline. The aircraft may breakaway from there. <u>Alternate Pushback Procedure</u> The aircraft (on idle thrust) shall be pushed back onto Taxilane N2 to face South followed by Taxilane N3 until the nose of the aircraft is behind the stopbar line behind the aircraft stand D35. The aircraft may break away from there. <u>Alternate Pushback Procedure</u> The aircraft (on idle thrust) shall be pushed back onto Taxilane N2 to face South followed by Taxilane N1 until the nose of the aircraft is behind the stopbar line behind aircraft stand C16. The aircraft may break away from there.	Standard pushback approved. Pushback approved, to face South on Taxilane N3. Pushback approved, to face South on Taxilane N1.
D35	The aircraft (on idle thrust) shall be pushed back onto Taxilane N3 to face North until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane N3 centreline. The aircraft may breakaway from there. OR The aircraft (on idle thrust) shall be pushed back onto Taxilane N3 to face South until the nose of the aircraft is behind the stopbar line behind aircraft stand D35. The aircraft may breakaway from there. <u>Alternate Pushback Procedure</u> The aircraft (on idle thrust) shall be pushed back onto Taxilane N3 to face North until the nose of the aircraft is behind the stopbar behind aircraft stand D34 on taxilane N2. The aircraft may break away from there.	Pushback approved, to face North. Pushback approved, to face South. Pushback approved to face North on Taxilane N2.

WSSS/SIN **JEPPesen**
10 MAR 17 **(10-9L2)****SINGAPORE, SINGAPORE**
CHANGI

APRON/ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
D36	<p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N3 to face North (or South) until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane N3 centreline. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N3 to face North until the nose of the aircraft is behind the stopbar behind aircraft stand D34 on Taxilane N2. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North (or South).</p> <p>Pushback approved, to face North on Taxilane N2.</p>
D37	<p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N3 to face North until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane N3 centreline. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N3 to face North until the nose of the aircraft is behind the stopbar behind aircraft stand D34 on Taxilane N2. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p> <p>Pushback approved, to face North on Taxilane N2.</p>
D38	<p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N3 to face North until the nose of the aircraft is behind the stopbar behind aircraft stand D37. The aircraft may breakaway from there.</p>	Standard pushback approved.
C11	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line to face North until its nosewheel is at the "EOP 21" position. The aircraft shall then be towed forward following the tow line onto Taxilane N2 until its nosewheel is at the "EOT 22A" position. The aircraft may breakaway from there.</p>	Standard pushback approved.
C13	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane N2 to face North until its nosewheel is at the "EOP 22" position. The aircraft shall then be towed forward until its nosewheel is at the "EOT 22A" position. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N2 to face South followed by Taxilane N3 until the nose of the aircraft is behind the stopbar line behind the aircraft stand D35. The aircraft may break away from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N2 to face South followed by Taxilane N1 until the nose of the aircraft is behind the stopbar line behind the aircraft stand C16. The aircraft may break away from there.</p>	<p>Standard pushback approved.</p> <p>Pushback approved, to face South on Taxilane N3.</p> <p>Pushback approved, to face South on Taxilane N1.</p>
C15	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane N2 to face North until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane N2 centreline. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N2 to face South followed by Taxilane N3 until the nose of the aircraft is behind the stopbar line behind aircraft stand D35. The aircraft may break away from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N2 to face South followed by Taxilane N1 until the nose of the aircraft is behind the stopbar line behind the aircraft stand C16. The aircraft may break away from there.</p>	<p>Standard pushback approved.</p> <p>Pushback approved, to face South on Taxilane N3.</p> <p>Pushback approved, to face South on Taxilane N1.</p>
C16	<p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N1 to face North until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane N1 centreline. The aircraft may breakaway from there.</p> <p>OR</p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N1 to face South until the nose of the aircraft is behind the stopbar line behind aircraft stand C16. The aircraft may break away from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N1 to face North until the nose of the aircraft is behind the stopbar behind aircraft stand C15 on Taxilane N2. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p> <p>Pushback approved, to face North on Taxilane N2.</p>

WSSS/SIN

10 MAR 17

**JEPPesen****(10-9L3)****SINGAPORE, SINGAPORE****CHANGI**

APRON/ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
C17	The aircraft (on idle thrust) shall be pushed back onto Taxilane N1 to face North (or South) until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane N1 centreline. The aircraft may break away from there. <u>Alternate Pushback Procedure</u> The aircraft (on idle thrust) shall be pushed back onto Taxilane N1 to face North until the nose of the aircraft is behind the stopbar behind aircraft stand C15 on Taxilane N2. The aircraft may break away from there.	Pushback approved, to face North (or South). Pushback approved, to face North on Taxilane N2.
C18	The aircraft (on idle thrust) shall be pushed back onto Taxilane N1 to face North until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane N1 centreline. The aircraft may break away from there. <u>Alternate Pushback Procedure</u> The aircraft (on idle thrust) shall be pushed back onto Taxilane N1 to face North until the nose of the aircraft is behind the stopbar behind aircraft stand C15 on Taxilane N2. The aircraft may break away from there.	Standard pushback approved. Pushback approved, to face North on Taxilane N2.
C19	The aircraft (on idle thrust) shall be pushed back onto Taxilane N1 to face North until the nose of the aircraft is behind the stopbar behind aircraft stand C18. The aircraft may break away from there.	Standard pushback approved.
TERMINAL 1 - EAST APRON		
D40, D41, D42	The aircraft (on idle thrust) shall be pushed back onto Taxilane A6 to face North (or South) until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane A6 centreline. The aircraft may break away from there.	Pushback approved, to face North (or South).
D42L, D42R	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane A6 to face North (or South) until its nosewheel is at the intersection of the aircraft stand pushback line and Taxilane A6 centreline. The aircraft may break away from there.	Pushback approved, to face North (or South).
D44, D46, D47, D48	The aircraft (on idle thrust) shall be pushed back onto Taxilane A6 to face North (or South) until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane A6 centreline. The aircraft may break away from there.	Pushback approved, to face North (or South).
D49	The aircraft (on idle thrust) shall be pushed back onto Taxilane A6 to face North until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane A6 centreline. The aircraft may break away from there. OR The aircraft (on idle thrust) shall be pushed back onto Taxilane A6 to face South until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane A6 centreline. The aircraft shall then be towed forward until its nosewheel is on the "EOT D49" position behind aircraft stand D49. The aircraft may break away from there.	Pushback approved, to face North. Pushback approved, to face South.
TERMINAL 2 - CENTRAL APRON		
E1	The aircraft (on idle thrust) shall be pushed back following the pushback line to face East until its nosewheel is at the "EOP 12" position. The aircraft shall then be towed forward onto Taxilane B2 until its nosewheel is at the "EOT 9" position. The aircraft may breakaway from there.	Standard pushback approved.
E2	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane B2 to face East until its nosewheel is at the intersection of the aircraft stand pushback line and Taxilane B2 centreline. The aircraft shall then be towed forward to "EOT 9" position. The aircraft may breakaway from there.	Standard pushback approved.
E3	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane B2 to face East until its nosewheel is at the intersection of the aircraft stand pushback line and Taxilane B2 centreline. The aircraft may breakaway from there.	Standard pushback approved.
E4	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane B2 to face East until its nosewheel is at the "EOP 8" position. The aircraft may breakaway from there. <u>Alternate Pushback Procedure</u> The aircraft (on idle thrust) shall be pushed back onto Taxilane B1 to face South until its nosewheel is at the "EOP 13A" position. The aircraft may break away from there. <u>Alternate Pushback Procedure</u> The aircraft (on idle thrust) shall be pushed back onto Taxilane B3 to face North until its nosewheel is at the "EOP 7A" position. The aircraft may break away from there.	Standard pushback approved. Pushback approved, to face South on Taxilane B1. Pushback approved, to face North on Taxilane B3.

WSSS/SIN

10 MAR 17

**JEPPESSEN**

(10-9L4)

SINGAPORE, SINGAPORE**CHANGI**

APRON/ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
E5, E6	The aircraft (on idle thrust) shall be pushed back onto Taxilane B1 to face North until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane B1 centreline. The aircraft shall then be towed forward until the nose of the aircraft is behind the stopbar behind aircraft stand E6. The aircraft may breakaway from there.	Standard pushback approved.
E7	The aircraft (on idle thrust) shall be pushed back onto Taxilane B1 to face North until its nose of the aircraft is behind the stopbar behind aircraft stand E6. The aircraft may breakaway from there.	Standard pushback approved.
F30	The aircraft (on idle thrust) shall be pushed back following the pushback to face East until its nosewheel is at the "EOP 11" position. The aircraft shall then be towed forward onto Taxilane B2 until its nosewheel is at the "EOT 9" position. The aircraft may breakaway from there.	Standard pushback approved.
F31	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane B2 to face East until its nosewheel is at the "EOT 10" position. The aircraft shall then be towed forward to "EOT 9" position. The aircraft may breakaway from there.	Standard pushback approved.
F32	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane B2 to face East until its nosewheel is at the "EOT 9" position. The aircraft may breakaway from there.	Standard pushback approved.
F33	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane B2 to face East until its nosewheel is at the "EOP 8" position. The aircraft may breakaway from there. <u>Alternate Pushback Procedure</u> The aircraft (on idle thrust) shall be pushed back onto Taxilane B1 to face South until is at the "EOP 13A" position. The aircraft may breakaway from there. <u>Alternate Pushback Procedure</u> The aircraft (on idle thrust) shall be pushed back onto Taxilane B3 to face North until its nosewheel is at the "EOP 7A" position. The aircraft may breakaway from there.	Standard pushback approved. Pushback approved, to face South on Taxilane B1. Pushback approved, to face North on Taxilane B3.
F34	The aircraft (on idle thrust) shall be pushed back onto Taxilane B3 to face South until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane B3 centreline. The aircraft shall then be towed forward until the nose of the aircraft is behind the stopbar behind aircraft stand F35. The aircraft may breakaway from there.	Standard pushback approved.
F35, F35R	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane B3 to face South until its nosewheel is at the intersection of the aircraft stand pushback line and Taxilane B3 centreline. The aircraft may breakaway from there.	Standard pushback approved.
F35L, F36	The aircraft (on idle thrust) shall be pushed back onto Taxilane B3 to face South until the nose of the aircraft is behind the stopbar behind aircraft stand F35. The aircraft may breakaway from there.	Standard pushback approved.
TERMINAL 2 - NORTH APRON		
E8	The aircraft (on idle thrust) shall be pushed back onto TWY A4 to face East until its nosewheel is at "EOP 14" position. The aircraft shall then be towed forward to "EOT 15" position. The aircraft may breakaway from there.	Standard pushback approved.
E10	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane A6 to face North until its nosewheel is at the "EOP 19" position. The aircraft may breakaway from there.	Standard pushback approved.
E11	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane A6 to face North until its nosewheel is at the intersection of Taxilane A6 and TWY A5 centreline. The aircraft shall then be towed forward following TWY A5 centreline to "EOT 16" position. The aircraft may breakaway from there. <u>Alternate Pushback Procedure</u> The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane A6 to face North until its nosewheel is at the "EOP 19A" position behind aircraft stand E24. The aircraft shall then be towed forward to "EOT 18B" position behind aircraft stand E26. The aircraft may breakaway from there.	Standard pushback approved. Pushback approved, to face North on Taxilane A6.

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JEPPESSEN
10 MAR 17 **(10-9L5)**
SINGAPORE, SINGAPORE
CHANGI

APRON/ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
E12	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto TWY A5 to face North until its nosewheel is at the intersection of the aircraft stand pushback line and TWY A5 centreline. The aircraft shall then be towed forward until its nosewheel is at the "EOT 16" position. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane A5 to face North until its nosewheel is at the intersection of Taxilane A6 and TWY A5 centreline. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p> <p>Pushback approved, to face North on Taxilane A6.</p>
E20	The aircraft (on idle thrust) shall be pushed back following the pushback line until its nosewheel is at the "EOP 17" position. The aircraft shall then be towed forward following the tow line onto Taxilane A6 to face North until its nosewheel is at the "EOT 18A" position. The aircraft may breakaway from there.	Standard pushback approved.
E22	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane A6 to face North until its nosewheel is at "EOP 19" position. The aircraft shall then be towed forward until its nosewheel is at the "EOT 18" position. The aircraft may breakaway from there.	Standard pushback approved.
E24, E24L, E24R, E26	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane A6 to face North until its nosewheel is at the intersection of the aircraft stand pushback line and Taxilane A6 centreline. The aircraft may breakaway from there.	Standard pushback approved.
E27, E28	The aircraft (on idle thrust) shall be pushed back onto Taxilane A6 to face North (or South) until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane A6 centreline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
TERMINAL 2 - SOUTH APRON		
F37	<p>The aircraft (on idle thrust) shall be pushed back following the the pushback line onto Taxilane C2 to face South until its nosewheel is at the "EOT 4" position. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto TWY C1 to face East until its nosewheel is at the "EOP 5" position. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p> <p>Pushback approved, to face East on Twy C1.</p>
F40	The aircraft (on idle thrust) shall be pushed back following the the pushback line onto Taxilane C6 to face South until its nosewheel is at the "EOP 2" position. The aircraft shall then be towed forward until its nosewheel is at the "EOT 3" position. The aircraft may breakaway from there.	Standard pushback approved.
F41	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C2 to face South until its nosewheel is at the intersection of the aircraft stand pushback line and Taxilane C2 centreline. The aircraft shall then be towed forward until its nosewheel is at the "EOT 4" position. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C2 to face South, following Taxilane C2 centreline onto Taxilane C6 until its nosewheel is at the intersection of Taxilane C2 and Taxilane C6 centreline. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p> <p>Pushback approved, to pushback onto Taxilane C6.</p>
F42	<p><u>Main pushback procedure (for all aircraft wingspan)</u></p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C2 to face South until its nosewheel is at the intersection of the aircraft stand pushback line and Taxilane C2 centreline. The aircraft shall then be towed forward until its nosewheel is at the "EOT 4" position. The aircraft may breakaway from there.</p> <p><u>Alternate pushback procedure (for all aircraft types except A380)</u></p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C2 to face South, following Taxilane C2 centreline onto Taxilane C6 until its nosewheel is at the intersection of Taxilane C2 and Taxilane C6 centreline. The aircraft may breakaway from there.</p> <p><u>Alternate pushback procedure (for A380 aircraft)</u></p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C2 to face South until its nosewheel is at the "EOP 4A" position. The aircraft shall then be towed forward following the tow line until its nosewheel is at the "EOT 4B" position on Taxilane C6, behind aircraft stand F59. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p> <p>Pushback approved, to pushback onto Taxilane C6.</p> <p>Pushback approved, to pushback onto Taxilane C6.</p>
F50	The aircraft (on idle thrust) shall be pushed back following the pushback line until its nosewheel is at the "EOP 1" position. The aircraft shall then be towed forward following the tow line onto Taxilane C6 to face South until its nosewheel is at the "EOT 3" position. The aircraft may breakaway from there.	Standard pushback approved.

WSSS/SIN **JEPPesen**
10 MAR 17 **(10-9L6)****SINGAPORE, SINGAPORE**
CHANGI

APRON/ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
F52	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C6 to face South until its nosewheel is at the "EOP 2" position. The aircraft shall then be towed forward until its nosewheel is at the "EOT 3" position. The aircraft may breakaway from there.	Standard pushback approved.
F52L	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C6 to face South until its nosewheel is at the intersection of the aircraft stand pushback line and Taxilane C6 centreline. The aircraft may breakaway from there.	Standard pushback approved.
F52R	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C6 to face South until its nosewheel is at the intersection of the aircraft stand pushback line and Taxilane C6 centreline. The aircraft shall then be towed forward until its nosewheel is at the "EOT" position. The aircraft may breakaway from there.	Standard pushback approved.
F54	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C6 to face South until its nosewheel is at the intersection of Taxilane C2 and Taxilane C6 centreline. The aircraft may breakaway from there.	Standard pushback approved.
F56	The aircraft (on idle thrust) shall be pushed back onto Taxilane C6 to face South until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane C6 centreline. The aircraft may breakaway from there.	Standard pushback approved.
F56L, F56R	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C6 to face South until its nosewheel is at the intersection of the aircraft stand pushback line and Taxilane C6 centreline. The aircraft may breakaway from there.	Standard pushback approved.
F58, F59	The aircraft (on idle thrust) shall be pushed back onto Taxilane C6 to face North (or South) until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane C6 centreline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
F59L, F59R	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C6 to face North (or South) until its nosewheel is at the intersection of the aircraft stand pushback line and Taxilane C6 centreline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
F60	The aircraft (on idle thrust) shall be pushed back onto Taxilane C6 to face North (or South) until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane C6 centreline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
BUDGET TERMINAL		
G1	The aircraft (on idle thrust) shall be pushed back to face West until its nosewheel is at the "EOP-G1" position. The aircraft shall then be towed forward onto Taxilane L5 to face North until its nosewheel is abeam aircraft stand G3. The aircraft may breakaway from there.	Pushback approved, to face North on Taxilane L5.
G2	The aircraft (on idle thrust) shall be pushed back onto Taxilane L5 to face North until its nosewheel is at the "EOP-G2" position. The aircraft may breakaway from there.	Pushback approved, to face North on Taxilane L5.
G3, G4	The aircraft (on idle thrust) shall be pushed back onto Taxilane L5 to face North until its nosewheel is at the intersection of the pushback line and centerline of Taxilane L5. The aircraft may breakaway from there.	Pushback approved, to face North on Taxilane L5.
G5, G6, G7, G8, G9, G10, G11, G12, G13	The aircraft (on idle thrust) shall be pushed back onto Taxilane L5 to face North or South until its nosewheel is at the intersection of the pushback line and centerline of Taxilane L5. The aircraft may breakaway from there.	Pushback approved, to face North or South on Taxilane L5.
G14, G15	The aircraft (on idle thrust) shall be pushed back onto Taxilane L5 to face North until its nosewheel is at the intersection of the pushback line and centerline of Taxilane L5. The aircraft may breakaway from there. OR The aircraft (on idle thrust) shall be pushed back onto Taxilane L5 to face South until its nosewheel is at the intersection of the pushback line and centerline of Taxilane L5. The aircraft shall then be towed forward along the centerline of Taxilane L5 until its nosewheel is at the "EOT-G14, G15" position behind aircraft stand G14. The aircraft may breakaway from there.	Pushback approved, to face North on Taxilane L5. Pushback approved, to face South on Taxilane L5.
G16, G17	The aircraft (on idle thrust) shall be pushed back onto Taxilane L5 to face North until its nose is behind the stopbar behind aircraft stand G15. The aircraft may breakaway from there.	Pushback approved, to face North on Taxilane L5.

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 **JEPPESEN**
10 MAR 17 (10-9L7)**SINGAPORE, SINGAPORE**
CHANGI

APRON/ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
WEST CARGO APRON		
502, 503, 504, 505, 506, 507, 508, 509, 510	The aircraft (on idle thrust) shall be pushed back onto TWY WC to face North (or South) until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY WC centreline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
511	The aircraft (on idle thrust) shall be pushed back onto TWY WC to face North until the nose of the aircraft is behind the stopbar behind aircraft stand 511. The aircraft may breakaway from there. OR The aircraft (on idle thrust) shall be pushed back onto TWY WC to face South until the nosewheel of the aircraft is at the intersection of the aircraft stand lead-in line and TWY WC centreline. The aircraft shall then be towed forward until the nosewheel is at the "EOT" position behind aircraft stand 510. The aircraft may breakaway from there.	Pushback approved to face North. Pushback approved to face South.
513	The aircraft (on idle thrust) shall be pushed back onto TWY WC to face North until the nosewheel of the aircraft is at the intersection of the aircraft stand lead-in line and TWY WC centreline. The aircraft may breakaway from there. OR The aircraft (on idle thrust) shall be pushed back onto TWY WC to face South following TWY WC centreline onto Taxilane WD until the nose of the aircraft is behind the stopbar behind aircraft stand 515 on Taxilane WD. The aircraft may breakaway from there.	Pushback approved to face North. Pushback approved to face South.
514	The aircraft (on idle thrust) shall be pushed back onto TWY WC to face North until the nose of the aircraft is behind the stopbar behind aircraft stand 513. The aircraft may breakaway from there. OR The aircraft (on idle thrust) shall be pushed back onto TWY WC to face South following TWY WC centreline onto Taxilane WD until the nose of the aircraft is behind the stopbar behind aircraft stand 515 on Taxilane WD. The aircraft may breakaway from there.	Pushback approved to face North. Pushback approved to face South.
515	The aircraft (on idle thrust) shall be pushed back onto Taxilane WD to face South until the nose of the aircraft is behind the stopbar behind aircraft stand 515. The aircraft may breakaway from there.	Standard pushback approved.
516	The aircraft (on idle thrust) shall be pushed back onto Taxilane WD to face South until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane WD centreline. The aircraft shall then be towed forward until the nose of the aircraft is behind the stopbar behind aircraft stand 515. The aircraft may breakaway from there.	Standard pushback approved.
516L, 516R	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane WD to face South until its nosewheel is at the intersection of the aircraft stand pushback line and Taxilane WD centreline. The aircraft shall then be towed forward until the nose of the aircraft is behind the stopbar behind aircraft stand 515. The aircraft may breakaway from there.	Standard pushback approved.
517	The aircraft (on idle thrust) shall be pushed back onto Taxilane WD to face South until its nosewheel is at the "EOP 517" position. The aircraft shall then be towed forward until the nose of the aircraft is behind the stopbar behind aircraft stand 515. The aircraft may breakaway from there.	Standard pushback approved.
517L	The aircraft (on idle thrust) shall be pushed back onto Taxilane WD to face South until its nosewheel is at the "EOP 517L" position. The aircraft shall then be towed forward until the nose of the aircraft is behind the stopbar behind aircraft stand 515. The aircraft may breakaway from there.	Standard pushback approved.
517R	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane WD to face South until its nosewheel is at the intersection of the aircraft stand pushback line and Taxilane WD centreline. The aircraft shall then be towed forward until the nose of the aircraft is behind the stopbar behind aircraft stand 515. The aircraft may breakaway from there.	Standard pushback approved.
EAST CARGO APRON		
601, 602	The aircraft (on idle thrust) shall be pushed back onto Taxilane EA to face South until its nosewheel is at the intersection of the lead-in line and Taxilane EA centerline. The aircraft may breakaway from there.	Standard pushback approved.
603	The aircraft (on idle thrust) shall be pushed back onto Taxilane EA to face South until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane EA centreline. The aircraft shall then be towed forward until its nosewheel is at the "EOT" position behind aircraft stand 602. The aircraft may breakaway from there.	Standard pushback approved.

WSSS/SIN

 **JEPPesen**
10 MAR 17 **(10-9L8)****SINGAPORE, SINGAPORE**
CHANGI

APRON/ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
604	The aircraft (on idle thrust) shall be pushed back onto Taxilane EA to face South until its nosewheel is at the "EOP" position behind aircraft stand 604. The aircraft shall then be towed forward until its nosewheel is at the "EOT" position behind aircraft stand 602. The aircraft may breakaway from there.	Standard pushback approved.
605	The aircraft (on idle thrust) shall be pushed back onto Taxilane EC to face West until its nosewheel is at the "EOP" position on Taxilane EC. The aircraft shall then be towed forward following Taxilane EC centreline onto Taxilane EA until its nosewheel is at the "EOT" position behind aircraft stand 602. The aircraft may breakaway from there.	Standard pushback approved.
611, 612	<p>The aircraft (on idle thrust) shall be pushed back to face North until its nosewheel is at the "EOP" position. The aircraft shall then be towed forward following Taxilane EC centreline onto Taxilane EA until its nosewheel is at the "EOT" position behind aircraft stand 602. The aircraft may breakaway from there. Engine start-up is not permitted during stand pushback.</p> <p><u>Alternate pushback procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back to face North until its nosewheel is at the "EOP" position. Engine start -up is permitted only on the port engine. The aircraft shall then be towed forward following Taxilane EC centreline onto Taxilane EA until its nosewheel is at the "EOT" position behind aircraft stand 602. The aircraft may breakaway from there.</p> <p>This alternate pushback procedure can only be exercised if the auxiliary power unit of the aircraft is unserviceable.</p>	<p>Standard pushback approved.</p> <p>Alternate pushback approved.</p>

WSSS/SIN

Apt Elev **22'**
N01 21.6 E103 59.4

JEPPesen

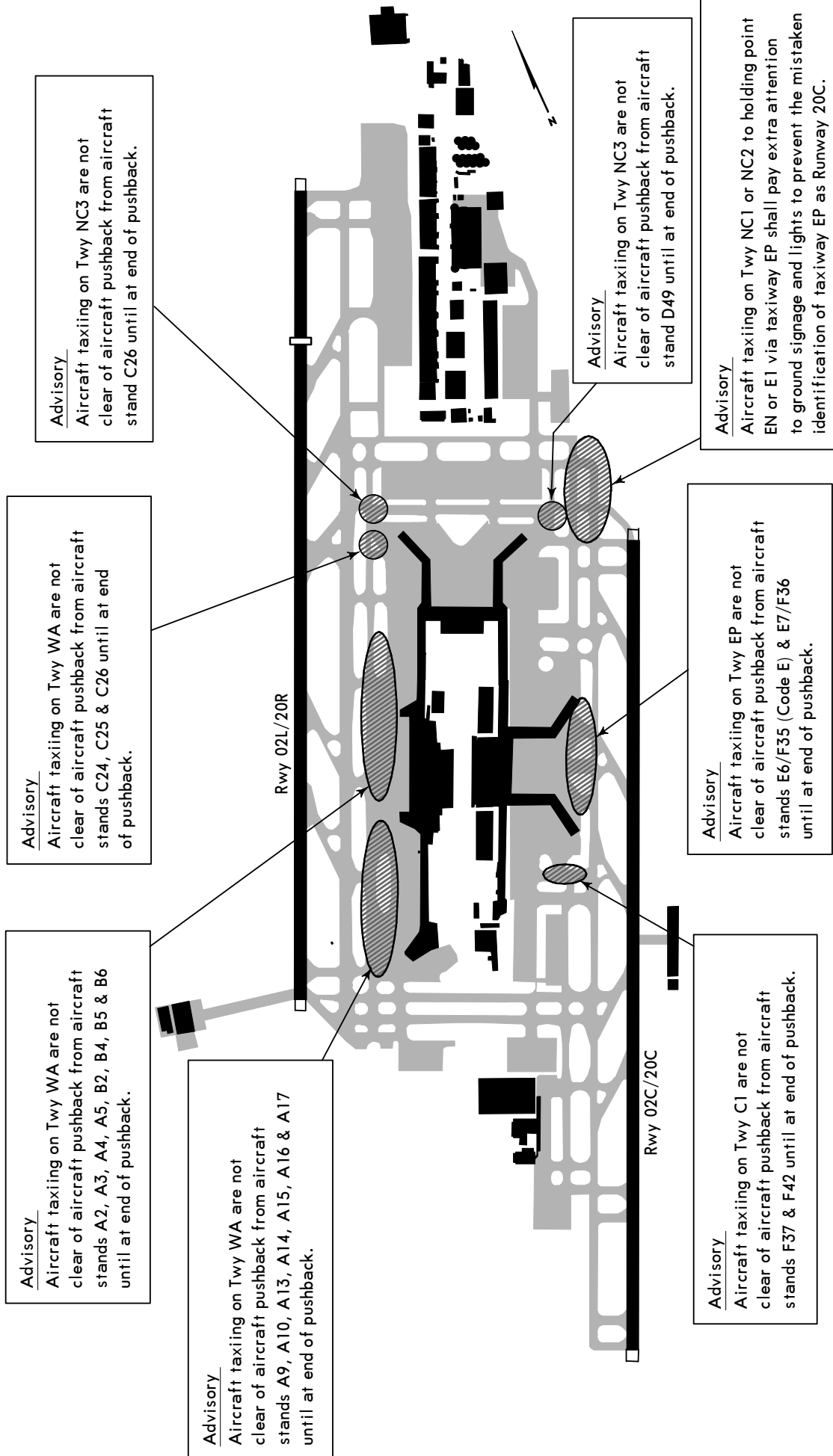
7 APR 17

10-9M

SINGAPORE, SINGAPORE

CHANGI

AERODROME ADVISORY CHART



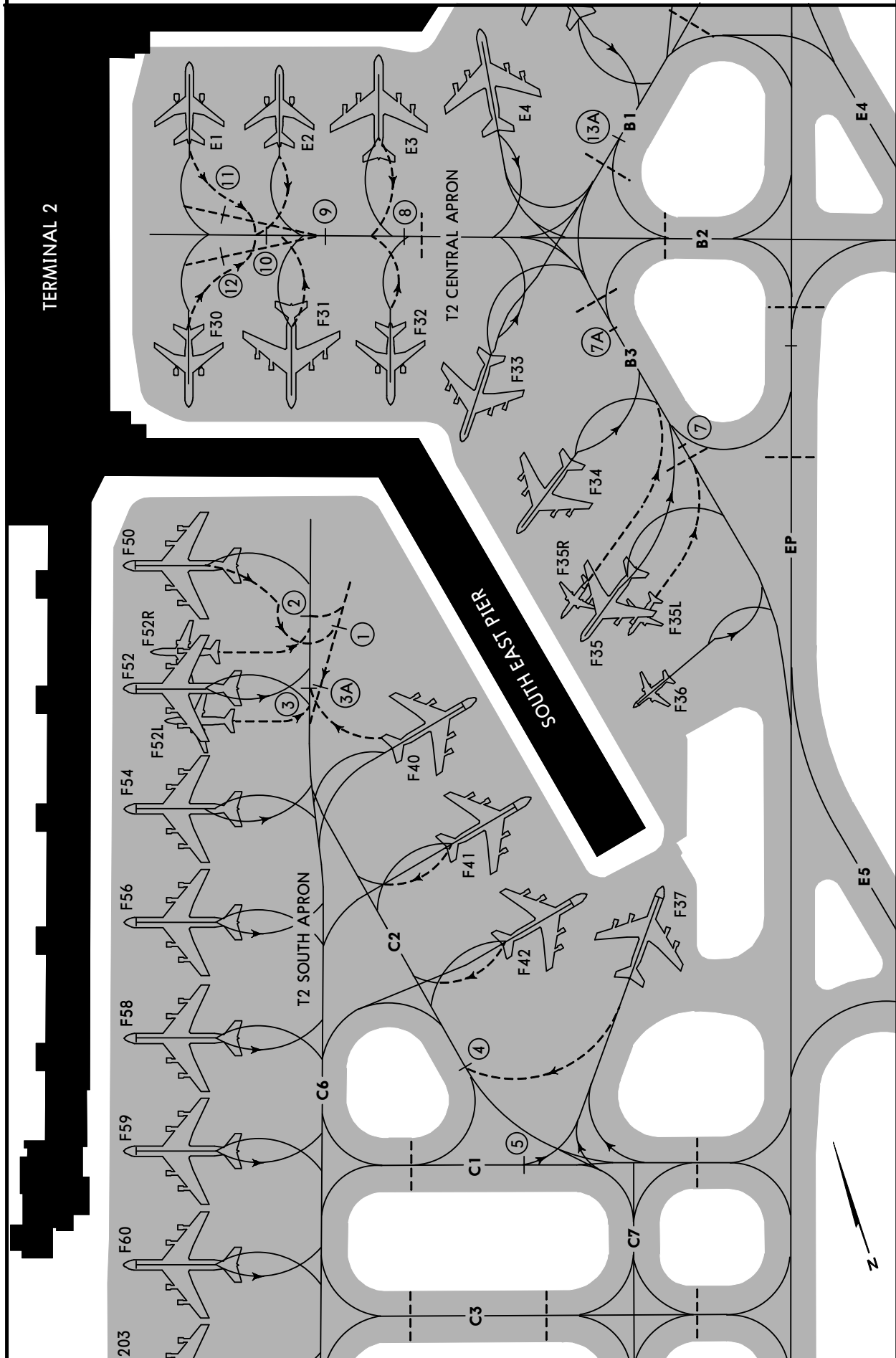
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7 APR 17

(10-9M1)

SINGAPORE, SINGAPORE
CHANGI

PUSHBACK PROCEDURES



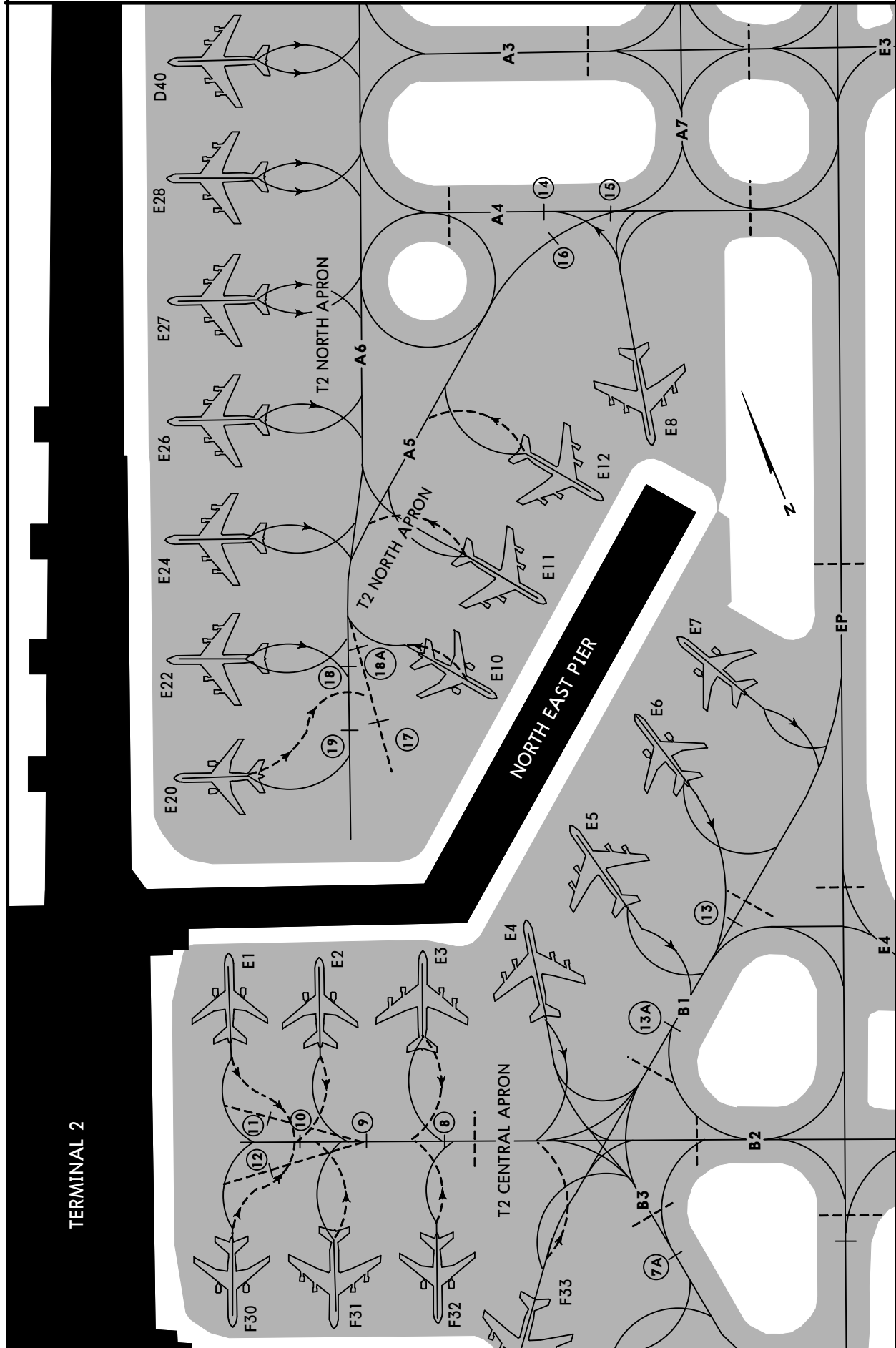
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(10-9M2)

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PUSHBACK PROCEDURES



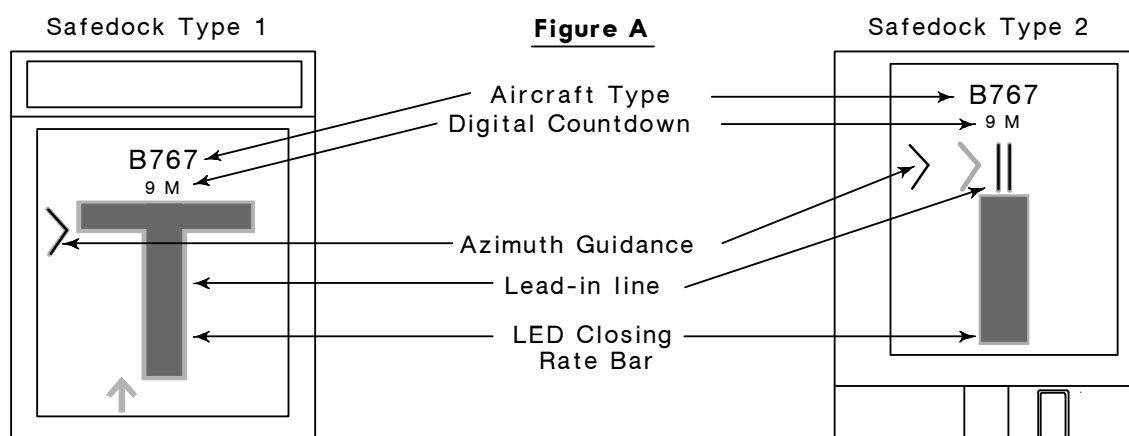
TERMINAL 2

WSSS/SIN**JEPPESSEN**
7 APR 17 **(10-9N)****SINGAPORE, SINGAPORE**
CHANGI**SAFEGATE AIRCRAFT DOCKING GUIDANCE SYSTEM - SAFEDOCK****1. INTRODUCTION**

1.1 The Safegate Aircraft Docking Guidance System - SAFEDOCK is a fully automatic aircraft docking guidance system installed at the fixed gates in Terminals 1, 2, and 3 of Singapore Changi Airport. There are two types of ADGS in Singapore Changi Airport, Safedock Type 1 ADGS and Safedock Type 2 ADGS.

2. DESCRIPTION OF SYSTEM

- 2.1 The system is based on a laser scanning technique and it tracks both the lateral and longitudinal position of the aircraft. This 3D technique allows the system to identify the incoming aircraft and check it against the one selected by the operator to ensure that the pilot is provided with the correct stop indication for the aircraft.
- 2.2 The system is operated only in Automatic Mode. When the system fails, the aircraft is to be marshalled into the stand manually.
- 2.3 Azimuth guidance, continuous closing rate information, aircraft type, etc., are shown to the pilot on a single display clearly visible for both pilot and co-pilots. Figure A shows the Display and Laser Scanning Unit mounted on the terminal or pole in front of the aircraft stand.

LED DISPLAY AND LASER SCANNING UNIT**3. DOCKING PROCEDURES****Checking of Aircraft Type**

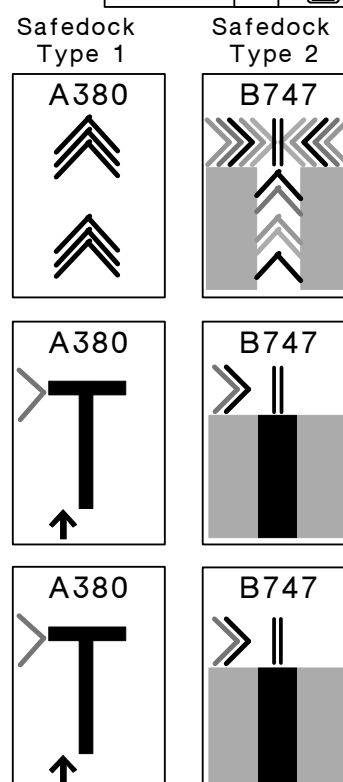
- Check that the correct aircraft type is displayed. The scrolling arrows indicate that the system is activated.
- Follow the lead-in line.

Capture of Correct Aircraft Type

- When the aircraft has been caught by the scanning unit, the scanning unit checks that the aircraft is the correct type and the display provides azimuth guidance information. When the solid yellow closing rate bar appears, the aircraft is being tracked by the system.

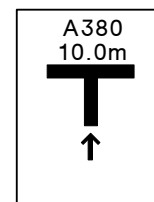
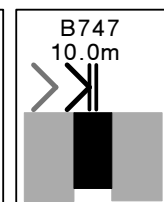
Steering and Alignment of Aircraft

- Look for the flashing red arrow and solid yellow arrow which provide azimuth guidance information. The flashing red arrow shows which direction to steer, while the solid yellow arrow gives an indication of how far the aircraft is off the centerline.

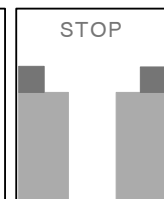


WSSS/SIN**JEPPesen**
7 APR 17 (10-9N1)**SINGAPORE, SINGAPORE**
CHANGI**SAFEDOCK-Continued.****Distance of Aircraft from STOP Position**

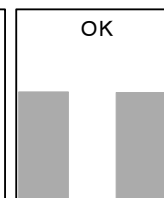
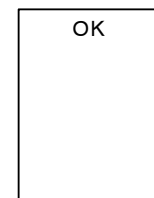
- When the aircraft is 15m from the stop position, closing rate information is given. "Distance to go" is indicated by turning off one row of LEDs (Laser Electronic Displays) for every half meter that the aircraft advances towards the stop position. From 15m to the stop position, the display will indicate the distance from the stop position for every 1m. At 3m from the stop position, the display will indicate the distance from the stop position for every 0.2m.

Safedock
Type 1Safedock
Type 2**STOP Position**

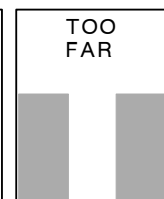
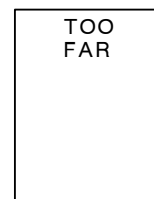
- When the correct stop position is reached, all of the LEDs for the closing rate bar will be off, the word "STOP" will appear in the display. For Safedock Type 1 ADGS, the word "STOP" will be displayed in red with red border. For Safedock Type 2 ADGS, the word "STOP" will be displayed in yellow and two red, rectangular fields will light in the azimuth guidance area of the display.

**Checking of STOP Position**

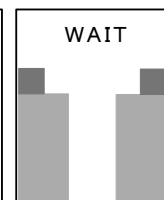
- If the aircraft stops at the correct position, "OK" will be displayed after a few seconds.

**Overshooting of STOP Position**

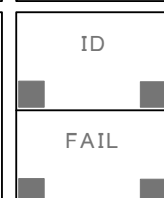
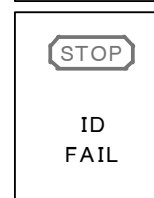
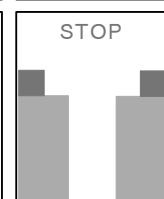
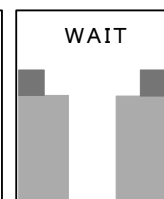
- If the aircraft has gone past the correct stop position, the display will show "TOO FAR" after the aircraft comes to a complete stop.

**Object Blocking the View**

- If some object is blocking the view towards the approaching aircraft or the detected aircraft is lost before 12m to the correct stop position, the system will show "WAIT"

**Identification of Aircraft**

- The aircraft must be identified at least 12m before the correct stop position. Otherwise, the display will show "WAIT", "STOP" and "ID FAIL".



WSSS/SIN**JEPPesen**
7 APR 17 (10-9N2)**SINGAPORE, SINGAPORE**
CHANGI**SAFEDOCK-Continued.****4. SAFETY MEASURES****ADGS Blank / Wrong Aircraft Type**

- Pilot should not turn an aircraft into the aircraft stand if the docking system is not activated or on seeing a wrong aircraft type displayed on the system.

Proceeding beyond Passenger Loading Bridges

- Pilot should not proceed beyond the passenger loading bridges unless the scrolling arrows (see figure 1) have been superseded by the solid yellow closing rate bar (see figure 2).

Minimum Speed

- When using the docking system, pilots are to taxi into the aircraft stand at minimum speed. The system will display "SLOW" to inform the pilot if the aircraft's taxiing speed exceeded 1.2 m/s.

Slow Down (In Abnormal Situations)

- In bad weather conditions, the docking system may go into downgrade mode. The display will show the aircraft type and "SLOW" and the scrolling arrows are disabled (see figures 1 & 2). When the system has detected the aircraft, the solid yellow closing rate bar appears. Docking process is allowed to continue but pilot should exercise caution.

Overshooting

- To avoid overshooting, pilots are advised to approach the stop position slowly and observe the closing rate information displayed. Pilots should stop the aircraft immediately when seeing the "STOP" or "WAIT" display or when given the stop sign by the aircraft marshaller or is unsure of the information displayed during the docking process.

No Display

- Pilot should stop the aircraft immediately if the display goes black, for power failure (see figure 1) or system failure (see figure 2), during the docking process. The aircraft is to be manually marshalled into the aircraft stand.

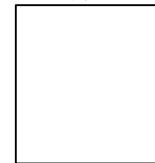
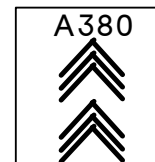
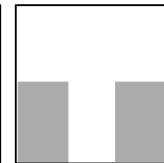
Safedock
Type 1Safedock
Type 2

Figure 1

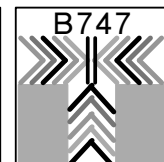


Figure 1

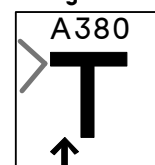


Figure 2

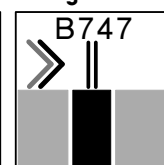


Figure 2

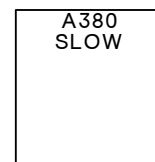
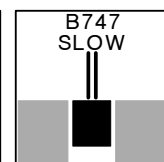
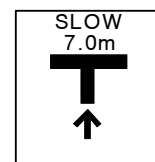


Figure 1

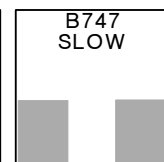


Figure 2

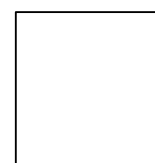
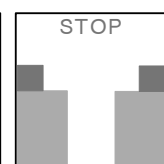


Figure 1

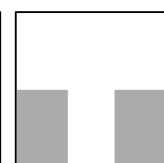


Figure 1

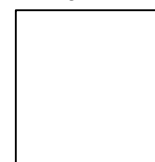


Figure 2

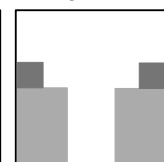


Figure 2

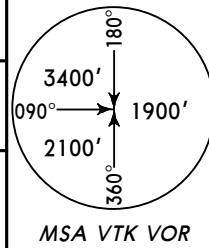
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JEPPESSEN
20 NOV 15 (11-1)

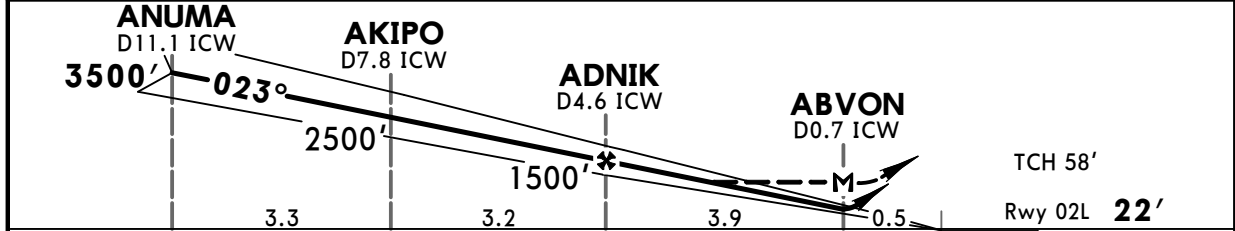
SINGAPORE, SINGAPORE
ILS DME Rwy 02L

BRIEFING STRIP

D-ATIS 128.6	SINGAPORE Approach (R) 120.3	SINGAPORE Arrival (R) 119.3	SINGAPORE Tower 118.6	Ground 124.3
LOC ICW 110.9	Final Appch Crs 023°	GS ANUMA 3500' (3478')	ILS DA(H) 222' (200')	Apt Elev 22' Rwy 02L 22'
MISSED APCH: Climb to 1000', then climbing LEFT turn to 4000' via heading 335° and PU R-356 to AKOMA (PU R-356/D20.0) and hold or as directed by ATC.				
Alt Set: hPa Rwy Elev: 1 hPa Trans level: FL 130 Trans alt: 11000'				
1. RADAR required. 2. Simultaneous approaches authorized with Rwy 02R or 02C. 3. ILS DME co-located with glideslope. 4. Maritime vessels of variable heights in water north and south of Rwy.				



LOC (GS out)	ICW DME	4.0	3.0	2.0
	ALTITUDE	1290'	970'	660'



Gnd speed-Kts	70	90	100	120	140	160	<div><div>ALSFI-II</div><div>REIL PAPI</div><div>PAPI</div></div>		
GS 3.00°	372	478	531	637	743	849	<div><div>1000'</div><div>4000'</div><div>335°</div></div>		
1 FAF to MAP 3.9	3:21	2:36	2:20	1:57	1:40	1:28	<div><div>↑</div><div>LT</div><div>via</div><div>hdg</div></div>		
MAP at ABVON/D0.7 ICW									

STRAIGHT-IN LANDING RWY02L					CIRCLE-TO-LAND	
ILS DA(H) 222' (200')			LOC (GS out) MDA(H) 420' (398')			
FULL	TDZ or CL out	ALS out	ALS out			
A					A	
B	RVR 550m	RVR 720m	RVR 720m	RVR 1500m	B	NA
C	VIS 800m	VIS 800m	VIS 800m	VIS 1600m	C	
D			1200m	RVR 1800m	D	
				VIS 2000m		

PANS OPS

1 Timing not authorized when GS inop.

CHANGES: Holding SAMKO revised to time-based.

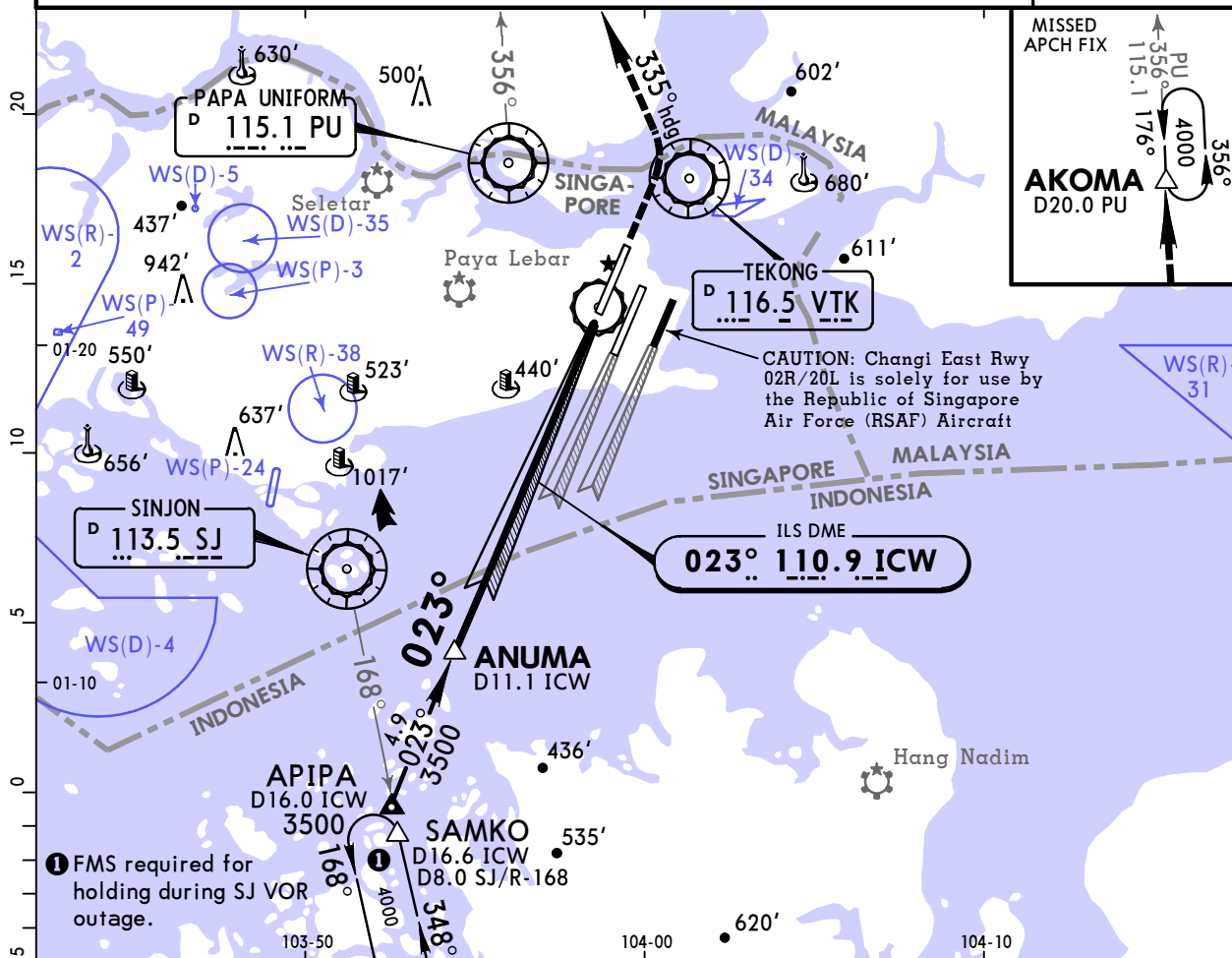
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JEPPESSEN
20 NOV 15 **(11-1A)**

SINGAPORE, SINGAPORE
ILS DME Rwy 02L CAT II

D-ATIS 128.6	SINGAPORE Approach (R) 120.3	SINGAPORE Arrival (R) 119.3	SINGAPORE Tower 118.6	Ground 124.3
LOC ICW 110.9	Final Apch Crs 023°	GS ANUMA 3500' (3478')	CAT II ILS Refer to Minimums	Apt Elev 22' Rwy 02L 22'
MISSED APCH: Climb to 1000', then climbing LEFT turn to 4000' via heading 335° and PU R-356 to AKOMA (PU R-356/D20.0) and hold or as directed by ATC.				
Alt Set: hPa Rwy Elev: 1 hPa Trans level: FL 130 Trans alt: 11000'				
1. Special Aircrew and Acft Certificaton Required. 2. RADAR required. 3. Simultaneous approaches authorized with Rwy 2R or 2C. 4. ILS DME co-located with glideslope. 5. Maritime vessels of variable heights in water north and south of Rwy.				
				MSA VTK VOR



ANUMA
D11.1 ICW

3500'

023°

10.9

TCH 58'

Rwy 02L 22'

Gnd speed-Kts	70	90	100	120	140	160		ALSF-II	1000'	4000'	335°
GS	3.00°	372	478	531	637	743	849	REIL PAPI	↑	LT	via hdg

STRAIGHT-IN LANDING RWY02L

CAT A B C

RA 112'

DA(H) 122'(100')

RVR 350m

CAT II ILS

CAT D

RA 131'

DA(H) 127'(105')

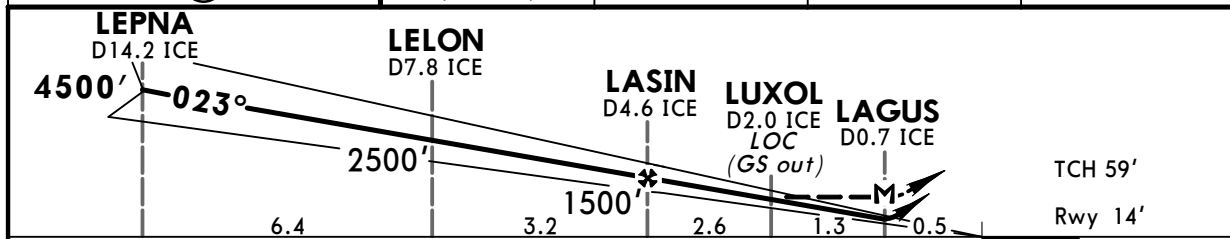
RVR 350m

PANS OPS

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CHANGIJEPPESEN
22 APR 16 (11-2)SINGAPORE, SINGAPORE
ILS DME Rwy 02C

BRIEFING STRIP™

D-ATIS 128.6	SINGAPORE Approach (R) 120.3	SINGAPORE Arrival (R) 119.3	SINGAPORE Tower 118.6 *118.25	Ground 124.3
LOC ICE 108.3	Final Apch Crs 023°	GS LEPNA 4500' (4486')	ILS DA(H) 214' (200')	Apt Elev 22' Rwy 14'
MISSED APCH: Climb to 3000' via heading 023° and VTK R-023 to NYLON (VTK R-023/D13.0) and hold or as directed by ATC.				
Alt Set: hPa Rwy Elev: 1 hPa Trans level: FL 130 Trans alt: 11000'				
1. RADAR required. 2. Simultaneous approaches authorized with Rwy 2R or 2L. 3. ILS DME co-located with glide slope. 4. Maritime vessels of variable heights in water north and south of Rwy.				
				 MSA VTK VOR



Gnd speed-Kts	70	90	100	120	140	160	ALSIF-I	3000'	023°	VTK
GS	3.00°	372	478	531	637	743	PAPI	via	hdg	and 116.5
1 FAF to MAP	3.9	3:21	2:36	2:20	1:57	1:40	REIL			R-023
MAP at LAGUS/D0.7 ICE										

STRAIGHT-IN LANDING RWY02C						CIRCLE-TO-LAND	
ILS			LOC (GS out)				
DA(H) 214' (200')			MDA(H) 420' (406') With LUXOL/D2.0 ICE				
FULL			ALS out				
A			RVR 720m	RVR 1500m	RVR 720m	RVR 1500m	NA
B	RVR 720m		VIS 800m	VIS 1600m	VIS 800m	VIS 1600m	
C	VIS 800m		1200m	RVR 1800m	RVR 1800m	2800m	
D				VIS 2000m	2400m	3200m	

1 Timing not authorized when GS inop.

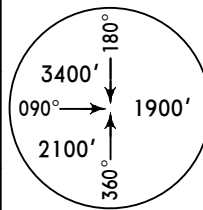
CHANGES: Rwy elevation, minimums.

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PANS OPS

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18 NOV 16 (11-3)SINGAPORE, SINGAPORE
ILS DME Rwy 20C

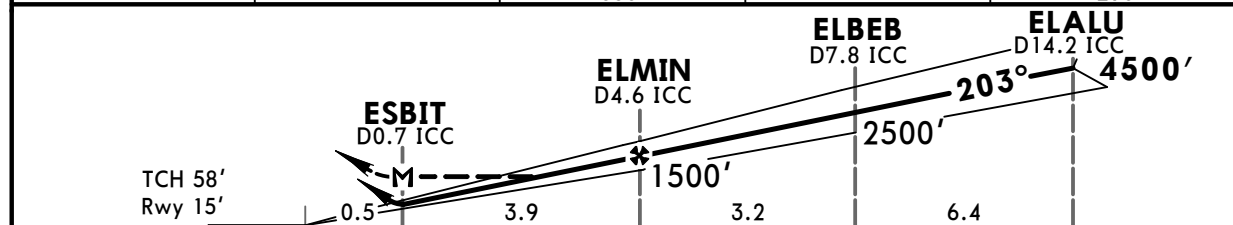
D-ATIS 128.6	SINGAPORE Approach (R) 120.3	SINGAPORE Arrival (R) 119.3	SINGAPORE Tower 118.6 *118.25	Ground 124.3
LOC ICC 109.7	Final Apch Crs 203°	GS ELALU 4500' (4485')	DA(H) (CONDITIONAL) 215' (200')	Apt Elev 22' Rwy 15'
MISSED APCH: Climb to 4000' via VTK R-203 to ESLUX (D6.7 VTK). At ESLUX turn LEFT heading 130° to intercept VTK R-158 to EXOMO (VTK R-158/D22.0) and hold or as directed by ATC.				
Alt Set: hPa Rwy Elev: 1 hPa Trans level: FL 130 Trans alt: 11000' 1. RADAR required. 2. Simultaneous approaches authorized with Rwy 20L or 20R. 3. ILS DME co-located with glide slope. 4. Maritime vessels of variable heights in water north and south of Rwy.				



MSA VTK VOR



LOC (GS out)	ICC DME ALTITUDE	2.0	3.0	4.0
		660'	980'	1290'



Gnd speed-Kts	70	90	100	120	140	160	ALSIF-II	4000'	VTK	ESLUX
GS	3.00°	372	478	531	637	743	849	↑	116.5	
FAF to MAP	3.9	3:21	2:36	2:20	1:57	1:40	1:28		R-203	
MAP at ESBIT/D0.7 ICC										

STRAIGHT-IN LANDING RWY20C

CIRCLE-TO-LAND

ILS			MISSED APPROACH			LOC (GS out)			CIRCLE-TO-LAND		
Missed approach climb gradient min 2.8% to 2000'			Missed approach climb gradient min 2.5%			LOC (GS out)			CIRCLE-TO-LAND		
DA(H) 215' (200')			DA(H) 315' (300')			MDA(H) 420' (405')					
FULL	TDZ or CL out	ALS out	FULL	TDZ or CL out	ALS out	FULL	TDZ or CL out	ALS out	FULL	TDZ or CL out	ALS out
A											
B	RVR 550m	RVR 720m	1200m	900m	1400m	RVR 720m	RVR 1500m				
C	VIS 800m	VIS 800m				VIS 800m	VIS 1600m				
D						1200m	RVR 1800m				
							VIS 2000m				

Timing not authorized when GS inop.

CHANGES: Missed approach climb gradient note.

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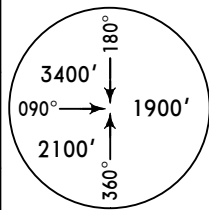
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JEPPesen
18 NOV 16 **(11-3A)**

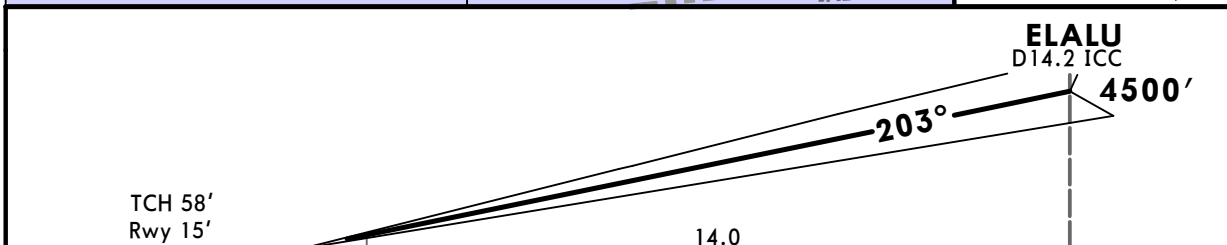
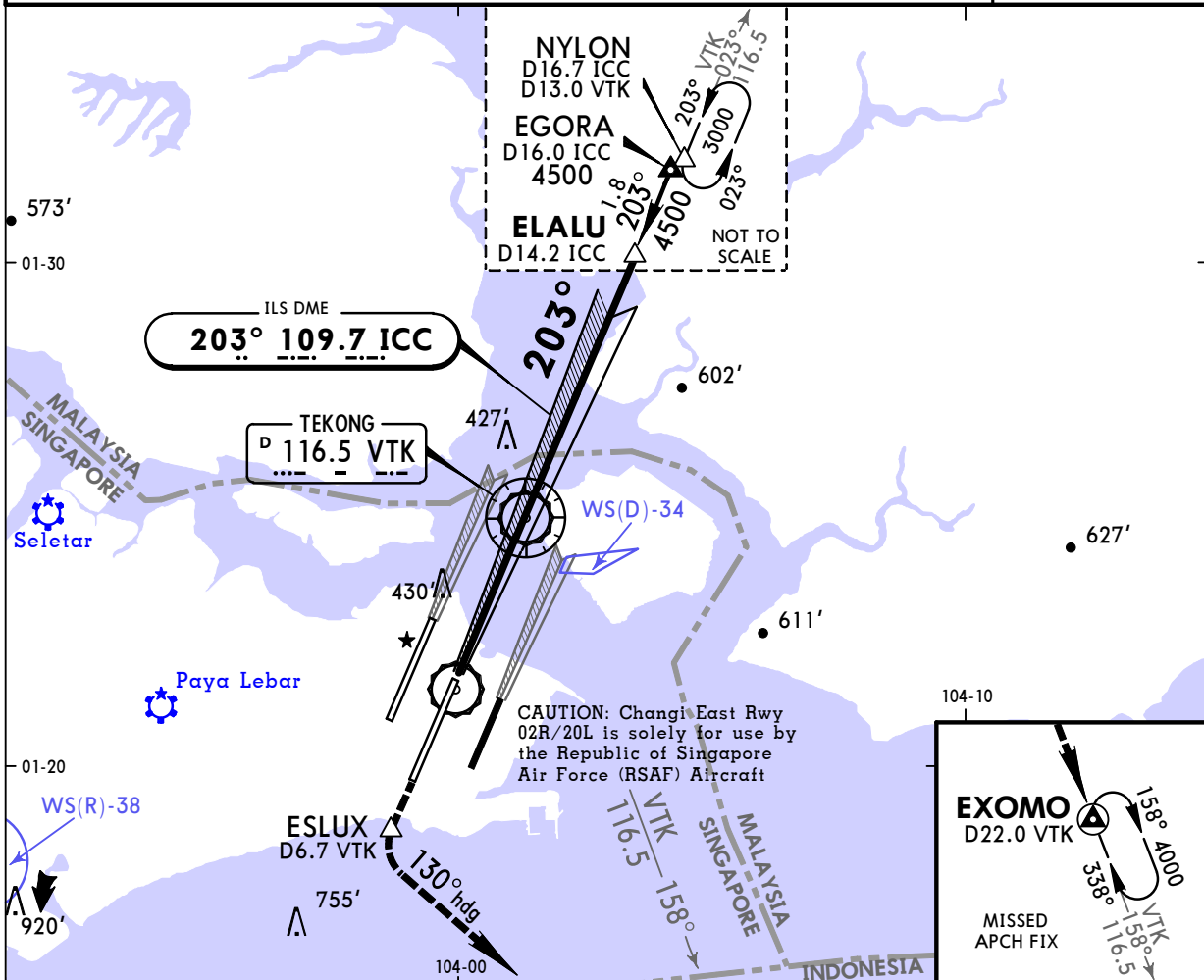
SINGAPORE, SINGAPORE
ILS DME Rwy 20C CAT II

BRIEFING STRIP™

D-ATIS 128.6	SINGAPORE Approach (R) 120.3	SINGAPORE Arrival (R) 119.3	SINGAPORE Tower 118.6 *118.25	Ground 124.3
LOC ICC 109.7	Final Apch Crs 203°	GS ELALU 4500' (4485')	CAT II ILS RA 102' DA(H) 115'(100')	Apt Elev 22' Rwy 15'
MISSED APCH: Climb to 4000' via VTK R-203 to ESLUX (D6.7 VTK). At ESLUX turn LEFT heading 130° to intercept VTK R-158 to EXOMO (VTK R-158/D22.0) and hold or as directed by ATC.				
Alt Set: hPa Rwy Elev: 1 hPa Trans level: FL 130 Trans alt: 11000' 1. RADAR required. 2. Simultaneous approaches authorized with Rwy 20L or 20R. 3. ILS DME co-located with glide slope. 4. Maritime vessels of variable heights in water north and south of Rwy.				



MSA VTK VOR



Gnd speed-Kts	70	90	100	120	140	160	ALSIF-II	4000'	VTK	ESLUX
GS	3.00°	372	478	531	637	743	PAPI REIL	↑	via 116.5 R-203	

STRAIGHT-IN LANDING RWY20C

CAT II ILS
RA 102'

DA(H) **115'** (100')

RVR 350m

PANS OPS

CHANGES: None.

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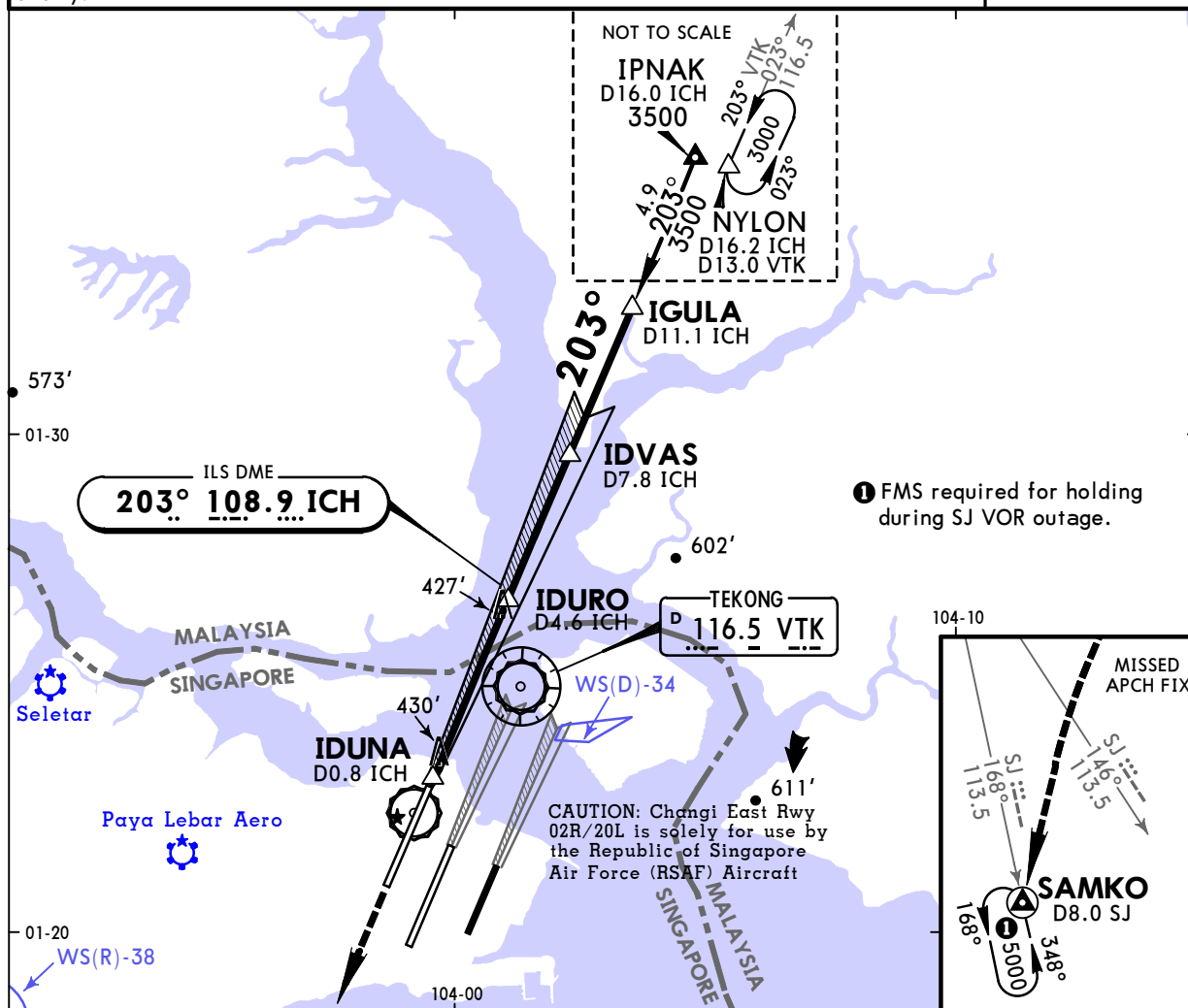
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CHANGI

18 NOV 16 **JEPPESSEN** (11-4)

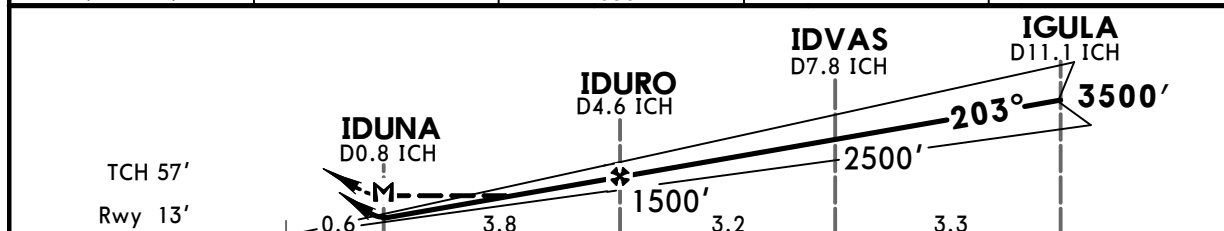
SINGAPORE, SINGAPORE
ILS DME Rwy 20R



D-ATIS 128.6	SINGAPORE Approach (R) 120.3	SINGAPORE Arrival (R) 119.3	SINGAPORE Tower 118.6 *118.25	Ground 124.3
LOC ICH 108.9	Final Apch Crs 203°	GS IGULA 3500' (3487')	DA(H) (CONDITIONAL) 213' (200')	Apt Elev 22' Rwy 13'
MISSED APCH: Climb straight ahead to 5000'. On crossing SJ R-146, proceed direct SAMKO holding area and hold or as directed by ATC.				
Alt Set: hPa Rwy Elev: 1 hPa Trans level: FL 130 Trans alt: 11000'				
1. RADAR required. 2. Simultaneous approaches authorized with Rwy 20L or 20C. 3. ILS DME co-located with glide slope. 4. Maritime vessels of variable heights in water north and south of rwy.				

MSA VTK VOR



LOC (GS out)	ICH DME	2.0	3.0	4.0
	ALTITUDE	650'	970'	1290'



Grnd speed-Kts	70	90	100	120	140	160	<div style="display: flex; align-items: center;"> <div style="text-align: center;"> HIALS  REIL PAPI </div> <div style="margin-left: 10px;"> 5000' on crossing 113.5 R-146 </div> </div>		SAMKCO
GS 3.00°	372	478	531	637	743	849			
1 FAF to MAP 3.9	3:21	2:36	2:20	1:57	1:40	1:28			
MAP at IDUNA/D0.8 ICH									

STRAIGHT-IN LANDING RWY20R							CIRCLE-TO-LAND		
Missed approach climb gradient mim 3.7% to 2500'		Missed approach climb gradient mim 2.5%		LOC (GS out)					
DA(H) 213'(200')		DA(H) 693'(680')		MDA(H) 420'(407')					
FULL		ALS out		ALS out					
A									
B	RVR 720m	1200m	3200m	3200m	RVR 720m VIS 800m	RVR 1500m VIS 1600m	B	NA	
C	VIS 800m								C
D					3600m	1200m	RVR 1800m VIS 2000m		D

[illegible]

CHANGES: Missed approach climb gradient note

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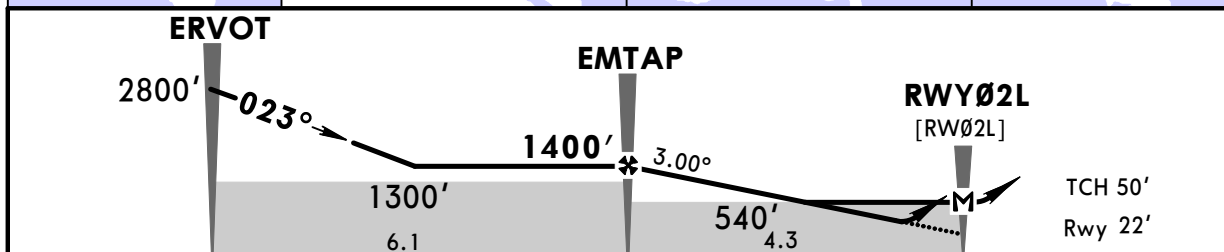
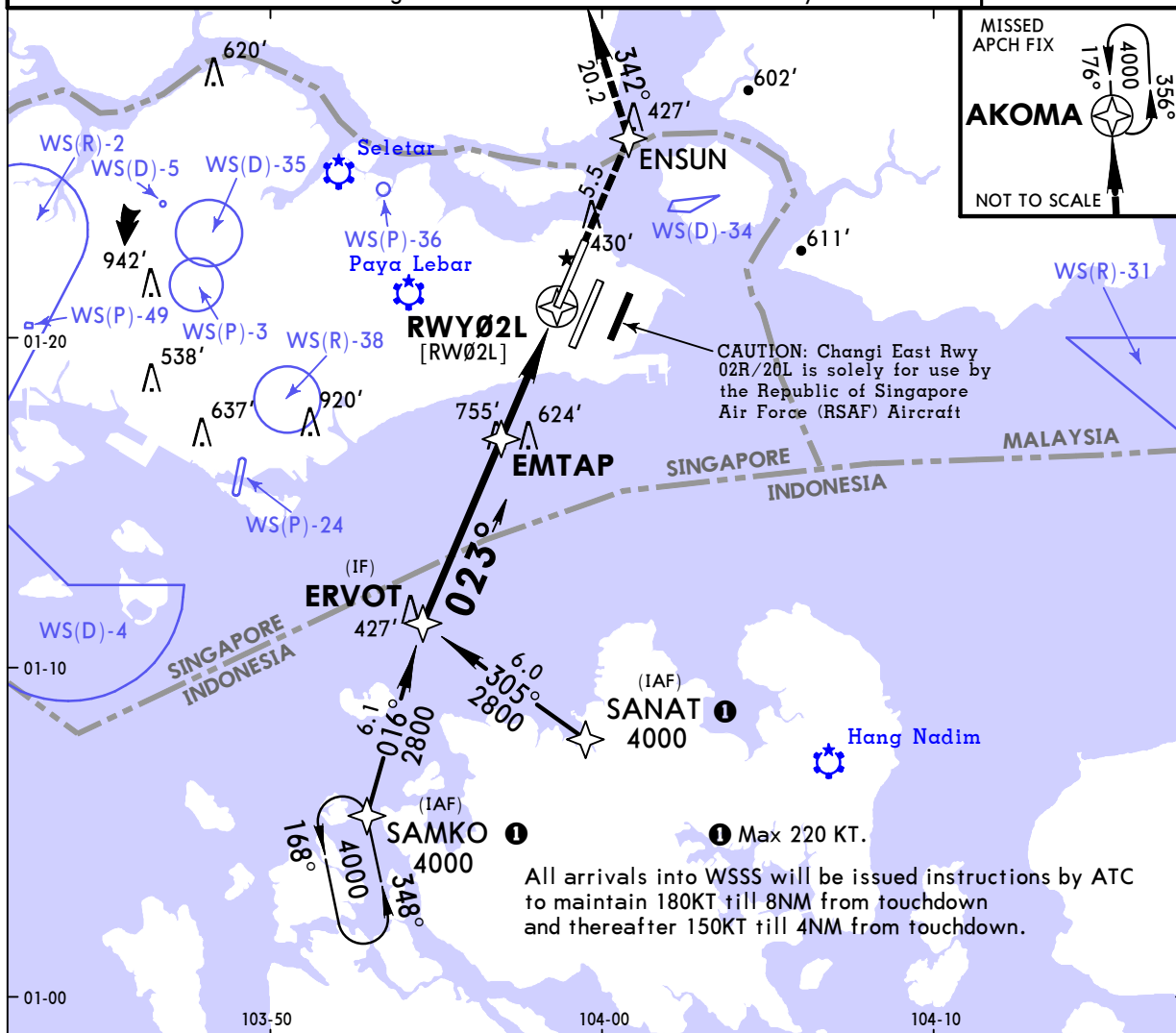
21 APR 17

(12-1)

SINGAPORE, SINGAPORE
RNAV (GNSS) Rwy 02L

BRIEFING STRIP

D-ATIS 128.6	SINGAPORE Approach (R) 120.3	SINGAPORE Arrival (R) 119.3	SINGAPORE Tower 118.6 *118.25	Ground 124.3
RNAV	Final Apch Crs 023°	Procedure Alt EMTAP 1400' (1378')	LNAV/VNAV DA(H) 450' (428')	Apt Elev 22' Rwy 22'
MISSED APCH: Climb direct to ENSUN. Turn LEFT to AKOMA to join the holding at 4000' or above or as directed by ATC.				
Alt Set: hPa Rwy Elev: 1 hPa Trans level: FL 130 Trans alt: 11000' 1. Minimum temperature for which Baro-VNAV operations are authorized: 5°C (41°F). 2. Maritime vessels of variable heights in water north and south of runway.				
				<div style="border: 1px solid black; border-radius: 50%; width: 100px; height: 100px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">3500</div> MSA ARP



Gnd speed-Kts	70	90	100	120	140	160	ALS F-II	4000'	ENSUN
Descent angle	3.00°	372	478	531	637	743	REIL PAPI		
MAP at RWY02L							PAPI		
EMTAP to MAP	4.3	3:41	2:52	2:35	2:09	1:51			

STRAIGHT-IN LANDING RWY02L				CIRCLE-TO-LAND	
LNAV/VNAV DA(H) 450' (428')		LNAV MDA(H) 540' (518')			
ALS out		ALS out			
A		RVR 1200m	RVR 1600m	A	
B		VIS 1200m	RVR 2400m	B	
C	RVR 1400m	RVR 2200m	RVR 2800m	C	
D				D	

PANS OPS

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CHANGI

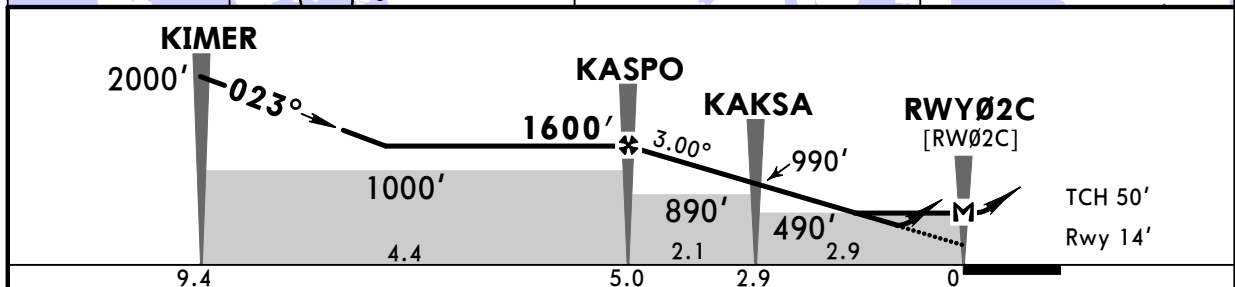
21 APR 17

(12-2)

SINGAPORE, SINGAPORE
RNAV (GNSS) Rwy 02C

BRIEFING STRIP™

D-ATIS	SINGAPORE Approach (R)	SINGAPORE Arrival (R)	SINGAPORE Tower	Ground
128.6	120.3	119.3	118.6 *118.25	124.3
RNAV	Final Apch Crs 023°	Procedure Alt KASPO 1600' (1586')	LNNAV/VNAV DA(H) 360' (346')	Apt Elev 22' Rwy 14'
MISSED APCH: Climb direct to NYLON to join the holding at 3000' or above or as directed by ATC.				3500
Alt Set: hPa Rwy Elev: 0 hPa Trans level: FL 130 Trans alt: 11000' 1. Minimum temperature for which Baro-VNAV operations are authorized: 5°C (41°F). 2. Maritime vessels of variable heights in water north and south of runway.				MSA ARP



Gnd speed-Kts	70	90	100	120	140	160	HIALS	3000'	NYLON
Descent angle 3.00°	372	478	531	637	743	849	REIL PAPI		
MAP at RWY02C							PAPI		
KASPO to MAP	5.0	4:17	3:20	3:00	2:30	2:09	1:52		

PANS OPS

STRAIGHT-IN LANDING RWY02C						CIRCLE-TO-LAND		
LNNAV/VNAV			LNNAV					
DA(H) 360'(346')			MDA(H) 490'(476')		without KAKSA MDA(H) 890'(876')			
ALS out			ALS out		ALS out			
A	RVR 1200m	RVR 1800m	RVR 1200m VIS 1200m	RVR 1600m	RVR 1200m VIS 1200m	RVR 1600m	A	NA
B				RVR 2000m	RVR 2000m	B		
C					RVR 3200m	RVR 4000m	C	
D			RVR 1500m VIS 1600m	RVR 2400m	RVR 3600m	RVR 4400m	D	

WSSS/SIN
CHANGI

21 APR 17

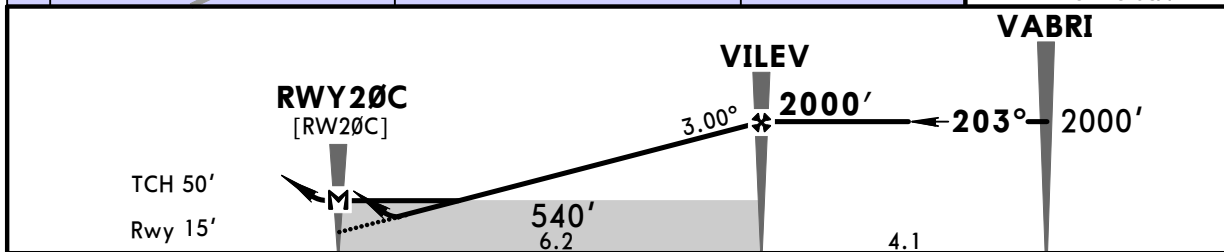
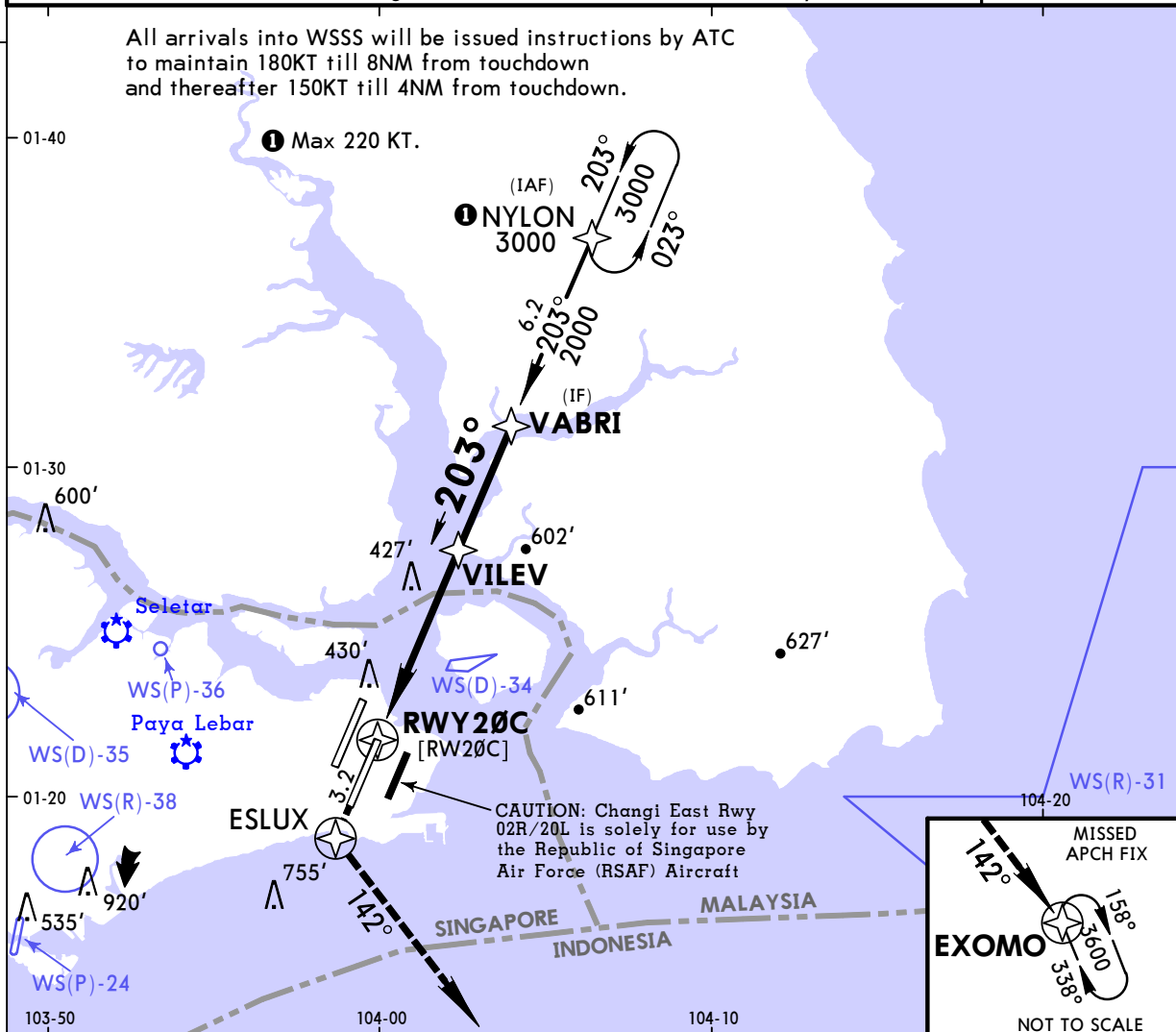
(12-3)

SINGAPORE, SINGAPORE
RNAV (GNSS) Rwy 20C

BRIEFING STRIP

D-ATIS 128.6	SINGAPORE Approach (R) 120.3	SINGAPORE Arrival (R) 119.3	SINGAPORE Tower 118.6 *118.25	Ground 124.3
RNAV	Final Apch Crs 203°	Procedure Alt VILEV 2000' (1985')	LNAV/VNAV DA(H) 490' (475')	Apt Elev 22' Rwy 15'
MISSED APCH: Climb direct to ESLUX. Turn LEFT to magnetic course 142° to join the holding at 3600' or above or as directed by ATC.				
Alt Set: hPa Rwy Elev: 1 hPa Trans level: FL 130 Trans alt: 11000' 1. Minimum temperature for which Baro-VNAV operations are authorized: 5°C (41°F). 2. Maritime vessels of variable heights in water north and south of runway.				
				3500 MSA ARP

25



Gnd speed-Kts	70	90	100	120	140	160	ALSF-II	3600'	ESLUX
Descent angle 3.00°	372	478	531	637	743	849	REIL PAPI		
MAP at RWY20C							PAPI		
VILEV to MAP	6.2	5:19	4:08	3:43	3:06	2:39			

STRAIGHT-IN LANDING RWY20C					CIRCLE-TO-LAND	
LNAV/VNAV			LNAV		NA	
DA(H) 490'(475')			MDA(H) 540'(525')			
ALS out			ALS out			
A	RVR 1600m	RVR 2400m	RVR 1200m	RVR 1600m		
B			VIS 1200m		B	
C			RVR 1600m	RVR 2400m	C	
D			RVR 2000m	RVR 2800m	D	

PANS OPS

WSSS/SIN
CHANGI

21 APR 17

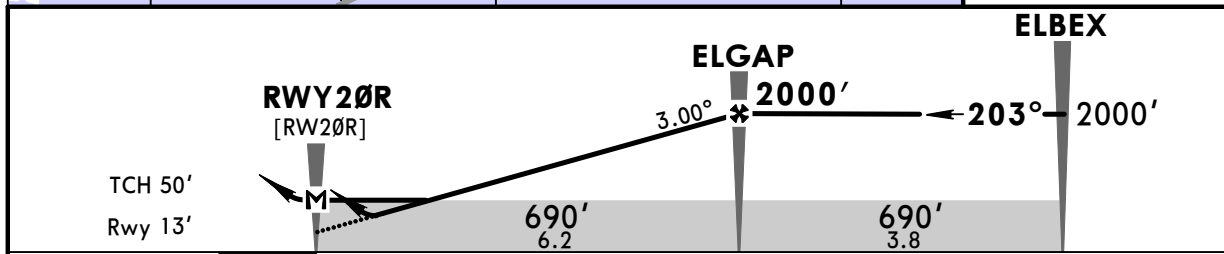
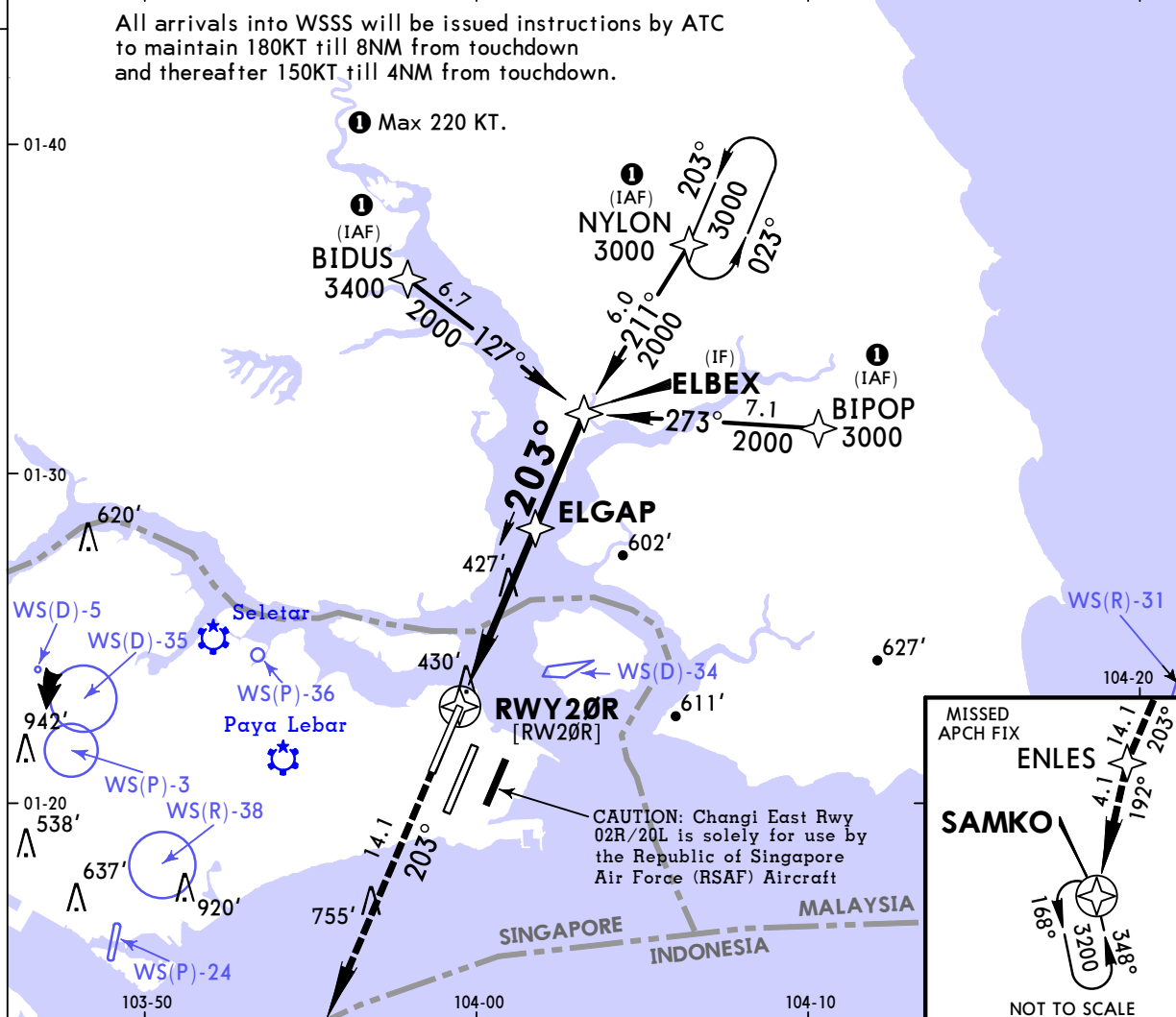
(12-4)

SINGAPORE, SINGAPORE
RNAV (GNSS) Rwy 20R

BRIEFING STRIP

D-ATIS 128.6	SINGAPORE Approach (R) 120.3	SINGAPORE Arrival (R) 119.3	SINGAPORE Tower 118.6 *118.25	Ground 124.3
RNAV	Final Apch Crs 203°	Procedure Alt ELGAP 2000' (1987')	LNAV/VNAV DA(H) 690' (677')	Apt Elev 22' Rwy 13'
MISSED APCH: Climb direct to ENLES. Turn LEFT to SAMKO to join the holding at 3200' or above or as directed by ATC.				
Alt Set: hPa Rwy Elev: 1 hPa Trans level: FL 130 Trans alt: 11000' 1. Minimum temperature for which Baro-VNAV operations are authorized: 5°C (41°F). 2. Maritime vessels of variable heights in water north and south of runway.				
				3500 MSA ARP

25



Gnd speed-Kts	70	90	100	120	140	160	ALSF-II	3200'	ENLES
Descent angle	3.00°	372	478	531	637	743	REIL PAPI		
MAP at RWY20R									
ELGAP to MAP	6.2	5:19	4:08	3:43	3:06	2:39			

STRAIGHT-IN LANDING RWY20R					CIRCLE-TO-LAND	
LNAV/VNAV			LNAV		NA	
DA(H) 690'(677')			MDA(H) 690'(677')			
ALS out			ALS out			
A	RVR 2800m	RVR 3600m	RVR 1200m	RVR 1600m	A	
B			VIS 1200m		B	
C			RVR 2400m	RVR 3200m	C	
D			RVR 2800m	RVR 3600m	D	

PANS OPS

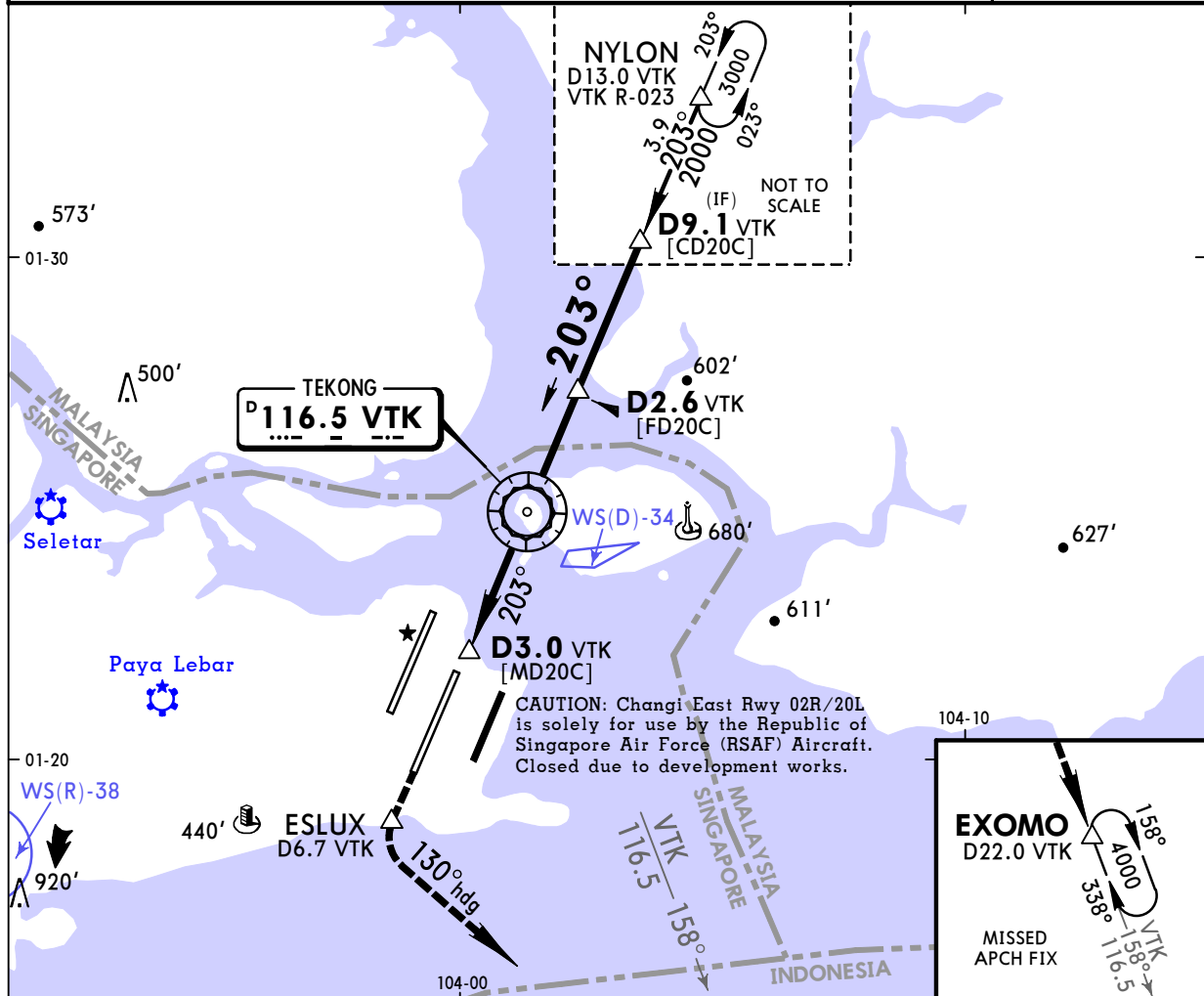
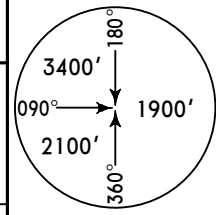
WSSS/SIN
CHANGI

JEPPesen
1 JUL 16 (13-1)

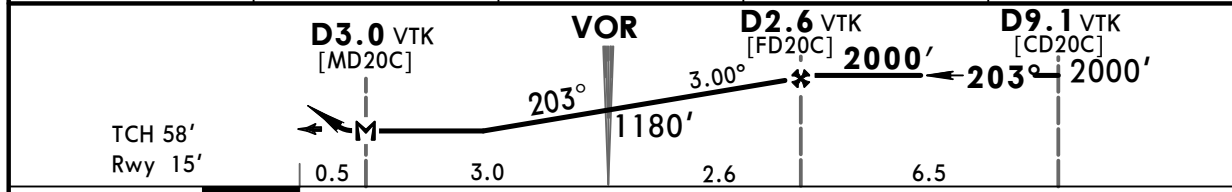
SINGAPORE, SINGAPORE
VOR DME Rwy 20C

BRIEFING STRIP

D-ATIS 128.6	SINGAPORE Approach (R) 120.3	SINGAPORE Arrival (R) 119.3	SINGAPORE Tower 118.6 * 118.25	Ground 124.3
VOR VTK 116.5	Final Apch Crs 203°	Minimum Alt D2.6 VTK 2000' (1985')	MDA(H) 580' (565')	Apt Elev 22' Rwy 15'
MISSED APCH: Climb to 4000' via VTK R-203 to ESLUX (D6.7 VTK). At ESLUX (1000' or above) turn LEFT heading 130° to intercept VTK R-158 to EXOMO (VTK R-158/D22.0) and hold or as directed by ATC.				
Alt Set: hPa Rwy Elev: 1 hPa Trans level: FL 130 Trans alt: 11000' 1. Maritime vessels of variable heights in water north and south of Rwy.				



VTK DME ALTITUDE	D1.0 AFTER VTK 860'	VTK 1180'	D1.0 BEFORE VTK 1500'	D2.0 BEFORE VTK 1820'
---------------------	------------------------	--------------	--------------------------	--------------------------



Gnd speed-Kts	70	90	100	120	140	160	ALSF-II PAPI REIL 4000' via 116.5 R-203 ESLUX
Descent Angle 3.00°	372	478	531	637	743	849	
MAP at D3.0 VTK or FAF to MAP 5.6	4:48	3:44	3:22	2:48	2:24	2:06	

STRAIGHT-IN LANDING RWY 20C
MDA(H) **580'** (565')

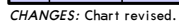
		ALS out
A	RVR 720m VIS 800m	RVR 1500m VIS 1600m
B		
C	RVR 1500m VIS 1600m	2400m
D	RVR 1800m VIS 2000m	2800m

PANS OPS

I GUSTI NGURAH RAI INTL

JEPPESEN BALI, INDONESIA

10-1R RADAR MINIMUM ALTITUDES



WADD/DPS

I GUSTI NGURAH RAI INTL

11 APR 14

10-2

JEPPESSEN

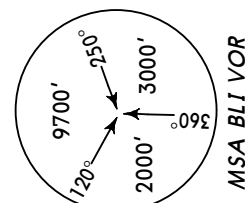
BALI, INDONESIA

RNAV STAR

*ATIS
126.2

Apt Elev
14'

Alt Set: hPa Trans level: FL130 Trans alt: 11000'
RNAV 1.



2

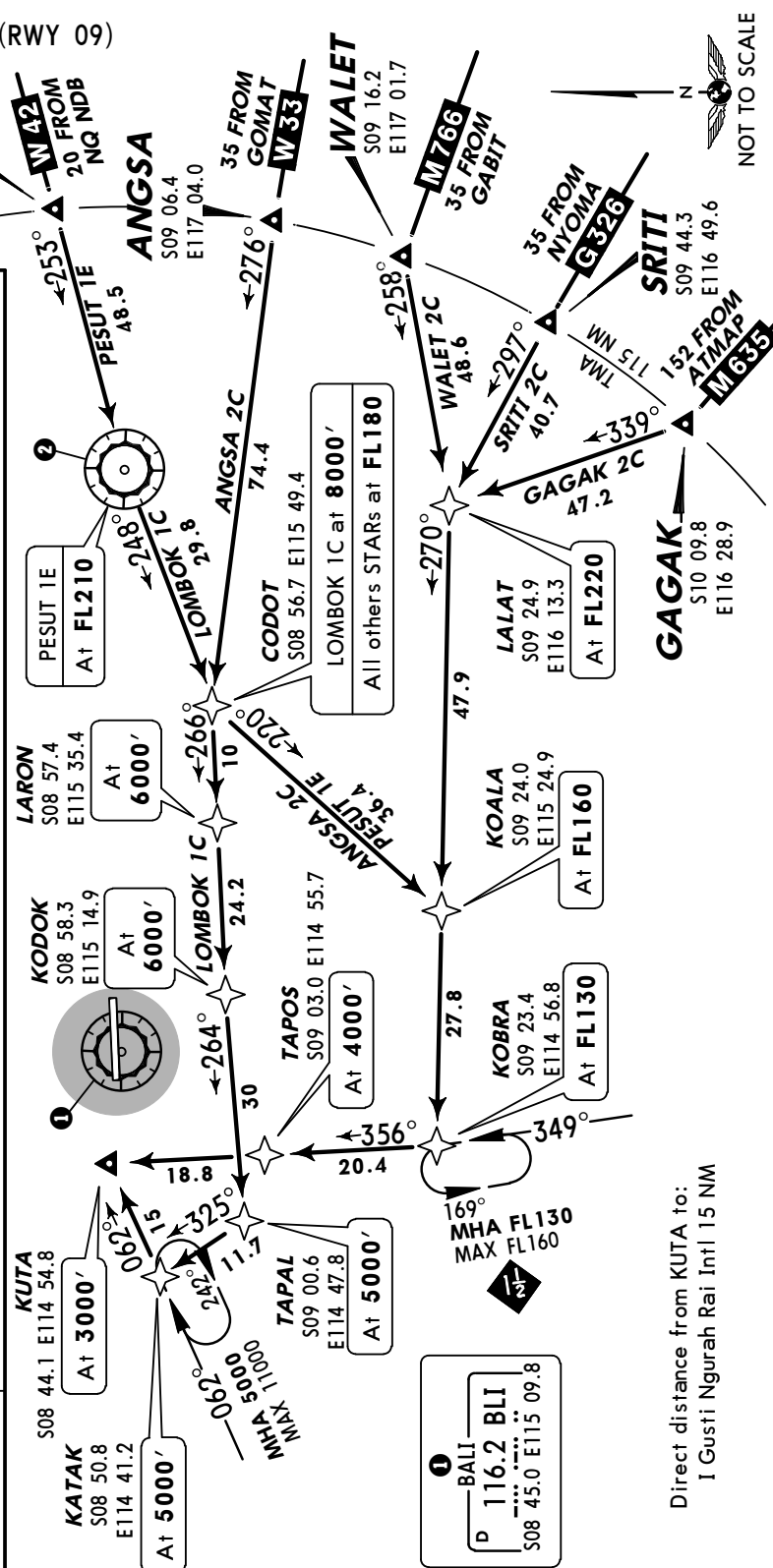
PRAYA

D 116.0 LMB
S08 46.3 E116 17.6

**ANGSA TWO CHARLIE [ANGS2C],
GAGAK TWO CHARLIE [GAGA2C],
LOMBOK ONE CHARLIE [LOMB1C],
PESUT ONE ECHO [PESU1E],
SRITI TWO CHARLIE [SRIT2C],
WALET TWO CHARLIE [WALE2C]**
ARRIVALS

(RWY 09)

STAR	ROUTING
ANGSA TWO CHARLIE	From ANGSA then to CODOT at FL180, then to KOALA at FL160, then to KOBRA at FL130, then to TAPOS at 4000', proceed to KUTA at 3000'.
GAGAK TWO CHARLIE	From M-635 after GAGAK, then to LALAT at FL220, then to KOALA at FL160, then to KOBRA at FL130, then to TAPOS at 4000', proceed to KUTA at 3000'.
LOMBOK ONE CHARLIE	From LOMBOK then to CODOT at 8000', then to LARON at 6000', then to KODOK at 6000', then to TAPAL at 5000', then to KATAK at 5000', then proceed to KUTA at 3000'.
PESUT ONE ECHO	From PESUT to LMB at FL210, then to CODOT at FL180, then to KOALA at FL160, then to KOBRA at FL130, then to TAPOS at 4000', then proceed to KUTA at 3000'.
SRITI TWO CHARLIE	From G-326 after SRITI then to LALAT at FL220, then to KOALA at FL160, then to KOBRA at FL130, then to TAPOS at 4000', then proceed to KUTA at 3000'.
WALET TWO CHARLIE	From M-766 after WALET, then to LALAT at FL220, then to KOALA at FL160, then to KOBRA at FL130, then to TAPOS at 4000', then proceed to KUTA at 3000'.



Direct distance from KUTA to:
I Gusti Ngurah Rai Intl 15 NM

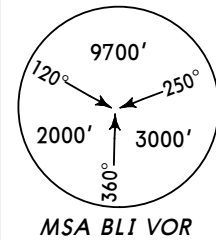
WADD/DPS
I GUSTI NGURAH RAI INTL

11 APR 14

JEPPesen
10-2A
BALI, INDONESIA
RNAV STAR

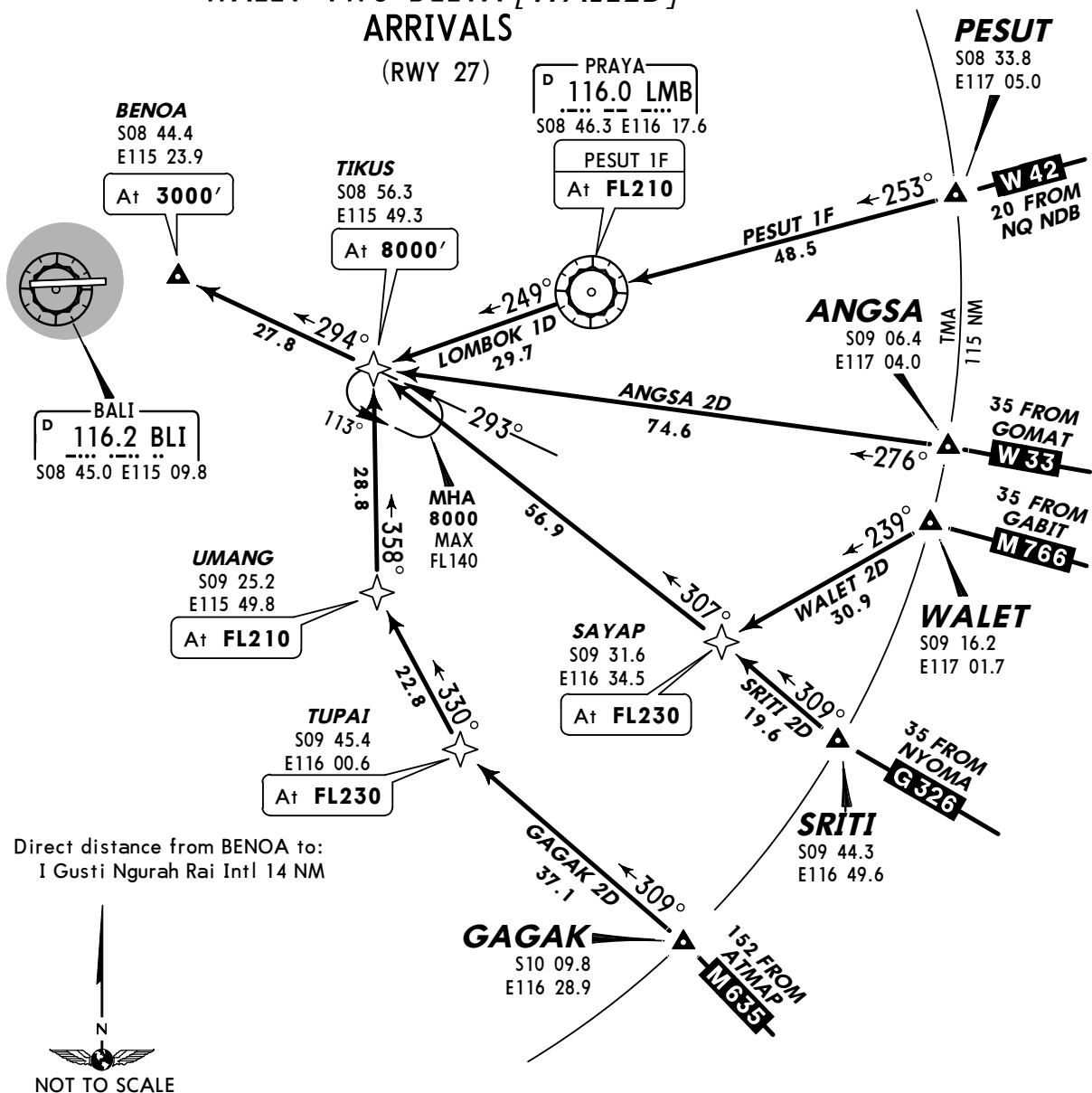
 *ATIS
 126.2

 Apt Elev
 14'

 Alt Set: hPa Trans level: FL130 Trans alt: 11000'
 RNAV 1.


ANGSA TWO DELTA [ANGS2D],
GAGAK TWO DELTA [GAGA2D],
LOMBOK ONE DELTA [LOMB1D],
PESUT ONE FOXTROT [PESU1F],
SRITI TWO DELTA [SRIT2D],
WALET TWO DELTA [WALE2D]
ARRIVALS

(RWY 27)


 Direct distance from BENOA to:
 I Gusti Ngurah Rai Intl 14 NM


STAR	ROUTING
ANGSA TWO DELTA	From W-33 after ANGSA, then to TIKUS at 8000' then proceed to BENOA at 3000'.
GAGAK TWO DELTA	From M-635 after GAGAK then to TUPAI at FL230, then to UMANG at FL210, then to TIKUS at 8000', then proceed to BENOA at 3000'.
LOMBOK ONE DELTA	From LMB then to TIKUS at 8000', then to BENOA at 3000'.
PESUT ONE FOXTROT	From W-42 after PESUT then to LMB at FL210, then to TIKUS at 8000', then to BENOA at 3000'.
SRITI TWO DELTA	From G-326 after SRITI then to SAYAP at FL230, then to TIKUS at 8000', then proceed to BENOA at 3000'.
WALET TWO DELTA	From M-766 after WALET then to SAYAP at FL230, then to TIKUS at 8000', then proceed to BENOA at 3000'.

WADD/DPS

I GUSTI NGURAH RAI INTL

11 APR 14

10-2B



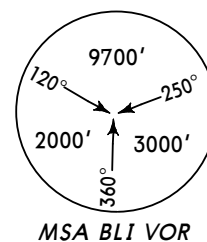
BALI, INDONESIA

RNAV STAR

*ATIS
126.2

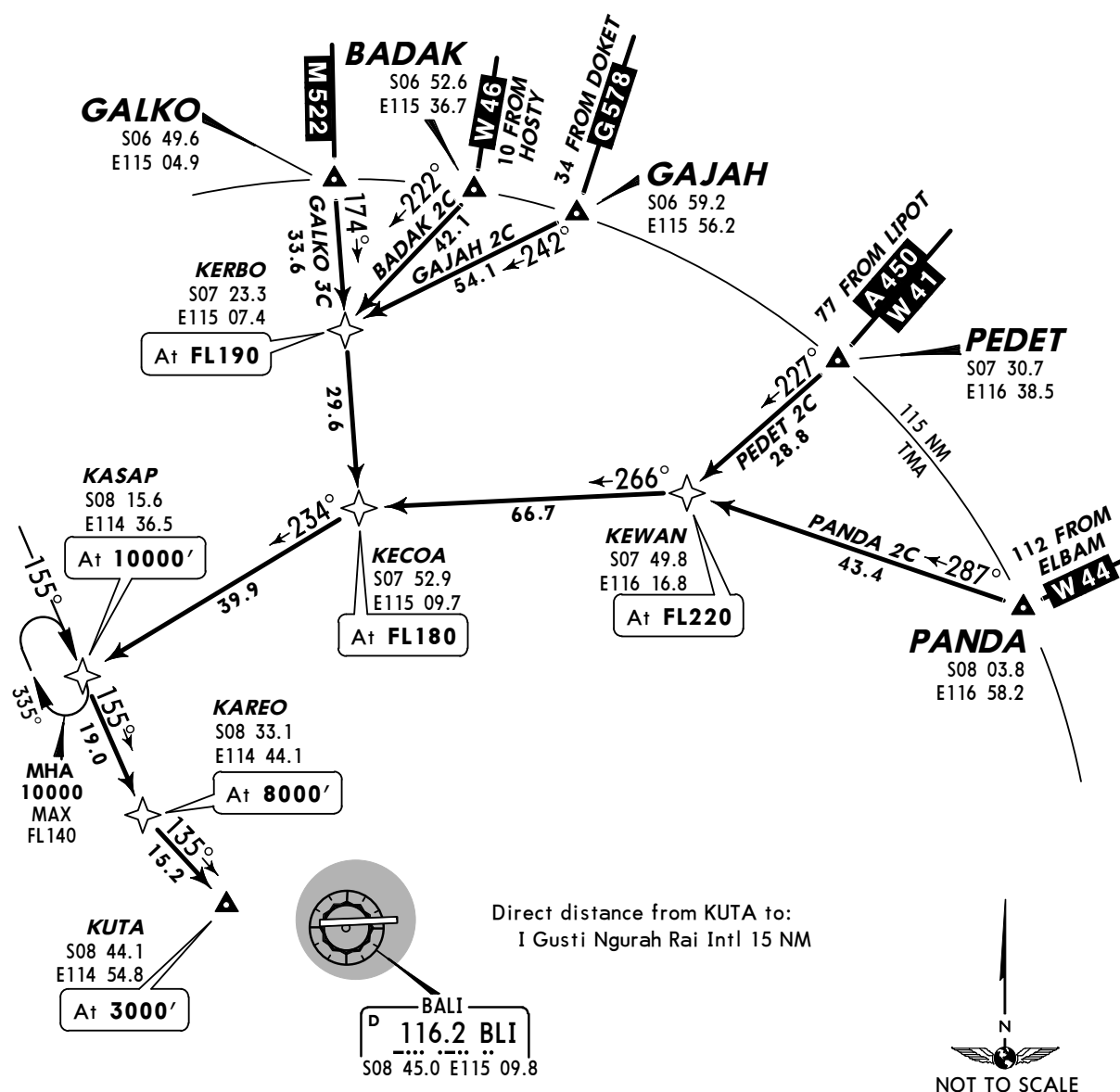
Apt Elev
14'

Set Alt: hPa Trans level: FL130 Trans alt: 11000'
RNAV 1.



BADAK TWO CHARLIE [BADA2C],
GAJAH TWO CHARLIE [GAJA2C],
GALKO THREE CHARLIE [GALK3C],
PANDA TWO CHARLIE [PAND2C],
PEDET TWO CHARLIE [PEDE2C]
ARRIVALS

(RWY 09)



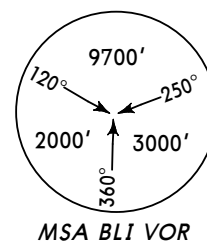
STAR	ROUTING
BADAK TWO CHARLIE	From BADAK to KERBO at FL190, then to KEOCA at FL180, then to KASAP at 10000', then to KAREO at 8000', then proceed to KUTA at 3000'.
GAJAH TWO CHARLIE	From GAJAH to KERBO at FL190, then to KEOCA at FL180, then to KASAP at 10000', then to KAREO at 8000', then proceed to KUTA at 3000'.
GALKO THREE CHARLIE	From GALKO to KERBO at FL190, then to KEOCA at FL180, then to KASAP at 10000', then to KAREO at 8000', then to KUTA at 3000'.
PANDA TWO CHARLIE	From PANDA to KEWAN at FL220, then to KEOCA at FL180, then to KASAP at 10000', then to KAREO at 8000', then proceed to KUTA at 3000'.
PEDET TWO CHARLIE	From PEDET to KEWAN at FL220, then to KEOCA at FL180, then to KASAP at 10000', then to KAREO at 8000', then proceed to KUTA at 3000'.

CHANGES: Airport name, ATIS added.

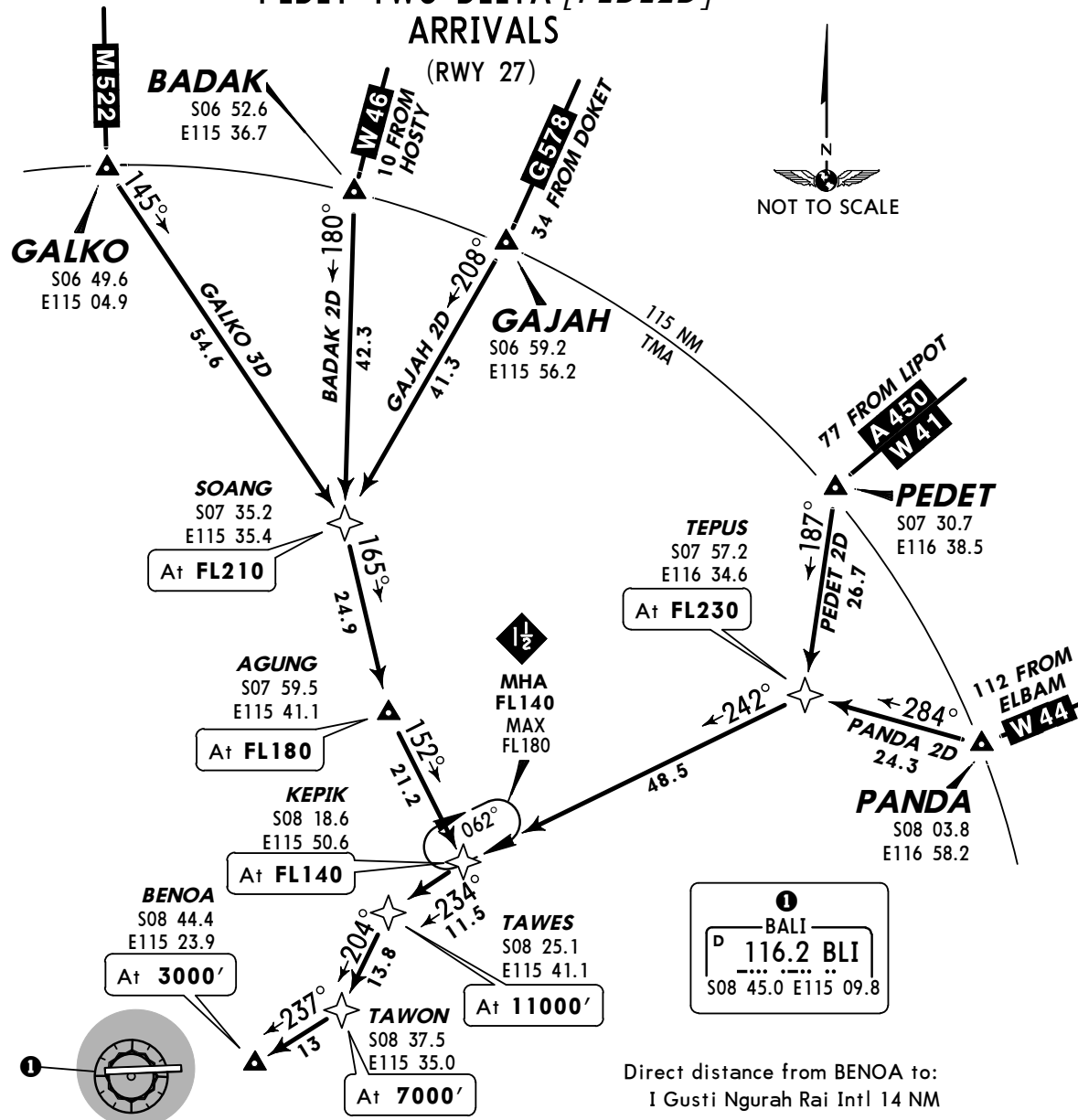
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WADD/DPS**I GUSTI NGURAH RAI INTL**

11 APR 14

(10-2C)**JEPPESEN****BALI, INDONESIA****RNAV STAR***ATIS
126.2Apt Elev
14'Set Alt: hPa Trans level: FL130 Trans alt: 11000'
RNAV 1.

**BADAK TWO DELTA [BADA2D],
GAJAH TWO DELTA [GAJA2D],
GALKO THREE DELTA [GALK3D],
PANDA TWO DELTA [PAND2D],
PEDET TWO DELTA [PEDE2D]**

ARRIVALS

STAR	ROUTING
BADAK TWO DELTA	From W-46 after BADAK then to SOANG at FL210, then to AGUNG at FL180, then to KEPIK at FL140, then to TAWES at 11000', then to TAWON at 7000', then proceed to BENOA at 3000'.
GAJAH TWO DELTA	From G-578 after GAJAH then to SOANG at FL210, then to AGUNG at FL180, then to KEPIK at FL140, then to TAWES at 11000', then to TAWON at 7000', then proceed to BENOA at 3000'.
GALKO THREE DELTA	From M-522 after GALKO then to SOANG at FL210, then to AGUNG at FL180, then to KEPIK at FL140, then to TAWES at 11000', then to TAWON at 7000', then proceed to BENOA at 3000'.
PANDA TWO DELTA	From W-44 after PANDA then to TEPUS at FL230, then to KEPIK at FL140, then to TAWES at 11000', then to TAWON at 7000', then proceed to BENOA at 3000'.
PEDET TWO DELTA	From W-41 after PEDET then to TEPUS at FL230, then to KEPIK at FL140, then to TAWES at 11000', then to TAWON at 7000', then proceed to BENOA at 3000'.

WADD/DPS

I GUSTI NGURAH RAI INTL

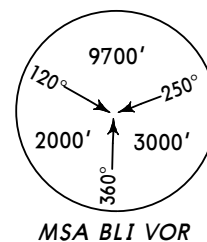
11 APR 14

(10-2D)

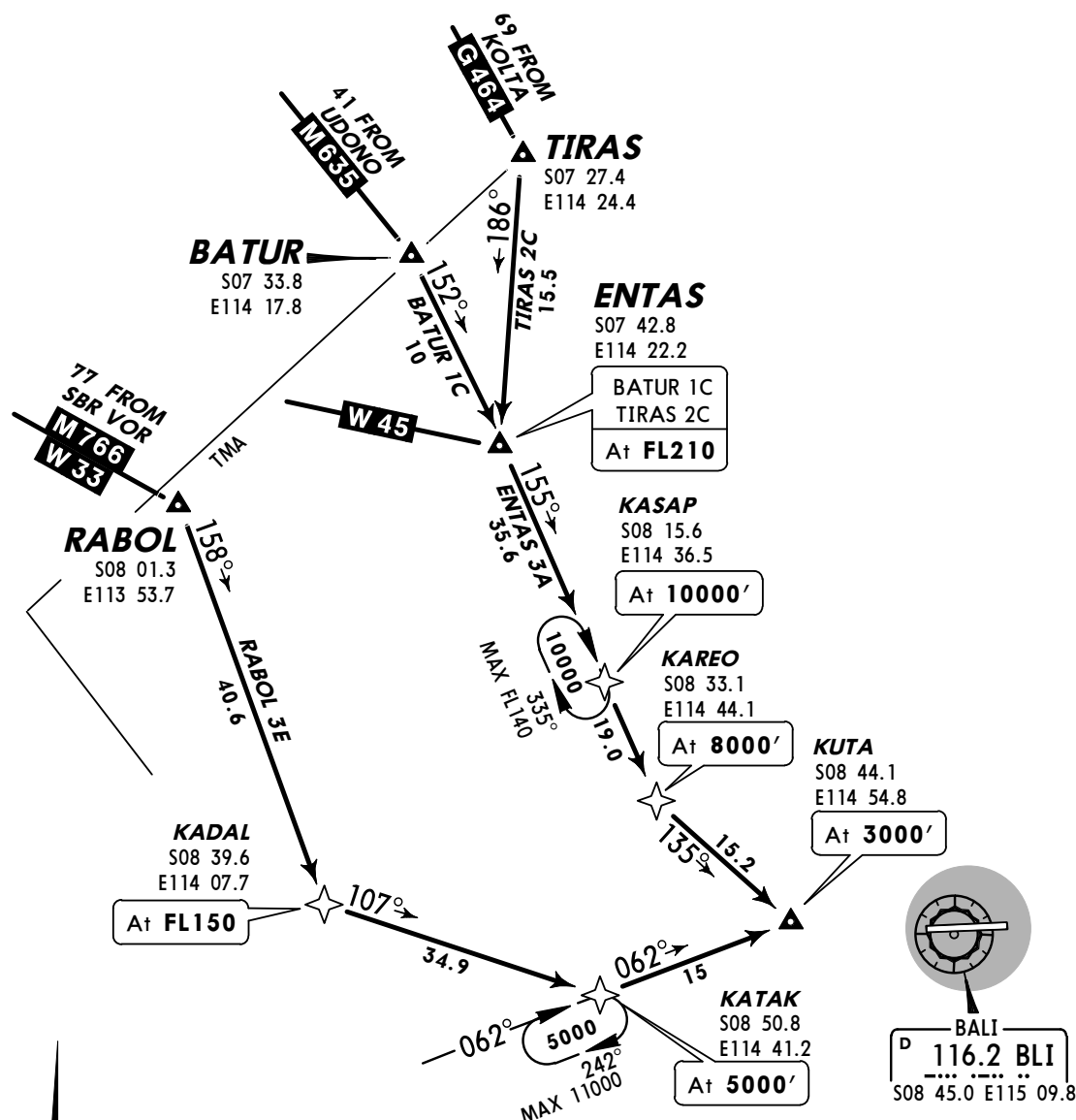
JEPPESEN

BALI, INDONESIA

RNAV STAR

*ATIS
126.2Apt Elev
14'Set Alt: hPa Trans level: FL130 Trans alt: 11000'
RNAV 1.

BATUR ONE CHARLIE [BATU1C],
ENTAS THREE ALPHA [ENTA3A],
RABOL THREE ECHO [RABO3E],
TIRAS TWO CHARLIE [TIRA2C]
ARRIVALS
(RWY 09)



NOT TO SCALE

Direct distance from KUTA to:
I Gusti Ngurah Rai Intl 15 NM

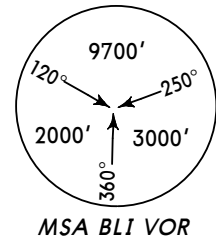
STAR	ROUTING
BATUR ONE CHARLIE	From BATUR to ENTAS at FL210, then to KASAP at 10000', then to KAREO at 8000', then proceed to KUTA at 3000'.
ENTAS THREE ALPHA	From ENTAS to KASAP at 10000', then to KAREO at 8000', then proceed to KUTA at 3000'.
RABOL THREE ECHO	From W-33, M-766 after RABOL to KADAL at FL150, then to KATAK at 5000', then proceed to KUTA at 3000'.
TIRAS TWO CHARLIE	From TIRAS to ENTAS at FL210, then to KASAP at 10000', then to KAREO at 8000', then proceed to KUTA at 3000'.

WADD/DPS
I GUSTI NGURAH RAI INTL

11 APR 14

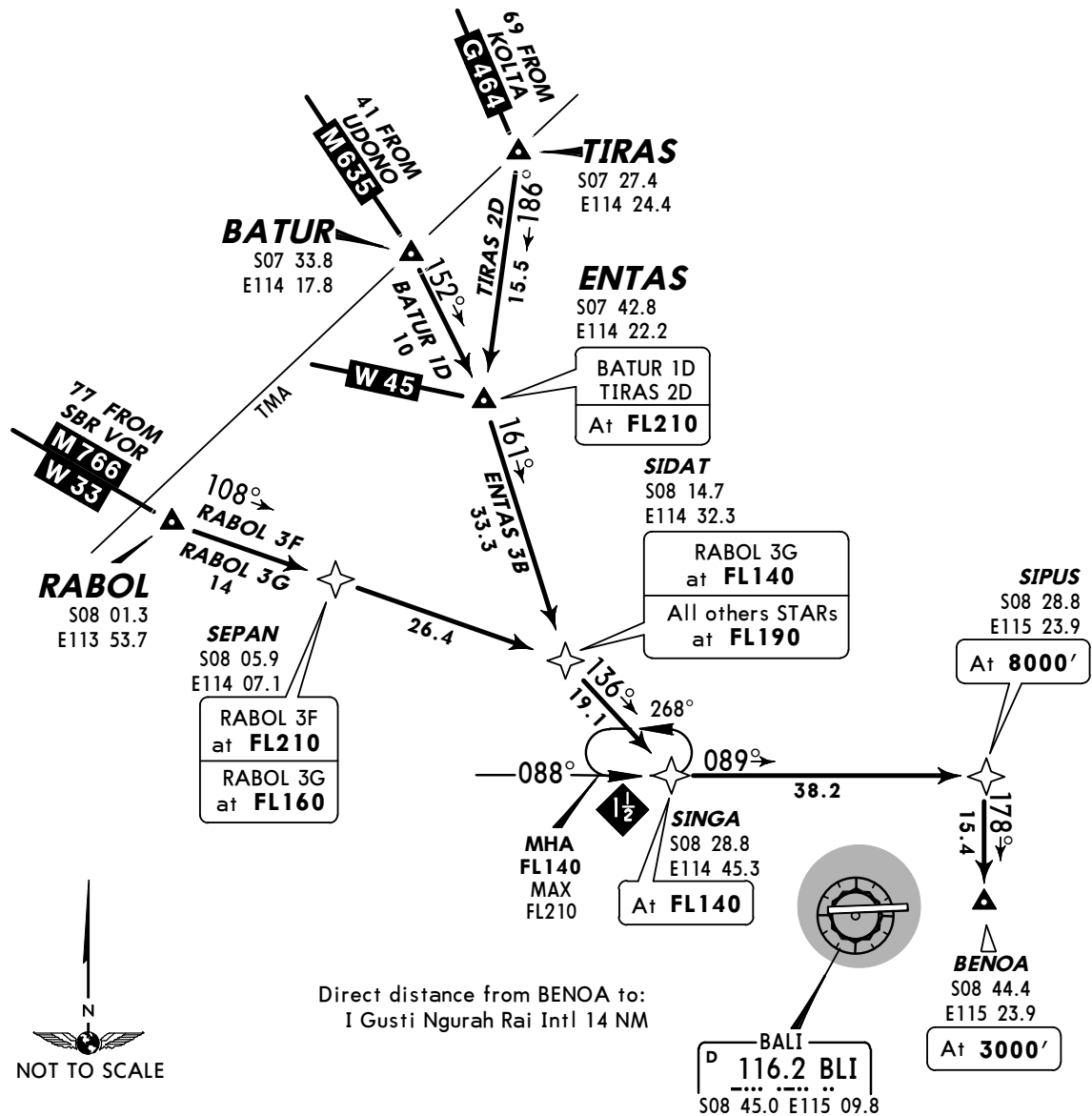
JEPPESEN
10-2E**BALI, INDONESIA**
RNAV STAR

*ATIS 126.2	Apt Elev 14'	Set Alt: hPa Trans level: FL130 Trans alt: 11000' RNAV 1.
-----------------------	------------------------	--



**BATUR ONE DELTA [BATU1D],
ENTAS THREE BRAVO [ENTA3B],
RABOL THREE FOXTROT [RABO3F],
RABOL THREE GOLF [RABO3G],
TIRAS TWO DELTA [TIRA2D]**
ARRIVALS

(RWY 27)

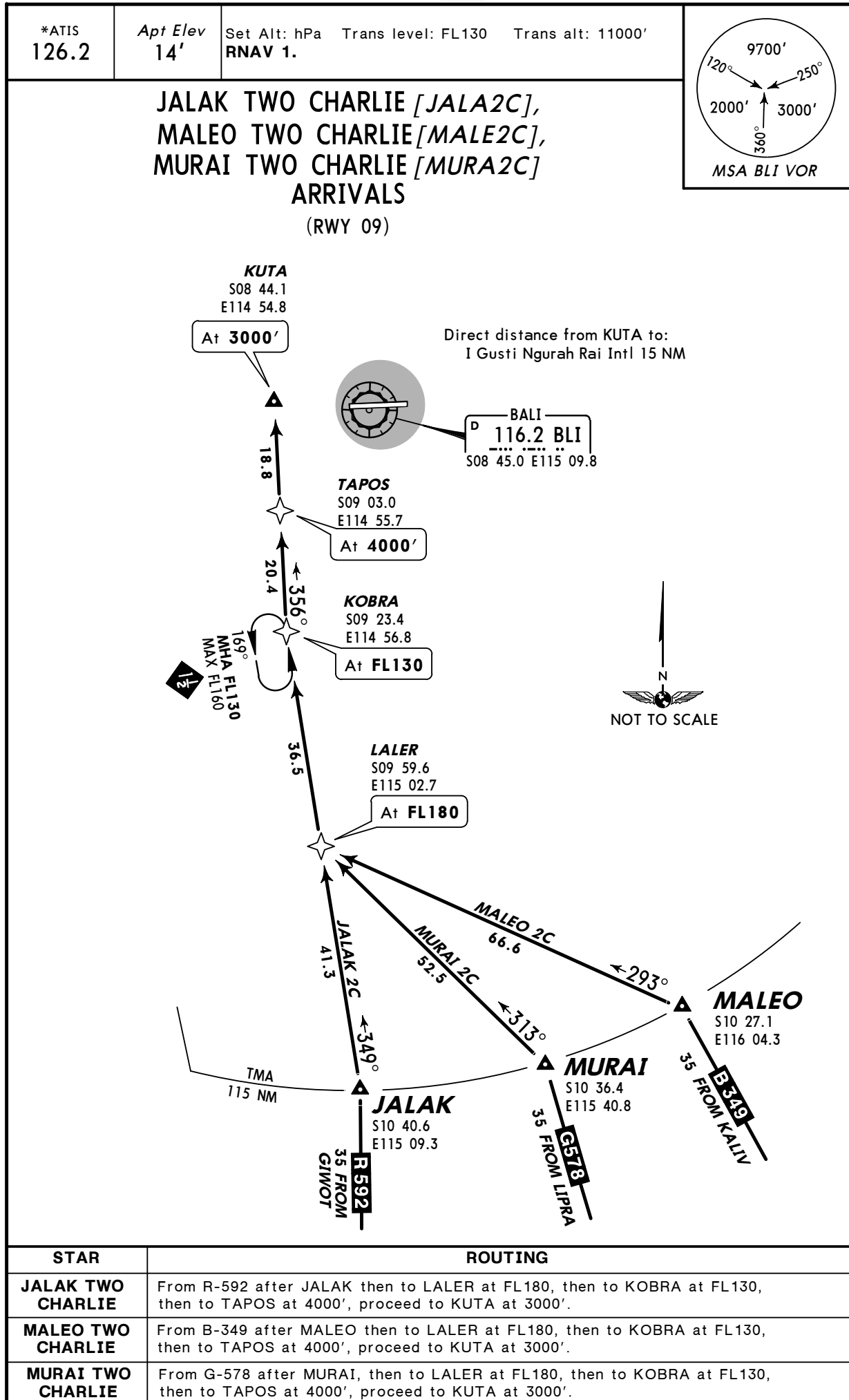


STAR	ROUTING
BATUR ONE DELTA	From BATUR to ENTAS at FL210, then to SIDAT at FL190, then to SINGA at FL140, then to SIPUS at 8000', then proceed to BENOA at 3000'.
ENTAS THREE BRAVO	From W-45 after ENTAS then to SIDAT at FL190, then to SINGA at FL140, then to SIPUS at 8000', then proceed to BENOA at 3000'.
RABOL THREE FOXTROT	From W-33, M-766 after RABOL then to SEPAN at FL210, then to SIDAT at FL190, then to SINGA at FL140, then to SIPUS at 8000', then proceed to BENOA at 3000'.
RABOL THREE GOLF	From W-33, M-766 after RABOL then to SEPAN at FL160, then to SIDAT at FL140, then to SINGA at FL140, then to SIPUS at 8000', then proceed to BENOA at 3000'.
TIRAS TWO DELTA	From G-464 after TIRAS then to ENTAS at FL210, then to SIDAT at FL190, then to SINGA at FL140, then to SIPUS at 8000', then proceed to BENOA at 3000'.

WADD/DPS
I GUSTI NGURAH RAI INTL

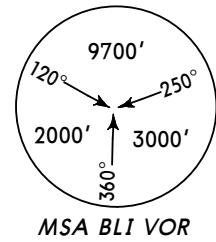
JEPPESEN
11 APR 14 **10-2F**

BALI, INDONESIA
RNAV STAR

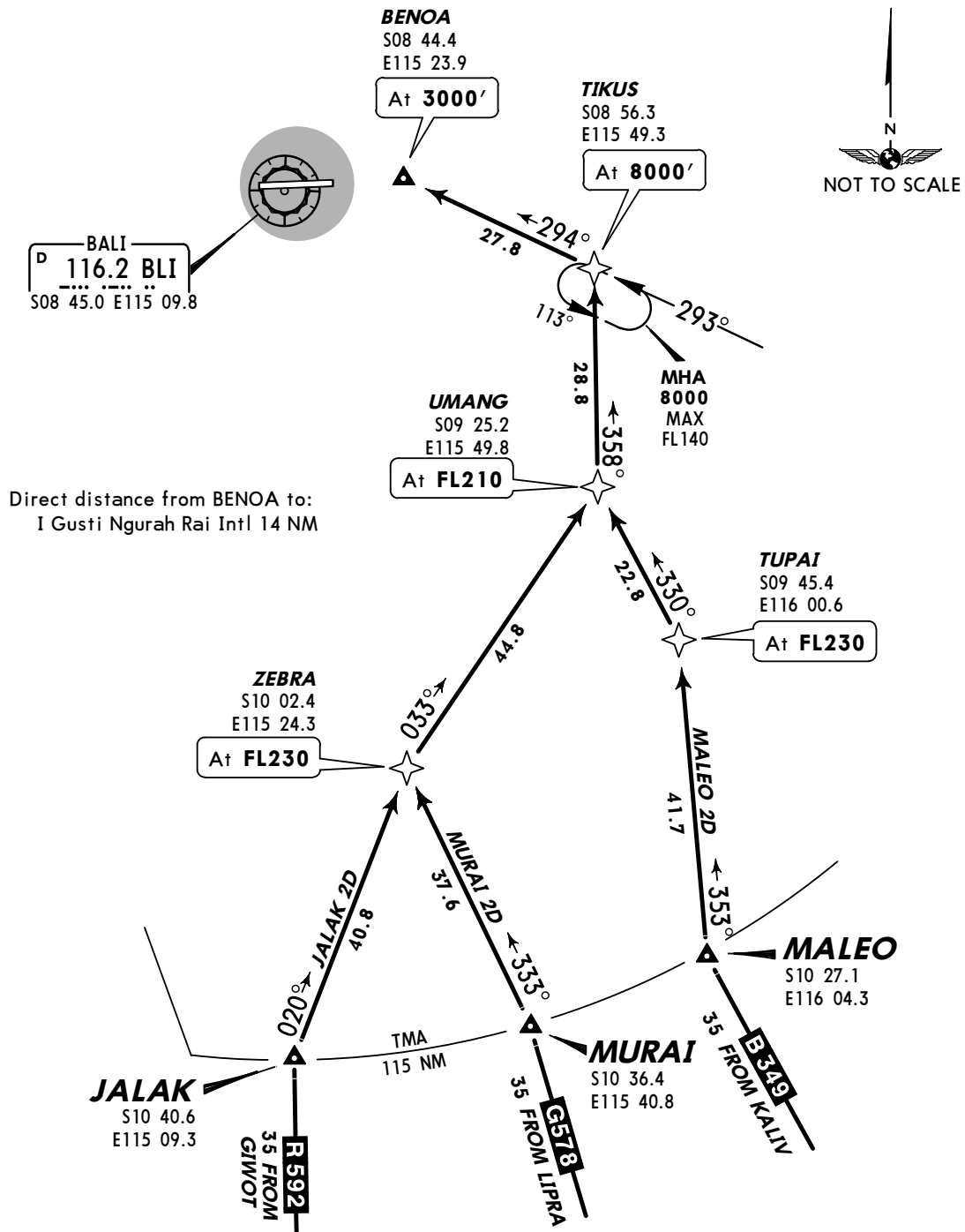


WADD/DPS
I GUSTI NGURAH RAI INTL

11 APR 14

JEPPESEN
10-2G**BALI, INDONESIA****RNAV STAR***ATIS
126.2Apt Elev
14'Set Alt: hPa Trans level: FL130 Trans alt: 11000'
RNAV 1.

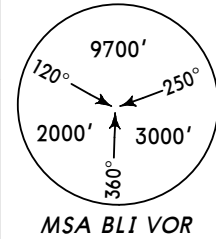
**JALAK TWO DELTA [JALA2D],
MALEO TWO DELTA [MALE2D],
MURAI TWO DELTA [MURA2D]
ARRIVALS
(RWY 27)**



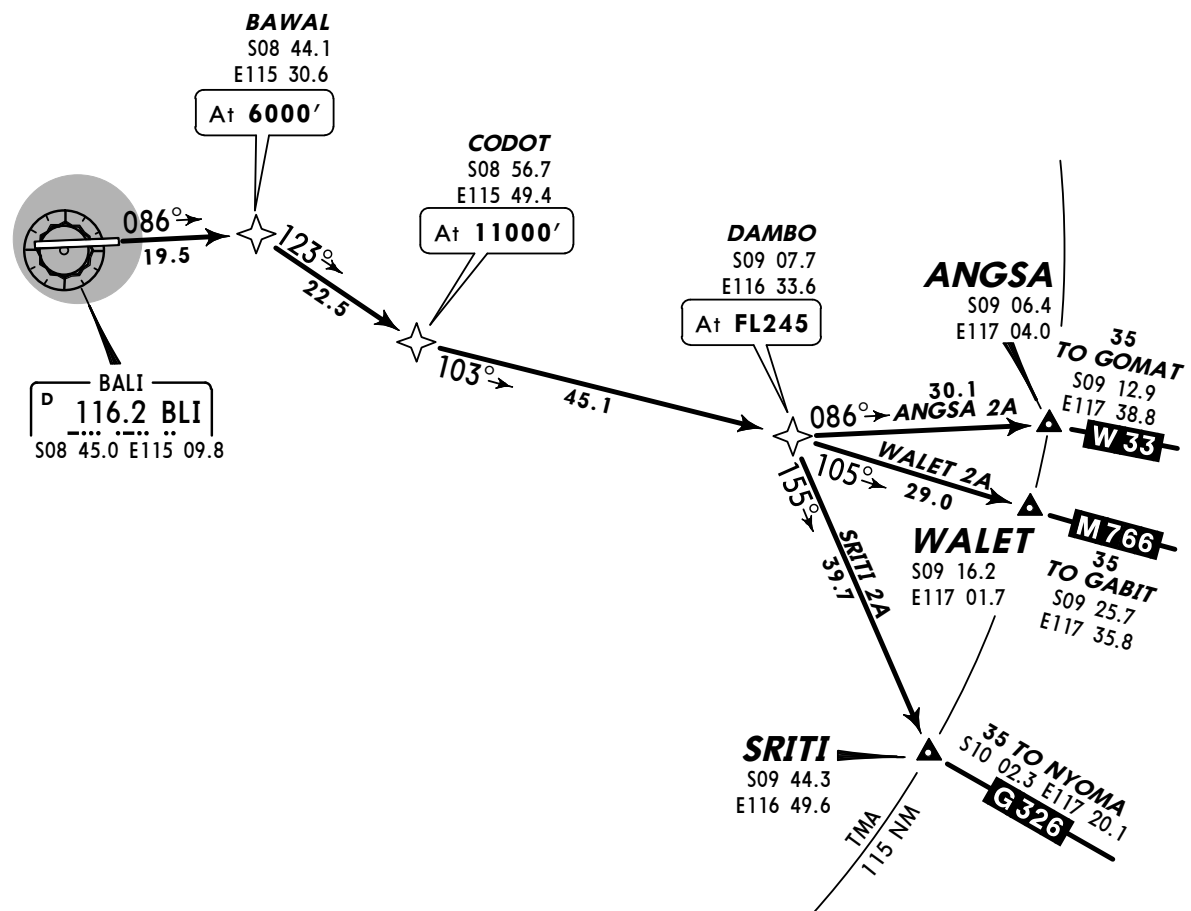
STAR	ROUTING
JALAK TWO DELTA	From R-592 after JALAK then to ZEBRA at FL230, then to UMANG at FL210 then to TIKUS at 8000', proceed to BENOA at 3000'.
MALEO TWO DELTA	From B-349 after MALEO then to TUPAI at FL230, then to UMANG at FL210, then to TIKUS at 8000', proceed to BENOA at 3000'.
MURAI TWO DELTA	From G-578 after MURAI, then to ZEBRA at FL230, then to UMANG at FL210, then to TIKUS at 8000', proceed to BENOA at 3000'.

WADD/DPS**I GUSTI NGURAH RAI INTL**

11 APR 14

JEPPESEN**10-3****BALI, INDONESIA****RNAV SID****Apt Elev**
14'Trans level: FL130 Trans alt: 11000'
RNAV 1.

**ANGSA TWO ALPHA [ANGS2A],
SRITI TWO ALPHA [SRIT2A],
WALET TWO ALPHA [WALE2A]
DEPARTURES**
(RWY 09)

**INITIAL CLIMB**

Take off to BAWAL at 6000', then to CODOT at 11000', then to DAMBO at FL245.

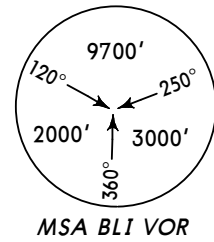
SID	ROUTING
ANGSA TWO ALPHA	From DAMBO proceed to ANGSA.
SRITI TWO ALPHA	From DAMBO proceed to SRITI.
WALET TWO ALPHA	From DAMBO proceed to WALET.

WADD/DPS
I GUSTI NGURAH RAI INTL

11 APR 14

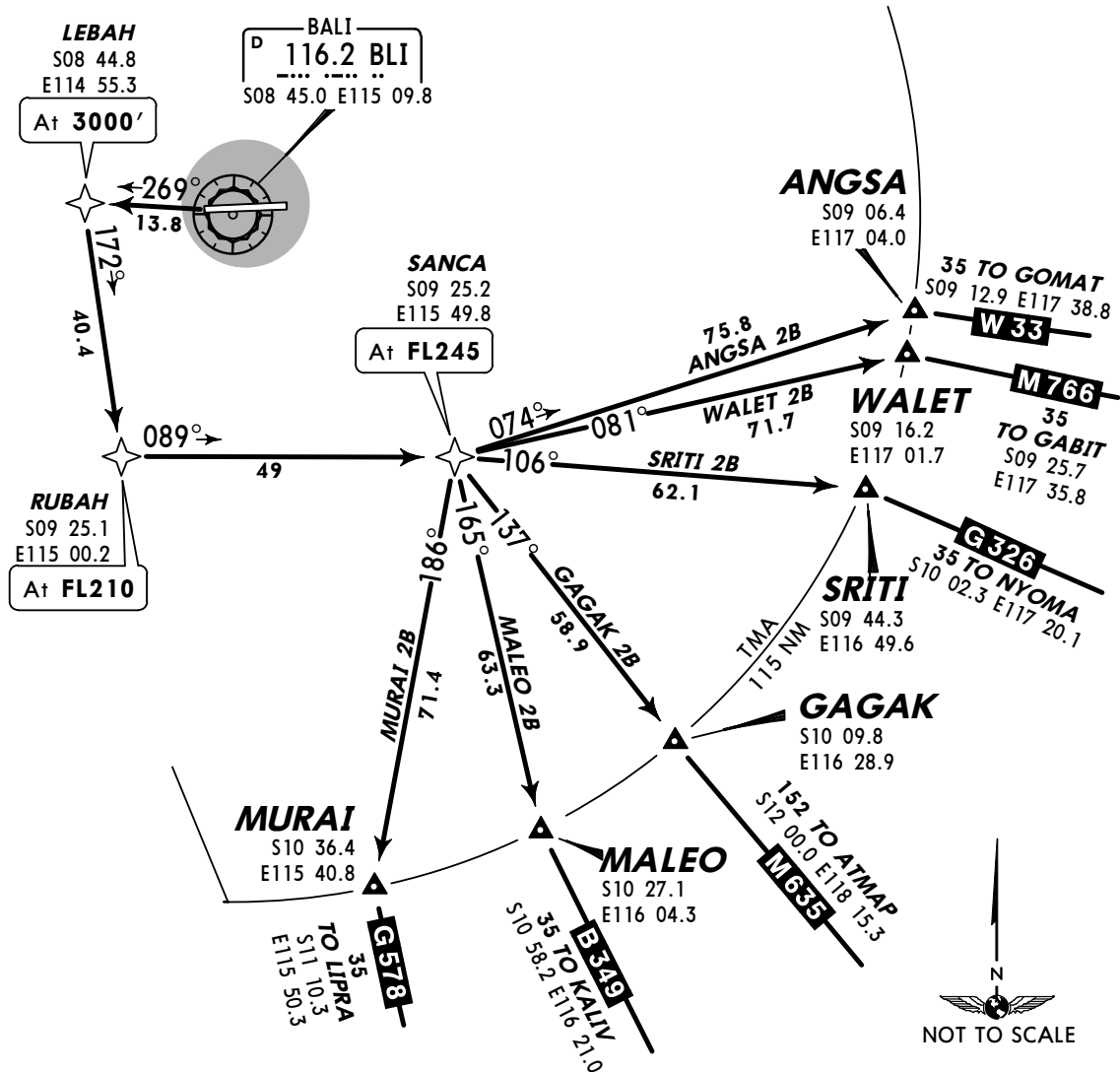
(10-3A)
JEPPESSEN
BALI, INDONESIA
RNAV SID

 Apt Elev
 14'

 Trans level: FL130 Trans alt: 11000'
 RNAV 1.


ANGSA TWO BRAVO [ANGS2B],
GAGAK TWO BRAVO [GAGA2B],
MALEO TWO BRAVO [MALE2B],
MURAI TWO BRAVO [MURA2B],
SRITI TWO BRAVO [SRIT2B]
WALET TWO BRAVO [WALE2B]
DEPARTURES

(RWY 27)


INITIAL CLIMB

Take off, MAINTAIN runway heading to LEBAH at 3000', then turn LEFT to RUBAH at FL210, then to SANCA at FL245.

SID	ROUTING
ANGSA TWO BRAVO	From SANCA proceed to ANGSA.
GAGAK TWO BRAVO	From SANCA proceed to GAGAK.
MALEO TWO BRAVO	From SANCA proceed to MALEO.
MURAI TWO BRAVO	From SANCA proceed to MURAI.
SRITI TWO BRAVO	From SANCA proceed to SRITI.
WALET TWO BRAVO	From SANCA proceed to WALET.

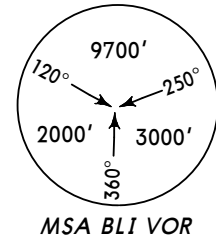
WADD/DPS
I GUSTI NGURAH RAI INTL

JEPPESSEN
11 APR 14 **(10-3B)**

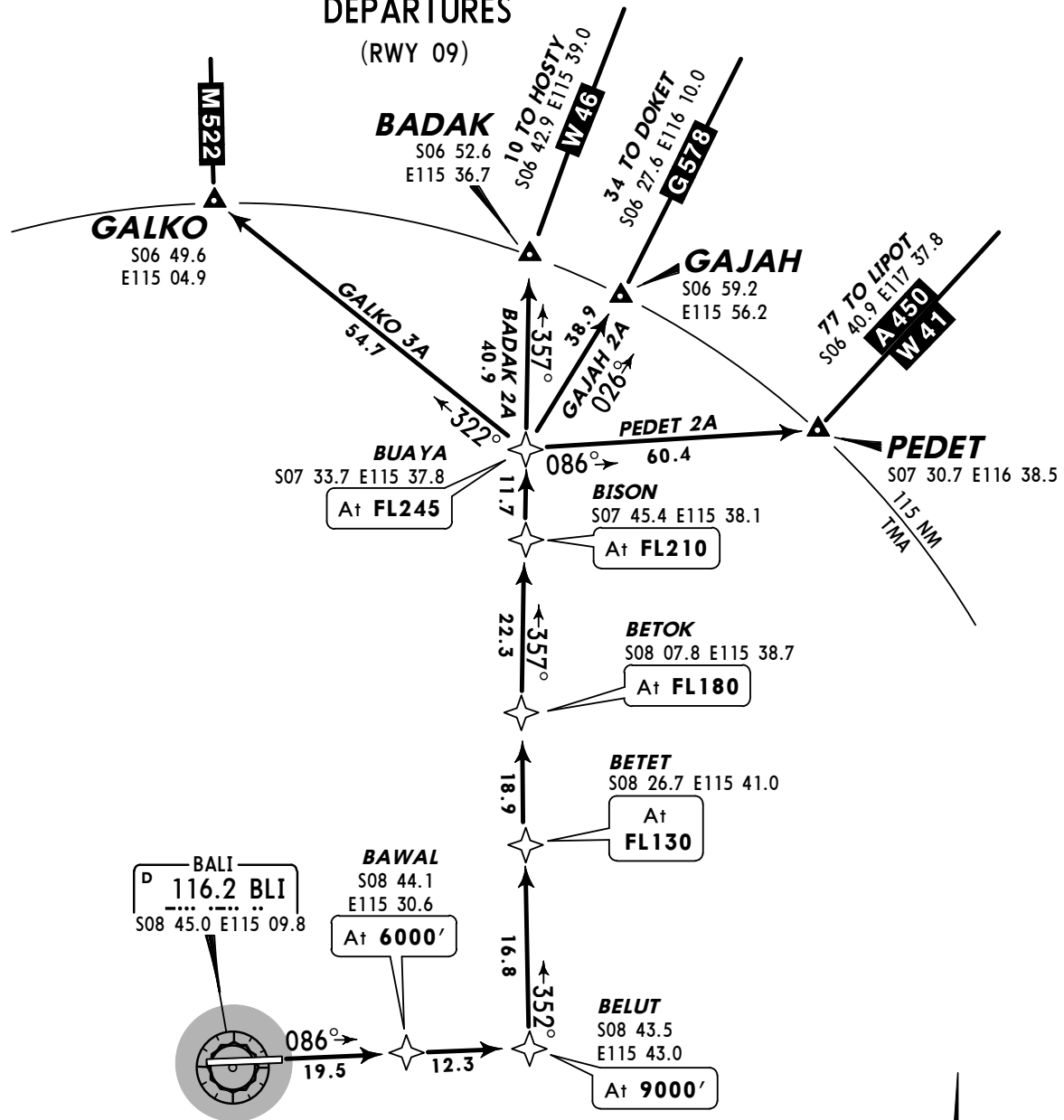
BALI, INDONESIA
RNAV SID

Apt Elev
14'

Trans level: FL130 Trans alt: 11000'
RNAV 1.



**BADAK TWO ALPHA [BADA2A],
GAJAH TWO ALPHA [GAJA2A],
GALKO THREE ALPHA [GALK3A],
PEDET TWO ALPHA [PEDE2A]**
DEPARTURES
(RWY 09)



INITIAL CLIMB

Take off to BAWAL at 6000', then to BELUT at 9000', then to BETET at FL130, then to BETOK at FL180, then to BISON at FL210, then to BUAYA at FL245.

SID	ROUTING
BADAK TWO ALPHA	From BUAYA proceed to BADAK.
GAJAH TWO ALPHA	From BUAYA proceed to GAJAH.
GALKO THREE ALPHA	From BUAYA proceed to GALKO.
PEDET TWO ALPHA	From BUAYA proceed to PEDET.

WADD/DPS

I GUSTI NGURAH RAI INTL

11 APR 14

JEPPESEN

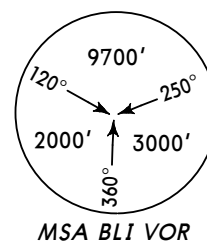
10-3C

BALI, INDONESIA

RNAV SID

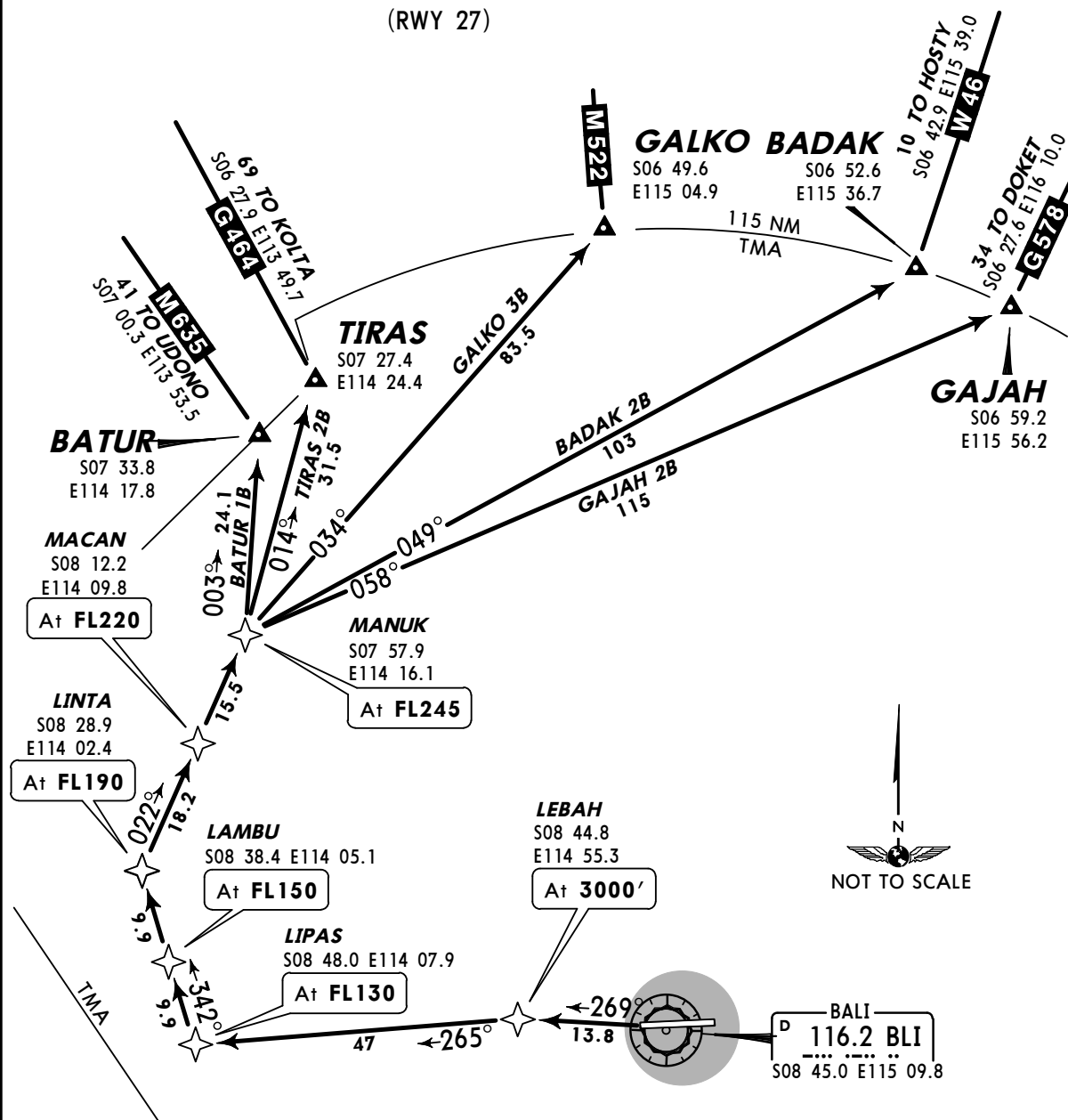
Apt Elev
14'

Trans level: FL130 Trans alt: 11000'
RNAV 1.



BADAK TWO BRAVO [BADA2B],
 BATUR ONE BRAVO [BATU1B],
 GAJAH TWO BRAVO [GAJA2B],
 GALKO THREE BRAVO [GALK3B],
 TIRAS TWO BRAVO [TIRA2B]
 DEPARTURES

(RWY 27)



INITIAL CLIMB

Take off, MAINTAIN runway heading to LEBAH at 3000', then to LIPAS at FL130, then to LAMBU at FL150, then to LINTA at FL190, then to MACAN at FL220, then to MANUK at FL245.

SID	ROUTING
BADAK TWO BRAVO	From MANUK proceed to BADAK.
BATUR ONE BRAVO	From MANUK proceed to BATUR.
GAJAH TWO BRAVO	From MANUK proceed to GAJAH.
GALKO THREE BRAVO	From MANUK proceed to GALKO.
TIRAS TWO BRAVO	From MANUK proceed to TIRAS.

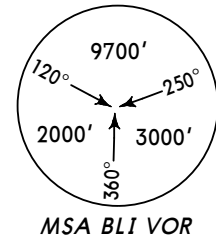
WADD/DPS
I GUSTI NGURAH RAI INTL

11 APR 14

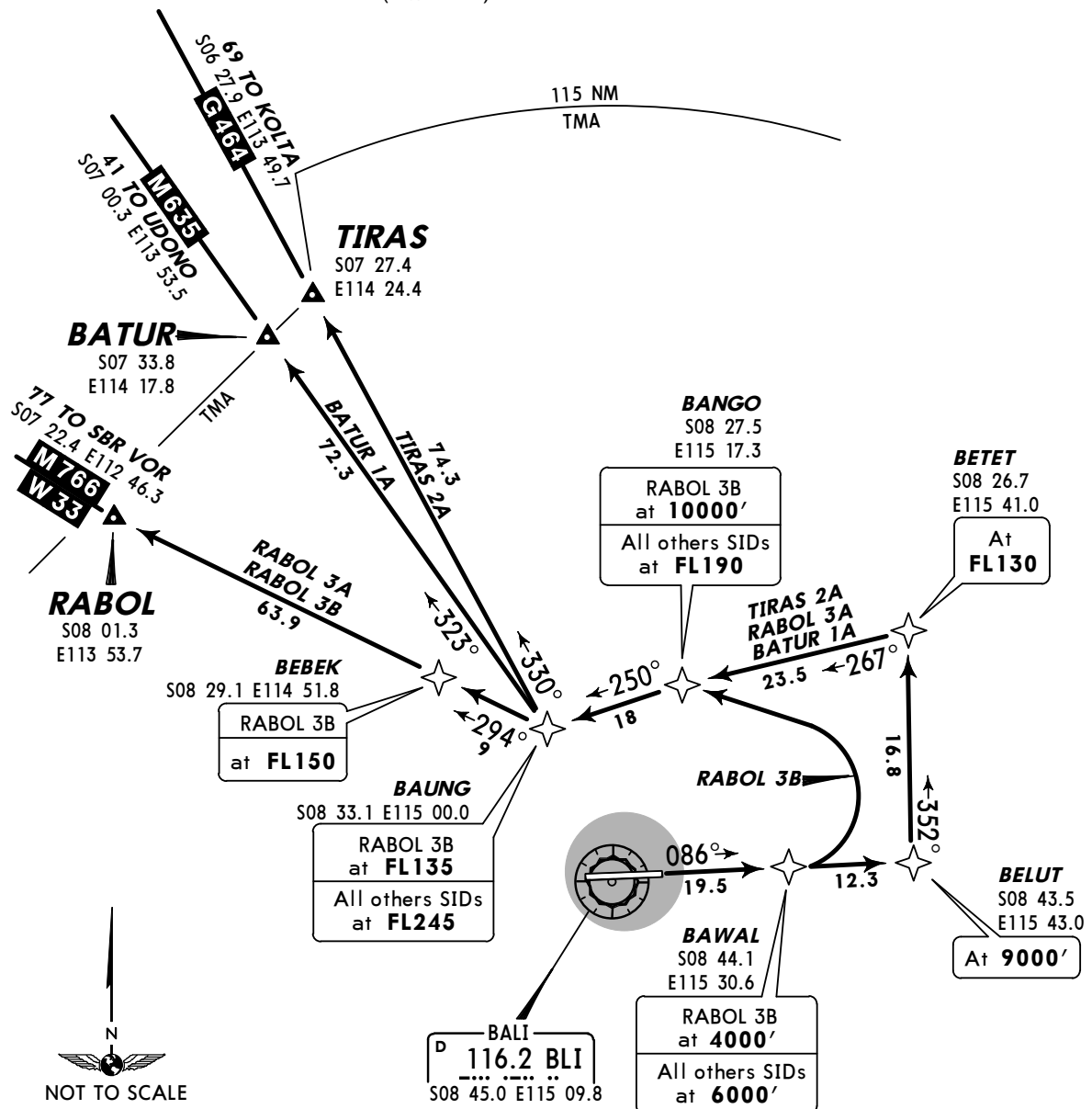
JEPPESEN
10-3D

BALI, INDONESIA

RNAV SID

Apt Elev
14'Trans level: FL130 Trans alt: 11000'
RNAV 1.

**BATUR ONE ALPHA [BATU1A],
RABOL THREE ALPHA [RABO3A],
RABOL THREE BRAVO [RABO3B],
TIRAS TWO ALPHA [TIRA2A]
DEPARTURES
(RWY 09)**



WADD/DPS

I GUSTI NGURAH RAI INTL

11 APR 14



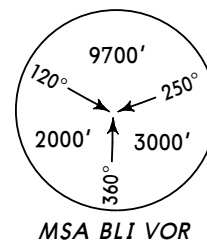
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BALI, INDONESIA

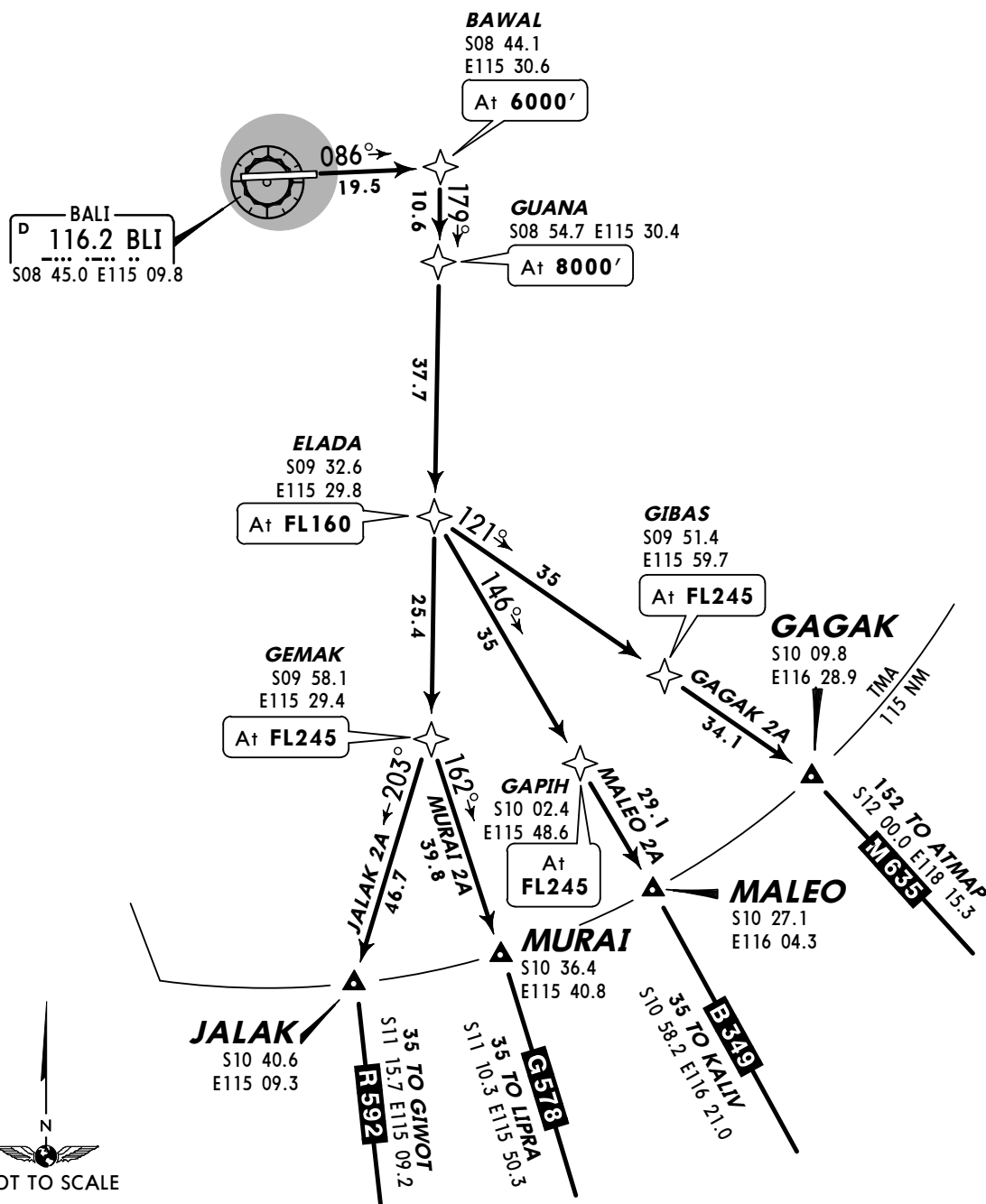
RNAV SID

Apt Elev
14'

Trans level: FL130 Trans alt: 11000'



GAGAK TWO ALPHA [GAGA2A],
JALAK TWO ALPHA [JALA2A],
MALEO TWO ALPHA [MALE2A],
MURAI TWO ALPHA [MURA2A]
DEPARTURES
(RWY 09)



INITIAL CLIMB

Take off to BAWAL at 6000', then to GUANA at 8000', then to ELADA at FL160.

SID	ROUTING
GAGAK TWO ALPHA	From ELADA to GIBAS at FL245, then proceed to GAGAK.
JALAK TWO ALPHA	From ELADA to GEMAK at FL245, then proceed to JALAK.
MALEO TWO ALPHA	From ELADA to GAPIH at FL245, then proceed to MALEO.
MURAI TWO ALPHA	From ELADA to GEMAK at FL245, then proceed to MURAI.

WADD/DPS

I GUSTI NGURAH RAI INTL

11 APR 14

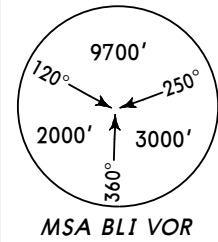
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JEPPESSEN

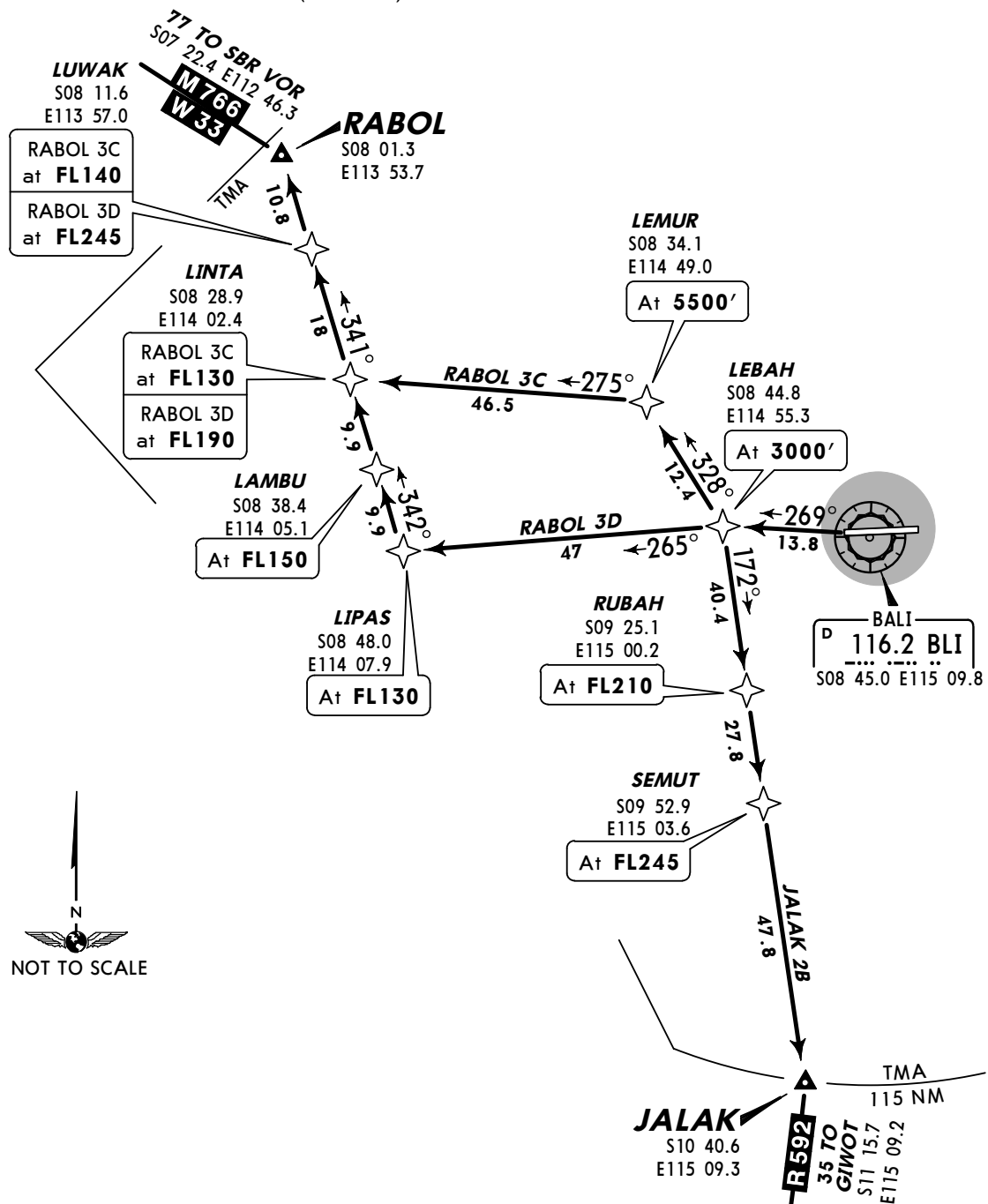
BALI, INDONESIA

RNAV SID

 Apt Elev
 14'

 Trans level: FL130 Trans alt: 11000'
 RNAV 1.


**JALAK TWO BRAVO [JALA2B],
 RABOL THREE CHARLIE [RABO3C],
 RABOL THREE DELTA [RABO3D]
 DEPARTURES**
 (RWY 27)

**INITIAL CLIMB**

Take off, MAINTAIN runway heading to LEBAH at 3000'.

SID	ROUTING
JALAK TWO BRAVO	From LEBAH turn LEFT to RUBAH at FL210, then to SEMUT at FL245, then proceed to JALAK.
RABOL THREE CHARLIE	From LEBAH turn RIGHT to LEMUR at 5500', then to LINTA at FL130, then to LUWAK at FL140, then proceed to RABOL.
RABOL THREE DELTA	From LEBAH to LIPAS at FL130, then to LAMBU at FL150, then to LINTA at FL190, then to LUWAK at FL245, then proceed to RABOL.

WADD/DPS
I GUSTI NGURAH RAI INTL

11 APR 14

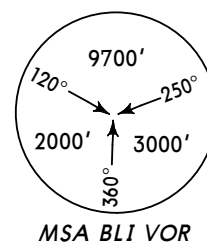
JEPPESSEN
APR 14 10-3G

BALI, INDONESIA

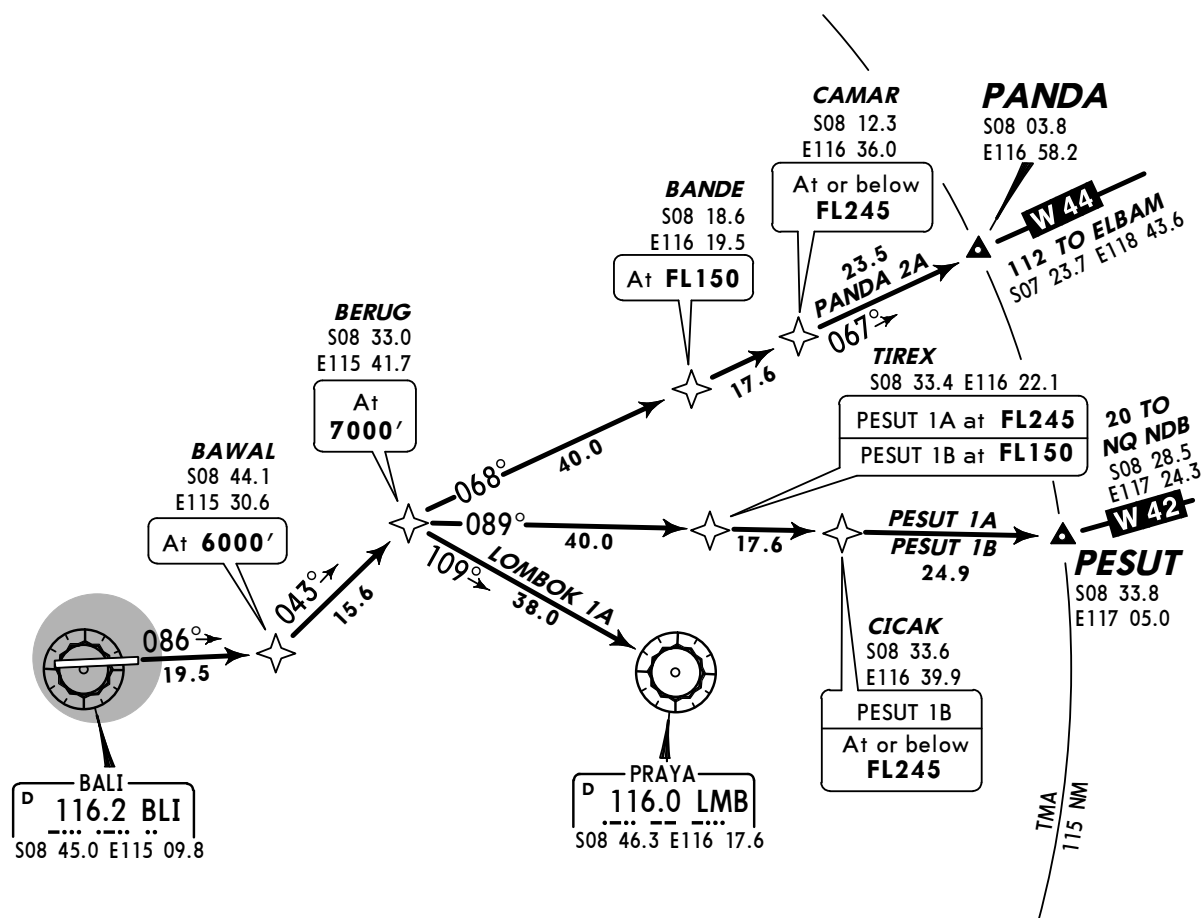
RNAV SID

Apt Elev
14'

Trans level: FL130 Trans alt: 11000'
RNAV 1.



LOMBOK ONE ALPHA [LOMB1A],
PANDA TWO ALPHA [PAND2A],
PESUT ONE ALPHA [PESU1A],
PESUT ONE BRAVO [PESU1B]
DEPARTURES
 (RWY 09)



INITIAL CLIMB

Take off to BAWAL at 6000', then to BERUG at 7000'.

SID	ROUTING
LOMBOK ONE ALPHA	From BERUG proceed to LMB.
PANDA TWO ALPHA	From BERUG to BANDE at FL150, then to CAMAR at FL245 or below, then to PANDA.
PESUT ONE ALPHA	From BERUG to TIREX at FL245, then to PESUT.
PESUT ONE BRAVO	From BERUG to TIREX at FL150, then to CICAk at FL245 or below, then to PESUT.

CHANGES: Airport name.

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WADD/DPS

I GUSTI NGURAH RAI INTL

27 JAN 17

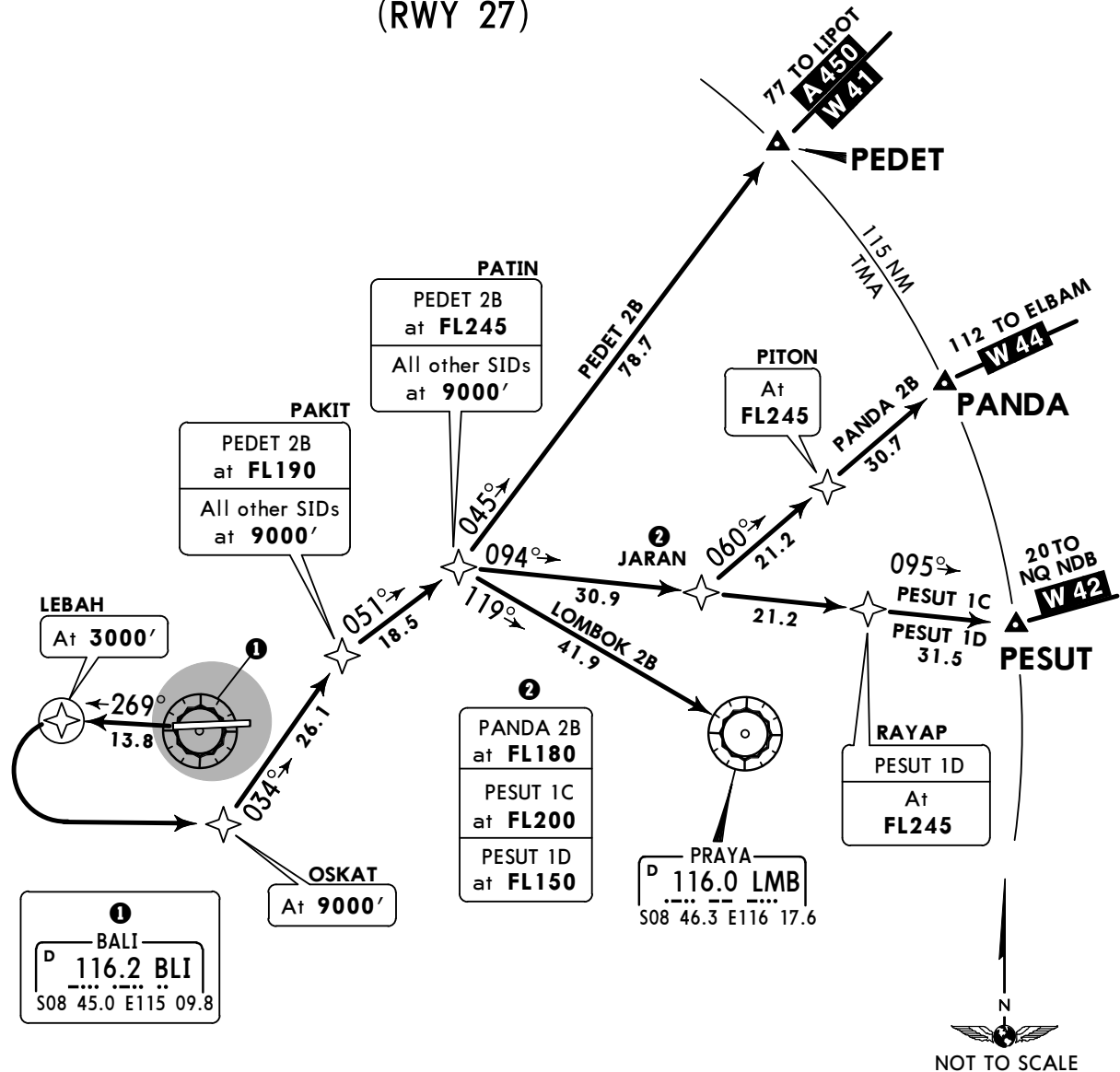
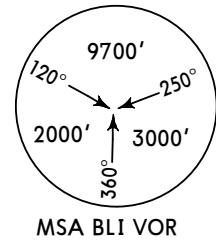
10-3H

BALI, INDONESIA

RNAV SID

Apt Elev
14'Trans level: FL130 Trans alt: 11000'
RNAV 1.

LOMBOK 2B [LOMB2B]
PANDA 2B [PAND2B]
PEDET 2B [PEDE2B]
PESUT 1C [PESU1C]
PESUT 1D [PESU1D]
DEPARTURES
(RWY 27)



INITIAL CLIMB

Take off, MAINTAIN runway heading to LEBAH at 3000', then turn LEFT to OSKAT at 9000', then to PAKIT.

SID	ROUTING
LOMBOK 2B	From PAKIT at 9000' to PATIN at 9000', then proceed to LMB.
PANDA 2B	From PAKIT at 9000' to PATIN at 9000', then to JARAN at FL180, then to PITON at FL245, then proceed to PANDA.
PEDET 2B	From PAKIT at FL190 to PATIN at FL245, then proceed to PEDET.
PESUT 1C	From PAKIT at 9000' to PATIN at 9000', then to JARAN at FL200, then proceed to PESUT.
PESUT 1D	From PAKIT at 9000' to PATIN at 9000', then to JARAN at FL150, then to RAYAP at FL245, then proceed to PESUT.

WADD/DPS

Apt Elev **14'**
S08 44.8 E115 10.1

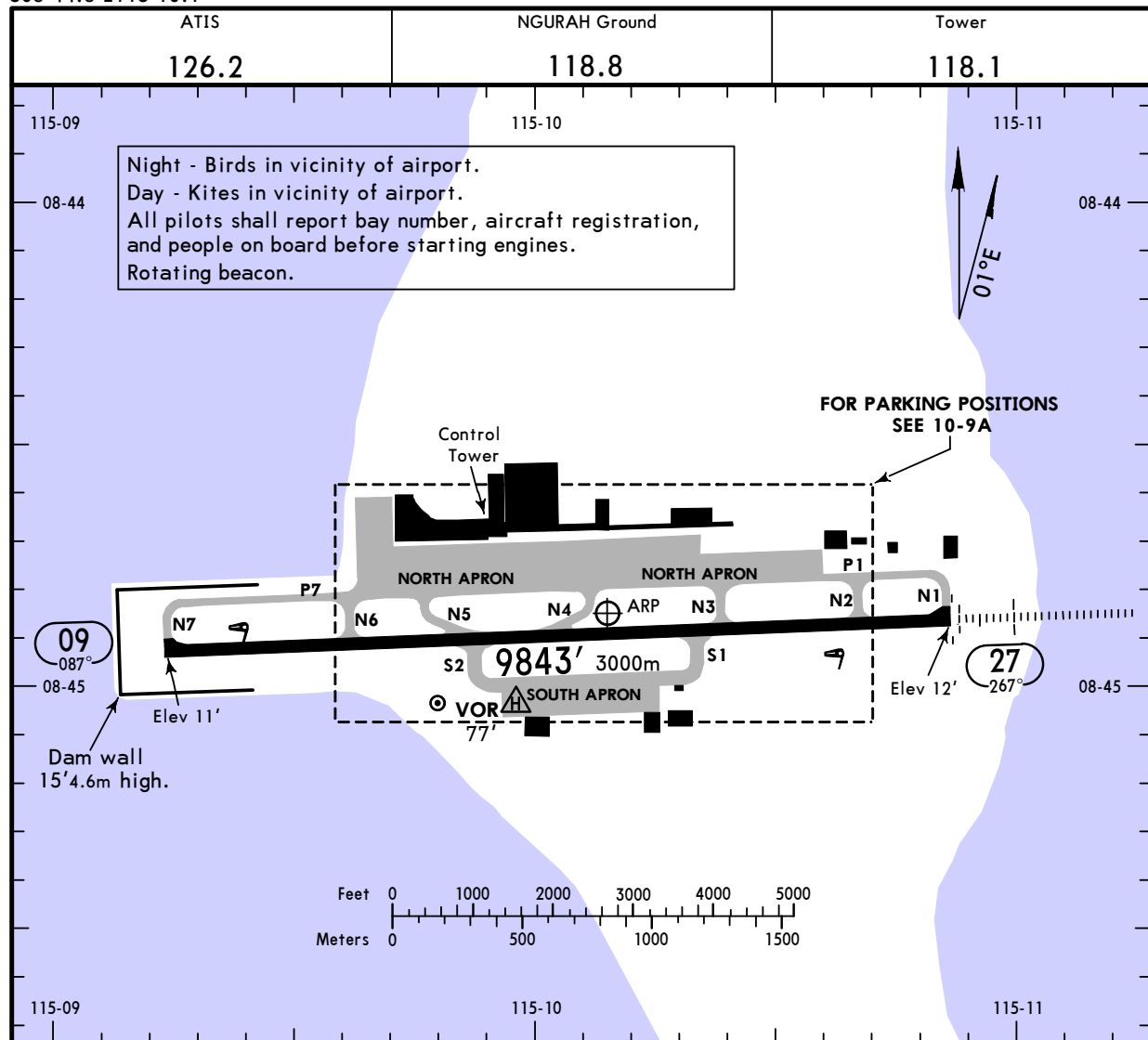
JEPPESEN

10 FEB 17

(10-9)

BALI, INDONESIA

I GUSTI NGURAH RAI INTL



ADDITIONAL RUNWAY INFORMATION

RWY		USABLE LENGTHS		TAKE-OFF	WIDTH
		Threshold	Landing Beyond Glide Slope		
09	HIRL PAPI-L (angle 3.0°)				148'
27	HIRL HIALS PAPI-L (angle 3.0°)		8888' 2709m		45m

GENERAL

Runway closed at 2100-2130 daily and every Tuesday at 1800-2300.

TAKE-OFF

AIR CARRIER (JAA)			AIR CARRIER (FAR 121)	
LVP must be in Force All Rwys RCLM (Day only) or RL		All Rwys RCLM (Day only) or RL	All Rwys Adequate Vis Ref	
A			2 Eng	
B	250m			
C		400m	3 & 4 Eng	400m
D	300m			

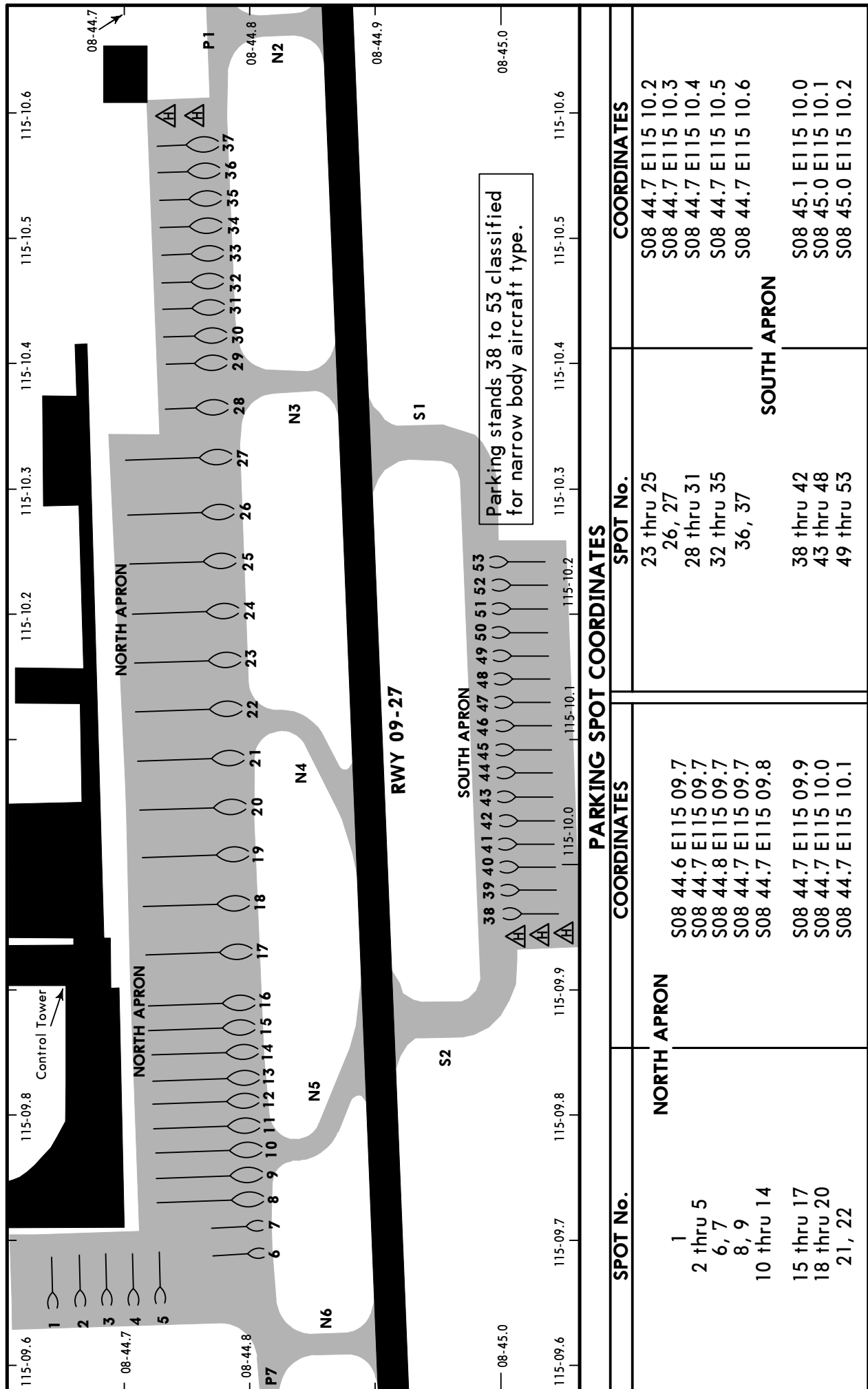
WADD/DPS

10 FEB 17

JEPPESEN

(10-9A)

BALI, INDONESIA
I GUSTI NGURAH RAI INTL



CHANGES: None.

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WADD/DPS**BALI, INDONESIA**
I GUSTI NGURAH RAI INTL**VISUAL DOCKING GUIDANCE SYSTEM****VISUAL DOCKING PARKING GUIDANCE SYSTEM AT AIRCRAFT STANDS**

- a. The RLG visual docking guidance system is installed at parking stand Nr. 17-27 at I Gusti Ngurah Rai Airport.
- b. The system is aligned for interpretation by the pilot in the left hand seat.

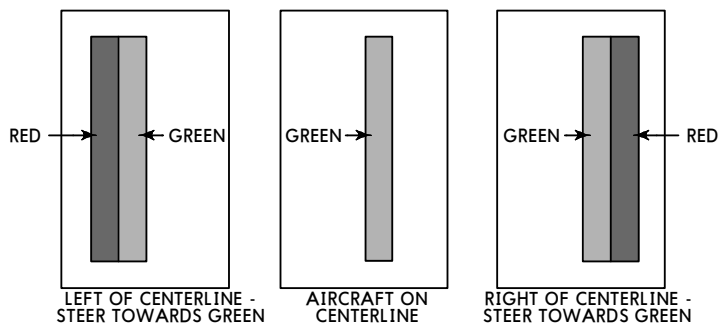
DOCKING PROCEDURES

- a. Pilot while taxiing Aircraft into a parking stand Nr. 17-27 shall stop the aircraft immediately, if he sees that the docking system is not switched on or is unserviceable or when it shows a different Aircraft type.
- b. Aircraft type indication
 1. Confirm Aircraft type displayed prior to turning into stand.
 2. Discontinue docking when wrong Aircraft type is illuminated.

(Aircraft Marshaller shall recheck system or Marshal Aircraft into stand)

c. Centerline Guidance

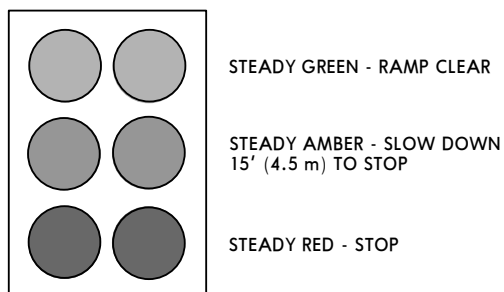
1. Look at bottom half of housing and interpret vertical neon light as shown:



2. Discontinue docking when lights go off.

d. Stopping Guidance

1. Look at round incandescent lamp on top half of housing and interpret as shown:



2. Discontinue docking immediately should lights go off.

(Aircraft Marshaller shall Marshal Aircraft into stand)

WADD/DPS



BALI, INDONESIA
I GUSTI NGURAH RAI INTL

VISUAL DOCKING GUIDANCE SYSTEM

TO AVOID OVER SHOOTING


- a. When Using the RLG system, pilots taxi into stand at minimum speed.
- b. On seeing the round incandescent amber lights, slowdown and prepare to stop.
- c. The round incandescent amber and red lights are activated by the Aircraft as its nose-wheel passes over the indication loops at the parking stand centerline. The lights may not come on if Aircraft is not properly lined up on the centerline. Pilot should stop aircraft immediately when the red lights come on suddenly or when given the stop sign by the Aircraft Marshaller.

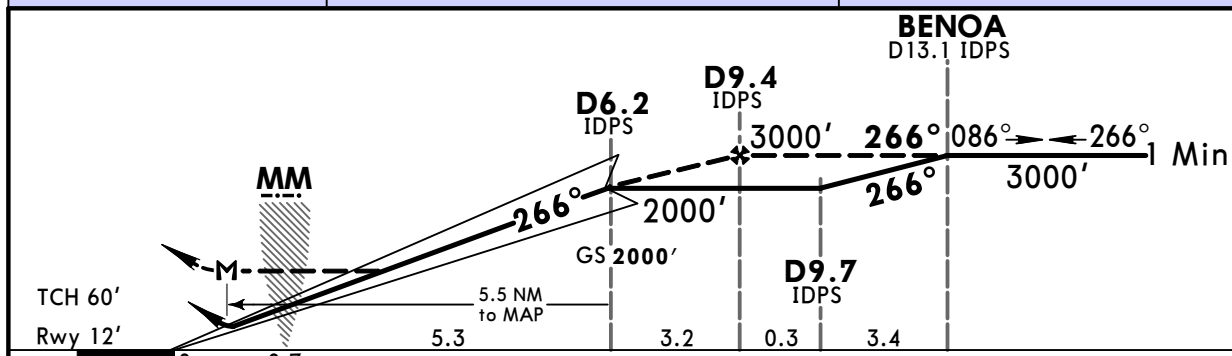
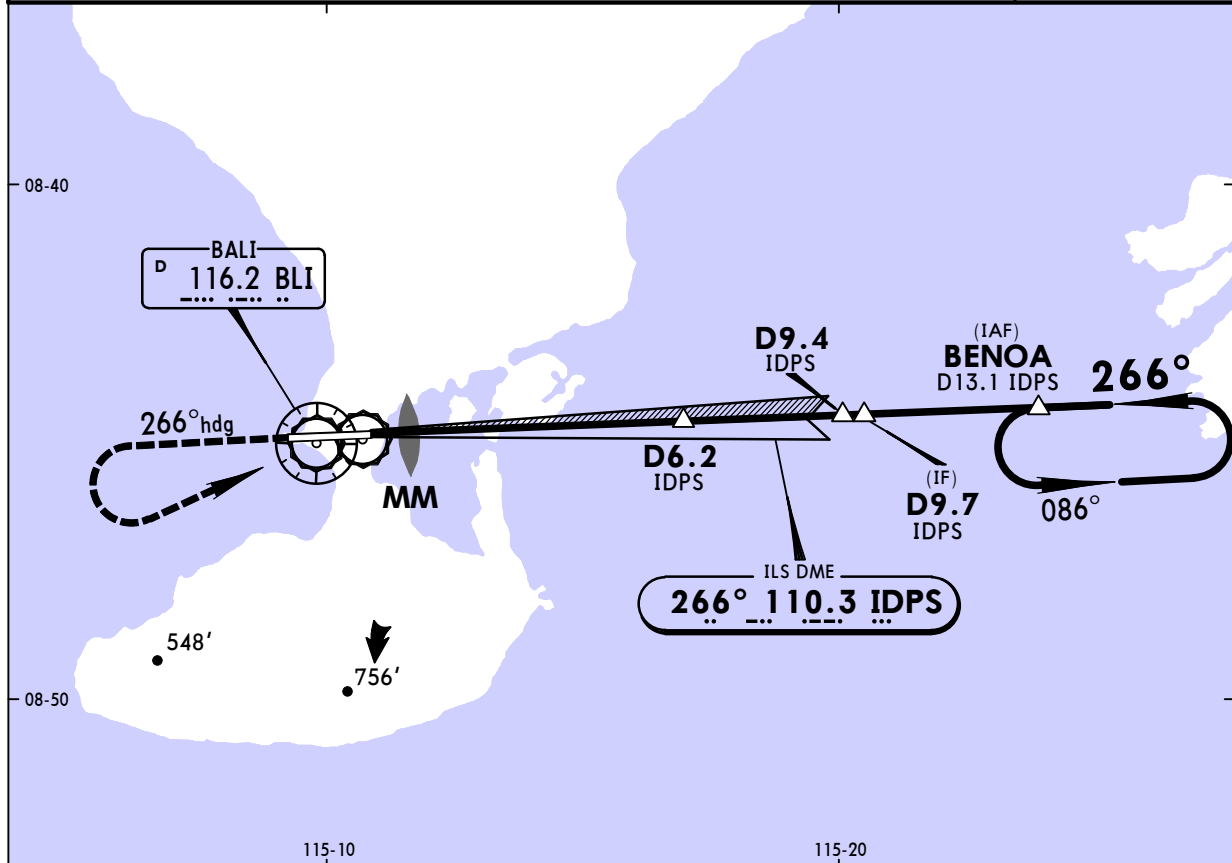
WADD/DPS
I GUSTI NGURAH RAI INTL

JEPPESEN
10 FEB 17 **(11-1)**

BALI, INDONESIA
ILS Rwy 27

BRIEFING STRIP

ATIS 126.2		BALI Director (R) 119.7		NGURAH Tower 118.1		Ground 118.8
LOC IDPS 110.3	Final Apch Crs 266°	GS D6.2 IDPS 2000' (1988')	ILS DA(H) Refer to Minimums	Apt Elev 14' Rwy 12'		
MISSED APCH: Maintain 266° heading until 1500', then turn LEFT, climb to 6000'. Proceed to BENOA holding point via overhead BLI VOR, cross BLI VOR at or above 5000' or as instructed by ATC.						
Alt Set: hPa		Rwy Elev: 0 hPa		Trans level: FL 130		



Gnd speed-Kts	70	90	100	120	140	160		266° hdg	1500' ↑
GS	372	478	531	637	743	849			
Rate of descent on final (feet/min)	362	465	517	621	724	827			
D6.2 IDPS to MAP	5.5	4:43	3:40	3:18	2:45	2:21			

STRAIGHT-IN LANDING RWY27				CIRCLE-TO-LAND	
ILS		LOC (GS out)			
DA(H) CAT A & B 245' (233')		MDA(H) 360' (348')			
CAT C & D 265' (253')					
FULL		ALS out		Max Kts	MDA(H)
				100	720' (706') -1600m
				135	
				180	1250' (1236') -4000m
				205	1250' (1236') -4400m
A	RVR 550m VIS 800m	1200m	800m	1600m	
B					
C			1600m	2000m	
D					

PANS OPS

WADD/DPS

I GUSTI NGURAH RAI INTL

10 FEB 17

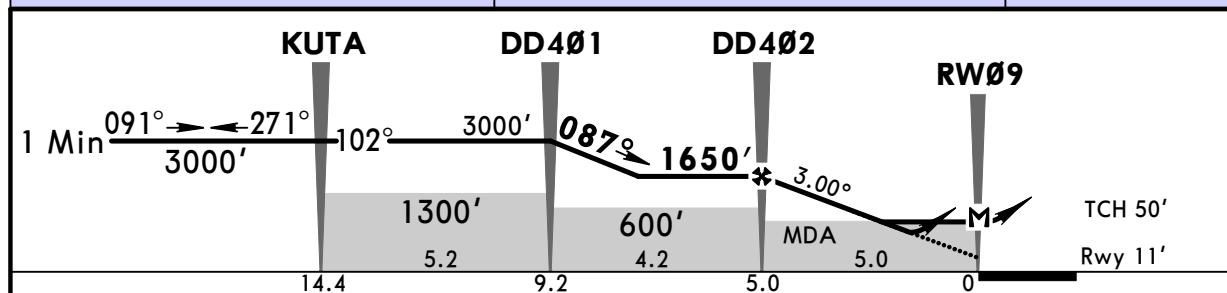
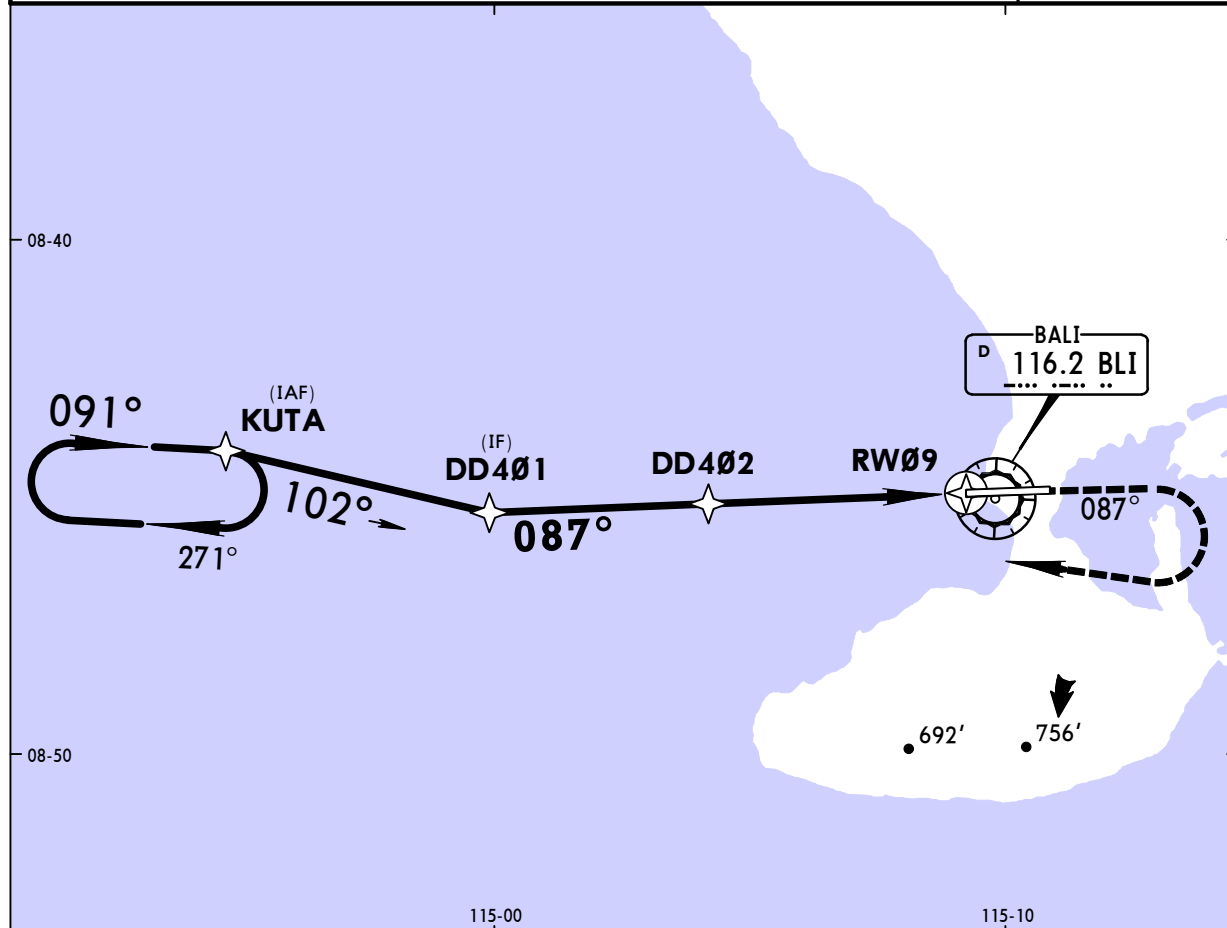
(12-1)

JEPPESSEN

BALI, INDONESIA
RNAV (GNSS) Rwy 09

BRIEFING STRIP

ATIS 126.2		BALI Director (R) 119.7		NGURAH Tower 118.1		Ground 118.8
RNAV	Final Apch Crs 087°	Procedure Alt DD402 1650' (1639')	LNAV/VNAV DA(H) 280' (269')	Apt Elev 14' Rwy 11'		 MSA BLI VOR
MISSED APCH: Climb to 2000' then turn RIGHT direct to KUTA or 3000' for holding or as instructed by ATC.						
Alt Set: hPa		Rwy Elev: 0 hPa		Trans level: FL 130		
1. GNSS required. 2. Baro VNAV not authorized below 15°C (59°F).						
Trans alt: 11000'						



Gnd speed-Kts	70	90	100	120	140	160	PAPI-L	2000'	RT	D	KUTA
Descent Angle	3.00°	372	478	531	637	743					
LNAV/VNAV: MAP at DA											
LNAV: MAP at RW09											

STRAIGHT-IN LANDING RWY 09				CIRCLE-TO-LAND	
LNAV/VNAV		LNAV		Max Kts	MDA(H)
DA(H) 280' (269')		MDA(H) 370' (359')		100	720' (706') -2000m
				135	720' (706') -2400m
				180	1250' (1236') -4000m
				205	1250' (1236') -5000m

PANS OPS

WADD/DPS

I GUSTI NGURAH RAI INTL

10 FEB 17

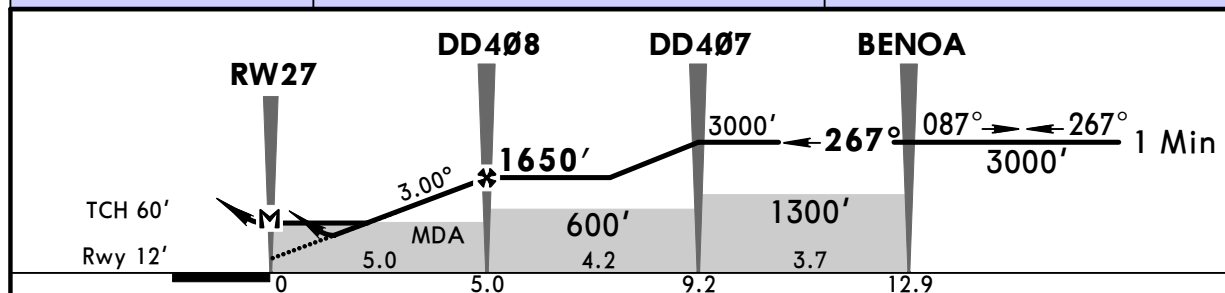
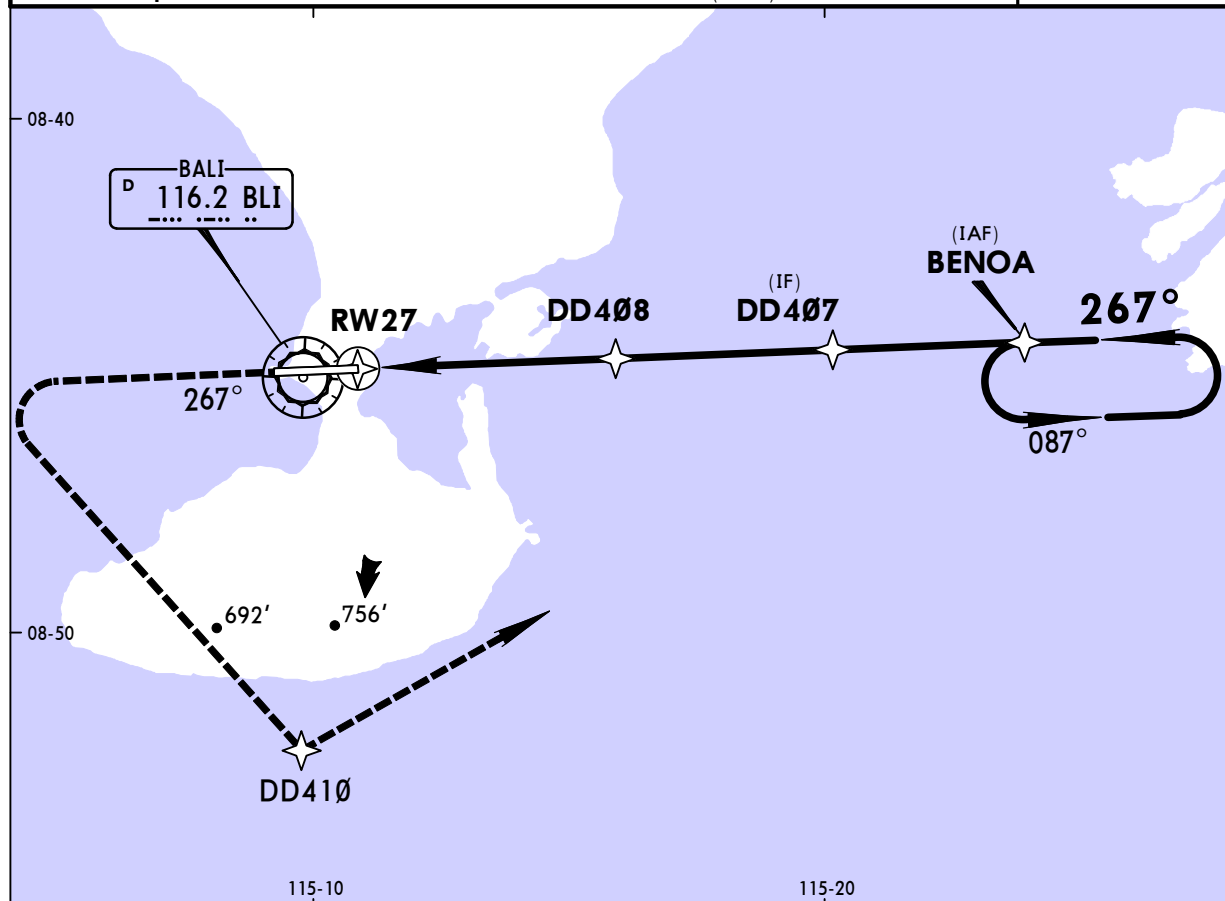
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JEPPESSEN

BALI, INDONESIA
RNAV (GNSS) Rwy 27

BRIEFING STRIP™

ATIS	BALI Director (R)	NGURAH Tower	Ground
126.2	119.7	118.1	118.8
RNAV	Final Apch Crs 267°	Procedure Alt DD408 1650' (1638')	LNAV/VNAV DA(H) 300' (288')
		Apt Elev 14'	Rwy 12'
MISSED APCH: Climb to 3000' then turn LEFT direct to DD410 at or above 5000', then to BENOA for holding or as instructed by ATC.			
Alt Set: hPa	Rwy Elev: 0 hPa	Trans level: FL 130	Trans alt: 11000'
1. GNSS required. 2. Baro VNAV not authorized below 15°C (59°F).			
			MSA BLI VOR



Gnd speed-Kts	70	90	100	120	140	160	HIALS	3000'	LT	DD410
Descent Angle	3.00°	372	478	531	637	743	PAPI			
LNAV/VNAV: MAP at DA										
LNAV: MAP at RW27										

STRAIGHT-IN LANDING RWY 27				CIRCLE-TO-LAND	
LNAV/VNAV		LNAV		Max Kts	MDA(H)
DA(H) 300' (288')		MDA(H) 390' (378')			
ALS out		ALS out		100	720' (706') -2100m
				135	720' (706') -2400m
				180	1250' (1236') -4000m
				205	1250' (1236') -5000m
A	1850m	2100m			
B					
C					
D					

PANS OPS

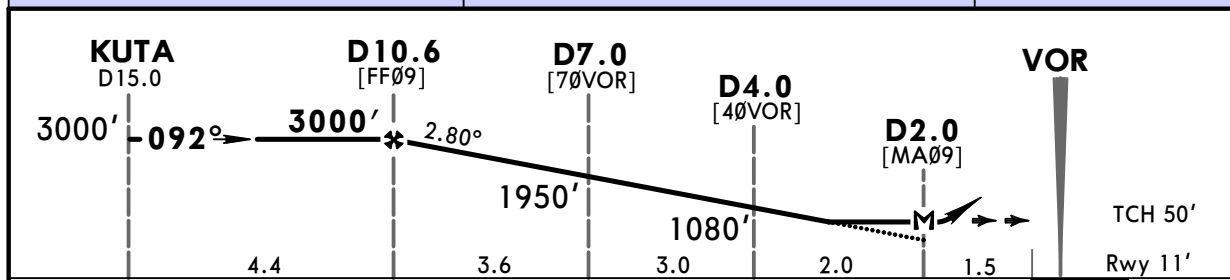
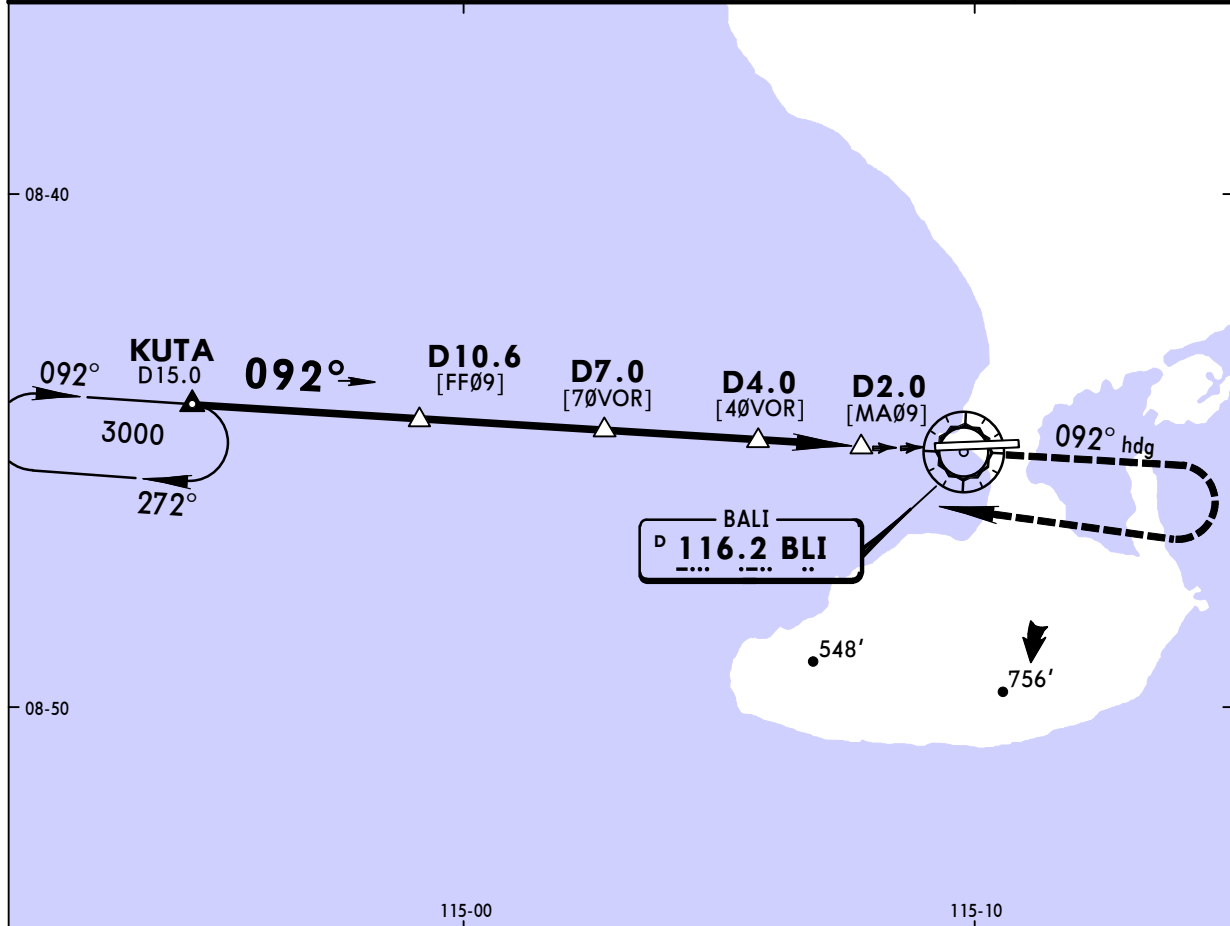
WADD/DPS
I GUSTI NGURAH RAI INTL

JEPPESEN
10 FEB 17 **(13-1)**

BALI, INDONESIA
VOR DME Rwy 09

BRIEFING STRIP

ATIS 126.2		BALI Director (R) 119.7		NGURAH Tower 118.1		Ground 118.8	
VOR BLI 116.2	Final Apch Crs 092°	Minimum Alt D10.6 3000' (2989')	MDA(H) 470' (459')	Apt Elev 14' Rwy 11'		A circular diagram with a center point. Four arrows point from the center to the circumference at 120°, 250°, 360°, and 2000' (at the bottom). The altitude 9700' is written at the top. The altitude 3000' is written at the right. The altitude 2000' is written at the bottom-left.	
MISSED APCH: Maintain heading 092° climb to 3000', then turn RIGHT and proceed to KUTA D15.0 or contact ATC for further instructions.							
Alt Set: hPa		Rwy Elev: 0 hPa		Trans level: FL 130		Trans alt: 11000'	
						MSA BLI VOR	



Gnd speed-Kts	70	90	100	120	140	160	PAPI-L	092° hdg	3000' ↑	RT	KUTA
Descent Angle	2.80°	347	446	495	594	792					
MAP at D2.0											

STRAIGHT-IN LANDING RWY09				CIRCLE-TO-LAND			
MDA(H) 470' (459')				Max Kts	MDA(H)		
2600m				100	720' (706') - 2600m		
				135			
				180	1250' (1236') - 4000m		
				205	1250' (1236') - 5000m		

PANS OPS

WADD/DPS

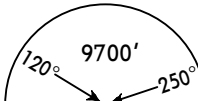
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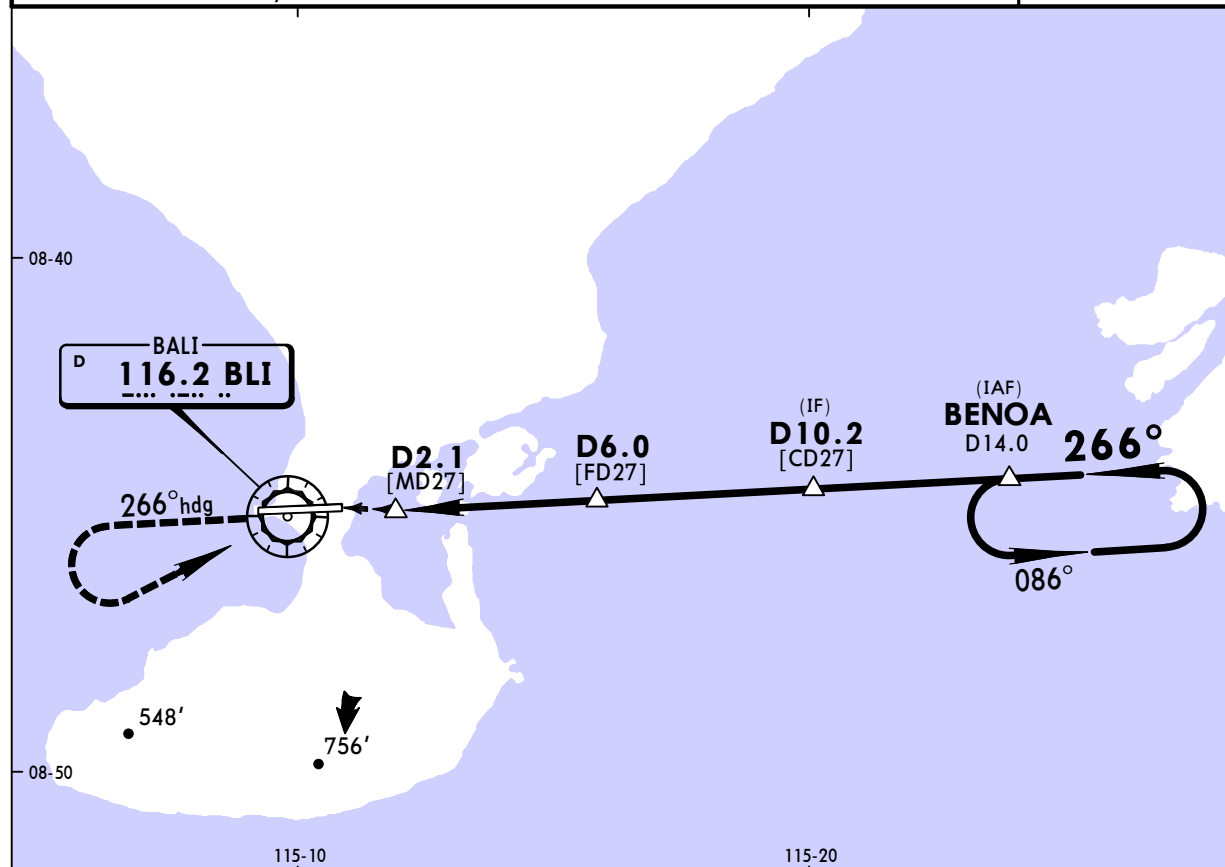
JEPPesen

10 FEB 17 **(13-2)**

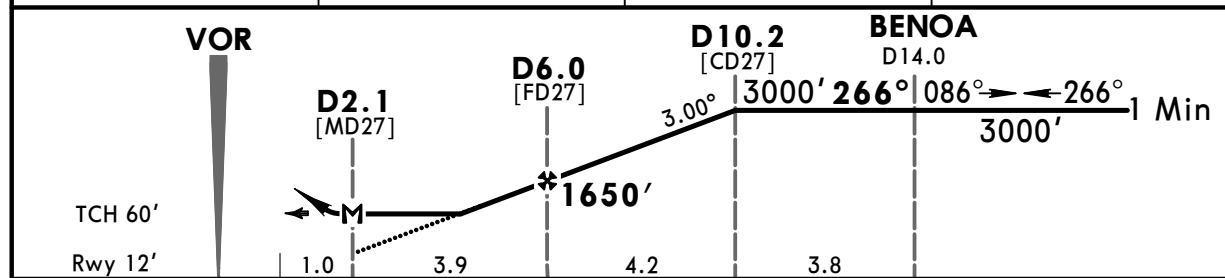
BALI, INDONESIA
VOR DME Rwy 27

BRIEFING STRIP

ATIS 126.2		BALI Director (R) 119.7		NGURAH Tower 118.1		Ground 118.8	
VOR BLI 116.2	Final Apch Crs 266°	Minimum Alt D6.0 1650' (1638')	MDA(H) 370' (358')	Apt Elev 14' Rwy 12'			
MISSED APCH: Maintain 266° heading until 2000', then turn LEFT climb to 6000' proceed to D14.0 holding point via overhead BLI VOR, cross BLI VOR at or above 5000' or as instructed by ATC.							
Alt Set: hPa		Rwy Elev: 0 hPa		Trans level: FL 130		Trans alt: 11000'	
MSA BLI VOR							



Distance from VOR	D3.0	D4.0	D5.0
ALTITUDE	698'	1016'	1335'



Gnd speed-Kts	70	90	100	120	140	160	
Descent Angle 3.00°	372	478	531	637	743	849	
MAP at D2.1 or							
D6.0 to MAP	3.9	3:21	2:36	2:20	1:57	1:40	

STRAIGHT-IN LANDING RWY 27				CIRCLE-TO-LAND			
MDA(H) 370' (358')							
ALS out				Max Kts	MDA(H)		
A				100			
B	1600m			135	720'(706') - 1600m		
C				180	1250'(1236') - 4000m		
D	2000m			205	1250'(1236') - 4400m		

PANS OPS