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REPUBLIC OF SINGAPORE
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 CIVIL AVIATION AUTHORITY OF SINGAPORE
 SINGAPORE CHANGI AIRPORT
 P.O. BOX 1, SINGAPORE 918141

AIRAC
 110/15
 26TH JUNE

**REVISIONS TO THE EXISTING STANDARD INSTRUMENT DEPARTURES (SIDs)
 AND STANDARD TERMINAL ARRIVAL ROUTES (STARs)
 FOR SINGAPORE CHANGI AIRPORT**

1 INTRODUCTION

- 1.1 This AIP Supplement replaces the AIP Supplement 107/15 due to some editorial amendments in Appendixes A and B. This AIP Supplement provides details on the revisions to the SIDs and STARs for Singapore Changi Airport to enhance air traffic management, safety and efficiency.
- 1.2 The revisions to the SIDs and STARs for Singapore Changi Airport shall be effective from **0000UTC, 23 July 2015**.
- 1.3 The SIDs and STARs are designed in accordance to ICAO Doc 8168 – Procedure for Air Navigation Services – Aircraft Operations (PANS-OPS) and designated with a navigation specification of RNAV 1 in accordance to ICAO Doc 9613 – Performance Based Navigation (PBN) Manual.

2 DETAILS OF THE SIDs AND STARs

- 2.1 The new SIDs replacing the existing SIDs are shown below:

New SIDs	Replaces	Details of New SIDs
ADMIM 1A	BOBAG 1A	Appendix A-1
ADMIM 1B	BOBAG 1B	
ADMIM 1E	BOBAG 1E	Appendix A-2
ADMIM 1F	BOBAG 1F	
ANITO 6A	ANITO 5A	Appendix A-3
ANITO 5B	ANITO 4B	
ANITO 6E	ANITO 5E	Appendix A-4
ANITO 5F	ANITO 4F	
AROSO 2A	AROSO 1A	Appendix A-5
AROSO 2B	AROSO 1B	
AROSO 2E	AROSO 1E	Appendix A-6
AROSO 2F	AROSO 1F	
BAVUS 1A	VENPA 1A BAVUS Transition	Appendix A-7
BAVUS 1B	VENPA 1B BAVUS Transition	
BAVUS 1E	VENPA 1E BAVUS Transition	Appendix A-8
BAVUS 1F	VENPA 1F BAVUS Transition	

New SIDs	Replaces	Details of New SIDs
KADAR 1A	VENPA 1A KADAR Transition	Appendix A-9
KADAR 1B	VENPA 1B KADAR Transition	
KADAR 1E	VENPA 1E KADAR Transition	Appendix A-10
KADAR 1F	VENPA 1F KADAR Transition	Appendix A-11
MASBO 2A	MASBO 1A	
MASBO 2B	MASBO 1B	Appendix A-12
MASBO 2E	MASBO 1E	
MASBO 2F	MASBO 1F	
TOMAN 2A	TOMAN 1A	
TOMAN 2B	TOMAN 1B	Appendix A-13
TOMAN 2E	TOMAN 1E	Appendix A-14
TOMAN 2F	TOMAN 1F	
VENIX 1A	VENPA 1A SURGA Transition	Appendix A-15
VENIX 1B	VENPA 1B SURGA Transition	
VENIX 1E	VENPA 1E SURGA Transition	Appendix A-16
VENIX 1F	VENPA 1F SURGA Transition	
VMR 5A	VMR 4A	Appendix A-17
VMR 6B	VMR 5B	
VMR 5E	VMR 4E	Appendix A-18
VMR 6F	VMR 5F	

2.2 The new STARs replacing the existing STARs are shown below:

New STARs	Replaces	Details of New STARs
ARAMA 1A	BOBAG 1A	Appendix B-1
ARAMA 1B	BOBAG 1B	Appendix B-2
ASUNA 1A	BOBAG 1A	Appendix B-3
ASUNA 1B	BOBAG 1B	Appendix B-4
BIKTA 1A	PASPU 1A BIKTA Transition	Appendix B-5
BIKTA 1B	PASPU 1B BIKTA Transition	Appendix B-6
KARTO 1A	LAVAX 1A TOMAN Transition	Appendix B-7
KARTO 1B	LAVAX 1B TOMAN Transition	Appendix B-8
LEBAR 2A	LEBAR 1A	Appendix B-9
LEBAR 2B BOBAG Transition	LEBAR 1B BOBAG Transition	Appendix B-10
LEBAR 2B REMES Transition	LEBAR 1B REMES Transition	
LELIB 3B	LELIB 2B	Appendix B-11
MABAL 1A	PASPU 1A MABAL Transition	Appendix B-12
MABAL 1B	PASPU 1B MABAL Transition	Appendix B-13
OBDOS 1A	LAVAX 1A OBDOS Transition	Appendix B-14
OBDOS 1B	LAVAX 1B OBDOS Transition	Appendix B-15
REPOV 1A	REMES 5A	Appendix B-16
REPOV 1B	REMES 6B	Appendix B-17
SURGA 1A	LAVAX 1A SURGA Transition	Appendix B-18
SURGA 1B	LAVAX 1B SURGA Transition	Appendix B-19
VEPLI 1A	PASPU 1A VEPLI Transition	Appendix B-20
VEPLI 1B	PASPU 1B VEPLI Transition	Appendix B-21

2.3 The following STARs will be removed permanently:

- (i) BOBAG 1K & 1L
- (ii) LAVAX 1K & 1L
- (iii) PASPU 1K & 1L
- (iv) REMES 1K & 1L

3 SPEED RESTRICTIONS ON SIDs AND STARs

- 3.1 To improve traffic flow, a revision to the existing departure speed restriction will be introduced. Departures shall fly an indicated airspeed of 230 knots until passing A040 and 250 knots until passing A100, unless otherwise specified in the SIDs.
- 3.2 Arrivals on the new STARs shall fly at the indicated airspeed as specified in the STARs.

4 HEIGHT RESTRICTIONS ON SIDs

- 4.1 The note “The restriction to cross SUNVA / SUDPO at or above 2000ft is applicable between 2301/1100 UTC” under General Information of Appendix A has been removed. The height restriction over SUNVA / SUDPO is a SID restriction that is applicable throughout the day.

5 CONTINGENCY PROCEDURES

- 5.1 In the event of airborne RNAV equipment deterioration or failure of navigation systems below the navigation requirements, pilot shall inform ATC as soon as practicable. ATC shall then provide the appropriate heading instructions to ensure flight safety and separation with other air traffic in the vicinity.

6 CANCELLATION

- 6.1 AIP Supplement 110/15 will remain current until the information is incorporated into AIP Singapore.

**STANDARD DEPARTURE CHART
RNAV (GNSS) -
INSTRUMENT (SID)**

TWR 118.6 / 118.25
APP 120.3
ACC 133.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02C/20C
ADMIM DEPARTURES
ADMIM 1A (R02C)
ADMIM 1B (R20C)**

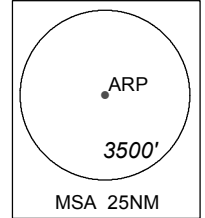
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

DISTANCES IN NM
NOTE: RADAR REQUIRED

NOTE: ACFT UNABLE TO FLY THE SID
PROFILE SHALL INFORM ATC
PRIOR TO DEPARTURE AND TO
EXPECT RADAR VECTORED,
IF NECESSARY

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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



GENERAL INFORMATION

**INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC**

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

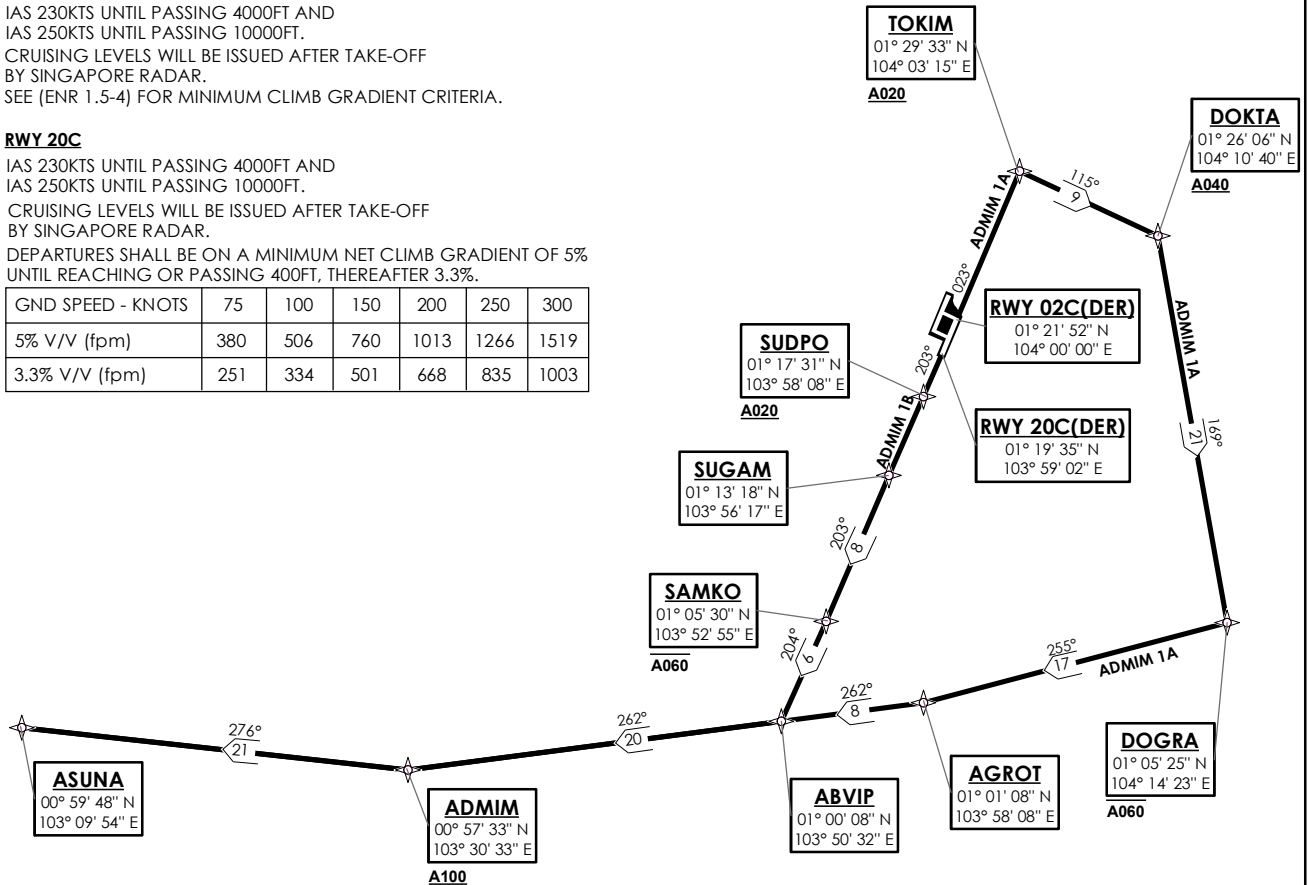
RWY 02C

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20C

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%
UNTIL REACHING OR PASSING 400FT, 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



NOT TO SCALE

ADMIM 1A (SID) RNAV GNSS RWY 02C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To TOKIM on course 023° at or above 2000ft, speed 230kts, turn right. To DOKTA at or above 4000ft, turn right. To DOGRA at or below 6000ft, turn right. To AGROT, turn right. To ABVIP. To ADMIM at or above 10000ft, turn right. To ASUNA.	TOKIM [M023; A020+; K230; R] -	CF	N
	DOKTA [A040+; R] -	TF	N
	DOGRA [A060-; R] -	TF	N
	AGROT [R] -	TF	N
	ABVIP -	TF	N
	ADMIM [A100+; R] -	TF	N
	ASUNA	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	TOKIM	-	023(022.5)	-0.5	R	A020+	K230	RNAV1
TF	DOKTA	-	115(114.5)	-0.5	R	A040+	-	RNAV1
TF	DOGRA	-	169(168.5)	-0.5	R	A060-	-	RNAV1
TF	AGROT	-	255(254.5)	-0.5	R	-	-	RNAV1
TF	ABVIP	-	262(261.5)	-0.5	-	-	-	RNAV1
TF	ADMIM	-	262(261.5)	-0.5	R	A100+	-	RNAV1
TF	ASUNA	-	276(275.5)	-0.5	-	-	-	RNAV1

ADMIM 1B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To SUDPO on course 203° at or above 2000ft, speed 230kts. To SUGAM. To SAMKO at or below 6000ft, turn right. To ABVIP, turn right. To ADMIM at or above 10000ft, turn right. To ASUNA.	SUDPO [M203; A020+; K230] -	CF	N
	SUGAM -	TF	N
	SAMKO [A060-; R] -	TF	N
	ABVIP [R] -	TF	N
	ADMIM [A100+; R] -	TF	N
	ASUNA	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	SUDPO	-	203(202.5)	-0.5	-	A020+	K230	RNAV1
TF	SUGAM	-	203(202.5)	-0.5	-	-	-	RNAV1
TF	SAMKO	-	203(202.5)	-0.5	R	A060-	-	RNAV1
TF	ABVIP	-	204(203.5)	-0.5	R	-	-	RNAV1
TF	ADMIM	-	262(261.5)	-0.5	R	A100+	-	RNAV1
TF	ASUNA	-	276(275.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

**STANDARD DEPARTURE CHART
RNAV (GNSS) -
INSTRUMENT (SID)**

TWR 118.6 / 118.25
APP 120.3
ACC 133.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02L/20R
ADMIM DEPARTURES
ADMIM 1E (R02L)
ADMIM 1F (R20R)**

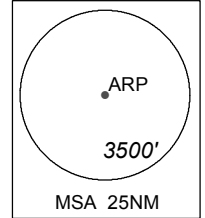
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

DISTANCES IN NM
NOTE: RADAR REQUIRED

NOTE: ACFT UNABLE TO FLY THE SID
PROFILE SHALL INFORM ATC
PRIOR TO DEPARTURE AND TO
EXPECT RADAR VECTORING,
IF NECESSARY

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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



GENERAL INFORMATION

**INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC**

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

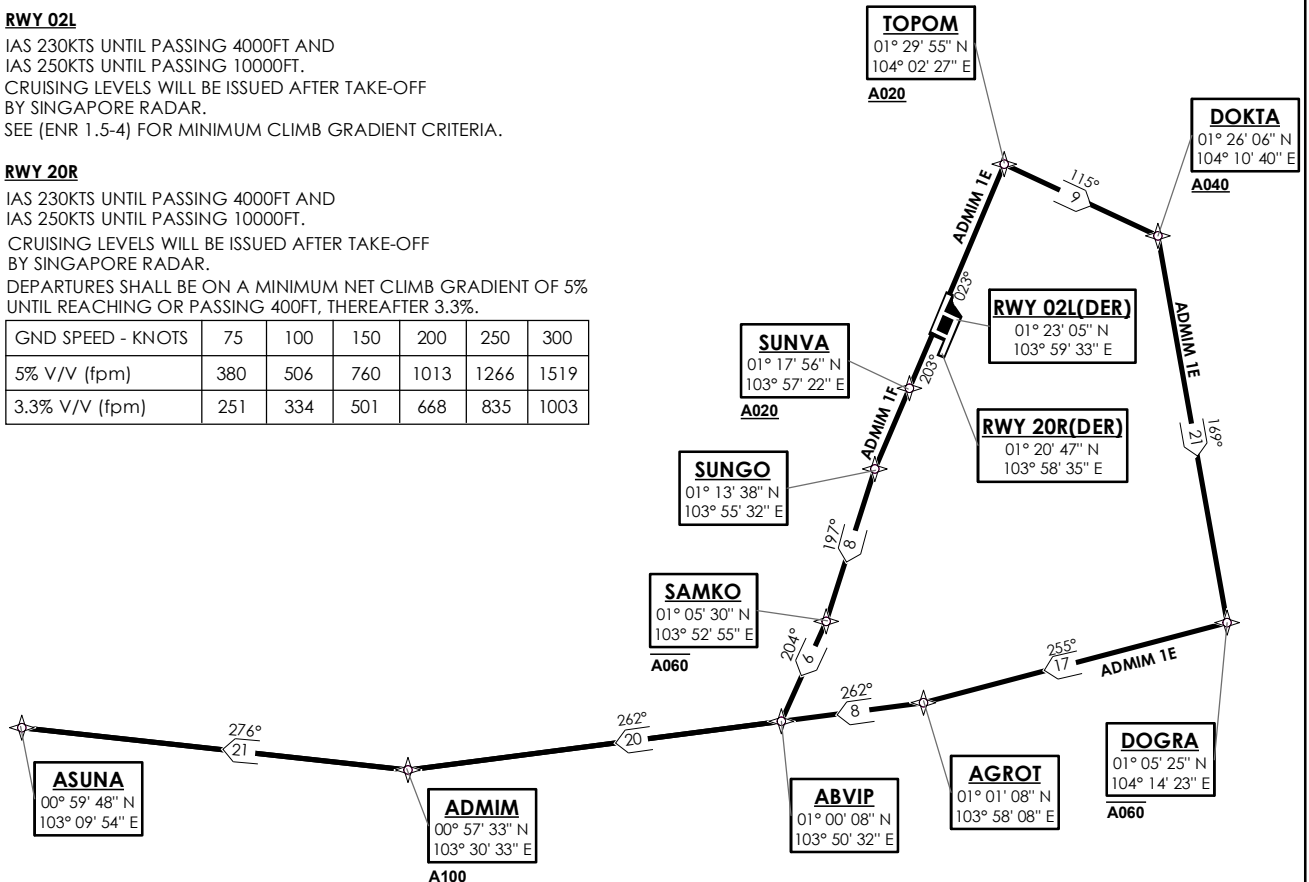
RWY 02L

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20R

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%
UNTIL REACHING OR PASSING 400FT, 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



NOT TO SCALE

ADMIM 1E (SID) RNAV GNSS RWY 02L - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To TOPOM on course 023° at or above 2000ft, speed 230kts, turn right. To DOKTA at or above 4000ft, turn right. To DOGRA at or below 6000ft, turn right. To AGROT, turn right. To ABVIP. To ADMIM at or above 10000ft, turn right. To ASUNA.	TOPOM [M023; A020+; K230; R] -	CF	N
	DOKTA [A040+; R] -	TF	N
	DOGRA [A060-; R] -	TF	N
	AGROT [R] -	TF	N
	ABVIP -	TF	N
	ADMIM [A100+; R] -	TF	N
	ASUNA	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	TOPOM	-	023(022.5)	-0.5	R	A020+	K230	RNAV1
TF	DOKTA	-	115(114.5)	-0.5	R	A040+	-	RNAV1
TF	DOGRA	-	169(168.5)	-0.5	R	A060-	-	RNAV1
TF	AGROT	-	255(254.5)	-0.5	R	-	-	RNAV1
TF	ABVIP	-	262(261.5)	-0.5	-	-	-	RNAV1
TF	ADMIM	-	262(261.5)	-0.5	R	A100+	-	RNAV1
TF	ASUNA	-	276(275.5)	-0.5	-	-	-	RNAV1

ADMIM 1F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To SUNVA on course 203° at or above 2000ft, speed 230kts. To SUNGO, turn left. To SAMKO at or below 6000ft, turn right. To ABVIP, turn right. To ADMIM at or above 10000ft, turn right. To ASUNA.	SUNVA [M203; A020+; K230] -	CF	N
	SUNGO [L] -	TF	N
	SAMKO [A060-; R] -	TF	N
	ABVIP [R] -	TF	N
	ADMIM [A100+; R] -	TF	N
	ASUNA	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	SUNVA	-	203(202.5)	-0.5	-	A020+	K230	RNAV1
TF	SUNGO	-	203(202.5)	-0.5	L	-	-	RNAV1
TF	SAMKO	-	197(197.5)	-0.5	R	A060-	-	RNAV1
TF	ABVIP	-	204(203.5)	-0.5	R	-	-	RNAV1
TF	ADMIM	-	262(261.5)	-0.5	R	A100+	-	RNAV1
TF	ASUNA	-	276(275.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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 SINGAPORE AIP ON RADIO COMMUNICATIONS FAILURE PROCEDURE. RWY 20R - PROCEED STRAIGHT AHEAD TO SAMKO HOLDING AREA (SHA) CLIMBING TO THE LAST ASSIGNED ALTITUDE, THEREAFTER REFER TO SINGAPORE AIP ON RADIO COMMUNICATIONS FAILURE PROCEDURE.

**STANDARD DEPARTURE CHART
RNAV (GNSS) -
INSTRUMENT (SID)**

TWR 118.6 / 118.25
APP 120.3
ACC 134.4

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02C/20C
ANITO DEPARTURES
ANITO 6A (R02C)
ANITO 5B (R20C)**

ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26'E (2015)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: ACFT UNABLE TO FLY THE SID
PROFILE SHALL INFORM ATC
PRIOR TO DEPARTURE AND TO
EXPECT RADAR VECTURING,
IF NECESSARY

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

GENERAL INFORMATION

**INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC**

ON INITIAL CONTACT WHEN REQUESTING ATC,
INFORM ATC OF THE FLIGHT LEVEL AIRCRAFT
CAN CROSS ANITO

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

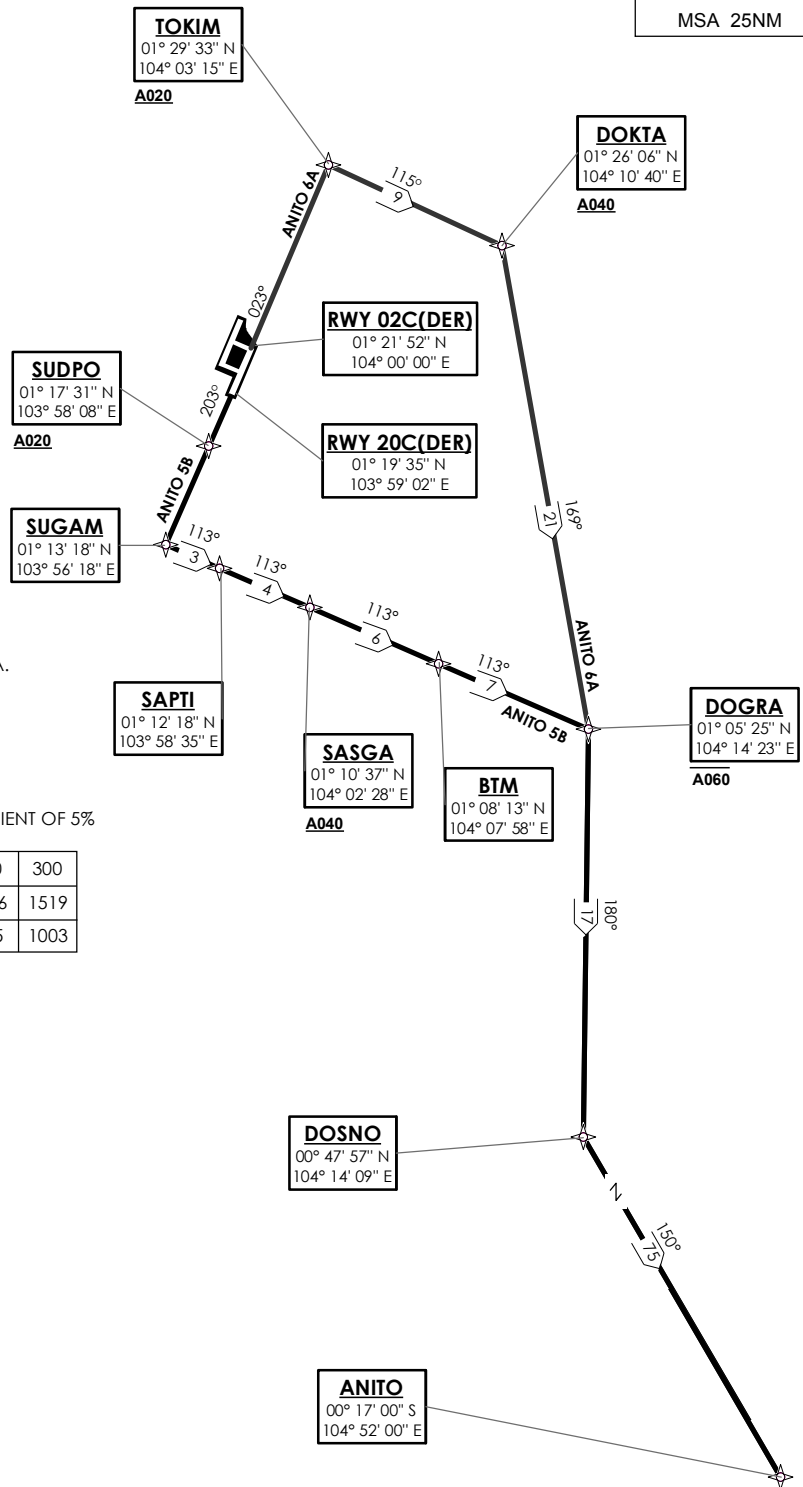
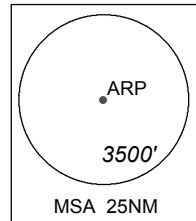
RWY 02C

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20C

IAS 230KTS UNTIL PASSING 4000FT AND
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UNTIL REACHING OR PASSING 400FT, 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



NOT TO SCALE

ANITO 6A (SID) RNAV GNSS RWY 02C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To TOKIM on course 023° at or above 2000ft, speed 230kts, turn right. To DOKTA at or above 4000ft, turn right. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To ANITO.	TOKIM [M023; A020+; K230; R] -	CF	N
	DOKTA [A040+; R] -	TF	N
	DOGRA [A060-; R] -	TF	N
	DOSNO [L] -	TF	N
	ANITO	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	TOKIM	-	023(022.5)	-0.5	R	A020+	K230	RNAV1
TF	DOKTA	-	115(114.5)	-0.5	R	A040+	-	RNAV1
TF	DOGRA	-	169(168.5)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	ANITO	-	150(149.5)	-0.5	-	-	-	RNAV1

ANITO 5B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To SUDPO on course 203° at or above 2000ft, speed 230kts. To SUGAM, speed 230kts, turn left. To SAPTI. To SASGA at or above 4000ft. To BTM. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To ANITO.	SUDPO [M203; A020+; K230] -	CF	N
	SUGAM [K230; L] -	TF	N
	SAPTI -	TF	N
	SASGA [A040+] -	TF	N
	BTM -	TF	N
	DOGRA [A060-; R] -	TF	N
	DOSNO [L] -	TF	N
	ANITO	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	SUDPO	-	203(202.5)	-0.5	-	A020+	K230	RNAV1
TF	SUGAM	-	203(202.5)	-0.5	L	-	K230	RNAV1
TF	SAPTI	-	113(113.3)	-0.5	-	-	-	RNAV1
TF	SASGA	-	113(113.3)	-0.5	-	A040+	-	RNAV1
TF	BTM	-	113(113.3)	-0.5	-	-	-	RNAV1
TF	DOGRA	-	113(113.3)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	ANITO	-	150(149.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

**STANDARD DEPARTURE CHART
RNAV (GNSS) -
INSTRUMENT (SID)**

TWR 118.6 / 118.25
APP 120.3
ACC 134.4

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02L/20R
ANITO DEPARTURES
ANITO 6E (R02L)
ANITO 5F (R20R)**

ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: ACFT UNABLE TO FLY THE SID
PROFILE SHALL INFORM ATC
PRIOR TO DEPARTURE AND TO
EXPECT RADAR VECTORING,
IF NECESSARY

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

NOTE: REFER TO BACK PAGE FOR
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GENERAL INFORMATION

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3000FT OR AS DIRECTED BY ATC**

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CAN CROSS ANITO

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

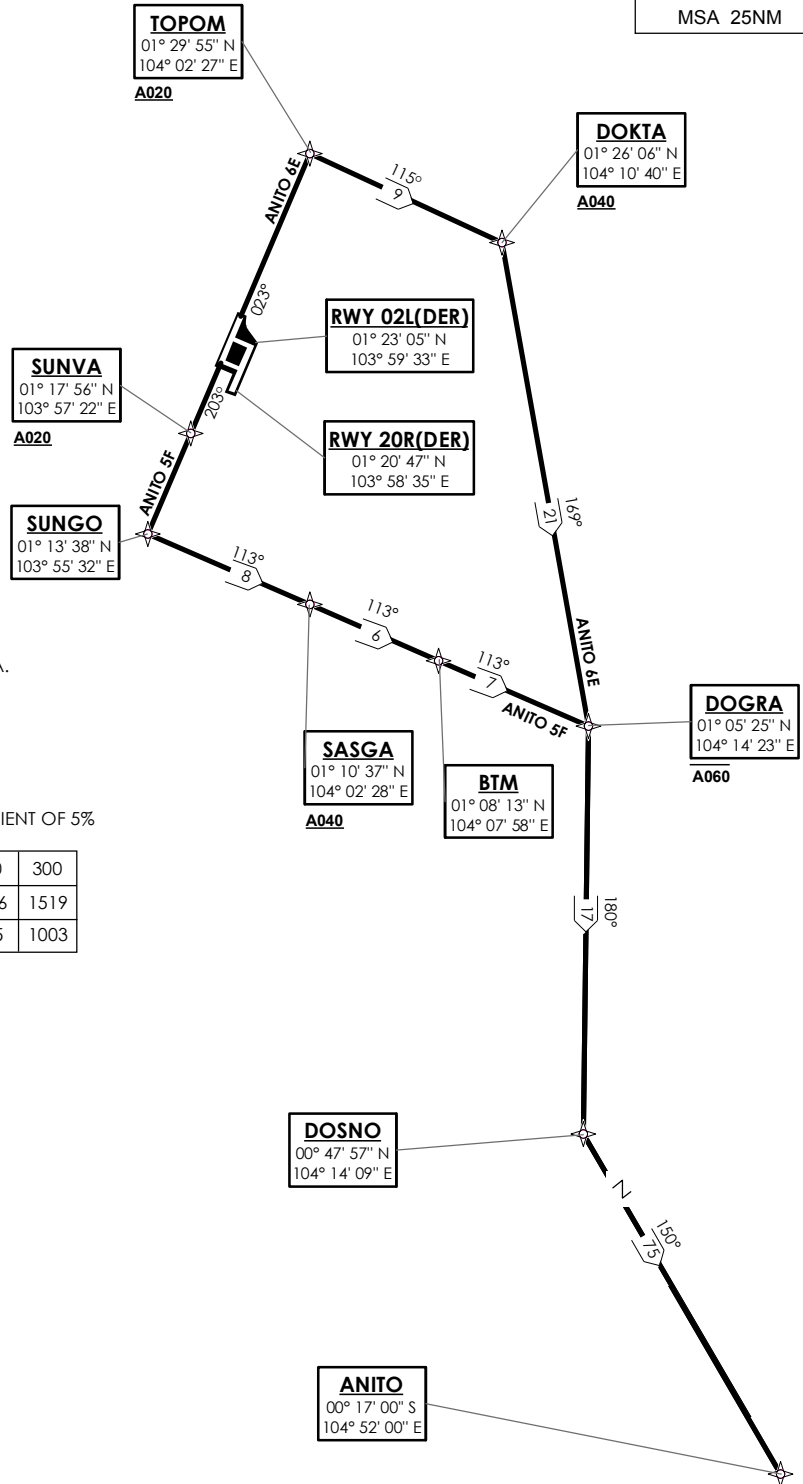
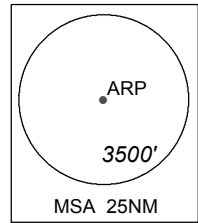
RWY 02L

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20R

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%
UNTIL REACHING OR PASSING 400FT, 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



NOT TO SCALE

ANITO 6E (SID) RNAV GNSS RWY 02L - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To TOPOM on course 023° at or above 2000ft, speed 230kts, turn right. To DOKTA at or above 4000ft, turn right. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To ANITO.	TOPOM [M023; A020+; K230; R] -	CF	N
	DOKTA [A040+; R] -	TF	N
	DOGRA [A060-; R] -	TF	N
	DOSNO [L] -	TF	N
	ANITO	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	TOPOM	-	023(022.5)	-0.5	R	A020+	K230	RNAV1
TF	DOKTA	-	115(114.5)	-0.5	R	A040+	-	RNAV1
TF	DOGRA	-	169(168.5)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	ANITO	-	150(149.5)	-0.5	-	-	-	RNAV1

ANITO 5F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To SUNVA on course 203° at or above 2000ft, speed 230kts. To SUNGO, speed 230kts, turn left. To SASGA at or above 4000ft. To BTM. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To ANITO.	SUNVA [M203; A020+; K230] -	CF	N
	SUNGO [K230; L] -	TF	N
	SASGA [A040+] -	TF	N
	BTM -	TF	N
	DOGRA [A060-; R] -	TF	N
	DOSNO [L] -	TF	N
	ANITO	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	SUNVA	-	203(202.5)	-0.5	-	A020+	K230	RNAV1
TF	SUNGO	-	203(202.5)	-0.5	L	-	K230	RNAV1
TF	SASGA	-	113(113.3)	-0.5	-	A040+	-	RNAV1
TF	BTM	-	113(113.3)	-0.5	-	-	-	RNAV1
TF	DOGRA	-	113(113.3)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	ANITO	-	150(149.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

**STANDARD DEPARTURE CHART
RNAV (GNSS) -
INSTRUMENT (SID)**

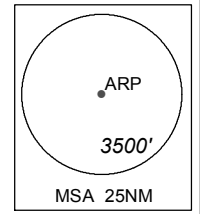
TWR 118.6 / 118.25
APP 120.3
ACC 133.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02C/20C
AROSO DEPARTURES
AROSO 2A (R02C)
AROSO 2B (R20C)**

ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)



DISTANCES IN NM
AROSO
02° 08' 46" N
103° 24' 21" E

- NOTE:** RADAR REQUIRED
- NOTE:** ACFT UNABLE TO FLY THE SID PROFILE SHALL INFORM ATC PRIOR TO DEPARTURE AND TO EXPECT RADAR VECTORING, IF NECESSARY
- NOTE:** RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED
- NOTE:** REFER TO BACK PAGE FOR
- FORMAL AND TABULAR DESCRIPTIONS
- RADIO COM FAILURE PROCEDURES

GENERAL INFORMATION

INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

RWY 02C
IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20C
IAS 230KTS UNTIL SASGA AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%
UNTIL REACHING OR PASSING 400FT, 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

RWY02C (DER)
01° 21' 52" N
104° 00' 00" E

RWY20C (DER)
01° 19' 35" N
103° 59' 02" E

SUDPO
01° 17' 31" N
103° 58' 08" E
A020

SUGAM
01° 13' 18" N
103° 56' 17" E

SAPTI
01° 12' 18" N
103° 58' 35" E

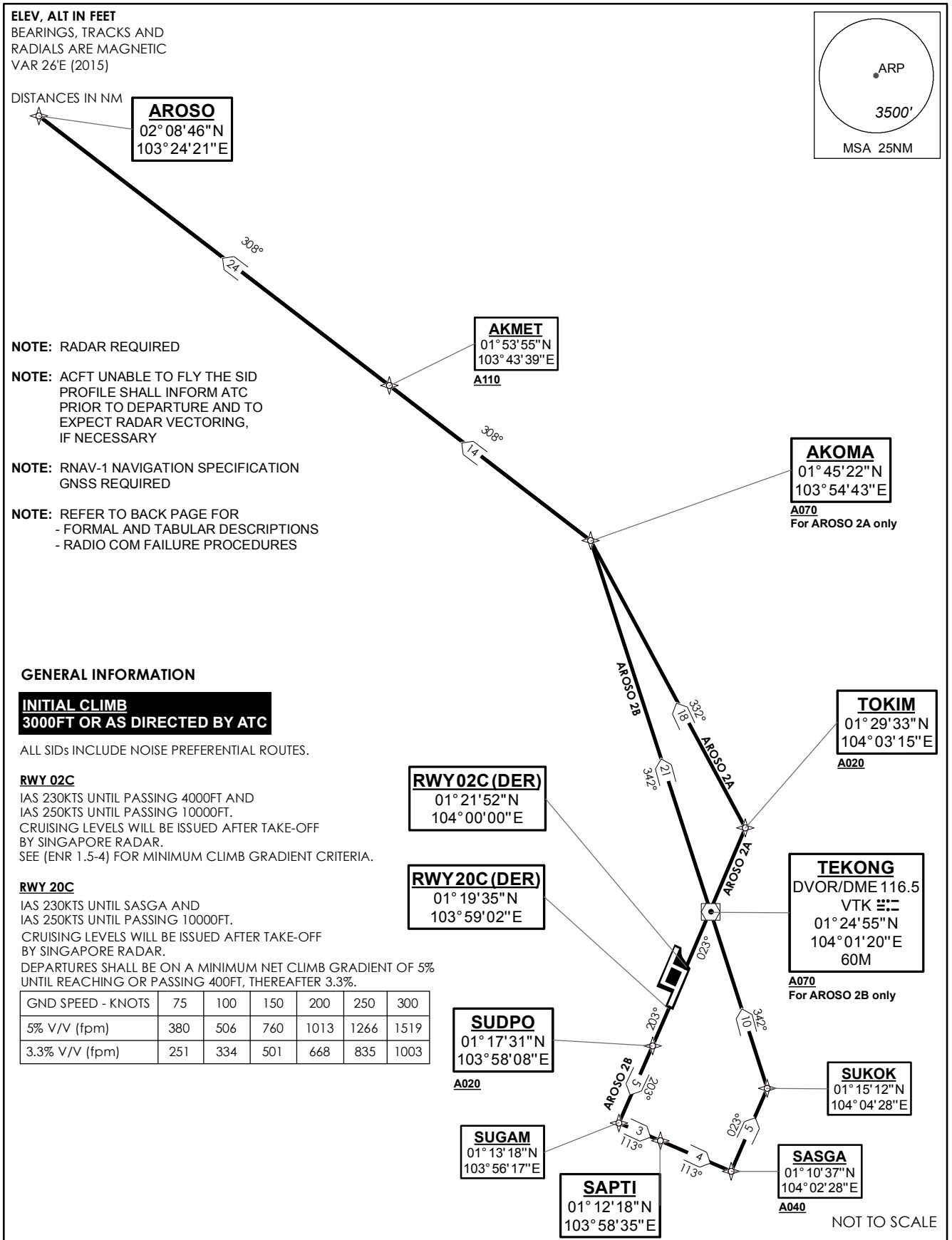
AKOMA
01° 45' 22" N
103° 54' 43" E
A070
For AROSO 2A only

TOKIM
01° 29' 33" N
104° 03' 15" E
A020

TEKONG
DVOR/DME 116.5
VTK
01° 24' 55" N
104° 01' 20" E
60M
A070
For AROSO 2B only

SUKOK
01° 15' 12" N
104° 04' 28" E

SASGA
01° 10' 37" N
104° 02' 28" E
A040



NOT TO SCALE

AROSO 2A (SID) RNAV GNSS RWY 02C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To TOKIM on course 023° at or above 2000ft, speed 230kts, turn left. To AKOMA at or above 7000ft, turn left. To AKMET at or above 11000ft. To AROSO.	TOKIM [M023; A020+; K230; L] -	CF	N
	AKOMA [A070+; L] -	TF	N
	AKMET [A110+] -	TF	N
	AROSO	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	TOKIM	-	023(022.5)	-0.5	L	A020+	K230	RNAV1
TF	AKOMA	-	332(331.5)	-0.5	L	A070+	-	RNAV1
TF	AKMET	-	308(307.5)	-0.5	-	A110+	-	RNAV1
TF	AROSO	-	308(307.5)	-0.5	-	-	-	RNAV1

AROSO 2B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To SUDPO on course 203° at or above 2000ft, speed 230kts. To SUGAM, speed 230kts, turn left. To SAPTI, speed 230kts. To SASGA at or above 4000ft, speed 230kts, turn left. To SUKOK, turn left. To VTK at or above 7000ft. To AKOMA, turn left. To AKMET at or above 11000ft. To AROSO.	SUDPO [M203; A020+; K230] -	CF	N
	SUGAM [K230; L] -	TF	N
	SAPTI [K230] -	TF	N
	SASGA [A040+; K230; L] -	TF	N
	SUKOK [L] -	TF	N
	VTK [A070+] -	TF	N
	AKOMA [L] -	TF	N
	AKMET [A110+] -	TF	N
	AROSO	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	SUDPO	-	203(202.5)	-0.5	-	A020+	K230	RNAV1
TF	SUGAM	-	203(202.5)	-0.5	L	-	K230	RNAV1
TF	SAPTI	-	113(113.3)	-0.5	-	-	K230	RNAV1
TF	SASGA	-	113(113.3)	-0.5	L	A040+	K230	RNAV1
TF	SUKOK	-	023(023.6)	-0.5	L	-	-	RNAV1
TF	VTK	-	342(341.5)	-0.5	-	A070+	-	RNAV1
TF	AKOMA	-	342(341.5)	-0.5	L	-	-	RNAV1
TF	AKMET	-	308(307.5)	-0.5	-	A110+	-	RNAV1
TF	AROSO	-	308(307.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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 SINGAPORE AIP ON RADIO COMMUNICATIONS FAILURE PROCEDURE. RWY 20C - PROCEED STRAIGHT AHEAD TO SAMKO HOLDING AREA (SHA) CLIMBING TO THE LAST ASSIGNED ALTITUDE, THEREAFTER REFER TO SINGAPORE AIP ON RADIO COMMUNICATIONS FAILURE PROCEDURE.

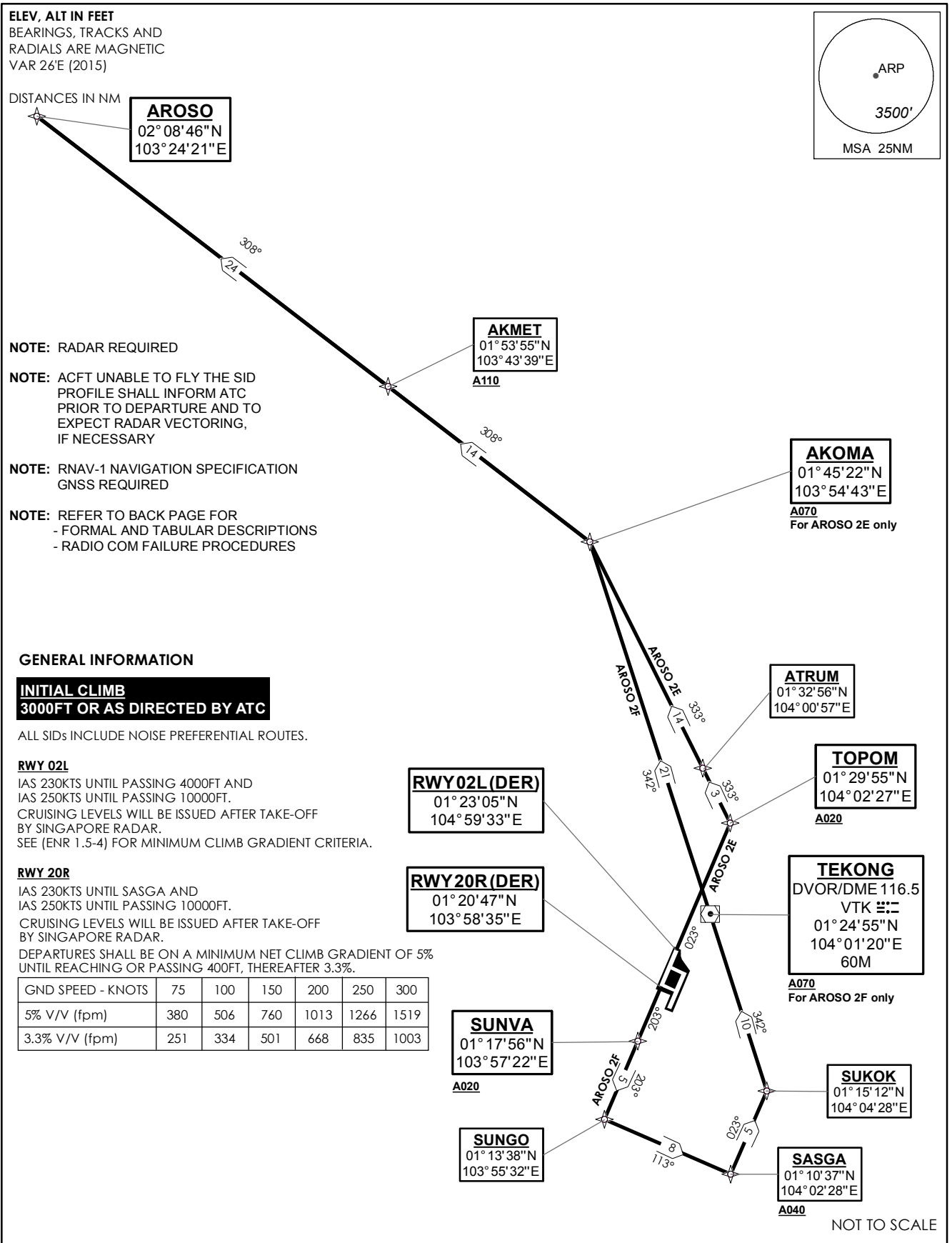
**STANDARD DEPARTURE CHART
RNAV (GNSS) -
INSTRUMENT (SID)**

TWR 118.6 / 118.25
APP 120.3
ACC 133.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02L/20R
AROSO DEPARTURES
AROSO 2E (R02L)
AROSO 2F (R20R)**



NOT TO SCALE

AROSO 2E (SID) RNAV GNSS RWY 02L - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To TOPOM on course 023° at or above 2000ft, speed 230kts, turn left. To ATRUM. To AKOMA at or above 7000ft, turn left. To AKMET at or above 11000ft. To AROSO.	TOPOM [M023; A020+; K230; L] -	CF	N
	ATRUM -	TF	N
	AKOMA [A070+; L] -	TF	N
	AKMET [A110+] -	TF	N
	AROSO	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	TOPOM	-	023(022.5)	-0.5	L	A020+	K230	RNAV1
TF	ATRUM	-	333(332.5)	-0.5	-	-	-	RNAV1
TF	AKOMA	-	333(332.5)	-0.5	L	A070+	-	RNAV1
TF	AKMET	-	308(307.5)	-0.5	-	A110+	-	RNAV1
TF	AROSO	-	308(307.5)	-0.5	-	-	-	RNAV1

AROSO 2F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To SUNVA on course 203° at or above 2000ft, speed 230kts. To SUNGO, speed 230kts, turn left. To SASGA at or above 4000ft, speed 230kts, turn left. To SUKOK, turn left. To VTK at or above 7000ft. To AKOMA, turn left. To AKMET at or above 11000ft. To AROSO.	SUNVA [M203; A020+; K230] -	CF	N
	SUNGO [K230; L] -	TF	N
	SASGA [A040+; K230; L] -	TF	N
	SUKOK [L] -	TF	N
	VTK [A070+] -	TF	N
	AKOMA [L] -	TF	N
	AKMET [A110+] -	TF	N
	AROSO	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	SUNVA	-	203(202.5)	-0.5	-	A020+	K230	RNAV1
TF	SUNGO	-	203(202.5)	-0.5	L	-	K230	RNAV1
TF	SASGA	-	113(113.3)	-0.5	L	A040+	K230	RNAV1
TF	SUKOK	-	023(023.6)	-0.5	L	-	-	RNAV1
TF	VTK	-	342(341.5)	-0.5	-	A070+	-	RNAV1
TF	AKOMA	-	342(341.5)	-0.5	L	-	-	RNAV1
TF	AKMET	-	308(307.5)	-0.5	-	A110+	-	RNAV1
TF	AROSO	-	308(307.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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 SINGAPORE AIP ON RADIO COMMUNICATIONS FAILURE PROCEDURE. RWY 20R - PROCEED STRAIGHT AHEAD TO SAMKO HOLDING AREA (SHA) CLIMBING TO THE LAST ASSIGNED ALTITUDE, THEREAFTER REFER TO SINGAPORE AIP ON RADIO COMMUNICATIONS FAILURE PROCEDURE.

**STANDARD DEPARTURE CHART
RNAV (GNSS) -
INSTRUMENT (SID)**

TWR 118.6 / 118.25 APP 120.3 ACC 134.4	TRANSITION ALTITUDE 11 000ft
	D-ATIS AP ID-WSSS 128.6

**SINGAPORE/Singapore Changi
RWY 02C/20C
BAVUS DEPARTURES
BAVUS 1A (R02C)
BAVUS 1B (R20C)**

ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: ACFT UNABLE TO FLY THE SID
PROFILE SHALL INFORM ATC
PRIOR TO DEPARTURE AND TO
EXPECT RADAR VECTURING,
IF NECESSARY

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

GENERAL INFORMATION

**INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC**

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

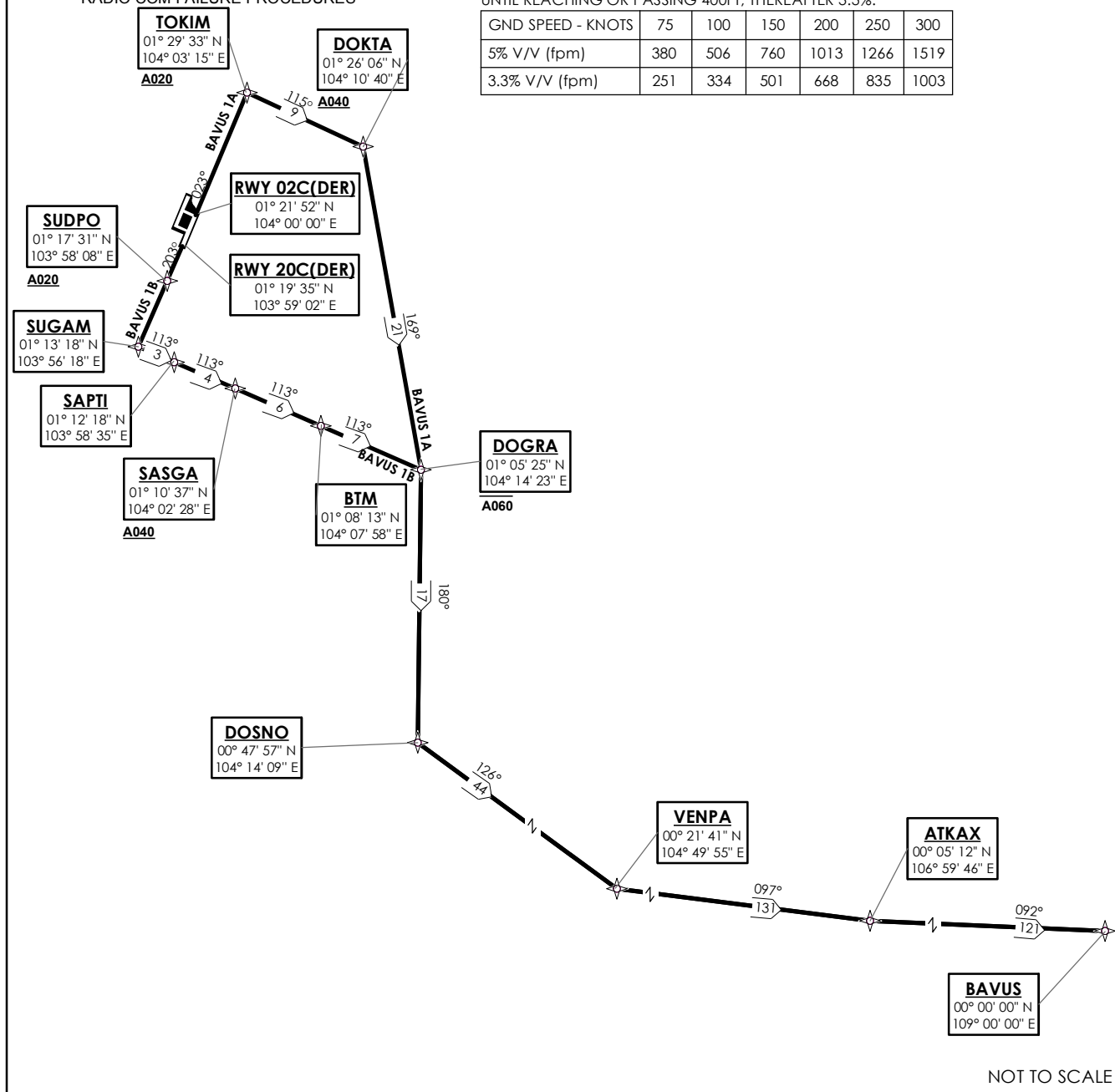
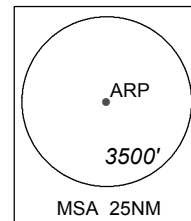
RWY 02C

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20C

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%
UNTIL REACHING OR PASSING 400FT, 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



BAVUS 1A (SID) RNAV GNSS RWY 02C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To TOKIM on course 023° at or above 2000ft, speed 230kts, turn right. To DOKTA at or above 4000ft, turn right. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To VENPA, turn left. To ATKAX, turn left. To BAVUS.	TOKIM [M023; A020+; K230; R] -	CF	N
	DOKTA [A040+; R] -	TF	N
	DOGRA [A060-; R] -	TF	N
	DOSNO [L] -	TF	N
	VENPA [L] -	TF	N
	ATKAX [L] -	TF	N
	BAVUS	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	TOKIM	-	023(022.5)	-0.5	R	A020+	K230	RNAV1
TF	DOKTA	-	115(114.5)	-0.5	R	A040+	-	RNAV1
TF	DOGRA	-	169(168.5)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	VENPA	-	126(125.5)	-0.5	L	-	-	RNAV1
TF	ATKAX	-	097(096.5)	-0.5	L	-	-	RNAV1
TF	BAVUS	-	092(091.5)	-0.5	-	-	-	RNAV1

BAVUS 1B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To SUDPO on course 203° at or above 2000ft, speed 230kts. To SUGAM, speed 230kts, turn left. To SAPTI. To SASGA at or above 4000ft. To BTM. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To VENPA, turn left. To ATKAX, turn left. To BAVUS.	SUDPO [M203; A020+; K230] -	CF	N
	SUGAM [K230; L] -	TF	N
	SAPTI -	TF	N
	SASGA [A040+] -	TF	N
	BTM -	TF	N
	DOGRA [A060-; R] -	TF	N
	DOSNO [L] -	TF	N
	VENPA [L] -	TF	N
	ATKAX [L] -	TF	N
	BAVUS	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	SUDPO	-	203(202.5)	-0.5	-	A020+	K230	RNAV1
TF	SUGAM	-	203(202.5)	-0.5	L	-	K230	RNAV1
TF	SAPTI	-	113(113.3)	-0.5	-	-	-	RNAV1
TF	SASGA	-	113(113.3)	-0.5	-	A040+	-	RNAV1
TF	BTM	-	113(113.3)	-0.5	-	-	-	RNAV1
TF	DOGRA	-	113(113.3)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	VENPA	-	126(125.5)	-0.5	L	-	-	RNAV1
TF	ATKAX	-	097(096.5)	-0.5	L	-	-	RNAV1
TF	BAVUS	-	092(091.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

**STANDARD DEPARTURE CHART
RNAV (GNSS) -
INSTRUMENT (SID)**

TWR 118.6 / 118.25
APP 120.3
ACC 134.4

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02L/20R
BAVUS DEPARTURES
BAVUS 1E (R02L)
BAVUS 1F (R20R)**

ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: ACFT UNABLE TO FLY THE SID
PROFILE SHALL INFORM ATC
PRIOR TO DEPARTURE AND TO
EXPECT RADAR VECTORED,
IF NECESSARY

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

GENERAL INFORMATION

**INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC**

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

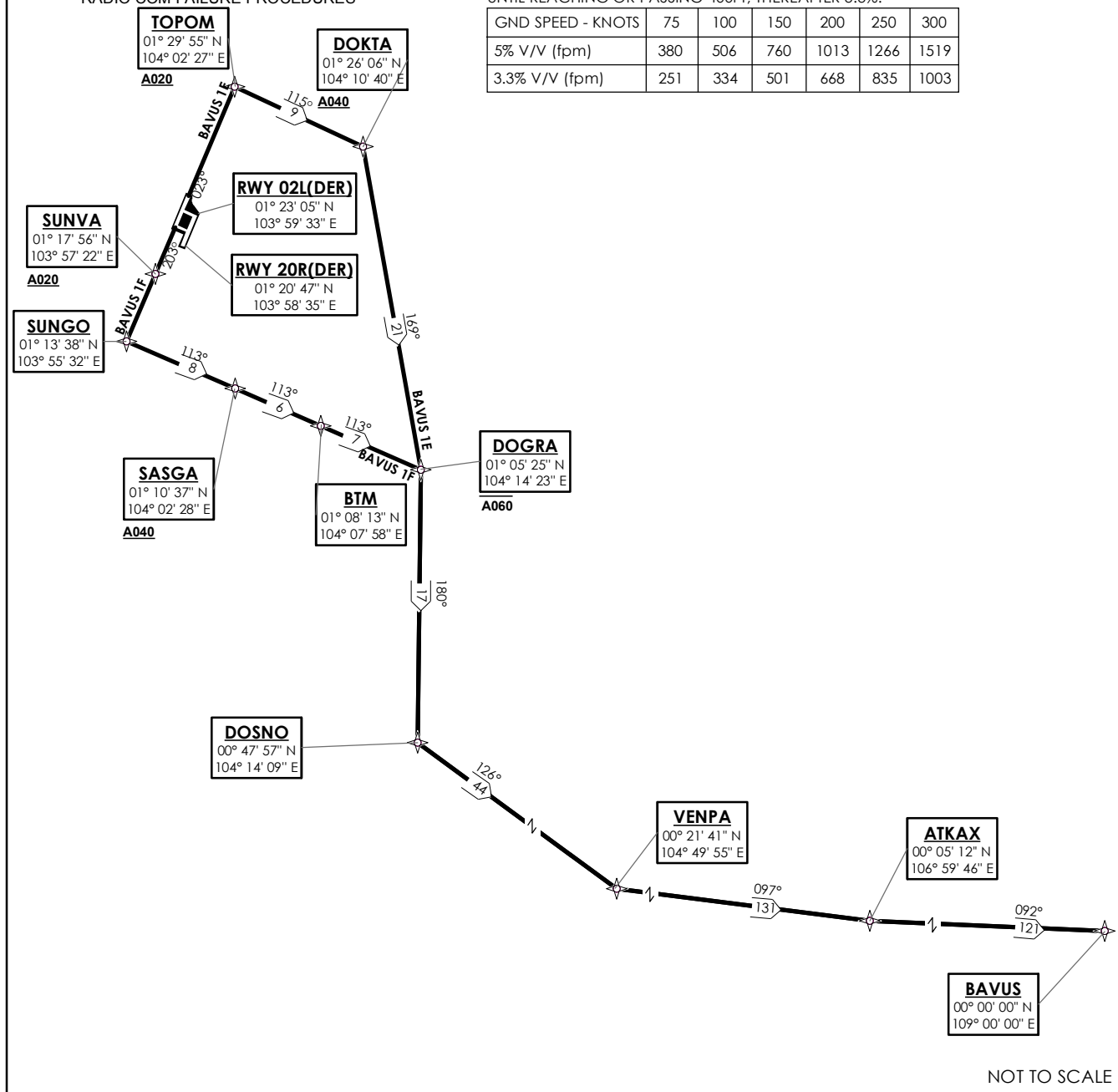
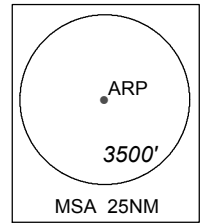
RWY 02L

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20R

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%
UNTIL REACHING OR PASSING 400FT, 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



NOT TO SCALE

BAVUS 1E (SID) RNAV GNSS RWY 02L - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To TOPOM on course 023° at or above 2000ft, speed 230kts, turn right. To DOKTA at or above 4000ft, turn right. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To VENPA, turn left. To ATKAX, turn left. To BAVUS.	TOPOM [M023; A020+; K230; R] -	CF	N
	DOKTA [A040+; R] -	TF	N
	DOGRA [A060-; R] -	TF	N
	DOSNO [L] -	TF	N
	VENPA [L] -	TF	N
	ATKAX [L] -	TF	N
	BAVUS	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	TOPOM	-	023(022.5)	-0.5	R	A020+	K230	RNAV1
TF	DOKTA	-	115(114.5)	-0.5	R	A040+	-	RNAV1
TF	DOGRA	-	169(168.5)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	VENPA	-	126(125.5)	-0.5	L	-	-	RNAV1
TF	ATKAX	-	097(096.5)	-0.5	L	-	-	RNAV1
TF	BAVUS	-	092(091.5)	-0.5	-	-	-	RNAV1

BAVUS 1F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To SUNVA on course 203° at or above 2000ft, speed 230kts. To SUNGO, speed 230kts, turn left. To SASGA at or above 4000ft. To BTM. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To VENPA, turn left. To ATKAX, turn left. To BAVUS.	SUNVA [M203; A020+; K230] -	CF	N
	SUNGO [K230; L] -	TF	N
	SASGA [A040+] -	TF	N
	BTM -	TF	N
	DOGRA [A060-; R] -	TF	N
	DOSNO [L] -	TF	N
	VENPA [L] -	TF	N
	ATKAX [L] -	TF	N
	BAVUS	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	SUNVA	-	203(202.5)	-0.5	-	A020+	K230	RNAV1
TF	SUNGO	-	203(202.5)	-0.5	L	-	K230	RNAV1
TF	SASGA	-	113(113.3)	-0.5	-	A040+	-	RNAV1
TF	BTM	-	113(113.3)	-0.5	-	-	-	RNAV1
TF	DOGRA	-	113(113.3)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	VENPA	-	126(125.5)	-0.5	L	-	-	RNAV1
TF	ATKAX	-	097(096.5)	-0.5	L	-	-	RNAV1
TF	BAVUS	-	092(091.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

**STANDARD DEPARTURE CHART
RNAV (GNSS) -
INSTRUMENT (SID)**

TWR 118.6 / 118.25
APP 120.3
ACC 134.4

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02C/20C
KADAR DEPARTURES
KADAR 1A (R02C)
KADAR 1B (R20C)**

ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: ACFT UNABLE TO FLY THE SID
PROFILE SHALL INFORM ATC
PRIOR TO DEPARTURE AND TO
EXPECT RADAR VECTORING,
IF NECESSARY

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

GENERAL INFORMATION

**INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC**

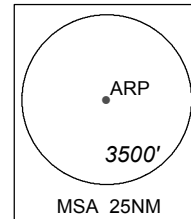
ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

RWY 02C

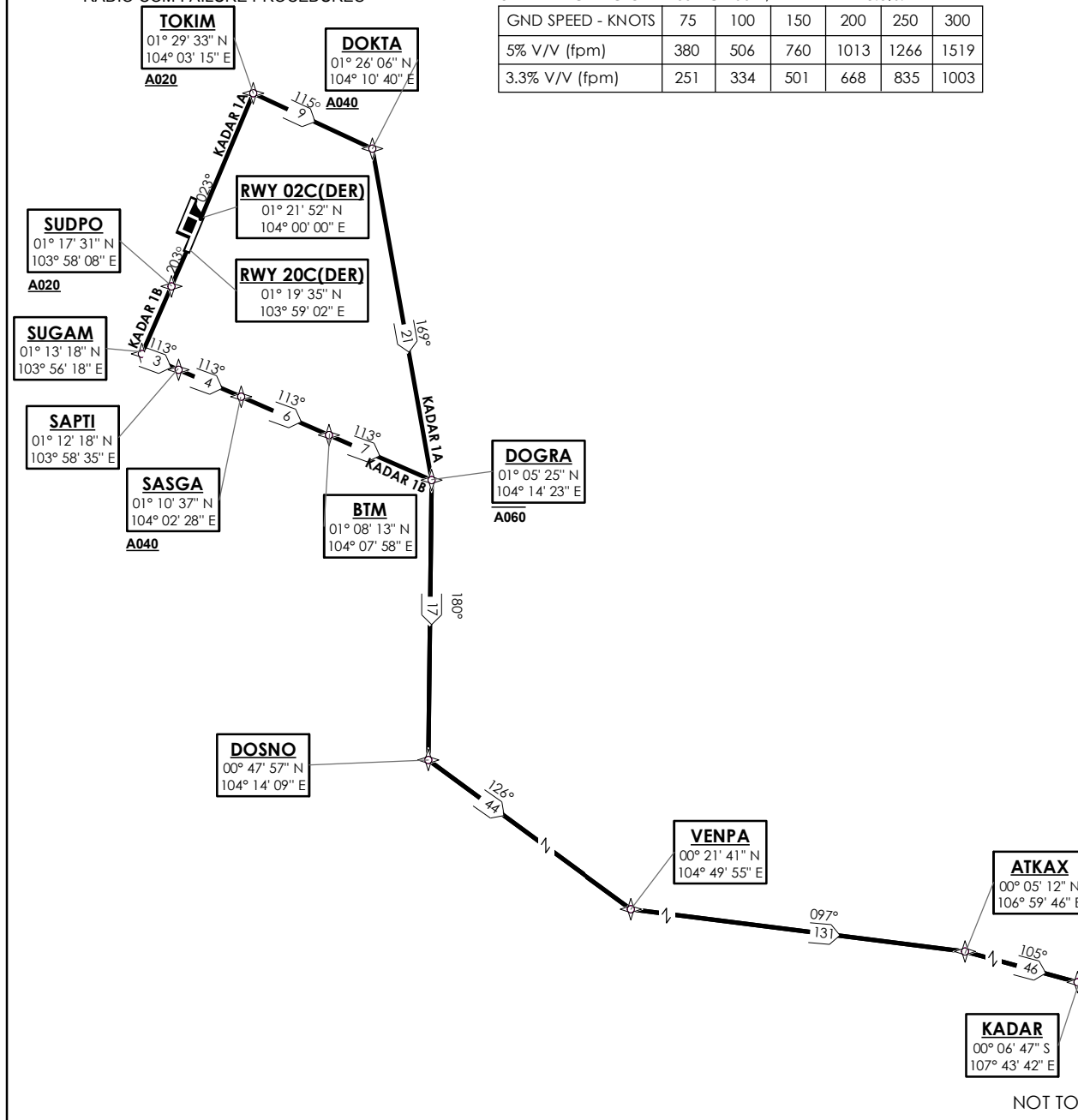
IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20C

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%
UNTIL REACHING OR PASSING 400FT, 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



KADAR 1A (SID) RNAV GNSS RWY 02C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To TOKIM on course 023° at or above 2000ft, speed 230kts, turn right. To DOKTA at or above 4000ft, turn right. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To VENPA, turn left. To ATKAX, turn right. To KADAR.	TOKIM [M023; A020+; K230; R] -	CF	N
	DOKTA [A040+; R] -	TF	N
	DOGRA [A060-; R] -	TF	N
	DOSNO [L] -	TF	N
	VENPA [L] -	TF	N
	ATKAX [R] -	TF	N
	KADAR	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	TOKIM	-	023(022.5)	-0.5	R	A020+	K230	RNAV1
TF	DOKTA	-	115(114.5)	-0.5	R	A040+	-	RNAV1
TF	DOGRA	-	169(168.5)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	VENPA	-	126(125.5)	-0.5	L	-	-	RNAV1
TF	ATKAX	-	097(096.5)	-0.5	R	-	-	RNAV1
TF	KADAR	-	105(104.5)	-0.5	-	-	-	RNAV1

KADAR 1B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To SUDPO on course 203° at or above 2000ft, speed 230kts. To SUGAM, speed 230kts, turn left. To SAPTI. To SASGA at or above 4000ft. To BTM. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To VENPA, turn left. To ATKAX, turn right. To KADAR.	SUDPO [M203; A020+; K230] -	CF	N
	SUGAM [K230; L] -	TF	N
	SAPTI -	TF	N
	SASGA [A040+] -	TF	N
	BTM -	TF	N
	DOGRA [A060-; R] -	TF	N
	DOSNO [L] -	TF	N
	VENPA [L] -	TF	N
	ATKAX [R] -	TF	N
	KADAR	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	SUDPO	-	203(202.5)	-0.5	-	A020+	K230	RNAV1
TF	SUGAM	-	203(202.5)	-0.5	L	-	K230	RNAV1
TF	SAPTI	-	113(113.3)	-0.5	-	-	-	RNAV1
TF	SASGA	-	113(113.3)	-0.5	-	A040+	-	RNAV1
TF	BTM	-	113(113.3)	-0.5	-	-	-	RNAV1
TF	DOGRA	-	113(113.3)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	VENPA	-	126(125.5)	-0.5	L	-	-	RNAV1
TF	ATKAX	-	097(096.5)	-0.5	R	-	-	RNAV1
TF	KADAR	-	105(104.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

**STANDARD DEPARTURE CHART
RNAV (GNSS) -
INSTRUMENT (SID)**

TWR 118.6 / 118.25
APP 120.3
ACC 134.4

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02L/20R
KADAR DEPARTURES
KADAR 1E (R02L)
KADAR 1F (R20R)**

ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26'E (2015)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: ACFT UNABLE TO FLY THE SID
PROFILE SHALL INFORM ATC
PRIOR TO DEPARTURE AND TO
EXPECT RADAR VECTURING,
IF NECESSARY

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

GENERAL INFORMATION

**INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC**

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

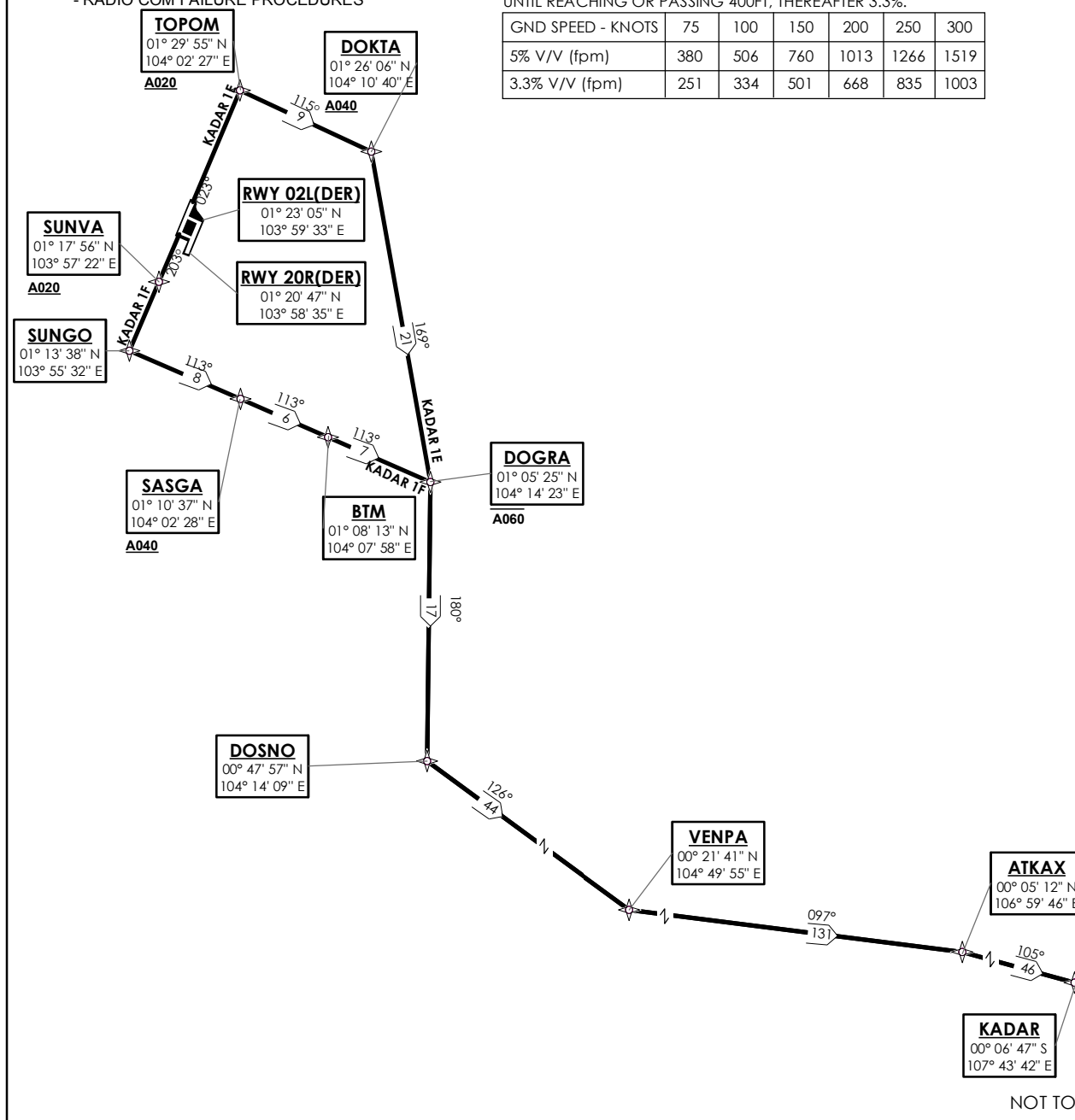
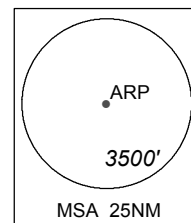
RWY 02L

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20R

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%
UNTIL REACHING OR PASSING 400FT, 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



KADAR 1E (SID) RNAV GNSS RWY 02L - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To TOPOM on course 023° at or above 2000ft, speed 230kts, turn right. To DOKTA at or above 4000ft, turn right. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To VENPA, turn left. To ATKAX, turn right. To KADAR.	TOPOM [M023; A020+; K230; R] -	CF	N
	DOKTA [A040+; R] -	TF	N
	DOGRA [A060-; R] -	TF	N
	DOSNO [L] -	TF	N
	VENPA [L] -	TF	N
	ATKAX [R] -	TF	N
	KADAR	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	TOPOM	-	023(022.5)	-0.5	R	A020+	K230	RNAV1
TF	DOKTA	-	115(114.5)	-0.5	R	A040+	-	RNAV1
TF	DOGRA	-	169(168.5)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	VENPA	-	126(125.5)	-0.5	L	-	-	RNAV1
TF	ATKAX	-	097(096.5)	-0.5	R	-	-	RNAV1
TF	KADAR	-	105(104.5)	-0.5	-	-	-	RNAV1

KADAR 1F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To SUNVA on course 203° at or above 2000ft, speed 230kts. To SUNGO, speed 230kts, turn left. To SASGA at or above 4000ft. To BTM. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To VENPA, turn left. To ATKAX, turn right. To KADAR.	SUNVA [M203; A020+; K230] -	CF	N
	SUNGO [K230; L] -	TF	N
	SASGA [A040+] -	TF	N
	BTM -	TF	N
	DOGRA [A060-; R] -	TF	N
	DOSNO [L] -	TF	N
	VENPA [L] -	TF	N
	ATKAX [R] -	TF	N
	KADAR	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	SUNVA	-	203(202.5)	-0.5	-	A020+	K230	RNAV1
TF	SUNGO	-	203(202.5)	-0.5	L	-	K230	RNAV1
TF	SASGA	-	113(113.3)	-0.5	-	A040+	-	RNAV1
TF	BTM	-	113(113.3)	-0.5	-	-	-	RNAV1
TF	DOGRA	-	113(113.3)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	VENPA	-	126(125.5)	-0.5	L	-	-	RNAV1
TF	ATKAX	-	097(096.5)	-0.5	R	-	-	RNAV1
TF	KADAR	-	105(104.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

**STANDARD DEPARTURE CHART
RNAV (GNSS) -
INSTRUMENT (SID)**

TWR 118.6 / 118.25
APP 120.3
ACC 133.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02C/20C
MASBO DEPARTURES
MASBO 2A (R02C)
MASBO 2B (R20C)**

ELEV, ALT IN FEET

BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

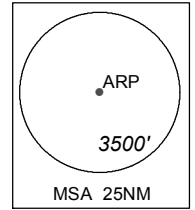
DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: ACFT UNABLE TO FLY THE SID
PROFILE SHALL INFORM ATC
PRIOR TO DEPARTURE AND TO
EXPECT RADAR VECTURING,
IF NECESSARY

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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



MASBO
02° 02' 48" N
102° 52' 51" E

SABKA
01° 50' 51" N
103° 17' 13" E

AGVAR
01° 47' 19" N
103° 41' 45" E
A110

AKOMA
01° 45' 22" N
103° 54' 43" E
A070
For MASBO 2A only

TOKIM
01° 29' 33" N
104° 03' 15" E
A020

RWY 02C (DER)
01° 21' 52" N
104° 00' 00" E

RWY 20C (DER)
01° 19' 35" N
103° 59' 02" E

TEKONG
DVOR/DME 116.5
VTK
01° 24' 55" N
104° 01' 20" E
60M
A070
For MASBO 2B only

SUDPO
01° 17' 31" N
103° 58' 08" E
A020

SUKOK
01° 15' 12" N
104° 04' 28" E

SUGAM
01° 13' 18" N
103° 56' 17" E

SAPTI
01° 12' 18" N
103° 58' 35" E

SASGA
01° 10' 37" N
104° 02' 28" E
A040

GENERAL INFORMATION

INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

RWY 02C

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20C

IAS 230KTS UNTIL SASGA AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%
UNTIL REACHING OR PASSING 400FT, 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

MASBO 2A (SID) RNAV GNSS RWY 02C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To TOKIM on course 023° at or above 2000ft, speed 230kts, turn left. To AKOMA at or above 7000ft, turn left. To AGVAR at or above 11000ft. To SABKA, turn right. To MASBO.	TOKIM [M023; A020+; K230; L] -	CF	N
	AKOMA [A070+; L] -	TF	N
	AGVAR [A110+] -	TF	N
	SABKA [R] -	TF	N
	MASBO	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	TOKIM	-	023(022.5)	-0.5	L	A020+	K230	RNAV1
TF	AKOMA	-	332(331.5)	-0.5	L	A070+	-	RNAV1
TF	AGVAR	-	278(277.5)	-0.5	-	A110+	-	RNAV1
TF	SABKA	-	278(277.5)	-0.5	R	-	-	RNAV1
TF	MASBO	-	296(295.5)	-0.5	-	-	-	RNAV1

MASBO 2B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To SUDPO on course 203° at or above 2000ft, speed 230kts. To SUGAM, speed 230kts, turn left. To SAPTI, speed 230kts. To SASGA at or above 4000ft, speed 230kts, turn left. To SUKOK, turn left. To VTK at or above 7000ft. To AKOMA, turn left. To AGVAR at or above 11000ft. To SABKA, turn right. To MASBO.	SUDPO [M203; A020+; K230] -	CF	N
	SUGAM [K230; L] -	TF	N
	SAPTI [K230] -	TF	N
	SASGA [A040+; K230; L] -	TF	N
	SUKOK [L] -	TF	N
	VTK [A070+] -	TF	N
	AKOMA [L] -	TF	N
	AGVAR [A110+] -	TF	N
	SABKA [R] -	TF	N
	MASBO	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	SUDPO	-	203(202.5)	-0.5	-	A020+	K230	RNAV1
TF	SUGAM	-	203(202.5)	-0.5	L	-	K230	RNAV1
TF	SAPTI	-	113(113.3)	-0.5	-	-	K230	RNAV1
TF	SASGA	-	113(113.3)	-0.5	L	A040+	K230	RNAV1
TF	SUKOK	-	023(023.6)	-0.5	L	-	-	RNAV1
TF	VTK	-	342(341.5)	-0.5	-	A070+	-	RNAV1
TF	AKOMA	-	342(341.5)	-0.5	L	-	-	RNAV1
TF	AGVAR	-	278(277.5)	-0.5	-	A110+	-	RNAV1
TF	SABKA	-	278(277.5)	-0.5	R	-	-	RNAV1
TF	MASBO	-	296(295.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

**STANDARD DEPARTURE CHART
RNAV (GNSS) -
INSTRUMENT (SID)**

TWR 118.6 / 118.25
APP 120.3
ACC 133.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02L/20R
MASBO DEPARTURES
MASBO 2E (R02L)
MASBO 2F (R20R)**

ELEV, ALT IN FEET

BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

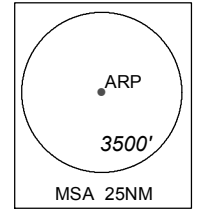
DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: ACFT UNABLE TO FLY THE SID
PROFILE SHALL INFORM ATC
PRIOR TO DEPARTURE AND TO
EXPECT RADAR VECTURING,
IF NECESSARY

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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



MASBO
02° 02' 48" N
102° 52' 51" E

SABKA
01° 50' 51" N
103° 17' 13" E

AGVAR
01° 47' 19" N
103° 41' 45" E
A110

AKOMA
01° 45' 22" N
103° 54' 43" E

A070
For MASBO 2E only

ATRUM
01° 32' 56" N
104° 00' 57" E

TOPOM
01° 29' 55" N
104° 02' 27" E

A020

TEKONG
DVOR/DME 116.5
VTK
01° 24' 55" N
104° 01' 20" E
60M

A070
For MASBO 2F only

RWY 02L (DER)
01° 23' 05" N
103° 59' 33" E

RWY 20R (DER)
01° 20' 47" N
103° 58' 35" E

SUNVA
01° 17' 56" N
103° 57' 22" E

A020

SUNGO
01° 13' 38" N
103° 55' 32" E

SUKOK
01° 15' 12" N
104° 04' 28" E

SASGA
01° 10' 37" N
104° 02' 28" E

A040

GENERAL INFORMATION

INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

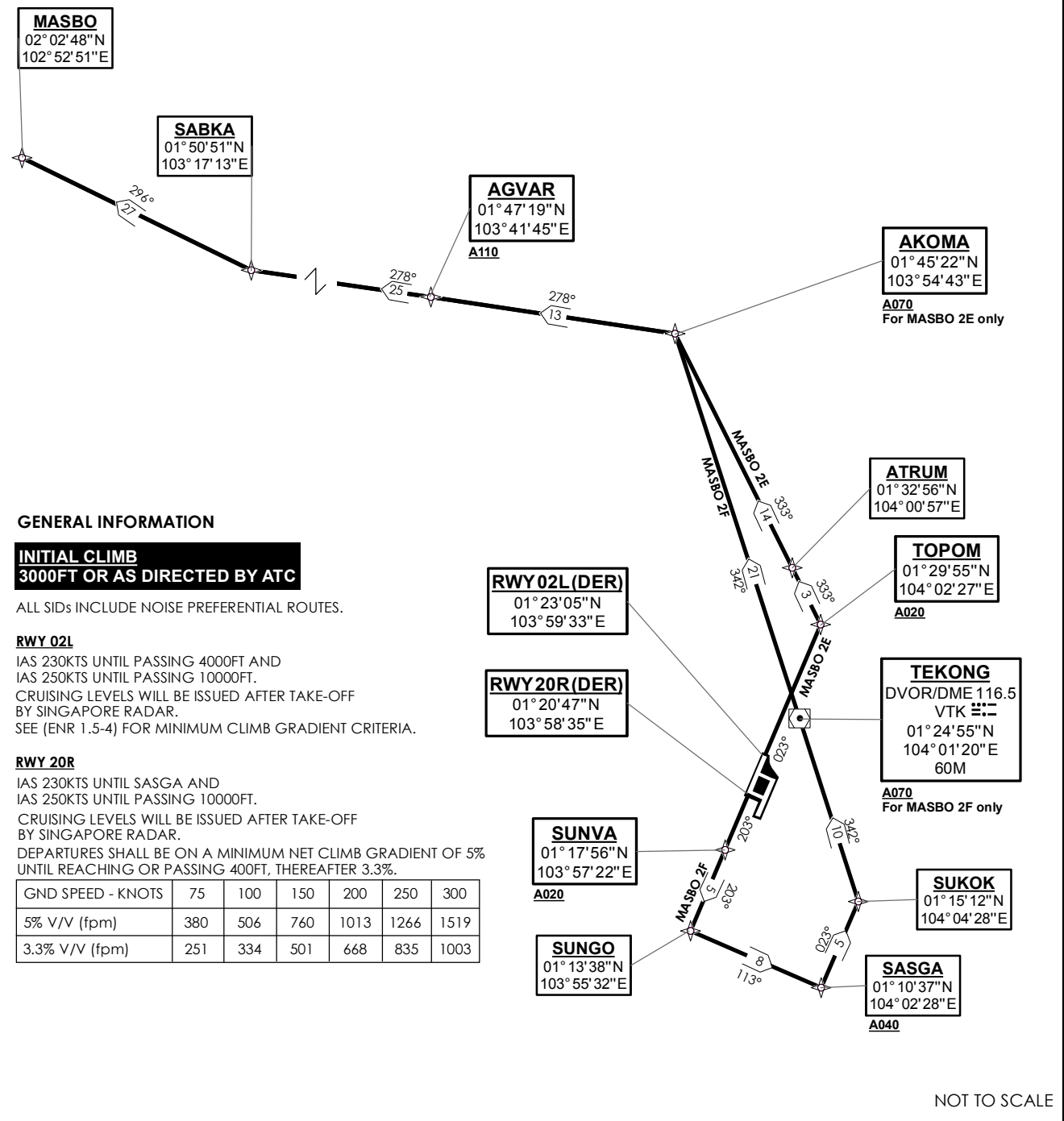
RWY 02L

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20R

IAS 230KTS UNTIL SASGA AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%
UNTIL REACHING OR PASSING 400FT, 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



NOT TO SCALE

MASBO 2E (SID) RNAV GNSS RWY 02L - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To TOPOM on course 023° at or above 2000ft, speed 230kts, turn left. To ATRUM. To AKOMA at or above 7000ft, turn left. To AGVAR at or above 11000ft. To SABKA, turn right. To MASBO.	TOPOM [M023; A020+; K230; L] -	CF	N
	ATRUM -	TF	N
	AKOMA [A070+; L] -	TF	N
	AGVAR [A110+] -	TF	N
	SABKA [R] -	TF	N
	MASBO	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	TOPOM	-	023(022.5)	-0.5	L	A020+	K230	RNAV1
TF	ATRUM	-	333(332.5)	-0.5	-	-	-	RNAV1
TF	AKOMA	-	333(332.5)	-0.5	L	A070+	-	RNAV1
TF	AGVAR	-	278(277.5)	-0.5	-	A110+	-	RNAV1
TF	SABKA	-	278(277.5)	-0.5	R	-	-	RNAV1
TF	MASBO	-	296(295.5)	-0.5	-	-	-	RNAV1

MASBO 2F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To SUNVA on course 203° at or above 2000ft, speed 230kts. To SUNGO, speed 230kts, turn left. To SASGA at or above 4000ft, speed 230kts, turn left. To SUKOK, turn left. To VTK at or above 7000ft. To AKOMA, turn left. To AGVAR at or above 11000ft. To SABKA, turn right. To MASBO.	SUNVA [M203; A020+; K230] -	CF	N
	SUNGO [K230; L] -	TF	N
	SASGA [A040+; K230; L] -	TF	N
	SUKOK [L] -	TF	N
	VTK [A070+] -	TF	N
	AKOMA [L] -	TF	N
	AGVAR [A110+] -	TF	N
	SABKA [R] -	TF	N
	MASBO	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	SUNVA	-	203(202.5)	-0.5	-	A020+	K230	RNAV1
TF	SUNGO	-	203(202.5)	-0.5	L	-	K230	RNAV1
TF	SASGA	-	113(113.3)	-0.5	L	A040+	K230	RNAV1
TF	SUKOK	-	023(023.6)	-0.5	L	-	-	RNAV1
TF	VTK	-	342(341.5)	-0.5	-	A070+	-	RNAV1
TF	AKOMA	-	342(341.5)	-0.5	L	-	-	RNAV1
TF	AGVAR	-	278(277.5)	-0.5	-	A110+	-	RNAV1
TF	SABKA	-	278(277.5)	-0.5	R	-	-	RNAV1
TF	MASBO	-	296(295.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

**STANDARD DEPARTURE CHART
RNAV (GNSS) -
INSTRUMENT (SID)**

TWR 118.6 / 118.25
APP 120.3
ACC 134.2

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02C/20C
TOMAN DEPARTURES
TOMAN 2A (R02C)
TOMAN 2B (R20C)**

ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: ACFT UNABLE TO FLY THE SID
PROFILE SHALL INFORM ATC
PRIOR TO DEPARTURE AND TO
EXPECT RADAR VECTORED,
IF NECESSARY

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

GENERAL INFORMATION

INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

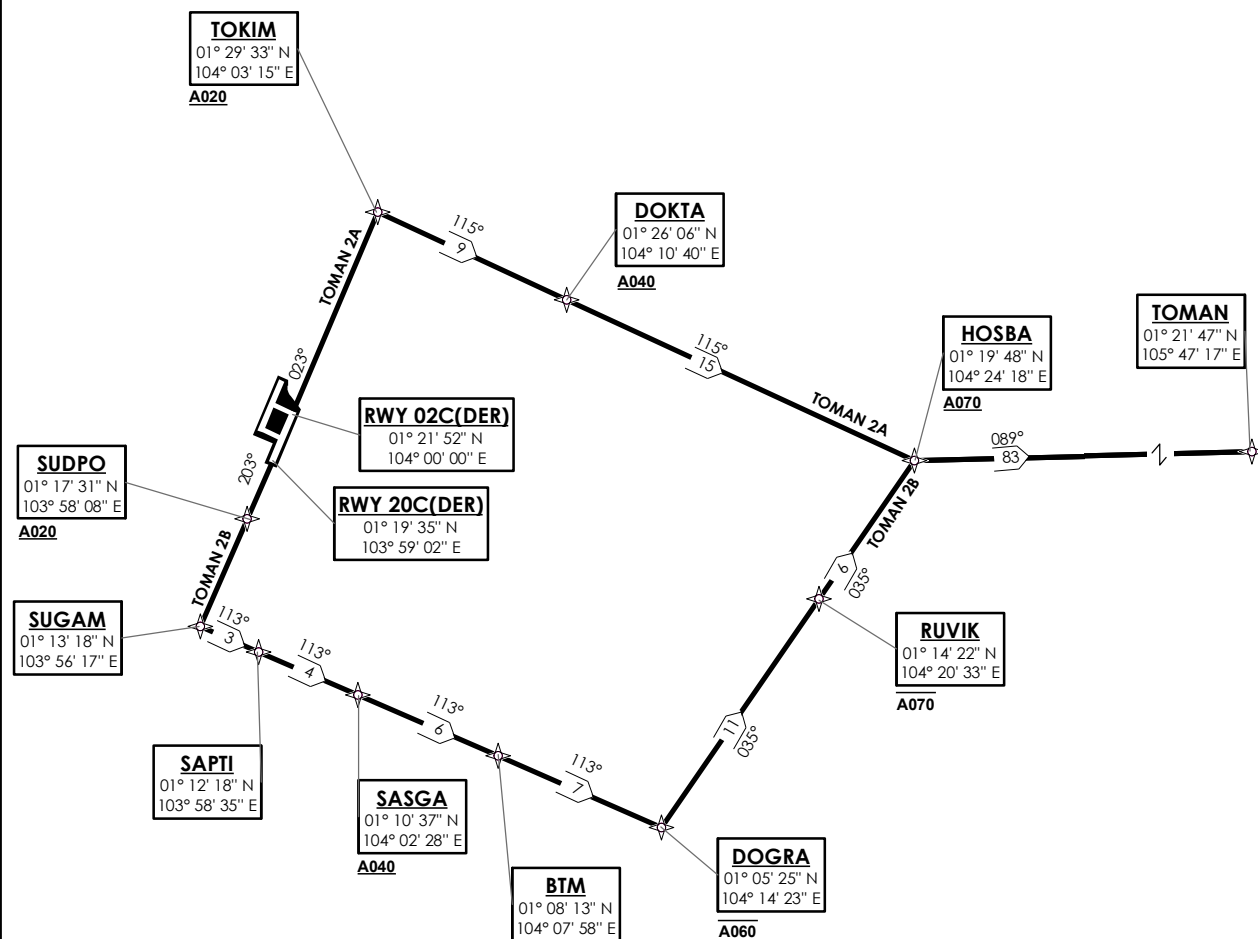
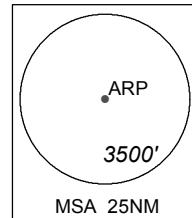
RWY 02C

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20C

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%
UNTIL REACHING OR PASSING 400FT, 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



NOT TO SCALE

TOMAN 2A (SID) RNAV GNSS RWY 02C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To TOKIM on course 023° at or above 2000ft, speed 230kts, turn right. To DOKTA at or above 4000ft. To HOSBA at or above 7000ft, turn left. To TOMAN.	TOKIM [M023; A020+; K230; R] -	CF	N
	DOKTA [A040+] -	TF	N
	HOSBA [A070+; L] -	TF	N
	TOMAN	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	TOKIM	-	023(022.5)	-0.5	R	A020+	K230	RNAV1
TF	DOKTA	-	115(114.5)	-0.5	-	A040+	-	RNAV1
TF	HOSBA	-	115(114.5)	-0.5	L	A070+	-	RNAV1
TF	TOMAN	-	089(088.5)	-0.5	-	-	-	RNAV1

TOMAN 2B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To SUDPO on course 203° at or above 2000ft, speed 230kts. To SUGAM, speed 230kts, turn left. To SAPTI. To SASGA at or above 4000ft. To BTM. To DOGRA at or below 6000ft, turn left. To RUVIK at or below 7000ft. To HOSBA at or above 7000ft, turn right. To TOMAN.	SUDPO [M203; A020+; K230] -	CF	N
	SUGAM [K230; L] -	TF	N
	SAPTI -	TF	N
	SASGA [A040+] -	TF	N
	BTM -	TF	N
	DOGRA [A060-; L] -	TF	N
	RUVIK [A070-] -	TF	N
	HOSBA [A070+; R] -	TF	N
TOMAN	TF	N	

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	SUDPO	-	203(202.5)	-0.5	-	A020+	K230	RNAV1
TF	SUGAM	-	203(202.5)	-0.5	L	-	K230	RNAV1
TF	SAPTI	-	113(113.3)	-0.5	-	-	-	RNAV1
TF	SASGA	-	113(113.3)	-0.5	-	A040+	-	RNAV1
TF	BTM	-	113(113.3)	-0.5	-	-	-	RNAV1
TF	DOGRA	-	113(113.3)	-0.5	L	A060-	-	RNAV1
TF	RUVIK	-	035(034.5)	-0.5	-	A070-	-	RNAV1
TF	HOSBA	-	035(034.5)	-0.5	R	A070+	-	RNAV1
TF	TOMAN	-	089(088.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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 SINGAPORE AIP ON RADIO COMMUNICATIONS FAILURE PROCEDURE. RWY 20C - PROCEED STRAIGHT AHEAD TO SAMKO HOLDING AREA (SHA) CLIMBING TO THE LAST ASSIGNED ALTITUDE, THEREAFTER REFER TO SINGAPORE AIP ON RADIO COMMUNICATIONS FAILURE PROCEDURE.

**STANDARD DEPARTURE CHART
RNAV (GNSS) -
INSTRUMENT (SID)**

TWR 118.6 / 118.25
APP 120.3
ACC 134.2

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02L/20R
TOMAN DEPARTURES
TOMAN 2E (R02L)
TOMAN 2F (R20R)**

ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: ACFT UNABLE TO FLY THE SID
PROFILE SHALL INFORM ATC
PRIOR TO DEPARTURE AND TO
EXPECT RADAR VECTURING,
IF NECESSARY

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

GENERAL INFORMATION

INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

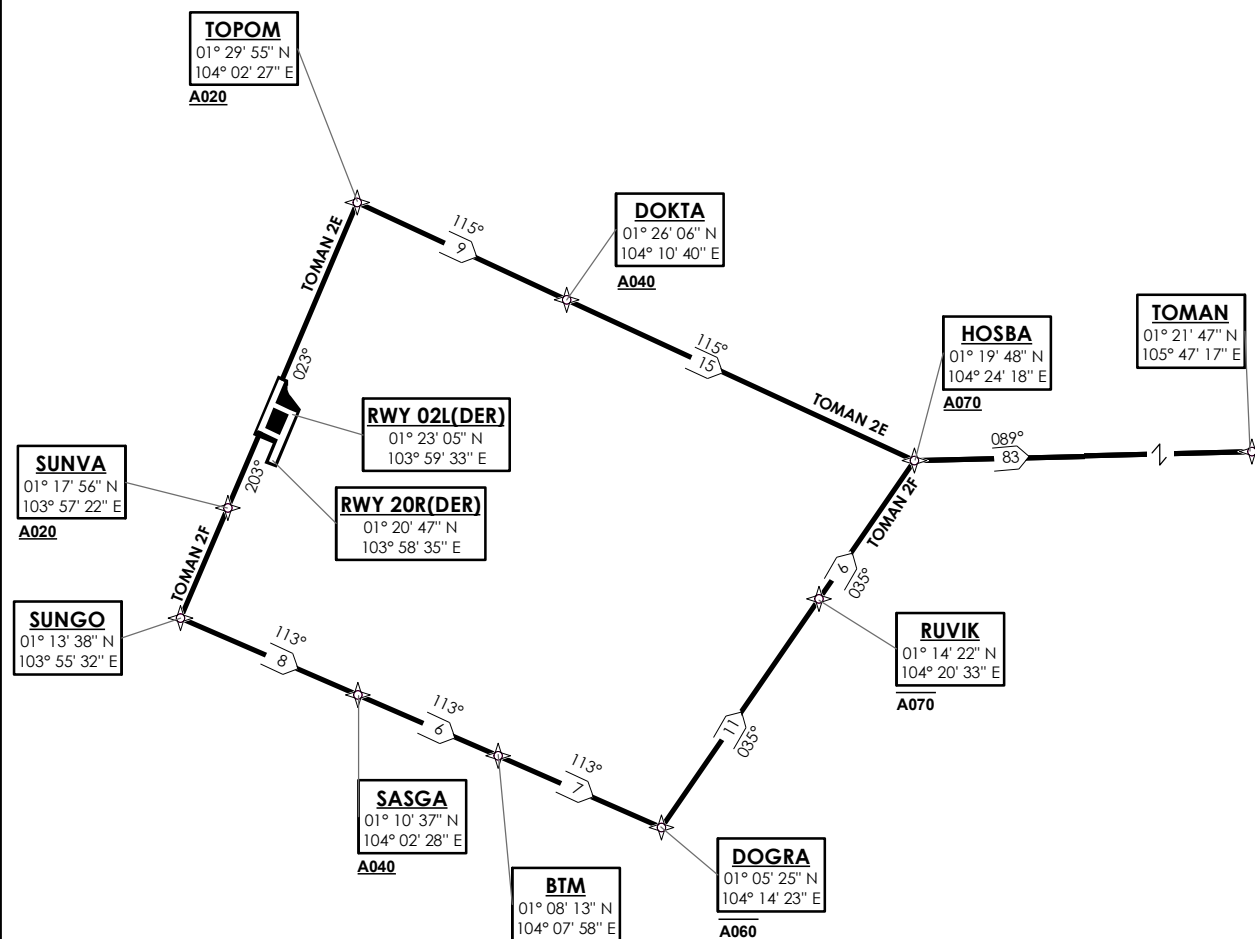
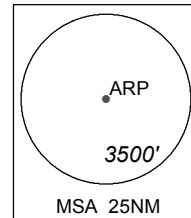
RWY 02L

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20R

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%
UNTIL REACHING OR PASSING 400FT, 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



NOT TO SCALE

TOMAN 2E (SID) RNAV GNSS RWY 02L - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To TOPOM on course 023° at or above 2000ft, speed 230kts, turn right. To DOKTA at or above 4000ft. To HOSBA at or above 7000ft, turn left. To TOMAN.	TOPOM [M023; A020+; K230; R] -	CF	N
	DOKTA [A040+] -	TF	N
	HOSBA [A070+; L] -	TF	N
	TOMAN	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	TOPOM	-	023(022.5)	-0.5	R	A020+	K230	RNAV1
TF	DOKTA	-	115(114.5)	-0.5	-	A040+	-	RNAV1
TF	HOSBA	-	115(114.5)	-0.5	L	A070+	-	RNAV1
TF	TOMAN	-	089(088.5)	-0.5	-	-	-	RNAV1

TOMAN 2F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To SUNVA on course 203° at or above 2000ft, speed 230kts. To SUNGO, speed 230kts, turn left. To SASGA at or above 4000ft. To BTM. To DOGRA at or below 6000ft, turn left. To RUVIK at or below 7000ft. To HOSBA at or above 7000ft, turn right. To TOMAN.	SUNVA [M203; A020+; K230] -	CF	N
	SUNGO [K230; L] -	TF	N
	SASGA [A040+] -	TF	N
	BTM -	TF	N
	DOGRA [A060-; L] -	TF	N
	RUVIK [A070-] -	TF	N
	HOSBA [A070+; R] -	TF	N
	TOMAN	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	SUNVA	-	203(202.5)	-0.5	-	A020+	K230	RNAV1
TF	SUNGO	-	203(202.5)	-0.5	L	-	K230	RNAV1
TF	SASGA	-	113(113.3)	-0.5	-	A040+	-	RNAV1
TF	BTM	-	113(113.3)	-0.5	-	-	-	RNAV1
TF	DOGRA	-	113(113.3)	-0.5	L	A060-	-	RNAV1
TF	RUVIK	-	035(034.5)	-0.5	-	A070-	-	RNAV1
TF	HOSBA	-	035(034.5)	-0.5	R	A070+	-	RNAV1
TF	TOMAN	-	089(088.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

**STANDARD DEPARTURE CHART
RNAV (GNSS) -
INSTRUMENT (SID)**

TWR 118.6 / 118.25
APP 120.3
ACC 134.4

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02C/20C
VENIX DEPARTURES
VENIX 1A (R02C)
VENIX 1B (R20C)**

ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: ACFT UNABLE TO FLY THE SID
PROFILE SHALL INFORM ATC
PRIOR TO DEPARTURE AND TO
EXPECT RADAR VECTURING,
IF NECESSARY

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

GENERAL INFORMATION

**INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC**

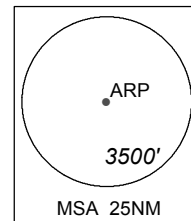
ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

RWY 02C

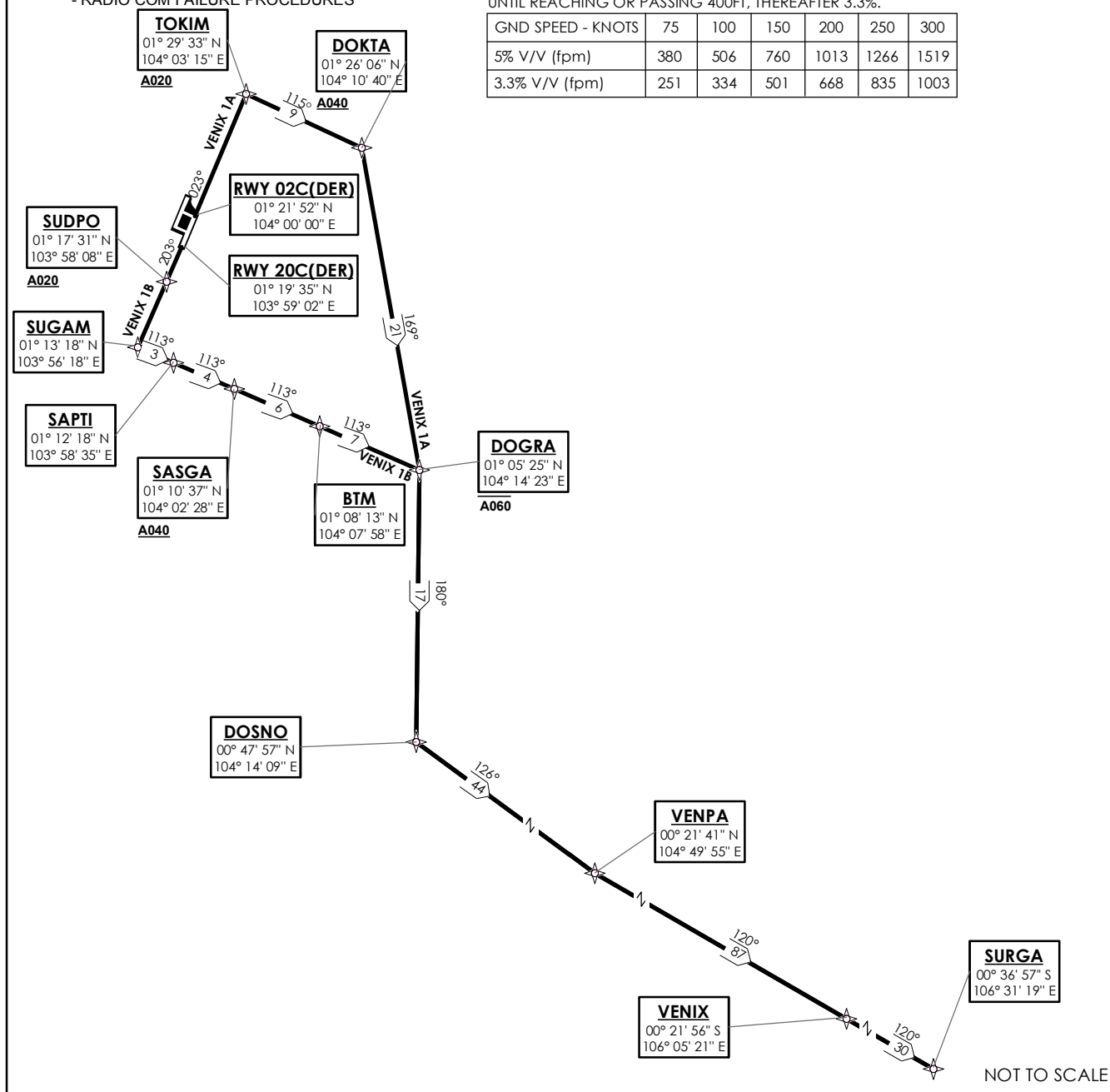
IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20C

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%
UNTIL REACHING OR PASSING 400FT, 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



VENIX 1A (SID) RNAV GNSS RWY 02C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To TOKIM on course 023° at or above 2000ft, speed 230kts, turn right. To DOKTA at or above 4000ft, turn right. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To VENPA, turn left. To VENIX. To SURGA.	TOKIM [M023; A020+; K230; R] -	CF	N
	DOKTA [A040+; R] -	TF	N
	DOGRA [A060-; R] -	TF	N
	DOSNO [L] -	TF	N
	VENPA [L] -	TF	N
	VENIX -	TF	N
	SURGA	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	TOKIM	-	023(022.5)	-0.5	R	A020+	K230	RNAV1
TF	DOKTA	-	115(114.5)	-0.5	R	A040+	-	RNAV1
TF	DOGRA	-	169(168.5)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	VENPA	-	126(125.5)	-0.5	L	-	-	RNAV1
TF	VENIX	-	120(199.5)	-0.5	-	-	-	RNAV1
TF	SURGA	-	120(199.5)	-0.5	-	-	-	RNAV1

VENIX 1B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To SUDPO on course 203° at or above 2000ft, speed 230kts. To SUGAM, speed 230kts, turn left. To SAPTI. To SASGA at or above 4000ft. To BTM. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To VENPA, turn left. To VENIX. To SURGA.	SUDPO [M203; A020+; K230] -	CF	N
	SUGAM [K230; L] -	TF	N
	SAPTI -	TF	N
	SASGA [A040+] -	TF	N
	BTM -	TF	N
	DOGRA [A060-; R] -	TF	N
	DOSNO [L] -	TF	N
	VENPA [L] -	TF	N
	VENIX -	TF	N
SURGA	TF	N	

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	SUDPO	-	203(202.5)	-0.5	-	A020+	K230	RNAV1
TF	SUGAM	-	203(202.5)	-0.5	L	-	K230	RNAV1
TF	SAPTI	-	113(113.3)	-0.5	-	-	-	RNAV1
TF	SASGA	-	113(113.3)	-0.5	-	A040+	-	RNAV1
TF	BTM	-	113(113.3)	-0.5	-	-	-	RNAV1
TF	DOGRA	-	113(113.3)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	VENPA	-	126(125.5)	-0.5	L	-	-	RNAV1
TF	VENIX	-	120(199.5)	-0.5	-	-	-	RNAV1
TF	SURGA	-	120(199.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

**STANDARD DEPARTURE CHART
RNAV (GNSS) -
INSTRUMENT (SID)**

TWR 118.6 / 118.25
APP 120.3
ACC 134.4

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02L/20R
VENIX DEPARTURES
VENIX 1E (R02L)
VENIX 1F (R20R)**

ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26'E (2015)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: ACFT UNABLE TO FLY THE SID
PROFILE SHALL INFORM ATC
PRIOR TO DEPARTURE AND TO
EXPECT RADAR VECTORING,
IF NECESSARY

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

GENERAL INFORMATION

**INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC**

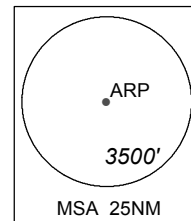
ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

RWY 02L

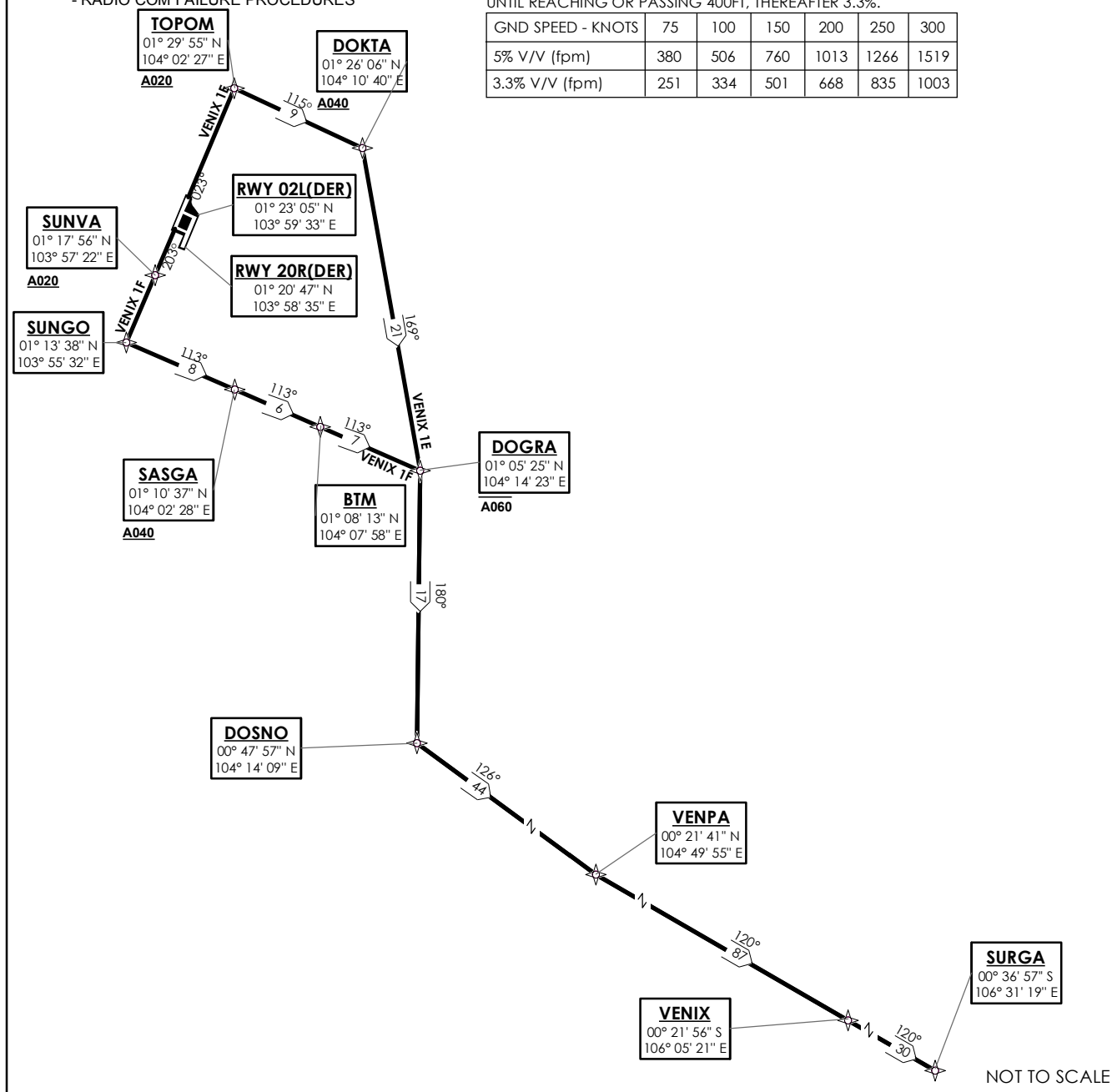
IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20R

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%
UNTIL REACHING OR PASSING 400FT, 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



VENIX 1E (SID) RNAV GNSS RWY 02L - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To TOPOM on course 023° at or above 2000ft, speed 230kts, turn right. To DOKTA at or above 4000ft, turn right. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To VENPA, turn left. To VENIX. To SURGA.	TOPOM [M023; A020+; K230; R] -	CF	N
	DOKTA [A040+; R] -	TF	N
	DOGRA [A060-; R] -	TF	N
	DOSNO [L] -	TF	N
	VENPA [L] -	TF	N
	VENIX -	TF	N
	SURGA	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	TOPOM	-	023(022.5)	-0.5	R	A020+	K230	RNAV1
TF	DOKTA	-	115(114.5)	-0.5	R	A040+	-	RNAV1
TF	DOGRA	-	169(168.5)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	VENPA	-	126(125.5)	-0.5	L	-	-	RNAV1
TF	VENIX	-	120(199.5)	-0.5	-	-	-	RNAV1
TF	SURGA	-	120(199.5)	-0.5	-	-	-	RNAV1

VENIX 1F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To SUNVA on course 203° at or above 2000ft, speed 230kts. To SUNGO, speed 230kts, turn left. To SASGA at or above 4000ft. To BTM. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To VENPA, turn left. To VENIX. To SURGA.	SUNVA [M203; A020+; K230] -	CF	N
	SUNGO [K230; L] -	TF	N
	SASGA [A040+] -	TF	N
	BTM -	TF	N
	DOGRA [A060-; R] -	TF	N
	DOSNO [L] -	TF	N
	VENPA [L] -	TF	N
	VENIX -	TF	N
SURGA	TF	N	

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	SUNVA	-	203(202.5)	-0.5	-	A020+	K230	RNAV1
TF	SUNGO	-	203(202.5)	-0.5	L	-	K230	RNAV1
TF	SASGA	-	113(113.3)	-0.5	-	A040+	-	RNAV1
TF	BTM	-	113(113.3)	-0.5	-	-	-	RNAV1
TF	DOGRA	-	113(113.3)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	VENPA	-	126(125.5)	-0.5	L	-	-	RNAV1
TF	VENIX	-	120(199.5)	-0.5	-	-	-	RNAV1
TF	SURGA	-	120(199.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

**STANDARD DEPARTURE CHART
RNAV (GNSS) -
INSTRUMENT (SID)**

TWR 118.6 / 118.25
APP 120.3
ACC 133.8

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02C/20C
MERSING DEPARTURES
VMR 5A (R02C)
VMR 6B (R20C)**

ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

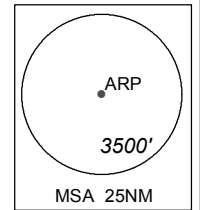
DISTANCES IN NM
NOTE: RADAR REQUIRED

**NOTE: ACFT UNABLE TO FLY THE SID
PROFILE SHALL INFORM ATC
PRIOR TO DEPARTURE AND TO
EXPECT RADAR VECTORED,
IF NECESSARY**

**NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED**

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

VMR
02° 23' 18" N
103° 52' 18" E



GENERAL INFORMATION

**INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC**

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

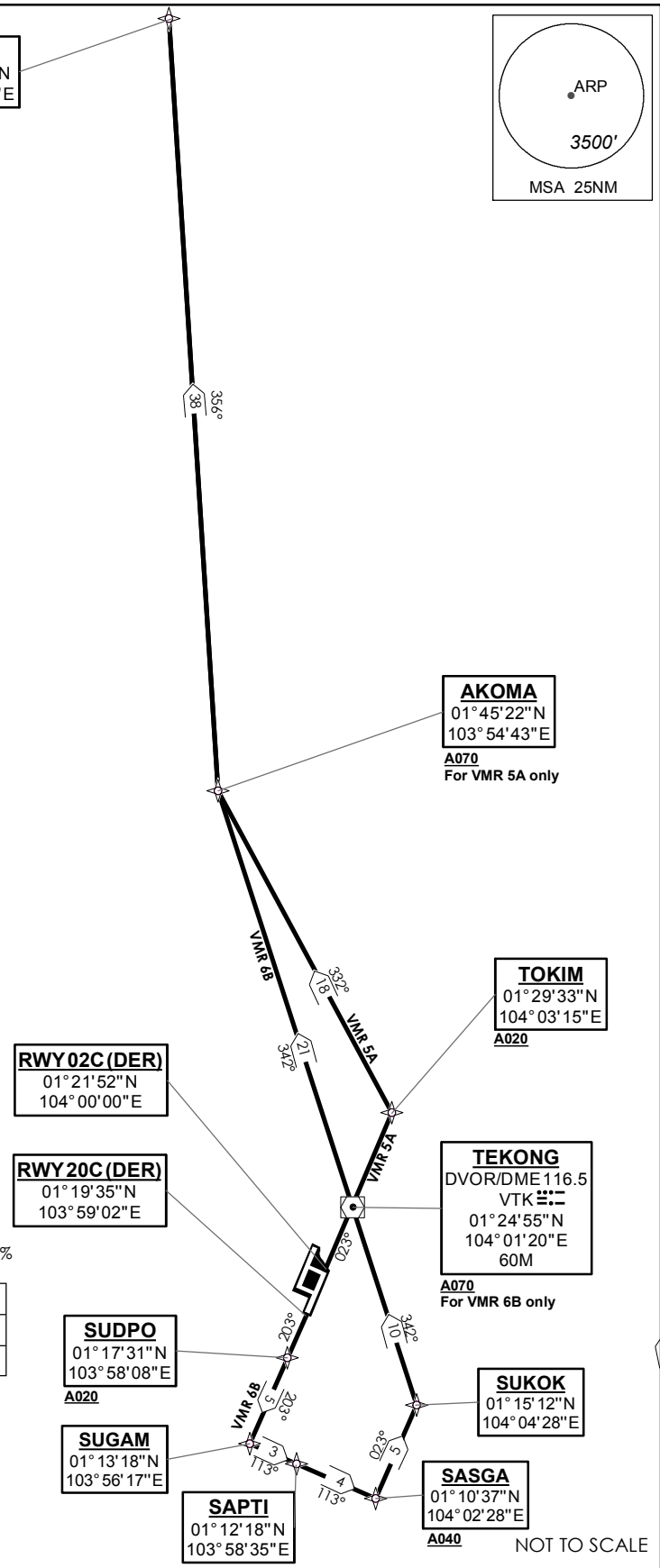
RWY 02C

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20C

IAS 230KTS UNTIL SASGA AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%
UNTIL REACHING OR PASSING 400FT, 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



NOT TO SCALE

VMR 5A (SID) RNAV GNSS RWY 02C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To TOKIM on course 023° at or above 2000ft, speed 230kts, turn left. To AKOMA at or above 7000ft, turn right. To VMR.	TOKIM [M023; A020+; K230; L] -	CF	N
	AKOMA [A070+; R] -	TF	N
	VMR	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	TOKIM	-	023(022.5)	-0.5	L	A020+	K230	RNAV1
TF	AKOMA	-	332(331.5)	-0.5	R	A070+	-	RNAV1
TF	VMR	-	356(355.5)	-0.5	-	-	-	RNAV1

VMR 6B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To SUDPO on course 203° at or above 2000ft, speed 230kts. To SUGAM, speed 230kts, turn left. To SAPTI, speed 230kts. To SASGA at or above 4000ft, speed 230kts, turn left. To SUKOK, turn left. To VTK at or above 7000ft. To AKOMA, turn right. To VMR.	SUDPO [M203; A020+; K230] -	CF	N
	SUGAM [K230; L] -	TF	N
	SAPTI [K230] -	TF	N
	SASGA [A040+; K230; L] -	TF	N
	SUKOK [L] -	TF	N
	VTK [A070+] -	TF	N
	AKOMA [R] -	TF	N
	VMR	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	SUDPO	-	203(202.5)	-0.5	-	A020+	K230	RNAV1
TF	SUGAM	-	203(202.5)	-0.5	L	-	K230	RNAV1
TF	SAPTI	-	113(113.3)	-0.5	-	-	K230	RNAV1
TF	SASGA	-	113(113.3)	-0.5	L	A040+	K230	RNAV1
TF	SUKOK	-	023(023.6)	-0.5	L	-	-	RNAV1
TF	VTK	-	342(341.5)	-0.5	-	A070+	-	RNAV1
TF	AKOMA	-	342(341.5)	-0.5	R	-	-	RNAV1
TF	VMR	-	356(355.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

**STANDARD DEPARTURE CHART
RNAV (GNSS) -
INSTRUMENT (SID)**

TWR 118.6 / 118.25
APP 120.3
ACC 133.8

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02L/20R
MERSING DEPARTURES
VMR 5E (R02L)
VMR 6F (R20R)**

ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

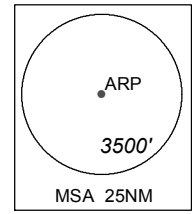
DISTANCES IN NM
NOTE: RADAR REQUIRED

NOTE: ACFT UNABLE TO FLY THE SID
PROFILE SHALL INFORM ATC
PRIOR TO DEPARTURE AND TO
EXPECT RADAR VECTORED,
IF NECESSARY

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

VMR
02° 23' 18" N
103° 52' 18" E



GENERAL INFORMATION

INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

RWY 02L

IAS 230KTS UNTIL PASSING 4000FT AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20R

IAS 230KTS UNTIL SASGA AND
IAS 250KTS UNTIL PASSING 10000FT.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%
UNTIL REACHING OR PASSING 400FT, 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

RWY02L (DER)
01° 23' 05" N
103° 59' 33" E

RWY20R (DER)
01° 20' 47" N
103° 58' 35" E

SUNVA
01° 17' 56" N
103° 57' 22" E
A020

SUNGO
01° 13' 38" N
103° 55' 32" E

AKOMA
01° 45' 22" N
103° 54' 43" E
A070
For VMR 5E only

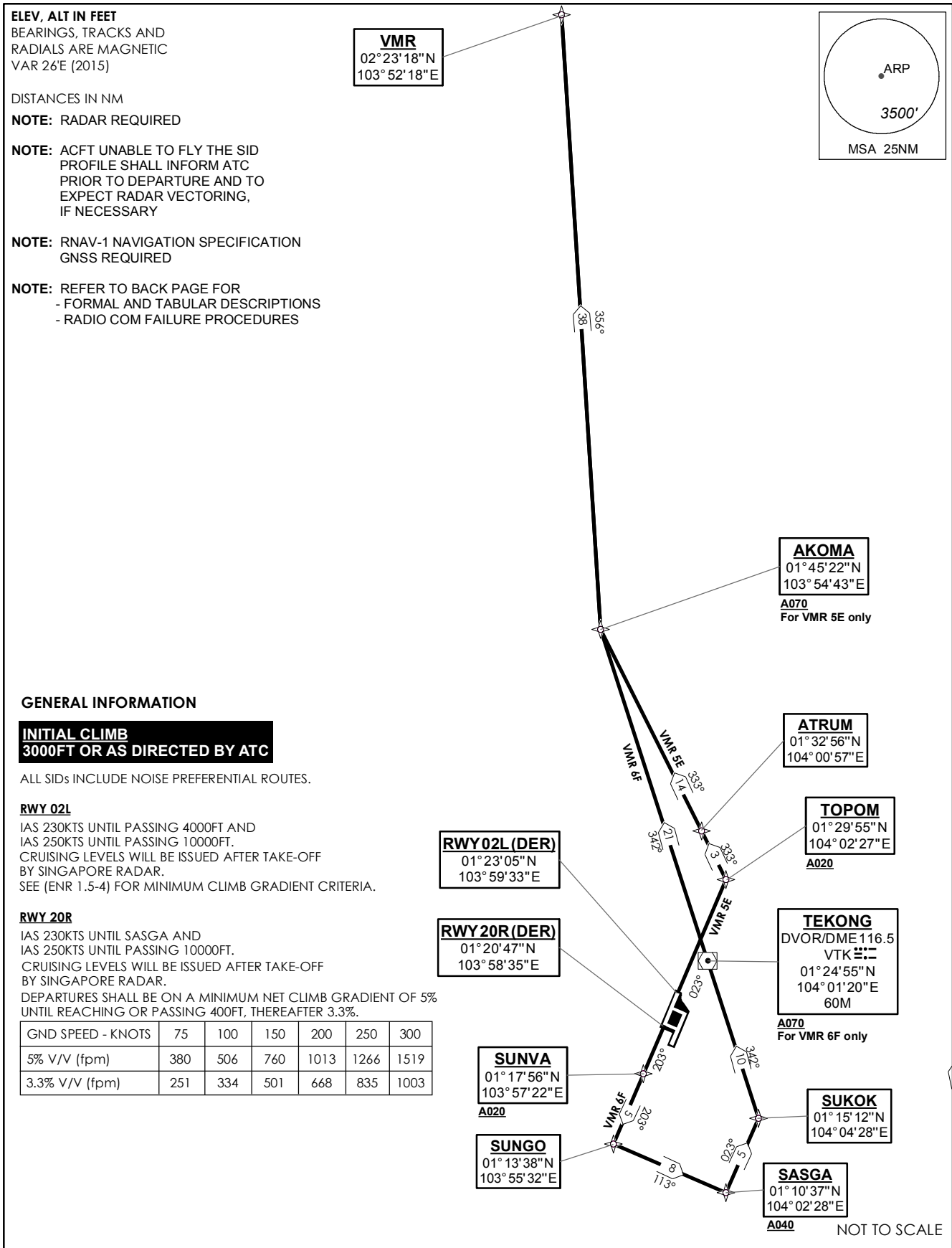
ATRUM
01° 32' 56" N
104° 00' 57" E

TOPOM
01° 29' 55" N
104° 02' 27" E
A020

TEKONG
DVOR/DME 116.5
VTK
01° 24' 55" N
104° 01' 20" E
60M
A070
For VMR 6F only

SUKOK
01° 15' 12" N
104° 04' 28" E

SASGA
01° 10' 37" N
104° 02' 28" E
A040



NOT TO SCALE

VMR 5E (SID) RNAV GNSS RWY 02L - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To TOPOM on course 023° at or above 2000ft, speed 230kts, turn left. To ATRUM. To AKOMA at or above 7000ft, turn right. To VMR.	TOPOM [M023; A020+; K230; L] -	CF	N
	ATRUM -	TF	N
	AKOMA [A070+; R] -	TF	N
	VMR	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	TOPOM	-	023(022.5)	-0.5	L	A020+	K230	RNAV1
TF	ATRUM	-	333(332.5)	-0.5	-	-	-	RNAV1
TF	AKOMA	-	333(332.5)	-0.5	R	A070+	-	RNAV1
TF	VMR	-	356(355.5)	-0.5	-	-	-	RNAV1

VMR 6F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To SUNVA on course 203° at or above 2000ft, speed 230kts. To SUNGO, speed 230kts, turn left. To SASGA at or above 4000ft, speed 230kts, turn left. To SUKOK, turn left. To VTK at or above 7000ft. To AKOMA, turn right. To VMR.	SUNVA [M203; A020+; K230] -	CF	N
	SUNGO [K230; L] -	TF	N
	SASGA [A040+; K230; L] -	TF	N
	SUKOK [L] -	TF	N
	VTK [A070+] -	TF	N
	AKOMA [R] -	TF	N
	VMR	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	SUNVA	-	203(202.5)	-0.5	-	A020+	K230	RNAV1
TF	SUNGO	-	203(202.5)	-0.5	L	-	K230	RNAV1
TF	SASGA	-	113(113.3)	-0.5	L	A040+	K230	RNAV1
TF	SUKOK	-	023(023.6)	-0.5	L	-	-	RNAV1
TF	VTK	-	342(341.5)	-0.5	-	A070+	-	RNAV1
TF	AKOMA	-	342(341.5)	-0.5	R	-	-	RNAV1
TF	VMR	-	356(355.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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 SINGAPORE AIP ON RADIO COMMUNICATIONS FAILURE PROCEDURE. RWY 20R - PROCEED STRAIGHT AHEAD TO SAMKO HOLDING AREA (SHA) CLIMBING TO THE LAST ASSIGNED ALTITUDE, THEREAFTER REFER TO SINGAPORE AIP ON RADIO COMMUNICATIONS FAILURE PROCEDURE.

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

ACC 133.25
APP 124.6 / 120.3
ARR 119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

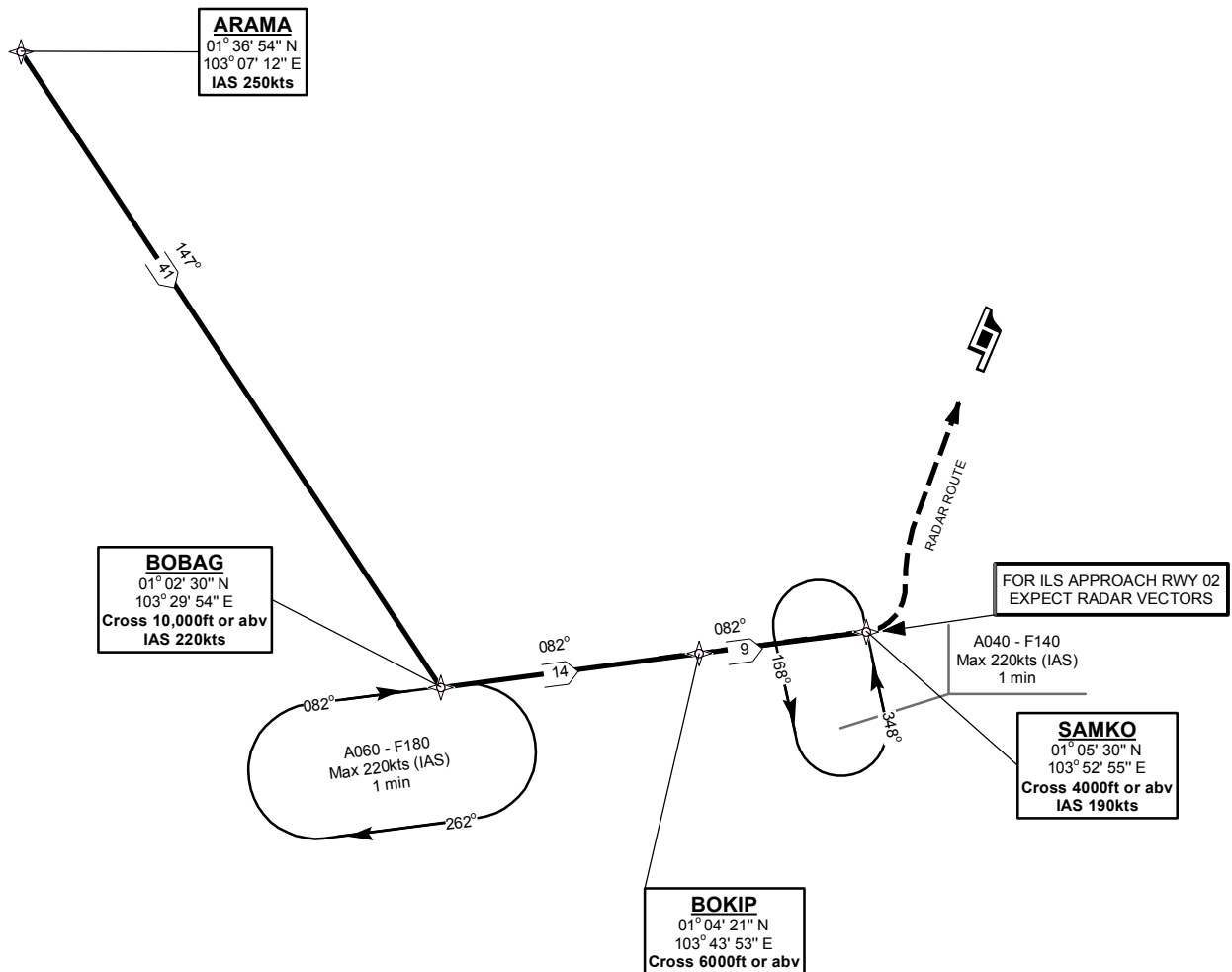
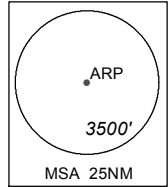
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

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



NOT TO SCALE

ARAMA 1A (STAR) RNAV GNSS RWY 02L/02C - 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] -	IF	N
	BOBAG [A100+; K220; L] -	TF	N
	BOKIP [A060+] -	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	ARAMA	-	-	-0.5	-	-	K250	RNAV1
TF	BOBAG	-	147(147.5)	-0.5	L	A100+	K220	RNAV1
TF	BOKIP	-	082(082.5)	-0.5	-	A060+	-	RNAV1
TF	SAMKO	-	082(082.8)	-0.5	-	A040+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via ARAMA 1A by Singapore ATC</p> <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	<p>No clearance or instruction received from Singapore ATC</p> <p>- Refer to Singapore AIP for radio communications failure procedure</p>

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

ACC 133.25
APP 124.6 / 120.3
ARR 119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

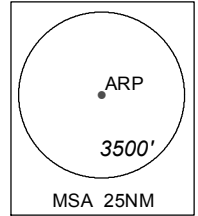
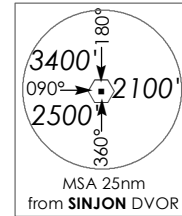
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

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
01° 36' 54" N
103° 07' 12" E
IAS 250kts

BOBAG
01° 02' 30" N
103° 29' 54" E
Cross 10,000ft or abv
IAS 220kts

A060 - F180
Max 220kts (IAS)
1 min

NYLON
01° 36' 57" N
104° 06' 24" E

FOR ILS APPROACH RWY 20
EXPECT RADAR VECTORS

BIPOP
01° 31' 22" N
104° 10' 18" E
Cross 3000ft or abv
IAS 190kts

DOVAN
01° 19' 38" N
104° 12' 49" E
Cross 4000ft or abv

BTM
01° 08' 13" N
104° 07' 58" E
Cross 7000ft or abv
IAS 220kts

SAMKO
01° 05' 30" N
103° 52' 55" E

When Runway 20 at Singapore Changi Airport is in use, arrivals from west within 120 DME SJ are to request for the STAR from Singapore ATC on PRI freq 133.25MHz or SEC freq 135.8MHz. Flight shall still remain under the control of WMKK ATC.

NOT TO SCALE

ARAMA 1B (STAR) RNAV GNSS RWY 20R/20C - 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	-	-	-0.5	-	-	K250	RNAV1
TF	BOBAG	-	147(147.5)	-0.5	L	A100+	K220	RNAV1
TF	SAMKO	-	082(082.6)	-0.5	L	-	-	RNAV1
TF	BTM	-	080(080.5)	-0.5	L	A070+	K220	RNAV1
TF	DOVAN	-	023(023.1)	-0.5	L	A040+	-	RNAV1
TF	BIPOP	-	348(348.5)	-0.5	-	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>

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

ACC 133.25
APP 124.6 / 120.3
ARR 119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

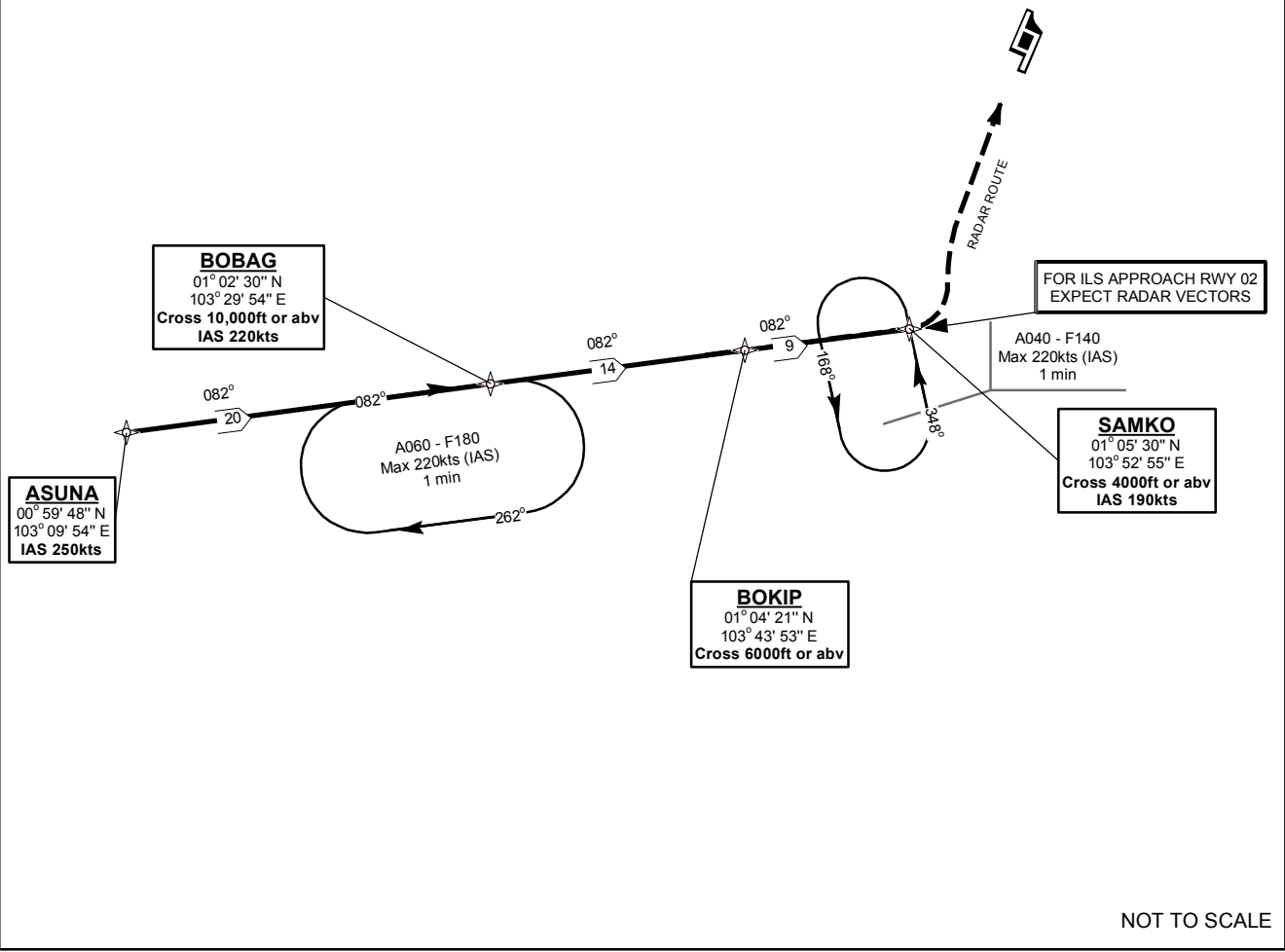
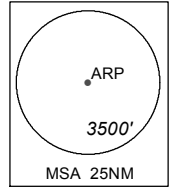
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

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



NOT TO SCALE

ASUNA 1A (STAR) RNAV GNSS RWY 02L/02C - 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 BOKIP at or above 6000ft. To SAMKO at or above 4000ft, speed 190kts.	ASUNA [K250] -	IF	N
	BOBAG [A100+; K220] -	TF	N
	BOKIP [A060+] -	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	ASUNA	-	-	-0.5	-	-	K250	RNAV1
TF	BOBAG	-	082(082.4)	-0.5	-	A100+	K220	RNAV1
TF	BOKIP	-	082(082.5)	-0.5	-	A060+	-	RNAV1
TF	SAMKO	-	082(082.8)	-0.5	-	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>

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

ACC 133.25
APP 124.6 / 120.3
ARR 119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

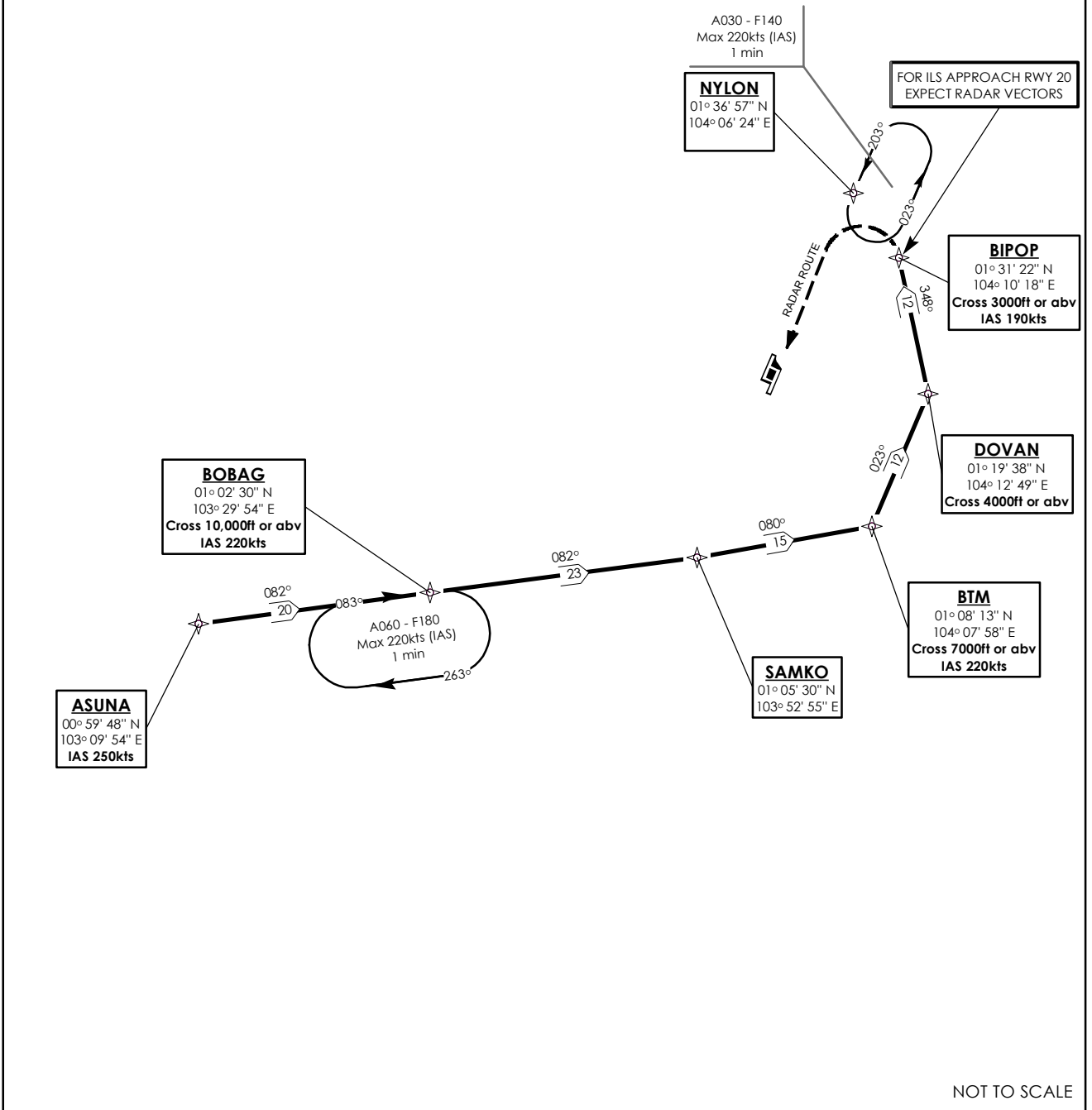
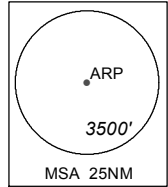
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

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



ASUNA 1B (STAR) RNAV GNSS RWY 20R/20C - 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	-	-	-0.5	-	-	K250	RNAV1
TF	BOBAG	-	082(082.4)	-0.5	-	A100+	K220	RNAV1
TF	SAMKO	-	082(082.6)	-0.5	L	-	-	RNAV1
TF	BTM	-	080(080.5)	-0.5	L	A070+	K220	RNAV1
TF	DOVAN	-	023(023.1)	-0.5	L	A040+	-	RNAV1
TF	BIPOP	-	348(348.5)	-0.5	-	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>

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

ACC 133.8
APP 124.05 / 120.3
ARR 119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

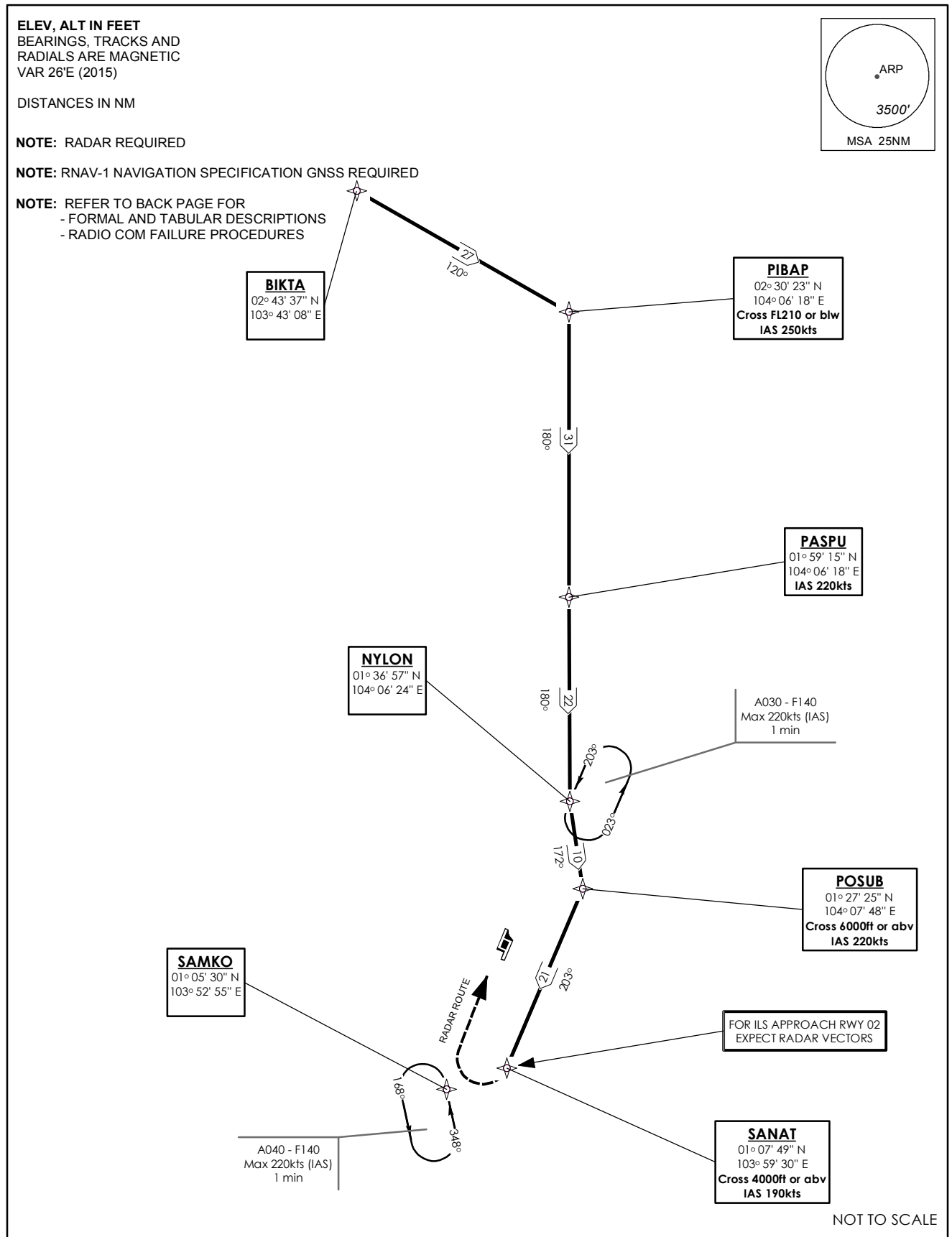
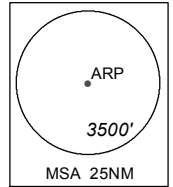
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

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



BIKTA 1A (STAR) RNAV GNSS RWY 02L/02C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From BIKTA. To PIBAP at or below FL210, speed 250kts, turn right. 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.	BIKTA -	IF	N
	PIBAP [FL210-; K250; R] -	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	BIKTA	-	-	-0.5	-	-	-	RNAV1
TF	PIBAP	-	120(120.5)	-0.5	R	FL210-	K250	RNAV1
TF	PASPU	-	180(180.0)	-0.5	-	-	K220	RNAV1
TF	NYLON	-	180(180.5)	-0.5	L	-	-	RNAV1
TF	POSUB	-	172(172.5)	-0.5	R	A060+	K220	RNAV1
TF	SANAT	-	203(203.1)	-0.5	-	A040+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via BIKTA 1A by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on BIKTA 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>

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

ACC 133.8
APP 124.05 / 120.3
ARR 119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

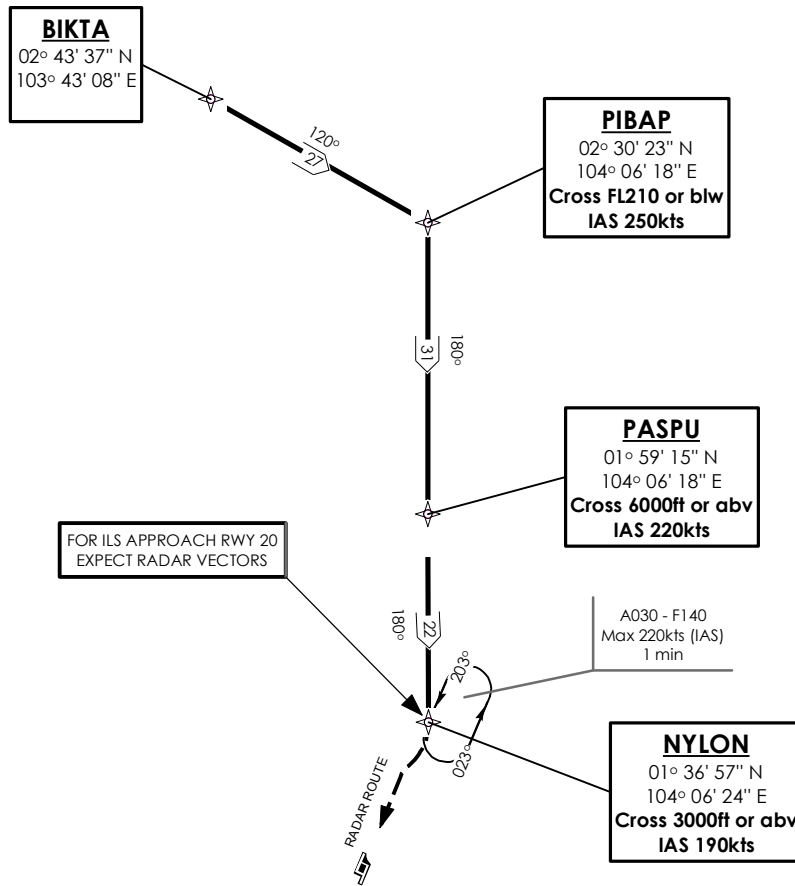
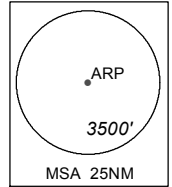
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

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



NOT TO SCALE

BIKTA 1B (STAR) RNAV GNSS RWY 20R/20C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From BIKTA. To PIBAP at or below FL210, speed 250kts, turn right. To PASPU, at or above 6000ft, speed 220kts. To NYLON at or above 3000ft, speed 190kts.	BIKTA -	IF	N
	PIBAP [FL210-; K250; R] -	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	BIKTA	-	-	-0.5	-	-	-	RNAV1
TF	PIBAP	-	120(120.5)	-0.5	R	FL210-	K250	RNAV1
TF	PASPU	-	180(180.0)	-0.5	-	A060+	K220	RNAV1
TF	NYLON	-	180(180.5)	-0.5	-	A030+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via BIKTA 1B by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on BIKTA 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>

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

ACC 134.2
APP 124.05 / 120.3
ARR 119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

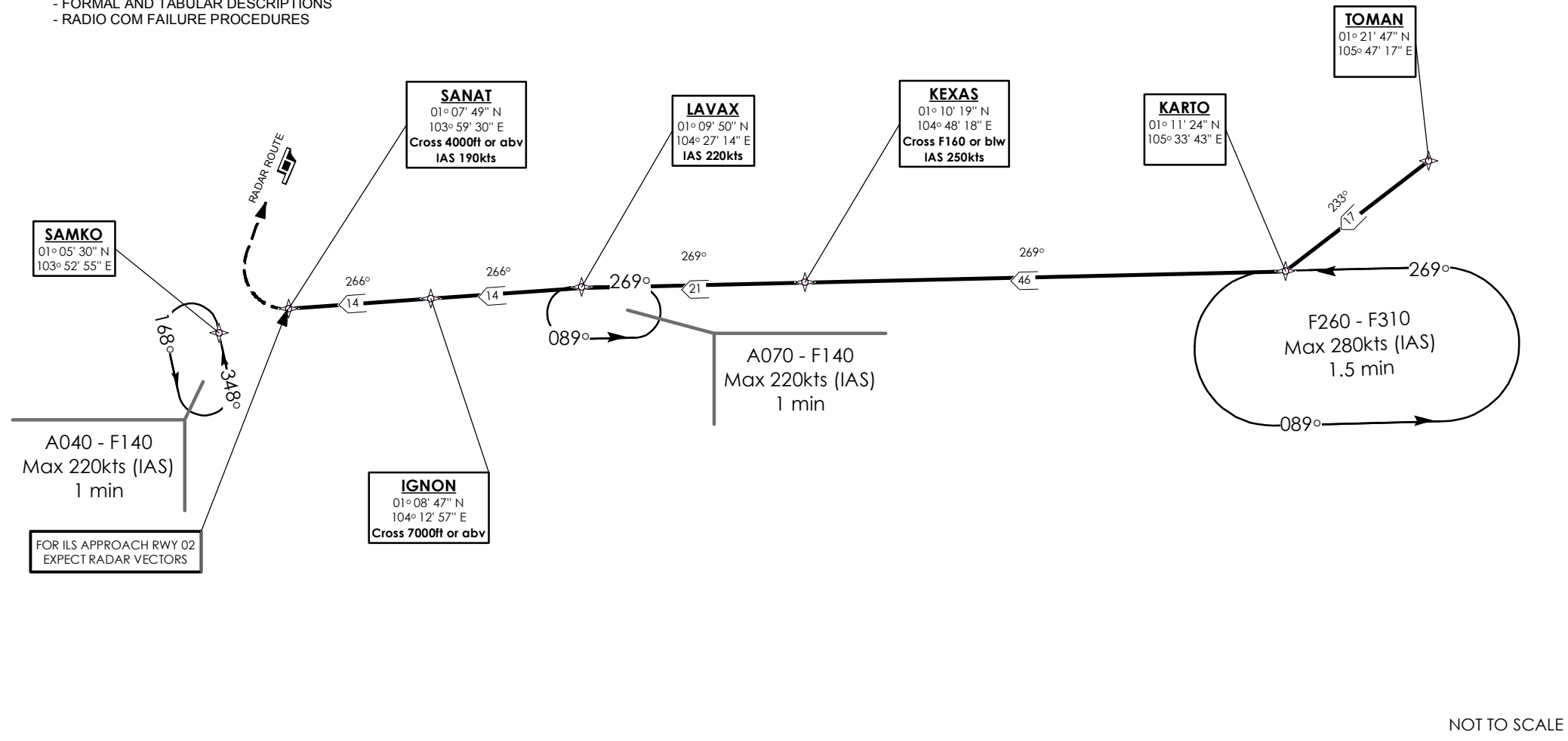
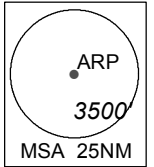
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

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



KARTO 1A (STAR) RNAV GNSS RWY 02L/02C - 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	-	-	-0.5	-	-	-	RNAV1
TF	KARTO	-	233(233.5)	-0.5	R	-	-	RNAV1
TF	KEXAS	-	269(269.5)	-0.5	-	FL160-	K250	RNAV1
TF	LAVAX	-	269(269.5)	-0.5	L	-	K220	RNAV1
TF	IGNON	-	266(266.5)	-0.5	-	A070+	-	RNAV1
TF	SANAT	-	266(266.5)	-0.5	-	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>

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

ACC 134.2
APP 124.05 / 120.3
ARR 119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

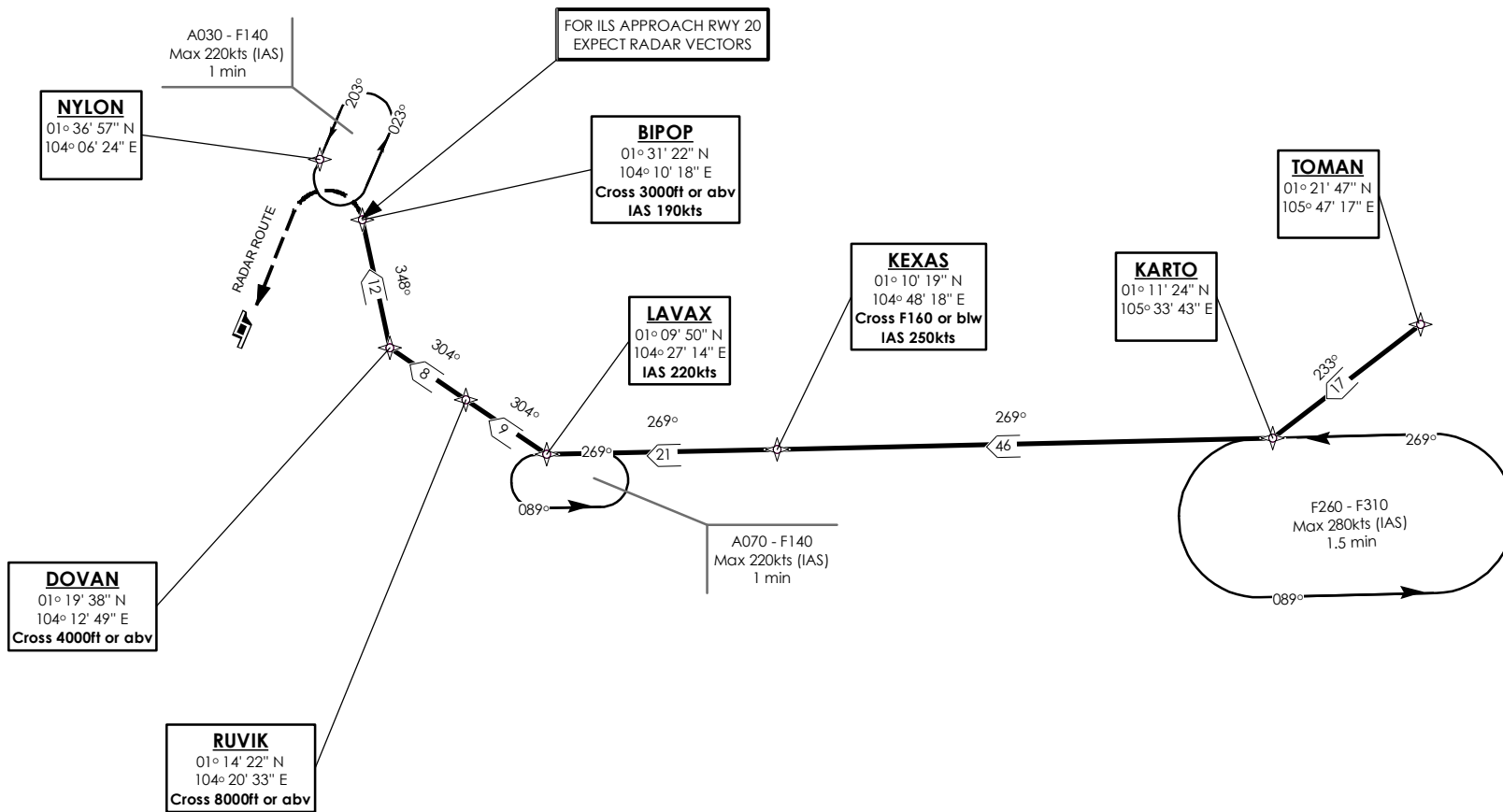
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

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



NOT TO SCALE

KARTO 1B (STAR) RNAV GNSS RWY 20R/20C - 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	-	-	-0.5	-	-	-	RNAV1
TF	KARTO	-	233(233.5)	-0.5	R	-	-	RNAV1
TF	KEXAS	-	269(269.5)	-0.5	-	FL160-	K250	RNAV1
TF	LAVAX	-	269(269.5)	-0.5	R	-	K220	RNAV1
TF	RUVIK	-	304(304.0)	-0.5	-	A080+	-	RNAV1
TF	DOVAN	-	304(304.1)	-0.5	R	A040+	-	RNAV1
TF	BIPOP	-	348(348.5)	-0.5	-	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>

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

ACC 133.8
APP 124.05 / 120.3
ARR 119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

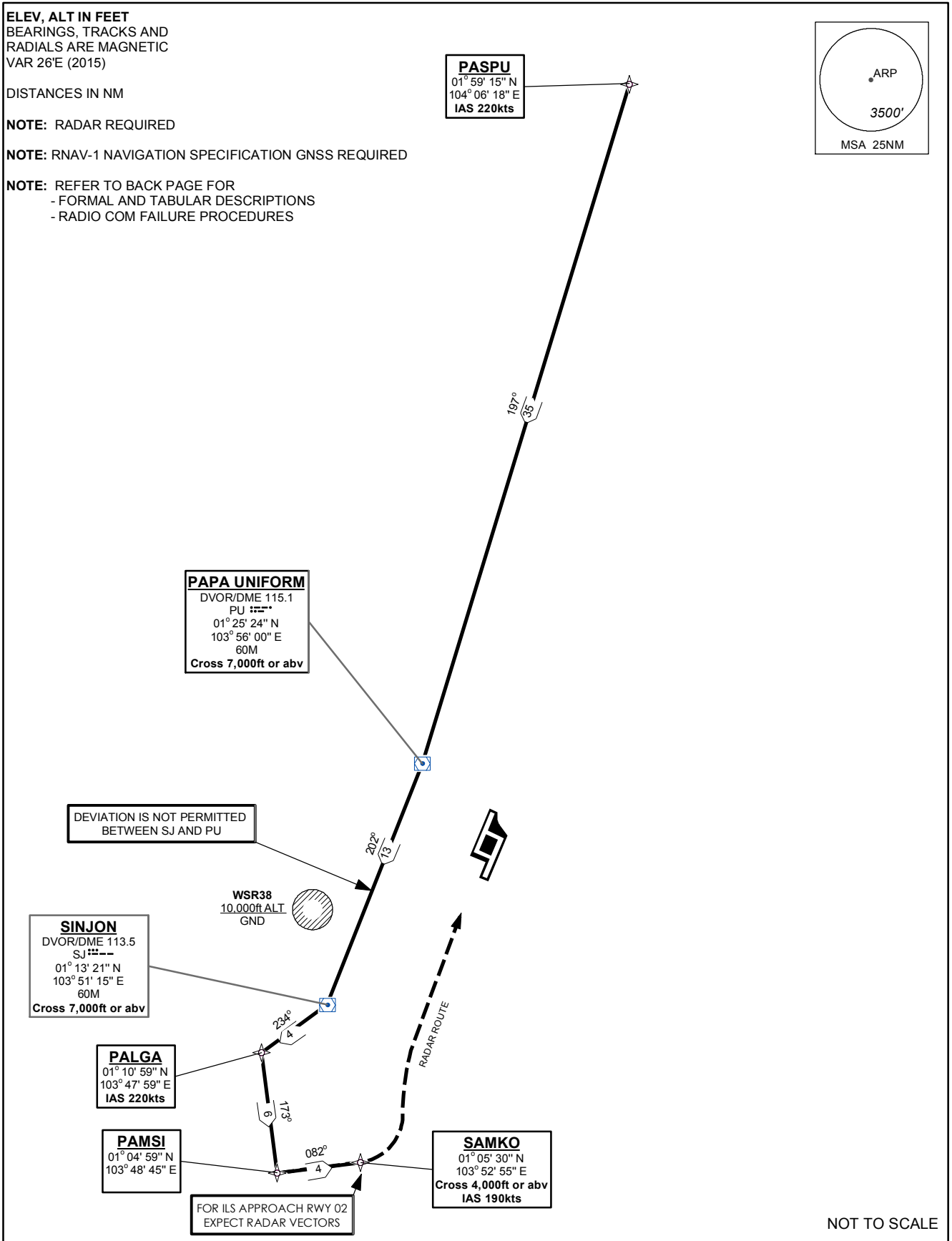
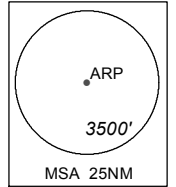
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

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



LEBAR 2A (STAR) RNAV GNSS RWY 02L - 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	-	-	-0.5	-	-	K220	RNAV1
TF	PU	-	197(197.5)	-0.5	R	A070+	-	RNAV1
TF	SJ	-	202(202.5)	-0.5	R	A070+	-	RNAV1
TF	PALGA	-	234(234.5)	-0.5	L	-	K220	RNAV1
TF	PAMSI	-	173(173.5)	-0.5	L	-	-	RNAV1
TF	SAMKO	-	082(082.5)	-0.5	-	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>

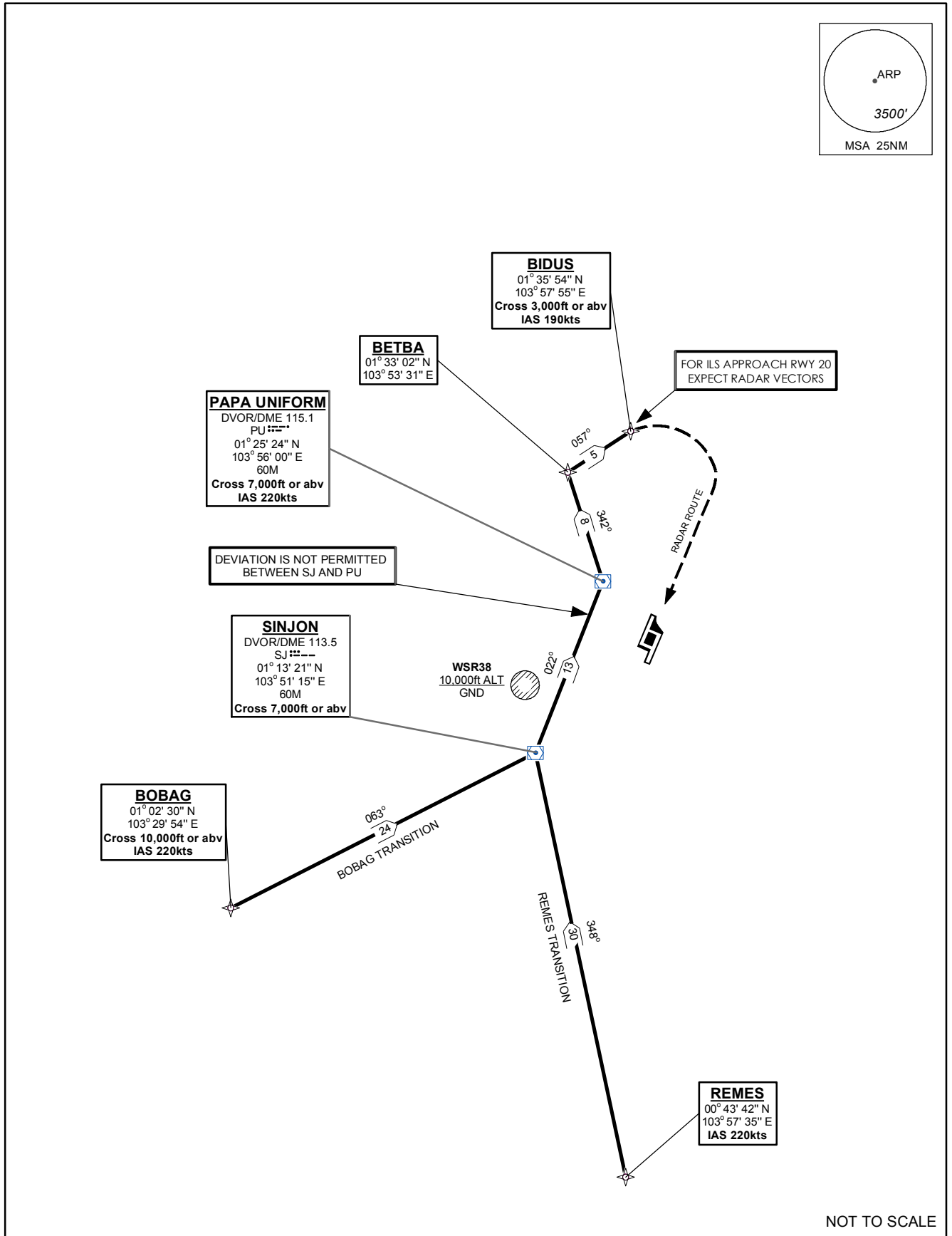
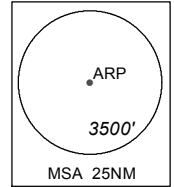
**STANDARD ARRIVAL CHART
RNAV (GNSS) -
INSTRUMENT (STAR)**

ACC 133.25 / 134.4
APP 124.6 / 120.3
ARR 119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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



NOT TO SCALE

LEBAR 2B (STAR) RNAV GNSS RWY 20R - 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	-	-	-0.5	-	A100+	K220	RNAV1
TF	SJ	-	063(063.5)	-0.5	L	A070+	-	RNAV1
TF	PU	-	022(022.5)	-0.5	L	A070+	K220	RNAV1
TF	BETBA	-	342(342.5)	-0.5	R	-	-	RNAV1
TF	BIDUS	-	057(057.5)	-0.5	-	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	-	-	-0.5	-	-	K220	RNAV1
TF	SJ	-	348(348.5)	-0.5	R	A070+	-	RNAV1
TF	PU	-	022(022.5)	-0.5	L	A070+	K220	RNAV1
TF	BETBA	-	342(342.5)	-0.5	R	-	-	RNAV1
TF	BIDUS	-	057(057.5)	-0.5	-	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>

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

ACC 133.25
APP 124.6 / 120.3
ARR 119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

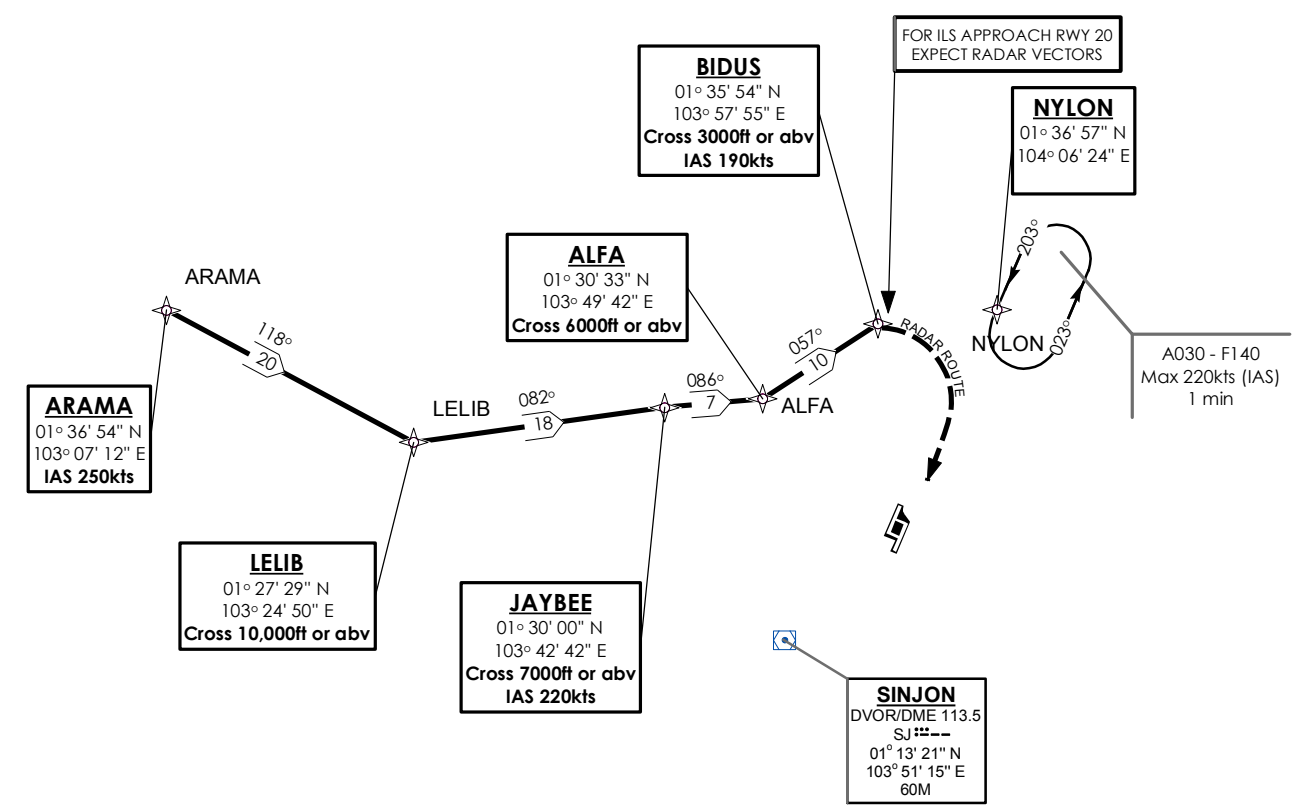
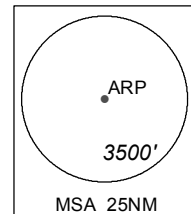
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

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



When Runway 20 at Singapore Changi Airport is in use, arrivals from west within 120 DME SJ are to request for the STAR from Singapore ATC on PRI freq 133.25MHz or SEC freq 135.8MHz. Flight shall still remain under the control of WMKK ATC.

NOT TO SCALE

LELIB 3B (STAR) RNAV GNSS RWY 20R/20C - 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	-	-	-0.5	-	-	K250	RNAV1
TF	LELIB	-	118(118.5)	-0.5	L	A100+	-	RNAV1
TF	JAYBEE	-	082(082.0)	-0.5	R	A070+	K220	RNAV1
TF	ALFA	-	086(086.5)	-0.5	L	A060+	-	RNAV1
TF	BIDUS	-	057(057.1)	-0.5	-	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>

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

ACC 133.8
APP 124.05 / 120.3
ARR 119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

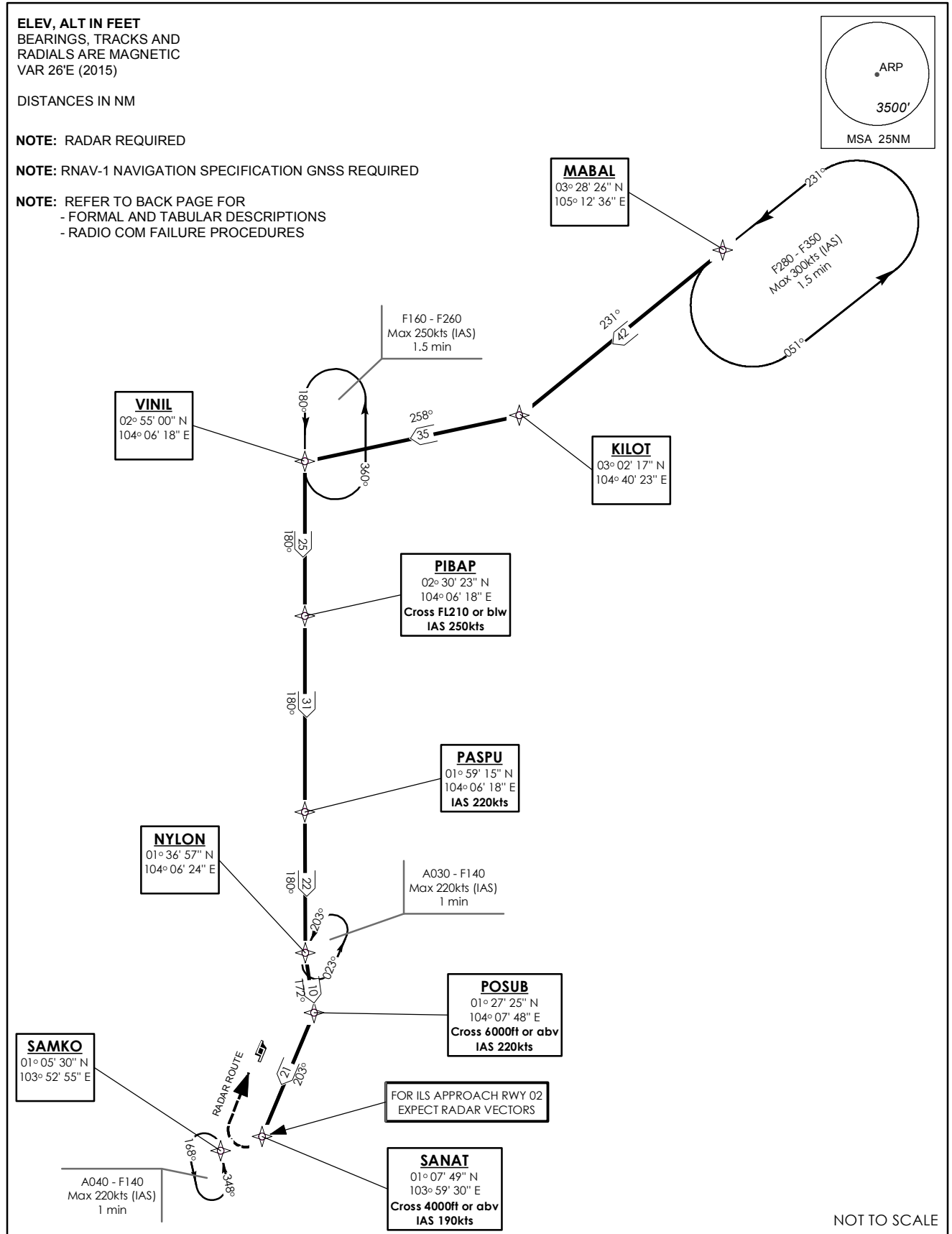
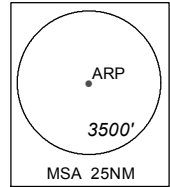
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

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



MABAL 1A (STAR) RNAV GNSS RWY 02L/02C - DESCRIPTIONS

Formal & Abbreviated Descriptions

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

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	MABAL	-	-	-0.5	-	-	-	RNAV1
TF	KILOT	-	231(231.1)	-0.5	R	-	-	RNAV1
TF	VINIL	-	258(258.0)	-0.5	L	-	-	RNAV1
TF	PIBAP	-	180(180.0)	-0.5	-	FL210-	K250	RNAV1
TF	PASPU	-	180(180.0)	-0.5	-	-	K220	RNAV1
TF	NYLON	-	180(180.5)	-0.5	L	-	-	RNAV1
TF	POSUB	-	172(172.5)	-0.5	R	A060+	K220	RNAV1
TF	SANAT	-	203(203.1)	-0.5	-	A040+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via MABAL 1A by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on MABAL 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>

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

ACC 133.8
APP 124.05 / 120.3
ARR 119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

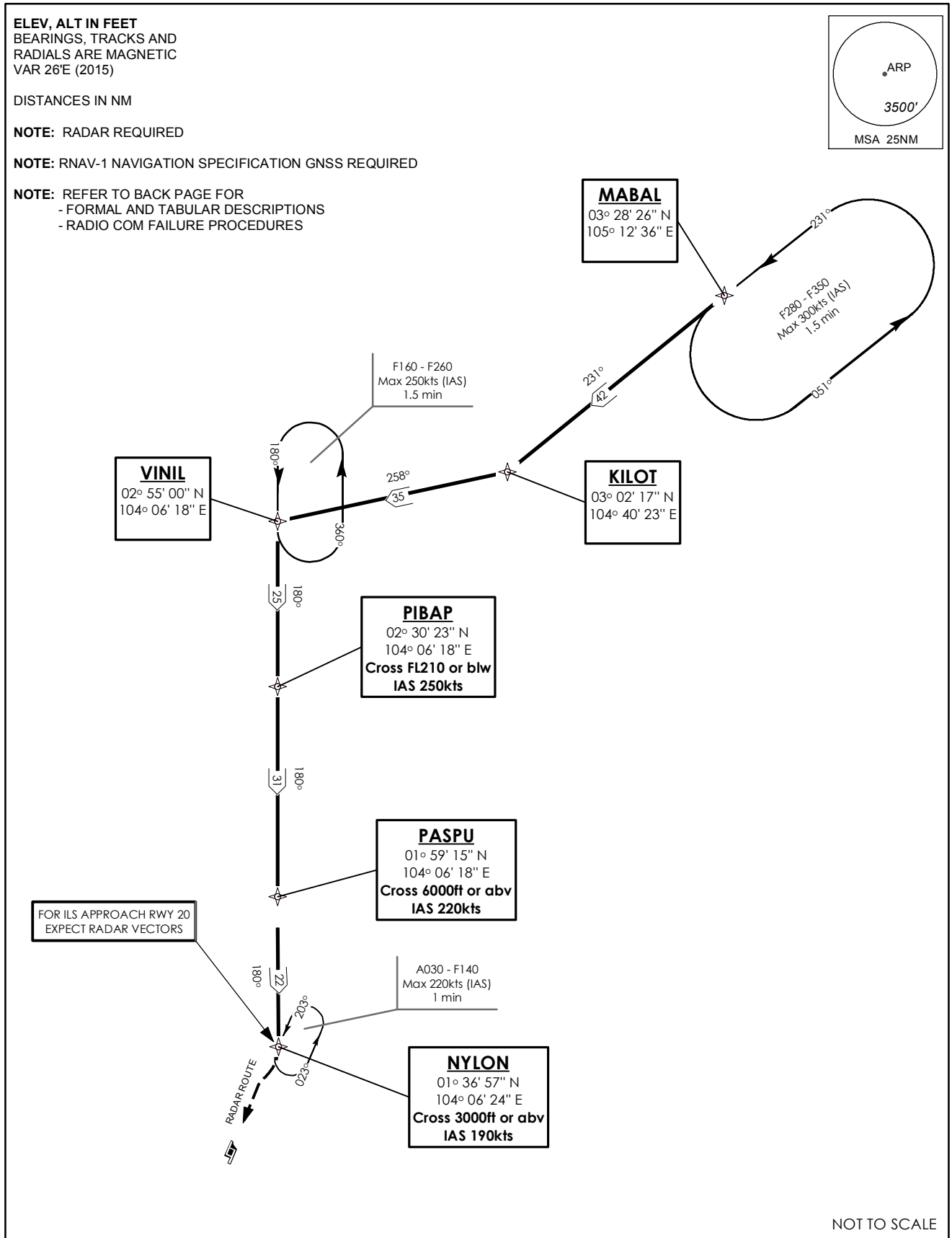
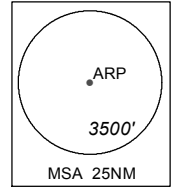
**ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)**

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**



MABAL 1B (STAR) RNAV GNSS RWY 20R/20C - DESCRIPTIONS

Formal & Abbreviated Descriptions

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

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	MABAL	-	-	-0.5	-	-	-	RNAV1
TF	KILOT	-	231(231.1)	-0.5	R	-	-	RNAV1
TF	VINIL	-	258(258.0)	-0.5	L	-	-	RNAV1
TF	PIBAP	-	180(180.0)	-0.5	-	FL210-	K250	RNAV1
TF	PASPU	-	180(180.0)	-0.5	-	A060+	K220	RNAV1
TF	NYLON	-	180(180.5)	-0.5	-	A030+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via MABAL 1B by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on MABAL 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>

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

ACC 134.4
APP 124.05 / 120.3
ARR 119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

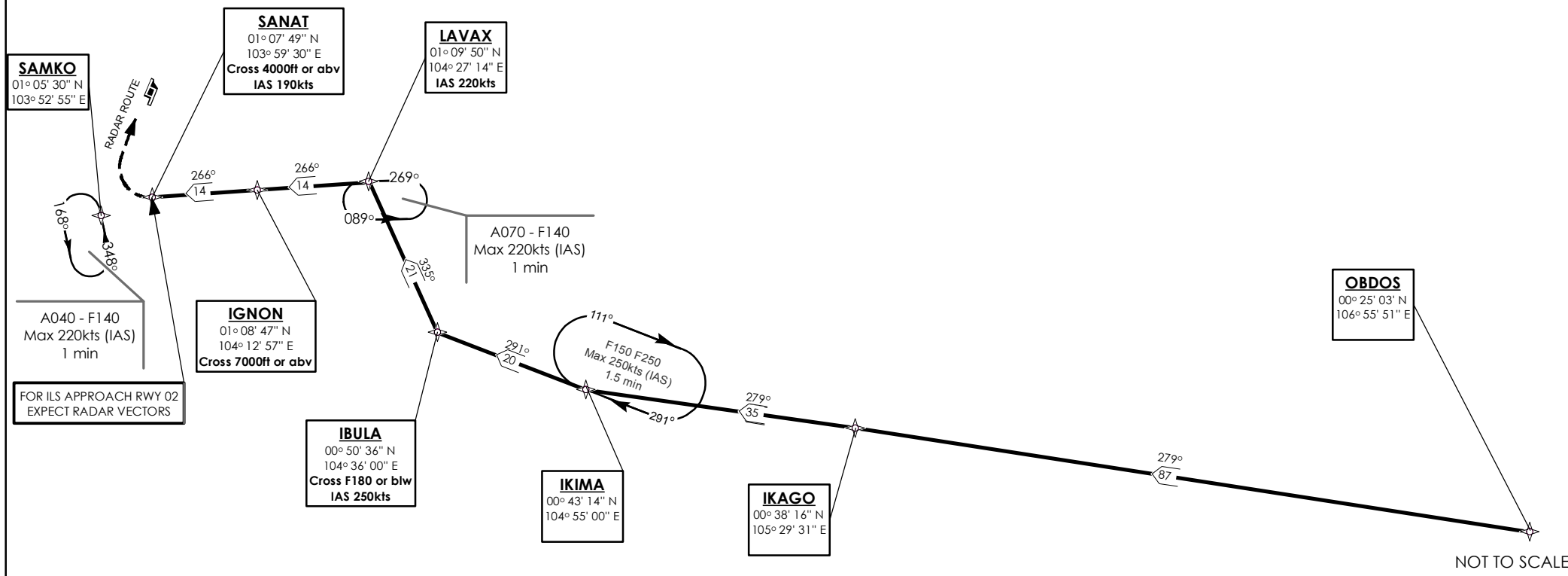
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

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



OBDOS 1A (STAR) RNAV GNSS RWY 02L/02C - 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	-	-	-0.5	-	-	-	RNAV1
TF	IKAGO	-	279(279.5)	-0.5	-	-	-	RNAV1
TF	IKIMA	-	279(279.5)	-0.5	R	-	-	RNAV1
TF	IBULA	-	291(291.1)	-0.5	R	FL180-	K250	RNAV1
TF	LAVAX	-	335(335.4)	-0.5	L	-	K220	RNAV1
TF	IGNON	-	266(266.5)	-0.5	-	A070+	-	RNAV1
TF	SANAT	-	266(266.5)	-0.5	-	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>

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

ACC 134.4
APP 124.05 / 120.3
ARR 119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

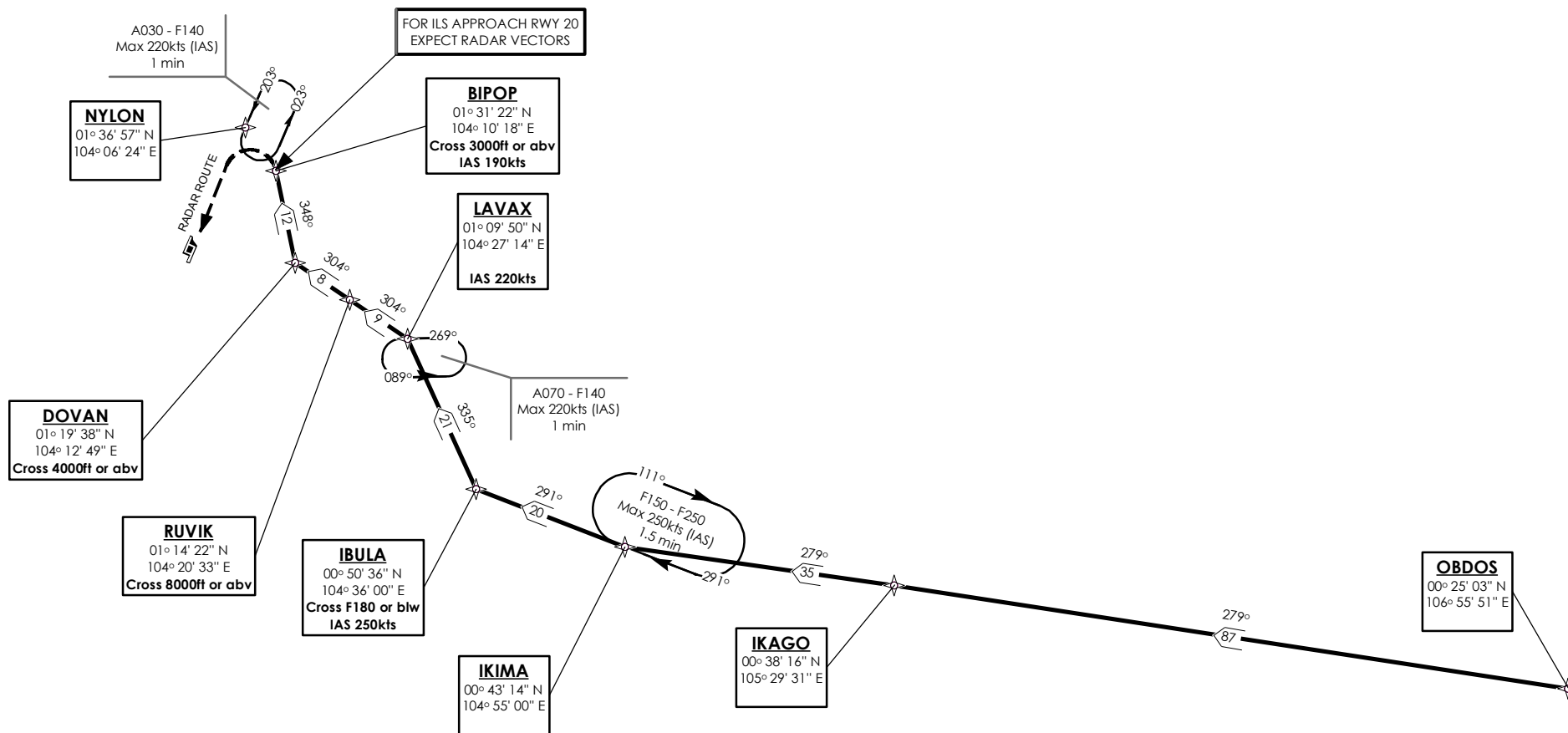
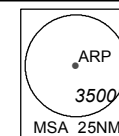
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

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



NOT TO SCALE

OBDOS 1B (STAR) RNAV GNSS RWY 20R/20C - 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 TF	N N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	OBDOS	-	-	-0.5	-	-	-	RNAV1
TF	IKAGO	-	279(279.5)	-0.5	-	-	-	RNAV1
TF	IKIMA	-	279(279.5)	-0.5	R	-	-	RNAV1
TF	IBULA	-	291(291.1)	-0.5	R	FL180-	K250	RNAV1
TF	LAVAX	-	335(335.4)	-0.5	L	-	K220	RNAV1
TF	RUVIK	-	304(304.0)	-0.5	-	A080+	-	RNAV1
TF	DOVAN	-	304(304.1)	-0.5	R	A040+	-	RNAV1
TF	BIPOP	-	348(348.5)	-0.5	-	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>

REPOV 1A (STAR) RNAV GNSS RWY 02L/02C - 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	-	-	-0.5	-	FL210-	K250	RNAV1
TF	REMES	-	348(348.7)	-0.5	-	A060+	K220	RNAV1
TF	SAMKO	-	348(348.5)	-0.5	-	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>

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

ACC 134.4
APP 124.6 / 120.3
ARR 119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

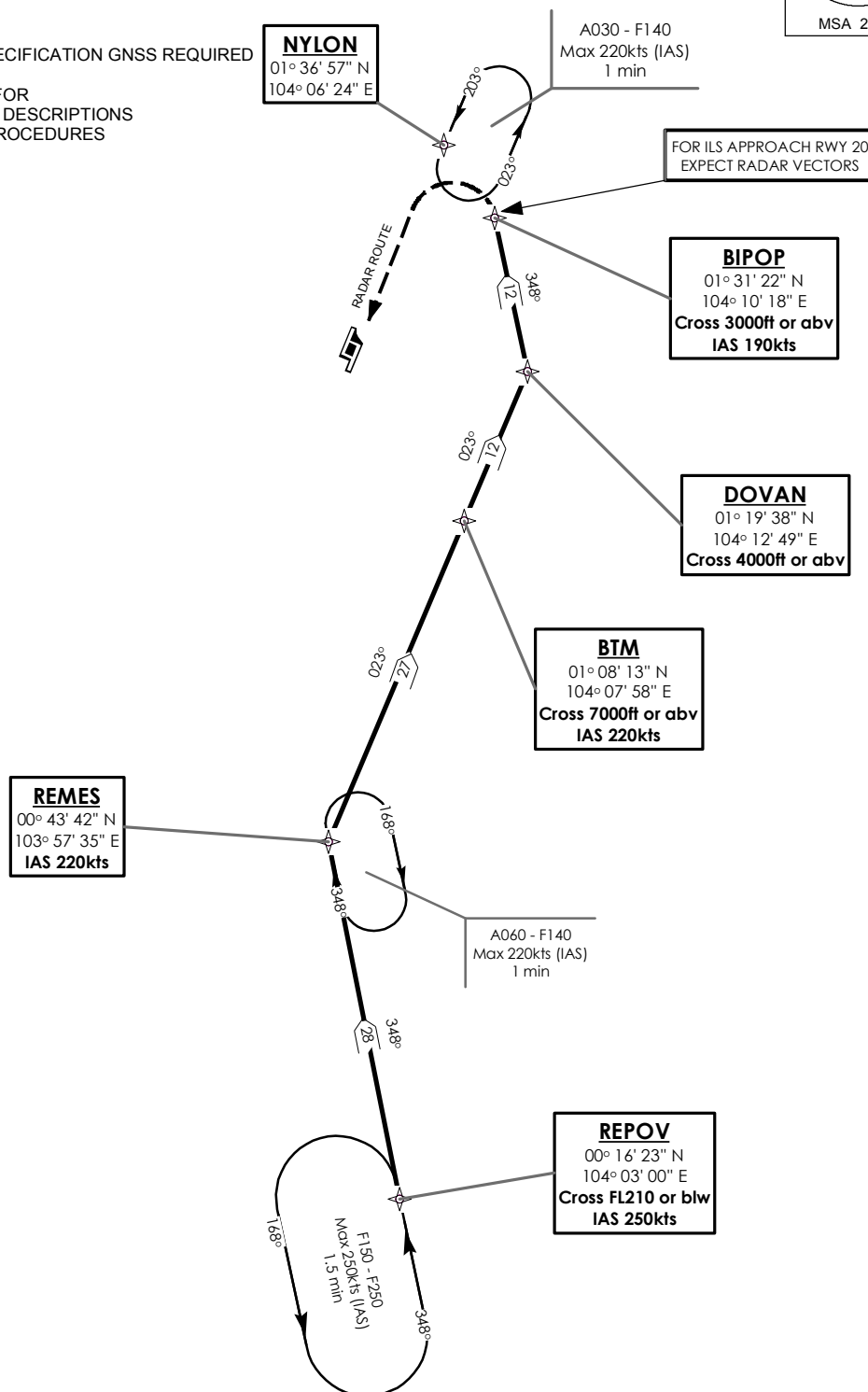
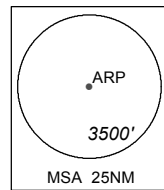
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

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



NOT TO SCALE

REPOV 1B (STAR) RNAV GNSS RWY 20R/20C - 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] -	IF	N
	REMES [K220; R] -	TF	N
	BTM [A070+; K220] -	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	REPOV	-	-	-0.5	-	FL210-	K250	RNAV1
TF	REMES	-	348(348.7)	-0.5	R	-	K220	RNAV1
TF	BTM	-	023(023.1)	-0.5	-	A070+	K220	RNAV1
TF	DOVAN	-	023(023.1)	-0.5	L	A040+	-	RNAV1
TF	BIPOP	-	348(348.5)	-0.5	-	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>

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

ACC 134.4
APP 124.05 / 120.3
ARR 119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSS3
128.6

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

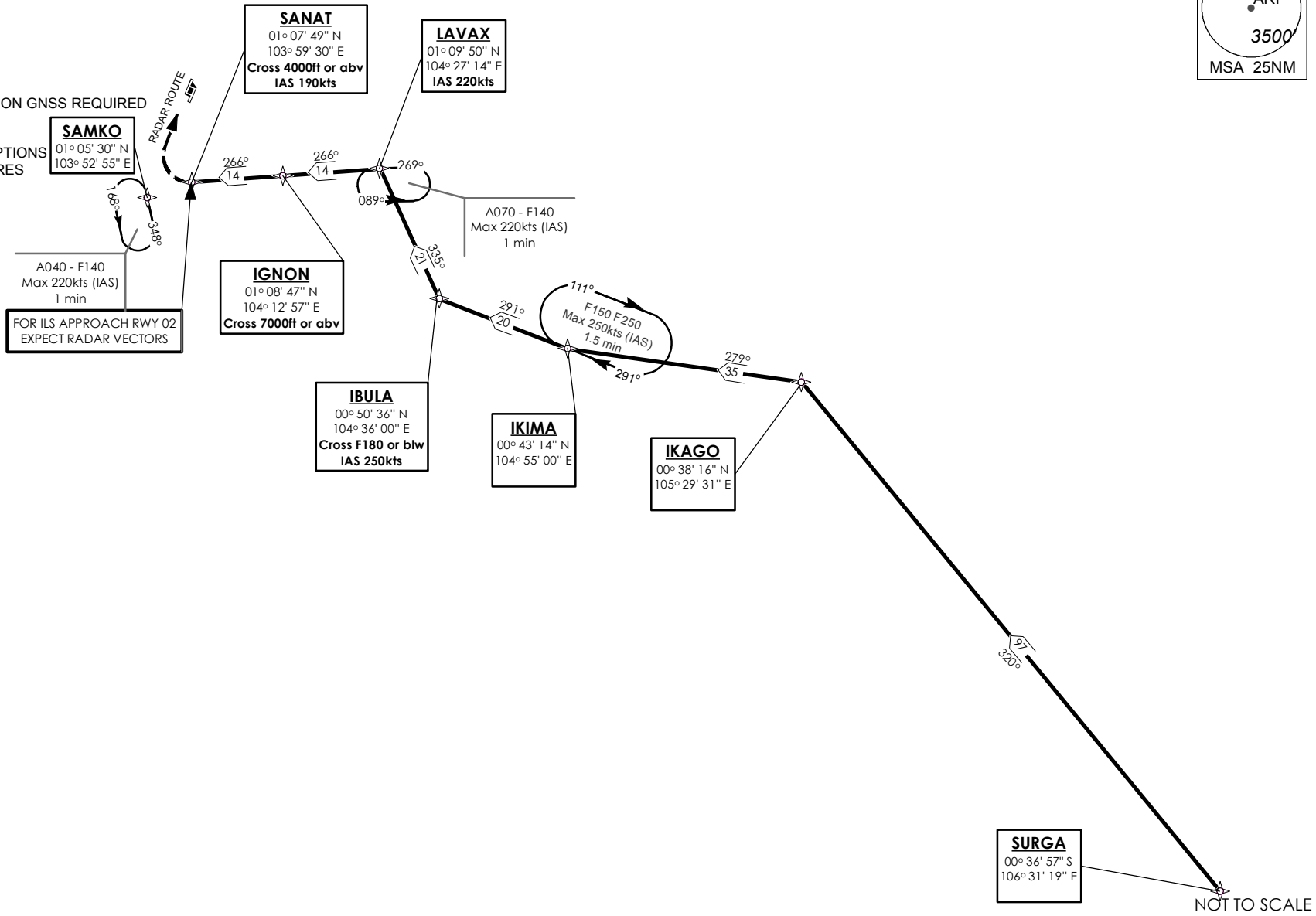
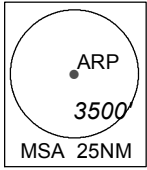
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

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



NOT TO SCALE

SURGA 1A (STAR) RNAV GNSS RWY 02L/02C - 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	-	-	-0.5	-	-	-	RNAV1
TF	IKAGO	-	320(320.4)	-0.5	L	-	-	RNAV1
TF	IKIMA	-	279(279.5)	-0.5	R	-	-	RNAV1
TF	IBULA	-	291(291.1)	-0.5	R	FL180-	K250	RNAV1
TF	LAVAX	-	335(335.4)	-0.5	L	-	K220	RNAV1
TF	IGNON	-	266(266.5)	-0.5	-	A070+	-	RNAV1
TF	SANAT	-	266(266.5)	-0.5	-	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>

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

ACC 134.4
APP 124.05 / 120.3
ARR 119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

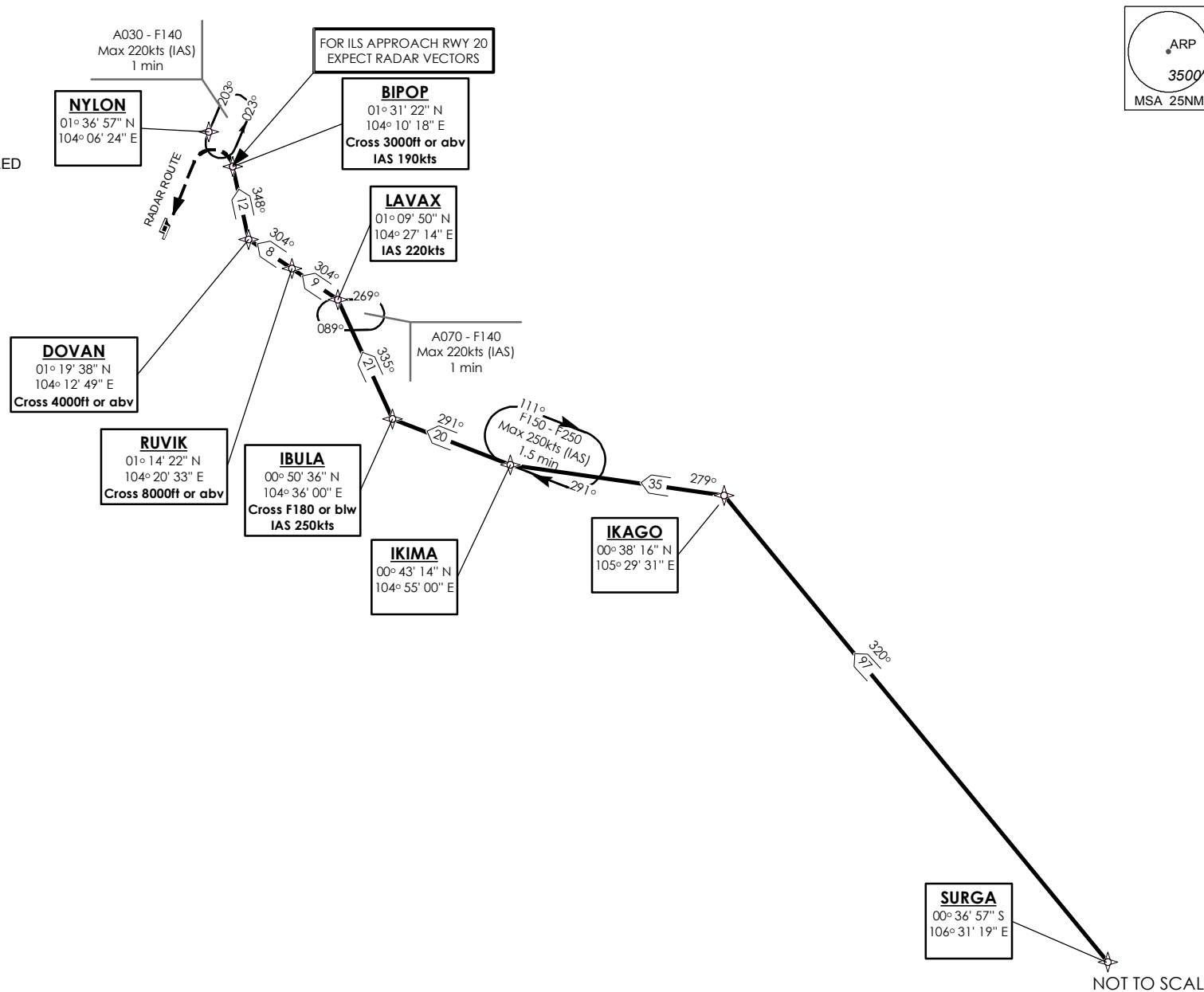
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

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



NOT TO SCALE

SURGA 1B (STAR) RNAV GNSS RWY 20R/20C - 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 -	IF	N
	IKAGO [L] -	TF	N
	IKIMA [R] -	TF	N
	IBULA [FL180-; K250; R] -	TF	N
	LAVAX [K220; L] -	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	SURGA	-	-	-0.5	-	-	-	RNAV1
TF	IKAGO	-	320(320.4)	-0.5	L	-	-	RNAV1
TF	IKIMA	-	279(279.5)	-0.5	R	-	-	RNAV1
TF	IBULA	-	291(291.1)	-0.5	R	FL180-	K250	RNAV1
TF	LAVAX	-	335(335.4)	-0.5	L	-	K220	RNAV1
TF	RUVIK	-	304(304.0)	-0.5	-	A080+	-	RNAV1
TF	DOVAN	-	304(304.1)	-0.5	R	A040+	-	RNAV1
TF	BIPOP	-	348(348.5)	-0.5	-	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>

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

ACC 133.8
APP 124.05 / 120.3
ARR 119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

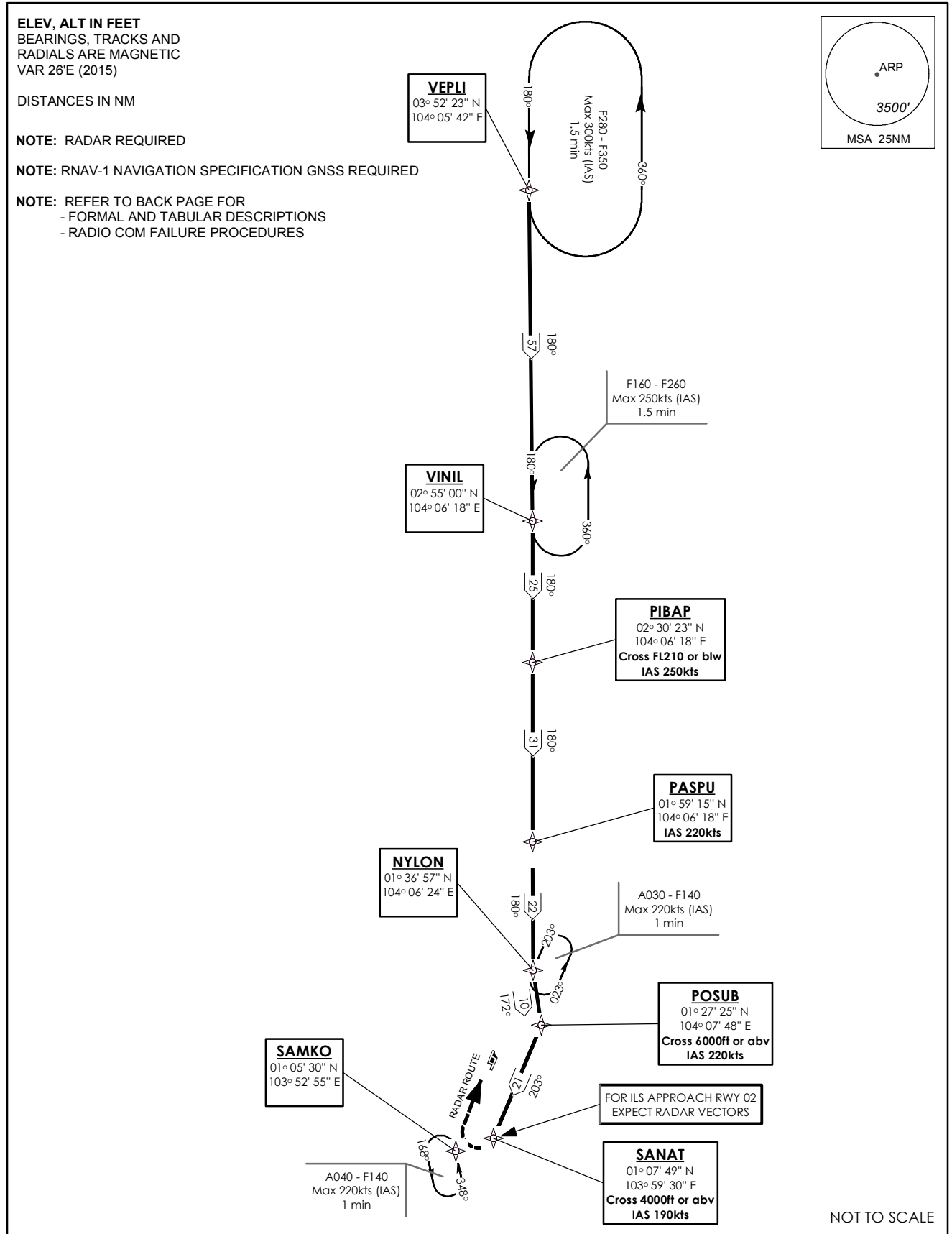
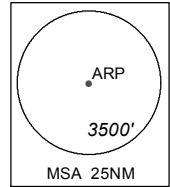
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

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



VEPLI 1A (STAR) RNAV GNSS RWY 02L/02C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From VEPLI. To VINIL. To PIBAP at or below FL210, speed 250kts. 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.	VEPLI -	IF	N
	VINIL -	TF	N
	PIBAP [FL210-; K250] -	TF	N
	PASPU [K220] -	TF	N
	NYLON [L] -	TF	N
	POSUB [A060+; K220; R] - SANAT [A040+; K190]	TF TF	N N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	VEPLI	-	-	-0.5	-	-	-	RNAV1
TF	VINIL	-	180(180.5)	-0.5	-	-	-	RNAV1
TF	PIBAP	-	180(180.0)	-0.5	-	FL210-	K250	RNAV1
TF	PASPU	-	180(180.0)	-0.5	-	-	K220	RNAV1
TF	NYLON	-	180(180.5)	-0.5	L	-	-	RNAV1
TF	POSUB	-	172(172.5)	-0.5	R	A060+	K220	RNAV1
TF	SANAT	-	203(203.1)	-0.5	-	A040+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via VEPLI 1A by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on VEPLI 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>

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

ACC 133.8
APP 124.05 / 120.3
ARR 119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

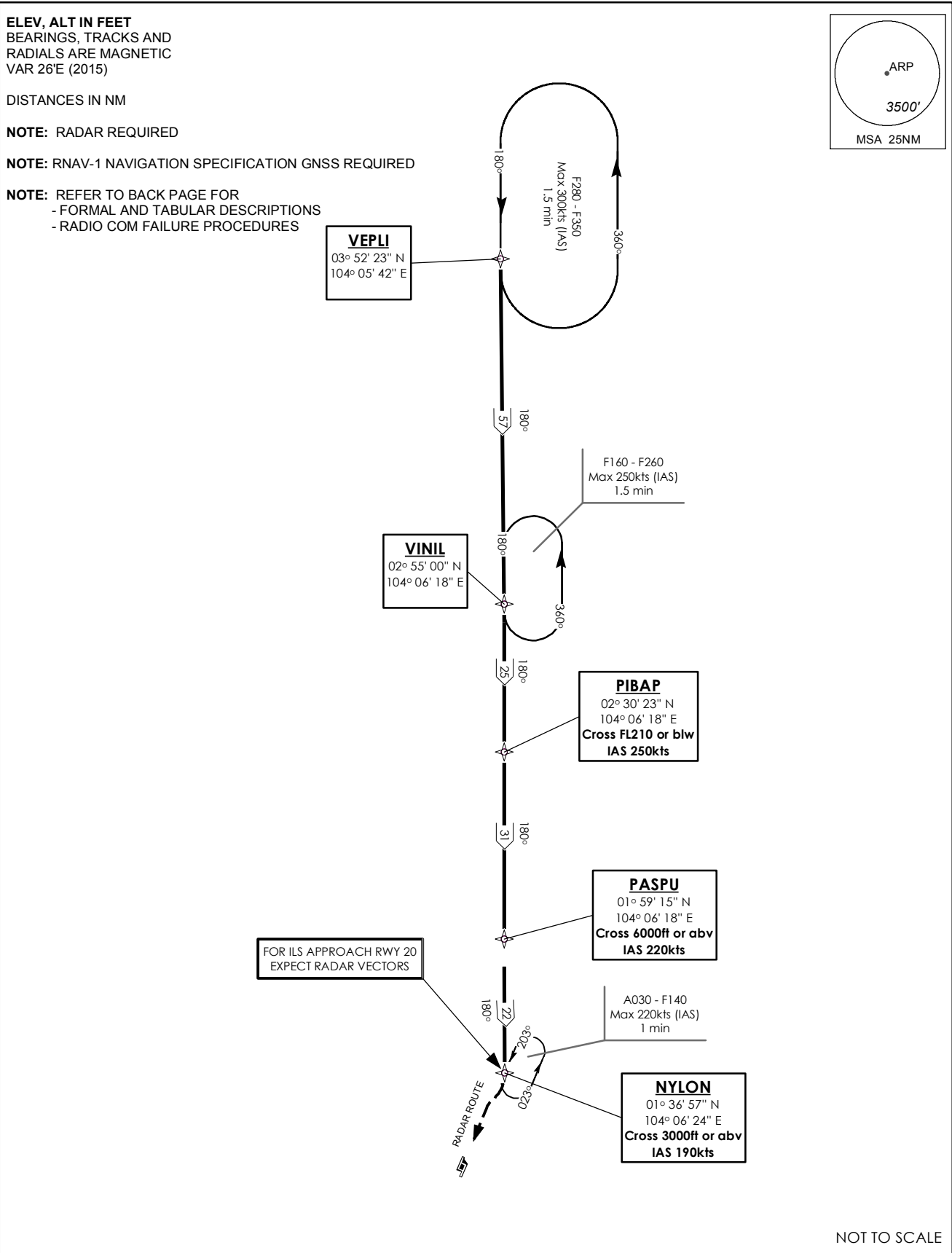
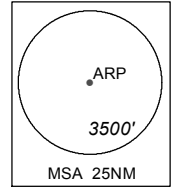
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

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



NOT TO SCALE

VEPLI 1B (STAR) RNAV GNSS RWY 20R/20C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
From VEPLI. To VINIL. To PIBAP at or below FL210, speed 250kts. To PASPU, at or above 6000ft, speed 220kts. To NYLON at or above 3000ft, speed 190kts.	VEPLI - VINIL - PIBAP [FL210-; K250] - 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	VEPLI	-	-	-0.5	-	-	-	RNAV1
TF	VINIL	-	180(180.5)	-0.5	-	-	-	RNAV1
TF	PIBAP	-	180(180.0)	-0.5	-	FL210-	K250	RNAV1
TF	PASPU	-	180(180.0)	-0.5	-	A060+	K220	RNAV1
TF	NYLON	-	180(180.5)	-0.5	-	A030+	K190	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p>When cleared via VEPLI 1B by Singapore ATC</p> <p>(a) Maintain last assigned flight level or altitude and proceed on VEPLI 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>