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Email: caas_singaporeais@caas.gov.sgURL: www.caas.gov.sgURL: <https://aim-sg.caas.gov.sg>**AIP Supplement for
Singapore****AIRAC AIP SUP
084/2020****Effective from 03 DEC 2020****PERM****Published on 24 SEP 2020****DEPARTURE AND ARRIVAL PROCEDURES FOR SINGAPORE CHANGI AIRPORT****1 INTRODUCTION**

1.1 This AIP Supplement informs aircraft operators and pilots of new departure and arrival procedures for Runway 02R and 20L, as well as revisions to existing procedures for departures and arrivals to include Runway 02R and 20L, **effective from 03 December 2020 0000UTC**.

1.2 Revision to existing procedures for departures and arrivals

- a. Low level holding areas
- b. RNAV-1 STARs to serve Runway 02 and 20
- c. Vessel movement affecting instrument approaches on Runway 02 and 20
- d. Vessel movement advisories for Runway 02 departures
- e. Total radio failure special procedures

1.3 New departure and arrival procedures for Runway 02R and 20L

- a. Instrument approach procedures
- b. Radar departure SID and climb gradient restrictions

2 REVISION TO EXISTING PROCEDURES FOR DEPARTURES AND ARRIVALS**2.1 Low Level Holding Areas**

2.1.1 With the operationalization of Runway 02R and 20L, the existing low level holding areas at SAMKO and NYLON for procedural traffic landing at Singapore Changi Airport as described in AIP Singapore, ENR 1.5 paragraph 1.3.1 a. and b. will be revised to include Runway 02R and 20L as follows:

- a. RWY 02L/02C/02R - SAMKO Holding Area (SHA) - Lower/Upper limits – 3,500ft / FL140.
- b. RWY 20R/20C/20L - NYLON Holding Area (NHA) - Lower/Upper limits – 2,500ft / FL140.

2.2 RNAV-1 STARs for RWY 02 and 20

2.2.1 The existing Changi Instrument Flight Procedure (IFP) STAR charts published in AIP Singapore are listed in section WSSS AD 2.24. Runway 02R and 20L have been added to these existing IFP STAR charts (refer to Appendix A).

2.2.2 The existing Changi IFP STARs were designed to be only runway direction specific (i.e. it does not serve a specific runway for the given direction). Pilots can expect ATC vectors to the respective Instrument Approach Procedures (IAPs) before reaching the last waypoint on the STAR.

STAR	AIP Reference	AIP SUP Reference
ARAMA 1A	AD-2-WSSS-STAR-1 to 1.1	Appendix A-1 to A-1.1
ASUNA 1A	AD-2-WSSS-STAR-2 to 2.1	Appendix A-2 to A-2.1
ARAMA 1B	AD-2-WSSS-STAR-3 to 3.1	Appendix A-3 to A-3.1
ASUNA 1B	AD-2-WSSS-STAR-4 to 4.1	Appendix A-4 to A-4.1
KARTO 1A	AD-2-WSSS-STAR-5 to 5.1	Appendix A-5 to A-5.1
OBDOS 1A	AD-2-WSSS-STAR-6 to 6.1	Appendix A-6 to A-6.1
KARTO 1B	AD-2-WSSS-STAR-7 to 7.1	Appendix A-7 to A-7.1
OBDOS 1B	AD-2-WSSS-STAR-8 to 8.1	Appendix A-8 to A-8.1
LELIB 3B	AD-2-WSSS-STAR-9 to 9.1	Appendix A-9 to A-9.1
MABAL 2A	AD-2-WSSS-STAR-11 to 11.1	Appendix A-10 to A-10.1
MABAL 2B	AD-2-WSSS-STAR-13 to 13.1	Appendix A-11 to A-11.1
LEBAR 2A	AD-2-WSSS-STAR-14 to 14.1	Appendix A-12 to A-12.1
LEBAR 2B	AD-2-WSSS-STAR-15 to 15.1	Appendix A-13 to A-13.1
REPOV 1A	AD-2-WSSS-STAR-16 to 16.1	Appendix A-14 to A-14.1
SURGA 1A	AD-2-WSSS-STAR-17 to 17.1	Appendix A-15 to A-15.1
REPOV 1B	AD-2-WSSS-STAR-18 to 18.1	Appendix A-16 to A-16.1
SURGA 1B	AD-2-WSSS-STAR-19 to 19.1	Appendix A-17 to A-17.1
ELALO 1A	AD-2-WSSS-STAR-20 to 20.1	Appendix A-18 to A-18.1
ELALO 1B	AD-2-WSSS-STAR-21 to 21.1	Appendix A-19 to A-19.1

2.3 Vessel Movement affecting instrument approaches on Runway 02 and 20

2.3.1 This section will supersede the information published in AIP Singapore, ENR 1.5 paragraph 2.5 and 2.6.

2.3.2 There are possible tall vessel movements in waters around Singapore Changi Airport. As these mobile vessels vary in height and location, they are only indicated as "possible vessel" obstacles in the instrument approach charts.

2.3.3 Information on the heights of these tall vessels are relayed to ATC by the Maritime and Port Authority of Singapore. ATC will advise arriving aircraft of any restrictions on the types of instrument approaches and landing runway.

2.4 Vessel Movement Advisories for Runway 02 Departures

2.4.1 This section will supersede the information published in AIP Singapore, ENR 1.5 paragraph 3.2b, 3.3b and 3.5.

2.4.2 Values in the table below are calculated based on a nominal climb gradient of 3.3% and will provide the required obstacle clearance with vessel movements along the northern shipping channel. ATC will advise departing aircraft on respective runways when the vessel height is above these values:

Departure	No advice from ATC if the vessels are at or below the following heights with respect to their departure runways
02L	35m (AMSL) or below
02C	70m (AMSL) or below
02R	65m (AMSL) or below

2.4.3 Aircraft operators shall calculate their own climb gradients based on actual lift off point to ensure enough clearance with the vessels crossing the northern shipping channel. The calculation will have to ensure the following:

- The most penalising 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

Note: The calculated climb gradient shall not be lower than the procedure climb gradient for departures (refer to paragraph 3.2.2 below and published in AIP Singapore, ENR 1.5 paragraphs 3.2 a. and 3.3 a.)

2.4.4 For the above calculations, aircraft operators shall use the distance information for the various departure runways as follows:

DEP RWY	02L	02C	02R
Distance	1100m	2590m	2310m

Note: The distance for departure Runways 02L, 02C and 02R are measured from the DER to the shipping channel north of Changi.

2.5 Total Radio Failure – Special Procedures – Singapore Changi Airport – Arrivals

2.5.1 This section will supersede the information published in AIP Singapore, ENR 1.6 paragraph 1.10.

2.5.2 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.

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

- a. Proceed according to the last acknowledged clearance received from Singapore ATC, or
- b. If no specific instructions or clearance has been received from Singapore ATC:
 - i. Maintain the last assigned altitude or flight level and proceed via planned ATS Routes thereafter the appropriate STAR for RWY 02L/02C/02R to SAMKO Holding Area (SHA). If SHA is not part of the STAR, flight shall proceed to SHA after the last waypoint on the STAR.
 - ii. Commence descent from SHA at or as close as possible to the ETA as indicated on the flight plan.
 - iii. Carry out the appropriate instrument approach procedure from SHA to land on RWY 02L/02C/02R.
- c. If radio failure occurs while flight is on assigned heading from an ATC issued instruction which takes the aircraft off the STAR, the pilot shall rejoin the last assigned STAR by resuming own navigation to the next ensuing waypoint on STAR.
- d. Identify the runway-in-use in accordance to paragraph 2.6. If unable to effect a landing on:
 - i. RWY 02L
Carry out missed approach procedure to AKOMA (PU R-356/20DME)(014522N 1035443E). Leave AKOMA at 4,000ft to NYLON Holding Area (NHA) and execute the appropriate instrument procedure from NHA to land on RWY 20L, RWY 20C or RWY 20R.
 - ii. RWY 02C
Carry out missed approach procedure to NYLON Holding Area (NHA) and execute the appropriate instrument procedure from NHA to land on RWY 20L, RWY 20C or RWY 20R.
 - iii. RWY 02R
Carry out missed approach procedure to HOSBA (VTK R-103/24DME) (011948N 1042418E) Holding Area (HHA). Leave HHA at 7,000ft to NHA via ATS route W401 and VTK DVOR. Execute the appropriate instrument procedure from NHA to land on RWY 20L, RWY 20C or RWY 20R.
 - iv. 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, RWY 02C or RWY 02R.
 - v. RWY 20C
Carry out missed approach procedure to EXOMO (VTK R-158/22DME) (010425.49N 1040933.17E). Leave EXOMO at 4,000ft to SAMKO Holding Area (SHA) and execute the appropriate instrument procedure from SHA to land on RWY 02L, RWY 02C or RWY 02R.
 - vi. RWY 20L
Carry out missed approach procedure to HOSBA (SJ R-079/34DME) (011948N 1042418E) Holding Area (HHA). Leave HHA at 7,000ft to SHA via ATS route G580 and SJ DVOR. Execute the appropriate instrument procedure from SHA to land on RWY 02L, RWY 02C or RWY 02R.

2.6 Identification of Runway-in-use

2.6.1 As per AIP Singapore, ENR 1.6 paragraph 1.11, 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.

2.6.2 If unable to land within 30 minutes of EAT or ETA, if no EAT has been received and acknowledged, proceed in accordance with AIP Singapore, ENR 1.6 paragraph 1.8.3 d.

2.7 Total Radio Failure – Special Procedures – Singapore Changi Airport – Departures

2.7.1 Existing radio communication failure procedures for RWY 02L/02C departures published in AIP Singapore ENR 1.6 paragraph 1.12.2 will be applicable for RWY 02R departures.

2.7.2 Existing radio communication failure procedures for RWY 20R/20C departures published in AIP Singapore ENR 1.6 paragraph 1.12.3 will be applicable for RWY 20L departures.

3 NEW DEPARTURE AND ARRIVAL PROCEDURES FOR RUNWAY 02R AND 20L

3.1 Instrument Approach Procedures

3.1.1 Required Navigation Performance (RNP) procedures were designed for Runway 02R and 20L in accordance with criteria RNP APCH procedures using barometric vertical navigation as stipulated in the ICAO PANS-OPS (Doc 8168) Volume II and ICAO Manual of PBN (Doc 9613).

3.1.2 The RNP procedures can be flown as a Non-Precision Approach (NPA) down to Lateral Navigation (LNAV) minima or an Approach with Vertical Guidance (APV) using barometric vertical navigation (BaroVNAV) down to LNAV/VNAV minima. Details of the procedures can be found in **Appendix B** of this AIP Supplement as follows:

Instrument Approach	AIP SUP Reference
RNP RWY 02R	Appendix B-1 to B-1.1
RNP RWY 20L	Appendix B-2 to B-2.1

3.1.3 Aircraft operators must possess the necessary operational approvals to conduct RNP APCH and BaroVNAV operations from their respective State authorities to carry out these procedures. The on-board performance monitoring and alerting, criteria for specific navigation systems and functional requirement must be in accordance to ICAO Doc 9613.

3.1.4 The pilot must notify ATC of any loss of the RNP APCH capability, together with the proposed course of action. If unable to comply with the requirements of an RNP APCH procedure, pilot must advise ATC as soon as possible. The loss of RNP APCH capability includes any failure or event causing the aircraft to no longer satisfy the RNP APCH requirements.

3.2 Radar Departure SID and Climb Gradient Restrictions

3.2.1 Radar departures designed for Runway 02R and 20L are in accordance to ICAO Doc 8168 Volume II. Details of the procedures can be found in **Appendix C** of this AIP Supplement as follows:

Instrument Departure	AIP SUP Reference
SID CHA 1C & 1D	Appendix C-1 to C-1.1

3.2.2 When there are no reports of vessel movements along the northern shipping channel or when the vessel height is 65m AMSL and below, all aircraft departures on Runway 02R, regardless of on SID or vectors, shall be on a minimum climb gradient of 5% until reaching or passing 2,500ft. Thereafter, the minimum climb gradient shall be 3.3%.

3.2.3 All aircraft departures on Runway 20L, regardless of on SID or vectors, shall be on a minimum climb gradient of 9% until reaching or passing 2,500ft. Thereafter, the minimum climb gradient shall be 3.3%.

3.2.4 The minimum climb gradient restrictions stated above are for the purpose of air traffic management. If the climb gradient restriction cannot be complied with, the pilot-in-command of an aircraft departure shall inform ATC during the time when the aircraft commences taxiing to the holding point for departure. Delays can be expected as coordination is required.

4 CANCELLATION

4.1 This AIP Supplement will be cancelled when the contents are incorporated into AIP Singapore.

Charts

ARAMA 1A	Appendix A-1
ARAMA 1A	Appendix A-1.1
ASUNA 1A	Appendix A-2
ASUNA 1A	Appendix A-2.1
ARAMA 1B	Appendix A-3
ARAMA 1B	Appendix A-3.1
ASUNA 1B	Appendix A-4
ASUNA 1B	Appendix A-4.1
KARTO 1A	Appendix A-5
KARTO 1A	Appendix A-5.1
OBDOS 1A	Appendix A-6
OBDOS 1A	Appendix A-6.1
KARTO 1B	Appendix A-7
KARTO 1B	Appendix A-7.1
OBDOS 1B	Appendix A-8
OBDOS 1B	Appendix A-8.1
LELIB 3B	Appendix A-9

LELIB 3B	Appendix A-9.1
MABAL 2A	Appendix A-10
MABAL 2A	Appendix A-10.1
MABAL 2B	Appendix A-11
MABAL 2B	Appendix A-11.1
LEBAR 2A	Appendix A-12
LEBAR 2A	Appendix A-12.1
LEBAR 2B	Appendix A-13
LEBAR 2B	Appendix A-13.1
REPOV 1A	Appendix A-14
REPOV 1A	Appendix A-14.1
SURGA 1A	Appendix A-15
SURGA 1A	Appendix A-15.1
REPOV 1B	Appendix A-16
REPOV 1B	Appendix A-16.1
SURGA 1B	Appendix A-17
SURGA 1B	Appendix A-17.1
ELALO 1A	Appendix A-18
ELALO 1A	Appendix A-18.1
ELALO 1B	Appendix A-19
ELALO 1B	Appendix A-19.1
RNP RWY 02R	Appendix B-1
RNP RWY 02R	Appendix B-1.1
RNP RWY 20L	Appendix B-2
RNP RWY 20L	Appendix B-2.1
SID CHA 1C & 1D	Appendix C-1
SID CHA 1C & 1D	Appendix C-1.1

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**STANDARD ARRIVAL CHART
RNAV (GNSS) -
INSTRUMENT (STAR)**

ACC 133.25
APP 124.05
119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
ARR 128.025

**SINGAPORE/Singapore Changi
RWY 02L/C/R
ARAMA ONE ALPHA ARRIVAL
ARAMA 1A**

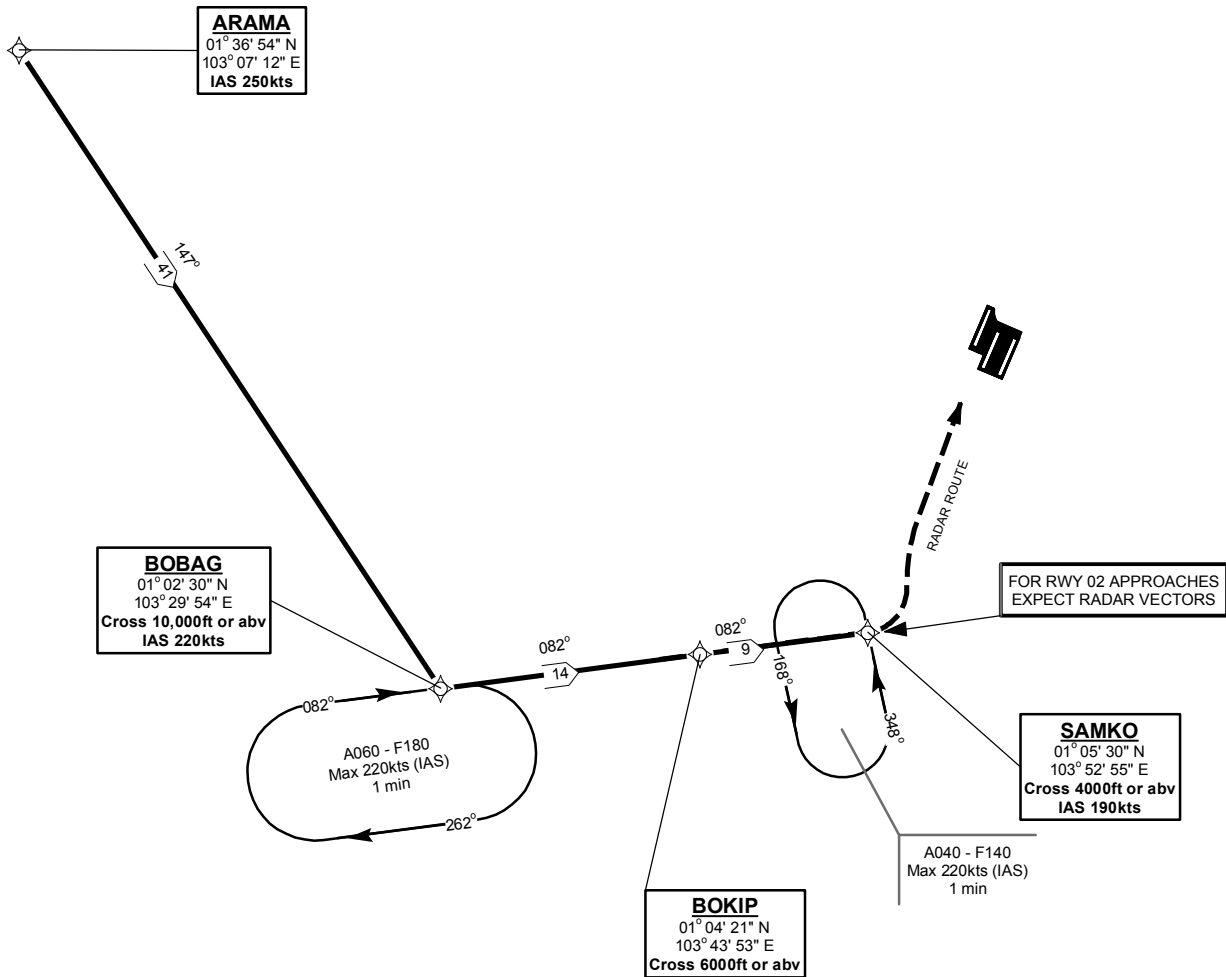
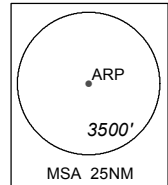
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 0°23'E (2020)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

NOTE: REFER TO BACK PAGE FOR
- FORMAL AND TABULAR DESCRIPTIONS
- RADIO COM FAILURE PROCEDURES



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ARAMA 1A (STAR) RNAV GNSS RWY 02L/02C/02R - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From ARAMA, speed 250kts. To BOBAG at or above 10000ft, speed 220kts, turn left. To BOKIP at or above 6000ft. To SAMKO at or above 4000ft, speed 190kts.	ARAMA [K250] - BOBAG [A100+; K220; L] - BOKIP [A060+] - SAMKO [A040+; K190]	IF TF TF TF	N N N N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	ARAMA	-	-	-	-	-	K250	RNAV1
TF	BOBAG	-	147(147.4)	-0.4	L	A100+	K220	RNAV1
TF	BOKIP	-	082(082.4)	-0.4	-	A060+	-	RNAV1
TF	SAMKO	-	082(082.4)	-0.4	-	A040+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	When cleared via ARAMA 1A by Singapore ATC <p>(a) Maintain last assigned flight level or altitude and proceed on ARAMA 1A to SAMKO</p> <p>(b) From SAMKO commence descent and carry out appropriate landing procedure for RWY 02 as close as possible to EAT or ETA</p> <p>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</p>
3	No clearance or instruction received from Singapore ATC <p>- Refer to Singapore AIP for radio communications failure procedure</p>

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**STANDARD ARRIVAL CHART
RNAV (GNSS) -
INSTRUMENT (STAR)**

ACC 133.25
APP 124.05
119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.025

**SINGAPORE/Singapore Changi
RWY 02L/C/R
ASUNA ONE ALPHA ARRIVAL
ASUNA 1A**

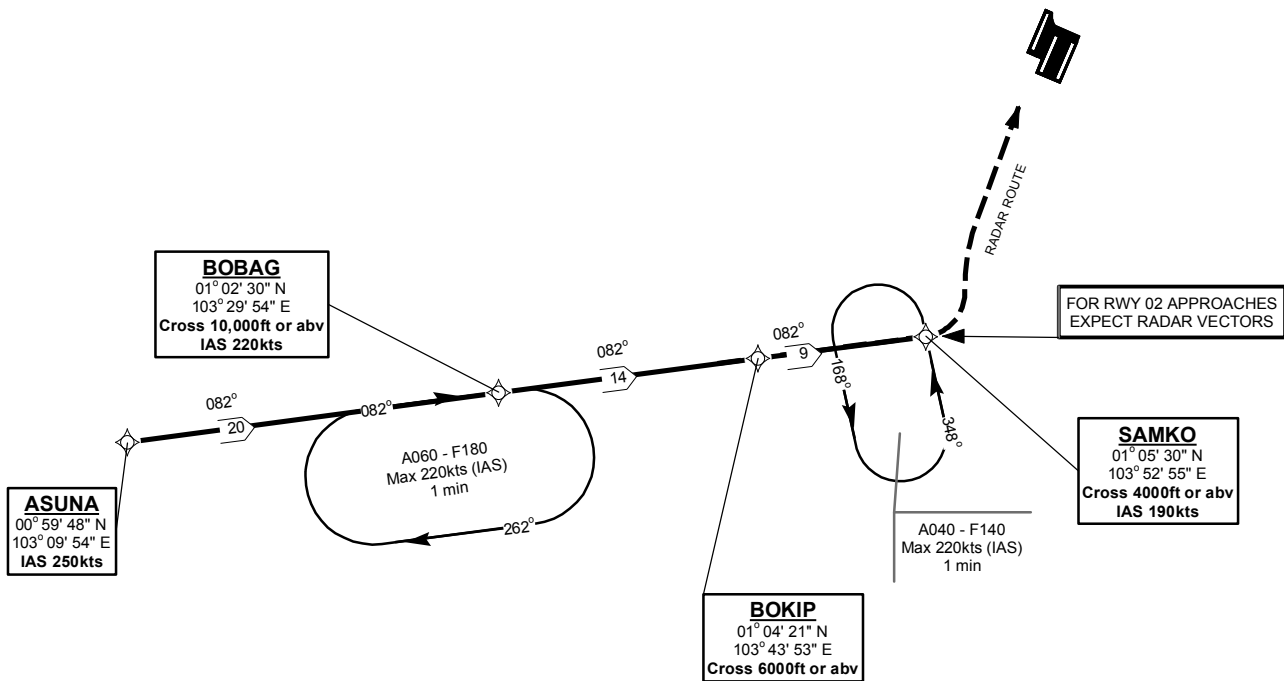
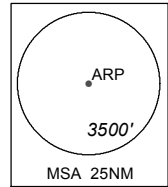
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 0°23'E (2020)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

NOTE: REFER TO BACK PAGE FOR
- FORMAL AND TABULAR DESCRIPTIONS
- RADIO COM FAILURE PROCEDURES



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ASUNA 1A (STAR) RNAV GNSS RWY 02L/02C/02R - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From ASUNA, speed 250kts. To BOBAG at or above 1000ft, speed 220kts. To BOKIP at or above 6000ft. To SAMKO at or above 4000ft, speed 190kts.	ASUNA [K250] - BOBAG [A100+; K220] - BOKIP [A060+] - SAMKO [A040+; K190]	IF TF TF TF	N N N N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	ASUNA	-	-	-	-	-	K250	RNAV1
TF	BOBAG	-	082(082.4)	-0.4	-	A100+	K220	RNAV1
TF	BOKIP	-	082(082.4)	-0.4	-	A060+	-	RNAV1
TF	SAMKO	-	082(082.4)	-0.4	-	A040+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via ASUNA 1A by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on ASUNA 1A to SAMKO</p> <p>(b) From SAMKO commence descent and carry out appropriate landing procedure for RWY 02 as close as possible to EAT or ETA</p> <p>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</p>
3	<p>No clearance or instruction received from Singapore ATC</p> <p>- Refer to Singapore AIP for radio communications failure procedure</p>

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**STANDARD ARRIVAL CHART
RNAV (GNSS) -
INSTRUMENT (STAR)**

ACC 133.25
APP 124.05
119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.025

**SINGAPORE/Singapore Changi
RWY 20R/C/L
ARAMA ONE BRAVO ARRIVAL
ARAMA 1B**

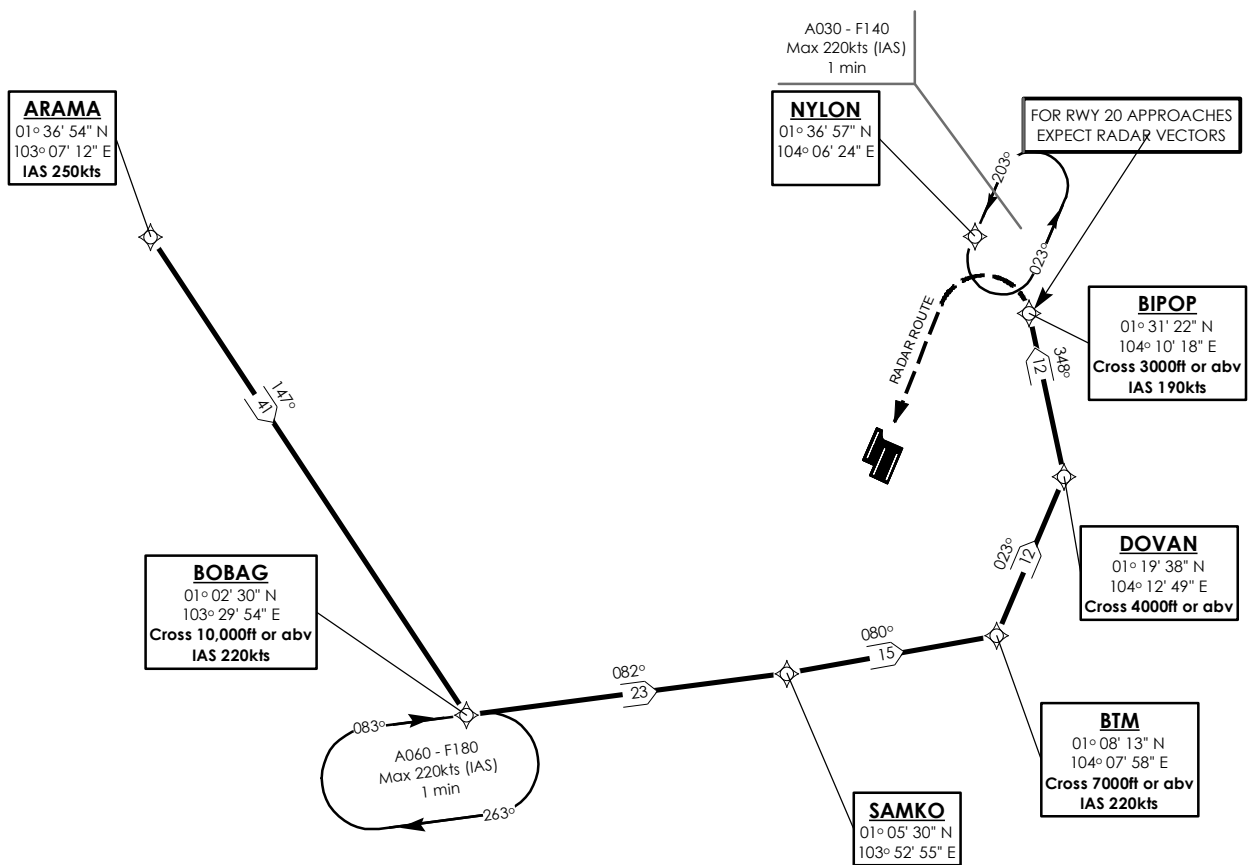
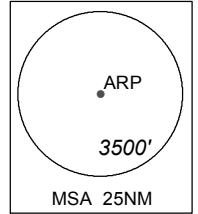
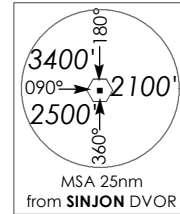
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 0°23'E (2020)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

NOTE: REFER TO BACK PAGE FOR
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- RADIO COM FAILURE PROCEDURES



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ARAMA 1B (STAR) RNAV GNSS RWY 20R/20C/20L - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From ARAMA, speed 250kts. To BOBAG at or above 10000ft, speed 220kts, turn left. To SAMKO, turn left. To BTM at or above 7000ft, speed 220kts, turn left. To DOVAN at or above 4000ft, turn left. To BIPOP at or above 3000ft, speed 190kts.	ARAMA [K250] -	IF	N
	BOBAG [A100+; K220; L] -	TF	N
	SAMKO [L] -	TF	N
	BTM [A070+; K220; L] -	TF	N
	DOVAN [A040+; L] -	TF	N
	BIPOP [A030+; K190]	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	ARAMA	-	-	-	-	-	K250	RNAV1
TF	BOBAG	-	147(147.4)	-0.4	L	A100+	K220	RNAV1
TF	SAMKO	-	082(082.4)	-0.4	L	-	-	RNAV1
TF	BTM	-	080(080.4)	-0.4	L	A070+	K220	RNAV1
TF	DOVAN	-	023(023.4)	-0.4	L	A040+	-	RNAV1
TF	BIPOP	-	348(348.4)	-0.4	-	A030+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via ARAMA 1B by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on ARAMA 1B to BIPOP, then direct to NYLON</p> <p>(b) From NYLON commence descent and carry out appropriate landing procedure for RWY 20 as close as possible to EAT or ETA</p> <p>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</p>
3	<p>No clearance or instruction received from Singapore ATC</p> <p>- Refer to Singapore AIP for radio communications failure procedure</p>

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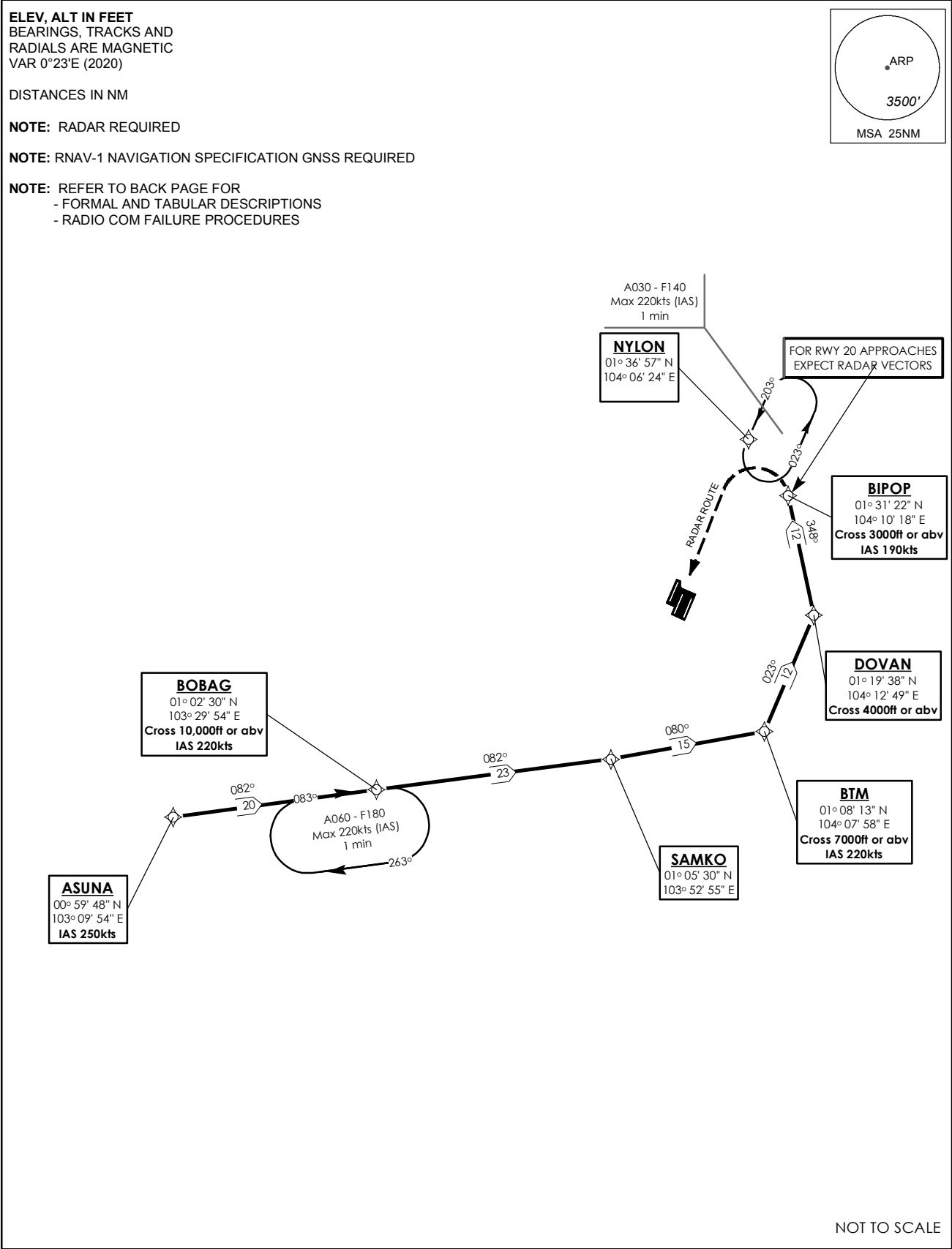
**STANDARD ARRIVAL CHART
RNAV (GNSS) -
INSTRUMENT (STAR)**

ACC 133.25
APP 124.05
119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.025

**SINGAPORE/Singapore Changi
RWY 20R/C/L
ASUNA ONE BRAVO ARRIVAL
ASUNA 1B**



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ASUNA 1B (STAR) RNAV GNSS RWY 20R/20C/20L - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From ASUNA, speed 250kts. To BOBAG at or above 10000ft, speed 220kts. To SAMKO, turn left. To BTM at or above 7000ft, speed 220kts, turn left. To DOVAN at or above 4000ft, turn left. To BIPOP at or above 3000ft, speed 190kts.	ASUNA [K250] -	IF	N
	BOBAG [A100+; K220] -	TF	N
	SAMKO [L] -	TF	N
	BTM [A070+; K220; L] -	TF	N
	DOVAN [A040+; L] -	TF	N
	BIPOP [A030+; K190]	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	ASUNA	-	-	-	-	-	K250	RNAV1
TF	BOBAG	-	082(082.4)	-0.4	-	A100+	K220	RNAV1
TF	SAMKO	-	082(082.4)	-0.4	L	-	-	RNAV1
TF	BTM	-	080(080.4)	-0.4	L	A070+	K220	RNAV1
TF	DOVAN	-	023(023.4)	-0.4	L	A040+	-	RNAV1
TF	BIPOP	-	348(348.4)	-0.4	-	A030+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via ASUNA 1B by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on ASUNA 1B to BIPOP, then direct to NYLON</p> <p>(b) From NYLON commence descent and carry out appropriate landing procedure for RWY 20 as close as possible to EAT or ETA</p> <p>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</p>
3	<p>No clearance or instruction received from Singapore ATC</p> <p>- Refer to Singapore AIP for radio communications failure procedure</p>

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STANDARD ARRIVAL CHART
RNAV (GNSS) -
INSTRUMENT (STAR)

ACC 134.2
 APP 124.05
 119.3
 TWR 118.6 / 118.25

TRANSITION ALTITUDE
 11 000ft

D-ATIS AP ID-WSSS
 128.025

SINGAPORE/Singapore Changi
RWY 02L/C/R
KARTO ONE ALPHA ARRIVAL
KARTO 1A

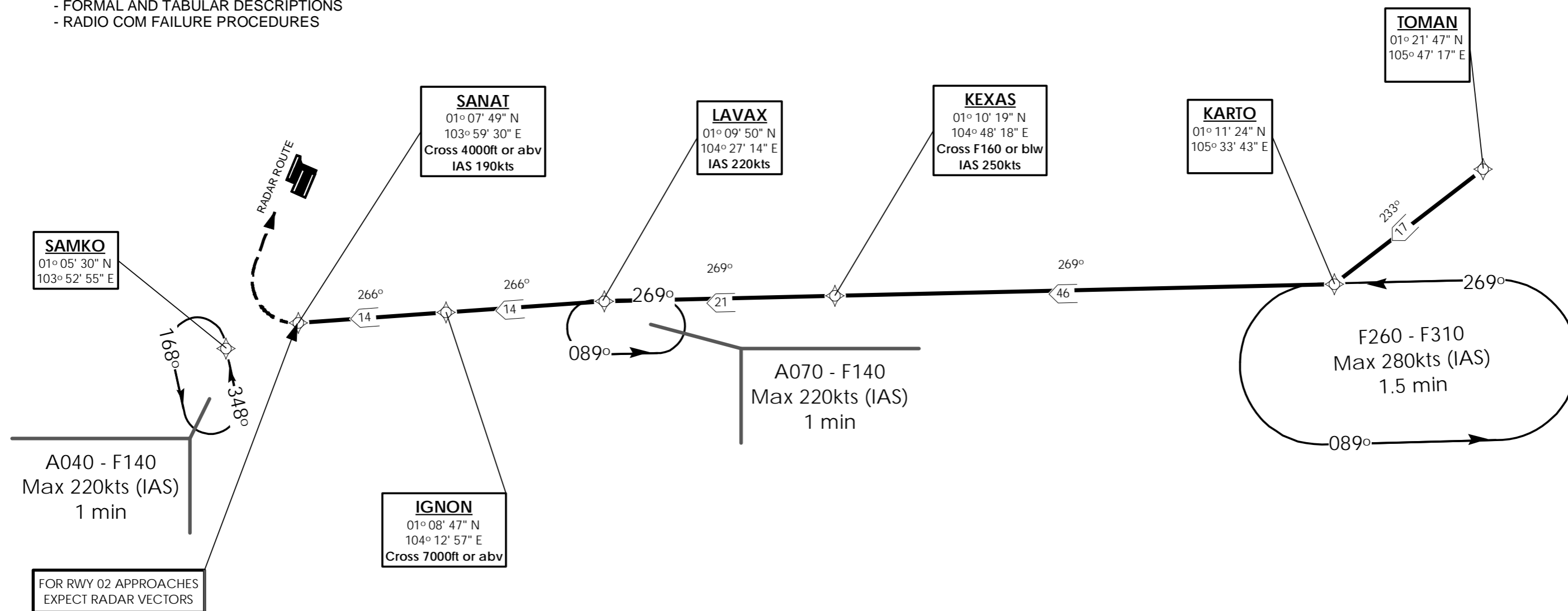
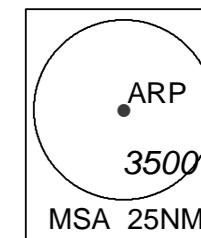
ELEV, ALT IN FEET
 BEARINGS, TRACKS AND
 RADIALS ARE MAGNETIC
 VAR 0°23'E (2020)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

NOTE: REFER TO BACK PAGE FOR
 - FORMAL AND TABULAR DESCRIPTIONS
 - RADIO COM FAILURE PROCEDURES



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24 SEP 2020

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KARTO 1A (STAR) RNAV GNSS RWY 02L/02C/02R - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From TOMAN. To KARTO, turn right. To KEXAS at or below FL160, speed 250kts. To LAVAX, speed 220kts, turn left. To IGNON at or above 7000ft. To SANAT at or above 4000ft, speed 190kts.	TOMAN -	IF	N
	KARTO [R] -	TF	N
	KEXAS [FL160-; K250] -	TF	N
	LAVAX [K220; L] -	TF	N
	IGNON [A070+] -	TF	N
	SANAT [A040+; K190]	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	TOMAN	-	-	-	-	-	-	RNAV1
TF	KARTO	-	233(233.4)	-0.4	R	-	-	RNAV1
TF	KEXAS	-	269(269.4)	-0.4	-	FL160-	K250	RNAV1
TF	LAVAX	-	269(269.4)	-0.4	L	-	K220	RNAV1
TF	IGNON	-	266(266.4)	-0.4	-	A070+	-	RNAV1
TF	SANAT	-	266(266.4)	-0.4	-	A040+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via KARTO 1A by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on KARTO 1A to SANAT, then direct to SAMKO</p> <p>(b) From SAMKO commence descent and carry out appropriate landing procedure for RWY 02 as close as possible to EAT or ETA</p> <p>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</p>
3	<p>No clearance or instruction received from Singapore ATC</p> <p>- Refer to Singapore AIP for radio communications failure procedure</p>

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STANDARD ARRIVAL CHART
RNAV (GNSS) -
INSTRUMENT (STAR)

ACC 134.4
 APP 124.05
 119.3
 TWR 118.6 / 118.25

TRANSITION ALTITUDE
 11 000ft

D-ATIS AP ID-WSSS
 128.025

SINGAPORE/Singapore Changi
RWY 02L/C/R
OBDOS ONE ALPHA ARRIVAL
OBDOS 1A

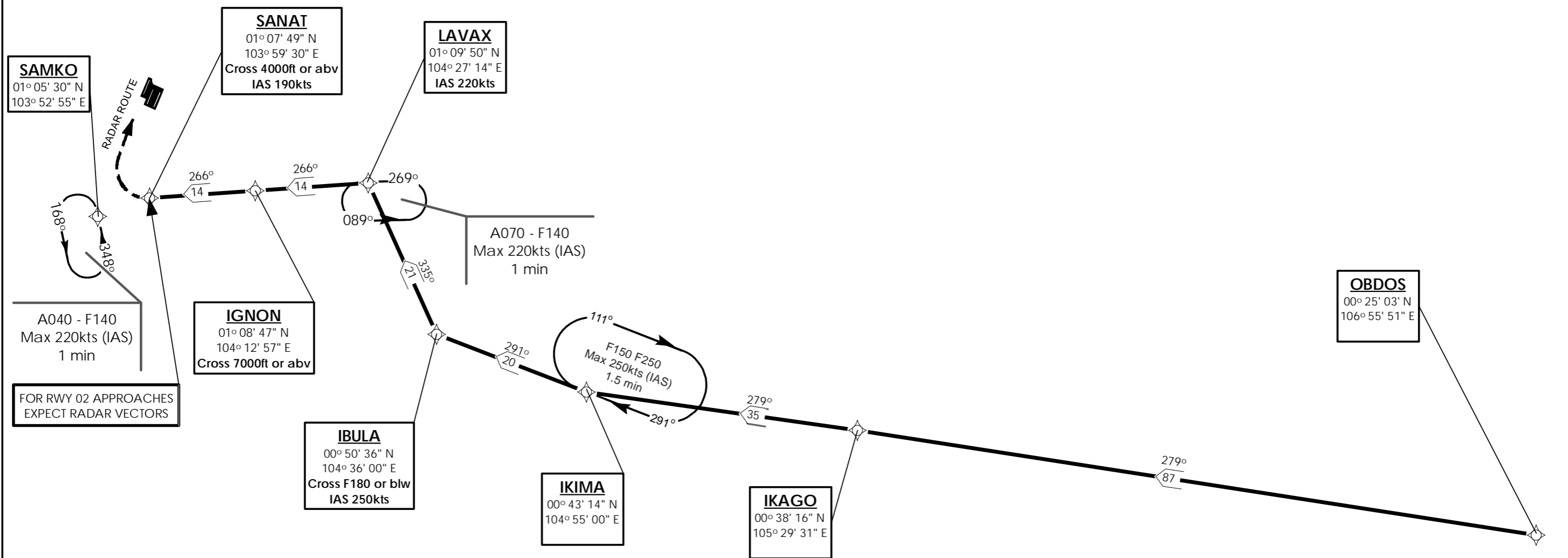
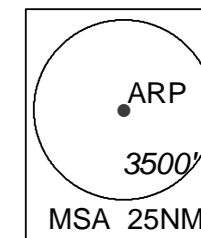
ELEV, ALT IN FEET
 BEARINGS, TRACKS AND
 RADIALS ARE MAGNETIC
 VAR 0°23'E (2020)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

NOTE: REFER TO BACK PAGE FOR
 - FORMAL AND TABULAR DESCRIPTIONS
 - RADIO COM FAILURE PROCEDURES



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OBDOS 1A (STAR) RNAV GNSS RWY 02L/02C/02R - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From OBDOS. To IKAGO. To IKIMA, turn right. To IBULA at or below FL180, speed 250kts, turn right. To LAVAX, speed 220kts, turn left. To IGNON at or above 7000ft. To SANAT at or above 4000ft, speed 190kts.	OBDOS -	IF	N
	IKAGO -	TF	N
	IKIMA [R] -	TF	N
	IBULA [FL180-; K250; R] -	TF	N
	LAVAX [K220; L] -	TF	N
	IGNON [A070+] -	TF	N
	SANAT [A040+; K190]	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	OBDOS	-	-	-	-	-	-	RNAV1
TF	IKAGO	-	279(279.4)	-0.4	-	-	-	RNAV1
TF	IKIMA	-	279(279.4)	-0.4	R	-	-	RNAV1
TF	IBULA	-	291(291.4)	-0.4	R	FL180-	K250	RNAV1
TF	LAVAX	-	335(335.4)	-0.4	L	-	K220	RNAV1
TF	IGNON	-	266(266.4)	-0.4	-	A070+	-	RNAV1
TF	SANAT	-	266(266.4)	-0.4	-	A040+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via OBDOS 1A by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on OBDOS 1A to SANAT, then direct to SAMKO</p> <p>(b) From SAMKO commence descent and carry out appropriate landing procedure for RWY 02 as close as possible to EAT or ETA</p> <p>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</p>
3	<p>No clearance or instruction received from Singapore ATC</p> <p>- Refer to Singapore AIP for radio communications failure procedure</p>

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STANDARD ARRIVAL CHART
RNAV (GNSS) -
INSTRUMENT (STAR)

ACC 134.2
 APP 124.05
 119.3
 TWR 118.6 / 118.25

TRANSITION ALTITUDE
 11 000ft

D-ATIS AP ID-WSSS
 128.025

SINGAPORE/Singapore Changi
RWY 20R/C/L
KARTO ONE BRAVO ARRIVAL
KARTO 1B

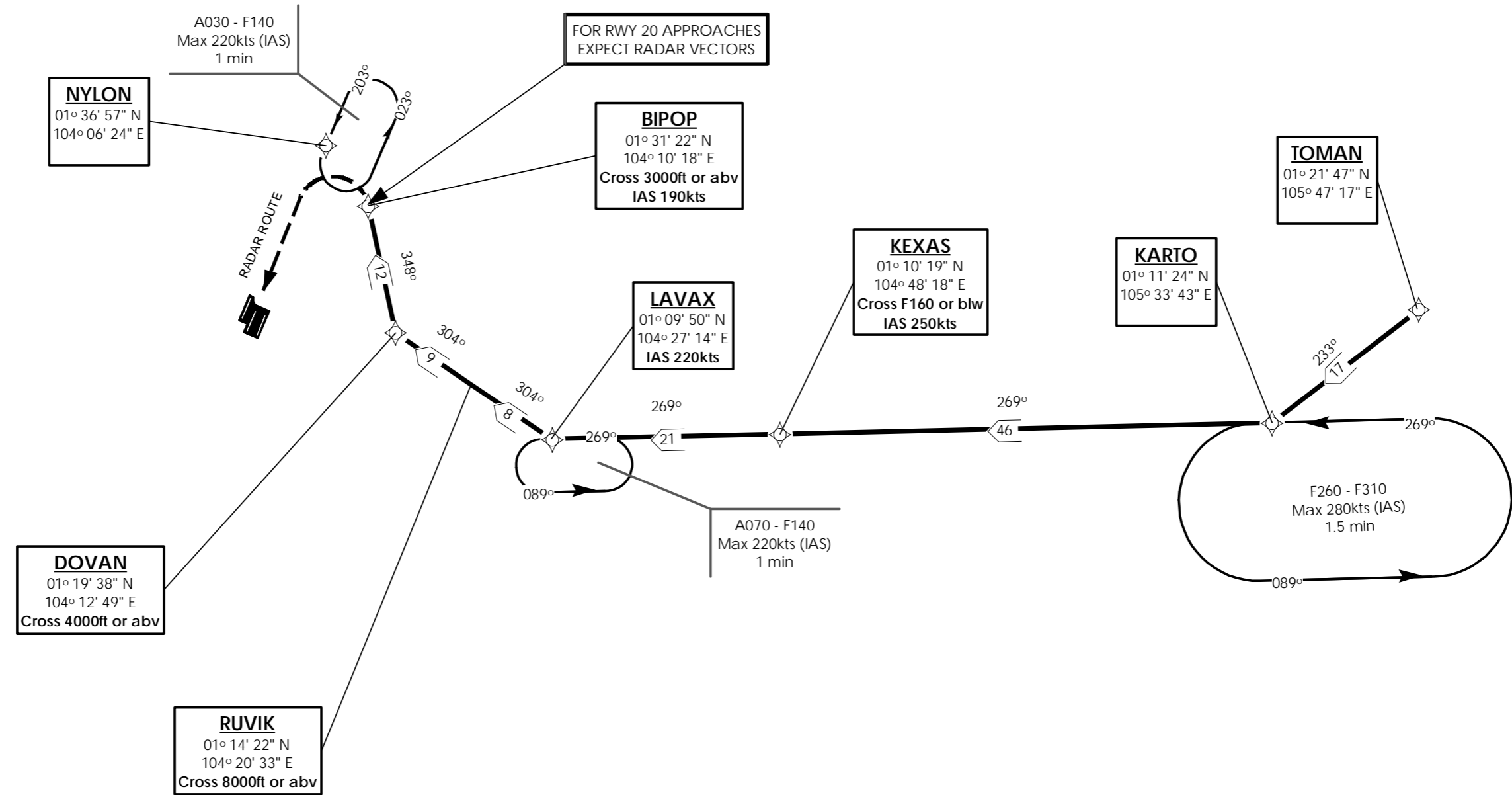
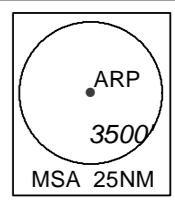
ELEV, ALT IN FEET
 BEARINGS, TRACKS AND
 RADIALS ARE MAGNETIC
 VAR 0°23'E (2020)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

NOTE: REFER TO BACK PAGE FOR
 - FORMAL AND TABULAR DESCRIPTIONS
 - RADIO COM FAILURE PROCEDURES



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KARTO 1B (STAR) RNAV GNSS RWY 20R/20C/20L - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From TOMAN. To KARTO, turn right. To KEXAS at or below FL160, speed 250kts. To LAVAX, speed 220kts, turn right. To RUVIK at or above 8000ft. To DOVAN at or above 4000ft, turn right. To BIPOP at or above 3000ft, speed 190kts.	TOMAN -	IF	N
	KARTO [R] -	TF	N
	KEXAS [FL160-; K250] -	TF	N
	LAVAX [K220; R] -	TF	N
	RUVIK [A080+] -	TF	N
	DOVAN [A040+; R] -	TF	N
	BIPOP [A030+; K190]	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	TOMAN	-	-	-	-	-	-	RNAV1
TF	KARTO	-	233(233.4)	-0.4	R	-	-	RNAV1
TF	KEXAS	-	269(269.4)	-0.4	-	FL160-	K250	RNAV1
TF	LAVAX	-	269(269.4)	-0.4	R	-	K220	RNAV1
TF	RUVIK	-	304(304.4)	-0.4	-	A080+	-	RNAV1
TF	DOVAN	-	304(304.4)	-0.4	R	A040+	-	RNAV1
TF	BIPOP	-	348(348.4)	-0.4	-	A030+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via KARTO 1B by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on KARTO 1B to BIPOP, then direct to NYLON</p> <p>(b) From NYLON commence descent and carry out appropriate landing procedure for RWY 20 as close as possible to EAT or ETA</p> <p>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</p>
3	<p>No clearance or instruction received from Singapore ATC</p> <p>- Refer to Singapore AIP for radio communications failure procedure</p>

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STANDARD ARRIVAL CHART
RNAV (GNSS) -
INSTRUMENT (STAR)

ACC 134.4
 APP 124.05
 119.3
 TWR 118.6 / 118.25

TRANSITION ALTITUDE
 11 000ft

D-ATIS AP ID-WSSS
 128.025

SINGAPORE/Singapore Changi
RWY 20R/C/L
OBDOS ONE BRAVO ARRIVAL
OBDOS 1B

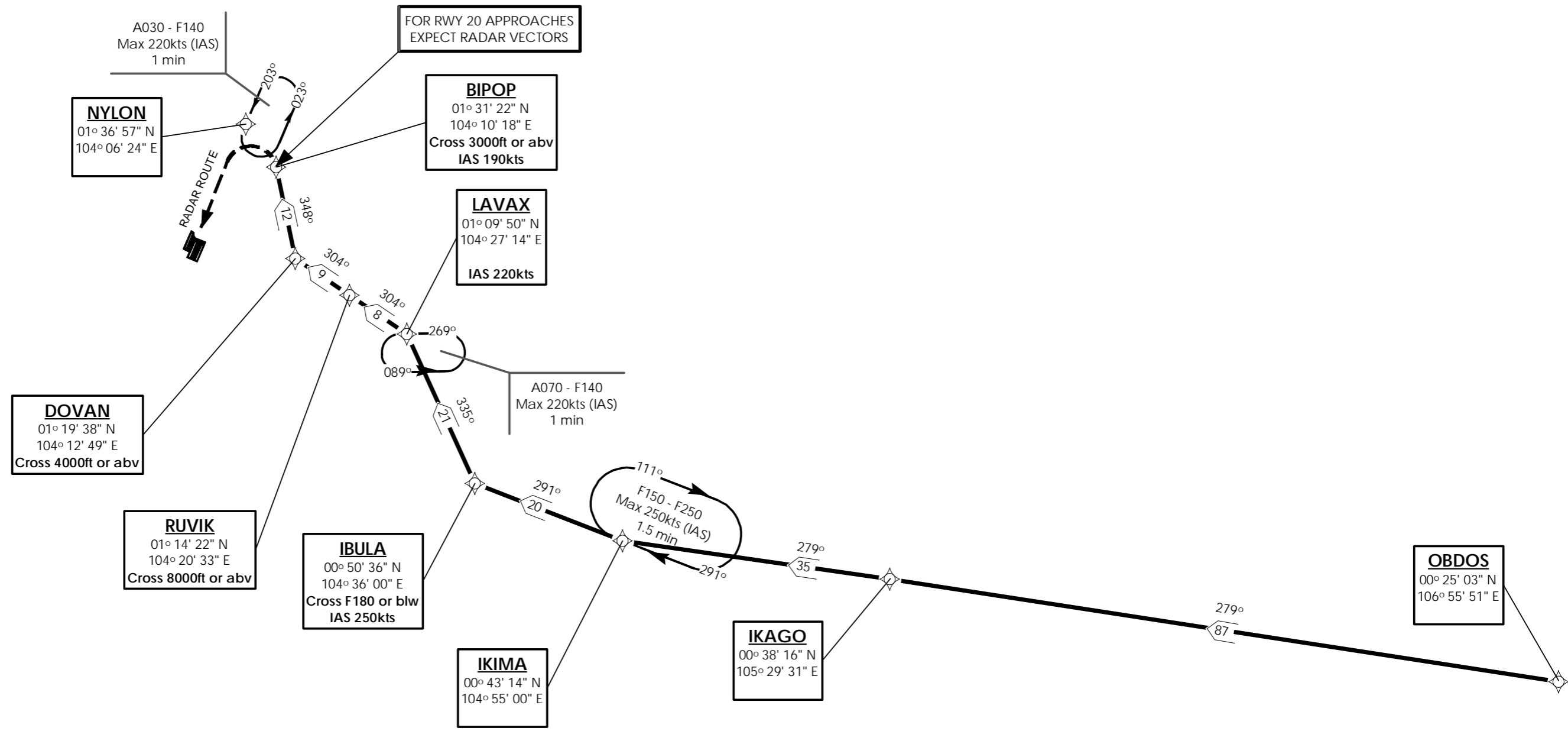
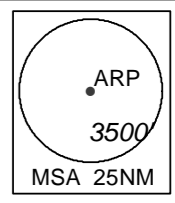
ELEV, ALT IN FEET
 BEARINGS, TRACKS AND
 RADIALS ARE MAGNETIC
 VAR 0°23'E (2020)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

NOTE: REFER TO BACK PAGE FOR
 - FORMAL AND TABULAR DESCRIPTIONS
 - RADIO COM FAILURE PROCEDURES



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OBDOS 1B (STAR) RNAV GNSS RWY 20R/20C/20L - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From OBDOS. To IKAGO. To IKIMA, turn right. To IBULA at or below FL180, speed 250kts, turn right. To LAVAX, speed 220kts, turn left. To RUVIK at or above 8000ft. To DOVAN at or above 4000ft, turn right. To BIPOP at or above 3000ft, speed 190kts.	OBDOS -	IF	N
	IKAGO -	TF	N
	IKIMA [R] -	TF	N
	IBULA [FL180-; K250; R] -	TF	N
	LAVAX [K220; L] -	TF	N
	RUVIK [A080+] -	TF	N
	DOVAN [A040+; R] - BIPOP [A030+; K190]	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	OBDOS	-	-	-	-	-	-	RNAV1
TF	IKAGO	-	279(279.4)	-0.4	-	-	-	RNAV1
TF	IKIMA	-	279(279.4)	-0.4	R	-	-	RNAV1
TF	IBULA	-	291(291.4)	-0.4	R	FL180-	K250	RNAV1
TF	LAVAX	-	335(335.4)	-0.4	L	-	K220	RNAV1
TF	RUVIK	-	304(304.4)	-0.4	-	A080+	-	RNAV1
TF	DOVAN	-	304(304.4)	-0.4	R	A040+	-	RNAV1
TF	BIPOP	-	348(348.4)	-0.4	-	A030+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via OBDOS 1B by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on OBDOS 1B to BIPOP, then direct to NYLON</p> <p>(b) From NYLON commence descent and carry out appropriate landing procedure for RWY 20 as close as possible to EAT or ETA</p> <p>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</p>
3	<p>No clearance or instruction received from Singapore ATC</p> <p>- Refer to Singapore AIP for radio communications failure procedure</p>

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**STANDARD ARRIVAL CHART
RNAV (GNSS) -
INSTRUMENT (STAR)**

ACC 133.25
APP 124.05
119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.025

**SINGAPORE/Singapore Changi
RWY 20R/C/L
LELIB THREE BRAVO ARRIVAL
LELIB 3B**

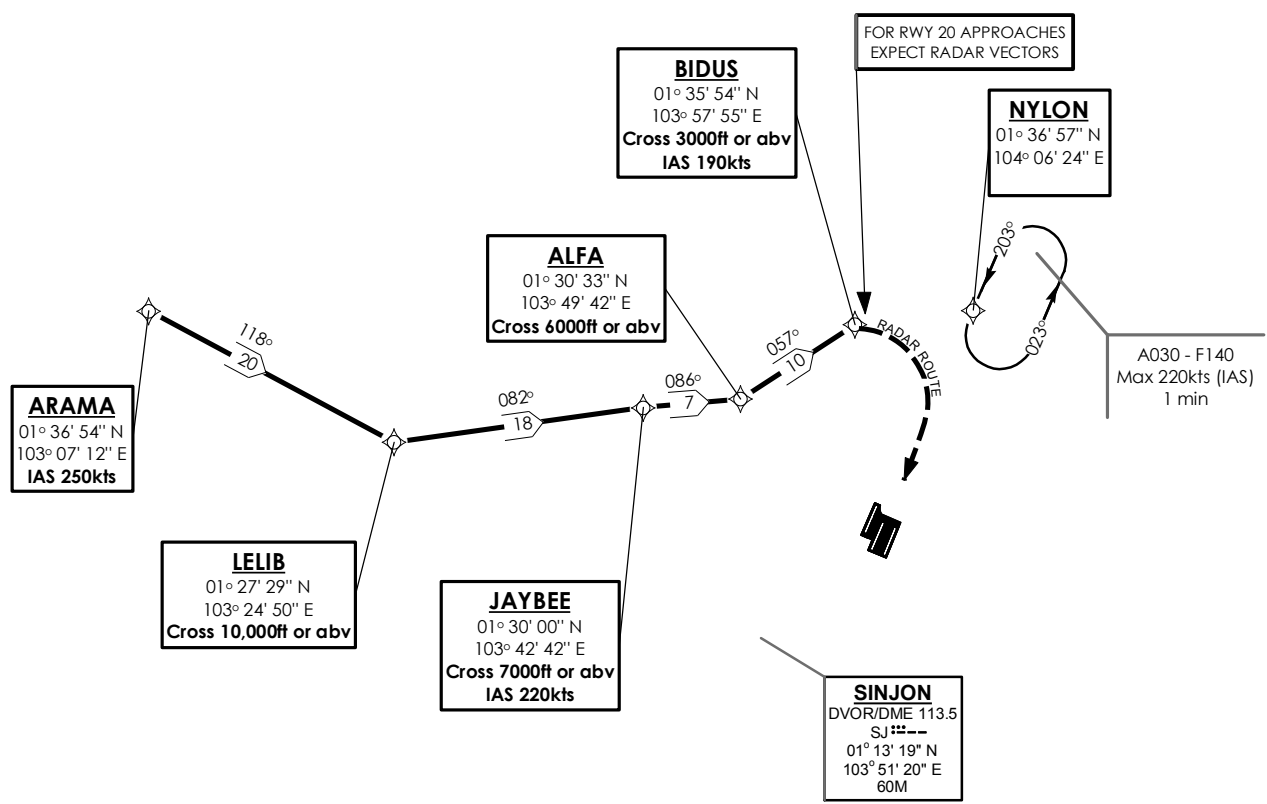
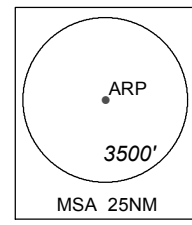
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 0°23'E (2020)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

NOTE: REFER TO BACK PAGE FOR
- FORMAL AND TABULAR DESCRIPTIONS
- RADIO COM FAILURE PROCEDURES



ARAMA 1B shall be the default STAR for WSSS RWY 20.
ATC will offer LELIB 3B when traffic permits.

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LELIB 3B (STAR) RNAV GNSS RWY 20R/20C/20L - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From ARAMA, speed 250kts. To LELIB at or above 10000ft, turn left. To JAYBEE at or above 7000ft, speed 220kts, turn right. To ALFA at or above 6000ft, turn left. To BIDUS at or above 3000ft, speed 190kts.	ARAMA [K250] -	IF	N
	LELIB [A100+; L] -	TF	N
	JAYBEE [A070+; K220; R] -	TF	N
	ALFA [A060+; L] -	TF	N
	BIDUS [A030+; K190]	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	ARAMA	-	-	-	-	-	K250	RNAV1
TF	LELIB	-	118(118.4)	-0.4	L	A100+	-	RNAV1
TF	JAYBEE	-	082(082.4)	-0.4	R	A070+	K220	RNAV1
TF	ALFA	-	086(086.4)	-0.4	L	A060+	-	RNAV1
TF	BIDUS	-	057(057.4)	-0.4	-	A030+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via LELIB 3B by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on LELIB 3B to BIDUS, then direct to NYLON</p> <p>(b) From NYLON commence descent and carry out appropriate landing procedure for RWY 20 as close as possible to EAT or ETA</p> <p>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</p>
3	<p>No clearance or instruction received from Singapore ATC</p> <p>- Refer to Singapore AIP for radio communications failure procedure</p>

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**STANDARD ARRIVAL CHART
RNAV (GNSS) -
INSTRUMENT (STAR)**

ACC 133.8
APP 124.05
119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.025

**SINGAPORE/Singapore Changi
RWY 02L/C/R
MABAL TWO ALPHA ARRIVAL
MABAL 2A**

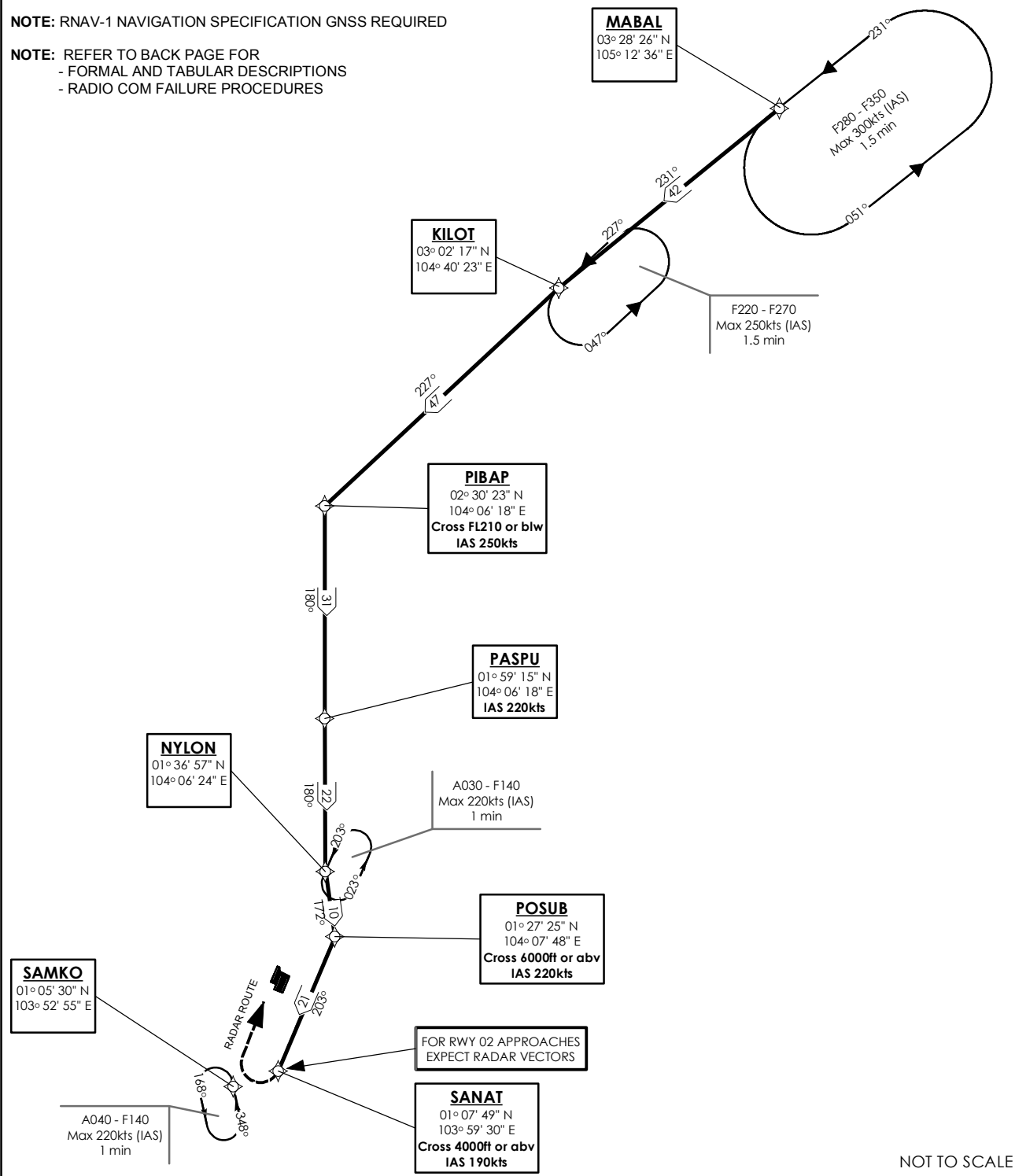
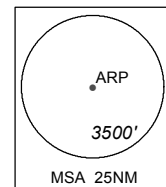
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 0°23'E (2020)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

NOTE: REFER TO BACK PAGE FOR
- FORMAL AND TABULAR DESCRIPTIONS
- RADIO COM FAILURE PROCEDURES



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MABAL 2A (STAR) RNAV GNSS RWY 02L/02C/02R - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From MABAL. To KILOT, turn left. To PIBAP at or below FL210, speed 250kts, turn left. To PASPU, speed 220kts. To NYLON, turn left. To POSUB at or above 6000ft, speed 220kts, turn right. To SANAT at or above 4000ft, speed 190kts.	MABAL -	IF	N
	KILOT [L] -	TF	N
	PIBAP [FL210-; K250; L] -	TF	N
	PASPU [K220] -	TF	N
	NYLON [L] -	TF	N
	POSUB [A060+; K220; R] -	TF	N
	SANAT [A040+; K190]	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	MABAL	-	-	-	-	-	-	RNAV1
TF	KILOT	-	231(231.4)	-0.4	L	-	-	RNAV1
TF	PIBAP	-	227(227.4)	-0.4	L	FL210-	K250	RNAV1
TF	PASPU	-	180(180.4)	-0.4	-	-	K220	RNAV1
TF	NYLON	-	180(180.4)	-0.4	L	-	-	RNAV1
TF	POSUB	-	172(172.4)	-0.4	R	A060+	K220	RNAV1
TF	SANAT	-	203(203.4)	-0.4	-	A040+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via MABAL 2A by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on MABAL 2A to SANAT, then direct to SAMKO</p> <p>(b) From SAMKO commence descent and carry out appropriate landing procedure for RWY 02 as close as possible to EAT or ETA</p> <p>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</p>
3	<p>No clearance or instruction received from Singapore ATC</p> <p>- Refer to Singapore AIP for radio communications failure procedure</p>

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**STANDARD ARRIVAL CHART
RNAV (GNSS) -
INSTRUMENT (STAR)**

ACC 133.8
APP 124.05
119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.025

**SINGAPORE/Singapore Changi
RWY 20R/C/L
MABAL TWO BRAVO ARRIVAL
MABAL 2B**

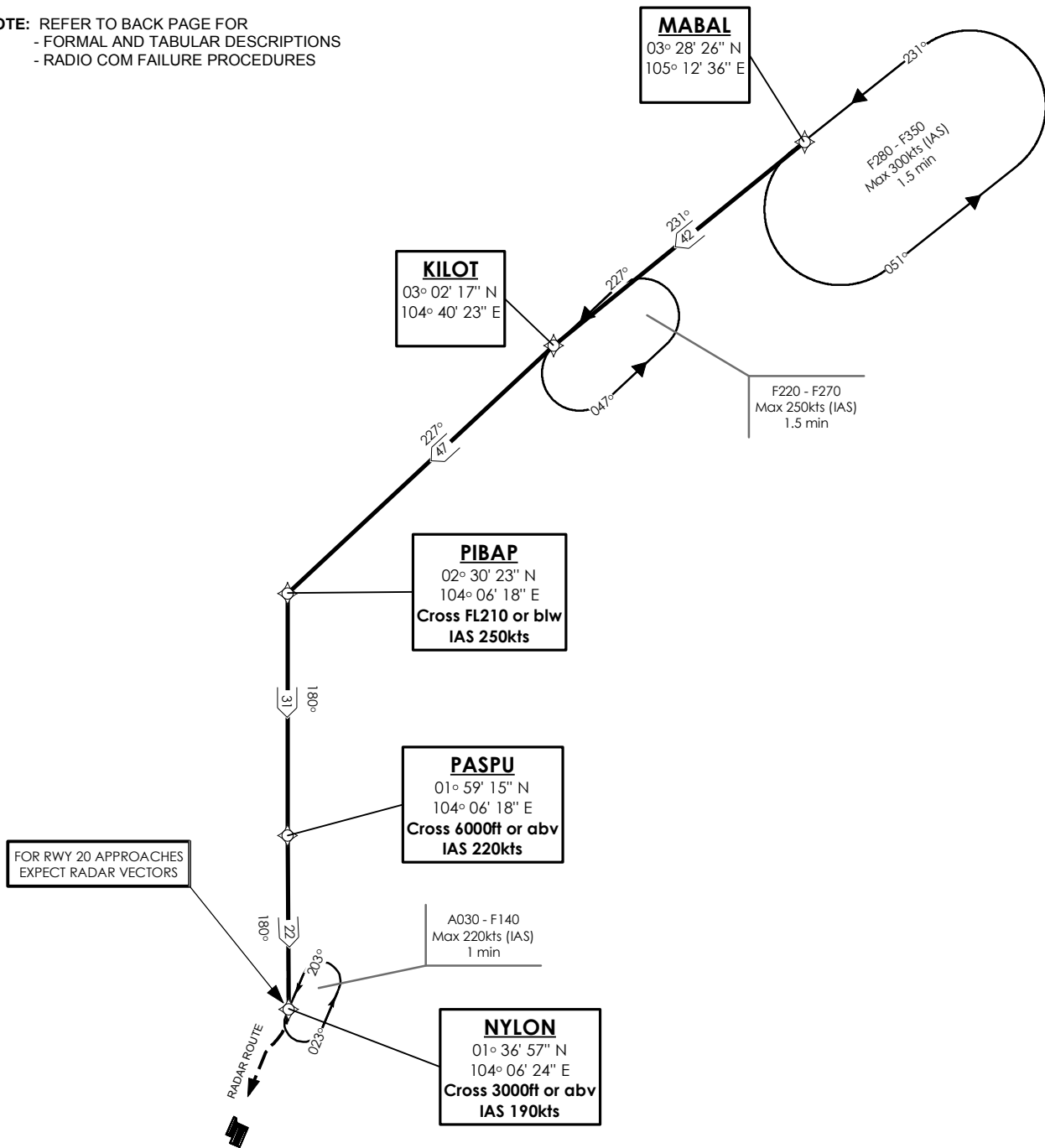
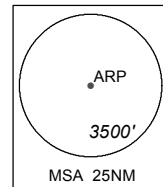
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 0°23'E (2020)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

NOTE: REFER TO BACK PAGE FOR
- FORMAL AND TABULAR DESCRIPTIONS
- RADIO COM FAILURE PROCEDURES



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MABAL 2B (STAR) RNAV GNSS RWY 20R/20C/20L - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From MABAL. To KILOT, turn left. To PIBAP at or below FL210, speed 250kts, turn left. To PASPU, at or above 6000ft, speed 220kts. To NYLON at or above 3000ft, speed 190kts.	MABAL - KILOT [L] - PIBAP [FL210-; K250; L] - PASPU [A060+; K220] - NYLON [A030+; K190]	IF TF TF TF TF	N N N N N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	MABAL	-	-	-	-	-	-	RNAV1
TF	KILOT	-	231(231.4)	-0.4	L	-	-	RNAV1
TF	PIBAP	-	227(227.4)	-0.4	L	FL210-	K250	RNAV1
TF	PASPU	-	180(180.4)	-0.4	-	A060+	K220	RNAV1
TF	NYLON	-	180(180.4)	-0.4	-	A030+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via MABAL 2B by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on MABAL 2B to NYLON</p> <p>(b) From NYLON commence descent and carry out appropriate landing procedure for RWY 20 as close as possible to EAT or ETA</p> <p>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</p>
3	<p>No clearance or instruction received from Singapore ATC</p> <p>- Refer to Singapore AIP for radio communications failure procedure</p>

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STANDARD ARRIVAL CHART
RNAV (GNSS) -
INSTRUMENT (STAR)

ACC 133.8
 APP 124.05
 119.3
 TWR 118.6

TRANSITION ALTITUDE
 11 000ft

D-ATIS AP ID-WSSS
 128.025

SINGAPORE/Singapore Changi
RWY 02L/C/R
LEBAR TWO ALPHA ARRIVAL
LEBAR 2A

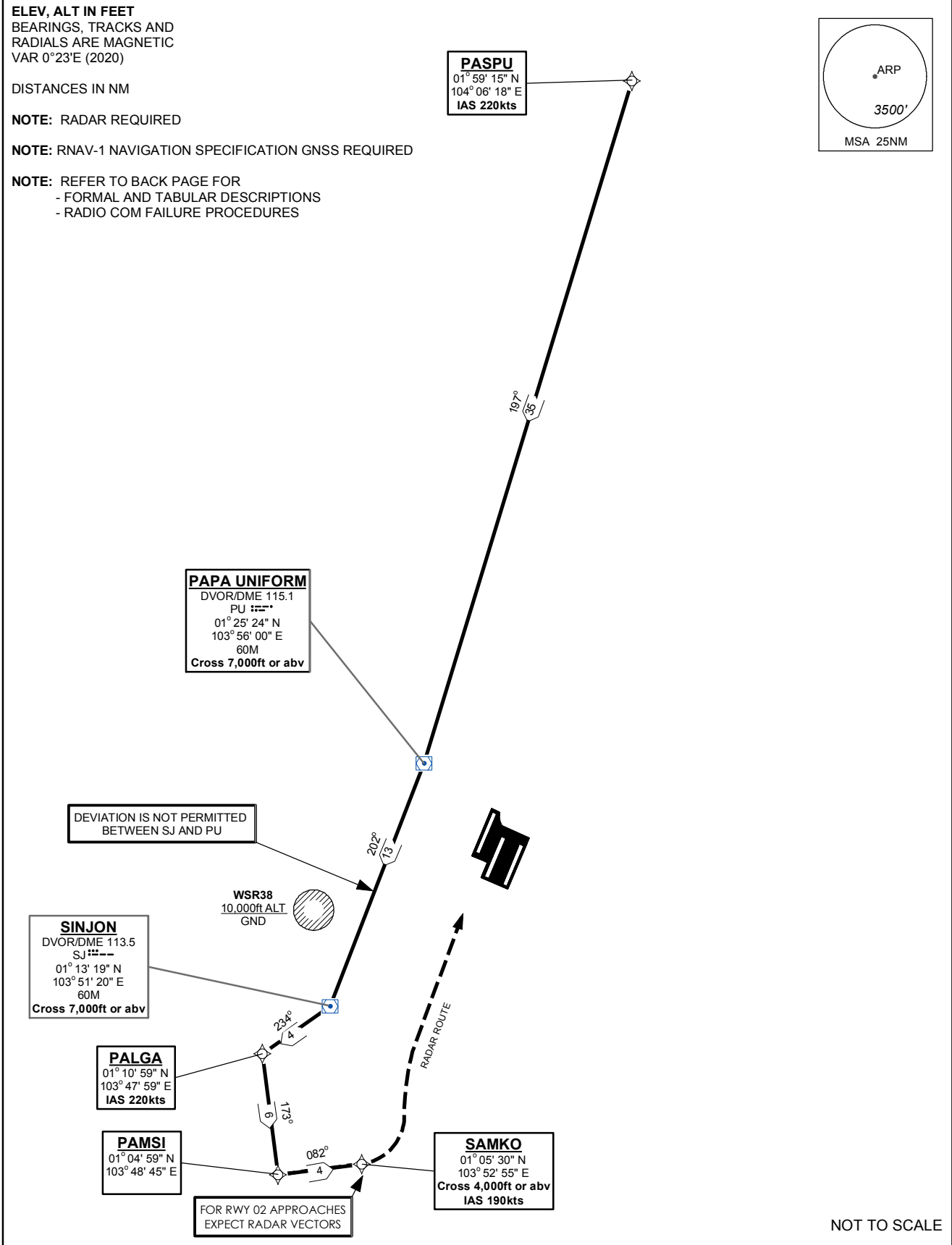
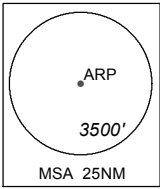
ELEV, ALT IN FEET
 BEARINGS, TRACKS AND
 RADIALS ARE MAGNETIC
 VAR 0°23'E (2020)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

NOTE: REFER TO BACK PAGE FOR
 - FORMAL AND TABULAR DESCRIPTIONS
 - RADIO COM FAILURE PROCEDURES



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LEBAR 2A (STAR) RNAV GNSS RWY 02L/02C/02R - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From PASPU, speed 220kts. To PU at or above 7000ft, turn right. To SJ at or above 7000ft, turn right. To PALGA, speed 220kts, turn left. To PAMSI, turn left. To SAMKO at or above 4000ft, speed 190kts.	PASPU [K220] -	IF	N
	PU [A070+; R] -	TF	N
	SJ [A070+; R] -	TF	N
	PALGA [K220; L] -	TF	N
	PAMSI [L] -	TF	N
	SAMKO [A040+; K190]	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	PASPU	-	-	-	-	-	K220	RNAV1
TF	PU	-	197(197.4)	-0.4	R	A070+	-	RNAV1
TF	SJ	-	202(202.4)	-0.4	R	A070+	-	RNAV1
TF	PALGA	-	234(234.4)	-0.4	L	-	K220	RNAV1
TF	PAMSI	-	173(173.4)	-0.4	L	-	-	RNAV1
TF	SAMKO	-	082(082.4)	-0.4	-	A040+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via LEBAR 2A by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on LEBAR 2A to SAMKO</p> <p>(b) From SAMKO commence descent and carry out appropriate landing procedure for RWY 02L as close as possible to EAT or ETA</p> <p>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</p>
3	<p>No clearance or instruction received from Singapore ATC</p> <p>- Refer to Singapore AIP for radio communications failure procedure</p>

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**STANDARD ARRIVAL CHART
RNAV (GNSS) -
INSTRUMENT (STAR)**

ACC 133.25 / 134.4
APP 124.05
119.3
TWR 118.6

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.025

**SINGAPORE/Singapore Changi
RWY 20R/C/L
LEBAR TWO BRAVO ARRIVAL
LEBAR 2B**

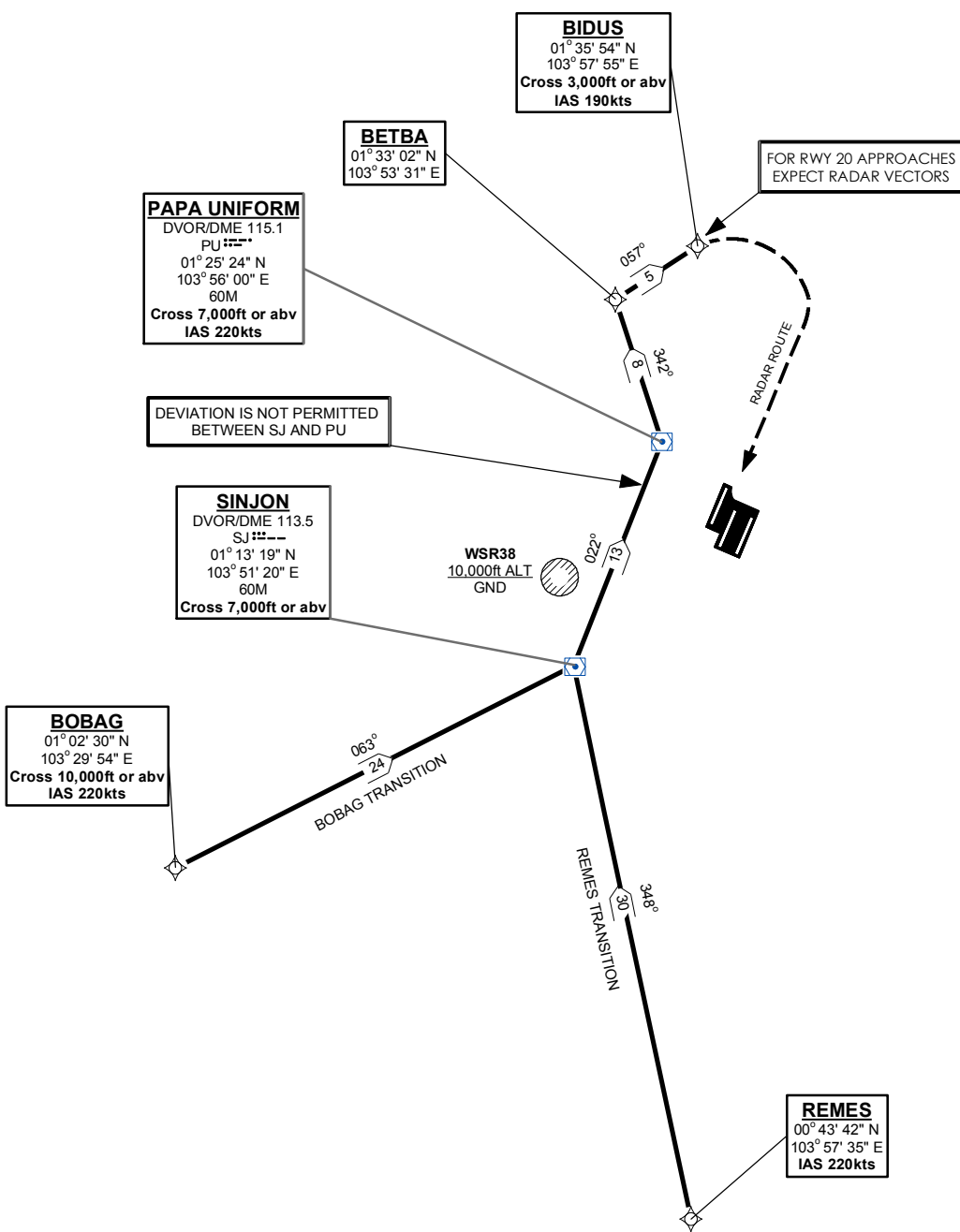
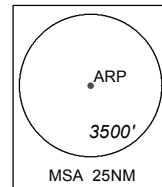
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 0°23'E (2020)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

NOTE: REFER TO BACK PAGE FOR
- FORMAL AND TABULAR DESCRIPTIONS
- RADIO COM FAILURE PROCEDURES



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LEBAR 2B (STAR) RNAV GNSS RWY 20R/20C/20L - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description (BOBAG Transition)	Abbreviated Description	Path Terminator	Fly-Over required
From BOBAG at or above 10000ft, speed 220kts. To SJ at or above 7000ft, turn left. To PU at or above 7000ft, speed 220kts, turn left. To BETBA, turn right. To BIDUS at or above 3000ft, speed 190kts.	BOBAG [A100+; K220] -	IF	N
	SJ [A070+; L] -	TF	N
	PU [A070+; K220; L] -	TF	N
	BETBA [R] -	TF	N
	BIDUS [A030+; K190]	TF	N
Formal Description (REMES Transition)	Abbreviated Description	Path Terminator	Fly-Over required
From REMES, speed 220kts. To SJ at or above 7000ft, turn right. To PU at or above 7000ft, speed 220kts, turn left. To BETBA, turn right. To BIDUS at or above 3000ft, speed 190kts.	REMES [K220] -	IF	N
	SJ [A070+; R] -	TF	N
	PU [A070+; K220; L] -	TF	N
	BETBA [R] -	TF	N
	BIDUS [A030+; K190]	TF	N

Tabular Descriptions (BOBAG Transition)

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	BOBAG	-	-	-	-	A100+	K220	RNAV1
TF	SJ	-	063(063.4)	-0.4	L	A070+	-	RNAV1
TF	PU	-	022(022.4)	-0.4	L	A070+	K220	RNAV1
TF	BETBA	-	342(342.4)	-0.4	R	-	-	RNAV1
TF	BIDUS	-	057(057.4)	-0.4	-	A030+	K190	RNAV1

Tabular Descriptions (REMES Transition)

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	REMES	-	-	-	-	-	K220	RNAV1
TF	SJ	-	348(348.4)	-0.4	R	A070+	-	RNAV1
TF	PU	-	022(022.4)	-0.4	L	A070+	K220	RNAV1
TF	BETBA	-	342(342.4)	-0.4	R	-	-	RNAV1
TF	BIDUS	-	057(057.4)	-0.4	-	A030+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via LEBAR 2B by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on LEBAR 2B to BIDUS, then direct to NYLON</p> <p>(b) From NYLON commence descent and carry out appropriate landing procedure for RWY 20R as close as possible to EAT or ETA</p> <p>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</p>
3	<p>No clearance or instruction received from Singapore ATC</p> <p>- Refer to Singapore AIP for radio communications failure procedure</p>

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STANDARD ARRIVAL CHART
RNAV (GNSS) -
INSTRUMENT (STAR)

ACC 134.4
 APP 124.05
 119.3
 TWR 118.6 / 118.25

TRANSITION ALTITUDE
 11 000ft

D-ATIS AP ID-WSSS
 128.025

SINGAPORE/Singapore Changi
RWY 02L/C/R
REPOV ONE ALPHA ARRIVAL
REPOV 1A

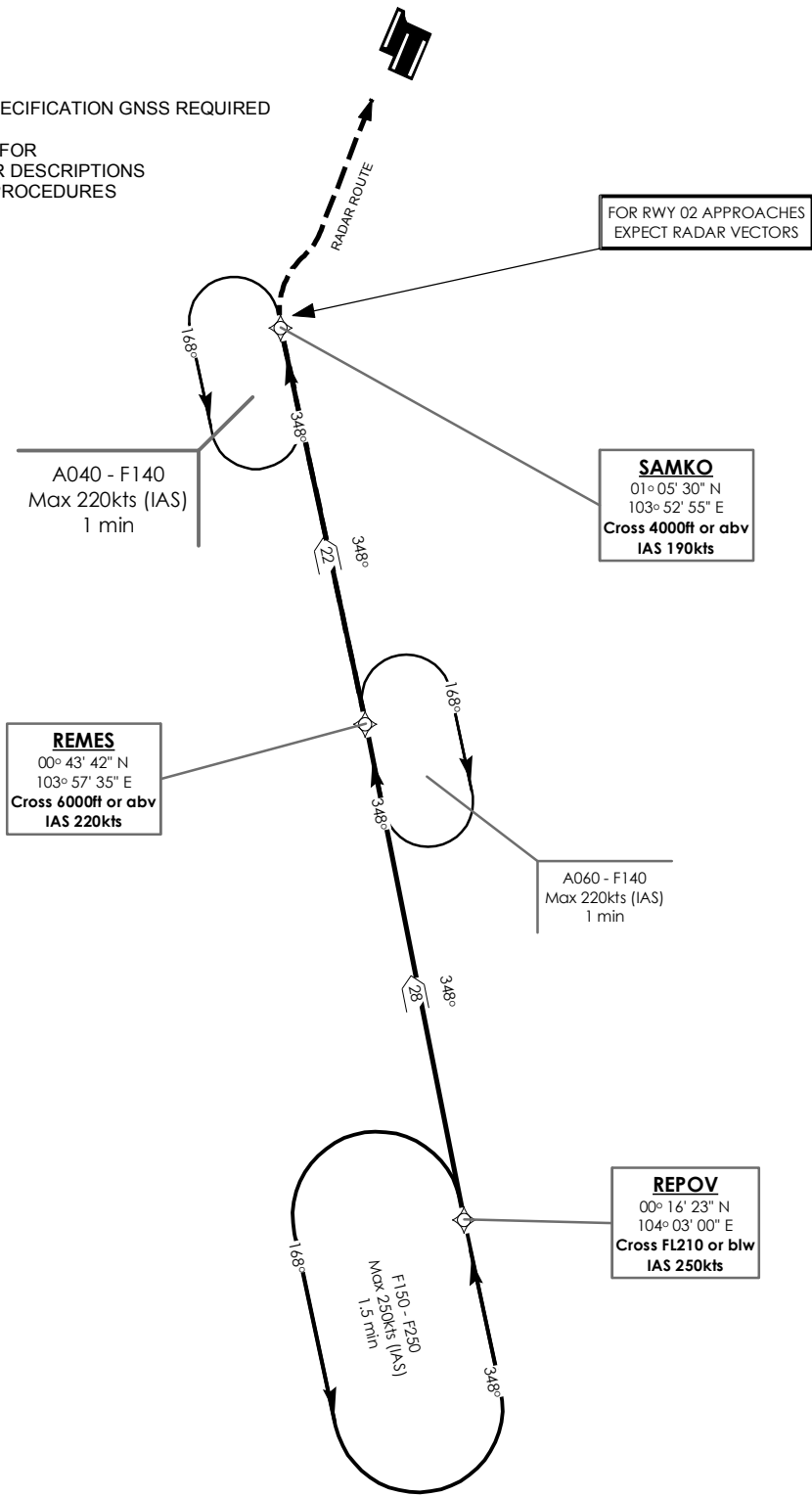
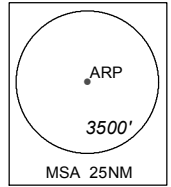
ELEV, ALT IN FEET
 BEARINGS, TRACKS AND
 RADIALS ARE MAGNETIC
 VAR 0°23'E (2020)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

NOTE: REFER TO BACK PAGE FOR
 - FORMAL AND TABULAR DESCRIPTIONS
 - RADIO COM FAILURE PROCEDURES



A040 - F140
 Max 220kts (IAS)
 1 min

FOR RWY 02 APPROACHES
 EXPECT RADAR VECTORS

SAMKO
 01° 05' 30" N
 103° 52' 55" E
 Cross 4000ft or abv
 IAS 190kts

REMES
 00° 43' 42" N
 103° 57' 35" E
 Cross 6000ft or abv
 IAS 220kts

A060 - F140
 Max 220kts (IAS)
 1 min

REPOV
 00° 16' 23" N
 104° 03' 00" E
 Cross FL210 or blw
 IAS 250kts

F150 - F250
 Max 250kts (IAS)
 1.5 min

NOT TO SCALE

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REPOV 1A (STAR) RNAV GNSS RWY 02L/02C/02R - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From REPOV at or below FL210, speed 250kts. To REMES at or above 6000ft, speed 220kts. To SAMKO at or above 4000ft, speed 190kts.	REPOV [FL210-; K250] - REMES [A060+; K220] - SAMKO [A040+; K190]	IF TF TF	N N N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	REPOV	-	-	-	-	FL210-	K250	RNAV1
TF	REMES	-	348(348.4)	-0.4	-	A060+	K220	RNAV1
TF	SAMKO	-	348(348.4)	-0.4	-	A040+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via REPOV 1A by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on REPOV 1A to SAMKO</p> <p>(b) From SAMKO commence descent and carry out appropriate landing procedure for RWY 02 as close as possible to EAT or ETA</p> <p>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</p>
3	<p>No clearance or instruction received from Singapore ATC</p> <p>- Refer to Singapore AIP for radio communications failure procedure</p>

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STANDARD ARRIVAL CHART
RNAV (GNSS) -
INSTRUMENT (STAR)

ACC 134.4
 APP 124.05
 119.3
 TWR 118.6 / 118.25

TRANSITION ALTITUDE
 11 000ft

D-ATIS AP ID-WSSS
 128.025

SINGAPORE/Singapore Changi
RWY 02L/C/R
SURGA ONE ALPHA ARRIVAL
SURGA 1A

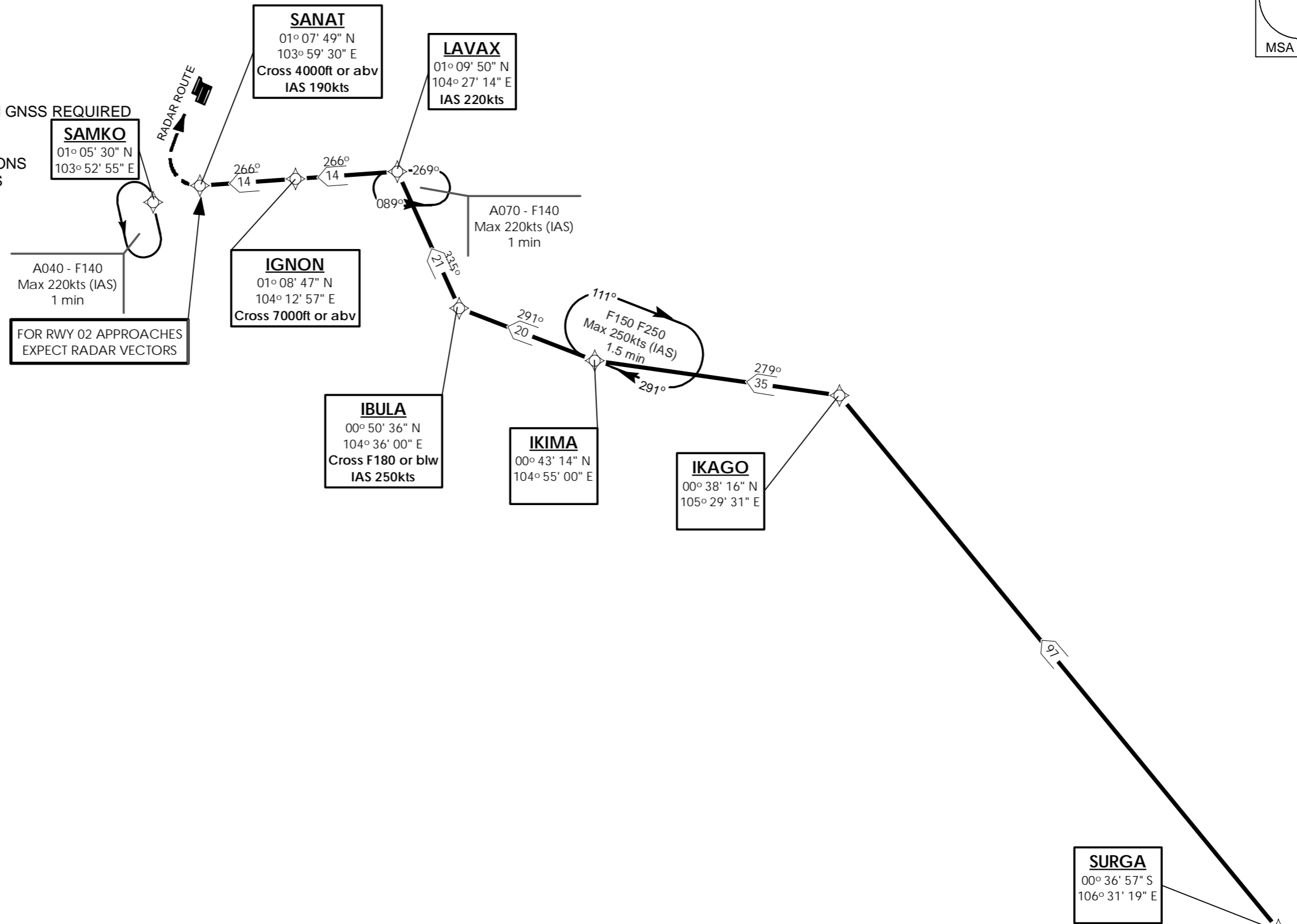
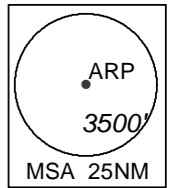
ELEV, ALT IN FEET
 BEARINGS, TRACKS AND
 RADIALS ARE MAGNETIC
 VAR 0°23'E (2020)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

NOTE: REFER TO BACK PAGE FOR
 - FORMAL AND TABULAR DESCRIPTIONS
 - RADIO COM FAILURE PROCEDURES



FOR RWY 02 APPROACHES
 EXPECT RADAR VECTORS

NOT TO SCALE

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SURGA 1A (STAR) RNAV GNSS RWY 02L/02C/02R - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From SURGA. To IKAGO, turn left. To IKIMA, turn right. To IBULA at or below FL180, speed 250kts, turn right. To LAVAX, speed 220kts, turn left. To IGNON at or above 7000ft. To SANAT at or above 4000ft, speed 190kts.	SURGA -	IF	N
	IKAGO [L] -	TF	N
	IKIMA [R] -	TF	N
	IBULA [FL180-; K250; R] -	TF	N
	LAVAX [K220; L] -	TF	N
	IGNON [A070+] -	TF	N
	SANAT [A040+; K190]	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	SURGA	-	-	-	-	-	-	RNAV1
TF	IKAGO	-	320(320.4)	-0.4	L	-	-	RNAV1
TF	IKIMA	-	279(279.4)	-0.4	R	-	-	RNAV1
TF	IBULA	-	291(291.4)	-0.4	R	FL180-	K250	RNAV1
TF	LAVAX	-	335(335.4)	-0.4	L	-	K220	RNAV1
TF	IGNON	-	266(266.4)	-0.4	-	A070+	-	RNAV1
TF	SANAT	-	266(266.4)	-0.4	-	A040+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via SURGA 1A by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on SURGA 1A to SANAT, then direct to SAMKO</p> <p>(b) From SAMKO commence descent and carry out appropriate landing procedure for RWY 02 as close as possible to EAT or ETA</p> <p>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</p>
3	<p>No clearance or instruction received from Singapore ATC</p> <p>- Refer to Singapore AIP for radio communications failure procedure</p>

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**STANDARD ARRIVAL CHART
RNAV (GNSS) -
INSTRUMENT (STAR)**

ACC 134.4
APP 124.05
119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.025

**SINGAPORE/Singapore Changi
RWY 20R/C/L
REPOV ONE BRAVO ARRIVAL
REPOV 1B**

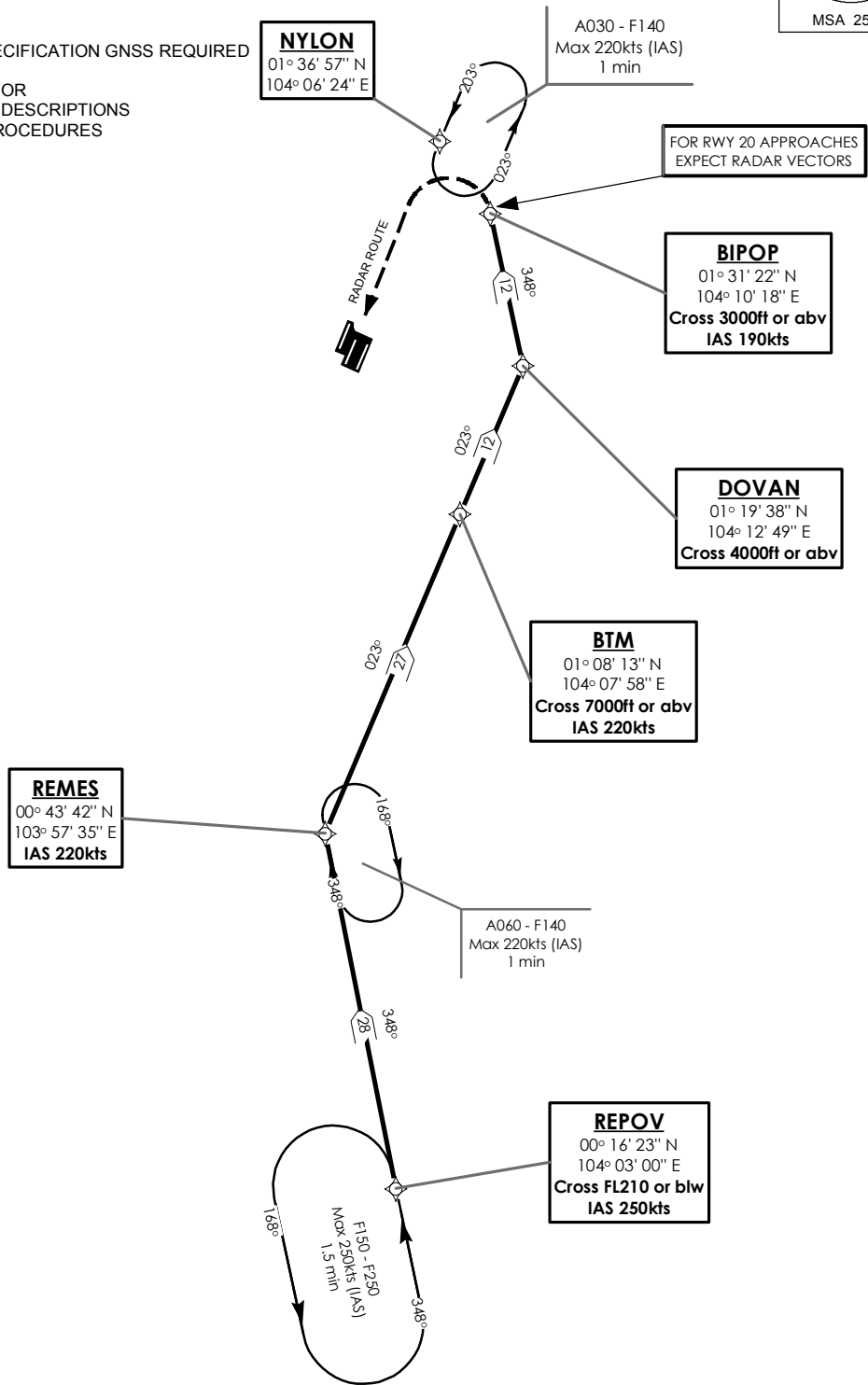
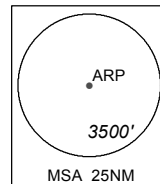
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 0°23'E (2020)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

NOTE: REFER TO BACK PAGE FOR
- FORMAL AND TABULAR DESCRIPTIONS
- RADIO COM FAILURE PROCEDURES



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REPOV 1B (STAR) RNAV GNSS RWY 20R/20C/20L - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From REPOV at or below FL210, speed 250kts. To REMES, speed 220kts, turn right. To BTM at or above 7000ft, speed 220kts. To DOVAN at or above 4000ft, turn left. To BIPOP at or above 3000ft, speed 190kts.	REPOV [FL210-; K250] - REMES [K220; R] - BTM [A070+; K220] - DOVAN [A040+; L] - BIPOP [A030+; K190]	IF TF TF TF TF	N N N N N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	REPOV	-	-	-	-	FL210-	K250	RNAV1
TF	REMES	-	348(348.4)	-0.4	R	-	K220	RNAV1
TF	BTM	-	023(023.4)	-0.4	-	A070+	K220	RNAV1
TF	DOVAN	-	023(023.4)	-0.4	L	A040+	-	RNAV1
TF	BIPOP	-	348(348.4)	-0.4	-	A030+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via REPOV 1B by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on REPOV 1B to BIPOP, then direct to NYLON</p> <p>(b) From NYLON commence descent and carry out appropriate landing procedure for RWY 20 as close as possible to EAT or ETA</p> <p>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</p>
3	<p>No clearance or instruction received from Singapore ATC</p> <p>- Refer to Singapore AIP for radio communications failure procedure</p>

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STANDARD ARRIVAL CHART
RNAV (GNSS) -
INSTRUMENT (STAR)

ACC 134.4
 APP 124.05
 119.3
 TWR 118.6 / 118.25

TRANSITION ALTITUDE
 11 000ft

D-ATIS AP ID-WSSS
 128.025

SINGAPORE/Singapore Changi
RWY 20R/C/L
SURGA ONE BRAVO ARRIVAL
SURGA 1B

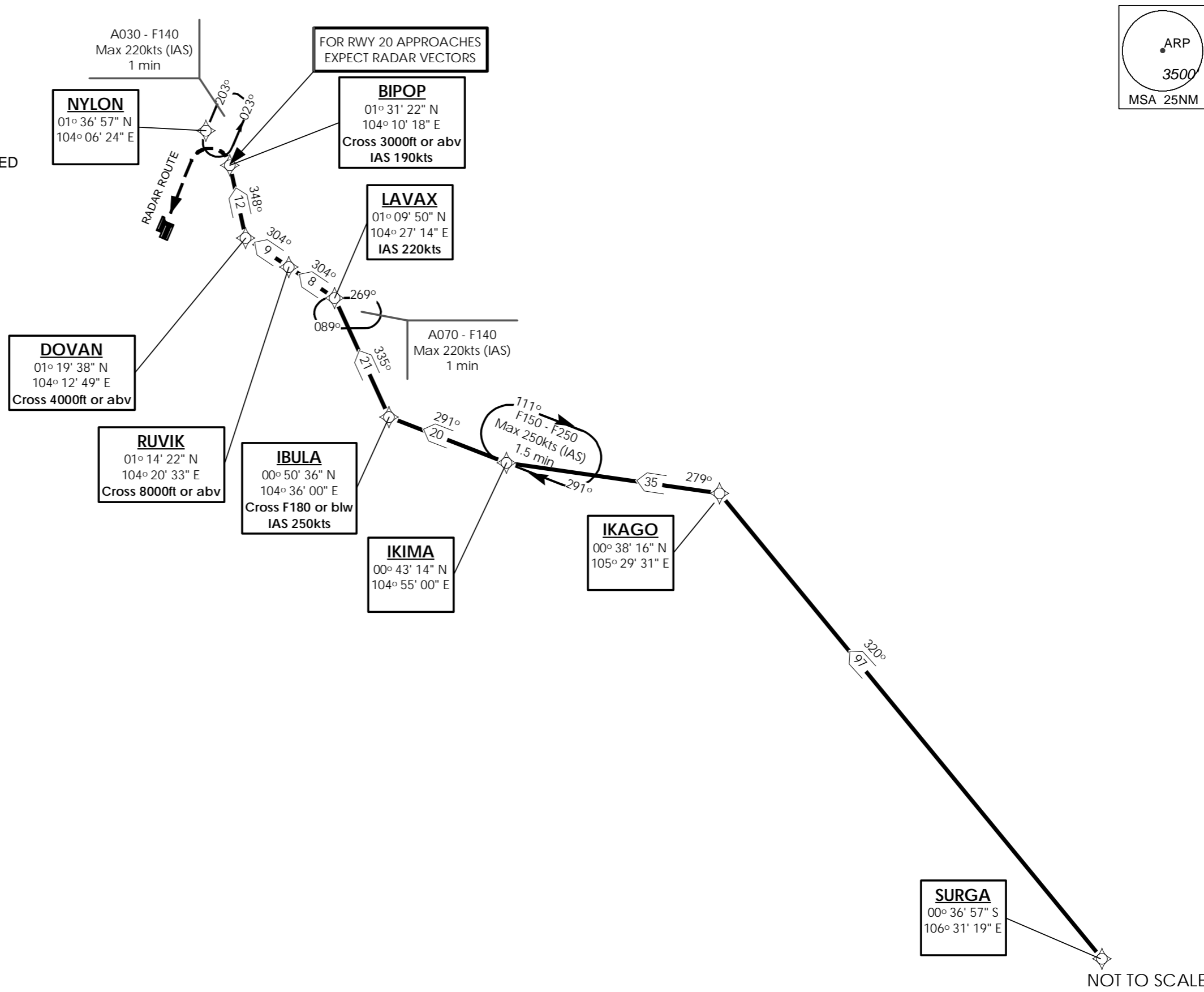
ELEV, ALT IN FEET
 BEARINGS, TRACKS AND
 RADIALS ARE MAGNETIC
 VAR 0°23'E (2020)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

NOTE: REFER TO BACK PAGE FOR
 - FORMAL AND TABULAR DESCRIPTIONS
 - RADIO COM FAILURE PROCEDURES



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SURGA 1B (STAR) RNAV GNSS RWY 20R/20C/20L - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From SURGA. To IKAGO, turn left. To IKIMA, turn right. To IBULA at or below FL180, speed 250kts, turn right. To LAVAX, speed 220kts, turn left. To RUVIK at or above 8000ft. To DOVAN at or above 4000ft, turn right. To BIPOP at or above 3000ft, speed 190kts.	SURGA - IKAGO [L] - IKIMA [R] - IBULA [FL180-; K250; R] - LAVAX [K220; L] - RUVIK [A080+] - DOVAN [A040+; R] - BIPOP [A030+; K190]	IF TF TF TF TF TF TF TF	N N N N N N N N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	SURGA	-	-	-	-	-	-	RNAV1
TF	IKAGO	-	320(320.4)	-0.4	L	-	-	RNAV1
TF	IKIMA	-	279(279.4)	-0.4	R	-	-	RNAV1
TF	IBULA	-	291(291.4)	-0.4	R	FL180-	K250	RNAV1
TF	LAVAX	-	335(335.4)	-0.4	L	-	K220	RNAV1
TF	RUVIK	-	304(304.4)	-0.4	-	A080+	-	RNAV1
TF	DOVAN	-	304(304.4)	-0.4	R	A040+	-	RNAV1
TF	BIPOP	-	348(348.4)	-0.4	-	A030+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via SURGA 1B by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on SURGA 1B to BIPOP, then direct to NYLON</p> <p>(b) From NYLON commence descent and carry out appropriate landing procedure for RWY 20 as close as possible to EAT or ETA</p> <p>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</p>
3	<p>No clearance or instruction received from Singapore ATC</p> <p>- Refer to Singapore AIP for radio communications failure procedure</p>

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**STANDARD ARRIVAL CHART
RNAV (GNSS) -
INSTRUMENT (STAR)**

ACC 133.8
APP 124.05
119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.025

**SINGAPORE/Singapore Changi
RWY 02L/C/R
ELALO ONE ALPHA ARRIVAL
ELALO 1A**

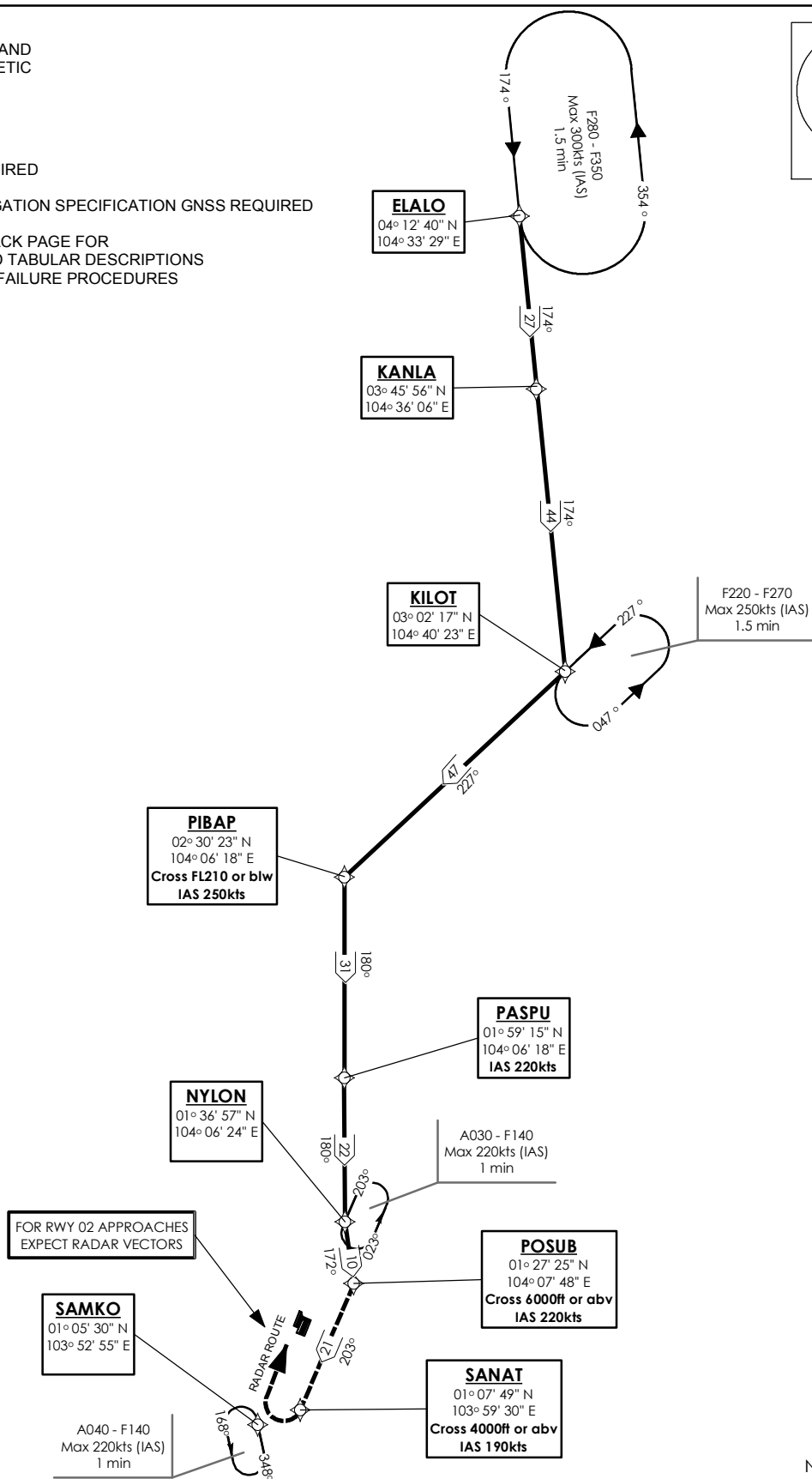
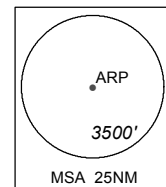
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 0°23'E (2020)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

NOTE: REFER TO BACK PAGE FOR
- FORMAL AND TABULAR DESCRIPTIONS
- RADIO COM FAILURE PROCEDURES



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ELALO 1A (STAR) RNAV GNSS RWY 02L/02C/02R - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From ELALO. To KANLA. To KILOT, turn right. To PIBAP at or below FL210, speed 250kts, turn left. To PASPU, speed 220kts. To NYLON, turn left. To POSUB at or above 6000ft, speed 220kts, turn right. To SANAT at or above 4000ft, speed 190kts.	ELALO -	IF	N
	KANLA -	TF	N
	KILOT [R] -	TF	N
	PIBAP [FL210-; K250; L] -	TF	N
	PASPU [K220] -	TF	N
	NYLON [L] -	TF	N
	POSUB [A060+; K220; R] -	TF	N
SANAT [A040+; K190]	TF	N	

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	ELALO	-	-	-	-	-	-	RNAV1
TF	KANLA	-	174(174.4)	-0.4	-	-	-	RNAV1
TF	KILOT	-	174(174.4)	-0.4	R	-	-	RNAV1
TF	PIBAP	-	227(227.4)	-0.4	L	FL210-	K250	RNAV1
TF	PASPU	-	180(180.4)	-0.4	-	-	K220	RNAV1
TF	NYLON	-	180(180.4)	-0.4	L	-	-	RNAV1
TF	POSUB	-	172(172.4)	-0.4	R	A060+	K220	RNAV1
TF	SANAT	-	203(203.4)	-0.4	-	A040+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via ELALO 1A by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on ELALO 1A to SANAT, then direct to SAMKO</p> <p>(b) From SAMKO commence descent and carry out appropriate landing procedure for RWY 02 as close as possible to EAT or ETA</p> <p>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</p>
3	<p>No clearance or instruction received from Singapore ATC</p> <p>- Refer to Singapore AIP for radio communications failure procedure</p>

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**STANDARD ARRIVAL CHART
RNAV (GNSS) -
INSTRUMENT (STAR)**

ACC 133.8
APP 124.05
119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.025

**SINGAPORE/Singapore Changi
RWY 20R/C/L
ELALO ONE BRAVO ARRIVAL
ELALO 1B**

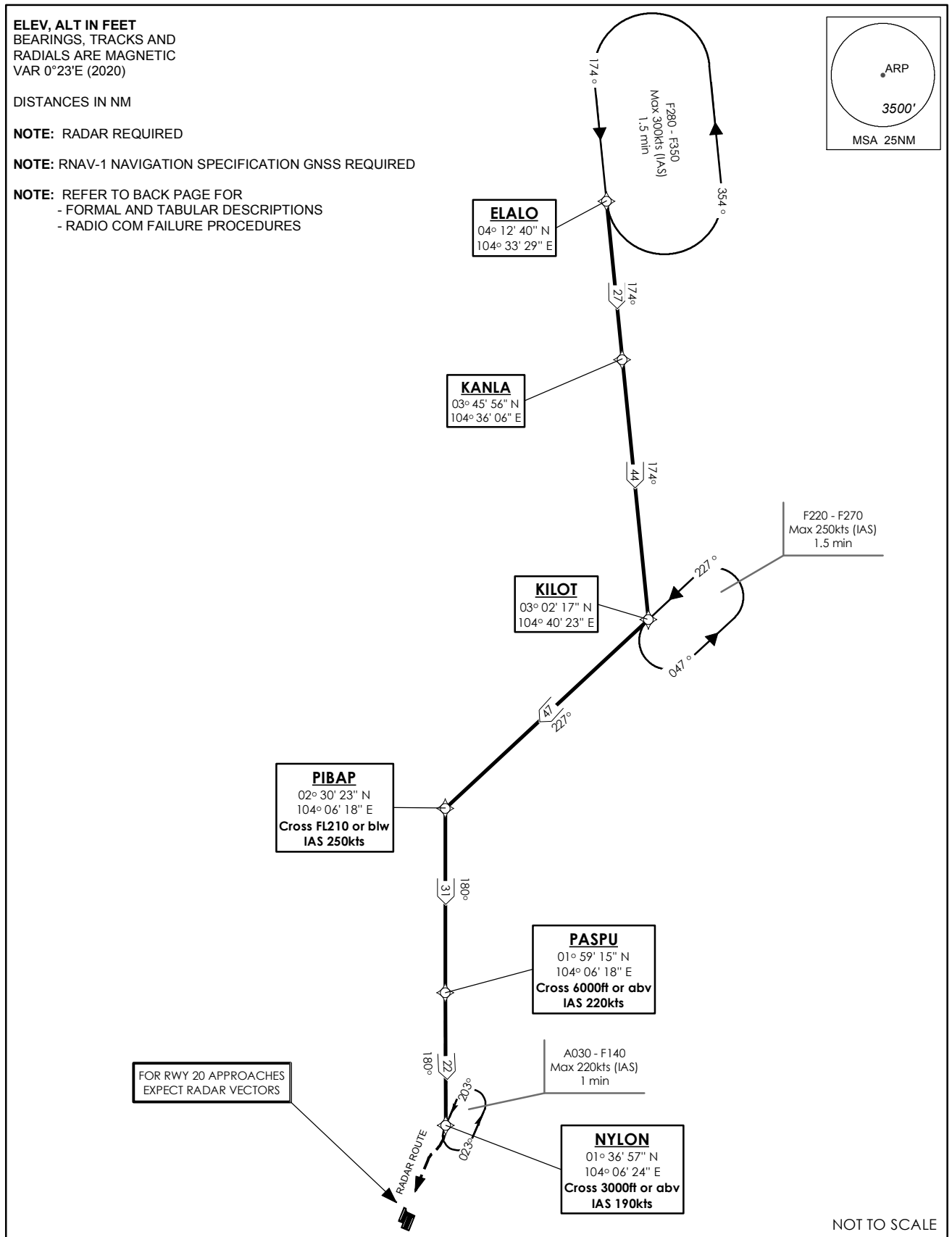
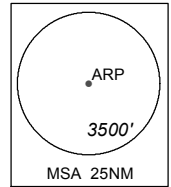
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 0°23'E (2020)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

NOTE: REFER TO BACK PAGE FOR
- FORMAL AND TABULAR DESCRIPTIONS
- RADIO COM FAILURE PROCEDURES



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ELALO 1B (STAR) RNAV GNSS RWY 20R/20C/20L - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From ELALO. To KANLA. To KILOT, turn right. To PIBAP at or below FL210, speed 250kts turn left. To PASPU, at or above 6000ft, speed 220kts. To NYLON at or above 3000ft, speed 190kts.	ELALO -	IF	N
	KANLA -	TF	N
	KILOT [R] -	TF	N
	PIBAP [FL210-; K250; L] -	TF	N
	PASPU [A060+; K220] -	TF	N
	NYLON [A030+; K190]	TF	N

Tabular Descriptions

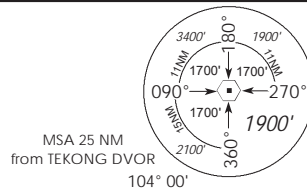
Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	ELALO	-	-	-	-	-	-	RNAV1
TF	KANLA	-	174(174.4)	-0.4	-	-	-	RNAV1
TF	KILOT	-	174(174.4)	-0.4	R	-	-	RNAV1
TF	PIBAP	-	227(227.4)	-0.4	L	FL210-	K250	RNAV1
TF	PASPU	-	180(180.4)	-0.4	-	A060+	K220	RNAV1
TF	NYLON	-	180(180.4)	-0.4	-	A030+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via ELALO 1B by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on ELALO 1B to NYLON</p> <p>(b) From NYLON commence descent and carry out appropriate landing procedure for RWY 20 as close as possible to EAT or ETA</p> <p>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</p>
3	<p>No clearance or instruction received from Singapore ATC</p> <p>- Refer to Singapore AIP for radio communications failure procedure</p>

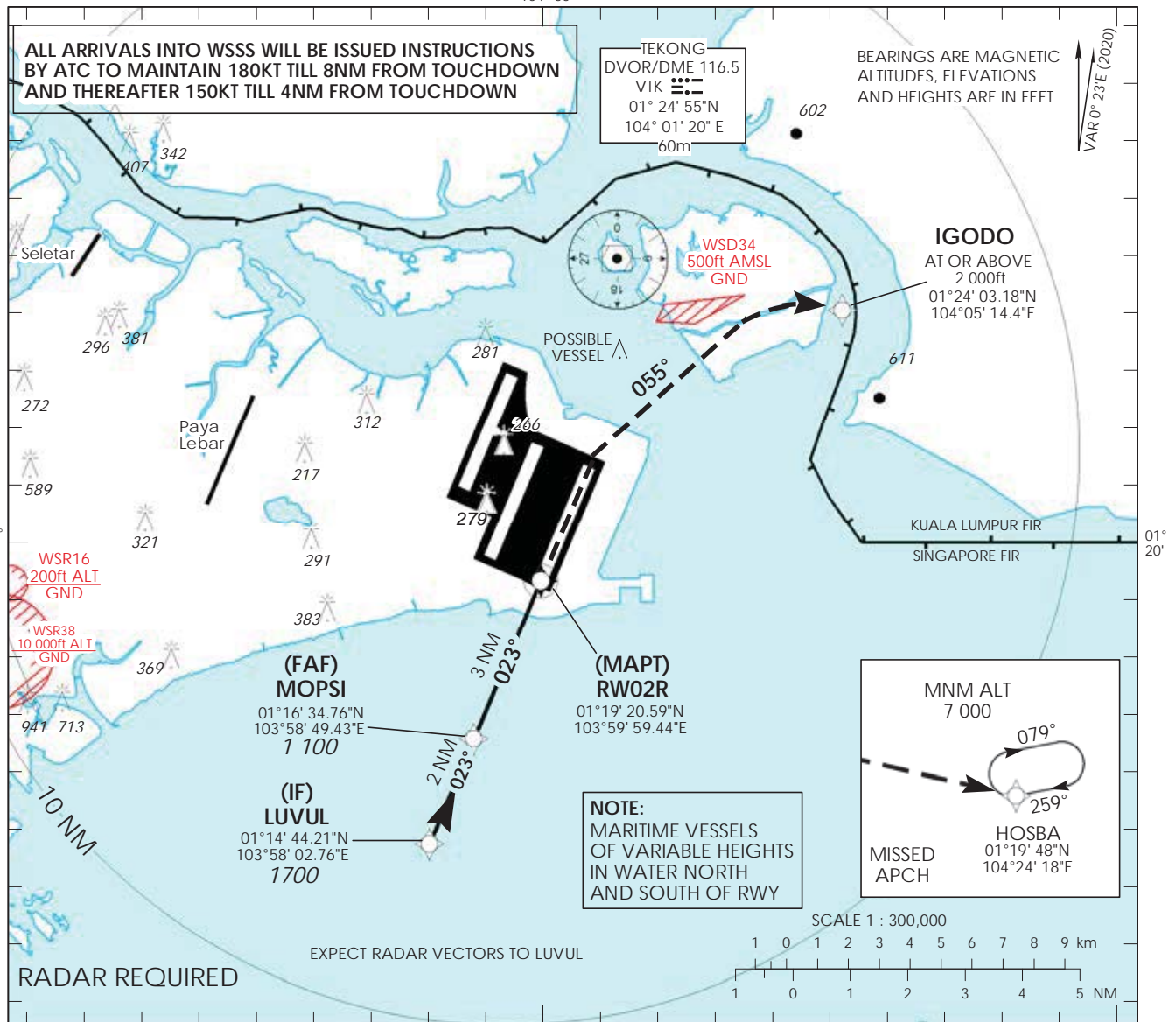
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INSTRUMENT APPROACH CHART
 AERODROME ELEV 22ft
 HEIGHT RELATED TO
 THR RWY 02R - ELEV 16ft

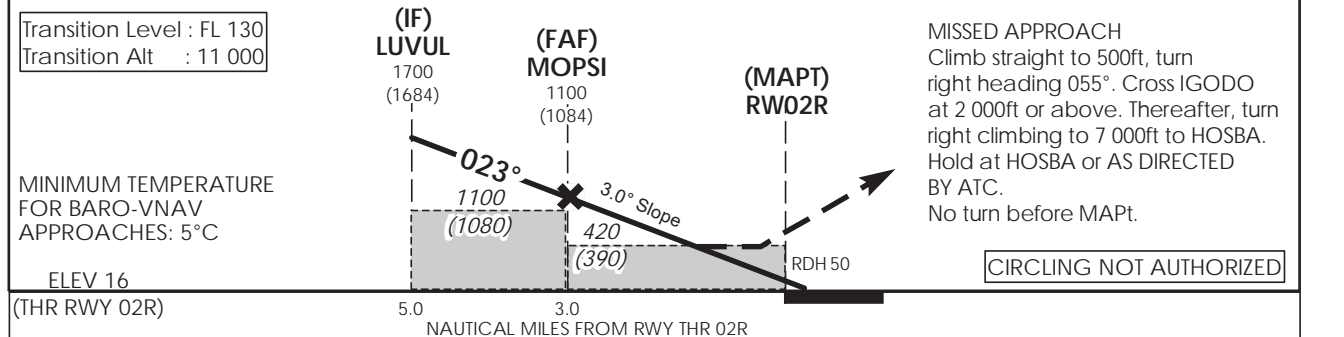


D-ATIS AP ID WSSS
 128.025
 APP 124.05
 TWR 124.6
 131.4

SINGAPORE/ SINGAPORE CHANGI RNP RWY 02R



- This procedure requires a missed approach climb gradient of 5% (304 ft/NM) until passing 2,000ft. MAX IAS 185kts during turning missed approach.
- For aircraft which can only achieve a 2.5% (152 ft/NM) climb gradient, the CAT I OCA (OCH) is 820ft (800ft) and aircraft shall climb straight to 1200ft before commencing right turn climbing to 7000ft to HOSBA.



		OCA (OCH)			
Category of Aircraft		A	B	C	D
LNAV/VNAV	5%	330 (310)			
LNAV	5%	420 (390)			

		LUVUL		MOPSI	
Distance		1700 (1684)		1100 (1084)	
Altitude (Height)		1700 (1684)		1100 (1084)	
Speed	knots	70	120	150	185
FAF - MAPT 3.0nm	min : s *	2 : 34	1 : 30	1 : 12	0 : 58
Rate of descent/GS	ft/min	370	635	795	980

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SINGAPORE CHANGI RNP-APCH RWY 02R – Approach from LUVUL

Path Terminator	Waypoint	Fly-Over	Course °M (°T)	Magnetic Variation	Distance (NM)	Turn Direction	Altitude (FT)	Speed Limit (KT)	VPA/ TCH(FT)	Navigation Specification
IF	LUVUL	-	023 (023.4)	-0.4	-	-	A017+	180	-	RNP APCH
TF	MOPSI	-	023 (023.4)	-0.4	2	-	A011+	150	-	RNP APCH
TF	RW02R	Y	023 (023.4)	-0.4	3	R	-	-	-3.0° / 50	RNP APCH
DF	IGODO	-	055 (055.4)	-0.4	-	R	A020+	185	-	RNP APCH
TF	HOSBA	-	103 (103.4)	-0.4	-	-	A070+	-	-	RNP APCH

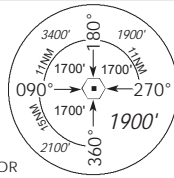
Waypoint Coordinates

Name	Latitude	Longitude
LUVUL (IF)	01° 14' 44.21" N	103° 58' 02.76" E
MOPSI (FAF)	01° 16' 34.76" N	103° 58' 49.43" E
RW02R	01° 19' 20.59" N	103° 59' 59.44" E
IGODO	01° 24' 03.18" N	104° 05' 14.40" E
HOSBA	01° 19' 48.00" N	104° 24' 18.00" E

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INSTRUMENT APPROACH CHART

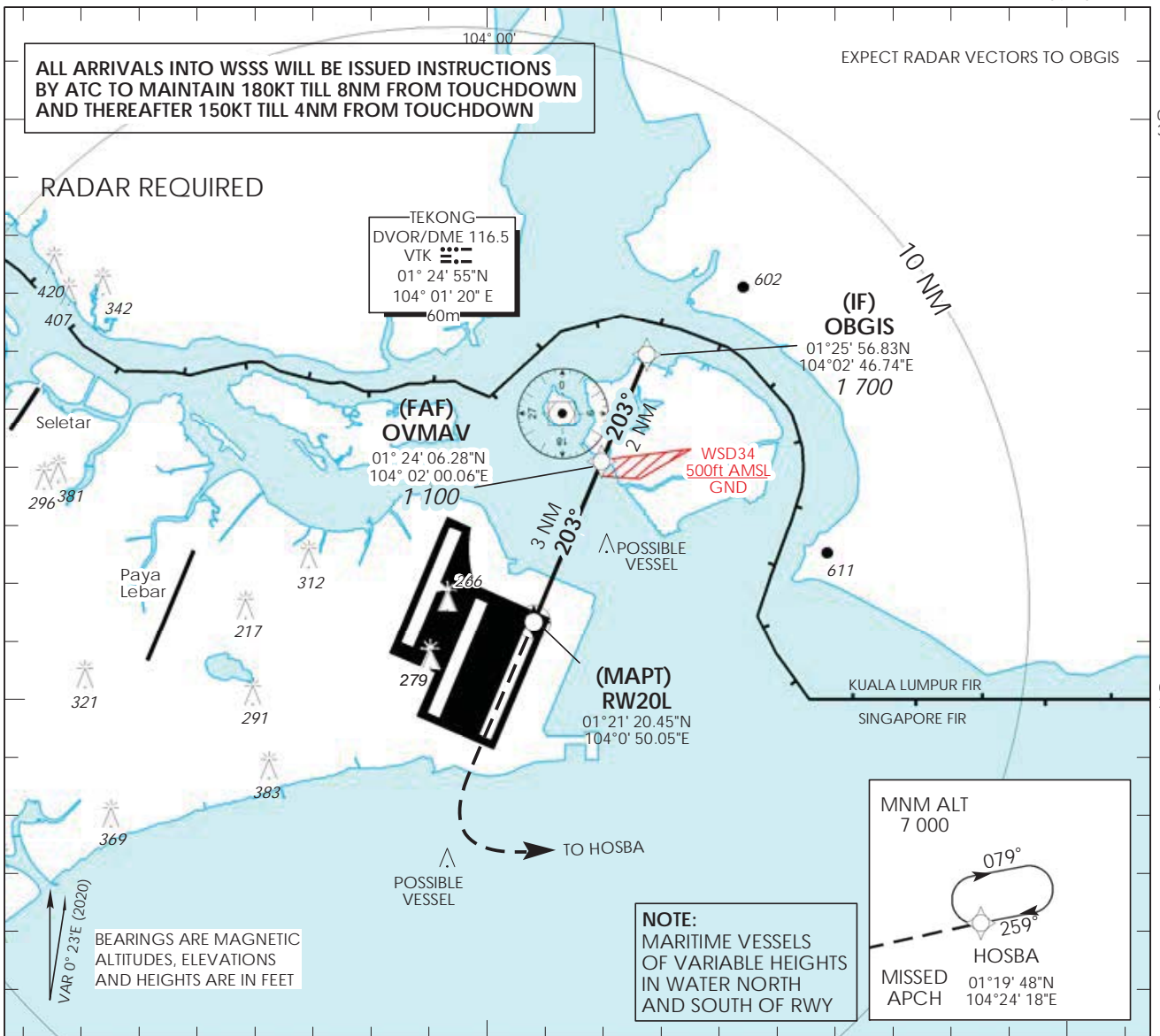
AERODROME ELEV 22ft
 HEIGHT RELATED TO
 THR RWY 20L - ELEV 16ft
 MSA 25 NM
 from TEKONG DVOR



D-ATIS	AP ID	WSSS
APP	128.6	124.05
TWR	124.6	131.4

SINGAPORE/
 SINGAPORE CHANGI
RNP RWY 20L

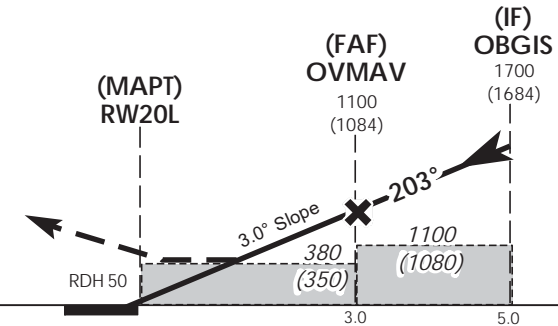
104° 10'



This procedure requires a missed approach climb gradient of 5% (304 ft/NM) until passing 3,000ft.
 For aircraft which can only achieve a 2.5% (152 ft/NM) climb gradient, the CAT I OCA (OCH) is 1080ft (1050ft).
 Transition Level : FL 130
 Transition Alt : 11 000

MISSED APPROACH
 Climb straight to 1 500ft, turn left climbing to 7 000ft to HOSBA.
 Hold at HOSBA or AS DIRECTED BY ATC.
 No turn before MAPt.

CIRCLING NOT AUTHORIZED



MINIMUM TEMPERATURE FOR BARO-VNAV APPROACHES: 5°C
 ELEV 16
 (THR RWY 20L)

		OCA (OCH)			
Category of Aircraft		A	B	C	D
LNAV/VNAV	5%	280 (260)			
LNAV	5%	380 (350)			
Distance		OBGIS		OVMAN	
Altitude (Height)		1700 (1684)		1100 (1084)	
Speed	knots	70	120	150	185
FAF - MAPT 3.0nm	min : s *	2 : 34	1 : 30	1 : 12	0 : 58
Rate of descent/GS	ft/min	370	635	795	980

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SINGAPORE CHANGI RNP-APCH RWY 20L – Approach from OBGIS

Path Terminator	Waypoint	Fly-Over	Course °M (°T)	Magnetic Variation	Distance (NM)	Turn Direction	Altitude (FT)	Speed Limit (KT)	VPA/ TCH(FT)	Navigation Specification
IF	OBGIS	-	203 (203.4)	-0.4	-	-	A017+	180	-	RNP APCH
TF	OVMAN	-	203 (203.4)	-0.4	2	-	A011+	150	-	RNP APCH
TF	RW20L	Y	203 (203.4)	-0.4	3	-	-	-	-3.0° / 50	RNP APCH
CA	-	-	203 (203.4)	-0.4	-	L	A015+	-	-	RNP APCH
DF	HOSBA	-	-	-	-	-	A070+	-	-	RNP APCH

Waypoint Coordinates

Name	Latitude	Longitude
OBGIS (IF)	01° 25' 56.83" N	104° 02' 46.74" E
OVMAN (FAF)	01° 24' 06.28" N	104° 02' 00.06" E
RW20L	01° 21' 20.45" N	104° 00' 50.05" E
HOSBA	01° 19' 48.00" N	104° 24' 18.00" E

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STANDARD INSTRUMENT DEPARTURES (SID) CHART

TWR 131.4
APP 120.3
ACC 133.8/134.4/133.25

TRANSITION ALTITUDE
11 000ft

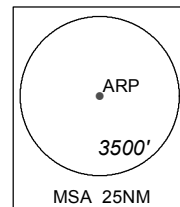
D-ATIS AP ID-WSSS
128.6

SINGAPORE/Singapore Changi RWY 02R/20L CHANGI DEPARTURE (RADAR) CHA 1C (R02R) CHA 1D (R20L)

ELEV, ALT IN FEET

BEARINGS, TRACKS AND RADIALS ARE MAGNETIC VAR 0°23'E (2020)

DISTANCES IN NM



GENERAL INFORMATION

INITIAL CLIMB 3000FT

NOTE: RADAR REQUIRED

NOTE: CLIMB GRADIENT RESTRICTION IS FOR THE PURPOSE OF AIR TRAFFIC MANAGEMENT. ACFT UNABLE TO COMPLY WITH CLIMB GRADIENT RESTRICTION SHALL INFORM ATC DURING THE TIME ACFT COMMENCES TAXIING TO HOLDING POINT FOR DEPARTURE

NOTE: REFER TO BACK PAGE FOR
- FORMAL AND TABULAR DESCRIPTIONS
- RADIO COM FAILURE PROCEDURES

PROCEDURE INFORMATION

ACFT ON DEPARTURE SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.

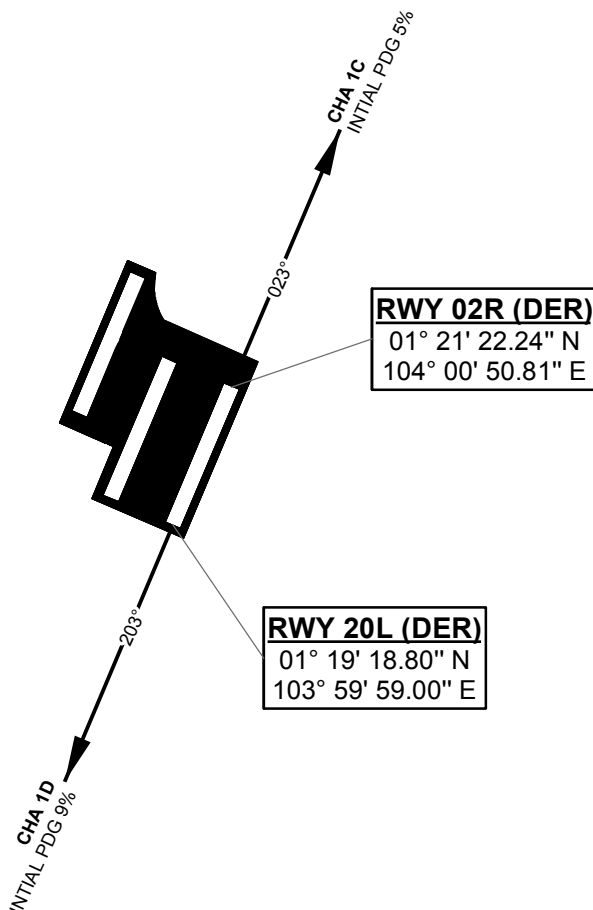
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF BY SINGAPORE RADAR.

ACFT ON DEPARTURE **02R** SHALL BE ON A MINIMUM CLIMB GRADIENT OF 5% UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
5% V/V (fpm)	380	506	760	1013	1266	1519
3.3% V/V (fpm)	251	334	501	668	835	1003

ACFT ON DEPARTURE **20L** SHALL BE ON A MINIMUM CLIMB GRADIENT OF 9% UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
9% V/V (fpm)	684	911	1367	1823	2279	2734
3.3% V/V (fpm)	251	334	501	668	835	1003



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CHA 1C SID (RADAR) RWY 02R - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator
Climb runway heading 023°, Gradient 5% to 2500ft, thence 3.3%. Expect radar vectors to planned ATS route or depicted waypoints (See table A)	-	VA

Tabular Descriptions

Path Terminator	Turn Direction	Course °T (°M)	Altitude	Speed Limit
VA	-	023 (022.5)	A030	-

CHA 1D SID (RADAR) RWY 20L - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator
Climb runway heading 203°, Gradient 9% to 2500ft, thence 3.3%. Expect radar vectors to planned ATS route or depicted waypoints (See table A)	-	VA

Tabular Descriptions

Path Terminator	Turn Direction	Course °T (°M)	Altitude	Speed Limit
VA	-	203 (202.5)	A030	-

Table A

Planned ATS Routes	Expect Radar Vectors to the waypoints listed below and thereafter fly direct between subsequent waypoints to join the respective planned ATS Route
A457	AKOMA DCT SABKA DCT MASBO
B470	DOSNO DCT ANITO
G580 / M646 / L625	HOSBA DCT TOMAN
L504	DOSNO DCT VENPA DCT ATKAX DCT BAVUS
M635	DOSNO DCT VENPA DCT VENIX DCT SURGA
B469 / M751 / M771 / L642 / M753	AKOMA DCT VMR
M774	DOSNO DCT VENPA DCT ATKAX DCT KADAR
L762 / R469	ADMIM DCT ASUNA
Y339	AKOMA DCT AKMET DCT AROSO

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	COMMUNICATIONS FAILURE OCCURS IMMEDIATELY AFTER DEPARTURE ON: RWY 02R - PROCEED DIRECT TO NYLON HOLDING AREA (NHA) CLIMBING TO THE LAST ASSIGNED ALTITUDE, THEREAFTER REFER TO SINGAPORE AIP ON RADIO COMMUNICATIONS FAILURE PROCEDURE. RWY 20L - PROCEED DIRECT TO SAMKO HOLDING AREA (SHA) CLIMBING TO THE LAST ASSIGNED ALTITUDE, THEREAFTER REFER TO SINGAPORE AIP ON RADIO COMMUNICATIONS FAILURE PROCEDURE.

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