

Contact

Post:

AERONAUTICAL
INFORMATION SERVICES
Civil Aviation Authority of
Singapore,
Singapore Changi Airport,
P. O. Box 1
Singapore 918141

Tel: (65) 64227036

Fax: (65) 64410221

Email: caas_singaporeais@caas.gov.sg

AMDT
06/2019
Effective date
10 OCT 2019
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10 OCT 2019

wp-AMDT-2019-06**1. Significant information and changes****1.1 Singapore Changi Airport**

- a. Inclusion of additional notes in WSSS SIDs chart, all aircraft departing from Runway 20C and Runway 20R are to adhere to the required minimum climb gradients.
- b. Changes to Danger Area WSD4 active periods.
- c. Permanent deactivation of Danger Area WSD5 and Prohibited Area WSP49.
- d. Establishment of new Restricted Areas WSR6, WSR9 and WSR16.
- e. AIM-SG website domain name changed from <https://fpl-1.caasaim.gov.sg> to <https://aim-sg.caas.gov.sg>.

1.2 Seletar Airport

- a. Updated ENR 1.10 Flight Planning Requirements and WSSL AD 2.22 Procedures for Arrivals into Seletar Aerodrome.
- b. Revised AD-2-WSSL-IFR-1 and AD-2-WSSL-IFR-2 to include vertical limits of WSR38.
- c. Revised AD-2-WSSL-VDC-1 and AD-2-WSSL-VDC-2 Cautionary Note and Advisory Departure Procedures for Runway 03 and 21 respectively.

2. This amendment incorporates information contained in the listed NOTAMs and AIP Supplement which are hereby superseded:

NOTAM

A1775 dated 13/05/19
A2192 dated 17/06/19
A2504 dated 09/07/19
A2587 dated 18/07/19
A2860 dated 06/08/19
A2861 dated 06/08/19
A2862 dated 06/08/19
A2863 dated 06/08/19
A3114 dated 26/08/19
A3291 dated 31/08/19
A3817 dated 01/10/19
A3818 dated 01/10/19
A3819 dated 01/10/19

AIP Supplement

AIRAC 083/2019 dated 27/08/19

Amended Pages

GEN 0.1-1/2: : *replace.*
GEN 0.2-1/2: : *replace.*
GEN 0.3-1/2: : *replace.*
GEN 0.3-3/4: : *replace.*
GEN 0.3-5: : *insert.*
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GEN 0.4-3: : *replace.*
GEN 2.1-1/2: : *replace.*
GEN 3.1-1/2: : *replace.*
GEN 3.1-3/4: : *replace.*
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ENR 3.3-7/8: : *replace.*
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ENR 5.1-5: : *replace.*
ENR-5.1-9: : *replace.*
AD 2.WSSS-9/10: : *replace.*
AD-2-WSSS-ADC-2: : *replace.*
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AD 2.WSSL-15/16: : *replace.*
AD 2.WSSL-19/20: : *replace.*
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AD-2-WSSL-VAC-1: : *replace.*
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AD-2-WSSL-VDC-1: : *replace.*
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AD-2-WSAP-IAC-6: : *replace.*

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Part 1 — General (GEN)**GEN 0****GEN 0.1 PREFACE****1 Name of the publishing authority**

- 1.1 The Singapore Aeronautical Information Products are published by authority of the Civil Aviation Authority of Singapore.

2 Applicable ICAO documents

- ICAO Annex 15 - Aeronautical Information Service;
- ICAO Annex 4 - Aeronautical Charts;
- ICAO Doc 8126 - AIS Manual;
- ICAO Doc 8697 - Aeronautical Chart Manual.
- ICAO Doc 10066 - Procedures for Air Navigation Services - Aeronautical Information Management (PANS-AIM)

- 2.1 Differences to ICAO Standards, Recommended Practices and Procedures are listed under subsection GEN 1.7.

3 Publication Media

- 3.1 The Singapore Aeronautical Information Products comprising AIP Singapore, AIP Amendments, AIP Supplements, Aeronautical Information Circulars and NOTAM Lists, including NOTAMs and Pre-Flight Information Bulletins are available for retrieval from AIM-SG URL <https://aim-sg.caas.gov.sg>

4 The AIP structure and established regular amendment interval**4.1 The AIP structure**

The AIP forms part of the Aeronautical Information Products, details of which are given in subsection GEN 3.1. The principal AIP structure is shown in graphic form on page GEN 0.1-3.

The AIP is made up of three Parts, General ([GEN](#)), En-route ([ENR](#)) and Aerodromes ([AD](#)), each divided into sections and subsections as applicable, containing various types of information.

4.1.1 PART 1 — GENERAL (GEN)

Part 1 consists of five sections containing information briefly described hereafter.

- [GEN 0](#) - Preface; Record of AIP Amendments; Record of current AIP Supplements; Checklist of AIP pages; List of hand amendments to the AIP; and Table of Contents to Part 1.
- [GEN 1](#) - *National regulations and requirements* - Designated authorities; Entry, transit and departure of aircraft; Entry, transit and departure of passengers and crew; Entry, transit and departure of cargo; Aircraft instruments, equipment and flight documents; Summary of national regulations and international agreements/conventions; and Differences from ICAO Standards, Recommended Practices and Procedures.
- [GEN 2](#) - *Tables and codes* - Measuring system, aircraft markings, holidays; Abbreviations used in AIS publications; Chart symbols; Location indicators; List of radio navigation aids; Conversion tables; and Sunrise/Sunset tables.
- [GEN 3](#) - *Services* - Aeronautical Information Services; Aeronautical Charts; Air Traffic Services; Communication Services; Meteorological Services; and Search and Rescue.
- [GEN 4](#) - *Charges for aerodromes and air navigation services* - Aerodrome charges and Air navigation services charges.

4.1.2 PART 2 — EN-ROUTE (ENR)

Part 2 consists of seven sections containing information briefly described hereafter.

- [ENR 0](#) - Table of Contents to Part 2.
- [ENR 1](#) - *General rules and procedures* - General rules; Visual flight rules; Instrument flight rules; ATS airspace classification; Holding, approach and departure procedures; Radar services and procedures; Altimeter setting procedures; Regional supplementary procedures; Air traffic flow management; Flight planning; Addressing of flight plan messages; Interception of civil aircraft; Unlawful interference; and Air traffic incidents.
- [ENR 2](#) - *Air traffic services airspace* - Detailed description of Flight Information Region (FIR); Terminal Control Areas (TMA); and other regulated airspace.
- [ENR 3](#) - *ATS routes* - Detailed description of ATS routes; Area Navigation Routes; Helicopter Routes; other routes; and en-route holding.

Note - Other types of routes which are specified in connection with procedures for traffic to and from aerodromes are described in the relevant sections and subsections of Part 3 - Aerodromes.
- [ENR 4](#) - *Radio navigation aids/systems* - Radio navigation aids - en-route; special navigation systems; name-code designators for significant points; and aeronautical ground lights - en-route.
- [ENR 5](#) - *Navigation warnings* - Prohibited, restricted and danger areas; military exercise and training areas; other activities of a dangerous nature; air navigation obstacles - en-route; aerial sporting and recreational activities; and bird migration and areas with sensitive fauna.
- [ENR 6](#) - *En-route charts* - En-route Chart - ICAO.

4.1.3 PART 3 - AERODROMES (AD)

Part 3 consists of three sections containing information briefly described hereafter.

- [AD 0](#) - Table of Contents to Part 3.
- [AD 1](#) - *Aerodromes* - Introduction - Aerodromes availability; Rescue and fire fighting services; Index to aerodromes; and Grouping of aerodromes.
- [AD 2](#) - *Aerodromes* - Detailed information about aerodromes listed under 24 sub-sections.
- [AD 3](#) - This section has been omitted as there are no heliports in Singapore.

4.2 Regular Amendment Interval

Regular amendments to AIP Singapore will be issued once every two months. The publication dates will be on alternate AIRAC effective dates as follows:

Amendment Number	Publication Date
06/2019	10 October 2019
07/2019	05 December 2019
01/2020	30 January 2020
02/2020	26 March 2020
03/2020	21 May 2020
04/2020	16 July 2020
05/2020	10 September 2020
06/2020	05 November 2020
07/2020	31 December 2020

5 Service to contact in case of detected AIP errors or omissions

In the compilation of the AIP, care has been taken to ensure that the information contained therein is accurate and complete. Any errors and omissions which may nevertheless be detected, as well as any enquiries or suggestions concerning the Aeronautical Information Products, should be referred to:

Post:
 AERONAUTICAL INFORMATION SERVICES
 Civil Aviation Authority of Singapore,
 Singapore Changi Airport,
 P. O. Box 1
 Singapore 918141
 Tel: (65) 64227036
 Fax: (65) 64410221
 Email: caas_singaporeais@caas.gov.sg

GEN 0.2 RECORD OF AIP AMENDMENTS**AIP AMENDMENT**

NR/Year	Publication date	Date inserted	Inserted by
5/2014	18 SEP 2014	18 SEP 2014	
6/2014	13 NOV 2014	13 NOV 2014	
1/2015	08 JAN 2015	08 JAN 2015	
2/2015	05 MAR 2015	05 MAR 2015	
3/2015	30 APR 2015	30 APR 2015	
4/2015	25 JUN 2015	25 JUN 2015	
5/2015	20 AUG 2015	20 AUG 2015	
6/2015	15 OCT 2015	15 OCT 2015	
07/2015	10 DEC 2015	10 DEC 2015	
01/2016	04 FEB 2016	04 FEB 2016	
02/2016	31 MAR 2016	31 MAR 2016	
03/2016	26 MAY 2016	26 MAY 2016	
04/2016	21 JUL 2016	21 JUL 2016	
05/2016	15 SEP 2016	15 SEP 2016	
06/2016	10 NOV 2016	10 NOV 2016	
01/2017	05 JAN 2017	05 JAN 2017	
02/2017	02 MAR 2017	02 MAR 2017	
03/2017	27 APR 2017	27 APR 2017	
04/2017	22 JUN 2017	22 JUN 2017	
05/2017	17 AUG 2017	17 AUG 2017	
06/2017	12 OCT 2017	12 OCT 2017	
07/2017	07 DEC 2017	07 DEC 2017	
01/2018	01 FEB 2018	01 FEB 2018	
02/2018	29 MAR 2018	29 MAR 2018	
03/2018	24 MAY 2018	24 MAY 2018	
04/2018	19 JUL 2018	19 JUL 2018	
05/2018	13 SEP 2018	13 SEP 2018	

AIP AMENDMENT

NR/Year	Publication date	Date inserted	Inserted by
06/2018	08 NOV 2018	08 NOV 2018	
01/2019	03 JAN 2019	03 JAN 2019	
02/2019	28 FEB 2019	28 FEB 2019	
03/2019	25 APR 2019	25 APR 2019	
04/2019	20 JUN 2019	20 JUN 2019	
05/2019	15 AUG 2019	15 AUG 2019	
06/2019	10 OCT 2019	10 OCT 2019	

GEN 0.3 RECORD OF CURRENT AIP SUPPLEMENTS

NR/Year	Subject	AIP section(s) affected	Period of validity (from/to)	Cancellation record
070/2016	Paya Lebar Airport - Luffer Cranes and Topless Cranes	AD	04 AUG 2016 / 31 DEC 2019	
025/2017	Paya Lebar Airport - Topless Cranes	AD	10 JAN 2017 / 21 NOV 2019	
026/2017	Paya Lebar Airport - Luffer Crane	AD	10 JAN 2017 / 08 DEC 2019	
057/2017	Paya Lebar Airport - Luffer Cranes	AD	13 APR 2017 / 14 JAN 2020	
058/2017	Paya Lebar Airport - Topless Cranes	AD	13 APR 2017 / 26 OCT 2020	
067/2017	Sembawang Aerodrome - Topless Crane	AD	27 APR 2017 / 01 FEB 2020	
068/2017	Paya Lebar Airport - Obstacles	AD	27 APR 2017 / 26 OCT 2020	
082/2017	Paya Lebar Airport - Topless Cranes	AD	11 JUL 2017 / 31 DEC 2019	
083/2017	Paya Lebar Airport - Topless Cranes	AD	11 JUL 2017 / 31 DEC 2019	
084/2017	Paya Lebar Airport - Luffer Cranes	AD	11 JUL 2017 / 31 DEC 2019	
085/2017	Paya Lebar Airport - Topless Cranes	AD	11 JUL 2017 / 01 JUN 2020	
095/2017	Paya Lebar Airport - Topless Crane and Luffer Cranes	AD	26 SEP 2017 / 31 DEC 2019	
098/2017	Paya Lebar Airport - Topless Cranes	AD	26 SEP 2017 / 31 DEC 2019	
108/2017	Paya Lebar Airport - Topless Crane and Luffer Cranes	AD	30 SEP 2017 / 06 JUL 2020	
113/2017	Paya Lebar Airport - Topless Cranes	AD	24 OCT 2017 / 18 OCT 2019	
114/2017	Paya Lebar Airport - Luffer Crane	AD	24 OCT 2017 / 20 OCT 2019	
115/2017	Paya Lebar Airport - Topless Cranes	AD	24 OCT 2017 / 24 OCT 2019	
121/2017	Paya Lebar Airport - Topless Cranes and Luffer Cranes	AD	10 DEC 2017 / 30 SEP 2020	
122/2017	Paya Lebar Airport - Luffer Cranes	AD	10 DEC 2017 / 31 DEC 2020	
123/2017	Paya Lebar Airport - Luffer Cranes	AD	10 DEC 2017 / 31 DEC 2020	
124/2017	Paya Lebar Airport - Luffer Crane	AD	10 DEC 2017 / 31 DEC 2020	
125/2017	Paya Lebar Airport - Topless Cranes	AD	10 DEC 2017 / 18 DEC 2019	
126/2017	Paya Lebar Airport - Luffer Cranes	AD	10 DEC 2017 / 19 DEC 2019	
003/2018	Paya Lebar Airport - Luffer Crane	AD	22 JAN 2018 / 31 DEC 2019	
004/2018	Paya Lebar Airport - Crawler Cranes and Boring Rigs	AD	22 JAN 2018 / 31 DEC 2019	
005/2018	Paya Lebar Airport - Topless Cranes	AD	22 JAN 2018 / 29 FEB 2020	
006/2018	Paya Lebar Airport - Topless Crane and Luffer Crane	AD	22 JAN 2018 / 28 FEB 2021	
015/2018	Paya Lebar Airport - Luffer Crane	AD	06 APR 2018 / 31 DEC 2019	

NR/Year	Subject	AIP section(s) affected	Period of validity (from/to)	Cancellation record
016/2018	Paya Lebar Airport - Luffer Crane and Topless Cranes	AD	06 APR 2018 / 01 JAN 2020	
017/2018	Paya Lebar Airport - Luffer Crane	AD	06 APR 2018 / 15 MAR 2020	
018/2018	Paya Lebar Airport - Topless Cranes and Luffer Crane	AD	25 APR 2018 / 27 OCT 2020	
019/2018	Paya Lebar Airport - Luffer Crane	AD	06 APR 2018 / 31 DEC 2020	
020/2018	Paya Lebar Airport - Mobile Crane	AD	06 APR 2018 / 03 FEB 2021	
021/2018	Paya Lebar Airport - Luffer Crane and Saddle Cranes	AD	06 APR 2018 / 31 DEC 2022	
026/2018	Paya Lebar Airport - Crawler Cranes	AD	20 JUN 2018 / 30 APR 2020	
027/2018	Paya Lebar Airport - Mobile Crane	AD	20 JUN 2018 / 10 MAY 2020	
028/2018	Paya Lebar Airport - Saddle Cranes	AD	20 JUN 2018 / 31 DEC 2022	
029/2018	Paya Lebar Airport - Luffer Cranes	AD	20 JUN 2018 / 31 DEC 2021	
030/2018	Paya Lebar Airport - Luffer Crane and Topless Cranes	AD	20 JUN 2018 / 31 DEC 2021	
053/2018	Sembawang Aerodrome - Saddle Cranes	AD	25 SEP 2018 / 31 DEC 2021	
054/2018	Paya Lebar Airport - Luffer Cranes	AD	25 SEP 2018 / 31 DEC 2019	
055/2018	Paya Lebar Airport - Topless Cranes	AD	25 SEP 2018 / 31 DEC 2019	
056/2018	Paya Lebar Airport - Obstacles	AD	25 SEP 2018 / 31 DEC 2019	
057/2018	Paya Lebar Airport - Luffer Cranes	AD	25 SEP 2018 / 30 MAR 2020	
058/2018	Paya Lebar Airport - Luffer Crane	AD	25 SEP 2018 / 14 AUG 2020	
059/2018	Paya Lebar Airport - Topless Cranes	AD	25 SEP 2018 / 31 AUG 2020	
060/2018	Paya Lebar Airport - Topless Cranes	AD	25 SEP 2018 / 01 SEP 2020	
061/2018	Paya Lebar Airport - Luffer Cranes	AD	25 SEP 2018 / 10 SEP 2020	
062/2018	Paya Lebar Airport - Topless Cranes and Luffer Cranes	AD	25 SEP 2018 / 31 DEC 2020	
068/2018	Paya Lebar Airport - Topless Cranes	AD	13 NOV 2018 / 31 OCT 2019	
069/2018	Paya Lebar Airport - Mobile Crane	AD	13 NOV 2018 / 10 MAY 2020	
070/2018	Paya Lebar Airport - Luffer Cranes and Flat Top Cranes	AD	13 NOV 2018 / 31 DEC 2020	
071/2018	Paya Lebar Airport - Saddle Cranes	AD	13 NOV 2018 / 31 DEC 2023	
075/2018	Paya Lebar Airport - Luffer Crane	AD	28 NOV 2018 / 31 MAR 2020	
076/2018	Paya Lebar Airport - Topless Cranes	AD	29 NOV 2018 / 30 NOV 2020	
077/2018	Paya Lebar Airport - Luffer Crane	AD	28 NOV 2018 / 18 NOV 2021	
078/2018	Paya Lebar Airport - Luffer Cranes	AD	28 NOV 2018 / 30 DEC 2022	
085/2018	Paya Lebar Airport - Mobile Crane	AD	20 DEC 2018 / 31 JAN 2020	

NR/Year	Subject	AIP section(s) affected	Period of validity (from/to)	Cancellation record
004/2019	Paya Lebar Airport - Luffer Crane	AD	30 JAN 2019 / 30 NOV 2019	
005/2019	Paya Lebar Airport - Topless Cranes	AD	14 FEB 2019 / 30 JUN 2020	
006/2019	Paya Lebar Airport - Topless Cranes and Luffer Crane	AD	30 JAN 2019 / 09 JAN 2021	
007/2019	Tengah Aerodrome - Topless Cranes and Luffer Crane	AD	30 JAN 2019 / 31 JAN 2021	
008/2019	Paya Lebar Airport - Mobile Crane	AD	31 JAN 2019 / 31 JAN 2021	
009/2019	Paya Lebar Airport - Luffer Cranes	AD	01 JUN 2019 / 31 MAY 2021	
011/2019	Paya Lebar Airport - Mobile Crane	AD	01 FEB 2019 / 22 DEC 2020	
012/2019	Sembawang Aerodrome - Mobile Crane	AD	01 FEB 2019 / 22 DEC 2019	
014/2019	Paya Lebar Airport - Topless Cranes	AD	01 FEB 2019 / 31 JAN 2021	
016/2019	Singapore Changi Airport - Updated information and data for Runway 02R/20L	AD	15 FEB 2019 PERM	
022/2019	Paya Lebar Airport - Crawler Cranes	AD	27 MAR 2019 / 30 OCT 2019	
023/2019	Sembawang Aerodrome - Mobile Crane	AD	27 MAR 2019 / 01 NOV 2019	
024/2019	Sembawang Aerodrome - Topless Cranes	AD	27 MAR 2019 / 31 DEC 2019	
025/2019	Paya Lebar Airport - Mobile Cranes	AD	31 MAR 2019 / 31 DEC 2019	
026/2019	Paya Lebar Airport - Luffer Crane	AD	27 MAR 2019 / 31 JAN 2020	
027/2019	Paya Lebar Airport - Luffer Crane	AD	27 MAR 2019 / 30 JUN 2020	
028/2019	Paya Lebar Airport - Topless Cranes	AD	27 MAR 2019 / 20 MAR 2021	
029/2019	Paya Lebar Airport - Topless Cranes	AD	27 MAR 2019 / 20 MAR 2021	
030/2019	Paya Lebar Airport - Luffer Crane and Topless Cranes	AD	27 MAR 2019 / 30 JUL 2021	
031/2019	Paya Lebar Airport - Luffer Cranes	AD	27 MAR 2019 / 28 JAN 2022	
032/2019	Paya Lebar Airport - Topless Cranes	AD	27 MAR 2019 / 09 MAR 2022	
033/2019	Paya Lebar Airport - Luffer Crane	AD	27 MAR 2019 / 31 DEC 2022	
034/2019	Paya Lebar Airport - Saddle Cranes	AD	27 MAR 2019 / 31 DEC 2022	
035/2019	Paya Lebar Airport - Luffer Crane	AD	27 MAR 2019 / 31 DEC 2022	
041/2019	Paya Lebar Airport - Crawler Crane	AD	04 APR 2019 / 29 FEB 2020	
042/2019	Paya Lebar Airport - Luffer Cranes	AD	04 APR 2019 / 31 DEC 2020	
043/2019	Paya Lebar Airport - Saddle Cranes	AD	04 APR 2019 / 31 DEC 2020	
044/2019	Paya Lebar Airport - Luffer Crane	AD	04 APR 2019 / 13 MAR 2021	
048/2019	Paya Lebar Airport - Topless Cranes	AD	07 MAY 2019 / 29 APR 2020	
049/2019	Paya Lebar Airport - Topless Cranes	AD	07 MAY 2019 / 30 DEC 2020	

NR/Year	Subject	AIP section(s) affected	Period of validity (from/to)	Cancellation record
050/2019	Paya Lebar Airport - Crawler Crane	AD	07 MAY 2019 / 30 NOV 2020	
051/2019	Paya Lebar Airport - Luffer Crane	AD	07 MAY 2019 / 22 APR 2021	
052/2019	Paya Lebar Airport - Cranes and Piling Rig	AD	07 MAY 2019 / 31 AUG 2020	
053/2019	Paya Lebar Airport - Saddle Cranes and Luffer Crane	AD	07 MAY 2019 / 31 DEC 2023	
054/2019	Paya Lebar Airport - Topless Cranes	AD	07 MAY 2019 / 30 SEP 2020	
055/2019	Paya Lebar Airport - Topless Cranes	AD	07 MAY 2019 / 25 APR 2021	
056/2019	Paya Lebar Airport - Luffing Crane	AD	07 MAY 2019 / 30 JUN 2020	
060/2019	Paya Lebar Airport - Topless Crane	AD	06 JUN 2019 / 14 NOV 2021	
061/2019	Paya Lebar Airport - Crawler Cranes	AD	06 JUN 2019 / 30 JUN 2020	
063/2019	Singapore Changi airport - works schedule and movement area restrictions pertaining to Changi East development works	AD	24 JUN 2019 / 26 OCT 2019	
064/2019	Paya Lebar Airport - Luffing Crane	AD	04 JUL 2019 / 30 AUG 2020	
065/2019	Paya Lebar Airport - Mobile Cranes	AD	04 JUL 2019 / 30 JUN 2020	
066/2019	Paya Lebar Airport - Luffing Crane	AD	04 JUL 2019 / 16 JUN 2021	
067/2019	Paya Lebar Airport - Topless Cranes	AD	04 JUL 2019 / 30 JUN 2021	
068/2019	Paya Lebar Airport - Luffing Crane	AD	04 JUL 2019 / 30 DEC 2021	
069/2019	Paya Lebar Airport - Luffing Crane	AD	04 JUL 2019 / 30 DEC 2020	
071/2019	Airspace closure Kuala Lumpur and Singapore FIRs Exercise BERSAMA LIMA 2019 060001UTC to 161100UTC October 2019	AD/ENR	06 OCT 2019 / 16 OCT 2019	
072/2019	Paya Lebar Airport - Luffing Cranes	AD	19 AUG 2019 / 01 AUG 2020	
073/2019	Paya Lebar Airport - Luffer Cranes	AD	19 AUG 2019 / 31 DEC 2021	
074/2019	Paya Lebar Airport - Crawler Cranes	AD	19 AUG 2019 / 30 DEC 2019	
075/2019	Paya Lebar Airport - Luffing Crane	AD	19 AUG 2019 / 31 DEC 2021	
076/2019	Paya Lebar Airport - Luffer Cranes	AD	19 AUG 2019 / 17 JUL 2020	
077/2019	Paya Lebar Airport - Mobile Crane	AD	19 AUG 2019 / 28 MAY 2020	
079/2019	Paya Lebar Airport - Mobile Crane	AD	19 AUG 2019 / 31 DEC 2019	
080/2019	Sembawang Aerodrome - Mobile Crane	AD	19 AUG 2019 / 13 JUL 2020	
081/2019	Sembawang Aerodrome - Obstacles	AD	19 AUG 2019 / 31 DEC 2019	
084/2019	Paya Lebar Airport - Topless Cranes	AD	10 SEP 2019 / 02 SEP 2020	
085/2019	Paya Lebar Airport - Luffer Cranes	AD	10 SEP 2019 / 30 SEP 2020	

NR/Year	Subject	AIP section(s) affected	Period of validity (from/to)	Cancellation record
086/2019	Paya Lebar Airport - Luffing Crane	AD	10 SEP 2019 / 01 OCT 2020	
087/2019	Paya Lebar Airport - Mobile Crane	AD	10 SEP 2019 / 31 MAR 2020	
088/2019	Paya Lebar Airport - Mobile Crane	AD	10 SEP 2019 / 31 MAR 2020	
089/2019	Paya Lebar Airport - Mobile Crane	AD	10 SEP 2019 / 31 MAR 2020	
090/2019	Paya Lebar Airport - Mobile Crane	AD	10 SEP 2019 / 31 MAR 2020	
091/2019	Paya Lebar Airport - Cranes	AD	10 SEP 2019 / 30 DEC 2021	
092/2019	Paya Lebar Airport - Mobile Crane	AD	10 SEP 2019 / 31 MAR 2020	
093/2019	Paya Lebar Airport - Obstacles	AD	10 SEP 2019 / 16 FEB 2020	
094/2019	Paya Lebar Airport - Cranes	AD	10 SEP 2019 / 28 AUG 2020	
095/2019	Paya Lebar Airport - Mobile Cranes	AD	10 SEP 2019 / 30 DEC 2020	
096/2019	Paya Lebar Airport - Flat Top Cranes	AD	10 SEP 2019 / 31 DEC 2020	
097/2019	Paya Lebar Airport - Cranes	AD	10 SEP 2019 / 31 DEC 2020	
098/2019	Sembawang Aerodrome - Mobile Crane	AD	10 SEP 2019 / 30 NOV 2019	
099/2019	Paya Lebar Airport - Luffer Cranes	AD	10 SEP 2019 / 05 AUG 2020	
100/2019	Paya Lebar Airport - Cranes	AD	10 SEP 2019 / 31 DEC 2020	
101/2019	Paya Lebar Airport - Topless Cranes	AD	10 SEP 2019 / 31 DEC 2019	
102/2019	Paya Lebar Airport - Luffer Crane	AD	10 SEP 2019 / 17 JUL 2020	
103/2019	Sembawang Aerodrome - Mobile Crane	AD	10 SEP 2019 / 31 DEC 2019	
104/2019	Sembawang Aerodrome - Mobile Crane	AD	10 SEP 2019 / 31 DEC 2019	
105/2019	Paya Lebar Airport - Cranes	AD	10 OCT 2019 / 31 DEC 2020	
106/2019	Paya Lebar Airport - Obstacles	AD	10 OCT 2019 / 30 SEP 2020	
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109/2019	Paya Lebar Airport - Mobile Cranes	AD	10 OCT 2019 / 20 JUN 2020	
110/2019	Paya Lebar Airport - Topless Cranes	AD	10 OCT 2019 / 01 OCT 2020	
111/2019	Paya Lebar Airport - Luffer Cranes	AD	10 OCT 2019 / 20 JUN 2020	
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GEN 0.1-3	08 NOV 2018	GEN 3.2-4	10 OCT 2019	ENR-1.6-9		21 JUL 2016	
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GEN 2 TABLES AND CODES

GEN 2.1 MEASURING SYSTEM, AIRCRAFT MARKING, HOLIDAYS

1 UNITS OF MEASUREMENT

- 1.1 The table of units of measurement shown below is used for the dissemination of information and in messages transmitted to aircraft.

<i>Measurement of</i>	<i>Units</i>
Distance used in navigation, position report, etc. - generally in excess of 4000m	* Kilometres (km) or Nautical miles (NM)
Relatively short distances such as those relating to aerodromes (e.g. runway lengths)	Metres (m)
Altitudes, elevations and heights	Metres (m) or Feet (ft)
Horizontal speed including wind speed	Knots (kt)
Vertical speed	Feet per minute (ft/min)
Wind direction for landing and taking-off	Degrees Magnetic (°M)
Wind direction except for landing and taking-off	Degrees True (°T)
Visibility, including runway visual range	Metres (m) or Kilometres (km)
Altimeter Setting	Hectopascals (hPa)
Temperature	Degrees Celsius (Centigrade) (°C)
Weight	Metric tonnes (t) or kilogrammes (kg)
Time	Hours and minutes, the day of 24 hours beginning at midnight UTC (hhmm)
* International nautical miles, for which conversion into metres is given by: 1 international NM = 1852 metres	

2 TIME SYSTEM

- 2.1 Co-ordinated Universal Time (UTC) is used in the air traffic and communication services and in documents published for international distribution by the Aeronautical Information Service. Reporting of time is expressed to the nearest minute, e.g. 12:40:35 is reported as 1241. Local time is 8 hours ahead of UTC. Time checks to aircraft are accurate to within 30 seconds.

3 GEODETIC REFERENCE DATUM

3.1 *Name/designation of datum*

- 3.1.1 All published geographical coordinates in the Singapore FIR indicating latitude and longitude are expressed in terms of the World Geodetic System-1984 (WGS-84) geodetic reference datum.

3.2 *Area of Application*

- 3.2.1 The area of application for the published geographical coordinates coincides with the area of responsibility of the Aeronautical Information Service, i.e. the entire territory of Singapore as well as the airspace over the high seas encompassed by the Singapore Flight Information Region.

3.3 *Use of asterisk*

- 3.3.1 An asterisk (*) will be used to identify those published geographical coordinates which have been transformed into WGS-84 coordinates but whose accuracy of original field work does not meet the requirements in ICAO Annex 11, Chapter 2 and ICAO Annex 14, Volume I, Chapter 2. Specifications for determination and reporting of WGS-84 coordinates are given in ICAO Annex 11, Chapter 2 and ICAO Annex 14, Volume I, Chapter 2.

4 AIRCRAFT NATIONALITY AND REGISTRATION MARKS

- 4.1 The nationality mark for aircraft registered in Singapore is the figure 9, followed by the letter V, i.e. 9V. The nationality mark is followed by a hyphen and a registration mark consisting of a three letter group, e.g. 9V-BAA.

5 PUBLIC HOLIDAYS IN SINGAPORE

5.1 The following dates are notified as public holidays:

Name of Holiday	Date	Day
Deepavali	27 October 2019*	Sunday
Christmas Day	25 December 2019	Wednesday
New Year's Day	01 January 2020	Wednesday
Chinese New Year	25 January 2020	Saturday
Chinese New Year	26 January 2020*	Sunday
Good Friday	10 April 2020	Friday
Labour Day	01 May 2020	Friday
Vesak Day	07 May 2020	Thursday
Hari Raya Puasa	24 May 2020*	Sunday
Hari Raya Haji	31 July 2020	Friday
National Day	09 August 2020*	Sunday
Deepavali	14 November 2020	Saturday
Christmas Day	25 December 2020	Friday

* The following Monday will be a public holiday.

GEN 3 SERVICES

GEN 3.1 AERONAUTICAL INFORMATION SERVICES

1 RESPONSIBLE SERVICE

1.1 Aeronautical Information Services is a unit of the Air Traffic Services Division of the Civil Aviation Authority of Singapore which ensures the flow of information necessary for the safety, regularity and efficiency of international and national air navigation within the area of its responsibility as indicated under paragraph 2 below. It consists of the AIS Headquarters and International NOTAM Office (NOF). Changi and Seletar AIS Aerodrome units operate 24 hours at the same location.

1.2 *AIS Headquarters*

Post:	Tel: (65) 64227036
Aeronautical Information Services	Fax: (65) 64410221
Civil Aviation Authority of Singapore	Email: caas_singaporeais@caas.gov.sg
Singapore Changi Airport	
P.O. Box 1	
Singapore 918141	

1.3 *International NOTAM office (NOF) and Changi and Seletar AIS Aerodrome Units*

Post:	Tel: (65) 65956056 (Duty Supervisor)
Singapore Air Traffic Control Centre (SATCC)	Tel: (65) 65956053 (NOF)
60 Biggin Hill Road	AFS: WSSSYNYX (NOF)
Singapore 509950	Tel: (65) 65956052 (Changi FPL Officer)
	Fax: (65) 65431826 (Changi AIS)
	AFS: WSSSYOYX (Changi AIS)
	Tel: (65) 64812909 (Seletar FPL Officer)
	Fax: (65) 64833044 (Seletar AIS)
	AFS: WSSLYOYX (Seletar AIS)

The service is provided in accordance with the provisions contained in ICAO Annex 15 - Aeronautical Information Services and the guidance material in the Aeronautical Information Services Manual (Doc 8126 - AN/872).

2 AREA OF RESPONSIBILITY

2.1 Aeronautical Information Services is responsible for the collection and dissemination of information for the entire territory of Singapore and for the airspace over the high seas encompassed by the Singapore Flight Information Region.

3 AERONAUTICAL PUBLICATIONS

3.1 Aeronautical information is provided in the form of Aeronautical Information Products containing the following elements:

Aeronautical Information Publication (AIP) and related amendment service;
AIP Supplement (AIP SUP);
Notice to Airmen (NOTAM) and Pre-flight Information Bulletins (PIB);
Aeronautical Information Circulars (AIC); and
Checklists and Lists of valid NOTAM

NOTAM and checklist are disseminated via the AFS and PIB via internet. All the other elements of the Aeronautical Information Products can be retrieved from AIM-SG URL at <https://aim-sg.caas.gov.sg>

3.2 *Aeronautical Information Publication (AIP)*

AIP Singapore is the basic aeronautical information document published for the Republic of Singapore and contains information of a lasting character essential to air navigation. It is available in English only. It is maintained up-to-date by a regular amendment service.

3.3 Amendment service to the AIP (AIP AMDT)

AIP AMDT is published in accordance with the established regular intervals (see GEN 0.1-2 paragraph 3.2). It incorporates permanent changes to the AIP on the indicated publication date.

A brief description of the amendments and changes made are provided in the AIP AMDT cover page.

Each AIP AMDT cover page also includes references to the serial numbers of those elements, if any, of the Integrated Aeronautical Information Package which have been incorporated into the AIP by the amendment.

Each AIP AMDT is allocated a serial number which is consecutive and based on the calendar year. The year, indicated by two digits, is a part of the serial number of the AIP AMDT.

3.4 AIP Supplement (AIP SUP)

Temporary changes of long duration (3 months or more) and information of short duration which contains extensive text and/or graphics, supplementing the permanent information contained in the AIP, are published as AIP SUP. Operationally significant changes to the AIP are published in accordance with the AIRAC system and its established effective dates, and are identified clearly by the acronym AIRAC.

Each AIP SUP (regular or AIRAC) is allocated a serial number which is consecutive and based on the calendar year.

An AIP SUP is kept as long as all or some of its contents remain valid. The period of validity of the information contained in the AIP SUP will normally be given in the AIP SUP itself. Alternatively, NOTAM may be used to indicate changes to the period of validity or cancellation of the AIP SUP.

The checklist of current AIP SUP is published in the monthly plain-language NOTAM List.

3.5 NOTAM and Pre-flight Information Bulletins (PIB)

A NOTAM contains information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel engaged in flight operations. Each NOTAM contains information in the order shown in the ICAO NOTAM format and is composed of abbreviated phraseology assigned to the ICAO NOTAM code complemented by ICAO abbreviations, indicators, identifiers, designators, callsigns, frequencies, figures and plain language. NOTAM originated and issued for Singapore FIR are distributed in 'A' series.

NOTAM are published as and when necessary to disseminate information of direct operational significance which:

- a. is of an ephemeral nature;
- b. requires advance distribution; or
- c. is appropriate to the AIP but needs immediate dissemination.

Each NOTAM is assigned a 4-digit serial number preceded by the letter 'A' indicating the series, followed by a stroke and 2 digits indicating the year of issue. The serial numbers begin with 0001 every year. A checklist of current NOTAMs is issued every month via the AFS. Additionally, a monthly plain language list of valid NOTAM, including indications of the latest AIP Amendment, AIP Supplement, AIC issued and a checklist of current AIP Supplements is also retrievable online at <https://aim-sg.caas.gov.sg>

NOTAM are exchanged with other International NOTAM Offices (NOF) as follows:

NOTAM exchanged with other NOF/Countries (R=Received only, S=Sent only, EAD=Received from/Sent to European AIS Database)		
Abu Dhabi/UAE	Jakarta/Indonesia	Paro/Bhutan (R)
Addis Ababa/Ethiopia	Jeddah/Saudi Arabia	Phnom Penh/Cambodia (R)
Almaty/Kazakhstan (EAD)	Johannesburg/South Africa	Plaisance/Mauritius
Amman/Jordan (EAD)	Kabul/Afghanistan	Port Moresby/Papua New Guinea
Amsterdam/Netherlands (EAD)	Karachi/Pakistan	Praha/Czech Republic (S)
Ankara/Turkey (EAD)	Kathmandu/Nepal	Pyongyang/Korea, North
Antananarivo/Madagascar	Khartoum/Sudan (R)	Riga/Latvia (EAD)
Athinai/Greece	Kobenhavn/Denmark (EAD)	Roma/Italy
Baghdad/Iraq	Kolkata/India	Sanaa/Yemen
Bahrain/Bahrain	Kuala Lumpur/Malaysia	Sarajevo/Bosnia & Herzegovina (S)
Baku/Azerbaijan (EAD)	Kuwait/Kuwait	Seoul/Korea, South
Bangkok/Thailand	Kyiv/Ukraine (EAD)	Shannon/Ireland (EAD)
Beijing/China	Lisboa/Portugal (EAD)	Sofia/Bulgaria
Beograd/Serbia-Montenegro (EAD)	Ljubljana/Slovenia (EAD)	Stockholm/Sweden (EAD)
Brasilia/Brazil (S)	Lobamba/Swaziland (R)	Taipei/Taiwan
Brazzaville/Congo (R)	London/UK (EAD)	Tallinn/Estonia (EAD)
Brunei/Brunei	Luqa/Malta (EAD)	Tbilisi/Georgia (EAD)
Bruxelles/Belgium (EAD)	Macao/Macao	Tehran/Iran
Bucuresti/Romania (EAD)	Madrid/Spain (EAD)	Tel Aviv/Israel
Budapest/Hungary (EAD)	Mahé/Seychelles	Tirana/Albania (EAD)
Cairo/Egypt (S)	Male/Maldives	Tokyo/Japan
Canberra/Australia	Manila/Philippines (EAD)	Tripoli/Libya
Chennai/India	Maseru/Lesotho (R)	Vientiane/Laos
Christchurch/New Zealand	Minsk/Belarus (EAD)	Vilnius/Lithuania (EAD)
Colombo/Sri Lanka	Moskva/Russian Federation	Warsaw/Poland (S) (EAD)
Damascus/Syria (R)	Mumbai/India	Washington/USA
Dar es-Salaam/Tanzania (R)	Muscat/Oman	Wien/Austria (EAD)
Dhaka/Bangladesh	Nadi/Fiji	Windhoek/Namibia (R)
Frankfurt/Germany (EAD)	Nairobi/Kenya	Yangon/Myanmar
Hanoi/Vietnam	New Delhi/India	Yerevan/Armenia (S) (EAD)
Harare/Zimbabwe	Nicosia/Cyprus (EAD)	Zagreb/Croatia (EAD)
Helsinki/Finland (EAD)	Ottawa/Canada	Zurich/Switzerland
Hong Kong/Hong Kong	Paris/France (EAD)	

Pre-flight Information Bulletin (PIB), a recapitulation of valid NOTAM in plain language, can be retrieved from AIM-SG URL: <https://aim-sg.caas.gov.sg>

3.6

Aeronautical Information Circular (AIC)

Aeronautical Information Circular (AIC) contains information on the long-term forecast of major change in legislation, regulations, procedures or facilities; information of a purely explanatory or advisory nature liable to affect flight safety; and information or notification of an explanatory or advisory nature concerning technical, legislative or purely administrative matters which is inappropriate to the AIP or NOTAM, and is published as required.

Each AIC is numbered consecutively on a calendar year basis. The year, indicated by 2 digits, is a part of the serial number of the AIC. A checklist of current AIC is issued in the form of an AIC once a year.

3.7

Checklist and NOTAM List

A checklist of current NOTAM is issued monthly via the AFS. A monthly NOTAM List containing the plain language presentation of current NOTAM, information on the latest AIP Amendment, AIP Supplement, AIC issued and a checklist for AIP Supplements is also available online.

4

AIRAC SYSTEM

4.1

In order to control and regulate operationally significant changes requiring amendments to charts, route manuals, etc., such changes, whenever possible, will be issued on predetermined dates according to the AIRAC SYSTEM. This type of information will be published in an AIRAC AIP Supplement.

- ← 4.2 AIRAC information will be issued so that the information will be received by the user not later than 28 days, and for major changes not later than 56 days, before the effective date. The table below indicates AIRAC effective dates for Years 2019 to 2023:

AIRAC Effective Dates				
Year 2019	Year 2020	Year 2021	Year 2022	Year 2023
03 January	02 January	28 January	27 January	26 January
31 January	30 January	25 February	24 February	23 February
28 February	27 February	25 March	24 March	23 March
28 March	26 March	22 April	21 April	20 April
25 April	23 April	20 May	19 May	18 May
23 May	21 May	17 June	16 June	15 June
20 June	18 June	15 July	14 July	14 July
18 July	16 July	12 August	11 August	10 August
15 August	13 August	09 September	08 September	07 September
12 September	10 September	07 October	06 October	05 October
10 October	08 October	04 November	03 November	02 November
07 November	05 November	02 December	01 December	30 November
05 December	03 December	30 December	29 December	28 December
	31 December			

- 4.3 A TRIGGER NOTAM will be issued 10 days before the effective date of the AIRAC AIP Supplement giving a brief description of the contents of the AIP Supplement, the effective date and the reference number of the AIRAC AIP Supplement. This trigger NOTAM will come into force on the same effective date as the AIRAC AIP Supplement and will remain in force until 14 days after the effective date.
- 4.4 A NIL AIRAC NOTAM will be issued one cycle before the AIRAC effective date if no information is submitted for publication of an AIRAC AIP Supplement for an AIRAC effective date. The NIL AIRAC NOTAM will remain current for a duration of 14 days.

5 PRE-FLIGHT INFORMATION SERVICE AT AERODROMES

Aerodrome	Briefing Coverage	Availability of Bulletins
SINGAPORE CHANGI	All route stages emanating from Singapore.	Pre-flight Information Bulletin (PIB) can be retrieved from AIM-SG URL - https://aim-sg.caas.gov.sg
SELETAR		

GEN 3.2 AERONAUTICAL CHARTS

1 RESPONSIBLE SERVICES

1.1 The Civil Aviation Authority of Singapore publishes a range of aeronautical charts for use by all types of civil aviation. The Aeronautical Information Services produces some of these charts which are part of the AIP. The charts published in the AIP are produced in accordance with the provisions contained in the ICAO documents listed in para 1.2. Differences to the provisions contained in ICAO Annex 4 - Aeronautical Charts are detailed in subsection [GEN 1.7](#)

1.2 Applicable ICAO Documents

Annex 4 – Aeronautical Charts, Eleventh Edition 2009.

Doc 8168-OPS/611 – Aircraft Operations, Volume II - Construction of Visual and Instrument Flight Procedures, Fifth Edition 2006.

2 MAINTENANCE OF CHARTS

2.1 Aeronautical charts published in the AIP are updated regularly. Significant changes or revisions in aeronautical information for other aeronautical charts are also included in the amendment.

2.2 Information found to be incorrect after publication will be corrected by an AIC or NOTAM if they are of operational significance.

3 AVAILABILITY OF CHARTS

3.1 The charts listed in paragraph 4.1 can be downloaded from AIM-SG URL: <https://aim-sg.caas.gov.sg>

4 AERONAUTICAL CHART SERIES AVAILABLE

4.1 **The following series of aeronautical charts are produced:**

- a. World Aeronautical Chart - ICAO;
- b. Aerodrome Chart - ICAO;
- c. Aerodrome Obstacle Chart - ICAO Type A (for each runway);
- d. Aerodrome Obstacle Chart - ICAO Type B;
- e. Precision Approach Terrain Chart - ICAO;
- f. Enroute Chart - ICAO;
- g. Area Chart - ICAO;
- h. Standard Departure Chart - Instrument (SID) - ICAO;
- i. Standard Arrival Chart - Instrument (STAR) - ICAO;
- j. Instrument Approach Chart - ICAO (for each runway and procedure type);
- k. Visual Approach Chart - ICAO

4.2 **General description of each series**

a. **World Aeronautical Chart - ICAO 1: 1 000 000**

This series is constructed on Lambert Conformal Conic Projection with two standard parallels at 0 deg 40 min and 3 deg 20 min. The spheroid is World Geodetic System 1984 (WGS84). The aeronautical data shown have been kept to a minimum, consistent with the use of the chart for visual air navigation. It includes a selection of aerodromes, significant obstacles, elements of the ATS system, prohibited, restricted and danger areas, and radio navigation aids. The chart provides information to satisfy visual air navigation and is also used as a pre-flight planning chart.

b. **Aerodrome Chart - ICAO**

This chart contains detailed aerodrome data to provide flight crews with information that will facilitate the ground movement of aircraft:

- * from the aircraft stand to the runway; and
- * from the runway to the aircraft stand;

It also provides essential operational information at Singapore Changi Airport and Seletar Aerodrome.

c. **Aerodrome Obstacle Chart - ICAO Type A (operating limitations)**

This chart contains detailed information on obstacles in the take-off flight path areas of Singapore Changi Airport, Seletar Aerodrome and Paya Lebar Airport. It is shown in plan and profile view. This obstacle information provides the data necessary to enable an operator to comply with the operating limitations of ICAO Annex 6, Parts I and II, Chapter 5.

d. **Aerodrome Obstacle Chart - ICAO Type B**

This chart is produced to assist in the determination of critical heights for Singapore Changi Airport and Seletar Aerodrome.

e. **Precision Approach Terrain Chart - ICAO**

This chart provides detailed terrain profile information within a defined portion of the final approach so as to enable aircraft operating agencies to assess the effects of the terrain on decision height determination by the use of radio altimeters. This chart is produced for the precision approach Cat II runways at Singapore Changi Airport.

f. **Enroute Chart - ICAO**

This chart is produced for the entire Singapore FIR. The aeronautical data include all aerodromes, prohibited, restricted and danger areas and the air traffic services system in detail. This chart provides the flight crew with information to facilitate navigation along ATS routes in compliance with air traffic services procedures.

g. **Area Chart - ICAO**

This chart is produced when the air traffic services routes or position reporting requirements are complex and cannot be shown on the En-route Chart - ICAO. It shows, in more detail, those aerodromes that affect terminal routings, prohibited, restricted and danger areas and the air traffic services system. This chart provides the flight crew with information to facilitate the various phases of instrument flight:

- * the transition between the en-route phase and the approach to an aerodrome;
- * the transition between the take-off/missed approach and the en-route phase of flight; and
- * flights through areas of complex ATS routes or airspace structure.

h. **Standard Departure Chart - Instrument (SID) - ICAO**

This chart is produced whenever a standard departure route - instrument has been established and cannot be shown with sufficient clarity on the Area Chart - ICAO.

The aeronautical data shown include the aerodrome of departure, aerodrome(s) which affect the designated standard departure route-instrument, prohibited, restricted and danger areas and the air traffic services system. This chart provides the flight crew with information that will enable them to comply with the designated standard departure route-instrument from the take-off phase to the en-route phase.

i. **Standard Arrival Chart - Instrument (STAR) - ICAO**

This chart is produced whenever a standard arrival route - instrument has been established and cannot be shown with sufficient clarity on the Area Chart - ICAO.

The aeronautical data shown include the aerodrome of landing, aerodrome(s) which affect the designated standard arrival route-instrument, prohibited, restricted and danger areas and the air traffic services system. This chart provides the flight crew with information that will enable them to comply with the designated arrival route-instrument from the en-route phase to the approach phase.

j. **Instrument Approach Chart - ICAO**

This chart is produced for all aerodromes used by civil aviation where instrument approach procedures have been established. A separate Instrument Approach Chart - ICAO has been provided for each approach procedure.

The aeronautical data shown include information on aerodromes, prohibited, restricted and danger areas, radio communication facilities and navigation aids, minimum sector altitude, procedure track portrayed in plan and profile view, aerodrome operating minima, etc.

This chart provides the flight crew with information that will enable them to perform an approved instrument approach procedure to the runway of intended landing including the missed approach procedure and where applicable, associated holding patterns.

k. **Visual Approach Chart - ICAO**

This chart is produced for aerodromes used by civil aviation where:

- * only limited navigation facilities are available; or
- * radio communication facilities are not available; or
- * no adequate aeronautical charts of the aerodrome and its surroundings at 1:500 000 or greater scale are available; or
- * visual approach procedures have been established

The aeronautical data shown include information on aerodromes obstacles, designated airspace, visual approach information, radio navigation aids and communication facilities, as appropriate.

5 LIST OF AERONAUTICAL CHARTS AVAILABLE

GEN 3.2.5 LIST OF AERONAUTICAL CHARTS AVAILABLE						
<i>Title of Chart Series</i>	<i>Scale</i>	<i>Name and/or number</i>		<i>Price (\$)</i>	<i>Date</i>	
World Aeronautical Chart ICAO (WAC)	1:1 000 000	WAC 2860		In AIP	17 AUG 17	
Enroute Chart ICAO (ENRC)		ERC 6-1		In AIP	15 AUG 19	
Instrument Approach Chart ICAO (IAC)	1:400 000	Singapore Changi				
		RWY 02L - ICW ILS/DME	AD-2-WSSS-IAC-1	In AIP	10 OCT 19	
		RWY 02C - ICE ILS/DME	AD-2-WSSS-IAC-2	In AIP	10 OCT 19	
		RWY 20R - ICH ILS/DME	AD-2-WSSS-IAC-5	In AIP	10 OCT 19	
		RWY 20C - ICC ILS/DME	AD-2-WSSS-IAC-6	In AIP	10 OCT 19	
		RWY 20C - VTK DVOR/DME	AD-2-WSSS-IAC-7	In AIP	10 OCT 19	
		RWY 02L - RNAV(GNSS)	AD-2-WSSS-IAC-9	In AIP	10 OCT 19	
		RWY 02C - RNAV(GNSS)	AD-2-WSSS-IAC-10	In AIP	10 OCT 19	
		RWY 20R - RNAV(GNSS)	AD-2-WSSS-IAC-11	In AIP	10 OCT 19	
		RWY 20C - RNAV(GNSS)	AD-2-WSSS-IAC-12	In AIP	10 OCT 19	
		Paya Lebar				
		RWY 20 - PU DVOR/DME	AD-2-WSAP IAC-1	In AIP	10 OCT 19	
		RWY 02 - PU DVOR/DME	AD-2-WSAP IAC-2	In AIP	10 OCT 19	
		RWY 20 - IPS ILS/DME	AD-2-WSAP IAC-3	In AIP	10 OCT 19	
		RWY 02 - IPN ILS/DME	AD-2-WSAP IAC-4	In AIP	10 OCT 19	
		RWY 02 - RNAV(GNSS)	AD-2-WSAP-IAC-5	In AIP	10 OCT 19	
RWY 20 - RNAV(GNSS)	AD-2-WSAP-IAC-6	In AIP	10 OCT 19			
Visual Approach Chart ICAO (VAC)	1:400 000	Singapore Changi		AD-2-WSSS-VAC-1	In AIP	10 OCT 19
		Seletar				
		RWY 03	AD-2-WSSL-VAC-1	In AIP	10 OCT 19	
		RWY 21	AD-2-WSSL-VAC-2	In AIP	10 OCT 19	
RWY 03	AD-2-WSSL-VAC-3	In AIP	10 OCT 19			
RWY 21	AD-2-WSSL-VAC-4	In AIP	10 OCT 19			
Visual Departure Chart	1:100 000	Seletar				
		RWY 03	AD-2-WSSL-VDC-1	In AIP	10 OCT 19	
		RWY 21	AD-2-WSSL-VDC-2	In AIP	10 OCT 19	
Aerodrome Chart ICAO (AC)		Singapore Changi		AD-2-WSSS-ADC-2	In AIP	10 OCT 19
		Seletar		AD-2-WSSL-ADC-1	In AIP	28 FEB 19
		Paya Lebar		AD-2-WSAP-ADC-1	In AIP	12 NOV 15
Aerodrome Obstacle Chart ICAO TYPE A (AOC)	1:10 000	Singapore Changi				
		RWY 20R/02L	AD-2-WSSS-AOC-1	In AIP	07 DEC 17	
	1:10 000	RWY 20C/02C	AD-2-WSSS-AOC-2	In AIP	29 MAR 18	
	1:10 000	Seletar				
		RWY 03/21	AD-2-WSSL-AOC-1	In AIP	17 AUG 17	
	1:20 000	Paya Lebar		AD-2-WSAP-AOC-1	In AIP	10 NOV 16
Aerodrome Obstacle Chart ICAO TYPE B (AOC)	1:20 000	Singapore Changi		AD-2-WSSS-AOC-3	In AIP	13 SEP 18
		Seletar				
		RWY 03/21	AD-2-WSSL-AOC-2	In AIP	08 NOV 18	
Precision Approach Terrain Chart ICAO (PATC)	1:2 500	Singapore Changi				
		RWY 02L	AD-2-WSSS-PATC-1	In AIP	10 OCT 19	
		RWY 20C	AD-2-WSSS-PATC-2	In AIP	01 FEB 18	

5 NOTIFICATION REQUIRED FROM OPERATORS

- 5.1 It is the responsibility of the operator or the pilot-in-command to notify the meteorological office of any flight for which meteorological documentation is required (ref. ICAO Annex 3, paragraph 2.3). As much prior notice as possible should be given, and at least one hour notice at Singapore Changi Airport and two hours at Seletar Aerodrome would be required for nonscheduled flights.

6 AIRCRAFT REPORTS REQUIRED FROM OPERATORS**6.1 AIREP**

- 6.1.1 Routine aircraft meteorological observations shall be made and the reports transmitted at ATS/ MET reporting points listed on page GEN 3.5-6 and as indicated in subsection ENR 3.1 - ATS ROUTES.
- 6.1.2 Special aircraft observations and aircraft observations during climb-out and approach shall be made and the reports transmitted as necessary.
- ← 6.1.3 Special aircraft observations of pre-eruption volcanic activity, volcanic eruption or volcanic ash cloud shall be recorded on the special Air-Report of Volcanic Activity form which can be downloaded from URL <https://aim-sg.caas.gov.sg>. A copy of the completed Volcanic Activity Report shall be delivered by the operator or a flight crew member, without delay, either personally or by telephone facsimile (TEL: 65425026 or 65429978) to the Meteorological Office, Singapore Changi Airport.

6.2 REPORTING OF LOW LEVEL WIND SHEAR

- 6.2.1 Pilots encountering wind shear shall report to ATC as soon as possible.
- 6.2.2 When reporting wind shear on radiotelephony, the information should be transmitted in this order:
- a. Aircraft callsign;
 - b. WIND SHEAR report;
 - c. Time (of wind shear occurrence);
 - d. Position (of wind shear);
 - e. Intensity (moderate, strong or severe);
 - f. Average height of wind shear layer.
- 6.2.3 On receipt of a wind shear report from a pilot, ATC will pass it to other aircraft in the vicinity. The following phraseology will be used:
- “WIND SHEAR WARNING
ARRIVING (or DEPARTING) (type of aircraft)
REPORTED (moderate, strong, severe)
WIND SHEAR IN APPROACH (or DEPARTURE)
RUNWAY (number) AT (time)
HEIGHT OF WIND SHEAR LAYER (feet)”
- 6.2.4 The presence of wind shear as reported by a pilot will also be broadcast in the ATIS for the next half an hour unless subsequent reports indicate that wind shear no longer exists.

6.3 AIRCRAFT ATS/MET REPORTING POINTS IN THE SINGAPORE FIR

- 6.3.1 Aircraft Meteorological Observations shall be made in relation to and transmitted in flight by all aircraft at the following selected Air Traffic Services position reporting points within the Singapore FIR except when:
- a. The flight duration is less than 2 hours, or
 - b. The altitude of the flight path is less than 5 000ft, or
 - c. The aircraft is less than 1 hour's flying time from the next intended point of landing.
- 6.3.2 The aircraft ATS/MET reporting points listed below are indicated in page ENR 3.1/ATS Chart.
- 6.3.3 The position of the mean wind or spot wind, to the nearest whole degree latitude and longitude, shall be recorded and transmitted in flight.

ATS ROUTE	AIRCRAFT ATS/MET REPORTING POINTS IN THE SINGAPORE FIR
G580	NIMIX
L642	ESPOB
L644	KIKOR
M635	SURGA
M758 / M767	TERIX
M767	TEGID
M768 / N884	LAGOT
M774	KADAR
L504	BAVUS
N875	ARUPA
N892	MELAS

7 VOLMET SERVICE

TABLE GEN 3.5.7 VOLMET SERVICE

<i>Name of station</i>	<i>CALLSIGN IDENT (EM)</i>	<i>Frequency</i>	<i>Broadcast period</i>	<i>HR of SER</i>	<i>Aerodromes included</i>	<i>Contents and format of REP and FCST</i>
1	2	3	4	5	6	7
SINGAPORE	SINGAPORE RADIO (A3J)	6676KHz (1230-2230) 11387KHz (2230-1230)	H + 20 to H + 25 and H + 50 to H + 55	H24	SINGAPORE (1) SINGAPORE (2) KUALA LUMPUR (3)(4) SUBANG AIRPORT (4) SOEKARNO-HATTA (3)(4) KUCHING (3)(4) BRUNEI (3)(4) KOTA KINABALU (3)(4) DEN PASAR (3) (4) PENANG (3)(4) SINGAPORE (5) KUALA LUMPUR (4)(8) SINGAPORE (1) SINGAPORE (6) KUALA LUMPUR (4)(7) SUBANG AIRPORT (4) SOEKARNO-HATTA (4)(7) KUCHING (4)(7) BRUNEI (4)(7) KOTA KINABALU (4)(7) DEN PASAR (4)(7) PENANG (4)(7) SINGAPORE (5) SOEKARNO HATTA (4)(8)	SIGMET METAR METAR METAR METAR METAR METAR METAR METAR METAR TAF TAF SIGMET METAR METAR METAR METAR METAR METAR METAR METAR TAF TAF
<p>Plain Language EN.</p> <p>(1) SIGMET message or 'NIL' is transmitted.</p> <p>(2) Latest routine report H+00 including trend statement; repeated at end of broadcast, time permitting.</p> <p>(3) H+00 (or the previous H+30 report when the H+00 report is not available) including trend statement when appended.</p> <p>(4) As available.</p> <p>(5) Valid for 12 hours.</p> <p>(6) Latest routine report H+30 including trend statement; repeated at end of broadcast, time permitting.</p> <p>(7) H+30 (or the H+00 report when the H+30 report is not available) including trend statement when appended.</p> <p>(8) Valid for 30 hours.</p>						

3 DEPARTING FLIGHTS**3.1 INTRODUCTION**

- a. The Instrument Departure Procedures are only applicable for aircraft with all engines operating. It remains the responsibility of the operator to develop contingency procedures for the individual type of aeroplane and to conduct the necessary examination of obstacles throughout the areas concerned in relation to the certificated performance of the individual aeroplane type. It is also the responsibility of the operator to ensure that contingency procedures comply fully with the aeroplane performance requirements of ICAO Annex 6.
- b. The specific routes to be followed are depicted in SID charts AD-2-WSSS-SID-1 to AD-2-WSSS-SID-18. Altitude restrictions at fixes and/or DME specify ATC/airspace requirements.
- c. Minimum climb gradient specifies obstacle clearance requirements.
- d. In the event that the minimum climb gradient cannot be achieved pilots shall inform ATC. ATC shall hold departures if pilots indicate that they are unable to meet the required climb gradient.

3.2 RUNWAY 02L

- a. When there are no reports of vessel movement along the northern shipping channel or where the reported vessel height is less than 32m AMSL, all aircraft departures on Runway 02L, regardless of on SID or vectors, shall be on a minimum climb gradient of 3.3%.
- b. Where the reported vessel height is 33m or higher, ATC shall advise departing pilots of the vessel height. Pilots on receipt of this information shall apply the minimum climb gradient in accordance with the following table:

HGT OF VESSEL (metres AMSL)	Gradient (%)	MINIMUM CROSSING ALTITUDE OVER VESSEL	
		(metres)	(feet)
33	3.4	39	125
40	4.0	49	158
50	4.9	59	191
60	5.8	69	224
70	6.8	79	257
80	7.8	89	290
90	8.8	99	322
100	9.7	109	355
110	10.7	119	388
120	11.7	129	421
130	12.7	139	454
140	13.7	149	486

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

3.3 RUNWAY 02C

- a. When there are no reports of vessel movement along the northern shipping channel or where the reported vessel height is less than 69m AMSL, all aircraft departures on Runway 02C, regardless of on SID or vectors, shall be on a minimum climb gradient of 3.3%.
- b. Where the reported vessel height is 70m or higher, ATC shall advise departing pilots of the vessel height. Pilots on receipt of this information shall apply the minimum climb gradient in accordance with the following table:

HGT OF VESSEL (metres AMSL)	Gradient (%)	MINIMUM CROSSING ALTITUDE OVER VESSEL	
		(metres)	(feet)
70	3.4	89	292
80	3.8	99	325
90	4.3	109	358

HGT OF VESSEL (metres AMSL)	Gradient (%)	MINIMUM CROSSING ALTITUDE OVER VESSEL	
		(metres)	(feet)
100	4.7	119	390
110	5.1	129	423
120	5.5	139	456
130	6.0	149	489
140	6.4	159	522

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

3.4 RUNWAYS 20C AND 20R

3.4.1 All aircraft departures on Runway 20C, regardless of on SID or vectors, shall be on a minimum climb gradient of 7% until reaching or passing 2,500ft. Thereafter, the minimum climb gradient shall be 3.3%.

3.4.2 All aircraft departures on Runway 20R, regardless of on SID or vectors, shall be on a minimum climb gradient of 6% until reaching or passing 2,500ft. Thereafter, the minimum climb gradient shall be 3.3%.

(Please also refer to charts AD-2-WSSS-SID-1 to AD-2-WSSS-SID-18: Standard Instrument Departures for Runway 20C and Runway 20R).

3.5 DETERMINATION OF CLIMB GRADIENT BY OPERATORS

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

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

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

- a. The most penalising obstacle is a tall vessel which is on the extended centre line of the runway. (ATC shall advise pilots of the height of the tall vessel).
- b. The required MOC in 3.5.1 (ii) is 0.8% of the distance **d** from the departure end of runway (DER) to the obstacle, in accordance with Vol II of ICAO Doc 8168: Procedures for Air Navigation Services Operations (PANS-OPS) where, in the case of Singapore Changi Airport, the DER is defined as the end of the clearway.
- c. The distance **d** for departure Runways 02L and 02C is measured from the DER to the shipping channel north of Changi. The distance **d** for departure Runways 20C and 20R is measured from the DER to the boundary of the restricted waters south of Changi wherein tall vessels of height above 49m AMSL are not permitted. The distance **d** for the various departure runways is as follows:

DEP RWY	02L	02C	20C	20R
Distance d	1 100m	2 590m	9 670m	12 830m

ENR 1.8 REGIONAL SUPPLEMENTARY PROCEDURES

1 RVSM PROCEDURES IN THE SINGAPORE FIR

1.1 **IMPLEMENTATION OF REVISED FLOS (FLIGHT LEVEL ORIENTATION SCHEME) AND FLAS (FLIGHT LEVEL ALLOCATION SCHEME) IN THE WESTERN PACIFIC/SOUTH CHINA SEA AREA**

1.1.1 In order to minimise flight level transition requirements for flights entering and leaving the Western Pacific / South China Sea area, the following flight level arrangements will be implemented simultaneously and permanently:

- a. a single alternate FLOS (i.e. 'east odd flight levels, west even flight levels') in compliance with the Table "RVSM-FEET" of Appendix 3 of ICAO Annex 2 and in accordance with the FLOS in surrounding areas;
- b. special high capacity arrangements for six unidirectional parallel routes (L642, M771, N892, L625, N884 and M767) that involve managed use of odd and even flight levels in the same direction of flight; and
- c. an associated FLAS agreed between affected ACCs to facilitate ATC 'No-PDC' operations.

1.1.2 To harmonise with RVSM operations within Jakarta FIR, RVSM operations within the Singapore FIR shall be conducted between FL290 and FL410 (inclusive) in the following areas:

ATS Routes	Flight Level Assignment
A464 (S) Southbound	FL290, FL310, FL330, FL350, FL370, FL390, FL410
A576 (S) Southbound	FL290, FL310, FL330, FL350, FL370, FL390, FL410
B470	FL290, FL300, FL310, FL320, FL330, FL340, FL350, FL360, FL370, FL380, FL390, FL400 and FL410 except for flights beyond Jakarta where only odd levels shall be assigned.
B469 (S) Southbound	FL290, FL310, FL330, FL350, FL370, FL390 and FL410
N875/G464 (S) Southbound	FL290, FL330, FL370 and FL410
W36 (S) Southbound	FL290, FL330, FL370 and FL410
L644 (S) Southbound	FL290, FL330, FL370 and FL410
L762(W) Westbound	FL300, FL320, FL340, FL360, FL380 and FL400
R469 (W) Westbound	FL300, FL320, FL340, FL360, FL380 and FL400
W22 (W) Westbound	FL300, FL320, FL340, FL360, FL380 and FL400

← 1.1.3 Non-RVSM approved aircraft shall fly below RVSM airspace unless prior approval has been obtained from the ACC concerned for such aircraft to operate in RVSM airspace. In the assignment of cruising level in RVSM airspace, RVSM-approved aircraft shall be given priority over non-RVSM approved aircraft.

1.1.4 When an RVSM-approved aircraft reports that it is no longer RVSM-compliant before the transfer of control point, the transferring ACC shall immediately notify the receiving ACC of this fact and provide conventional vertical separation of 2,000ft between this aircraft and the other aircraft.

1.2 **RVSM OPERATIONAL APPROVAL AND MONITORING**

1.2.1 Operators must obtain airworthiness and operational approval from the State of Registry or State of the Operator, as appropriate, to conduct RVSM operations. The requirement for operators to qualify for RVSM operational approval can be found at:

http://www.caas.gov.sg/caasWeb2010/export/sites/caas/en/Regulations/Safety/Advisory_Circulars/AC-AOC_series-AIR_Operators/AC_AOC-15_0.pdf

Each aircraft operating in RVSM airspace shall hold a valid RVSM approval. RVSM approval issued for one region will always be valid for RVSM operations in another region provided specific restrictions have not been imposed on the operator by the State of the Operator or State of Registry. The Monitoring Agency for Asia Region (MAAR) monitors operator compliance with State approvals requirements by performing periodic scrutiny checks using Traffic Sample Data and the RVSM approvals record (<http://www.aerothai.co.th/maar/approvals.php>)

- 1.2.2 Operators are required to participate in the RVSM aircraft monitoring program. This is an essential element of the RVSM implementation program in that it confirms that the aircraft altitude-keeping performance standard is being met. Monitoring accomplished for other regions can be used to fulfil the monitoring requirements for the Asia/Pacific Region. The information on height-keeping performance monitoring options can be found at:

<http://www.aerothai.co.th/maar/monitoringsystems.php>

1.3 ACAS II AND TRANSPONDER EQUIPAGE

- 1.3.1 Aircraft operating in RVSM airspace shall be equipped with an airborne collision avoidance system (ACAS II) and to operate the ACAS system in accordance with the relevant provisions of ICAO Annex 10, Volume IV, Chapter 4.

1.4 IN-FLIGHT PROCEDURES WITHIN RVSM AIRSPACE

- 1.4.1 Before entering RVSM airspace, the pilot should review the status of required equipment. The following equipment should be operating normally:

- a. two primary altimetry systems;
- b. one automatic altitude-keeping device; and
- c. one altitude-alerting device.

- 1.4.2 The pilot must notify ATC whenever the aircraft:

- a. is no longer RVSM compliant due to equipment failure; or
- b. experiences loss of redundancy of altimetry systems; or
- c. encounters turbulence that affects the capability to maintain flight level.

See pages ENR 1.8-8 to ENR 1.8-11 or Appendix 5 of FAA IG 91-RVSM for pilot and controller actions in contingency scenarios.

- 1.4.3 During cleared transition between levels, the aircraft should not overshoot or undershoot the assigned FL by more than 150ft (45m).

- 1.4.4 Except in an ADS or radar environment, pilots shall report reaching any altitude assigned within RVSM airspace.

- 1.4.5 Paragraphs 1.5, 1.6, 1.7 and 1.8 below contain procedures for in-flight contingencies that have been updated for RVSM operations. The contingency procedures in paragraphs 1.5 and 1.6 and the off-set procedures in paragraph 1.8 should be applied in Oceanic operations. The weather deviation procedures in paragraph 1.7 may be applied in all airspace in the region.

1.5 SPECIAL PROCEDURES FOR IN-FLIGHT CONTINGENCIES IN OCEANIC AIRSPACE IN THE SINGAPORE FIR

- 1.5.1 The following general procedures apply to both subsonic and supersonic aircraft and are intended as guidance only. Although all possible contingencies cannot be covered, they provide for cases of inability to maintain assigned level due to:

- a. weather;
- b. aircraft performance;
- c. pressurisation failure; and
- d. problems associated with high-level supersonic flight.

- 1.5.2 The procedures are applicable primarily when rapid descent and/or turn-back or diversion to an alternate airport is required. The pilot's judgement shall determine the sequence of actions to be taken, taking into account specific circumstances.

- 1.5.3 If an aircraft is unable to continue flight in accordance with its air traffic control clearance, a revised clearance shall, whenever possible, be obtained prior to initiating any action, using a distress or urgency signal as appropriate.

- 1.5.4 If prior clearance cannot be obtained, an ATC clearance shall be obtained at the earliest possible time and, until a revised clearance is received, the pilot shall:

- a. if possible, deviate away from an organised track or route system;
- b. establish communications with and alert nearby aircraft by broadcasting, at suitable intervals: flight identification, flight level, aircraft position (including the ATS route designator or the track code) and intentions on the frequency in use, as well as on frequency 121.5MHz (or, as a back-up, the VHF inter-pilot air-to-air frequency 123.45MHz);
- c. watch for conflicting traffic both visually and by reference to ACAS (if equipped); and
- d. turn on all aircraft exterior lights (commensurate with appropriate operating limitations).

ENR 1.10 FLIGHT PLANNING

1 PROCEDURES FOR SUBMISSION OF A FLIGHT PLAN

1.1 *Requirement for submission of a Flight Plan*

1.1.1 The pilot-in-command or airline operator shall submit an ICAO flight plan to ATC via the AFS or the AIM-SG system (accessible by registration at <https://aim-sg.caas.gov.sg>) for the following flights:

- a. Flights on airways, associated holding areas and all other controlled airspaces whether IFR or VFR;
- b. Any flight or portion thereof to be provided with air traffic control service;
- c. Any flight within or into designated areas, or along designated routes to facilitate co-ordination with appropriate military units or with air traffic service units in adjacent States in order to avoid the possible need for interception for the purpose of identification;
- d. Any flight across international borders.

1.1.2 The pilot-in-command or the airline operator shall submit details of a test/training flight, planned to be conducted in the Seletar aerodrome circuit or in Light Aircraft Training Areas A, B and C, by electronic mail using the "Seletar Test/Training Form" retrievable from webpage: <https://aim-sg.caas.gov.sg>

1.1.3 For a flight that will be operating within Singapore only (except for flights mentioned in paragraph 1.1.2, the pilot-in-command or the operator shall submit the ICAO flight plan using the automated AIM-SG system and to include Military ATC addressee WSARYWYX. If for any reason a flight plan is not approved, the pilot-in-command shall contact RSAF Air Operations Control (AOC) at 67683702 for clarification.

1.1.4 The pilot-in-command or the operator of IFR flight operating out of Seletar is required to file via KK or RECHI - PONJO - SJ.

1.1.5 The pilot-in-command or the operator of IFR flight operating into Seletar is required to file according to WSSL AD 2.22 Flight Procedures.

1.1.6 VFR flight operating between Seletar and Johor Bahru shall route via Point X (012830N1034954E), Tebrau City Mall (013259N1034748E), Felda Ulu Tebrau (013751N1034510E) and vice versa.

1.2 *Requirement for submission of a Flight Plan for Test Flights*

1.2.1 Test flights shall be conducted on Airway G580 between HOSBA and NIMIX to minimise disruption to civil scheduled flight movements and to facilitate the test flight operations.

1.2.2 A flight plan shall be submitted for a test flight at least one hour before departure. The pilot-in-command or the operator shall include in Item 18 of the flight plan 'RMK/TEST FLT APPROVED BY ATC'.

1.2.3 The pilot-in-command shall maintain a 2-way VHF communication with Singapore ATC on the assigned VHF frequency at all times.

1.2.4 The pilot-in-command of the test flight shall adhere to ATC instructions at all times. Test flight manoeuvres are subject to ATC clearance, real-time coordination and traffic.

1.2.5 Procedures for application to conduct test flights are provided on page GEN 1.2-6 paragraph 5.

1.3 *Lead time for filing flight plans and flight plan associated messages*

1.3.1 Flight plan shall be filed 120 hours, or five days, at the earliest but no later than 60 minutes prior to departure (estimated off-block time).

1.3.2 In the event of a delay of 30 minutes in excess of the estimated off-block time, the flight plan should be amended or a new flight plan submitted and the old flight plan cancelled, whichever is applicable. To indicate a delay to a flight, a DLA or a CHG message may be used depending on the circumstances.

1.3.3 The old flight plan shall be cancelled and a new flight plan shall be submitted when changes are made to any one of the following fields:
7/Aircraft Identification, 15/Route and/or 16/Destination Aerodrome.

1.3.4 A flight plan submitted in flight on HF RTF shall be submitted at least 20 minutes (or if on VHF RTF at least 10 minutes) prior to the intended point of entry into a control zone, control area, advisory area or advisory route.

1.3.5 A pilot-in-command may change from an IFR flight plan to a VFR flight plan by reporting "CANCELLING MY IFR FLIGHT" when weather conditions indicate that the remainder of the flight can be conducted under VFR.

[However, within Singapore, all flights whether IFR or VFR shall be regulated in accordance with instrument flight rules.] (see note 2 below).

1.3.6 ATC will acknowledge:

“IFR flight cancelled at.....(time)” or

if information is available which indicates the likelihood of IMC prevailing along the route, will notify these conditions as follows:

“Instrument MET conditions reported (or forecast) in the vicinity of.....”

Note:

- 1) The fact that pilot flying in VMC does not by itself constitute cancellation of an IFR flight plan.
- 2) Within the Singapore/Johor Airspace Complex and Control Zones all flights are regulated in accordance with IFR separation standards.

1.4 Persons on board (POB)

1.4.1 The pilot-in-command or his representative is required to state the total number of persons on board (POB - i.e. passengers and crew) in the flight plan.

1.5 DATA LINK Communication and Surveillance

1.5.1 Aircraft using data link communications (see page ENR 1.1-15) must insert one or more of the following letters in Item 10a of their flight plan to indicate serviceable COM aid equipment and capabilities available:

- J1 CPDLC ATN VDL Mode 2
- J2 CPDLC FANS 1/A HF DL
- J3 CPDLC FANS 1/A VDL Mode A
- J4 CPDLC FANS 1/A VDL Mode 2
- J5 CPDLC FANS 1/A SATCOM (INMARSAT)
- J6 CPDLC FANS 1/A SATCOM (MTSAT)
- J7 CPDLC FANS 1/A SATCOM (Iridium)
- P1 CPDLC RCP 400
- P2 CPDLC RCP 240
- P3 SATVOICE RCP 400
- P4-P9 Reserved for RCP

1.5.2 Aircraft using data link surveillance (page ENR 1.1-15) must insert one or more of the following letters in Item 10b of their flight plan to indicate serviceable SUR equipment and capabilities available:

- D1 ADS-C with FANS 1/A capabilities
- G1 ADS-C with ATN capabilities

1.5.3 Additional surveillance equipment or capabilities are to be listed in Item 18 following the indicator SUR/ .

1.6 RNAV Approved Aircraft

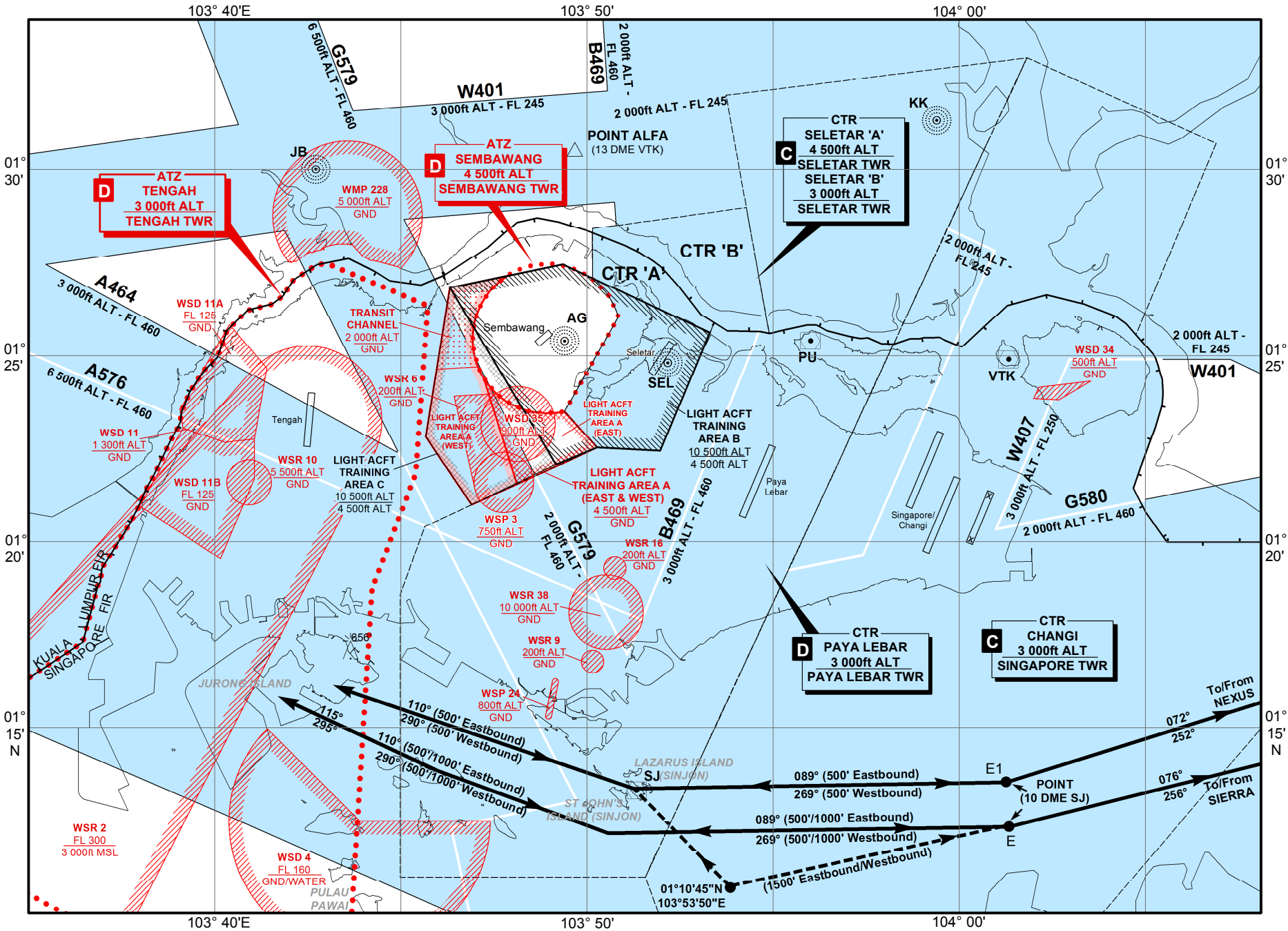
1.6.1 Aircraft flying on RNAV routes A464, A576, B470, G334, L625, L642, L644, L649, M646, M751, M753, M758, M761, M767, M768, M771, M772, M774, N875, N884, N891 and N892 (see page ENR 1.8-12) must be RNAV equipped and should annotate their flight plan as follows:

	Item 10	Item 15	Item 18
RNAV equipment is carried	<p>G (GNSS)</p> <p>I (Inertial Navigation)</p> <p>R (PBN approved) Guidance material in the application of performance based navigation to a specific route segment, route or area is contained in the Performance Based Navigation Manual (Doc 9613).</p>	True Mach NR and FL at entry and exit points	<p>The types of external GNSS augmentation, if any, are specified following the indicator NAV/ and separated by a space.</p> <p>The performance based navigation levels that can be met shall be specified following the indicator PBN/.</p>

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name	Significant Point Coordinates				Remarks	
{RNP Type}	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	FL series ↓ ↑		Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
L644	Route availability: (1) H24					
▲ DUDIS (WSJC/VVTS FIR BDRY)	070000N 1064836E				(7)	
(10)	192° -	165.8NM	FL 460 FL 240	Odd ⁽¹⁾		[Class A] (2) (3)
▲ MABLI	041717N 1061247E				(7)	
(10)	169° -	45.9NM	FL 460 FL 240	Odd ⁽¹⁾		[Class A] (4)
▲ OPULA	033155N 1062118E				(7)	
(10)	169° -	10.8NM	FL 460 FL 240	Odd ⁽¹⁾		[Class A] (4)
▲ ONAPO	032116N 1062318E				(7)	
(10)	169° -	26.4NM	FL 460 FL 240	Odd ⁽¹⁾		[Class A] (4)
▲ OMLIV	025512N 1062812E				(7)	
(10)	169° -	24.2NM	FL 460 FL 240	Odd ⁽¹⁾		[Class A] (5)
▲ OMBAP	023116N 1063242E				(7)	
(10)	169° -	30.7NM	FL 460 FL 240	Odd ⁽¹⁾		[Class A] (5)
▲ OLSAM	020059N 1063824E				(7)	
(10)	169° -	18.3NM	FL 460 FL 240	Odd ⁽¹⁾		[Class A] (5)
▲ OBLOT	014256N 1064147E				(7)	
(10)	169° -	20.1NM	FL 460 FL 240	Odd ⁽¹⁾		[Class A] (5)
▲ OBGET	012307N 1064531E				(7)	
(10)	169° -	107.2NM	FL 460 FL 240	Odd ⁽¹⁾		[Class A] (6)
▲ KIKOR (WSJC/WIIZ FIR BDRY)	002244S 1070524E				(7)	
<u>Route Remarks:</u>						
Lateral Limits: 25NM either side of line joining DUDIS to KIKOR.						
Available only for flights departing from Hong Kong or north of Hong Kong to Jakarta.						
<u>Point/Segment Remarks:</u>						
(2) ADS-C service is available to suitably equipped aircraft operating outside radar cover (between DUDIS and MABLI) and not in the exclusive ADS-B airspace within Singapore FIR.						
(3) Segment from DUDIS to MABLI use: P134.35 MHz S133.6 MHz						
(4) Segment from MABLI to OMLIV use: P134.7 MHz S134.15 MHz						
(5) Segment from OMLIV to OBGET use: P134.2 MHz S133.35 MHz						
(6) Segment from OBGET to KIKOR use: P134.4 MHz S128.1 MHz						
(7) NIL						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name {RNP Type}	Significant Point Coordinates		Upper limit Lower limit	FL series		Remarks
	Initial Track MAG ↓ ↑	Great Circle Dist NM		↓	↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
L649		Route availability: (1) H24				
▲ LAXOR (WSJC/RPHI FIR BDRY)	094937N 1144829E					
(10)		98.0NM	FL 460 FL 240		Even ⁽¹⁾	[Class A]
▲ URKET (WSJC/WBFC FIR BDRY)	081130N 1145000E					⁽²⁾
(10)		62.0NM	FL 460 FL 240		Even ⁽¹⁾	[Class A]
▲ DAKIX (WBFC/WSJC FIR BDRY)	070854N 1145054E					⁽³⁾
<p><u>Route Remarks:</u> Lateral Limits: 25NM either side of line joining DAKIX to LAXOR. Available only for flights departing from Brunei (WBSB), Labuan (WBKL) and Miri (WBGR) to Hong Kong (VHHH) only. No-PDC Flight Levels FL300 and FL380 applicable. ADS-C and CPDLC services are available to suitably equipped aircraft operating outside radar cover within the Singapore FIR.</p> <p><u>Point/Segment Remarks:</u> (2) NIL (3) BRU 359° 136NM</p>						

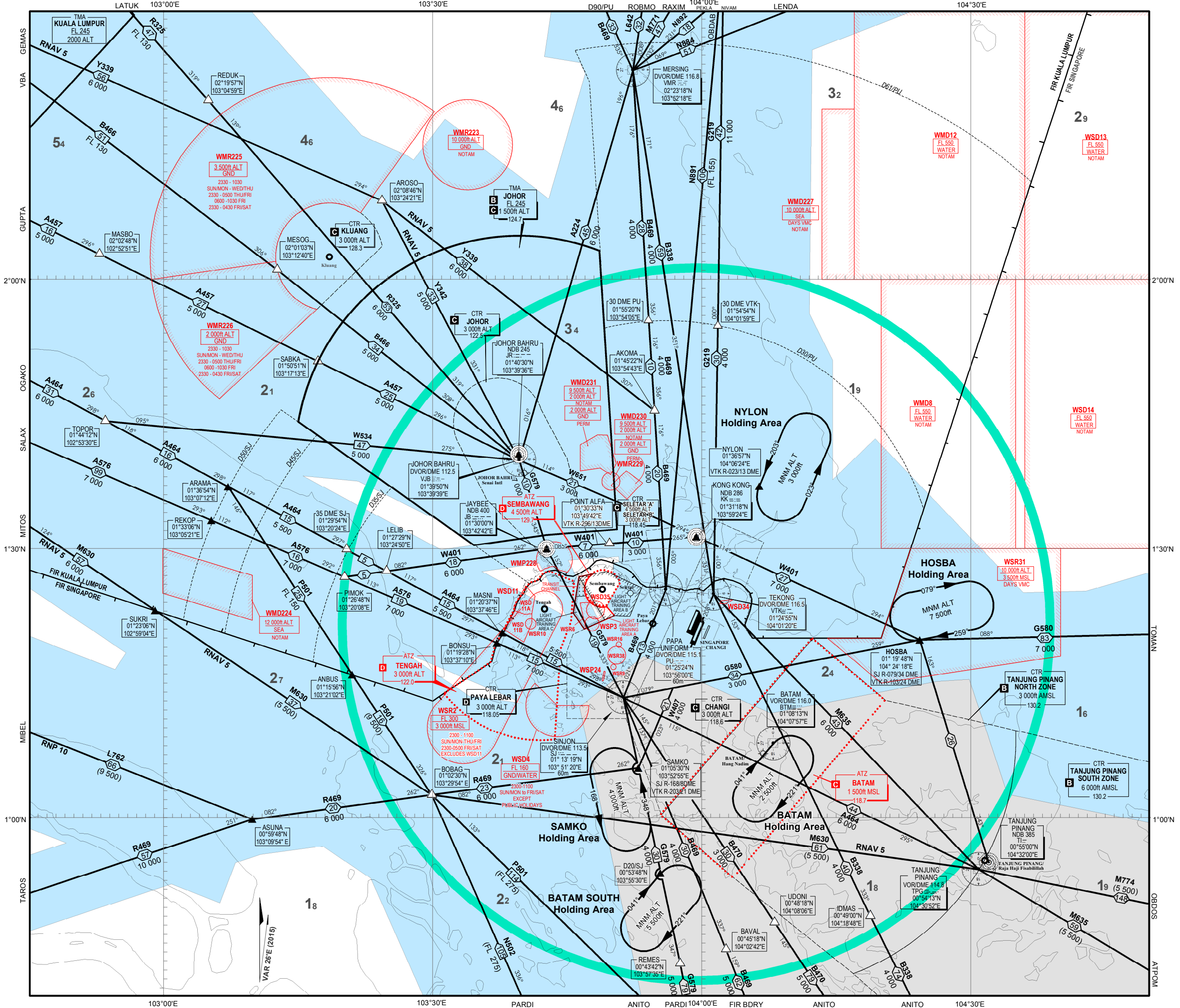
VMC CROSSING BY MILITARY AIRCRAFT



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AREA CHART - ICAO

SINGAPORE/JOHOR AIRSPACE COMPLEX
LOW LEVEL HOLDING AREAS



LEGEND	
Terminal Control Area (TMA)	<ul style="list-style-type: none"> Names of TMA: TMA JOHOR Airspace Classification: B, C Upper Limit: FL 145 Lower Limit: 1 500ft Radio frequency(ies): 124.7
Control Zone (CTR)	<ul style="list-style-type: none"> Name of CTR: CTR CHANGI Airspace Classification: G Upper Limit: 3 000ft Radio frequency(ies): 118.6m
Aerodrome Traffic Zone (ATZ)	<ul style="list-style-type: none"> Name of ATZ: ATZ TENGAH Airspace Classification: D Upper Limit: 3 000ft Radio frequency(ies): 122.0
ATS Routes	<ul style="list-style-type: none"> Route designator: B469 Distance in nautical miles: 4 000/FL 160 Minimum flight altitude (ft)/flight level: (4 000)/(FL 160) Lower limit (ft)/flight level: (4 000)/(FL 160)
Oceanic Control Area (OCA)	-
Reporting Point	<ul style="list-style-type: none"> Compulsory: ▲ On request: △
DME distance from SJ Navaid	D35/SJ
Radio Navigation Aid	<ul style="list-style-type: none"> Name: SINJON DVOR/DME 113.5 Vertical limits: 01°19'21"N - 103°11'19"E Geographical Coordinates: 60m Elevation of DME site: 60m
Collocated VOR and DME Radio Navigation Aids	<ul style="list-style-type: none"> Compass rose orientated on the chart to Magnetic North
Restricted Airspace (P - Prohibited, R - Restricted, D - Danger)	<ul style="list-style-type: none"> Identification of area: WSD13 Nationality letter: FL 400 Vertical limits: FL 400 Activation by NOTAM

Area Minimum Altitude (AMA)
Each quadrilateral contains an area minimum altitude (AMA) which represents the lowest altitude which may be used under instrument meteorological conditions (IMC). The AMA provides a minimum clearance of 1 000 feet (300m) above all terrain and obstacles in the quadrilateral. It is represented in thousands and hundreds of feet above mean sea level.
Example : 3 400 feet **34**
NOTE :- In computing the area minimum altitude, a margin of 200 feet (60m) for vegetation has been added for spot elevations.

Speed Control Procedures
Speed control procedures are in force unless notified otherwise by ATC or ATIS.
All arriving turbo-propeller and turbo-jet aircraft are to fly at not faster than indicated air speed 250 knots when within 40nm from Singapore Changi Airport or when at or below 10 000ft except all arriving aircraft into Singapore Changi Airport shall comply with the speed restrictions depicted on the transitions and RNAV STARS. Further speed reductions will be regulated by ATC as necessary.
Pilots who may not be able to comply with the speed limits specified above for reasons of flight safety and/or weather should inform ATC and state the speed(s) acceptable.

AIRSPACE CLASSIFICATION IN THE SINGAPORE FIR

Airspace	Levels	Classification
Controlled airspace	FL150 to FL460	A
	Surface to FL150	B
Controlled airspace more than 100 nm seaward from the shoreline	Lower limit to FL460	A
Control Zone (CTRs)	Changi CTR	C
	Paya Lebar CTR	D
	Seletar CTR	C
ATZs	Surface to upper limit	D
Uncontrolled airspace		G*

* Aircraft operating in the Light Aircraft Training Areas A, B and C (please refer to page ENR 5.2-1) are required to have continuous two-way communications with the appropriate ATS authority.

SINGAPORE	D-ATIS	128.6
	APP	120.3
	TWR	119.3
		118.6
		118.25

Note:
FOR DEPARTURE AND ARRIVAL ROUTES
REFER TO WSSB AD 2-51 TO WSSB AD 2-100

PROHIBITED, RESTRICTED AND DANGER AREAS

	ACTIVITY	UPPER LIMIT LOWER LIMIT	REMARKS
WSD1	Rifle Range	500ft ALT GND	Permanently Active as in ENR 5
WSR2	Jet Let-down Sector	FL 300 3 000ft MSL	Permanently Active as in ENR 5
WSP3	-	750ft ALT GND	Permanently Active as in ENR 5
WSD4	A/G and G/G Firing Range	FL 160 GND/WATER	Permanently Active as in ENR 5
WMD8	Naval Air/Air Firing Range	FL 550 WATER	Activation by NOTAM
WSD11	Small Arm Firing	1 300ft ALT GND	Permanently Active as in ENR 5
WSD11A	Artillery Firing	FL 125 GND	Activation by NOTAM
WSD11B	Artillery Firing	FL 125 GND	Activation by NOTAM
WMD12	Naval Anti-aircraft Firing	FL 550 WATER	Activation by NOTAM
WSD13	Naval Anti-aircraft Firing	FL 550 WATER	Activation by NOTAM
WSD14	Naval Anti-aircraft Firing & Live Air/Air Firing	FL 550 WATER	Activation by NOTAM
WSP24	-	800ft ALT GND/WATER	Permanently Active as in ENR 5
WSR6	Helicopter Operations	200ft ALT GND	Permanently Active as in ENR 5
WSR9	Helicopter Operations	200ft ALT GND	Permanently Active as in ENR 5
WSR16	Helicopter Operations	200ft ALT GND	Permanently Active as in ENR 5
WSR31	Training Area	10 000ft ALT 3 500ft MSL	Permanently Active as in ENR 5
WSD33	Rifle Range	500ft ALT GND	Permanently Active as in ENR 5
WSD34	Rifle Range	500ft ALT GND	Permanently Active as in ENR 5
WSD35	Rifle Range	900ft ALT GND	Permanently Active as in ENR 5
WSR10	-	5 500ft ALT GND	Permanently Active as in ENR 5
WSR38	-	10 000ft ALT GND	Permanently Active as in ENR 5
	Transit Channel	2 000ft ALT GND	Activated only for Military acft crossing
*	Light Aircraft Training Area A	4 500ft ALT GND/*2 000ft	Training & Local Flts in VMC only
*	Light Aircraft Training Area B	10 500ft ALT 4 500ft ALT	High Flying Training Ops in VMC only
*	Light Aircraft Training Area C	10 500ft ALT 4 500ft ALT	High Flying Training Ops in VMC only
WMR223	Parachute Dropping	10 000ft ALT GND	Permanently Active as in ENR 5
WMD224	Firing Range	12 000ft ALT SEA	Activation by NOTAM
WMR225	RMAF Helicopter Training Area	3 500ft ALT GND	Permanently Active as in ENR 5
WMR226	RMAF Helicopter Training Area	2 000ft ALT GND	Permanently Active as in ENR 5
WMD227	Radar Bombing Range	10 000ft ALT SEA	Activation by NOTAM
WMP228	Sultan's Palace	5 000ft ALT GND	Permanently Active as in ENR 5
WMR229	Helicopter Operations	1 500ft ALT GND	Permanently Active as in ENR 5
WMD230	Artillery Firing Range	2 000ft ALT GND	Permanently Active as in ENR 5
WMD231	Artillery Firing Range	2 000ft ALT GND	Permanently Active as in ENR 5

* In Transit Channel

* AEROBATICS IS PROHIBITED IN LIGHT AIRCRAFT TRAINING AREAS A, B and C.

SPECIAL NOTE :-

1. WEATHER BALLOONS

BALLOONS WILL BE RELEASED FOR MET OBSERVATION AT THE CENTRE FOR CLIMATE RESEARCH SINGAPORE, UPPER AIR OBSERVATORY (012025N 1035317E), BEARING 244° MAG AND DISTANCE 1.5NM FROM SOUTHERN END OF PAYA LEBAR RWY 02.

(I) BALLOONS WILL BE RELEASED DAILY AT 2330UTC AND 1040UTC. CUT-OFF TIMINGS FOR THE RELEASE ARE AT 0030UTC AND 1230UTC RESPECTIVELY. RATE OF ASCENT IS 320M PER MIN. MAX HGT OF BALLOON 115 000FT (35 000M). THE BALLOON, UNCOLOURED AND 162CM IN DIAMETER, IS ATTACHED WITH RADIOSONDE EQUIPMENT. IT WILL BURST 1.5 TO 2HRS AFTER RELEASE AND RADIOSONDE EQUIPMENT WILL DECSEND WITHIN 60NM RADIUS.

(II) A BALLOON WILL BE RELEASED BETWEEN 2330UTC AND 0030UTC ON EITHER THE 3rd OR 4th WEEK OF THE MONTH. RATE OF ASCENT IS 320M PER MIN. MAX HGT OF BALLOONS IS 115 000FT (35 000M). THE BALLOON, UNCOLOURED AND 191CM IN DIAMETER, IS ATTACHED WITH OZONESONDE/RADIOSONDE EQUIPMENT AND PARACHUTE. IT WILL BURST 1.5 TO 2HR AFTER RELEASE.

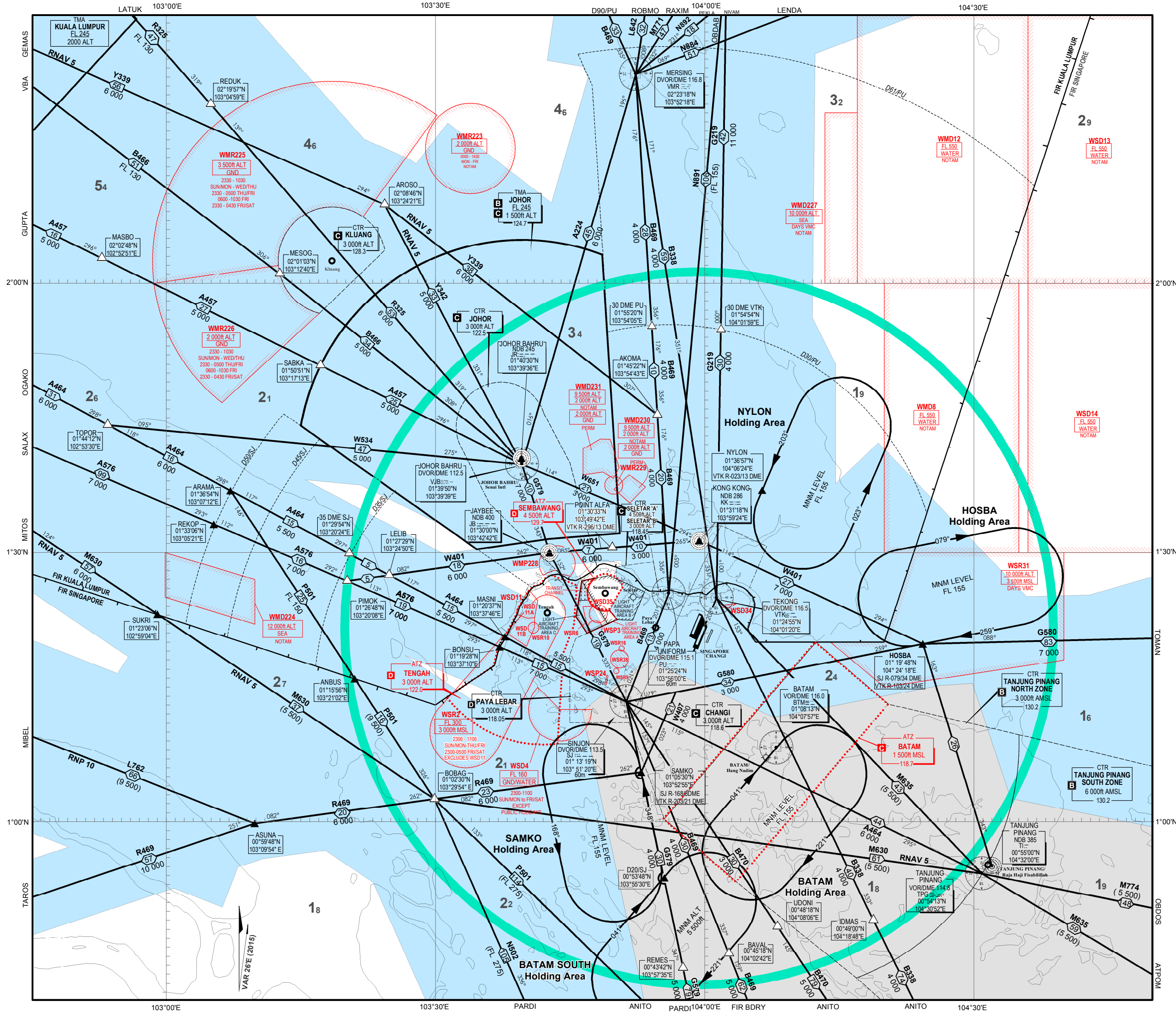
2. AEROMODELLING AND KITE FLYING

(A) GENERAL WARNING

- i) PILOTS FLYING AT LOW ALTITUDES SHOULD WATCH OUT FOR POSSIBLE HAZARDS SUCH AS MODEL AIRCRAFT AND KITES, ESPECIALLY WHEN FLYING NEAR PARKS AND OPEN GROUND.
- ii) THE LOCATION OF SOME OF THE PARKS IN SINGAPORE WHERE KITE AND AERO MODEL FLYING MAY OCCUR ARE SHOWN ON ENR 3.4-5. PILOTS SHOULD NOTE THAT THE CHART AT ENR 3.4-5 DOES NOT SHOW ALL THE PARKS IN SINGAPORE AND THAT HAZARDS SUCH AS KITE FLYING AND AERO MODEL FLYING MAY TAKE PLACE AT PARKS AND OPEN GROUND NOT INDICATED IN ENR 3.4-5.
- iii) ACCORDING TO THE SINGAPORE AIR NAVIGATION ORDER, 1985, KITE FLYING AND AERO MODEL FLYING ARE NOT PERMITTED ABOVE 200ft OR WITHIN 5km OF AN AERODROME. HOWEVER, PILOTS ARE ADVISED TO LOOK OUT FOR SUCH HAZARDS AT ALL TIMES AS MEMBERS OF THE PUBLIC MAY INADVERTENTLY FLY KITES OR AERO MODELS ABOVE THE HGT OF 200ft OR WITHIN 5km OF AN AERODROME.

AREA CHART - ICAO

SINGAPORE/JOHOR AIRSPACE COMPLEX
HIGH LEVEL HOLDING AREAS



LEGEND

Terminal Control Area (TMA)	<ul style="list-style-type: none"> Name of TMA: TMA JOHOR Airspace Classification: FL 145 Upper Limit: 1 500ft Lower Limit: 124.7 Radio frequency(ies):
Control Zone (CTR)	<ul style="list-style-type: none"> Name of CTR: CTR CHANGI Airspace Classification: 3 000ft Upper Limit: 118.6m Radio frequency(ies):
Aerodrome Traffic Zone (ATZ)	<ul style="list-style-type: none"> Name of ATZ: ATZ TENGAH Airspace Classification: 3 000ft Upper Limit: 122.0 Radio frequency(ies):
ATS Routes	<ul style="list-style-type: none"> Route designator: B469 Distance in nautical miles: 20 Minimum flight altitude (ft)/flight level: 4 000/FL 160 Lower limit (ft)/flight level: (4 000)/(FL 160)
Oceanic Control Area (OCA)	
Reporting Point	<ul style="list-style-type: none"> Compulsory: ▲ On request: △
DME distance from SJ Navaid	D35/SJ
Radio Navigation Aid	<ul style="list-style-type: none"> Name: SINJON DVOR/DME 113.5 Vertical limits: 01°19'21"N, 103°51'19"E Geographical Coordinates: 60m Elevation of DME site:
Collocated VOR and DME Radio Navigation Aids	Compass rose orientated on the chart to Magnetic North
Restricted Airspace (P - Prohibited, R - Restricted, D - Danger)	<ul style="list-style-type: none"> Identification of area: WSD13 Nationality letter: FL 550 Vertical limits: WATER Activation by NOTAM:

NOTE :- See flip side for details of designated areas

Area Minimum Altitude (AMA)

Each quadrilateral contains an area minimum altitude (AMA) which represents the lowest altitude which may be used under instrument meteorological conditions (IMC). The AMA provides a minimum clearance of 1 000 feet (300m) above all terrain and obstacles in the quadrilateral. It is represented in thousands and hundreds of feet above mean sea level.

Example : 3 400 feet **34**

NOTE :- In computing the area minimum altitude, a margin of 200 feet (60m) for vegetation has been added for spot elevations.

Speed Control Procedures

Speed control procedures are in force unless notified otherwise by ATC or ATIS.

All arriving turbo-propeller and turbo-jet aircraft are to fly at not faster than indicated air speed 250 knots when within 40nm from Singapore Changi Airport or when at or below 10,000ft except all arriving aircraft into Singapore Changi Airport shall comply with the speed restrictions depicted on the transitions and RNAV STARS. Further speed reductions will be regulated by ATC as necessary.

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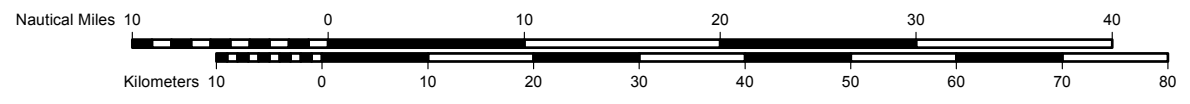
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SINGAPORE	D-ATIS	128.6
	APP	120.3
		119.3
	TWR	118.6
		118.25

Note :
FOR DEPARTURE AND ARRIVAL ROUTES
REFER TO WSSS AD 2-51 TO WSSS AD 2-100



PROHIBITED, RESTRICTED AND DANGER AREAS

	ACTIVITY	UPPER LIMIT LOWER LIMIT	REMARKS
WSD1	Rifle Range	500ft ALT GND	Permanently Active as in ENR 5
WSR2	Jet Let-down Sector	FL 300 3 000ft MSL	Permanently Active as in ENR 5
WSP3	-	750ft ALT GND	Permanently Active as in ENR 5
WSD4	A/G and G/G Firing Range	FL 160 GND/WATER	Permanently Active as in ENR 5
WMD8	Naval Air/Air Firing Range	FL 550 WATER	Activation by NOTAM
WSD11	Small Arm Firing	1 300ft ALT GND	Permanently Active as in ENR 5
WSD11A	Artillery Firing	FL 125 GND	Activation by NOTAM
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WSR31	Training Area	10 000ft ALT 3 500ft MSL	Permanently Active as in ENR 5
WSD33	Rifle Range	500ft ALT GND	Permanently Active as in ENR 5
WSD34	Rifle Range	500ft ALT GND	Permanently Active as in ENR 5
WSD35	Rifle Range	900ft ALT GND	Permanently Active as in ENR 5
WSR10	-	5 500ft ALT GND	Permanently Active as in ENR 5
WSR38	-	10 000ft ALT GND	Permanently Active as in ENR 5
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WMR223	Parachute Dropping	10 000ft ALT GND	Permanently Active as in ENR 5
WMD224	Firing Range	12 000ft ALT SEA	Activation by NOTAM
WMR225	RMAF Helicopter Training Area	3 500ft ALT GND	Permanently Active as in ENR 5
WMR226	RMAF Helicopter Training Area	2 000ft ALT GND	Permanently Active as in ENR 5
WMD227	Radar Bombing Range	10 000ft ALT SEA	Activation by NOTAM
WMP228	Sultan's Palace	5 000ft ALT GND	Permanently Active as in ENR 5
WMR229	Helicopter Operations	1 500ft ALT GND	Permanently Active as in ENR 5
WMD230	Artillery Firing Range	2 000ft ALT GND	Permanently Active as in ENR 5
WMD231	Artillery Firing Range	2 000ft ALT GND	Permanently Active as in ENR 5

* In Transit Channel

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SPECIAL NOTE :-

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2. AEROMODELLING AND KITE FLYING

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- iii) ACCORDING TO THE SINGAPORE AIR NAVIGATION ORDER, 1985, KITE FLYING AND AERO MODEL FLYING ARE NOT PERMITTED ABOVE 200ft OR WITHIN 5km OF AN AERODROME. HOWEVER, PILOTS ARE ADVISED TO LOOK OUT FOR SUCH HAZARDS AT ALL TIMES AS MEMBERS OF THE PUBLIC MAY INADVERTENTLY FLY KITES OR AERO MODELS ABOVE THE HGT OF 200ft OR WITHIN 5km OF AN AERODROME.

ENR 5 NAVIGATION WARNINGS

ENR 5.1 PROHIBITED, RESTRICTED AND DANGER AREAS

1 INTRODUCTION

- 1.1 All airspace in which a potential hazard to aircraft operations may exist and all areas over which the operation of civil aircraft may, for one reason or another be restricted either temporarily or permanently, are classified according to three types of areas as defined by ICAO.
- 1.2 Each area is described in the tabulation found in pages ENR 5.1-3 to 5.1-6 which indicates its lateral and vertical limits, the type of restriction or hazard involved, the times at which it applies and other pertinent information.

2 DANGER AREA

- 2.1 An airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times. This term is used only when the potential danger to aircraft has not led to the designation of the airspace as restricted or prohibited. The effect of the creation of the danger area is to caution operators or pilots of aircraft that it is necessary for them to assess the dangers in relation to their responsibility for the safety of their aircraft.

3 PROHIBITED AREA

- 3.1 An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited. This term is used only when the flight of civil aircraft within the designated airspace is not permitted at any time under any circumstances.

4 RESTRICTED AREA

- 4.1 An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions. This term is used whenever the flight of civil aircraft within the designated airspace is not absolutely prohibited but may be made only if specified conditions are complied with. Thus, prohibition of flight except at certain meteorological conditions. Similarly, prohibition of flight unless special permission had been obtained, leads to the designation of restricted area. However, conditions of flight imposed as a result of application of rules of the air or air traffic service practice or procedures (for example, compliance with minimum safe heights or with rules stemming from the establishment of controlled airspace) do not constitute conditions calling for designation as a restricted area.

5 DESIGNATION OF AREA

- 5.1 Each area is numbered and single series of numbers is used for all areas, regardless of type, to ensure that a number is never duplicated.
- 5.2 The type of area involved is indicated by the letter "P" for Prohibited, "R" for Restricted and "D" for Danger, preceded by the Nationality letters "WS". For example, areas are assigned numbers and letters in the following manner - WSD1, WSR2, WSP3, WSD4 etc.

Identification, Name and Lateral Limits	Upper limit	Remarks (time of activity, type of restriction, nature of hazard, risk of interception)
	Lower limit	
1	2	3
PROHIBITED AREAS		
WSP3 A circle, 0.8NM radius centred at 012136N 1034746E	750 FT GND	Active: Permanent. Under no circumstances shall a forced landing be permitted within the area. Rotary wing aircraft shall avoid overflying the area.
WSP24 Area within two circles, 150m radius, centred at Mt. Faber (011615N 1034909E) and Sentosa Island (011519N 1034858E) and the tangential lines joining these circles.	800 FT ALT GND/WATER	Active: Permanent.
← WMP228 BUKIT SERENE ← Area within 2NM centred at 012845N 1034334E with the southern border of the Prohibited Area coinciding with the coastline of South Johor.	5000 FT ALT GND	Sultan's Palace. Active: Permanent. (refer to AIP Malaysia)
RESTRICTED AREAS		
← WSR2 TENGAHCORRIDOR ← Area within two circles, 2NM radius, centred at Tengah and 4NM radius, centred at 011000N 1033324E and the tangents joining these circles but excluding WSD11 (Pasir Laba Range) when notified as active.	FL 300 3000 FT MSL	Jet Let-Down Sector. Active: BTN 2300-1100 SUN-MON to THU-FRI and BTN 2300-0500 FRI-SAT. Controlling Authority : Tengah APP on 130.0 or 263.4 MHz DRG AD OPR HR and SATCC (RSAF element) on 123.4 MHz and 288.2MHz after AD OPR HR.
← WSR6 Area bounded by 012355N 1034626E to 012359.0N 1034734.1E then along the boundaries of WSD35 and WSP3 to 012130.00N 1034658.37E.	200 FT ALT GND	Helicopter Operations. Active: Permanent.
← WSR9 ← A circle, 0.3NM radius centred at 011647N 1035009E. ← ←	200 FT ALT GND	Helicopter Operations. Active: Permanent.
WSR10 A circle, 0.6NM radius, centred at 012136.2197N 1034055.3795E.	5500 FT ALT GND	Active: Permanent.
WSR16 A circle, 0.3NM radius centred at 011918N 1035045E.	200 FT ALT GND	Helicopter Operations. Active: Permanent.
WSR31 012000N 1041400E 012000N 1042000E 013000N 1042300E 013000N 1044000E 011800N 1044000E 011500N 1042000E.	10000 FT ALT 3500 FT MSL	Training Area. Active daily during daylight hours in VMC only when radar unit in operations.
WSR38 A circle, 1NM radius centred at 011807N 1035031E	10000 FT ALT GND	Istana. Active: Permanent. All FLT BTN SJ/JP on AWY G579 are to avoid at all times the area which overlaps the eastern edge of G579 .
WMR104 032859N 1030254E 023959N 1023454E 022300N 1025954E 022300N 1034554E 032059N 1032054E 031859N 1031554E 032559N 1031254E 032859N 1030254E.	10000 FT ALT 3000 FT ALT	Training. Active: 2230-1030 SUN-MON to FRI-SAT (refer to AIP Malaysia)

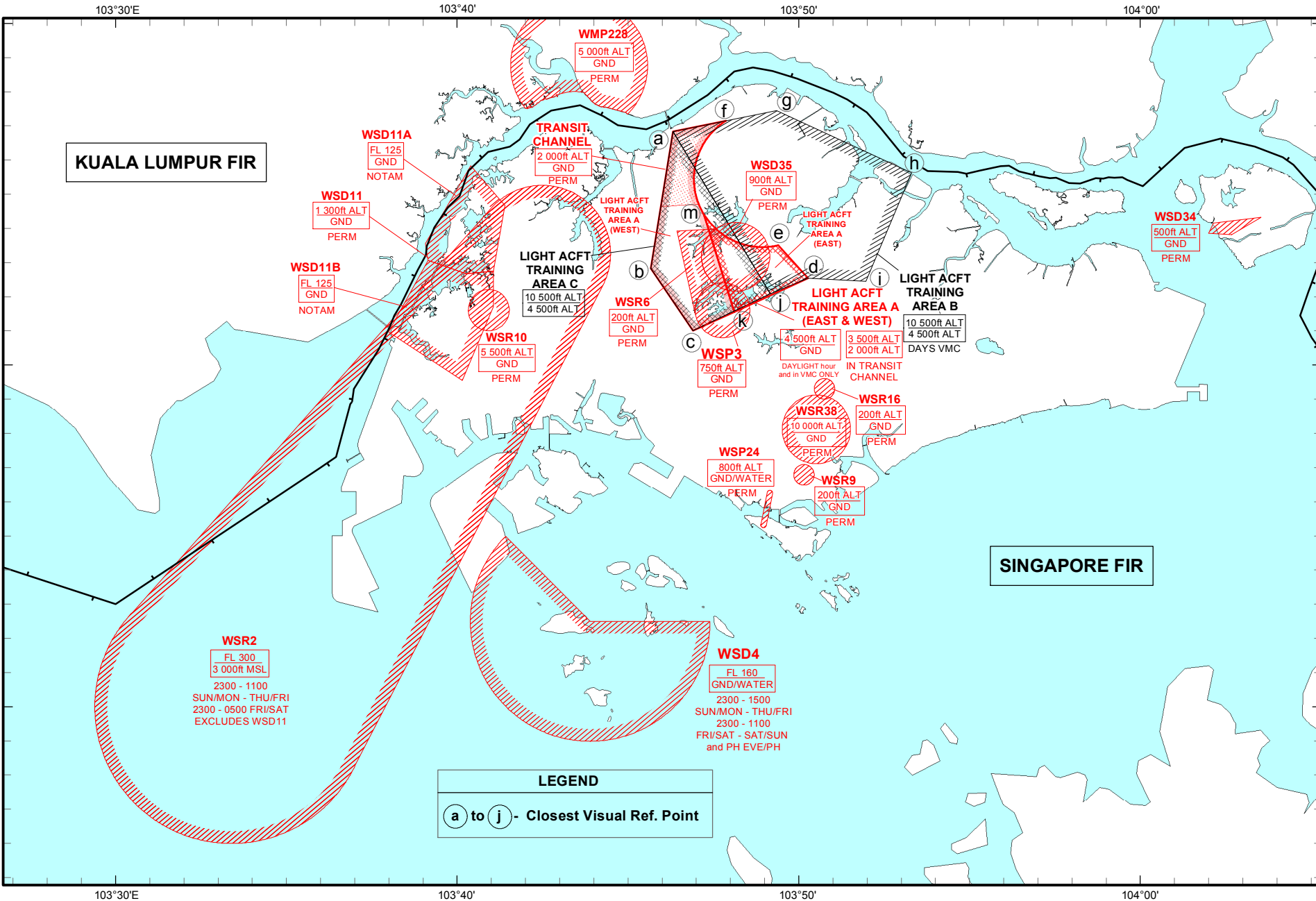
Identification, Name and Lateral Limits	Upper limit	Remarks (time of activity, type of restriction, nature of hazard, risk of interception)
	Lower limit	
1	2	3
RESTRICTED AREAS		
WMR223 KANGAR KAHANG A circle, 5NM radius, centred at 021500N 1033354E	10000 FT ALT GND	Parachute Dropping. Active: by NOTAM. Controlling Authority: Kluang Tower 128.3 MHz/122.4 MHz. (refer to AIP Malaysia)
WMR225 NORTH-KLUANG An arc of a circle, radius 20NM, centred at 020230N 1031824E (Kluang Control Tower) from 020000N 1025839E to 021830N 1032954E; then an arc of a circle, radius 6NM, centred at 020230N 1031824E (Kluang Control Tower) from 020200N 1031224E to 020730N 1032154E; then straight lines joining 020000N 1025839E to 020200N 1031224E and 021830N 1032954E to 020730N 1032224E.	3500 FT ALT GND	Army Airwing Helicopter Training Area Active: 2330-1030 SUN-MON TO WED-THU; 2330-0500 THU-FRI; 0600-1030 FRI; and 2330-0430 FRI-SAT; SUN and PH closed. Controlling Authority: Kluang Tower 128.3 MHz and 122.4 MHz
WMR226 WEST-KLUANG An arc of a circle, radius 20NM, centred at 020230N 1031824E (Kluang Control Tower) from 020000N 1025839E to 014630N 1030554E; then an arc of a circle, radius 6NM, centred at 020230N 1031824E (Kluang Control Tower) from 020200N 1031224E to 015650N 1031709E.	2000 FT ALT GND	PPR for all non-Malaysian Army aircraft. During hours of operations, request through Kluang Army Airwing Operations (48 hours prior notice). No refuelling for civil aircraft. (refer to AIP Malaysia)
WMR229 A circle, 1NM radius, centred at 013730N 1034952E.	1500 FT ALT GND	Helicopter Operations. Active: 0100-0830 MON-FRI. Visiting military aircraft are required to give advance notice of movements to Jungle Warfare School. (refer to AIP Malaysia)
DANGER AREAS		
← WSD4 SOUTHERN ISLAND LIVE FIRING RANGE An arc, 3.5NM radius, centred at 011230N 1034354E with eastern extremity at 011230N 1034724E and western extremity at 011459N 1034125E.	FL 160 GND/WATER	Air to GND and GND to GND Firing Range. Active: 2300-1500 SUN-MON to THU-FRI; 2300-1100 FRI-SAT to SAT-SUN and PH Eve-PH Activities outside these hours will be notified by NOTAM.
← WSD11 PASIR LABA ← 012550N 1034024E 012333N 1033904E ← 012303N 1033909E 012058N 1033759E ← 011933N 1034009E 012142N 1034104E ← 012245N 1034104E 012440N 1034124E (General Area).	← 1300 FT ALT ← GND	Small Arm Firing Active: Permanent.
← WSD11A PASIR LABA ← 012550N 1034024E 012333N 1033904E ← 012303N 1033909E 012240N 1034016E ← 012245N 1034104E 012440N 1034124E (Northern Area within the General Area).	← FL 125 ← GND	Artillery Firing At least 7 days advance notice by NOTAM.
← WSD11B PASIR LABA ← 012303N 1033909E 012240N 1034016E ← 012245N 1034104E 012142N 1034104E ← 011933N 1034009E 012058N 1033759E (Southern Area within the General Area).	← FL 125 ← GND	Artillery Firing At least 7 days advance notice by NOTAM.

Identification, Name and Lateral Limits	Upper limit Lower limit	Remarks (time of activity, type of restriction, nature of hazard, risk of interception)
1	2	3
DANGER AREAS		
← WSD13 AREA KILO		
← BTN LAT 020000N 023000N and LONG 1043600E 1045500E.	← FL 550 ← WATER	Naval Anti-Aircraft Firing 72 HR notice by NOTAM.
← WSD14 AREA LIMA		
← BTN LAT 013000N 020000N and LONG 1043600E 1045500E.	FL 550 WATER	Naval Anti-Aircraft Firing and Live Air to Air Firing. 72 HR notice by NOTAM.
← WSD15 AREA MIKE		
← BTN LAT 013000N 020000N and LONG 1045500E 1053000E.	FL 550 WATER	Naval Carrier Operation Area 72 HR notice by NOTAM.
← WSD20 AREA HOTEL		
← BTN LAT 023000N 030000N and LONG 1043600E 1045500E.	2000 FT ALT WATER	Naval Exercise Area 72 HR notice by NOTAM.
← WSD34 PULAU TEKONG		
← 012409N 1040208E 012419N 1040332E 012349N 1040240E 012351N 1040200E.	← 500 FT ALT ← GND	Rifle Range Active: Permanent
← WSD35 NEE SOON		
← A circle, 1NM radius, centred at 012310N 1034809E.	← 900 FT ALT GND	Rifle Range Active: Permanent
← WSD44		
← BTN LAT 020000N 023000N and LONG 1045500E 1051230E	← FL 550 ← WATER	Naval Exercise Area Active: 72hr prior notice by NOTAM
← WSD45		
← BTN LAT 020000N 023000N and LONG 1051230E 1053000E.	FL 550 WATER	Naval Exercise Area Active: 72hr prior notice by NOTAM
← WMD8 CHINA SEA NORTH RANGE		
← BTN LAT 013000N 020000N and LONG 1042000E 1043500E.	FL 550 WATER	Naval Air to Air Firing Range Active: 72hr prior notice by NOTAM
← WMD12 AREA JULIET		
← BTN LAT 020000N 023000N and LONG 1041700E 1043600E.	FL 550 WATER	Naval Anti-Aircraft Firing Range Active: 72hr prior notice by NOTAM
← WMD21 AREA GOLF		
← BTN LAT 023000N 030000N and LONG 1043600E 1041700E.	← 2000 FT ALT WATER	Naval Exercise Area Active: 72hr prior notice by NOTAM
← WMD224 MALAYSIAN NAVAL EXERCISE AREA		
← 012500N 1025954E 013000N 1025954E 012700N 1030954E 012200N 1030954E	← 12000 FT ALT WATER	Firing Range Active: 48hr prior notice by NOTAM. 2 exercises per month.
← WMD227 PULAU YU		
← 021900N 1041324E 020000N 1041324E 020000N 1041700E 021900N 1041700E 021900N 1041324E	← 10000 FT ALT WATER	Radar Bombing Range Active: 72hr prior notice by NOTAM. Area will be confirmed 'clear' by participating aircraft prior to commencing live attacks. (refer to AIP Malaysia)

<i>Identification, Name and Lateral Limits</i>	<i>Upper limit</i>	<i>Remarks (time of activity, type of restriction, nature of hazard, risk of interception)</i>
	<i>Lower limit</i>	
1	2	3
DANGER AREAS		
← WMD230 ULU TIRAM (SOUTH) 013720N 1035324E 013840N 1035135E 013704N 1034954E 013530N 1035140E.	2000 FT ALT # GND	Artillery Firing Range. Active: PERM # When activity necessitates raising upper limit to 9,500ft ALT, 48hr prior notice will be given by NOTAM. (refer to AIP Malaysia)
WMD231 ULU TIRAM (NORTH) 013815N 1034950E 013927N 1035028E 014238N 1034929E 014239N 1034822E 014133N 1034627E 013840N 1034627E 013858N 1034840E.	2000 FT ALT * GND	Artillery Firing Range. Active: PERM * When activity necessitates raising upper limit to 9,500ft ALT, 48hr prior notice will be given by NOTAM. (refer to AIP Malaysia)

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PROHIBITED, RESTRICTED AND DANGER AREAS - CHART 2



01° 20' N

01° 10' N

104°00'

103°50'

103°40'

103°30'E

104°00'

103°50'

103°40'

103°30'E

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2 PROCEDURES FOR START-UP AND PUSHBACK OF AIRCRAFT

- 2.1 Ground crew shall ensure that the area behind an aircraft is clear of vehicles, equipment and other obstructions before the start-up or pushback of aircraft commences.
- 2.2 When it becomes necessary to vary a procedure to expedite aircraft movements, Ground Movement Controller ("Singapore Ground") shall issue specific instructions to the pilot.
- 2.3 When the pilot is ready for start-up and pushback, he shall seek confirmation from the ground crew that there is no hazard to his aircraft starting up. He shall then notify Singapore Ground that he is ready for pushback. On being told by Singapore Ground that pushback is approved, he shall co-ordinate with the ground crew for the start-up and pushback of the aircraft.
- 2.4 The lead-in lines are for aircraft nose-in guidance. For aircraft stands without dedicated pushback lines, ground crew may use the lead-in lines for pushback guidance.
- 2.5 For more information, refer to Airport Operations Centre System (AOCS) at <https://aoc.changiairport.com/> for detailed pushback procedures.

3 ADVANCED MULTILATERATION SYSTEM

3.1 INTRODUCTION

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

3.2 CARRIAGE OF MODE-S SSR TRANSPONDER

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

3.3 MULTILATERATION SYSTEM OUTLINE

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

3.4 AIRCRAFT REQUIREMENTS

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

3.5 PROCEDURES/ACTIONS REQUIRED BY PILOTS

- 3.5.1 The Multilateration System needs to receive squitters and to acquire the Mode A code of a Mode S equipped aircraft at all times when it is on the ground. This is to enable detection and identification of the aircraft (from its Mode A code or ICAO callsign) as soon as it pushes back. Hence, the following actions from pilots are required.
- 3.5.2 Pre-Pushback / Taxi
- a. Pilots will be required to enter an assigned Mode A code at start-up. This code will be either a discrete or non-discrete code (a conspicuity code, e.g. 1000).

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

3.5.3 After Landing

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

4 **AIRFIELD GROUND LIGHTING CONTROL AND MONITORING SYSTEM (AGLCMS) AND MARKINGS**

4.1 **INTRODUCTION**

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

4.2 **TAXI INSTRUCTIONS**

- 4.2.1 When the green centreline lights are switched on, ATC will issue verbal instructions to pilots/ airline operators for taxi / tow clearance. The green taxiway centreline lights are provided for guidance. Pilots/ airline operators shall stop at all red stop bar lights.
- 4.2.2 All green centreline lights on taxiways leading to the runways terminate at the runway holding positions where, by default, red stop bar lights remain on unless deselected by the Runway Controller. When deselected, these stop bar lights will re-activate automatically. Pilots and drivers shall not cross any lighted red stop bar lights.
- 4.2.3 Pilots and drivers shall enter / cross the runway or taxiway only when **both** the following conditions are met:
The crew have
 - a. Received positive ATC clearance to enter / cross the runway or taxiway, and
 - b. Observed that the red stop-bar lights are turned off.

4.3 **INFORMATION AND MANDATORY SIGNS/MARKINGS**

- 4.3.1 When following ATC verbal taxi instructions, pilots are advised to also navigate their taxi route with reference to information and mandatory signs/markings provided at the airport so as to maintain situational awareness of their whereabouts at all times.

AERODROME CHART - ICAO

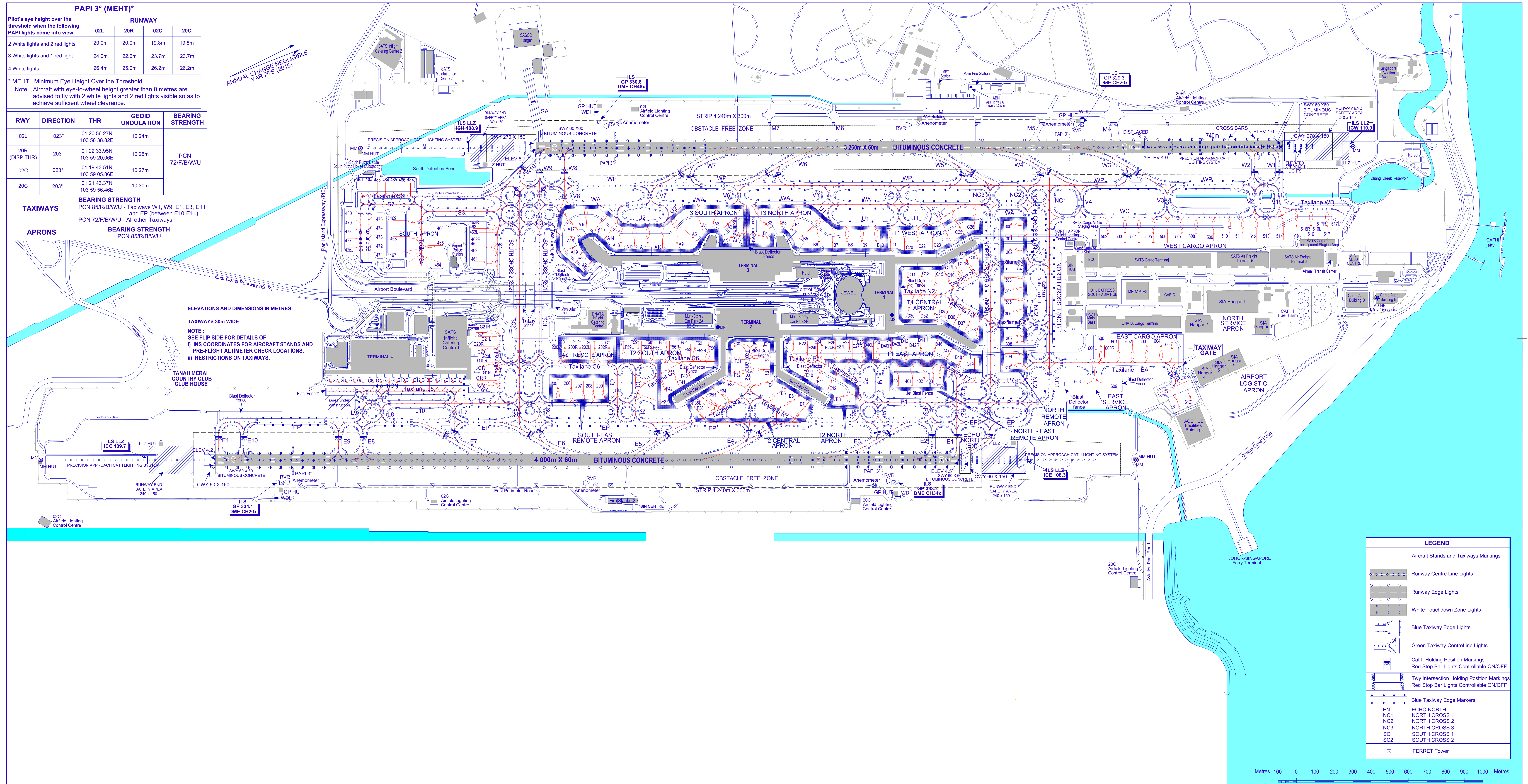
01° 21' 33"N
103° 59' 22"E

AERODROME ELEVATION 6.66m

TWR 118.6 / 118.25
GND 124.3 / 121.85 / 121.725
DELIVERY 121.65

RAMP TWR 122.55 (GMC 4 EAST)
GND 125.65 (GMC 4 WEST)

SINGAPORE/SINGAPORE CHANGI



PAPI 3° (MEHT)*				
Pilot's eye height over the threshold when the following PAPI lights come into view.		RUNWAY		
	02L	20R	02C	20C
2 White lights and 2 red lights	20.0m	20.0m	19.8m	19.8m
3 White lights and 1 red light	24.0m	22.6m	23.7m	23.7m
4 White lights	26.4m	25.0m	26.2m	26.2m

* MEHT - Minimum Eye Height Over the Threshold.
Note - Aircraft with eye-to-wheel height greater than 8 metres are advised to fly with 2 white lights and 2 red lights visible so as to achieve sufficient wheel clearance.

RWY	DIRECTION	THR	GEOID UNDULATION	BEARING STRENGTH
02L	023°	01 20 56.27N 103 58 38.82E	10.24m	PCN 72/F/B/W/U
20R (DISP THR)	203°	01 22 33.95N 103 59 20.06E	10.25m	
02C	023°	01 19 43.51N 103 59 05.86E	10.27m	
20C	203°	01 21 43.37N 103 59 46.48E	10.30m	

TAXIWAYS
BEARING STRENGTH PCN 85/R/B/W/U - Taxiways W1, W9, E1, E3, E11 and EP (between E10-E11)
PCN 72/F/B/W/U - All other Taxiways

APRONS
BEARING STRENGTH PCN 85/R/B/W/U

ELEVATIONS AND DIMENSIONS IN METRES
TAXIWAYS 30m WIDE
NOTE:
SEE FLIP SIDE FOR DETAILS OF
I) INS COORDINATES FOR AIRCRAFT STANDS AND
PRE-FLIGHT ALTIMETER CHECK LOCATIONS.
II) RESTRICTIONS ON TAXIWAYS.

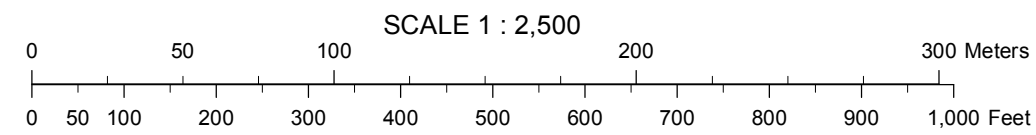
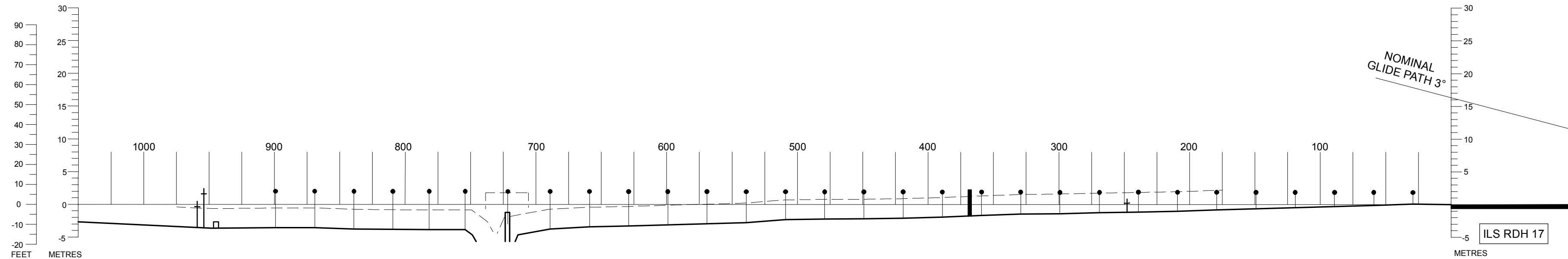
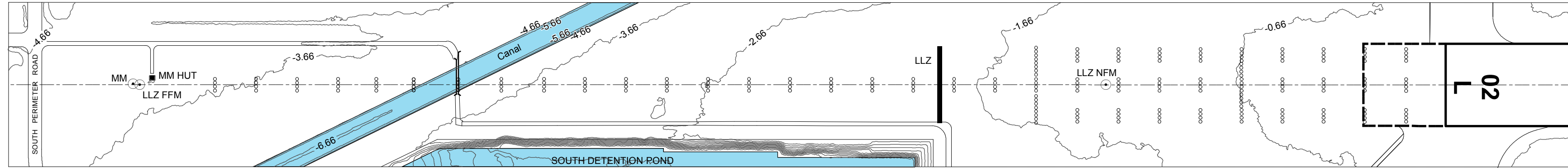
LEGEND	
	Aircraft Stands and Taxiways Markings
	Runway Centre Line Lights
	Runway Edge Lights
	White Touchdown Zone Lights
	Blue Taxiway Edge Lights
	Green Taxiway Centre Line Lights
	Cat II Holding Position Markings Red Stop Bar Lights Controllable ON/OFF
	Twy Intersection Holding Position Markings Red Stop Bar Lights Controllable ON/OFF
	Blue Taxiway Edge Markers
EN	ECHO NORTH
NC1	NORTH CROSS 1
NC2	NORTH CROSS 2
NC3	NORTH CROSS 3
SC1	SOUTH CROSS 1
SC2	SOUTH CROSS 2
	FERRET Tower

PRECISION APPROACH TERRAIN CHART - ICAO

SINGAPORE/Singapore Changi

DISTANCES AND HEIGHTS IN METRES

RWY 02L



HORIZONTAL SCALE 1 : 2,500
VERTICAL SCALE 1 : 500
CONTOUR AND HEIGHTS ARE RELATED TO ELEVATION OF RWY THR

LEGEND		
BUILDING		
ROAD		
CONTOUR		
BRIDGE		
ANTENNA		
LOCALISER		LLZ
APPROACH LIGHTS		
CENTRE-LINE PROFILE		
DEVIATION AT LEAST +/- 3m FROM CENTERLINE PROFILE		
AMENDMENT RECORD		
NO.	DATE	ENTERED BY

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

TWR 118.6 / 118.25
APP 120.3
ACC 134.4

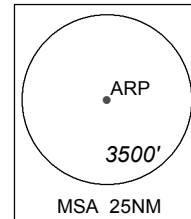
TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02L/20R
ANITO DEPARTURES
ANITO 6E (R02L)
ANITO 7F (R20R)**

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

DISTANCES IN NM



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

DOKTA
01° 26' 06" N
104° 10' 40" E
A040

LEDOX
01° 16' 42" N
103° 56' 51" E
A015

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

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

LETGO
01° 14' 11" N
103° 55' 48" E
A025

DIVSA
01° 11' 05" N
104° 03' 03" E
A040

BTM
01° 08' 13" N
104° 07' 58" E

DOGRA
01° 05' 25" N
104° 14' 23" E
A060

DOSNO
00° 47' 57" N
104° 14' 09" E

ANITO
00° 17' 00" S
104° 52' 00" E

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

NOTE: WHEN TAKEN OFF THE SID,
AS INSTRUCTED BY ATC,
REFER TO ENR 1.5, SECTION 3,
PARAGRAPH 3.2 [A] - FOR RWY 02L MINIMUM CLIMB GRADIENT AND
PARAGRAPH 3.4.2 - FOR RWY 20R MINIMUM CLIMB GRADIENT

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

GENERAL INFORMATION

**INITIAL CLIMB
3000FT**

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

RWY 02L

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 3.3%.

RWY 20R

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 6%
UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
6% V/V (fpm)	456	608	911	1215	1518	1821
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, 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+; 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+	-	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 7F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To LEDOX on course 203° at or above 1500ft. To LETGO at or above 2500ft, turn left. To DIVSA at or above 4000ft, turn right. To BTM, turn left. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To ANITO.	LEDOX [M203; A015+] -	CF	N
	LETGO [A025+; L] -	TF	N
	DIVSA [A040+; R] -	TF	N
	BTM [L] -	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	LEDOX	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	LETGO	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	R	A040+	-	RNAV1
TF	BTM	-	120(119.5)	-0.5	L	-	-	RNAV1
TF	DOGRA	-	113(112.5)	-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 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 7B (R20C)

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

NOTE: WHEN TAKEN OFF THE SID,
AS INSTRUCTED BY ATC,
REFER TO ENR 1.5, SECTION 3,
PARAGRAPH 3.3 [A] - FOR RWY 02C MINIMUM CLIMB GRADIENT AND
PARAGRAPH 3.4.1 - FOR RWY 20C MINIMUM CLIMB GRADIENT

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

GENERAL INFORMATION

INITIAL CLIMB
3000FT

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

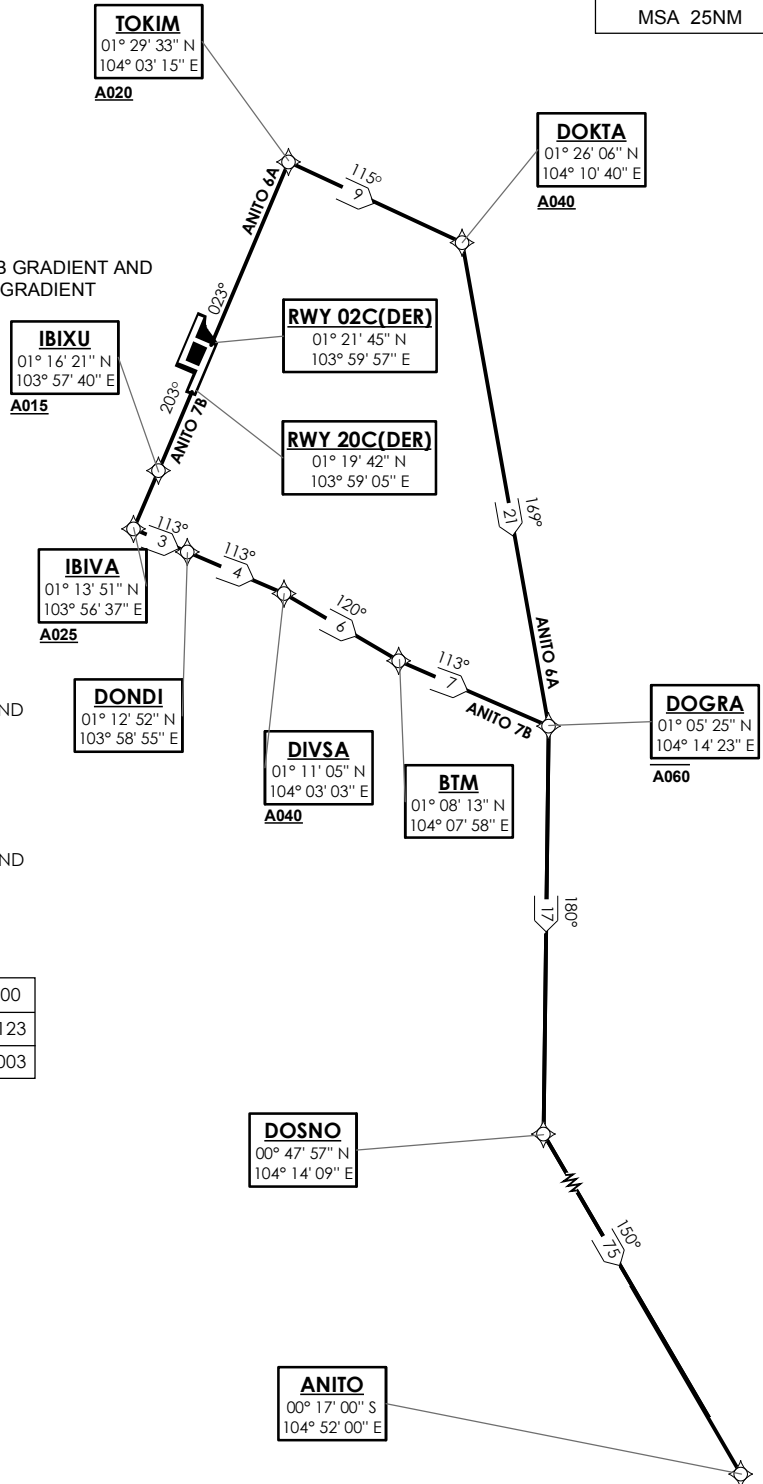
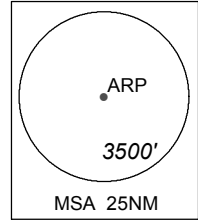
RWY 02C

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 3.3%.

RWY 20C

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 7%
UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
7% V/V (fpm)	532	709	1062	1416	1769	2123
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, 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+; 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+	-	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 7B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To IBIXU on course 203° at or above 1500ft. To IBIVA at or above 2500ft, turn left. To DONDI. To DIVSA at or above 4000ft, turn right. To BTM, turn left. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To ANITO.	IBIXU [M203; A015+] -	CF	N
	IBIVA [A025+; L] -	TF	N
	DONDI -	TF	N
	DIVSA [A040+; R] -	TF	N
	BTM [L] -	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	IBIXU	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	IBIVA	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DONDI	-	113(112.5)	-0.5	-	-	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	R	A040+	-	RNAV1
TF	BTM	-	120(119.5)	-0.5	L	-	-	RNAV1
TF	DOGRA	-	113(112.5)	-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	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
ADMIM DEPARTURES
ADMIM 1E (R02L)
ADMIM 3F (R20R)**

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

DISTANCES IN NM

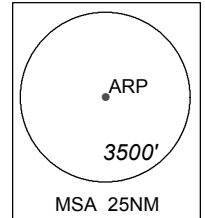
NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

NOTE: WHEN TAKEN OFF THE SID,
AS INSTRUCTED BY ATC,
REFER TO ENR 1.5, SECTION 3,
PARAGRAPH 3.2 [A] - FOR RWY 02L MINIMUM CLIMB GRADIENT AND
PARAGRAPH 3.4.2 - FOR RWY 20R MINIMUM CLIMB GRADIENT

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



GENERAL INFORMATION

**INITIAL CLIMB
3000FT**

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

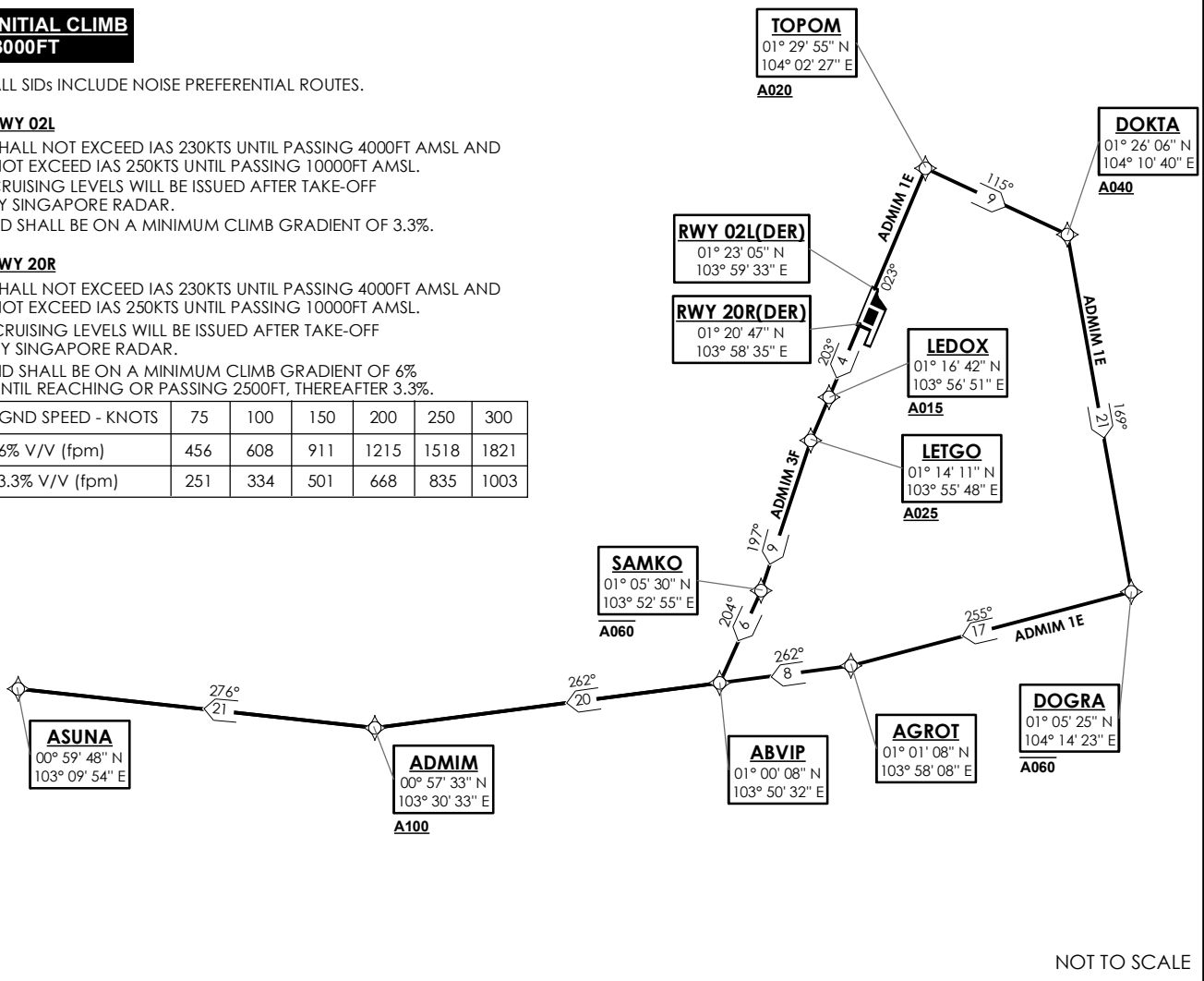
RWY 02L

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 3.3%.

RWY 20R

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 6%
UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
6% V/V (fpm)	456	608	911	1215	1518	1821
3.3% V/V (fpm)	251	334	501	668	835	1003



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, 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+; 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+	-	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 3F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To LEDOX on course 203° at or above 1500ft. To LETGO at or above 2500ft, turn left. To SAMKO at or below 6000ft, turn right. To ABVIP, turn right. To ADMIM at or above 10000ft, turn right. To ASUNA.	LEDOX [M203; A015+] -	CF	N
	LETGO [A025+; 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	LEDOX	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	LETGO	-	203(202.5)	-0.5	L	A025+	-	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	<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
ADMIM DEPARTURES
ADMIM 1A (R02C)
ADMIM 3B (R20C)**

ELEV, ALT IN FEET

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

DISTANCES IN NM

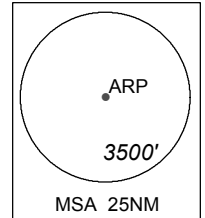
NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

NOTE: WHEN TAKEN OFF THE SID,
AS INSTRUCTED BY ATC,
REFER TO ENR 1.5, SECTION 3,
PARAGRAPH 3.3 [A] - FOR RWY 02C MINIMUM CLIMB GRADIENT AND
PARAGRAPH 3.4.1 - FOR RWY 20C MINIMUM CLIMB GRADIENT

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



GENERAL INFORMATION

**INITIAL CLIMB
3000FT**

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

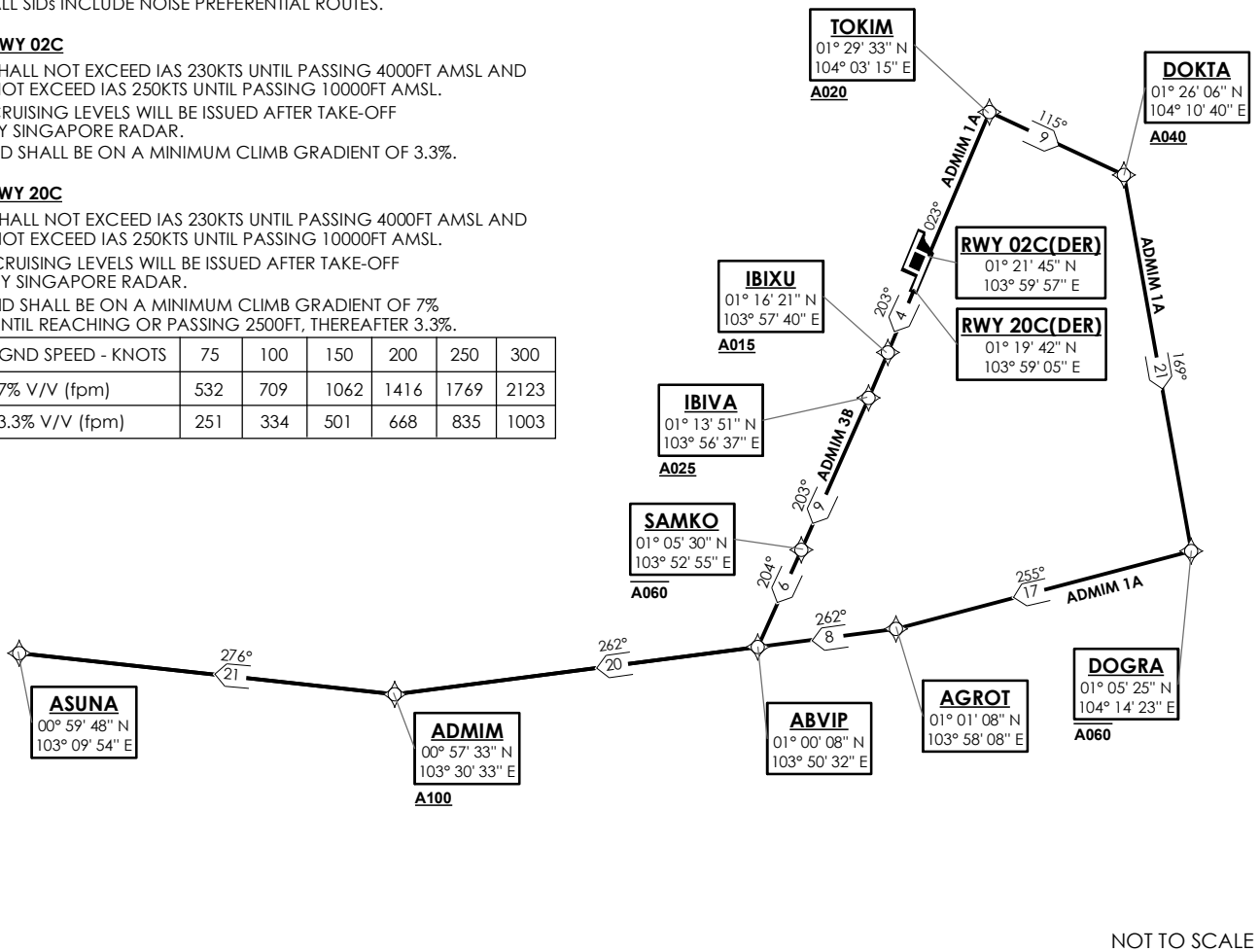
RWY 02C

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 3.3%.

RWY 20C

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 7%
UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
7% V/V (fpm)	532	709	1062	1416	1769	2123
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, 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+; 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+	-	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 3B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To IBIXU on course 203° at or above 1500ft. To IBIVA at or above 2500ft. To SAMKO at or below 6000ft, turn right. To ABVIP, turn right. To ADMIM at or above 10000ft, turn right. To ASUNA.	IBIXU [M203; A015+] -	CF	N
	IBIVA [A025+] -	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	IBIXU	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	IBIVA	-	203(202.5)	-0.5	-	A025+	-	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 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 4F (R20R)

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

DISTANCES IN NM

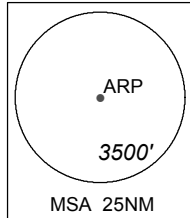
NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

NOTE: WHEN TAKEN OFF THE SID,
AS INSTRUCTED BY ATC,
REFER TO ENR 1.5, SECTION 3,
PARAGRAPH 3.2 [A] - FOR RWY 02L MINIMUM CLIMB GRADIENT AND
PARAGRAPH 3.4.2 - FOR RWY 20R MINIMUM CLIMB GRADIENT

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



GENERAL INFORMATION

INITIAL CLIMB
3000FT

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

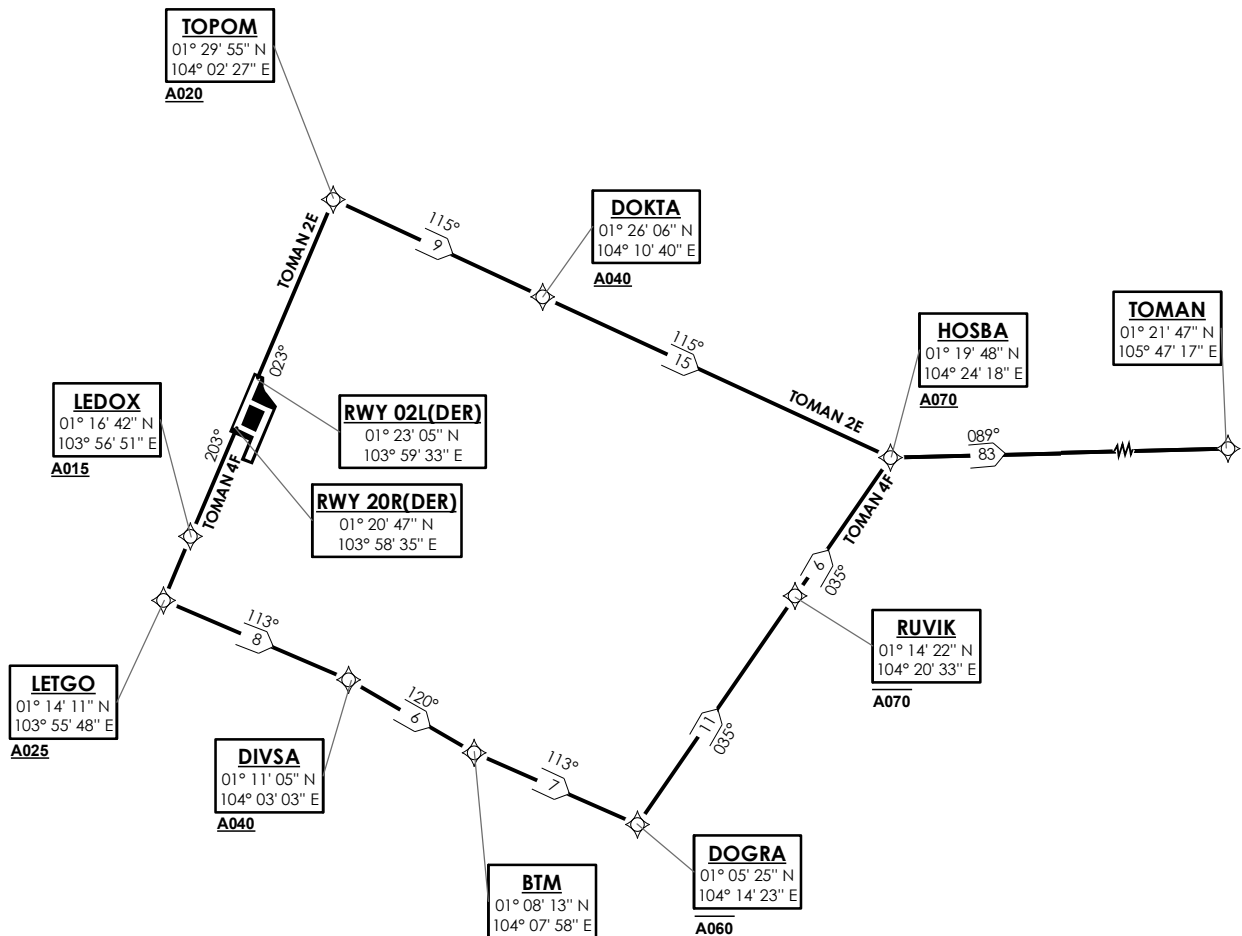
RWY 02L

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 3.3%.

RWY 20R

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 6%
UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
6% V/V (fpm)	456	608	911	1215	1518	1821
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, turn right. To DOKTA at or above 4000ft. To HOSBA at or above 7000ft, turn left. To TOMAN.	TOPOM [M023; A020+; 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+	-	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 4F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To LEDOX on course 203° at or above 1500ft. To LETGO at or above 2500ft, turn left. To DIVSA at or above 4000ft, turn right. To BTM, turn left. To DOGRA at or below 6000ft, turn left. To RUVIK at or below 7000ft. To HOSBA at or above 7000ft, turn right. To TOMAN.	LEDOX [M203; A015+] -	CF	N
	LETGO [A025+; L] -	TF	N
	DIVSA [A040+; R] -	TF	N
	BTM [L] -	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	LEDOX	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	LETGO	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	R	A040+	-	RNAV1
TF	BTM	-	120(119.5)	-0.5	L	-	-	RNAV1
TF	DOGRA	-	113(112.5)	-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 134.2

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

SINGAPORE/Singapore Changi
RWY 02C/20C
TOMAN DEPARTURES
TOMAN 2A (R02C)
TOMAN 4B (R20C)

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

NOTE: WHEN TAKEN OFF THE SID,
AS INSTRUCTED BY ATC,
REFER TO ENR 1.5, SECTION 3,
PARAGRAPH 3.3 [A] - FOR RWY 02C MINIMUM CLIMB GRADIENT AND
PARAGRAPH 3.4.1 - FOR RWY 20C MINIMUM CLIMB GRADIENT

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

GENERAL INFORMATION

INITIAL CLIMB
3000FT

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

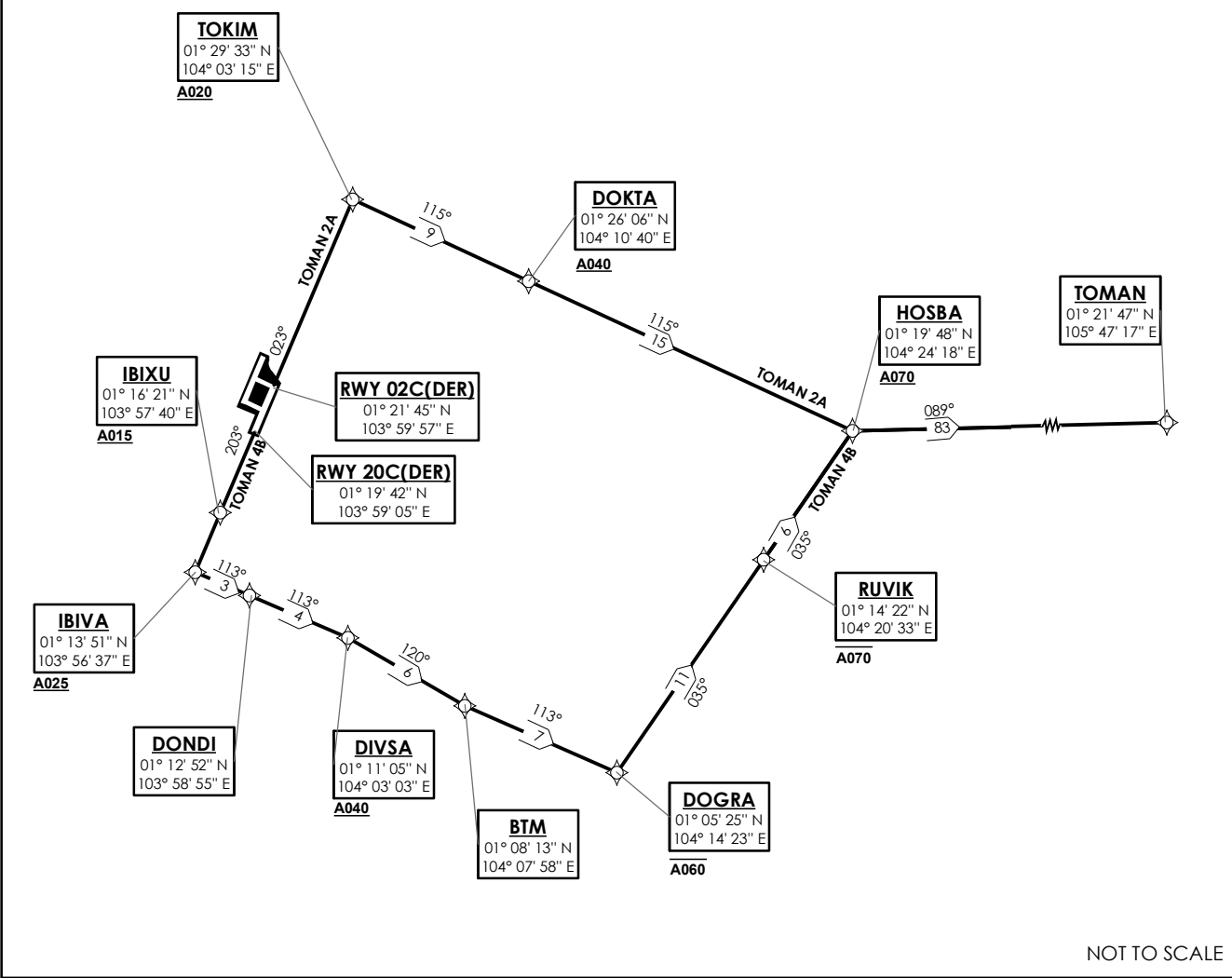
RWY 02C

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 3.3%.

RWY 20C

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 7%
UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
7% V/V (fpm)	532	709	1062	1416	1769	2123
3.3% V/V (fpm)	251	334	501	668	835	1003



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, turn right. To DOKTA at or above 4000ft. To HOSBA at or above 7000ft, turn left. To TOMAN.	TOKIM [M023; A020+; 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+	-	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 4B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To IBIXU on course 203° at or above 1500ft. To IBIVA at or above 2500ft, turn left. To DONDI. To DIVSA at or above 4000ft, turn right. To BTM, turn left. To DOGRA at or below 6000ft, turn left. To RUVIK at or below 7000ft. To HOSBA at or above 7000ft, turn right. To TOMAN.	IBIXU [M203; A015+] -	CF	N
	IBIVA [A025+; L] -	TF	N
	DONDI -	TF	N
	DIVSA [A040+; R] -	TF	N
	BTM [L] -	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	IBIXU	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	IBIVA	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DONDI	-	113(112.5)	-0.5	-	-	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	R	A040+	-	RNAV1
TF	BTM	-	120(119.5)	-0.5	L	-	-	RNAV1
TF	DOGRA	-	113(112.5)	-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 134.4

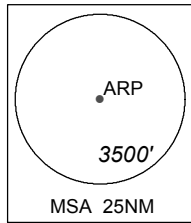
TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02L/20R
BAVUS DEPARTURES
BAVUS 1E (R02L)
BAVUS 3F (R20R)**

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:** ACFT UNABLE TO FLY THE SID
PROFILE SHALL INFORM ATC
PRIOR TO DEPARTURE AND TO
EXPECT RADAR VECTORED,
IF NECESSARY
- NOTE:** WHEN TAKEN OFF THE SID,
AS INSTRUCTED BY ATC,
REFER TO ENR 1.5, SECTION 3,
PARAGRAPH 3.2 [A] - FOR RWY 02L MINIMUM CLIMB GRADIENT AND
PARAGRAPH 3.4.2 - FOR RWY 20R MINIMUM CLIMB GRADIENT
- NOTE:** REFER TO BACK PAGE FOR
- FORMAL AND TABULAR DESCRIPTIONS
- RADIO COM FAILURE PROCEDURES

GENERAL INFORMATION

**INITIAL CLIMB
3000FT**

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

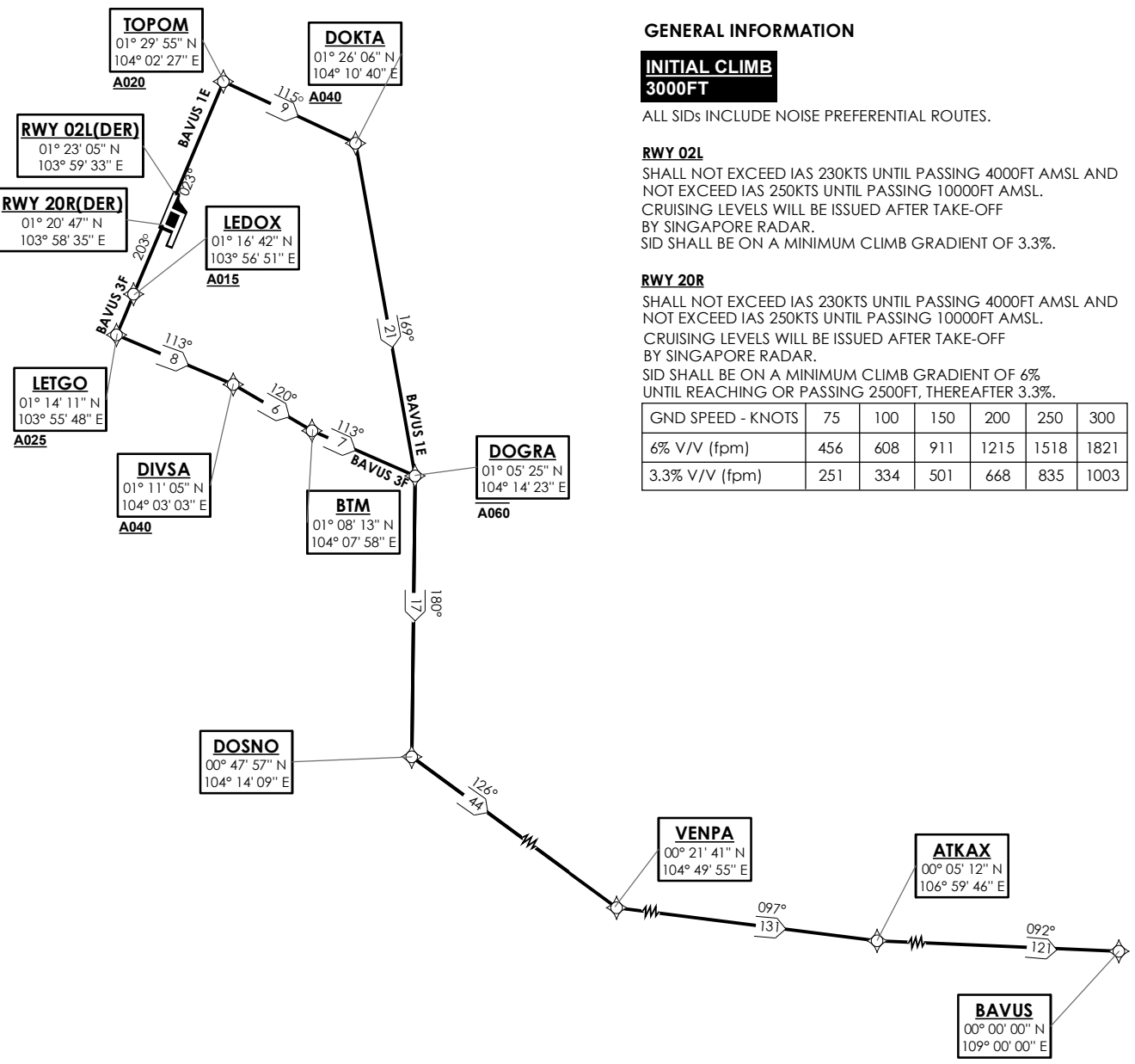
RWY 02L

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 3.3%.

RWY 20R

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 6%
UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
6% V/V (fpm)	456	608	911	1215	1518	1821
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, 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+; 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+	-	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 3F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To LEDOX on course 203° at or above 1500ft. To LETGO at or above 2500ft, turn left. To DIVSA at or above 4000ft, turn right. To BTM, turn left. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To VENPA, turn left. To ATKAX, turn left. To BAVUS.	LEDOX [M203; A015+] -	CF	N
	LETGO [A025+; L] -	TF	N
	DIVSA [A040+; R] -	TF	N
	BTM [L] -	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	LEDOX	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	LETGO	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	R	A040+	-	RNAV1
TF	BTM	-	120(119.5)	-0.5	L	-	-	RNAV1
TF	DOGRA	-	113(112.5)	-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

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

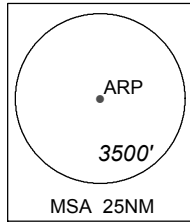
TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02C/20C
BAVUS DEPARTURES
BAVUS 1A (R02C)
BAVUS 3B (R20C)**

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:** ACFT UNABLE TO FLY THE SID PROFILE SHALL INFORM ATC PRIOR TO DEPARTURE AND TO EXPECT RADAR VECTORED, IF NECESSARY
- NOTE:** WHEN TAKEN OFF THE SID, AS INSTRUCTED BY ATC, REFER TO ENR 1.5, SECTION 3, PARAGRAPH 3.3 [A] - FOR RWY 02C MINIMUM CLIMB GRADIENT AND PARAGRAPH 3.4.1 - FOR RWY 20C MINIMUM CLIMB GRADIENT
- NOTE:** REFER TO BACK PAGE FOR
 - FORMAL AND TABULAR DESCRIPTIONS
 - RADIO COM FAILURE PROCEDURES

GENERAL INFORMATION

**INITIAL CLIMB
3000FT**

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

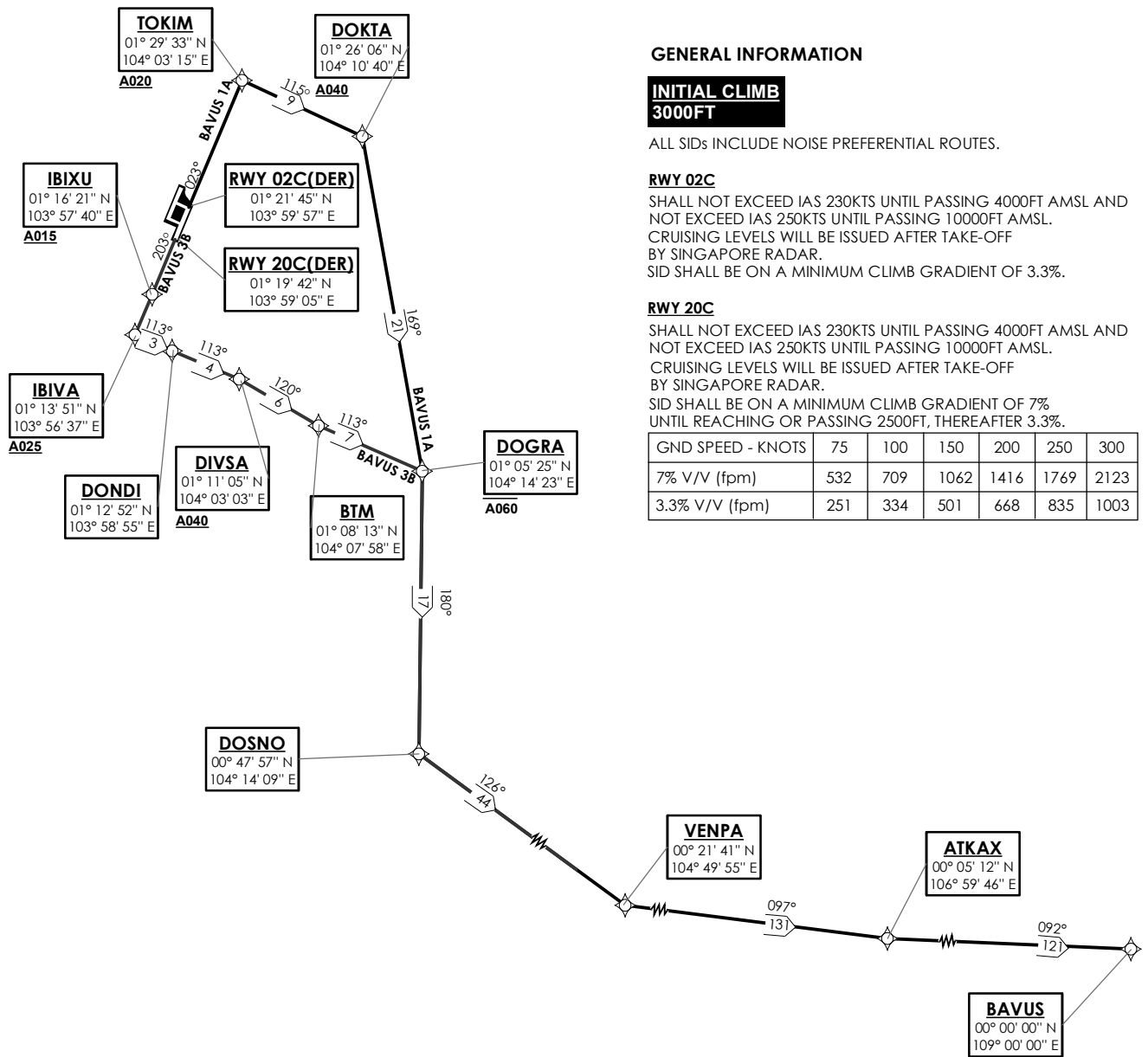
RWY 02C

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL. CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF BY SINGAPORE RADAR. SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 3.3%.

RWY 20C

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL. CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF BY SINGAPORE RADAR. SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 7% UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
7% V/V (fpm)	532	709	1062	1416	1769	2123
3.3% V/V (fpm)	251	334	501	668	835	1003



NOT TO SCALE

10 OCT 2019

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, 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+; 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+	-	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 3B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To IBIXU on course 203° at or above 1500ft. To IBIVA at or above 2500ft, turn left. To DONDI. To DIVSA at or above 4000ft, turn right. To BTM, turn left. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To VENPA, turn left. To ATKAX, turn left. To BAVUS.	IBIXU [M203; A015+] -	CF	N
	IBIVA [A025+; L] -	TF	N
	DONDI -	TF	N
	DIVSA [A040+; R] -	TF	N
	BTM [L] -	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	IBIXU	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	IBIVA	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DONDI	-	113(112.5)	-0.5	-	-	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	R	A040+	-	RNAV1
TF	BTM	-	120(119.5)	-0.5	L	-	-	RNAV1
TF	DOGRA	-	113(112.5)	-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

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

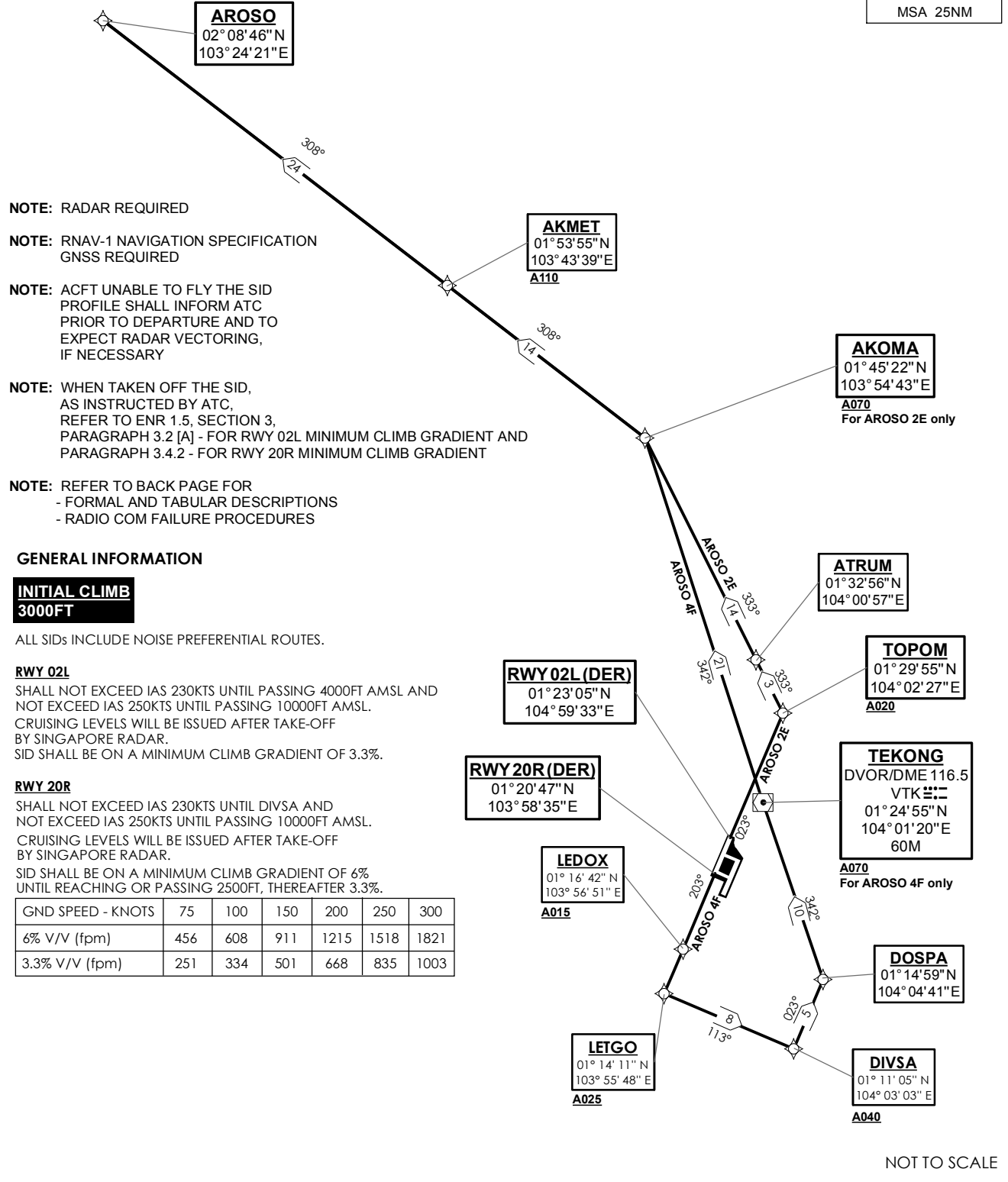
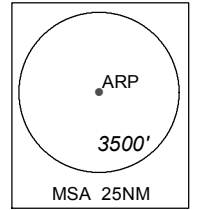
D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02L/20R
AROSO DEPARTURES
AROSO 2E (R02L)
AROSO 4F (R20R)**

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:** ACFT UNABLE TO FLY THE SID PROFILE SHALL INFORM ATC PRIOR TO DEPARTURE AND TO EXPECT RADAR VECTURING, IF NECESSARY
- NOTE:** WHEN TAKEN OFF THE SID, AS INSTRUCTED BY ATC, REFER TO ENR 1.5, SECTION 3, PARAGRAPH 3.2 [A] - FOR RWY 02L MINIMUM CLIMB GRADIENT AND PARAGRAPH 3.4.2 - FOR RWY 20R MINIMUM CLIMB GRADIENT
- NOTE:** REFER TO BACK PAGE FOR
 - FORMAL AND TABULAR DESCRIPTIONS
 - RADIO COM FAILURE PROCEDURES

GENERAL INFORMATION

**INITIAL CLIMB
3000FT**

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

RWY 02L
SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL. CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF BY SINGAPORE RADAR. SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 3.3%.

RWY 20R
SHALL NOT EXCEED IAS 230KTS UNTIL DIVSA AND NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL. CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF BY SINGAPORE RADAR. SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 6% UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
6% V/V (fpm)	456	608	911	1215	1518	1821
3.3% V/V (fpm)	251	334	501	668	835	1003

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, turn left. To ATRUM. To AKOMA at or above 7000ft, turn left. To AKMET at or above 11000ft. To AROSO.	TOPOM [M023; A020+; 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+	-	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 4F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To LEDOX on course 203° at or above 1500ft. To LETGO at or above 2500ft, turn left. To DIVSA at or above 4000ft, speed 230kts, turn left. To DOSPA, turn left. To VTK at or above 7000ft. To AKOMA, turn left. To AKMET at or above 11000ft. To AROSO.	LEDOX [M203; A015+] -	CF	N
	LETGO [A025+; L] -	TF	N
	DIVSA [A040+; K230; L] -	TF	N
	DOSPA [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	LEDOX	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	LETGO	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	L	A040+	K230	RNAV1
TF	DOSPA	-	023(022.5)	-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 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 4F (R20R)**

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

DISTANCES IN NM

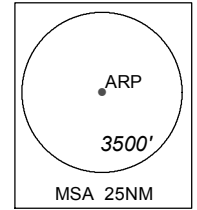
NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

NOTE: WHEN TAKEN OFF THE SID,
AS INSTRUCTED BY ATC,
REFER TO ENR 1.5, SECTION 3,
PARAGRAPH 3.2 [A] - FOR RWY 02L MINIMUM CLIMB GRADIENT AND
PARAGRAPH 3.4.2 - FOR RWY 20R MINIMUM CLIMB GRADIENT

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

RWY 02L (DER)
01°23'05"N
103°59'33"E

RWY 20R (DER)
01°20'47"N
103°58'35"E

TEKONG
DVOR/DME 116.5
VTK
01°24'55"N
104°01'20"E
60M
A070
For MASBO 4F only

LEDOX
01°16'42"N
103°56'51"E
A015

DOSPA
01°14'59"N
104°04'41"E

LETGO
01°14'11"N
103°55'48"E
A025

DIVSA
01°11'05"N
104°03'03"E
A040

GENERAL INFORMATION

**INITIAL CLIMB
3000FT**

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

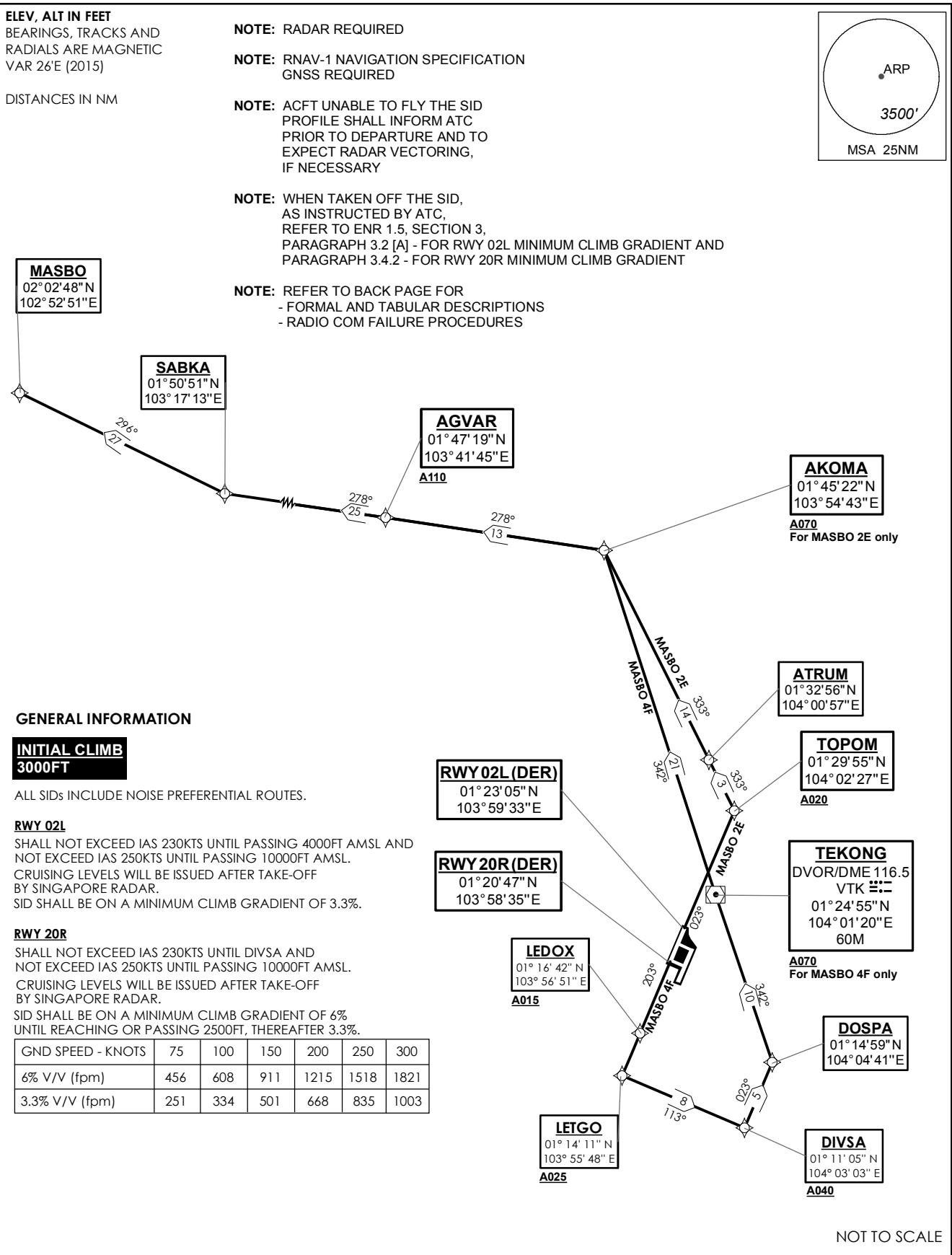
RWY 02L

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL. CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF BY SINGAPORE RADAR. SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 3.3%.

RWY 20R

SHALL NOT EXCEED IAS 230KTS UNTIL DIVSA AND NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL. CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF BY SINGAPORE RADAR. SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 6% UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
6% V/V (fpm)	456	608	911	1215	1518	1821
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, 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+; 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+	-	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 4F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To LEDOX on course 203° at or above 1500ft. To LETGO at or above 2500ft, turn left. To DIVSA at or above 4000ft, speed 230kts, turn left. To DOSPA, turn left. To VTK at or above 7000ft. To AKOMA, turn left. To AGVAR at or above 11000ft. To SABKA, turn right. To MASBO.	LEDOX [M203; A015+] -	CF	N
	LETGO [A025+; L] -	TF	N
	DIVSA [A040+; K230; L] -	TF	N
	DOSPA [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	LEDOX	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	LETGO	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	L	A040+	K230	RNAV1
TF	DOSPA	-	023(022.5)	-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>

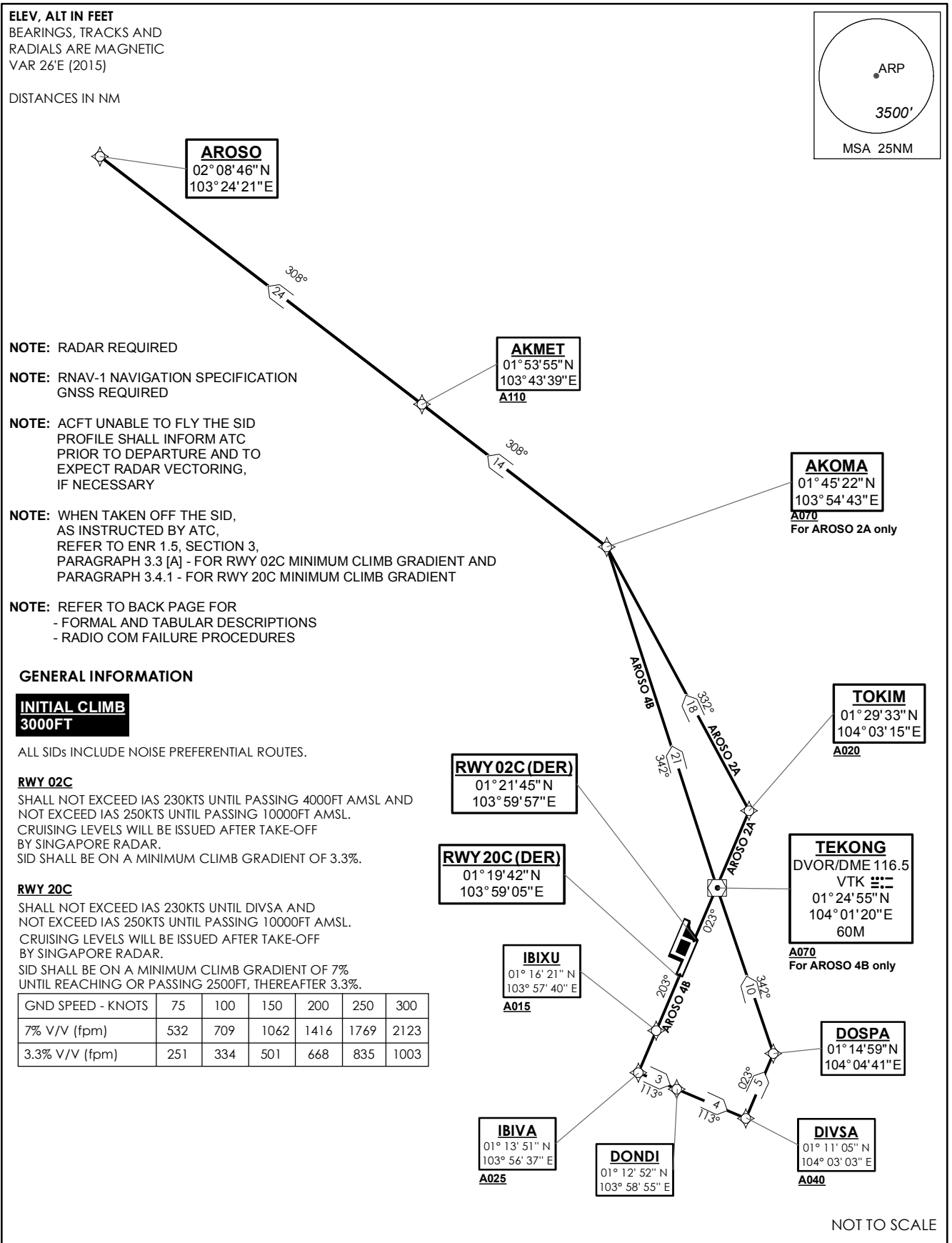
**STANDARD DEPARTURE CHART
RNAV (GNSS) -
INSTRUMENT (SID)**

TWR 118.6 / 118.25
APP 120.3
ACC 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 4B (R20C)**



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, turn left. To AKOMA at or above 7000ft, turn left. To AKMET at or above 11000ft. To AROSO.	TOKIM [M023; A020+; 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+	-	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 4B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To IBIXU on course 203° at or above 1500ft. To IBIVA at or above 2500ft, turn left. To DOND I. To DIVSA at or above 4000ft, speed 230kts, turn left. To DOSPA, turn left. To VTK at or above 7000ft. To AKOMA, turn left. To AKMET at or above 11000ft. To AROSO.	IBIXU [M203; A015+] -	CF	N
	IBIVA [A025+; L] -	TF	N
	DOND I -	TF	N
	DIVSA [A040+; K230; L] -	TF	N
	DOSPA [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	IBIXU	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	IBIVA	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DOND I	-	113(113.3)	-0.5	-	-	-	RNAV1
TF	DIVSA	-	113(113.3)	-0.5	L	A040+	K230	RNAV1
TF	DOSPA	-	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

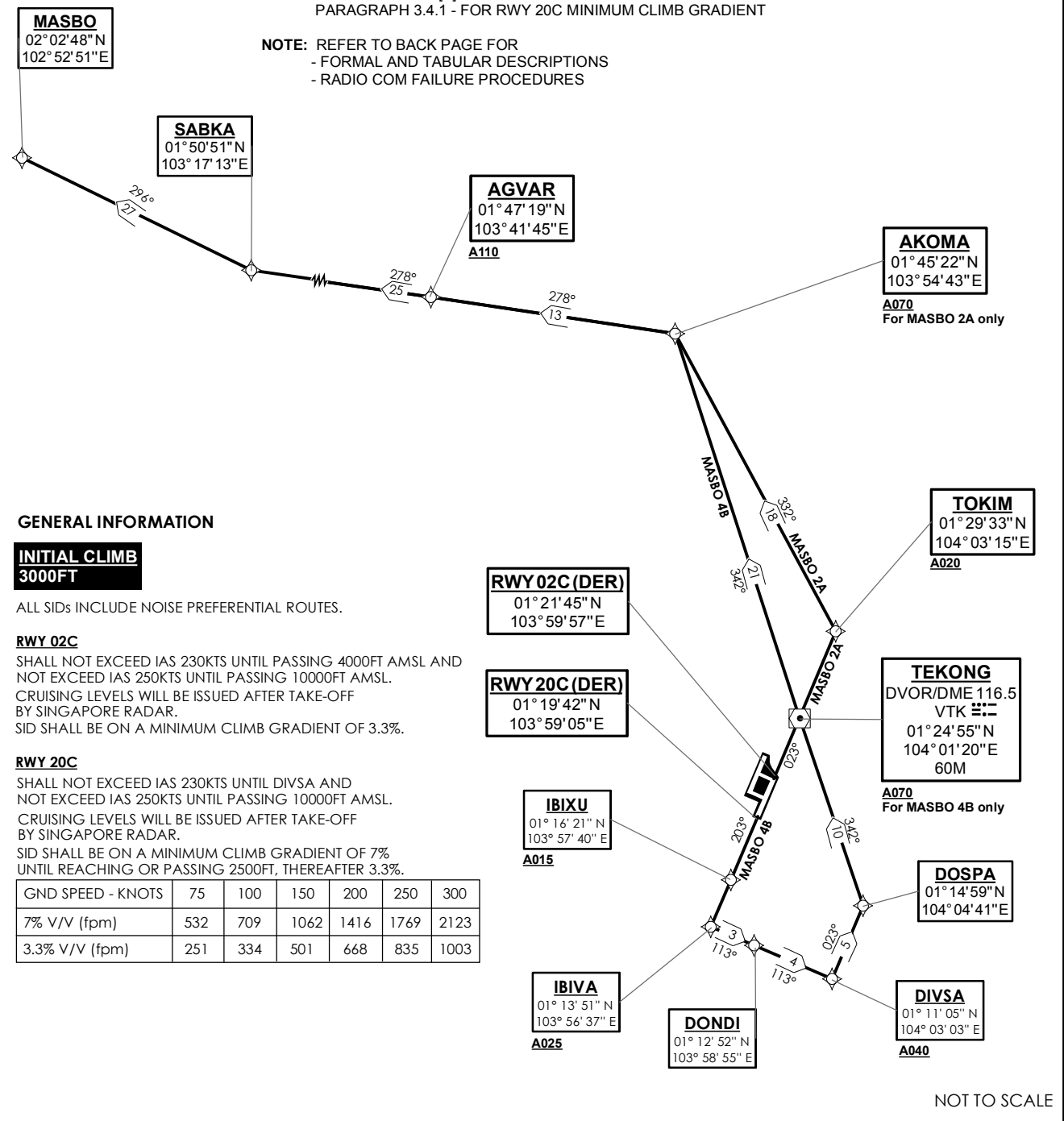
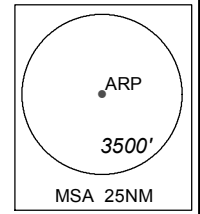
D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02C/20C
MASBO DEPARTURES
MASBO 2A (R02C)
MASBO 4B (R20C)**

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:** ACFT UNABLE TO FLY THE SID
PROFILE SHALL INFORM ATC
PRIOR TO DEPARTURE AND TO
EXPECT RADAR VECTORED,
IF NECESSARY
- NOTE:** WHEN TAKEN OFF THE SID,
AS INSTRUCTED BY ATC,
REFER TO ENR 1.5, SECTION 3,
PARAGRAPH 3.3 [A] - FOR RWY 02C MINIMUM CLIMB GRADIENT AND
PARAGRAPH 3.4.1 - FOR RWY 20C MINIMUM CLIMB GRADIENT
- NOTE:** REFER TO BACK PAGE FOR
- FORMAL AND TABULAR DESCRIPTIONS
- RADIO COM FAILURE PROCEDURES



GENERAL INFORMATION

**INITIAL CLIMB
3000FT**

ALL SIDS INCLUDE NOISE PREFERENTIAL ROUTES.

RWY 02C
SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 3.3%.

RWY 20C
SHALL NOT EXCEED IAS 230KTS UNTIL DIVSA AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 7%
UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
7% V/V (fpm)	532	709	1062	1416	1769	2123
3.3% V/V (fpm)	251	334	501	668	835	1003

NOT TO SCALE

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, 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+; 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+	-	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 4B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To IBIXU on course 203° at or above 1500ft. To IBIVA at or above 2500ft, turn left. To DONDI. To DIVSA at or above 4000ft, speed 230kts, turn left. To DOSPA, turn left. To VTK at or above 7000ft. To AKOMA, turn left. To AGVAR at or above 11000ft. To SABKA, turn right. To MASBO.	IBIXU [M203; A015+] -	CF	N
	IBIVA [A025+; L] -	TF	N
	DONDI -	TF	N
	DIVSA [A040+; K230; L] -	TF	N
	DOSPA [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	IBIXU	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	IBIVA	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DONDI	-	113(112.5)	-0.5	-	-	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	L	A040+	K230	RNAV1
TF	DOSPA	-	023(022.5)	-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 133.8

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02L/20R
MERSING DEPARTURES
VMR 5E (R02L)
VMR 8F (R20R)**

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

DISTANCES IN NM

NOTE: RADAR REQUIRED

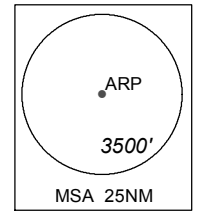
NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

NOTE: WHEN TAKEN OFF THE SID,
AS INSTRUCTED BY ATC,
REFER TO ENR 1.5, SECTION 3,
PARAGRAPH 3.2 [A] - FOR RWY 02L MINIMUM CLIMB GRADIENT AND
PARAGRAPH 3.4.2 - FOR RWY 20R MINIMUM CLIMB GRADIENT

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**

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

RWY 02L

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 3.3%.

RWY 20R

SHALL NOT EXCEED IAS 230KTS UNTIL DIVSA AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 6%
UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
6% V/V (fpm)	456	608	911	1215	1518	1821
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

LEDOX
01° 16' 42" N
103° 56' 51" E
A015

LETGO
01° 14' 11" N
103° 55' 48" E
A025

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

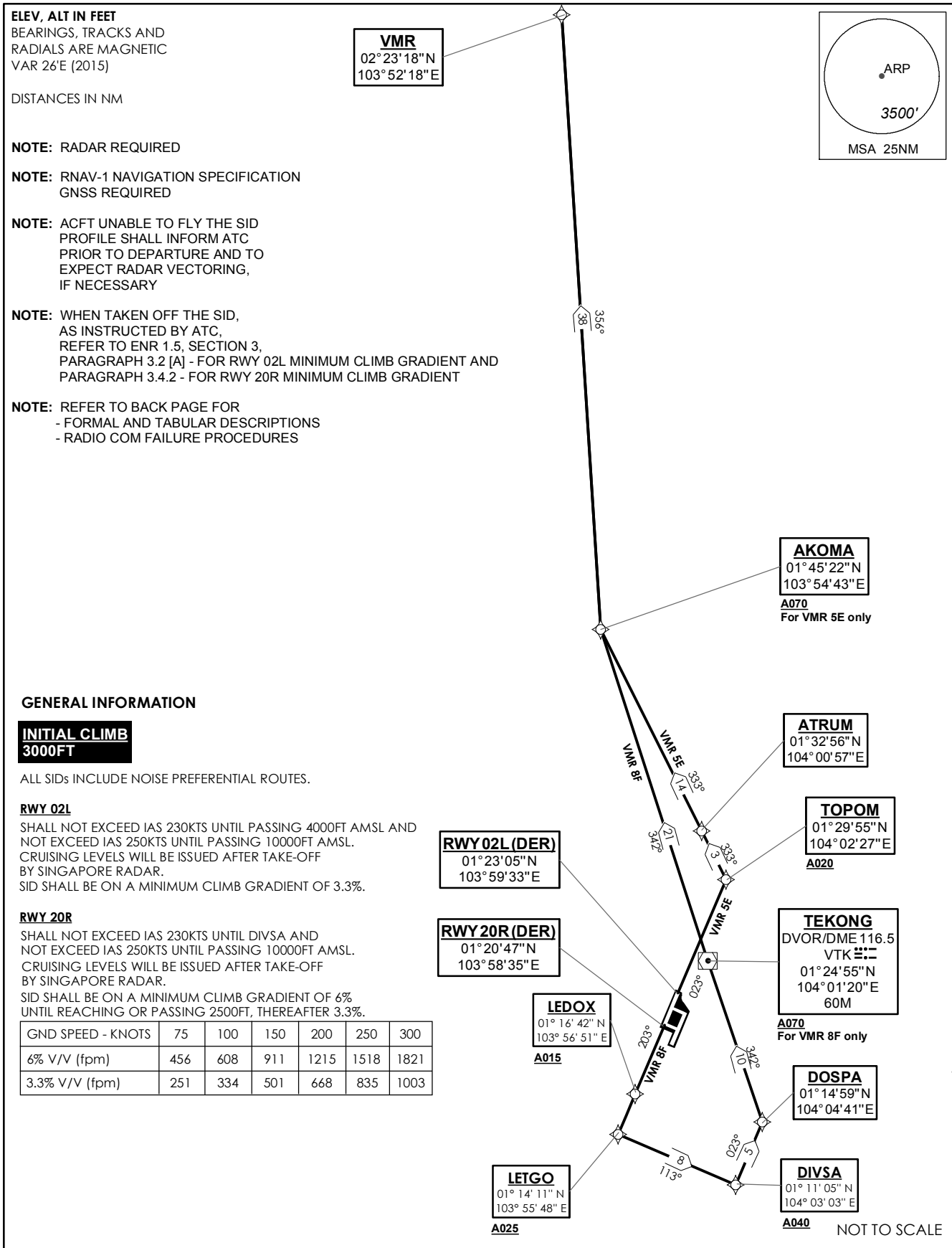
ATRUM
01° 32' 56" N
104° 00' 57" E

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 8F only

DOSPA
01° 14' 59" N
104° 04' 41" E

DIVSA
01° 11' 05" N
104° 03' 03" 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, turn left. To ATRUM. To AKOMA at or above 7000ft, turn right. To VMR.	TOPOM [M023; A020+; 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+	-	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 8F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To LEDOX on course 203° at or above 1500ft. To LETGO at or above 2500ft, turn left. To DIVSA at or above 4000ft, speed 230kts, turn left. To DOSPA, turn left. To VTK at or above 7000ft. To AKOMA, turn right. To VMR.	LEDOX [M203; A015+] -	CF	N
	LETGO [A025+; L] -	TF	N
	DIVSA [A040+; K230; L] -	TF	N
	DOSPA [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	LEDOX	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	LETGO	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	L	A040+	K230	RNAV1
TF	DOSPA	-	023(022.5)	-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 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 8B (R20C)**

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

DISTANCES IN NM

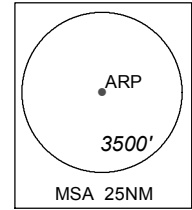
NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

NOTE: WHEN TAKEN OFF THE SID,
AS INSTRUCTED BY ATC,
REFER TO ENR 1.5, SECTION 3,
PARAGRAPH 3.3 [A] - FOR RWY 02C MINIMUM CLIMB GRADIENT AND
PARAGRAPH 3.4.1 - FOR RWY 20C MINIMUM CLIMB GRADIENT

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



VMR
02° 23' 18" N
103° 52' 18" E

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

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

RWY02C (DER)
01° 21' 45" N
103° 59' 57" E

RWY20C (DER)
01° 19' 42" N
103° 59' 05" E

TEKONG
DVOR/DME 116.5
VTK
01° 24' 55" N
104° 01' 20" E
60M
A070
For VMR 8B only

IBIXU
01° 16' 21" N
103° 57' 40" E
A015

DOSPA
01° 14' 59" N
104° 04' 41" E

IBIVA
01° 13' 51" N
103° 56' 37" E
A025

DONDI
01° 12' 52" N
103° 58' 55" E

DIVSA
01° 11' 05" N
104° 03' 03" E
A040

GENERAL INFORMATION

**INITIAL CLIMB
3000FT**

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

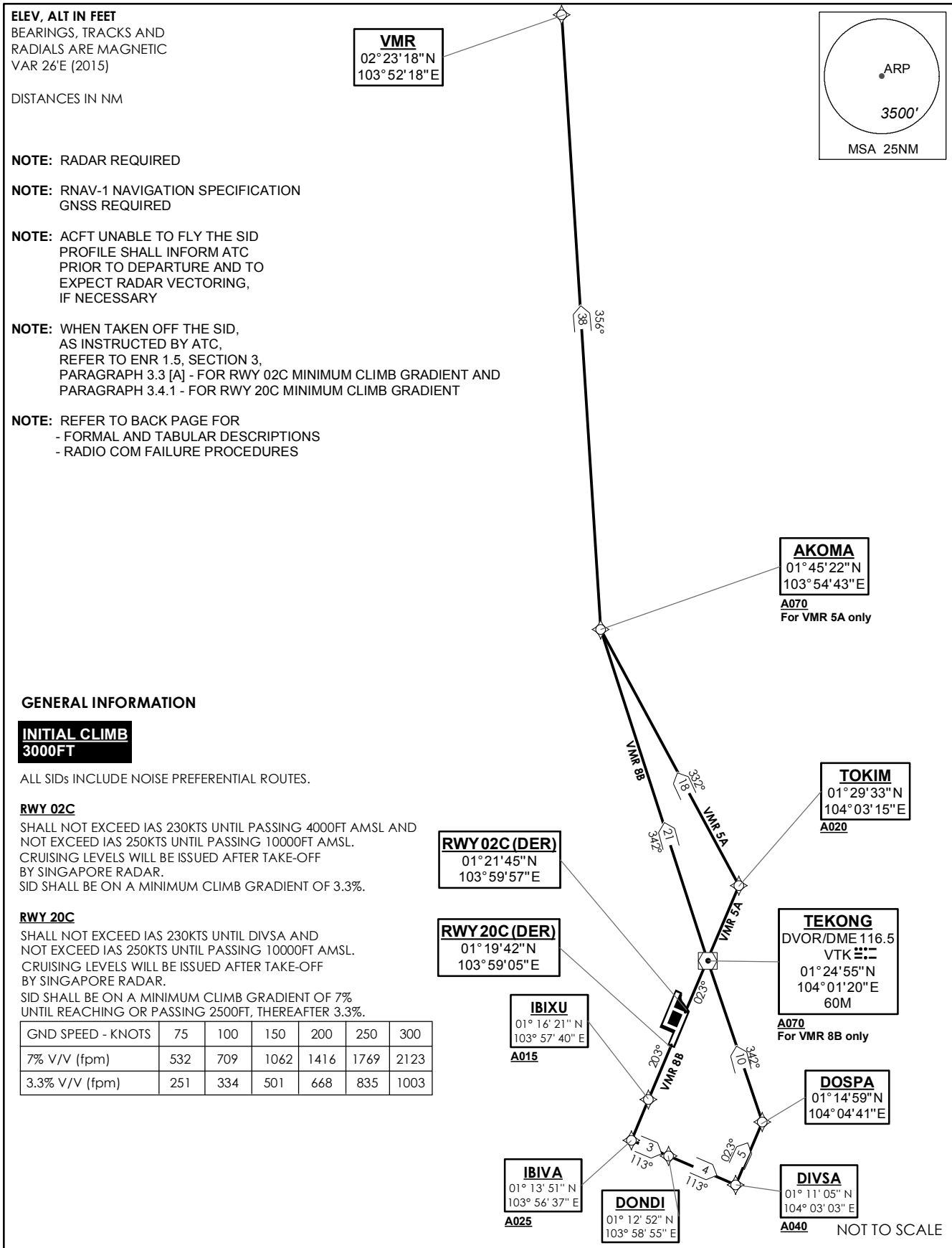
RWY 02C

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 3.3%.

RWY 20C

SHALL NOT EXCEED IAS 230KTS UNTIL DIVSA AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 7%
UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
7% V/V (fpm)	532	709	1062	1416	1769	2123
3.3% V/V (fpm)	251	334	501	668	835	1003



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, turn left. To AKOMA at or above 7000ft, turn right. To VMR.	TOKIM [M023; A020+; 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+	-	RNAV1
TF	AKOMA	-	332(331.5)	-0.5	R	A070+	-	RNAV1
TF	VMR	-	356(355.5)	-0.5	-	-	-	RNAV1

VMR 8B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To IBIXU on course 203° at or above 1500ft. To IBIVA at or above 2500ft, turn left. To DONDI. To DIVSA at or above 4000ft, speed 230kts, turn left. To DOSPA, turn left. To VTK at or above 7000ft. To AKOMA, turn right. To VMR.	IBIXU [M203; A015+] -	CF	N
	IBIVA [A025+; L] -	TF	N
	DONDI -	TF	N
	DIVSA [A040+; K230; L] -	TF	N
	DOSPA [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	IBIXU	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	IBIVA	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DONDI	-	113(112.5)	-0.5	-	-	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	L	A040+	K230	RNAV1
TF	DOSPA	-	023(022.5)	-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 134.4

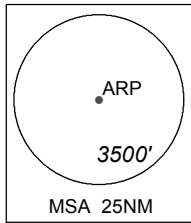
TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02C/20C
VENIX DEPARTURES
VENIX 1A (R02C)
VENIX 3B (R20C)**

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:** ACFT UNABLE TO FLY THE SID
PROFILE SHALL INFORM ATC
PRIOR TO DEPARTURE AND TO
EXPECT RADAR VECTORED,
IF NECESSARY
- NOTE:** WHEN TAKEN OFF THE SID,
AS INSTRUCTED BY ATC,
REFER TO ENR 1.5, SECTION 3,
PARAGRAPH 3.3 [A] - FOR RWY 02C MINIMUM CLIMB GRADIENT AND
PARAGRAPH 3.4.1 - FOR RWY 20C MINIMUM CLIMB GRADIENT
- NOTE:** REFER TO BACK PAGE FOR
- FORMAL AND TABULAR DESCRIPTIONS
- RADIO COM FAILURE PROCEDURES

GENERAL INFORMATION

**INITIAL CLIMB
3000FT**

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

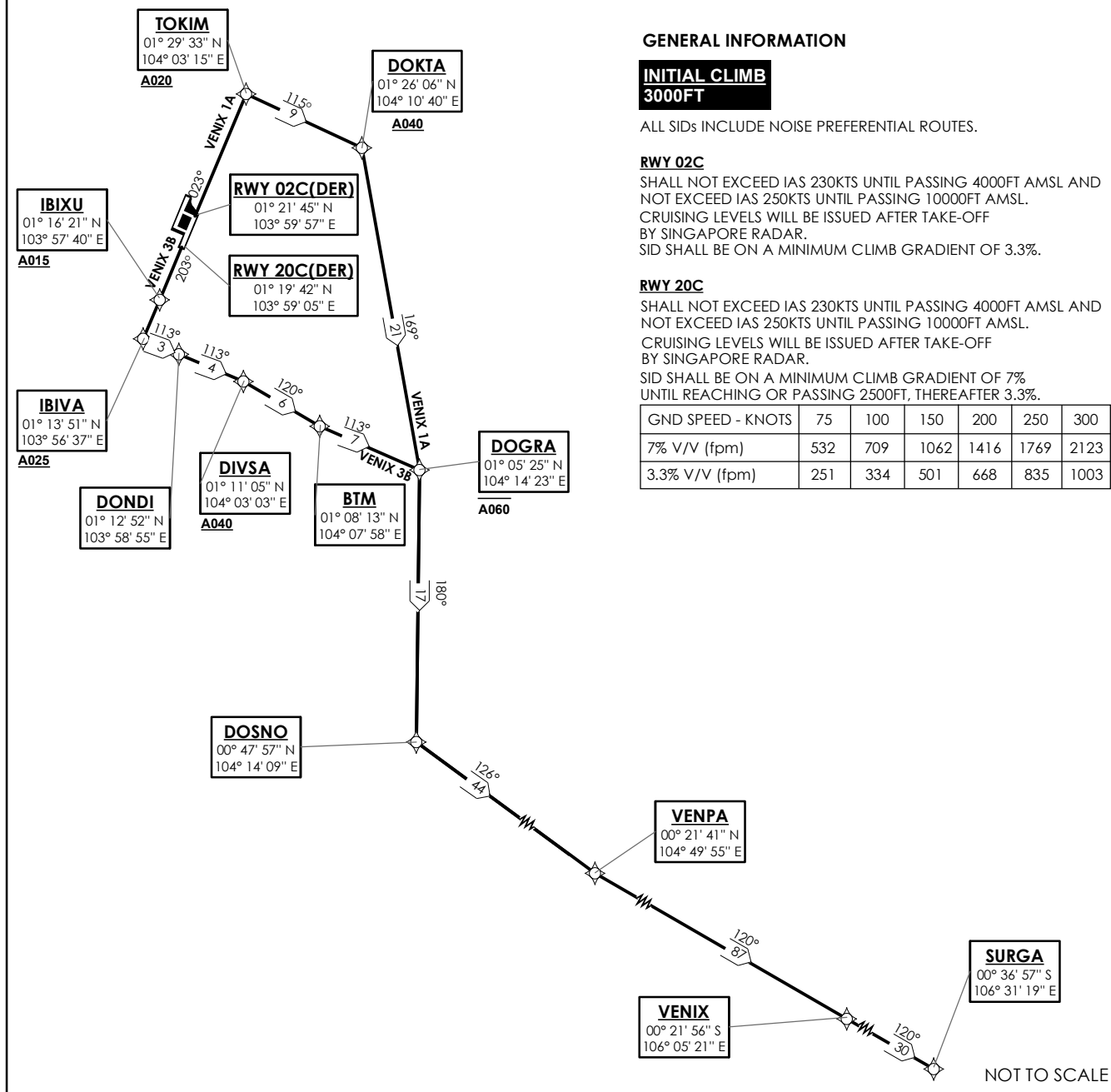
RWY 02C

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 3.3%.

RWY 20C

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 7%
UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
7% V/V (fpm)	532	709	1062	1416	1769	2123
3.3% V/V (fpm)	251	334	501	668	835	1003



NOT TO SCALE

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., 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+; 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+	-	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 3B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To IBIXU on course 203° at or above 1500ft. To IBIVA at or above 2500ft, turn left. To DONDI. To DIVSA at or above 4000ft, turn right. To BTM, turn left. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To VENPA, turn left. To VENIX. To SURGA.	IBIXU [M203; A015+] -	CF	N
	IBIVA [A025+; L] -	TF	N
	DONDI -	TF	N
	DIVSA [A040+; R] -	TF	N
	BTM [L] -	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	IBIXU	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	IBIVA	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DONDI	-	113(112.5)	-0.5	-	-	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	R	A040+	-	RNAV1
TF	BTM	-	120(119.5)	-0.5	L	-	-	RNAV1
TF	DOGRA	-	113(112.5)	-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

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

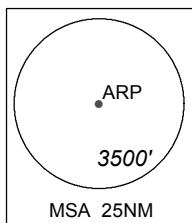
TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02L/20R
VENIX DEPARTURES
VENIX 1E (R02L)
VENIX 3F (R20R)**

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

NOTE: WHEN TAKEN OFF THE SID,
AS INSTRUCTED BY ATC,
REFER TO ENR 1.5, SECTION 3,
PARAGRAPH 3.2 [A] - FOR RWY 02L MINIMUM CLIMB GRADIENT AND
PARAGRAPH 3.4.2 - FOR RWY 20R MINIMUM CLIMB GRADIENT

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

GENERAL INFORMATION

**INITIAL CLIMB
3000FT**

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

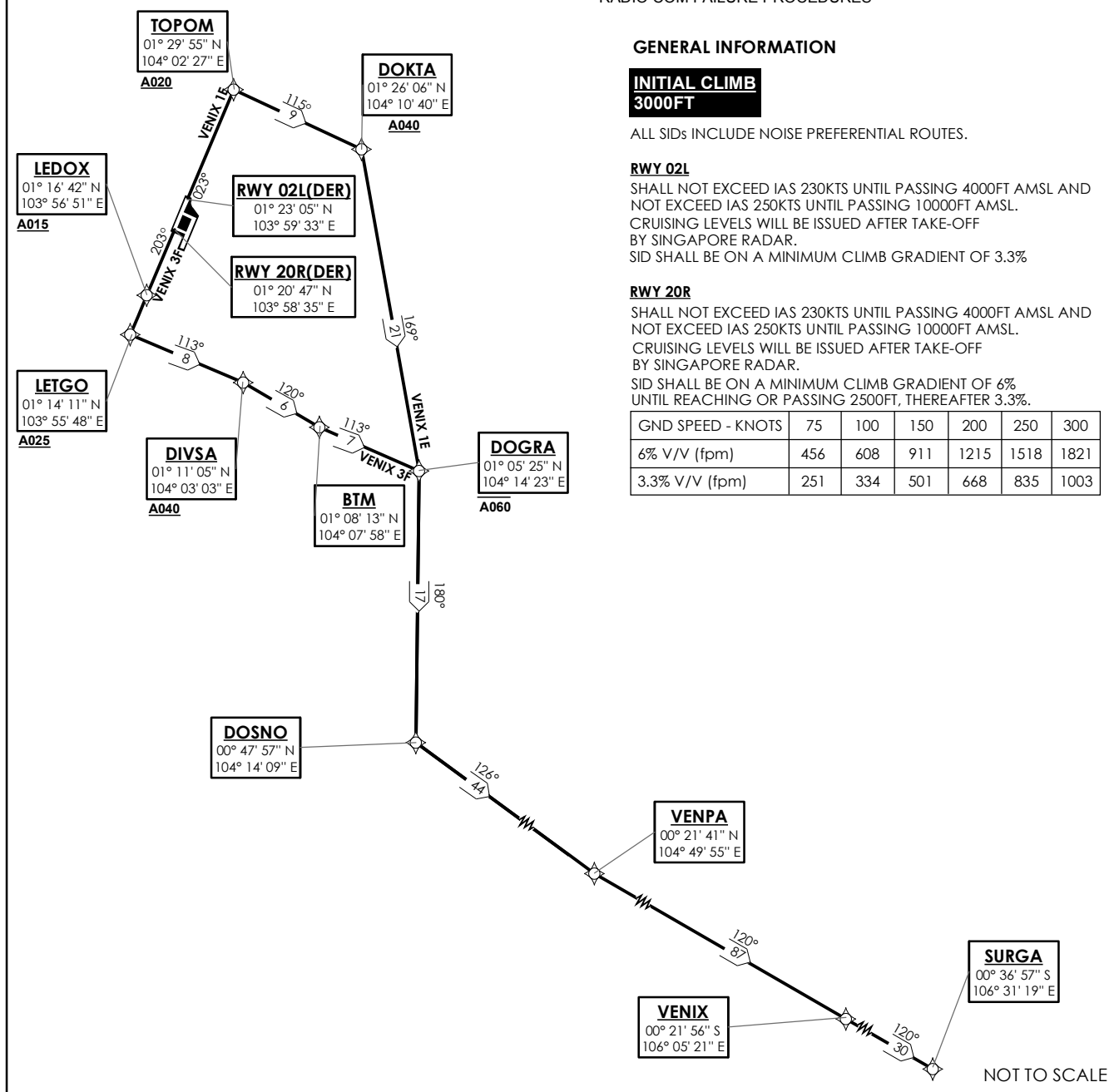
RWY 02L

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 3.3%

RWY 20R

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 6%
UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
6% V/V (fpm)	456	608	911	1215	1518	1821
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, 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+; 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+	-	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 3F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To LEDOX on course 203° at or above 1500ft. To LETGO at or above 2500ft, turn left. To DIVSA at or above 4000ft, turn right. To BTM, turn left. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To VENPA, turn left. To VENIX. To SURGA.	LEDOX [M203; A015+] -	CF	N
	LETGO [A025+; L] -	TF	N
	DIVSA [A040+; R] -	TF	N
	BTM [L] -	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	LEDOX	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	LETGO	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	R	A040+	-	RNAV1
TF	BTM	-	120(119.5)	-0.5	L	-	-	RNAV1
TF	DOGRA	-	113(112.5)	-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

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

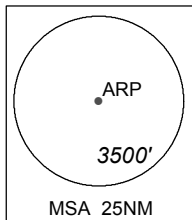
TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02C/20C
KADAR DEPARTURES
KADAR 1A (R02C)
KADAR 3B (R20C)**

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:** ACFT UNABLE TO FLY THE SID
PROFILE SHALL INFORM ATC
PRIOR TO DEPARTURE AND TO
EXPECT RADAR VECTORING,
IF NECESSARY
- NOTE:** WHEN TAKEN OFF THE SID,
AS INSTRUCTED BY ATC,
REFER TO ENR 1.5, SECTION 3,
PARAGRAPH 3.3 [A] - FOR RWY 02C MINIMUM CLIMB GRADIENT AND
PARAGRAPH 3.4.1 - FOR RWY 20C MINIMUM CLIMB GRADIENT
- NOTE:** REFER TO BACK PAGE FOR
 - FORMAL AND TABULAR DESCRIPTIONS
 - RADIO COM FAILURE PROCEDURES

GENERAL INFORMATION

**INITIAL CLIMB
3000FT**

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

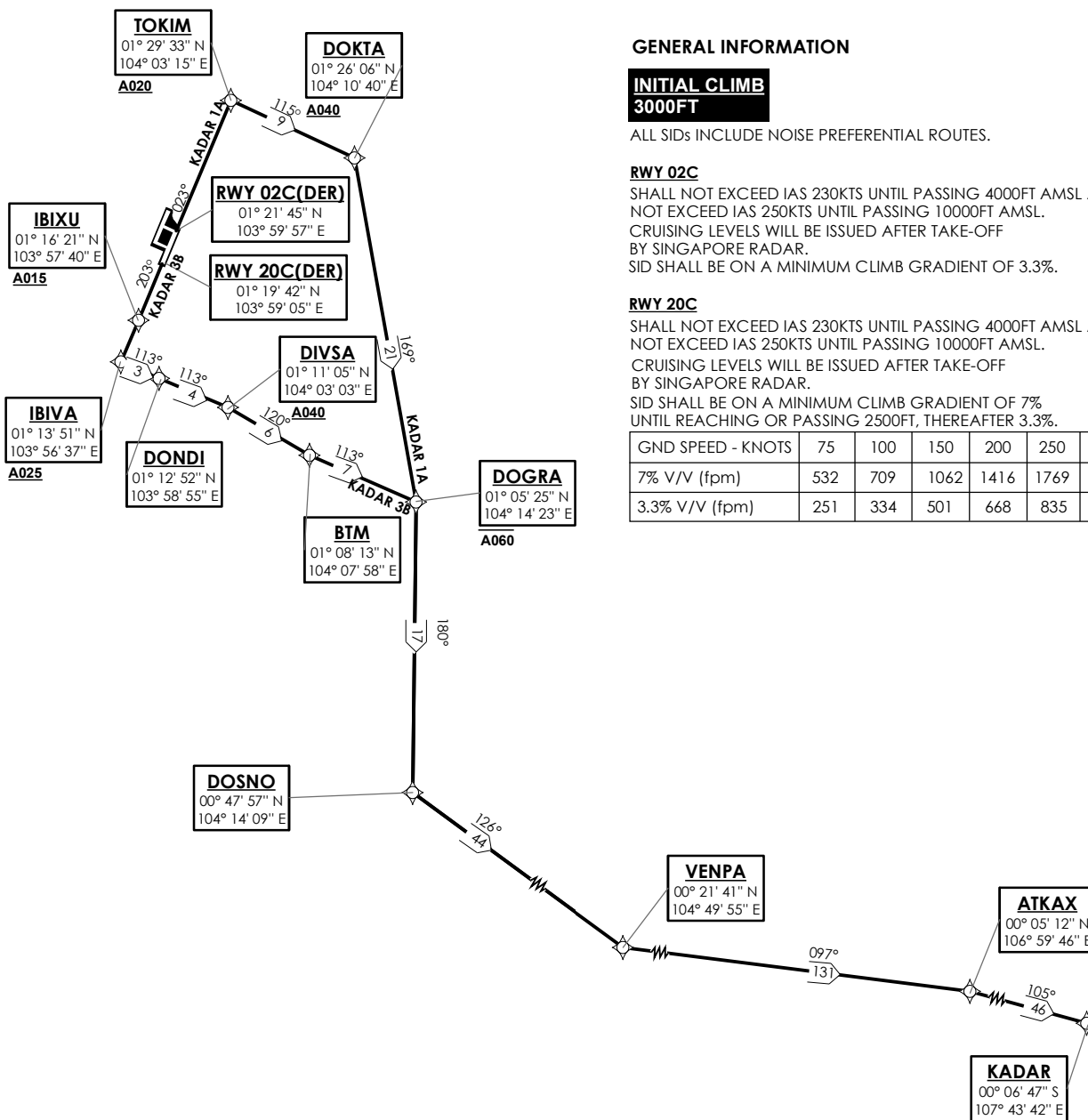
RWY 02C

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 3.3%.

RWY 20C

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 7%
UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
7% V/V (fpm)	532	709	1062	1416	1769	2123
3.3% V/V (fpm)	251	334	501	668	835	1003



NOT TO SCALE

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, 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+; 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+	-	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 3B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To IBIXU on course 203° at or above 1500ft. To IBIVA at or above 2500ft, turn left. To DONDI. To DIVSA at or above 4000ft, turn right. To BTM, turn left. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To VENPA, turn left. To ATKAX, turn right. To KADAR.	IBIXU [M203; A015+] -	CF	N
	IBIVA [A025+; L] -	TF	N
	DONDI -	TF	N
	DIVSA [A040+; R] -	TF	N
	BTM [L] -	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	IBIXU	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	IBIVA	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DONDI	-	113(112.5)	-0.5	-	-	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	R	A040+	-	RNAV1
TF	BTM	-	120(119.5)	-0.5	L	-	-	RNAV1
TF	DOGRA	-	113(112.5)	-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

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

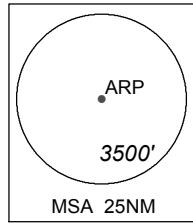
TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02L/20R
KADAR DEPARTURES
KADAR 1E (R02L)
KADAR 3F (R20R)**

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

NOTE: WHEN TAKEN OFF THE SID,
AS INSTRUCTED BY ATC,
REFER TO ENR 1.5, SECTION 3,
PARAGRAPH 3.2 [A] - FOR RWY 02L MINIMUM CLIMB GRADIENT AND
PARAGRAPH 3.4.2 - FOR RWY 20R MINIMUM CLIMB GRADIENT

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

GENERAL INFORMATION

**INITIAL CLIMB
3000FT**

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

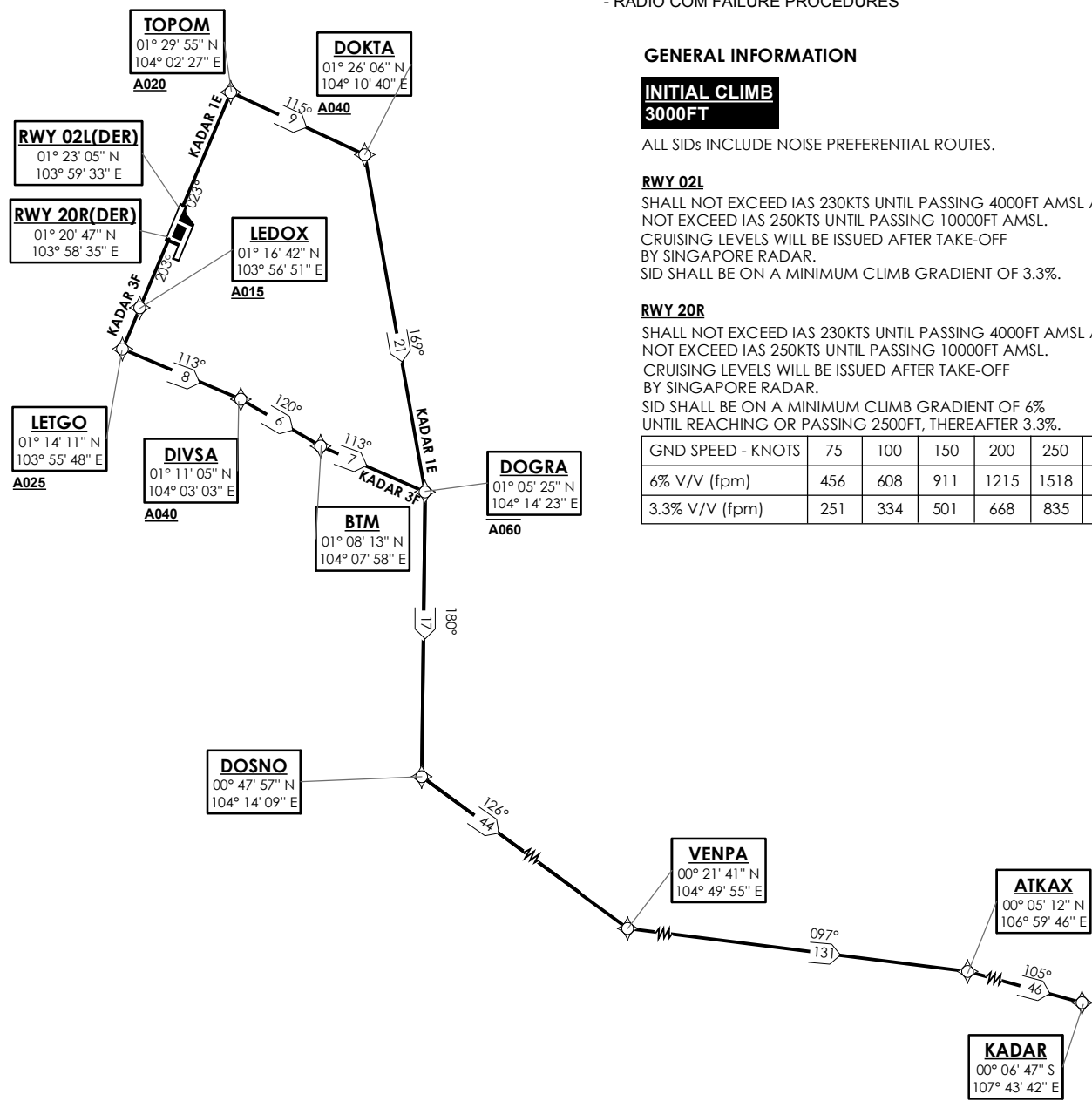
RWY 02L

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 3.3%.

RWY 20R

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SID SHALL BE ON A MINIMUM CLIMB GRADIENT OF 6%
UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
6% V/V (fpm)	456	608	911	1215	1518	1821
3.3% V/V (fpm)	251	334	501	668	835	1003



NOT TO SCALE

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, 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+; 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+	-	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 3F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To LEDOX on course 203° at or above 1500ft. To LETGO at or above 2500ft, turn left. To DIVSA at or above 4000ft, turn right. To BTM, turn left. To DOGRA at or below 6000ft, turn right. To DOSNO, turn left. To VENPA, turn left. To ATKAX, turn right. To KADAR.	LEDOX [M203; A015+] -	CF	N
	LETGO [A025+; L] -	TF	N
	DIVSA [A040+; R] -	TF	N
	BTM [L] -	TF	N
	DOGRA [A060-; R] -	TF	N
	DOSNO [L] -	TF	N
	VENPA [L] -	TF	N
	ATKAX [R] -	TF	N
	KADAR	TF	N

Tabular Descriptions

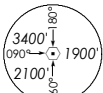
Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	LEDOX	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	LETGO	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	R	A040+	-	RNAV1
TF	BTM	-	120(119.5)	-0.5	L	-	-	RNAV1
TF	DOGRA	-	113(112.5)	-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

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>

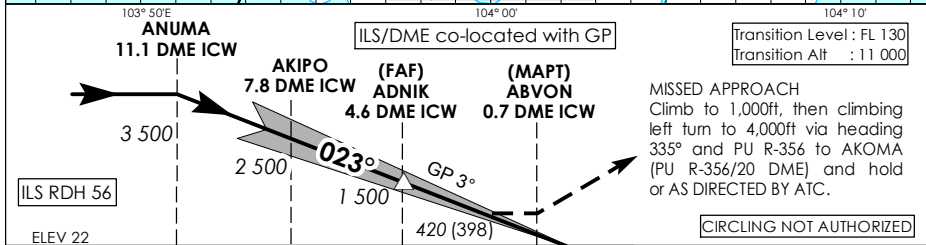
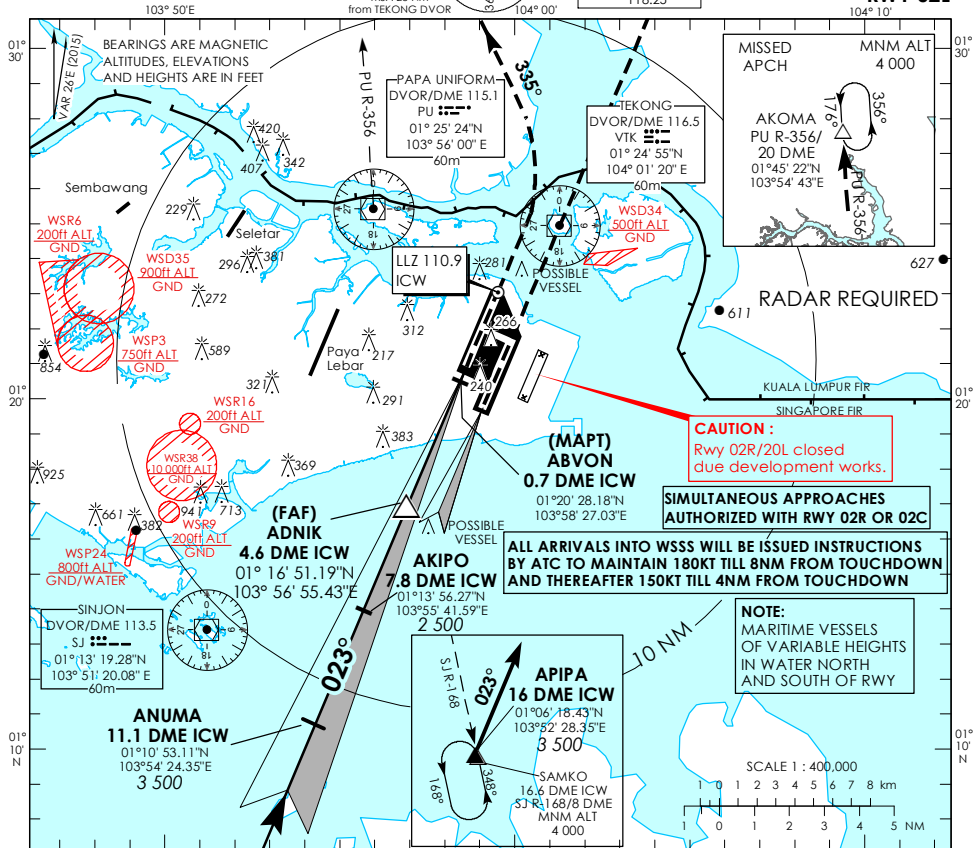
INSTRUMENT APPROACH CHART - ICAO

AERODROME ELEV **22ft**
HEIGHT RELATED TO
THR RWY 02L - ELEV **22ft**



D-ATIS AP ID WSSS	128.6
APP	120.3
TWR	119.3
	118.6
	118.25

SINGAPORE/ SINGAPORE CHANGI ICW ILS/DME RWY 02L



* TIMING NOT AUTHORIZED WHEN GP INOP

Category of Aircraft	OCA (OCH)					
	A	B	C	D	D _L	
Straight-in	CAT I ILS	173 (151)	187 (165)	203 (181)	216 (194)	219 (197)
	CAT II ILS	88 (66)	98 (76)	108 (86)	127 (105)	127 (105)
	GP INOP	420 (398)				
Distance	4 DME		3 DME		2 DME	
Altitude (Height)	1290 (1268)		970 (948)		660 (638)	
Speed	knots	70	120	150	185	
FAF - MAPT 3.9nm	min : s *	3 : 21	1 : 57	1 : 34	1 : 16	
Rate of descent/GS	ft/min	370	635	795	980	

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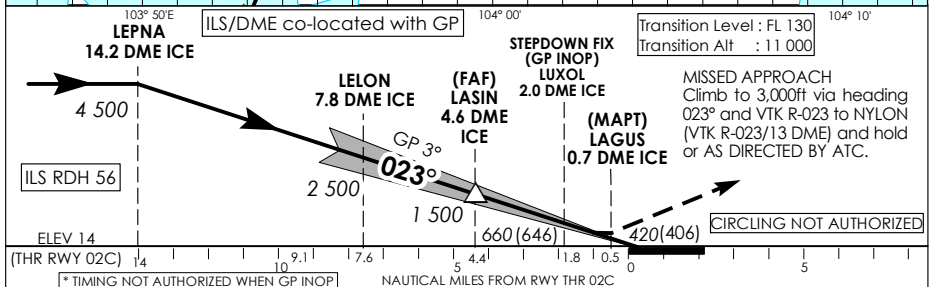
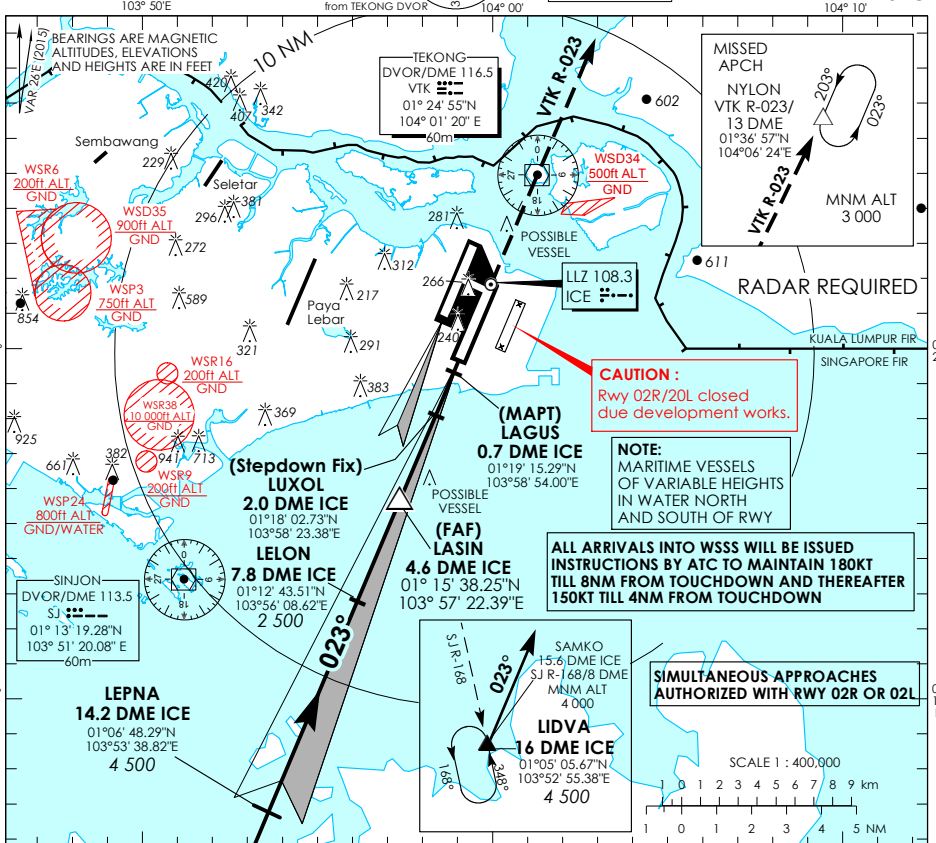
INSTRUMENT APPROACH CHART - ICAO **AERODROME ELEV 22ft**
 HEIGHT RELATED TO
THR RWY 02C - ELEV 14ft

MSA 25 NM from TEKONG DVOR

3400' 1900' 2100' 360° 090° 180°

D-ATIS AP ID WSSS
 APP 128.6
 120.3
 119.3
 118.6
 TWR 118.25

SINGAPORE/ SINGAPORE CHANGI ICE ILS/DME VTK R-02C



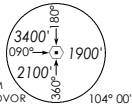
* TIMING NOT AUTHORIZED WHEN GP INOP

		OCA (OCH)				
		A	B	C	D	D ₁
Straight-in	CAT I ILS	170 (156)	180 (166)	196 (182)	209 (195)	212 (198)
	GP INOP (with stepdown fix)	420 (406)				
	GP INOP (without stepdown fix)	660 (646)				
Distance		4 DME			3 DME	
Altitude (Height)		1290 (1276)			970 (956)	
Speed		70	120	150	185	
FAF - MAPT 3.9nm		min : s*	3 : 21	1 : 57	1 : 34	1 : 16
Rate of descent/GS		ft/min	370	635	795	980

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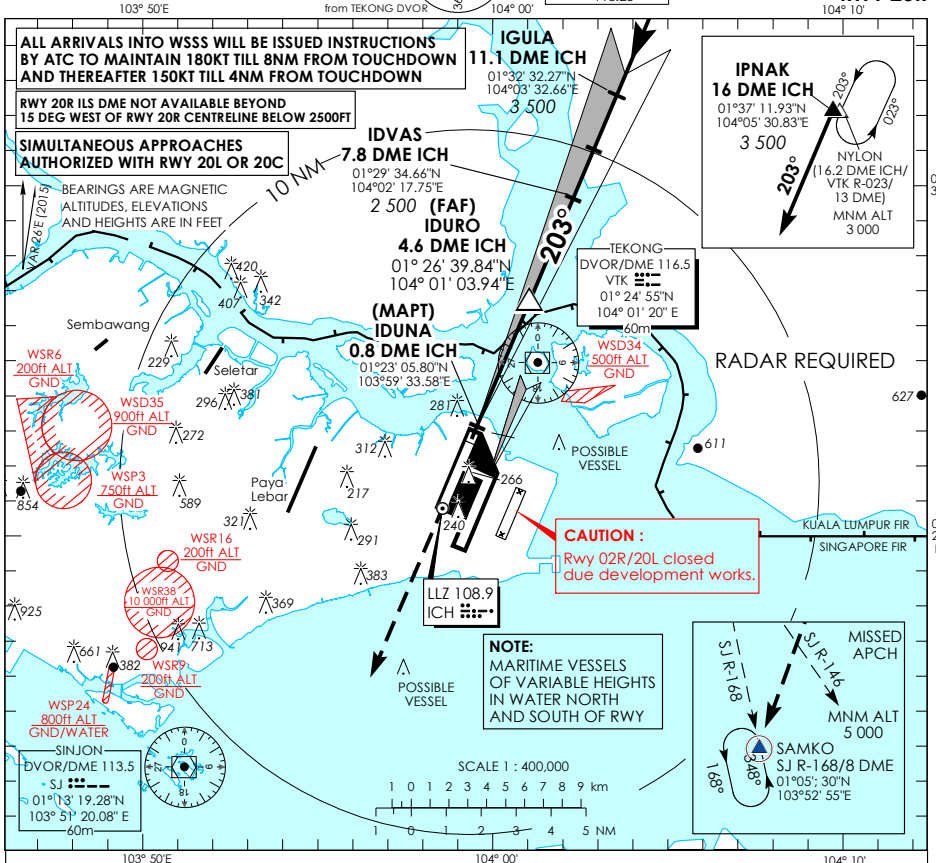
INSTRUMENT APPROACH CHART - ICAO

AERODROME ELEV 22ft
HEIGHT RELATED TO
DTHR RWY 20R - ELEV 13ft

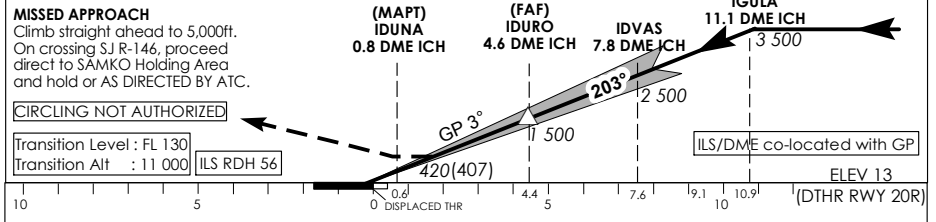


D-TAS	AP ID	WSS
APP	128.6	
	120.3	
	119.3	
TWR	118.6	
	118.25	

SINGAPORE/ SINGAPORE CHANGI ICH ILS/DME RWY 20R



This procedure requires a missed approach climb gradient of 3.7% (225 ft/NM) until passing 2,500ft. For aircraft which can only achieve a 2.5% (152 ft/NM) climb gradient, the CAT I OCA (OCH) is 693ft (680ft).

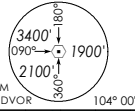


		OCA (OCH)				
Category of Aircraft		A	B	C	D	D _L
Straight-in	CAT I ILS	152 (139)	159 (146)	179 (166)	192 (179)	195 (182)
	GP INOP	420 (407)				
Distance		4 DME		3 DME	2 DME	
Altitude (Height)		1290 (1277)		970 (957)	650 (637)	
Speed	knots	70	120	150	185	
FAF - MAPT 3.9nm	min : s *	3 : 21	1 : 57	1 : 34	1 : 16	
Rate of descent/GS	ft/min	370	635	795	980	

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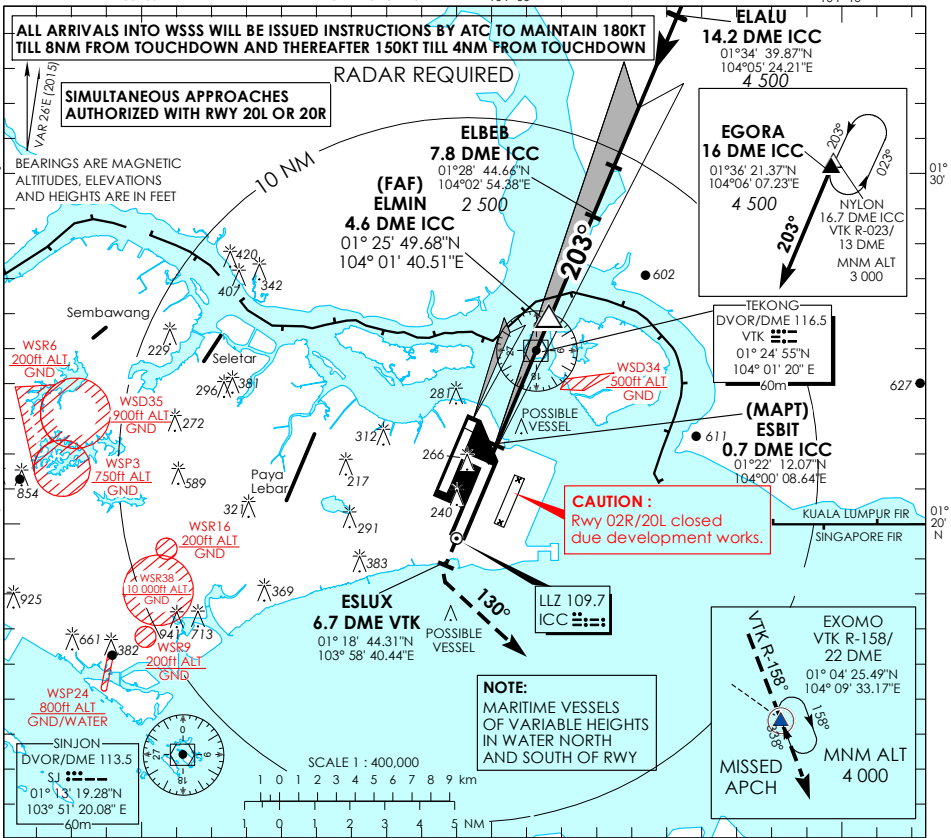
INSTRUMENT APPROACH CHART - ICAO

AERODROME ELEV **22ft**
HEIGHT RELATED TO
THR RWY 20C - ELEV **15ft**

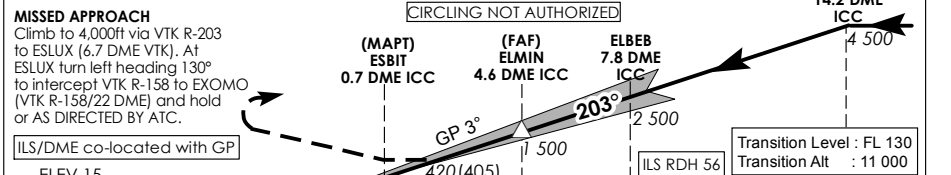


D-ATIS	AP ID	WSSS
APP	128.6	
TWR	120.3	
	119.3	
	118.6	
	118.25	

SINGAPORE/ SINGAPORE CHANGI ICC ILS/DME RWY 20C



This procedure requires a missed approach climb gradient of 2.8% (171 ft/NM) until passing 2,000ft. For aircraft which can only achieve a 2.5% (152 ft/NM) climb gradient, the CAT I OCA (OCH) is 315ft (300ft).



* TIMING NOT AUTHORIZED WHEN GP INOP

NAUTICAL MILES FROM RWY THR 20C

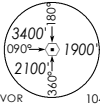
Category of Aircraft	OCA (OCH)					
	A	B	C	D	D _L	
Straight-in	CAT I ILS	166 (151)	180 (165)	196 (181)	209 (194)	212 (197)
	CAT II ILS	71 (56)	78 (63)	91 (76)	101 (86)	107 (92)
	GP INOP	420 (405)				

Distance	4 DME		3 DME		2 DME	
Altitude (Height)	1290 (1275)		980 (965)		660 (645)	
Speed	knots	70	120	150	185	
FAF - MAPT 3.9nm	min : s *	3 : 21	1 : 57	1 : 34	1 : 16	
Rate of descent/GS	ft/min		370	635	795	980

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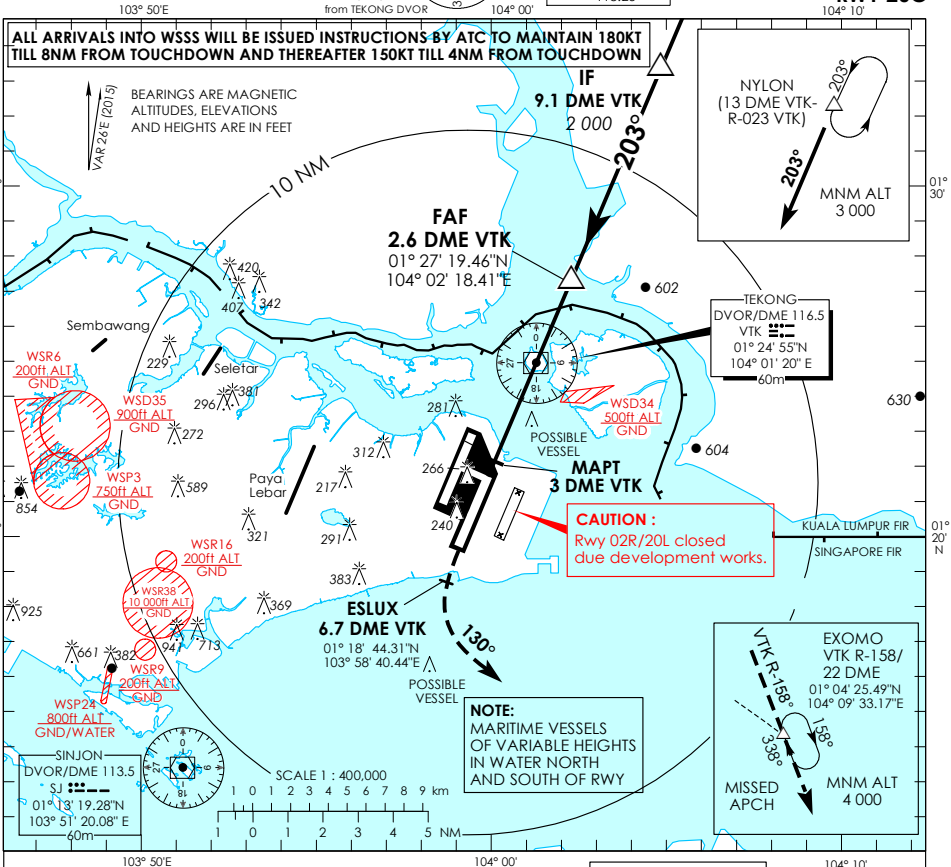
INSTRUMENT APPROACH CHART - ICAO

AERODROME ELEV **22ft**
HEIGHT RELATED TO AD ELEV

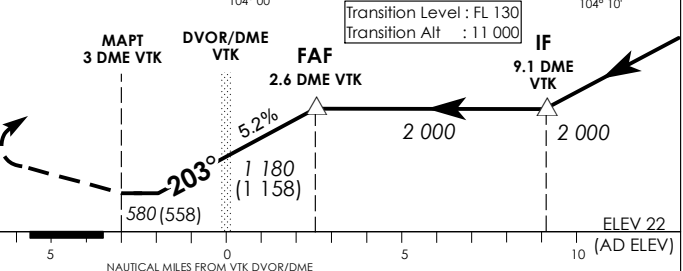


D-TAS AP ID WSS	128.6
APP	120.3
TWR	119.3
	118.6
	118.25

SINGAPORE/ SINGAPORE CHANGI VTK DVOR/DME RWY 20C



MISSED APPROACH
Climb to 4,000ft via VTK R-203 to ESLUX (6.7 DME VTK). At ESLUX (1,000ft or above) turn left heading 130° to intercept VTK R-158 to EXOMO (VTK R-158/22 DME) and hold or AS DIRECTED BY ATC.

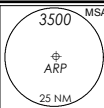


OCA (OCH)				
Category of Aircraft	A	B	C	D
Straight-in	580 (558)			
Distance	2 DME	1 DME	VTK	1 DME
Altitude (Height)	1820 (1798)	1500 (1478)	1180 (1158)	860 (838)
Speed	knots	70	120	150
Speed			150	185
FAF - MAPT 5.6nm	min : s	4 : 48	2 : 48	2 : 15
Rate of descent/GS	ft/min	370	635	795
				980

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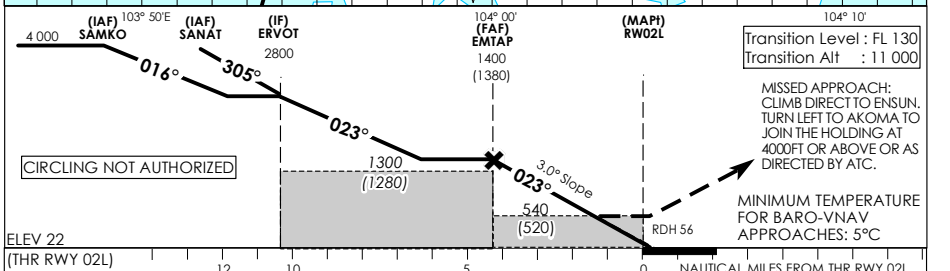
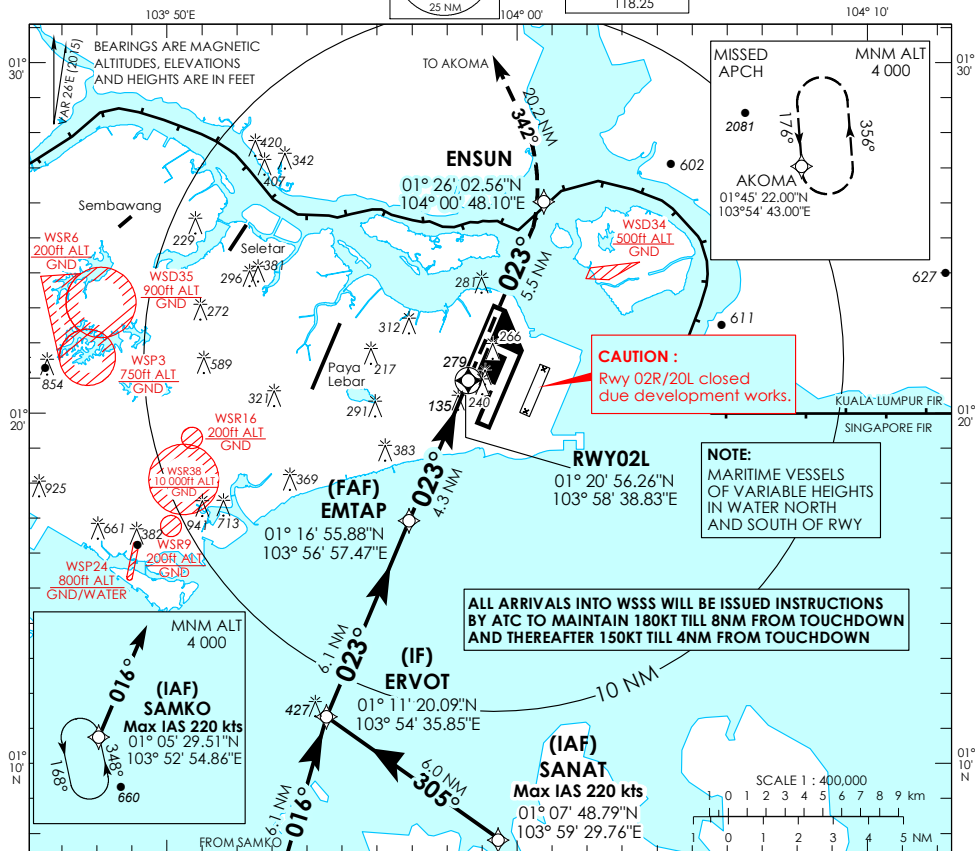
INSTRUMENT APPROACH CHART - ICAO

AERODROME ELEV 22ft
HEIGHT RELATED TO
THR RWY 02L - ELEV 22ft



D-ATIS AP ID	WSSS
APP	128.6
TWR	120.3
	119.3
	118.6
	118.25

**SINGAPORE/ SINGAPORE CHANGI
RNAV (GNSS) RWY 02L**

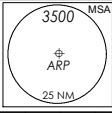


ELEV 22 (THR RWY 02L)		NAUTICAL MILES FROM THR RWY 02L						
		12	10	5	0			
Category of Aircraft		OCA (OCH)						
		A		B		C		D
LNAV/VNAV	2.5%	450 (430)						
LNAV	2.5%	540 (520)						
Fix		SAMKO	SANAT	ERVOT	EMTAP	RW02L	ENSUN	AKOMA
Altitude (Height)		4000 (3978)	4000 (3978)	2800 (2778)	1400 (1378)	540 (518)	880 (858)	4000 (3978)
Speed	knots	80	100	120	140	160	180	
FAF - MAP1 4.3nm	min : s	3 : 14	2 : 35	2 : 09	1 : 51	1 : 37	1 : 26	
Rate of descent/GS	ft/min		424	530	637	743	849	955

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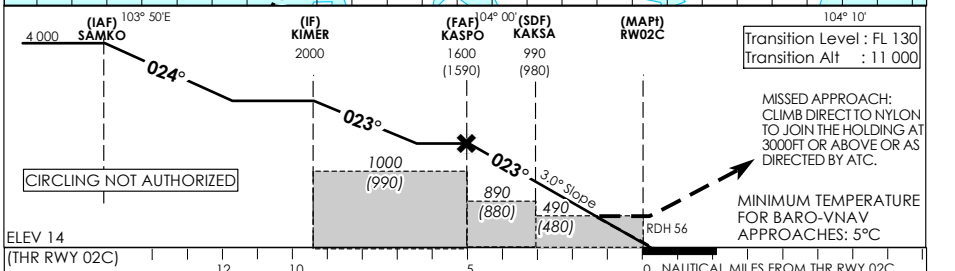
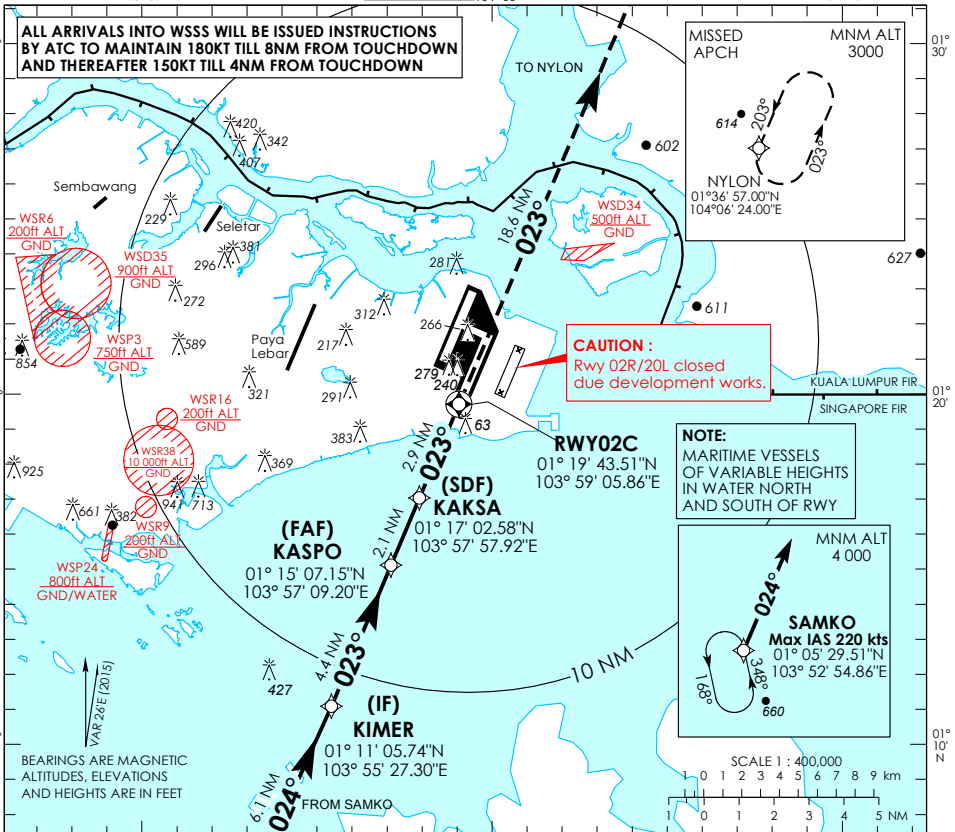
**INSTRUMENT
APPROACH
CHART - ICAO**

AERODROME ELEV **22ft**
HEIGHT RELATED TO
THR RWY 02C - ELEV **14ft**



D-ATIS AP ID WSSS	128.6
APP	120.3
TWR	119.3
	118.6
	118.25

**SINGAPORE/
SINGAPORE CHANGI
RNAV (GNSS) RWY 02C**

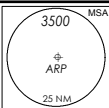


		OCA (OCH)							
Category of Aircraft		A		B		C		D	
LNAV		2.5%		490 (480)					
LNAV without SDF		2.5%		890 (880)					
LNAV/VNAV		2.5%		360 (350)					
Fix		SAMKO	KIMER	KASPO	KAKSA	RW02C	NYLON		
Altitude (Height)		4000 (3986)	2000 (1986)	1600 (1586)	990 (976)	490 (476)	3000 (2986)		
Speed		80	100	120	140	160	180		
FAF - MAPI 5nm		min : s	3 : 45	3 : 00	2 : 30	2 : 09	1 : 53	1 : 40	
Rate of descent/GS		ft/min	425	531	637	743	849	955	

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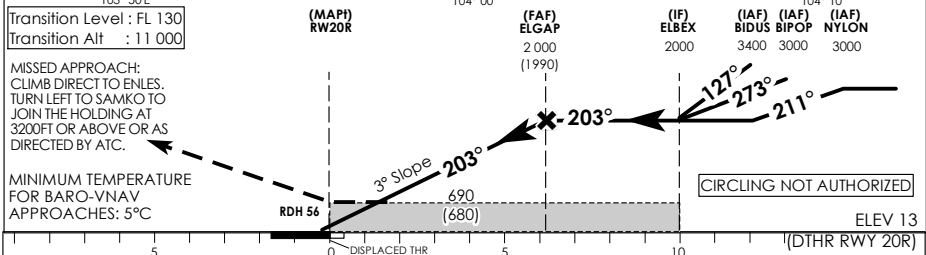
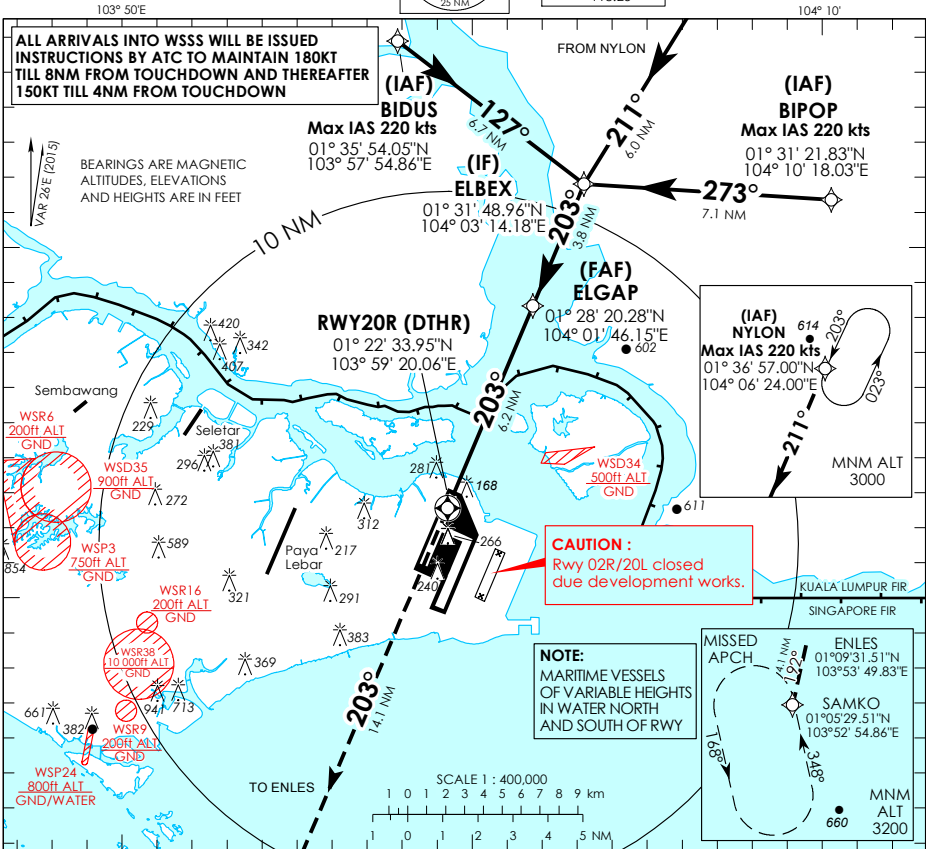
INSTRUMENT APPROACH CHART - ICAO

AERODROME ELEV **22ft**
HEIGHT RELATED TO
DTHR RWY 20R - ELEV **13ft**



D-ATIS	AP ID	WSSS
APP	128.6	
TWR	119.3	
	118.6	
	118.25	

**SINGAPORE/ SINGAPORE CHANGI
RNAV (GNSS) RWY 20R**

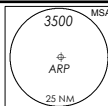


Category of Aircraft	A	B	C	D				
LNAV/VNAV	2.5%	690 (680)						
LNAV	2.5%	690 (680)						
Fix	BIDUS	NYLON	BIPOP	ELBEX	ELGAP	RW20R	ENLES	SAMKO
Altitude (Height)	3400 (3387)	3000 (2987)	3000 (2987)	2000 (1987)	2000 (1987)	690 (680)	2180 (2167)	3200 (3187)
Speed	knots	80	100	120	140	140	160	180
FAF - MAP1 6.2 nm	min : s	4 : 39	3 : 44	3 : 06	2 : 40	2 : 20	2 : 04	
Rate of descent/GS	ft/min	425	531	637	743	849	955	

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**INSTRUMENT
APPROACH
CHART - ICAO**

AERODROME ELEV **22ft**
HEIGHT RELATED TO
THR RWY 20C - ELEV **15ft**



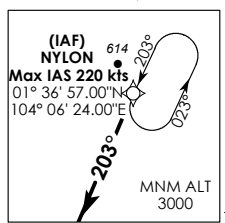
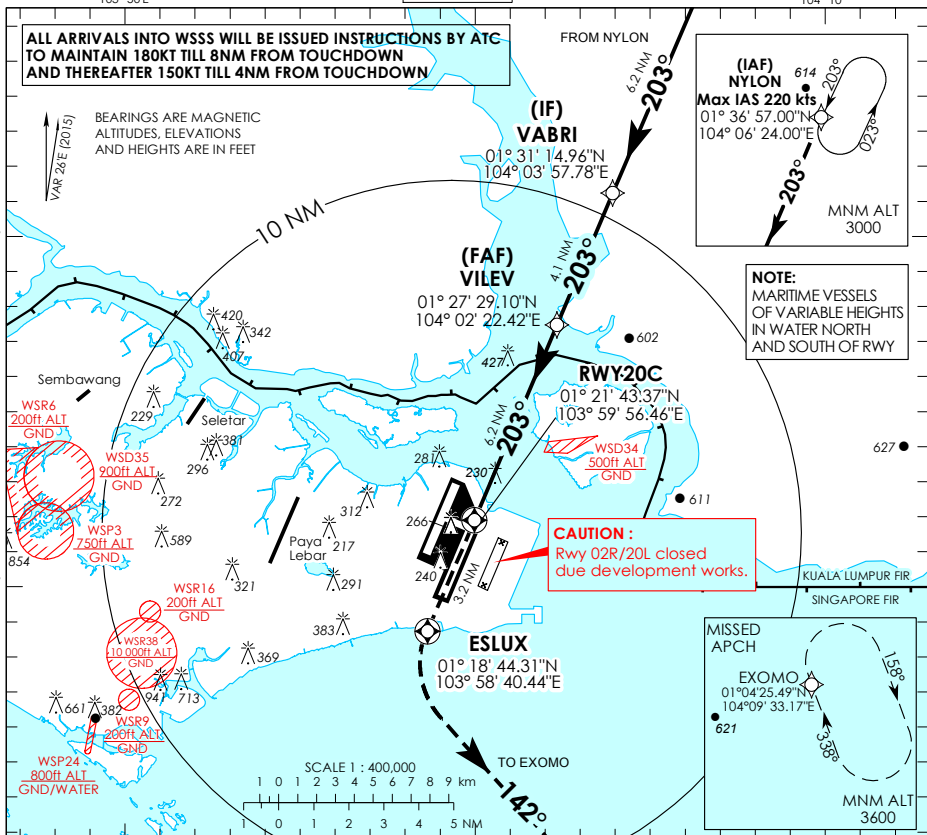
D-ATIS	AP ID	WSSS
APP	128.3	
TWR	119.3	
	118.6	
	118.25	

**SINGAPORE/
SINGAPORE CHANGI
RNAV (GNSS) RWY 20C**

ALL ARRIVALS INTO WSSS WILL BE ISSUED INSTRUCTIONS BY ATC TO MAINTAIN 180KT TILL 8NM FROM TOUCHDOWN AND THEREAFTER 150KT TILL 4NM FROM TOUCHDOWN

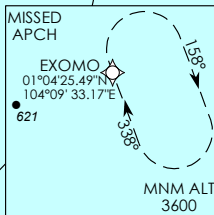
BEARINGS ARE MAGNETIC
ALTITUDES, ELEVATIONS
AND HEIGHTS ARE IN FEET

VAR 26 E (2015)



NOTE:
MARITIME VESSELS
OF VARIABLE HEIGHTS
IN WATER NORTH
AND SOUTH OF RWY

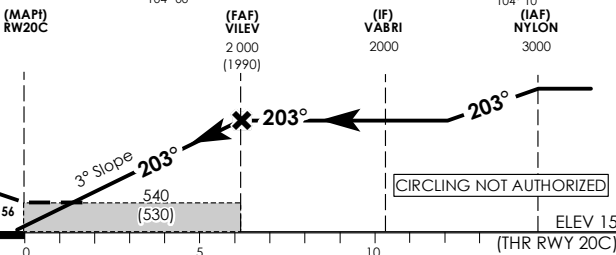
CAUTION :
Rwy 02R/20L closed
due development works.



Transition Level : FL 130
Transition Alt : 11 000

MISSED APPROACH:
CLIMB DIRECT TO ESLUX.
TURN LEFT TO MAGNETIC
COURSE 142° TO JOIN THE
HOLDING AT 3600FT OR ABOVE
OR AS DIRECTED BY ATC.

MINIMUM TEMPERATURE
FOR BARO-VNAV
APPROACHES: 5°C



Category of Aircraft	OCA (OCH)						
	A	B	C	D			
LNAV/VNAV	490 (480)						
LNAV	540 (530)						
Fix	NYLON	VABRI	VILEV	RW20C	ESLUX	EXOMO	
Altitude (Height)	3000 (2985)	2000 (1985)	2000 (1985)	540 (525)	540 (525)	3600 (3585)	
Speed	knots	80	100	120	140	160	180
FAF - MAP1 6.2 nm	min : s	4 : 39	3 : 44	3 : 06	2 : 40	2 : 20	2 : 04
Rate of descent/GS	ft/min	425	531	637	743	849	955

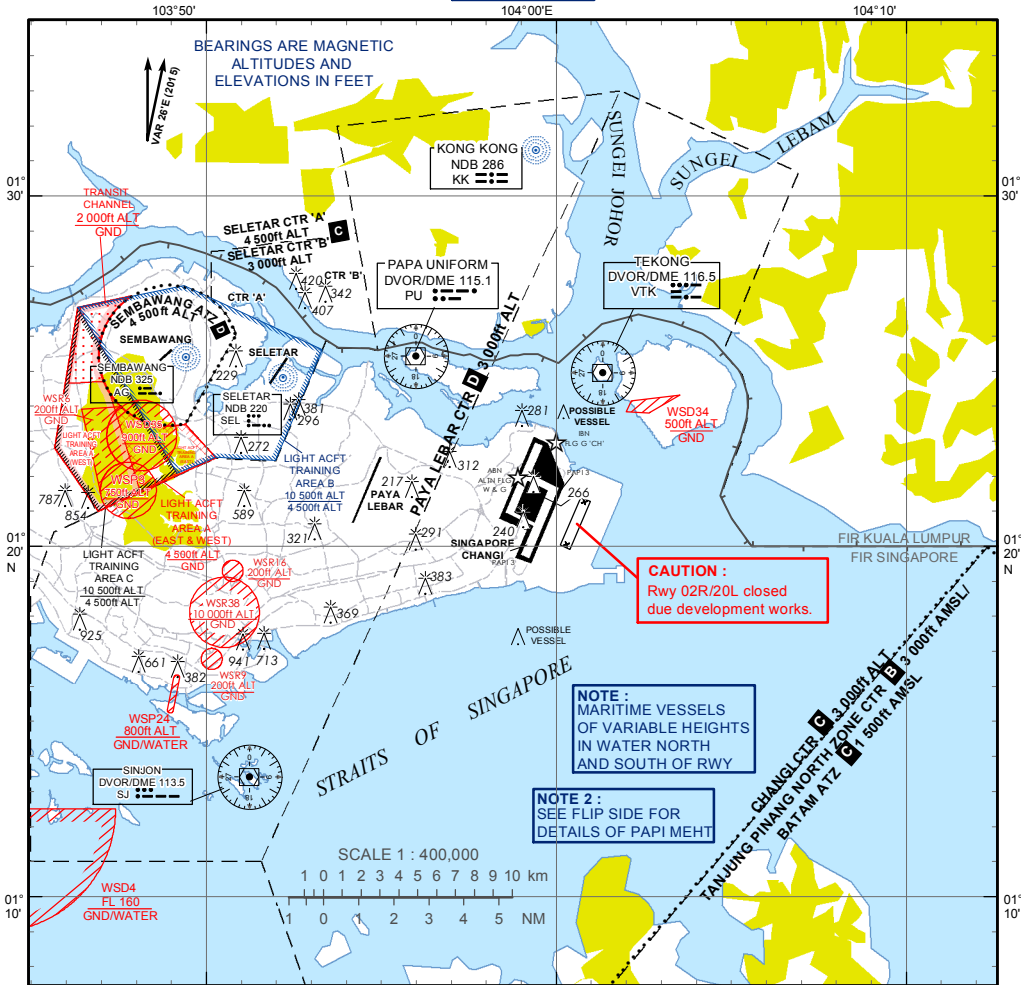
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VISUAL APPROACH CHART - ICAO

AERODROME ELEV 22 ft

D-ATIS	AP ID	WSSS
APP	128.6	
TWR	119.3	
	118.8	
	118.25	

SINGAPORE/SINGAPORE CHANGI



VISUAL APPROACH PROCEDURE

- An IFR flight operating into Singapore Changi Airport may be cleared for a visual approach subject to the following conditions :-
 - The pilot has the aerodrome in sight and can conduct his approach with visual reference to terrain;
 - The flight will not cause delay to other traffic;
 - There is no conflicting tall vessel movement;
 - The cloud ceiling at the aerodrome is 4,000ft or more for landing on RWY 02C/R and 3,000ft or more for on RWY 02C/L ; and
 - The visibility at the aerodrome is 5km or more.
- Notwithstanding para 1d) and 1e), if the pilot reports that he has the aerodrome in sight and can conduct his approach with visual reference to terrain, the flight may be cleared for a visual approach.
- Pilots may expect radar vectoring for separation and sequencing with other traffic prior to being cleared for a visual approach.

PAPI 3° (MEHT)*				
Pilot's eye height over the threshold when the following PAPI lights come in view.	RUNWAY			
	02L	20R	02C	20C
2 White lights and 2 Red lights	20.0m	20.0m	19.8m	19.8m
3 White lights and 1 Red light	24.0m	22.6m	23.7m	23.7m
4 White lights	26.4m	25.0m	26.2m	26.2m
<p>*MEHT : Minimum Eye Height Over the Threshold.</p> <p>Note : Aircraft with eye-to-wheel height greater than 8 metres are advised to fly with 2 white lights and 2 red lights visible so as to achieve sufficient wheel clearance.</p>				

WSSL AD 2.18 ATS COMMUNICATION FACILITIES

Service designation	Call sign	Frequency P-Pri S-Sec	Hours of operation	Remarks
TWR	Seletar Tower	P118.45 MHz S130.2 MHz 270.4 MHz	H24	* for vehicular movements
	Seletar Ground	121.6 MHz * 122.9 MHz		
ACC	Singapore Radar	P123.7 MHz S127.3 MHz	0000-1430	For AWY B469, G334, R208, L625, L629, L635, L642, M751, M753, M758, M761, M763, M771, N884, N891 and N892
		133.8 MHz		
		P133.25 MHz S135.8 MHz		
		P134.2 MHz S133.35 MHz		
	Singapore Radio	P134.4 MHz S128.1 MHz 255.4 MHz	H24	For AWY A457, A464, A576, B466, L762, R325 (all northbound) and R469.
		6556 kHz 11297 kHz		For AWY G580, M646 and M767
		5655 kHz 8942 kHz 11396 kHz		For AWY A464, A576, G579 (all southbound), B470, G220, N875 and in area in the immediate vicinity of Singapore
		6556 kHz		Radar Maintenance Period: Monthly - every third SAT BTN 1601-2359
APP	Singapore Approach	P120.3 MHz S124.6 MHz	0000-1500	SEA 1. SATCOM SER AVBL SSB suppressed carrier
	Seletar Approach	126.025 MHz		SEA 2. SATCOM SER AVBL SSB suppressed carrier
				SEA 3. SATCOM SER AVBL SSB suppressed carrier
				TAR: a) Intermediate APCH to Singapore Changi AP and other airports in Singapore b) DEP from all airports in Singapore
				Maintenance Period: Monthly: every first SAT BTN 1601-2359 (ASR I) and every fourth SAT BTN 1601-2359 (ASR II)
				TAR - Intermediate and final approach to Seletar Airport

WSSL AD 2.19 RADIO NAVIGATION AND LANDING AIDS

Type of Aid and Variation	IDENT	Frequency	OPR Hour	Position of Transmitting Antenna Coordinates	DME Transmitting Antenna Elevation / Remarks
1	2	3	4	5	6 & 7
JAYBEE NDB	JB	400 KHz (80w)	H24	012959.77N 1034241.82E	BRG 298° DIST 19.6km from ARP Seletar. Coverage 50NM. Unusable 285°-060° beyond 20NM. Bearing fluctuations greater than +/- 10° may be observed in sector 138° to 148°. EM: A0/A2
KONG KONG NDB	KK	286 KHz (70w)	H24	013117.76N 1035923.69E	BRG 049° DIST 17.7km from ARP Seletar. Coverage 50NM. Unusable 270°-010° beyond 30NM. Bearing fluctuations greater than +/- 10° may be observed in sector 048° to 052°. EM: A0/A2
SELETAR NDB	SEL	220 KHz	H24	012448.50N 1035210.16E	BRG 152° DIST 0.44km from ARP Seletar. Coverage 50NM. EM: A0/A2

WSSL AD 2.20 LOCAL TRAFFIC REGULATIONS

1 LOCAL FLYING RESTRICTIONS:

- 1.1 Fixed-wing aircraft operations including circuit flying and training operations are restricted to the west of Seletar runway. Helicopter operations are confined to the west of Seletar runway between sunset and sunrise, subject to the restrictions in paragraph 1.3 below.
- 1.2 Circuit Heights:
Light aircraft 800ft (west of Seletar runway only);
Other aircraft 1,000ft - 1,500ft (west of Seletar runway only);
Helicopter-only area east of runway up to 600ft AGL
- 1.3 Circuit Flying and Training Operations are not permitted between 1400-2300 daily.
- 1.4 Pilots are required to keep clear of PAYA LEBAR CTR and SEMBAWANG ATZ.

2 TEST/TRAINING FLIGHTS

- 2.1 Flight notification shall be given prior to departure. Flight notification by means of RTF should be avoided.
- 2.2 For circuits and landings or flights to Light Aircraft Training Areas A, B and C, locally based operators shall submit details of their flight by electronic mail using the Seletar Test / Training Form which can be retrieved from webpage:

<https://aim-sg.caas.gov.sg>
- 2.3 For test/currency maintenance flight in the fixed-wing circuit, the operator shall contact Seletar Tower Manager, giving at least 2 days' advance notice from the date of flight. The Tower Manager will then liaise with the host slot-time operator during which the test/currency maintenance flight is to be conducted. The advance notice will enable the host slot-time operator to adjust its training programme to accommodate the flight.

WSSL AD 2.21 NOISE ABATEMENT PROCEDURES

- 1.1 To alleviate the problem of noise, no flights are permitted between 1400-2300, other than MEDEVAC and emergency flights.
- 1.2 All aircraft on AWY G579 between SINJON (SJ) and JAYBEE (JB) shall operate at/above 5,000ft.
- 1.3 When overflying residential areas around Seletar Airport, aircraft are to adhere to the minimum altitudes specified within the Noise Abatement Areas.
- 1.4 Noise Abatement Area 1 is bounded by the following points, and aircraft are to maintain a minimum altitude of 1,500ft when overflying the area.

Lateral Limits of Noise Abatement Area 1	
POINT	COORDINATES
A	012551.0N 1035044.3E
B	012549.9N 1035059.2E
C	012522.3N 1035102.3E
D	012458.3N 1035044.4E
E	012443.4N 1035005.3E
A	012551.0N 1035044.3E

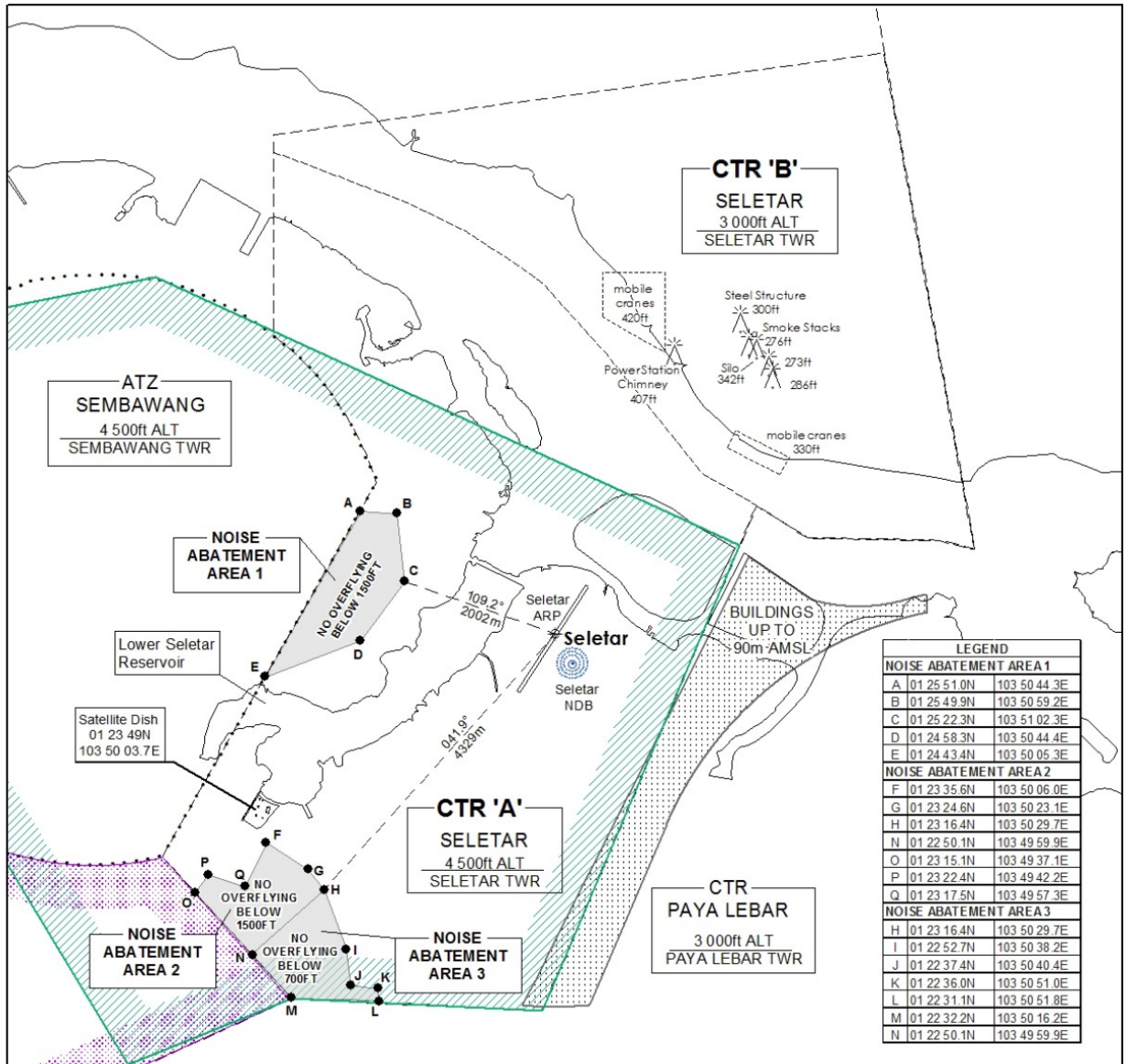
- 1.5 Noise Abatement Area 2 is bounded by the following points, and aircraft are to maintain a minimum altitude of 1,500ft when overflying the area.

Lateral Limits of Noise Abatement Area 2	
Point	Coordinates
F	012335.6N 1035006.0E
G	012324.6N 1035023.1E
H	012316.4N 1035029.7E
N	012250.1N 1034959.9E
O	012315.1N 1034937.1E
P	012322.4N 1034942.2E
Q	012317.5N 1034957.3E
F	012335.6N 1035006.0E

- 1.6 Noise Abatement Area 3 is bounded by the following points, and aircraft are to maintain a minimum altitude of 700ft when overflying the area.

Lateral Limits of Noise Abatement Area 3	
Point	Coordinates
H	012316.4N 1035029.7E
I	012252.7N 1035038.2E
J	012237.4N 1035040.4E
K	012236.0N 1035051.0E
L	012231.1N 1035051.8E
M	012232.2N 1035016.2E
N	012250.1N 1034959.9E
H	012316.4N 1035029.7E

1.7 The map below shows the locations of Noise Abatement Areas 1, 2 and 3 within Seletar Control Zone.



1.8 Aircraft which are unable to adhere to the minimum altitudes specified over the noise abatement areas are not allowed to operate at Seletar Airport.

1.9 No engine run up shall be permitted between 1400-2300.

WSSL AD 2.22 FLIGHT PROCEDURES

1 PROCEDURES FOR ARRIVALS INTO SELETAR AERODROME

1.1 Introduction

1.1.1 Aircraft on VFR flight plan, routing via Tebrau City Mall (013259N1034748E) to Seletar shall follow the joining procedures as described in paragraph 1.2 and illustrated in charts AD-2-WSSL-VAC-1, AD-2-WSSL-VAC-2 and AD-2-WSSL-VFR-1.

1.1.2 Aircraft returning from Light Aircraft Training Areas shall follow the joining procedures as described in paragraph 1.3 and illustrated in charts AD-2-WSSL-VAC-1 and AD-2-WSSL-VAC-2.

1.1.3 Aircraft on IFR flight plan, routing via JB, KK or SJ - PONJO - RECHI to Seletar shall be vectored under radar for a visual approach. Seletar Approach shall provide the radar service for aircraft routing via JB and KK, and Paya Lebar Approach shall provide the radar service for aircraft routing via SJ - PONJO - RECHI. When Seletar Approach and Paya Lebar Approach is closed, Singapore Approach shall provide the service. Unless authorised by ATC, pilots shall follow the joining procedures as described in paragraph 1.4 and 1.5. The joining procedures are illustrated in charts AD-2-WSSL-VAC-3, AD-2-WSSL-VAC-4, AD-2-WSSL-IFR-1 and AD-2-WSSL-IFR-2. All arrival clearances subject to ATC coordination.

- 1.1.4 When within 5km of the aerodrome reference point, aircraft are to fly; at a manoeuvring speed of not more than 170kt unless otherwise authorised by ATC. All aircraft are required to keep well clear of Sembawang ATZ and Paya Lebar CTR.
- 1.1.5 Circuit traffic already downwind shall have priority. Arriving aircraft shall position and sequence itself accordingly, unless directed otherwise by ATC.
- 1.1.6 Pilots shall not fly east of the runway. This is due to tall buildings up to 90m (296ft) AMSL to the east of Seletar CTR (the location is depicted in charts AD-2-WSSL-VAC-1 to AD-2-WSSL-VAC-4).

1.2 Joining Procedures for VFR flights from Tebrau City Mall (013259N1034748E)

- 1.2.1 Aircraft on VFR flight plan joining Seletar CTR from East of JB Town are to descend to altitude cleared by ATC. From Tebrau City Mall (013259N1034748E) descend in VMC to altitude cleared by ATC and proceed to POINT 'X' (located 012830N 1034954E or radial 297/7DME from PU DVOR/DME) keeping clear of WMP228 and then direct to overhead the airfield.
- 1.2.2 When overhead the airfield, the joining aircraft shall make a turn overflying the runway and after passing abeam the Control Tower, commence descent as cleared to cross the upwind end of the runway at 1,500ft. Passing over the end of the runway, descend to circuit altitude as cleared by ATC. Pilots shall ensure to keep clear of Sembawang ATZ and Paya Lebar CTR and not to fly east of the runway. This is to keep clear of tall buildings up to 90m AMSL to the east of Seletar CTR. The area where the tall buildings are located is indicated in the Seletar Visual Approach Charts AD-2-WSSL-VAC-1 to AD-2-WSSL-VAC-4. Procedures are illustrated in the following charts:
- i. AD-2-WSSL-VAC-1 : Visual Approach Chart - RWY 03
 - ii. AD-2-WSSL-VAC-2 : Visual Approach Chart - RWY 21
- 1.2.3 Traffic permitting and in good visibility, joining aircraft may be cleared to join directly for right base when landing on RWY 21 or turn downwind for RWY 03 from north-end of the runway (THR RWY 21).

1.3 Joining Procedures from Light Aircraft Training Areas

- 1.3.1 Unless otherwise authorised by ATC, aircraft are to join overhead the airfield at 2,000ft keeping clear of Sembawang ATZ and Paya Lebar CTR.
- 1.3.2 When overhead the airfield, the joining aircraft shall make a turn to the eastern side of the runway and after passing abeam the Control Tower, commence descent as cleared to cross the upwind end of the runway at 1,500ft. Passing over the end of the runway, descend to circuit altitude as cleared by ATC. Pilots shall ensure to keep clear of Sembawang ATZ and Paya Lebar CTR and not to fly east of the runway. This is to keep clear of tall buildings up to 90m AMSL to the east of Seletar CTR. The area where the tall buildings are located is indicated in the Seletar Approach Charts AD-2-WSSL-VAC-1 to AD-2-WSSL-VAC-4. Procedures are illustrated in the following charts:
- i. AD-2-WSSL-VAC-1: Visual Approach Chart - RWY 03
 - ii. AD-2-WSSL-VAC-2: Visual Approach Chart - RWY 21
- 1.3.3 Traffic permitting and in good visibility, joining aircraft may be cleared to join directly for right base when landing on RWY 21 or turn downwind for RWY 03 from north-end of the runway (THR RWY 21).

1.4 Joining Procedures for IFR flights from JB, KK or SJ - RWY 03

- 1.4.1 From KK
Cross KK at or above 3,000ft. On passing KK descend in VMC to 2,000ft or altitude cleared by ATC and join downwind RWY 03.
- i. Straight-in-Approach
Join downwind RWY 03 at 2,000ft (keeping clear of Sembawang ATZ). When downwind descend from 2,000ft for visual approach RWY 03, or as cleared by ATC. Pilots should have the runway in sight.
 - ii. Circling Approach
Join downwind RWY 03 at 2,000ft (keeping clear of Sembawang ATZ). At end of downwind turn left and overfly the runway. When passing over north end of the runway (THR RWY 21), descend from 2,000ft to 1,500ft and turn left for downwind RWY 03. At downwind descend for a visual approach RWY 03 or as cleared by ATC. Pilots should have the runway in sight.

- 1.4.2 From JB
Cross JB at or above 6,000ft enroute to Point ALFA. On passing Point ALFA, descend in VMC to 2,000ft or altitude cleared by ATC. (Point ALFA is located at 013033N 1034942E or Radial 296/7 DME VTK)
- i. Straight-in-Approach
On passing Point ALFA, turn right for downwind RWY 03 (keeping clear of Sembawang ATZ). At downwind descend from 2,000ft for a visual approach RWY 03, or as cleared by ATC. Pilots should have the runway in sight.
 - ii. Circling Approach
On passing Point ALFA, turn right for downwind RWY 03 (keeping clear of Sembawang ATZ). At end of downwind, turn left and overfly the runway. Passing over north end of the runway (THR RWY 21), descend from 2,000ft to 1,500ft and turn left for downwind RWY 03. At downwind descend for a visual approach RWY 03 or as cleared by ATC. Pilots should have the runway in sight.
- 1.4.3 From SJ
Cross SJ at 4,000ft or as cleared by ATC. On passing SJ, descend to 3,000ft for PONJO. On passing PONJO, descend in VMC to 2,000ft or altitude cleared by ATC. (PONJO is located at 011629N 1034629E or Radial 303 SJ)
- i. Straight-in-Approach
Join direct for a straight-in visual approach RWY 03 descending from 2,000ft at a speed of not more than 170kt, or as cleared by ATC. Pilots should have the runway in sight.
 - ii. Circling Approach
Overfly the runway at 2,000ft at a speed of not more than 160kt, or as cleared by ATC. When passing over the north-end of runway (THR RWY 21), descend from 2,000ft to 1,500ft and turn left for downwind RWY 03 (keeping clear of Sembawang ATZ and Light Aircraft Training Area A). At downwind, descend for visual approach or as cleared by ATC. Pilots should have the runway in sight.
- 1.4.4 Procedures are illustrated in the following charts:
- AD-2-WSSL-VAC-3 : Visual Approach Chart - RWY 03
 - AD-2-WSSL-IFR-1 : Seletar Aerodrome Joining Procedures (IFR flights) from JB, KK and SJ - RWY 03

← 1.5 **Joining Procedures for IFR flights from JB, KK or SJ - RWY 21**

- 1.5.1 From KK
Cross KK at or above 3,000ft. On passing KK descend in VMC to 2,000ft or altitude cleared by ATC.
- i. Straight-in-Approach
Join direct for a straight-in visual approach Rwy 21 descending from 2,000ft, or as cleared by ATC. Pilots should have the runway in sight.
 - ii. Circling Approach
Overfly the runway at 2,000ft, or as cleared by ATC. Passing over the south-end of the runway (THR RWY 03), descend from 2,000ft to 1,500ft and turn right for downwind RWY 21 (keeping clear of Light Aircraft Training Area A and Sembawang ATZ). At downwind descend for a visual approach RWY 21 or as cleared by ATC. Pilots should have the runway in sight.
- 1.5.2 From JB
Cross JB at or above 6,000ft enroute to Point ALFA. On passing Point ALFA, descend in VMC to 2,000ft or altitude cleared by ATC. (Point ALFA is located at 013033N 1034942E or Radial 296 VTK)
- i. Straight-in-Approach
On passing Point ALFA, join direct for a straight-in visual approach RWY 21 descending from 2,000ft, or as cleared by ATC (keeping clear of Sembawang ATZ).
 - ii. Circling Approach
On passing Point ALFA, overfly the runway at 2,000ft. When passing over the south end of the runway (THR RWY 03), descend from 2,000ft to 1,500ft and turn right for downwind RWY 21 (keeping clear of Light Aircraft Training Area A and Sembawang ATZ). At downwind descend for a visual approach RWY 21 or as cleared by ATC. Pilots should have the runway in sight.

- 1.5.3 From SJ
Cross SJ at 4,000ft or as cleared by ATC. On passing SJ, descend to 3,000ft for PONJO. On passing PONJO, descend in VMC to 2,000ft or altitude cleared by ATC and join downwind RWY 21 via RECHI-SETHI. (RECHI is located at 012033N 1034908E or Radial 235 PU and SETHI is located at 012439N 1035006E or Radial 263 PU)
- i. **Straight-in-Approach**
Join downwind RWY 21 via SETHI at 2,000ft (keeping clear of Sembawang ATZ) at a speed of not more than 170kt. When downwind, descend from 2,000ft for visual approach, or as cleared by ATC. Pilots should have the runway in sight.
 - ii. **Circling Approach**
Join downwind RWY 21 via SETHI at 2,000ft (keeping clear of Sembawang ATZ) at a speed of not more than 160kt. At end of downwind, turn right and overfly the runway. When passing over south-end of the runway (THR RWY 03), descend from 2,000ft to 1,500ft and turn right for downwind RWY 21. At downwind, descend for visual approach or as cleared by ATC. Pilots should have the runway in sight.
- 1.5.4 Procedures are illustrated in the following charts:
- AD-2-WSSL-VAC-4 : Visual Approach Chart - RWY 21
 - AD-2-WSSL-IFR-2 : Seletar Aerodrome Joining Procedures (IFR flights) from JB, KK and SJ - RWY 21

1.6 Holding Procedure

- 1.6.1 A low level holding procedure is established at SJ DVOR/DME. Suitably equipped aircraft bound for Seletar which may wish to hold for weather improvement may use this procedure (ENR 3.6-3 refers)

1.7 Approaches to Seletar Aerodrome

- 1.7.1 A deep-water shipping channel approximately 1525m from the northern threshold cuts across the extended centreline of Seletar RWY 21.
- 1.7.2 Information on the mast heights of tall vessels is relayed to ATC by Maritime and Port Authority of Singapore. ATC shall inform pilots of landing and departing aircraft of such information if the reported mast height of the vessel is above 30m.
- 1.7.3 At night ATC shall not permit landing on RWY 21 when vessels of mast height above 30m are reported.
- 1.7.4 Aircraft making approaches into Seletar are required to keep clear of Sembawang ATZ.
- 1.7.5 Aircraft are restricted from overflying built-up residential areas around Seletar Airport (charts AD-2-WSSL-VAC-1 to AD-2-WSSL-VAC-4 refer) at an altitude of below 1,500ft. Aircraft types which are unable to safely manoeuvre clear of the built-up residential areas are not allowed to operate at Seletar Airport.

2 DEPARTURES FROM SELETAR AERODROME

- 2.1 Aircraft departing Seletar on RWY 03 to RECHI - PONJO - SJ or on RWY 21 to KK are required to keep clear of Sembawang ATZ.
- 2.2 The pilot-in-command or the operator of IFR flight operating out of Seletar is required to file via KK or RECHI - PONJO - SJ under item 15 of the flight plan. All departure clearances subject to ATC coordination.

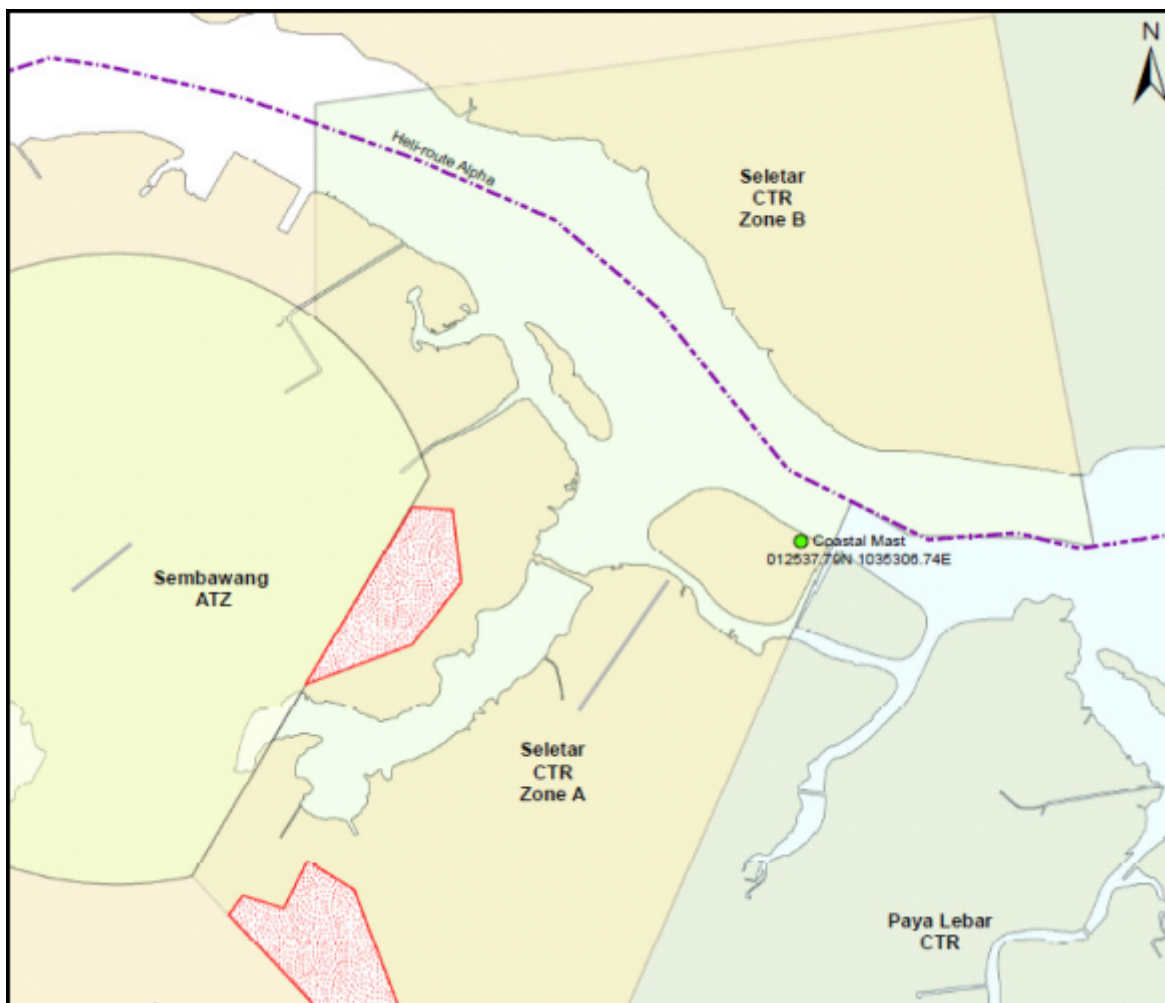
WSSL AD 2.23 ADDITIONAL INFORMATION

1 BIRD CONCENTRATION IN THE VICINITY OF THE AIRPORT

- 1.1 A number of varieties of birds are found in Singapore throughout the year. The larger birds commonly found in Seletar Airport includes the following:
 - Cattle egrets (weighing approximately 300g each)
 - Brahminy kites (weighing approximately 600g each)
- 1.2 There could be an increase in bird activities during the usual migratory months of September to April. During this period, migratory birds may use the airport as their feeding ground.
- 1.3 Handheld laser device, long range acoustic device and alternating amplified bird cries of distress are used for bird dispersal within Seletar Airport.

2 HELICOPTER CROSSING SELETAR NORTHERN EXTENDED CENTRELINE

- 2.1 Due to flying activities in Seletar Control Zone, all helicopters flying on Heli-route Alpha and intending to cross the northern extended centreline of Seletar Aerodrome shall obtain a positive clearance from Seletar Tower on 118.45MHz prior to crossing (see chart below).
- 2.2 For eastbound crossing, all helicopters are to hold over the western tip of Seletar Island until a clearance has been issued by Seletar Tower.
- 2.3 For westbound crossing, all helicopters are to hold on Heli-route Alpha abeam the coastal mast until a clearance has been issued by Seletar Tower.
- 2.4 The holding altitude is 200 feet or otherwise instructed by ATC.



WSSL AD 2.24 CHARTS RELATED TO SELETAR AIRPORT

Aerodrome Chart - ICAO	AD-2-WSSL-ADC-1
Layout of Significant Aerodrome Buildings and Apron Facilities	AD-2-WSSL-ADC-2
Aerodrome Hotspots	AD-2-WSSL-ADC-3
Aerodrome Obstacle Chart (AOC) - ICAO - TYPE A - RWY 03/21	AD-2-WSSL-AOC-1
Aerodrome Obstacle Chart (AOC) - ICAO - TYPE B - RWY 03/21	AD-2-WSSL-AOC-2
Visual Approach Chart (VAC) - ICAO - RWY 03	AD-2-WSSL-VAC-1
Visual Approach Chart (VAC) - ICAO - RWY 21	AD-2-WSSL-VAC-2
Visual Approach Chart (VAC) - ICAO - Advisory Joining Procedures - RWY 03	AD-2-WSSL-VAC-3
Visual Approach Chart (VAC) - ICAO - Advisory Joining Procedures - RWY 21	AD-2-WSSL-VAC-4
Visual Departure Chart - RWY 03	AD-2-WSSL-VDC-1
Visual Departure Chart - RWY 21	AD-2-WSSL-VDC-2
Joining Procedures - VFR Flights from JB	AD-2-WSSL-VFR-1
Joining procedures - IFR Flights from JB, KK and SJ - RWY 03	AD-2-WSSL-IFR-1
Joining procedures - IFR Flights from JB, KK and SJ - RWY 21	AD-2-WSSL-IFR-2

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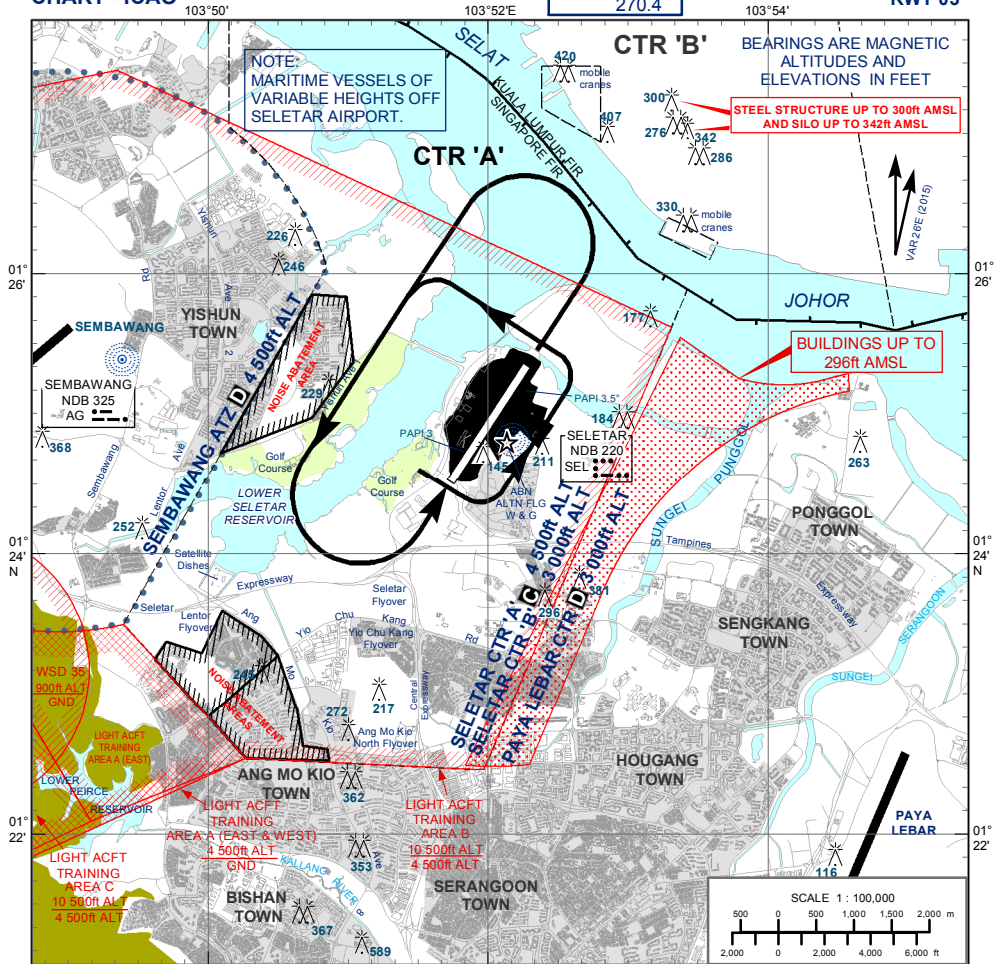
VISUAL APPROACH CHART - ICAO

AD ELEV 46 ft

APP	120.3
TWR	126.025
	118.45
	270.4

SINGAPORE/SELETAR

RWY 03



JOINING PROCEDURE - RWY 03

- 1) Join overhead at 2 000ft ALT or as cleared by ATC and at a speed of not more than 170kt.
- 2) When over the south-end of the runway (THR RWY 03), join the circuit crossing the upwind north-end of the runway (THR RWY 21) at 1 500ft ALT or above or at the altitude cleared by ATC.
- 3) Joining aircraft shall give way to circuit traffic already on downwind.

CAUTION

- a) Pilots are required to keep clear of Sembawang ATZ.
- b) Pilots should not fly to the east of the runway. This is to keep clear of tall buildings up to 296ft AMSL to the east of Seletar CTR. (See area shaded in red).



Minimum altitudes apply over noise abatement areas (WSSL AD 2.21)
Aircraft types which are unable to safely manoeuvre clear of the noise abatement areas are not allowed to operate at Seletar Airport.

PAPI 3°	RUNWAY	
	03	21
Pilot's eye height over the threshold when the following PAPI lights come into view		
2 white lights and 2 red lights (MEHT)*	17.720m	17.720m
3 white lights and 1 red light	20.323m	19.286m
4 white lights	22.927m	20.871m

*MEHT : Minimum Eye Height Over the Threshold.

Note : Aircraft with eye-to-wheel height greater than 6.3 metres are advised to fly with 2 white and 2 red lights visible so as to achieve sufficient wheel clearance.

Note:

- 1) Pilots are to be advised of the steel structure 300ft AMSL and the Silo 342ft AMSL 2nm north of the airfield.
- 2) Pilots are required to keep their turns within Seletar Control Zone.
- 3) Pilots are required to keep clear of Sembawang CTR and Paya Lebar CTR.

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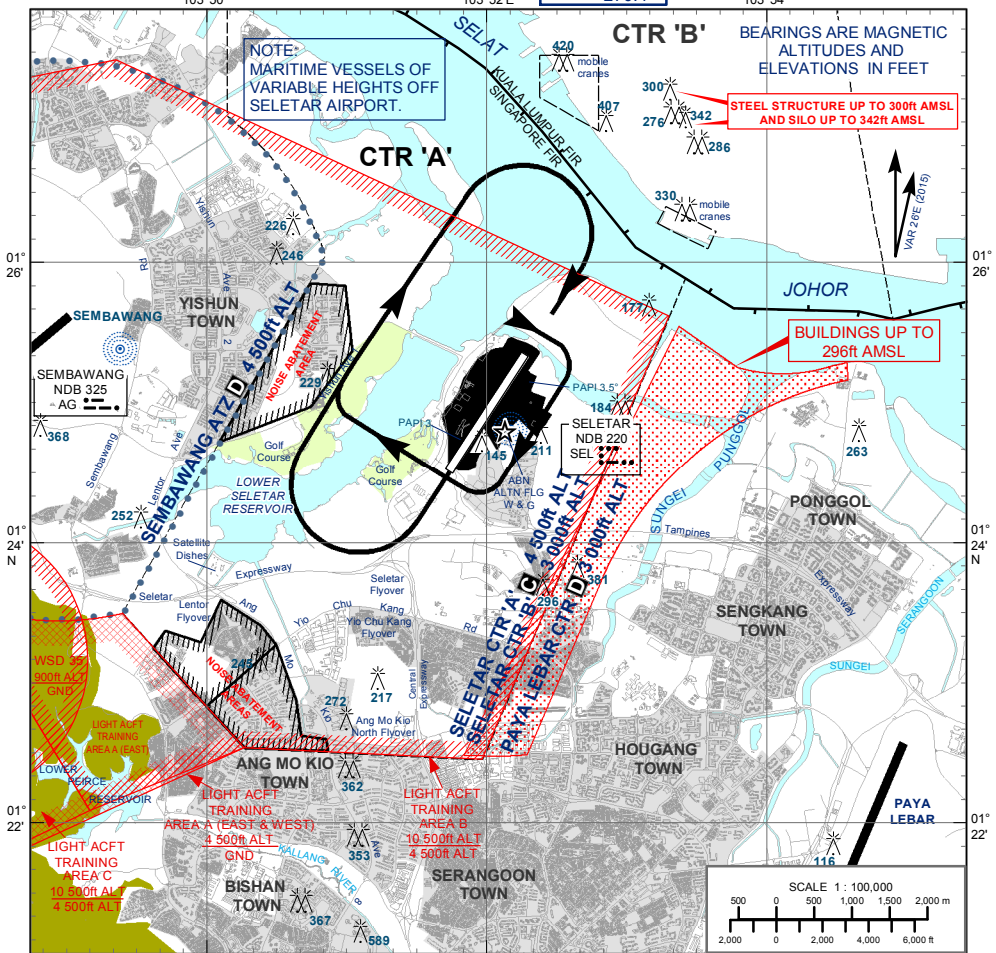
VISUAL APPROACH CHART - ICAO

AD ELEV 46 ft

APP	120.3
TWR	126.025
	118.45
	270.4

SINGAPORE/SELETAR

RWY 21



JOINING PROCEDURE - RWY 21

- 1) Join overhead at 2 000ft ALT or as cleared by ATC and at a speed of not more than 170kt.
- 2) When over the north-end of the runway (THR RWY 21), join the circuit crossing the upwind south-end of the runway (THR RWY 03) at 1 500ft ALT or above or at the altitude cleared by ATC.
- 3) Joining aircraft shall give way to circuit traffic already on downwind.

CAUTION

- a) Pilots are required to keep clear of Sembawang ATZ.
- b) Pilots should not fly to the east of the runway. This is to keep clear of tall buildings up to 296ft AMSL to the east of Seletar CTR. (See area shaded in red).

Minimum altitudes apply over noise abatement areas (WSSL AD 2.21) Aircraft types which are unable to safely manoeuvre clear of the noise abatement areas are not allowed to operate at Seletar Airport.

Pilot's eye height over the threshold when the following PAPI lights come into view	RUNWAY	
	03	21
2 white lights and 2 red lights (MEHT)*	17.720m	17.720m
3 white lights and 1 red light	20.323m	19.286m
4 white lights	22.927m	20.871m

*MEHT : Minimum Eye Height Over the Threshold.

Note : Aircraft with eye-to-wheel height greater than 6.3 metres are advised to fly with 2 white and 2 red lights visible so as to achieve sufficient wheel clearance.

- Note:
- 1) Pilots are to be advised of the steel structure 300ft AMSL and the Silo 342ft AMSL, 2mm north of the airfield.
 - 2) Pilots are required to keep their turns within Seletar Control Zone.
 - 3) Pilots are required to keep clear of Sembawang CTR and Paya Lebar CTR.

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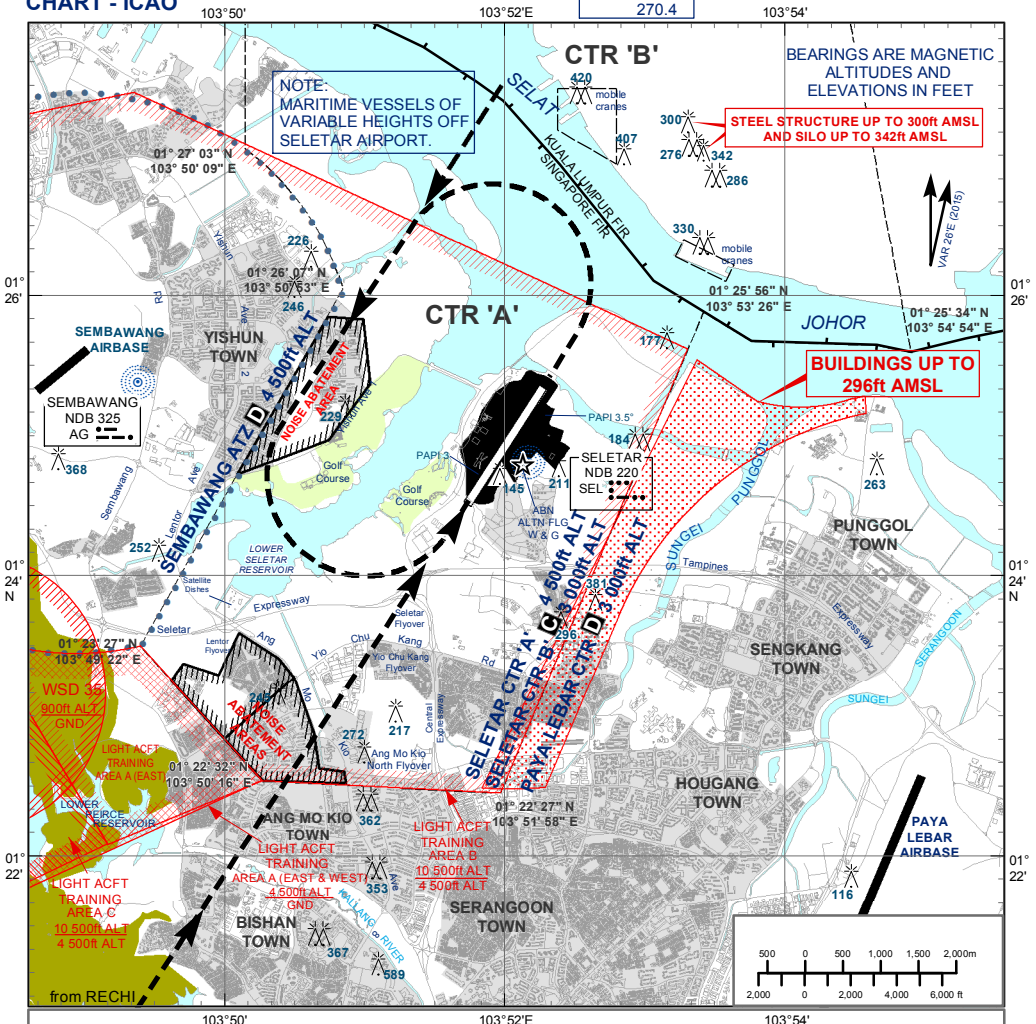
VISUAL APPROACH CHART - ICAO

AD ELEV 46 ft

APP	120.3
TWR	126.025
	118.45
	270.4

SINGAPORE/SELETAR

RWY 03



ADVISORY JOINING PROCEDURES - RWY 03

Straight-in Approach

- From JB or KK, join downwind at 2 000ft at a speed of not more than 170kt. When downwind, descend from 2 000ft for visual approach or as cleared by ATC. Pilots should have runway in sight.
- From SJ-PONJO-RECHI, join direct for visual approach, descending from 2 000ft at a speed of not more than 170kt, or as cleared by ATC. Pilots should have runway in sight.
- Joining aircraft shall give way to circuit traffic already on downwind.

Circling Approach

- From JB or KK, join downwind at 2 000ft at a speed of not more than 160kt. Passing over north-end of the runway (THR RWY 21), descend from 2 000ft to 1 500ft and turn left for downwind RWY 03. At downwind, descend for a visual approach or as cleared by ATC. Pilots should have the runway in sight.
- From SJ-PONJO-RECHI, overfly the runway at 2 000ft at a speed of not more than 160kt, or as cleared by ATC. When passing over the north-end of the runway (THR 21), descend from 2 000ft to 1 500ft and turn left for downwind RWY 03. At downwind, descend for a visual approach or as cleared by ATC. Pilots should have runway in sight.
- Joining aircraft shall give way to circuit traffic already on downwind.

CAUTION

- Pilots are required to keep clear of Sembawang ATZ. Turns should therefore be kept within Seletar CTR.
- Pilots should not fly to the east of the runway. This is to keep clear of tall buildings up to 296ft AMSL there. Pilots should have all relevant obstructions in sight, including the steel structure 300ft AMSL and the Silo 342ft AMSL 2nm north of the airfield.

- Minimum altitudes apply over noise abatement areas (WSSL AD 2.21)
Aircraft types which are unable to safely manoeuvre clear of the noise abatement areas are not allowed to operate at Seletar Airport.

PAPI 3°	RUNWAY	
	03	21
Pilot's eye height over the threshold when the following PAPI lights come into view		
2 white lights and 2 red lights (MEHT)	17.720m	17.720m
3 white lights and 1 red light	20.323m	19.286m
4 white lights	22.927m	20.871m

*MEHT : Minimum Eye Height Over the Threshold.

Note : Aircraft with eye-to-wheel height greater than 6.3 metres are advised to fly with 2 white and 2 red lights visible so as to achieve sufficient wheel clearance.

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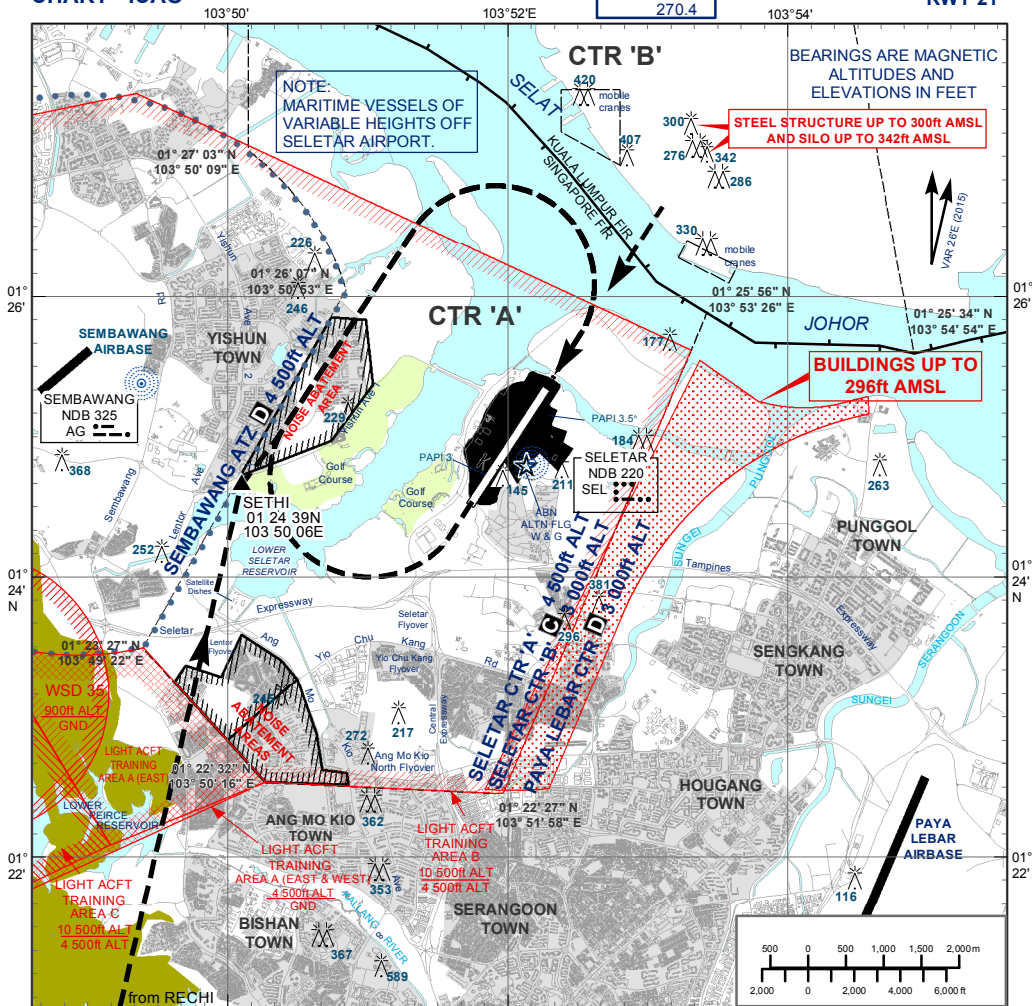
**VISUAL
APPROACH
CHART - ICAO**

AD ELEV 46 ft

APP	120.3
TWR	126.025
	118.45
	270.4

SINGAPORE/SELETAR

RWY 21



**ADVISORY JOINING PROCEDURES - RWY 21
Straight-in Approach**

- From JB or KK, join direct for a visual approach RWY 21, descending from 2 000ft at a speed of not more than 170kt, or as cleared by ATC. Pilots should have runway in sight.
- From SJ-PONJO-RECHI-SETHI, join downwind RWY 21 via SETHI at 2 000ft at a speed of not more than 170kt. When downwind, descend from 2 000ft for a visual approach or as cleared by ATC. Pilots should have runway in sight.
- Joining aircraft shall give way to circuit traffic already on downwind.

Circling Approach

- From JB or KK, overfly the runway at 2 000ft at a speed of not more than 160kt. When passing over south-end of the runway (THR RWY 03), descend from 2 000ft to 1 500ft and turn right for downwind RWY 21. At downwind, descend for a visual approach or as cleared by ATC. Pilots should have the runway in sight.
- From SJ-PONJO-RECHI-SETHI, join downwind RWY 21 via SETHI at 2 000ft at a speed of not more than 160kt. At end of downwind, turn right and overfly the runway. When passing over south-end of the runway (THR RWY 03), descend from 2 000ft to 1 500ft and turn right for downwind RWY 21. At downwind, descend for a visual approach or as cleared by ATC. Pilots should have the runway in sight.
- Joining aircraft shall give way to circuit traffic already on downwind.

CAUTION

- Pilots are required to keep clear of Semawang ATZ. Turns should therefore be kept within Seletar CTR.
- Pilots should not fly to the east of the runway. This is to keep clear of tall buildings up to 296ft AMSL there. Pilots should have all relevant obstructions in sight, including the steel structure 300ft AMSL and the Silo 342ft AMSL 2nm north of the airfield.



Minimum altitudes apply over noise abatement areas (WSSL AD 2.21). Aircraft types which are unable to safely manoeuvre clear of the noise abatement areas are not allowed to operate at Seletar Airport.

Pilot's eye height over the threshold when the following PAPI lights come into view	PAPI 3.5° RUNWAY	
	03	21
2 white lights and 2 red lights (MEHT)*	17.720m	17.720m
3 white lights and 1 red light	20.323m	19.286m
4 white lights	22.927m	20.871m

*MEHT : Minimum Eye Height Over the Threshold

Note : Aircraft with eye-to-wheel height greater than 6.3 metres are advised to fly with 2 white and 2 red lights visible so as to achieve sufficient wheel clearance.

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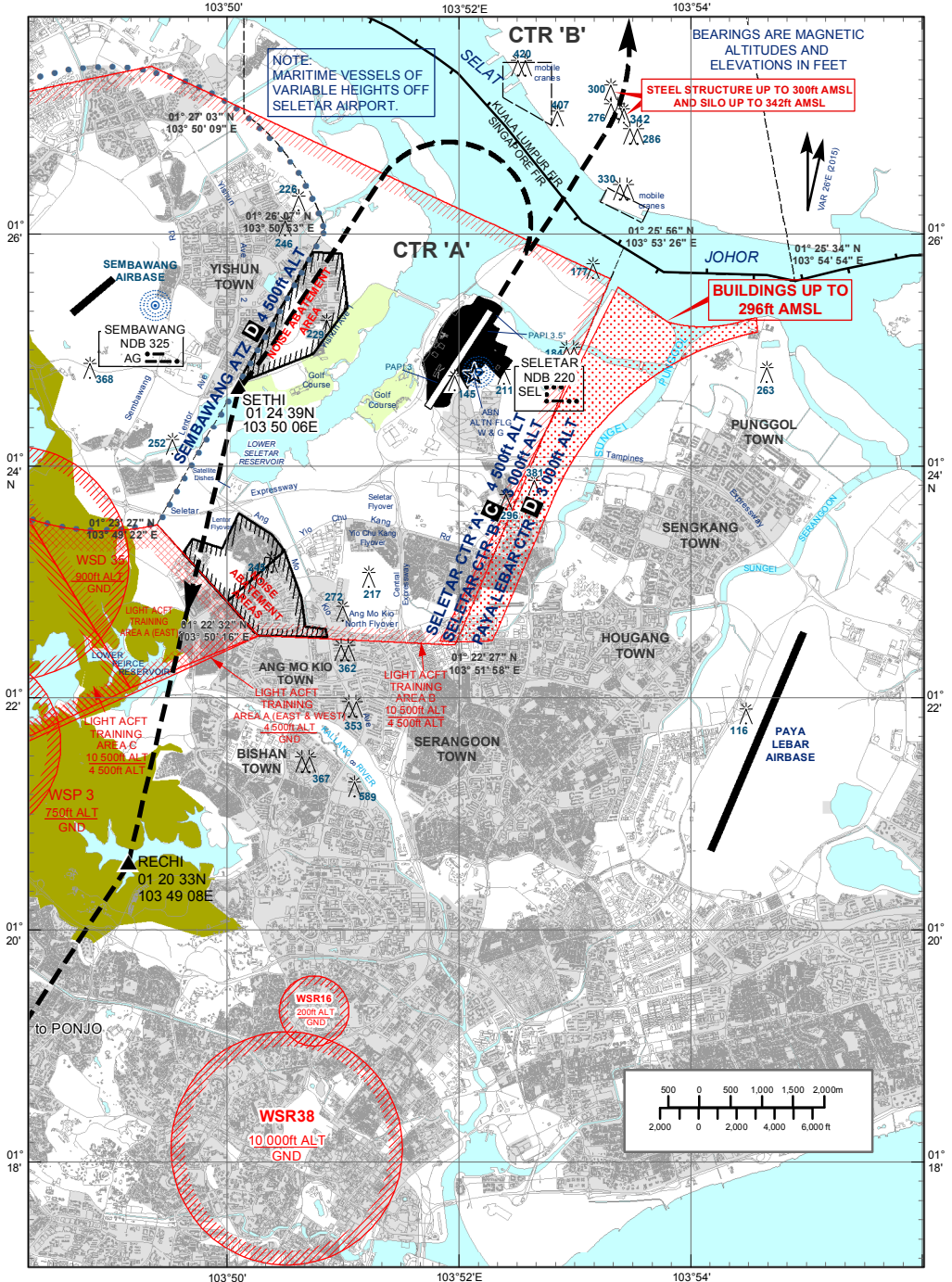
VISUAL DEPARTURE CHART

AD ELEV 46 ft

APP	120.3
TWR	126.025
	118.45
	270.4

SINGAPORE/SELETAR


RWY 03



ADVISORY DEPARTURE PROCEDURES FOR RUNWAY 03

On departure, pilots of both fixed-wing and rotary-wing aircraft should climb ahead to an altitude cleared by ATC. Pilots can expect a radar heading to leave Seletar CTR. Where a radar heading is not given, pilots shall navigate to SETHI-RECHI-PONJO-SJ, or navigate to KK in accordance with their ATC clearance.

CAUTION


- a) Pilots are required to keep clear of Sembawang ATZ. Turns should therefore be kept within Seletar CTR.
- b) Pilots should not fly to the east of the runway. This is to keep clear of tall buildings up to 296ft AMSL there. Pilots should have all relevant obstructions in sight, including the steel structure 300ft AMSL and the Silo 342ft AMSL 2nm north of the airfield.
- c) When cleared via SETHI-RECHI-PONJO-SJ, pilots shall not deviate from the clearance unless approved by ATC. This is due to the proximity of WSR38 which is Permanently active from Ground to 10,000ft.
- d)  Minimum altitudes apply over noise abatement areas (WSSL AD 2.21)
Aircraft types which are unable to safely manoeuvre clear of the noise abatement areas are not allowed to operate at Seletar Airport

ADVISORY DEPARTURE PROCEDURES FOR RUNWAY 21

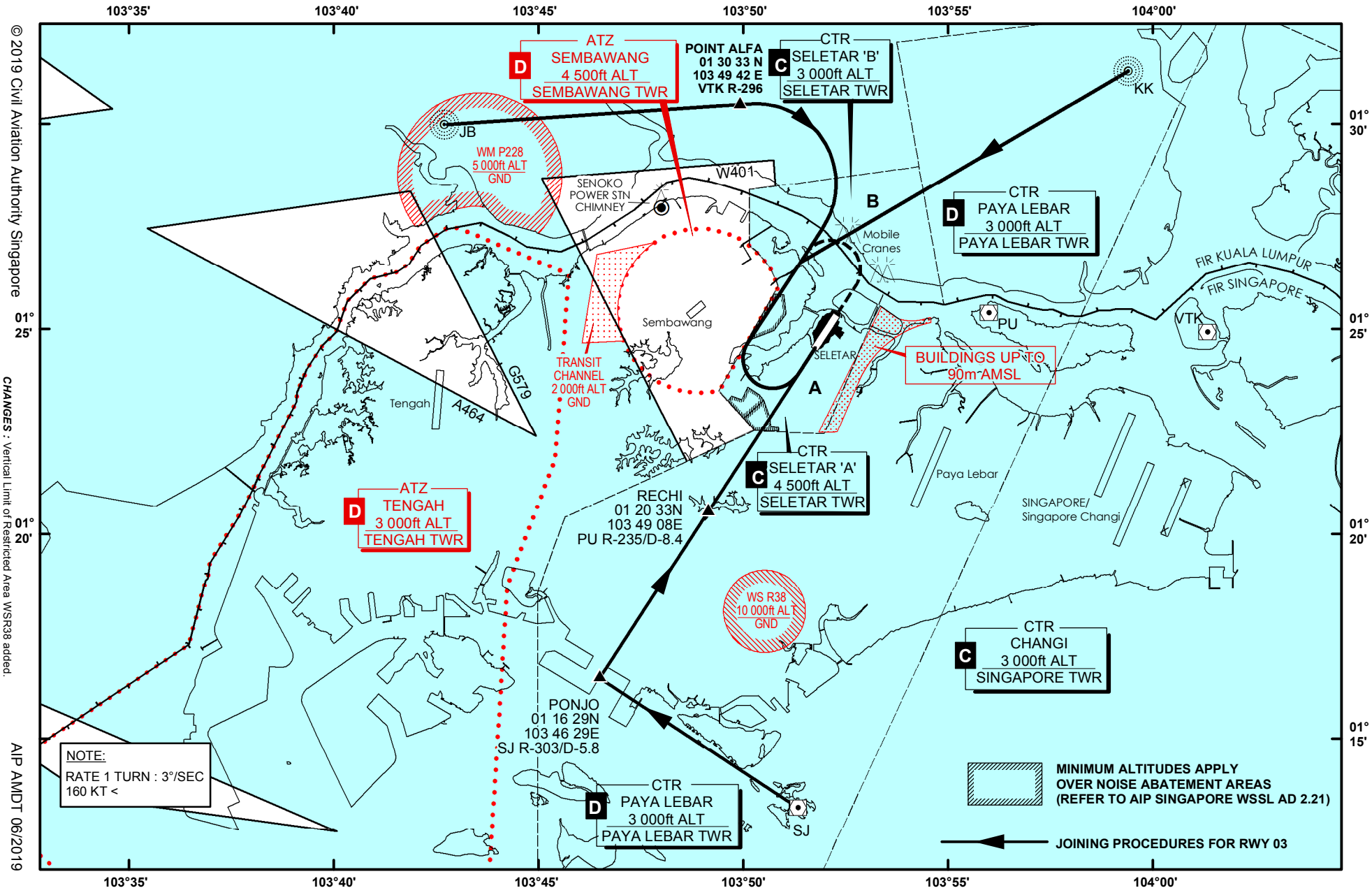
On departure, pilots can expect climb to an initial altitude cleared by ATC. Pilots of fixed-wing aircraft navigating to KK can expect to turn right to join the circuit till end of downwind and then expect a radar heading to leave Seletar CTR. Where a radar heading is not given, pilots shall navigate to RECHI-PONJO-SJ, or navigate to KK in accordance with their ATC clearance.

Pilots of rotary-wing aircraft can expect to turn left after departure to join the helicopter circuit pattern till end of downwind. Thereafter, they can expect further en-route clearance.

CAUTION

- a) Pilots are required to keep clear of Sembawang ATZ. Turns should therefore be kept within Seletar CTR.
- b) Pilots should not fly to the east of the runway. This is to keep clear of tall buildings up to 296ft AMSL there. Pilots should have all relevant obstructions in sight, including the steel structure 300ft AMSL and the Silo 342ft AMSL 2nm north of the airfield.
- c) When cleared via RECHI-PONJO-SJ, pilots shall not deviate from the clearance unless approved by ATC. This is due to the proximity of WSR38 which is Permanently active from Ground to 10,000ft.
- d)  Minimum altitudes apply over noise abatement areas (WSSL AD 2.21)
Aircraft types which are unable to safely manoeuvre clear of the noise abatement areas are not allowed to operate at Seletar Airport

SELETAR AERODROME JOINING PROCEDURE (IFR FLIGHTS) FROM JB, KK AND SJ - RUNWAY 03



© 2019 Civil Aviation Authority Singapore

CHANGES : Vertical Limit of Restricted Area WSR38 added.

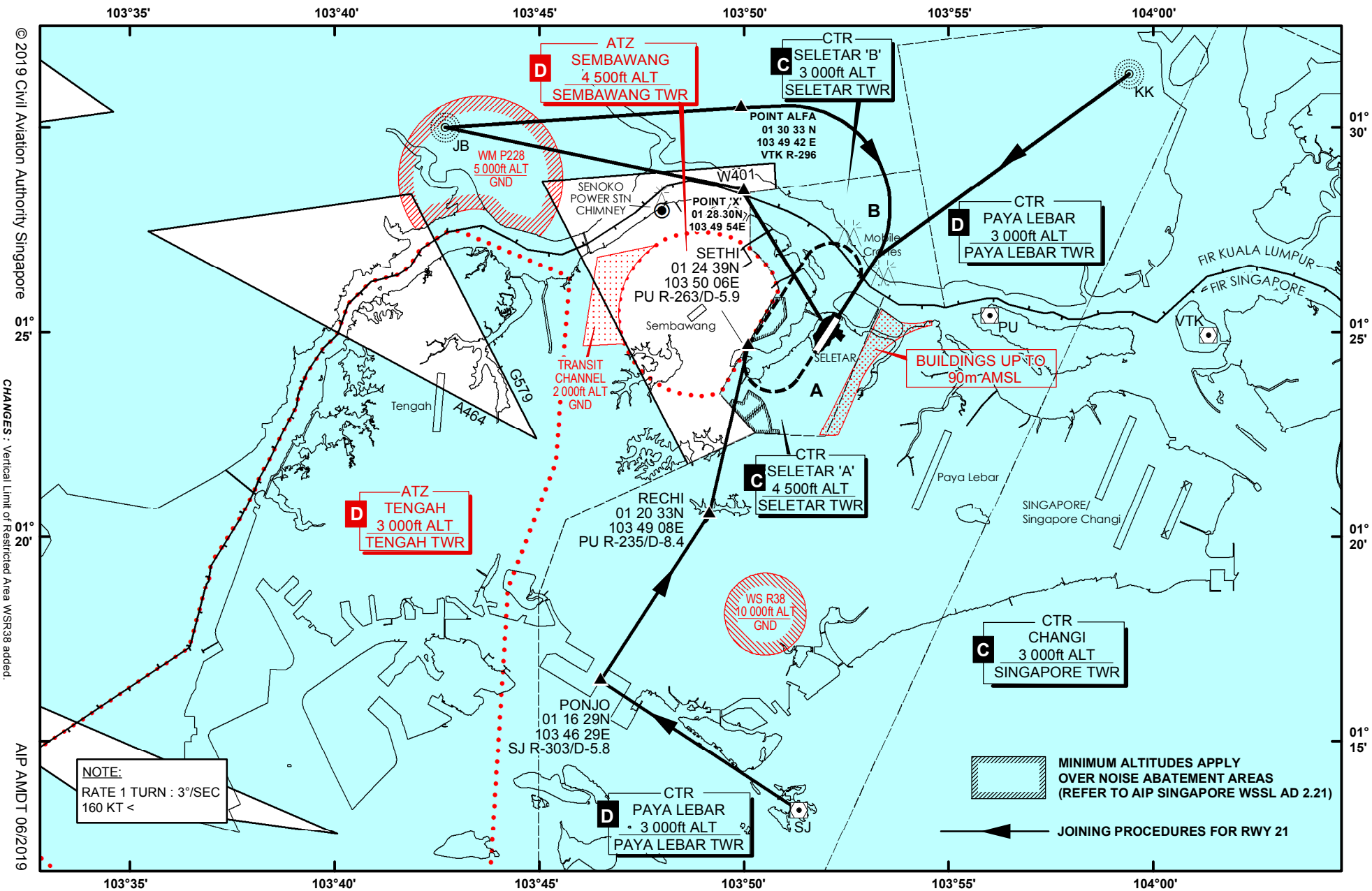
AIP AMDT 06/2019

A I P Singapore

AD-2-WSSL-IFR-1
10 OCT 2019

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SELETAR AERODROME JOINING PROCEDURE (IFR FLIGHTS) FROM JB, KK AND SJ - RUNWAY 21



© 2019 Civil Aviation Authority Singapore

CHANGES : Vertical Limit of Restricted Area WSR38 added

AIP AMDT 06/2019

AIP Singapore

AD-2-WSSL-IFR-2
10 OCT 2019

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WSAP AD 2.9 SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM AND MARKINGS

SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM AND MARKINGS		
1	Aircraft Parking Restrictions	
	There are 4 designated parking aprons: Apron A, Apron C, Jet Apron and Jet Apron Extension:	
	ACFT Stand	Largest ACFT Type
	Apron A	A1 to A5 C17
	Apron C	C1 to C7 (reserved for RSAF) C8 to C9 C10 C10A C11 C11A C130 C130 KC135 B747-400 C17 C5, AN124
	Jet Apron	J1 to J3 J1A and J2A C130 B747
	Jet Apron Extension	J4 and J5 C17
2	Taxiing Procedures	
2.1	Taxiing in/out of Apron Areas	
	Pilots taxiing in/out of apron areas must adhere to ATC's instructions. Once a pilot has reported visual with the marshallers, the pilot will be instructed to continue to taxi and follow the marshaller's instructions. At any time, should the aircraft pilot decide not to comply with the marshaller's instructions, it is mandatory for the pilot or the marshalling agency to inform ATC immediately. All marshalling services shall terminate at that moment and the pilot will be instructed by ATC to shutdown the aircraft. Concurrently, ATC will also inform the marshallers via the ground communications network. Subsequently, the aircraft will be towed to its allocated aircraft stand. Pilots are to exercise caution when operating in the apron areas due to close proximity of obstacles (e.g. Floodlights, buildings, etc.)	
2.2	To minimize the possibility of ground taxiing confliction within the apron areas as well as to achieve an orderly flow of aircraft ground movements, the following guidelines are recommended for both RWY 02 (Departures) and RWY 20 (Arrivals):	
	Apron	Departures Arrivals
	Apron A	Taxi for RWY 02 departure via TWY F4. TWY F3 or F4
	Apron B	No taxiing is allowed within Apron B and TWY W7. Aircraft will be towed in/out of Apron B to an assigned aircraft stand via TWY W7.
	Apron C	TWY F1 TWY F1 or F2
	Jet Apron/Jet Apron Extension	TWY F3 TWY F3
3	Ground Taxiing Guidelines	
3.1	The recommended taxiing guidelines may be subject to changes due to work-in-progress or unforeseen circumstances and shall be included in the NOTAM. Pilots will receive a taxiing brief from the Flight Planning office prior to departure.	
4	Ground Restrictions due to Weather	
4.1	In the event of inclement weather over Paya Lebar airport, ground support services for aircraft are to be terminated when the meteorological office issues a Lightning Risk Category 1 warning (very high lightning risk with extremely probable lightning producing CB clouds over the affected area). Ground agencies will be alerted of the warnings through the Base Public Announcement system as well as through the ground communications network. The following ground support services are to be terminated: a) aircraft refuelling and de-refuelling b) towing of aircraft in the open c) maintenance works on aircraft on the apron areas d) marshalling of aircraft in and out of the apron areas e) loading and unloading of cargo from aircraft f) customs and immigration checks in the apron areas	
4.2	There is no work restriction for Lightning Risk Categories 2, 3, 4 and 5. As aircraft marshalling is not permitted during Lightning Risk Category 1, aircraft that has landed at Paya Lebar Airport will be instructed to hold at the following designated areas until the warning has expired: a) Non-VIP aircraft at TWY F1, F2, F3 or F4 b) VIP aircraft at TWY F3 or F4	

SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM AND MARKINGS

4.3	<p>There may be occasions when despite a declaration of Lightning Risk Category 1, certain activities would still need to be performed in the open areas due to critical or operational requirements. In such instances, approval must be sought from Paya Lebar Tower after careful assessment of the overall weather situation over Paya Lebar Airport. Examples of such critical activities include:</p> <ul style="list-style-type: none">a) Marshalling of VVIP / VIP aircraftb) Embarkation / disembarkation of VIP from aircraft
5.	Ground Procedures - General
5.1	<p><u>Engine Start-ups and Ground Runs</u> Clearance from the Ground Controller must be sought and obtained for all engine start-ups or any associated activities within the apron areas. In addition, all engine ground runs, regardless of intensity, must be co-ordinated with ATC for approval. However, ground runs exceeding 85% of the engine power are prohibited within the apron areas. Within Paya Lebar Airport, the designated area for engine ground runs exceeding 85% of the engine power are the Northern Access Run-up Pad and Hush-House or as designated by Paya Lebar Base Command Post. The area allocated will be dependent on the type of aircraft concerned.</p>
5.2	<p><u>Aircraft to/from Apron B</u> Engine start-ups and shutdowns at TWY W7 are strictly prohibited. Aircraft departing or arriving to/from Apron B shall be allocated the appropriate aircraft stands for their start-ups or shutdowns and shall be towed in/out of the allocated aircraft stand. In addition, wing-walkers are to be provided for large aircraft on tow at TWY W7 due to construction works located next to TWY W7.</p>
5.3	<p><u>Prohibited Activities - Smoking in the Apron Areas</u> Smoking is strictly prohibited within the Apron areas. Disciplinary action will be taken on any personnel caught contravening this restriction.</p>

WSAP AD 2.10 AERODROME OBSTACLES

IN APPROACH / TKOF AREAS		
RWY/Area affected	OBST type, ELEV, Markings/LGT	Location/Coordinates
1	2	3
a. RWY 02 APCH RWY 20 TKOF	Industrial buildings, HGT 83ft AMSL. OBST LGTD.	Located on either side of approach funnel 2300ft from RWY 02 THR.
b. RWY 02 APCH RWY 20 TKOF	Structure (water tower), HGT AMSL, marked and LGTD.	012022N 1035436E (east of RWY)
c. RWY 02/20 APCH RWY 02/20 TKOF	LLS LLZ co-located with LLZ antennae, HGT 17ft AGL.	LLZ RWY 02 located 1324ft from RWY 20 THR. LLZ RWY 20 located 1525ft from RWY 02 THR.

IN CIRCLING AREA AND AT AERODROME		
OBST type, ELEV, Markings/LGT	Location/Coordinates	
1	2	
a. ILS GP huts co-located with GP antenna mast, 53ft AGL, marked and lighted.	GP RWY 02 located 296ft west of western edge of RWY and 858ft from RWY 02 THR. GP RWY 20 located 296ft west of western edge of RWY and 984ft from RWY 20 THR.	
b. Precision Approach Radar (PAR) hut, 46.2ft AGL, marked and lighted.	211ft east of eastern edge of RWY, 7089ft north of RWY 02 THR.	
c. 2 x Frangible PAR Moving Target Indicator (MTI) reflectors, 16ft AGL, marked and lighted.	RWY 02 MTI reflectors, located 213ft east of eastern edge of RWY, 4389ft from RWY 02 THR. RWY 20 MTI reflectors, located 209ft east of eastern edge of RWY, 2911ft from RWY 20 THR.	
d. Arrestor hookwire retriever unit, 4ft AGL, lighted.	Within the RWY strip. Located 52ft from both sides of the RWY edges, installed 1200ft from RWY 02 THR and 1100ft from RWY 20 THR.	
e. Arrestor barrier flat on the ground.	Within the RWY strip, installed 210ft south of RWY 02 THR and 118ft north of RWY 20 THR.	
f. Surface wind direction sleeves, 25ft AGL, marked and lighted.	344ft west of western edge of RWY for both sides, 458ft from RWY 02 THR and 307ft from RWY 20 THR.	
g. AWOS stanchions, 23ft AGL, marked and lighted.	296ft west of western edge of RWY on both sides, 658ft from RWY 02 THR and 654ft from RWY 20 THR.	
h. One wheel structure, 585ft AMSL, lighted.	Erected at 011726N 1035150E, BRG 216 DEG, DIST 5NM from WSAP ARP - within WSAP CTR.	
i. One Building, 804ft AMSL, lighted.	Erected at 011642N 1035105E, BRG 216 DEG, DIST 6.2NM from WSAP ARP - within WSAP CTR.	
j. Mobile aircraft arrestor gear, 6.6ft AGL, lighted.	39ft from edge of western taxiway between TWY W1 and W2 at 1362ft south of TWY W1.	
k. Lightning protection system, 218ft AMSL, marked and lighted.	Erected at 012203.36N 1035509.39E.	
l. Mobile aircraft arrestor gear, 6.6ft AGL, lighted.	300ft south of RWY 20 THR, 33ft from RWY edge on both sides. All RWY 20 inbound shall land 500ft up RWY 20 THR. LDA 11,900ft.	
m. Lightning protection system, 40ft AGL, marked and LGTD.	Erected at 012240N 1035453E.	
n. Trees, 197ft AMSL.	Exceed HGT limitations of Eastern Transitional Surface for Runway 02 and Runway 20. Pilots to exercise caution.	

WSAP AD 2.11 METEOROLOGICAL INFORMATION PROVIDED

1	Associated MET Office	Paya Lebar (WSAP)
2	Hours of service	H24
3	Office responsible for TAF preparation and Periods of validity	Paya Lebar (WSAP), 9, 24
4	Type of landing forecast and Interval of issuance	NIL
5	Briefing/consultation provided	P
6	Flight documentation and Language(s) used	Charts or Tabular forms, English
7	Charts and other information available for briefing or consultation	S, U, P
8	Supplementary equipment available for providing information	APT, WXR
9	ATS units provided with information	-
10	Additional information	Tel : 63813156 (Met Office)

WSAP AD 2.12 RUNWAY PHYSICAL CHARACTERISTICS

Designations RWY NR	TRUE & MAG BRG	Dimensions of RWY (m)	Strength (PCN) and surface of RWY/SWY	THR Coordinates	THR elevation and highest elevation of TDZ of precision APCH RWY
1	2	3	4	5	6
02	023° GEO 023° MAG	3780 x 61	72/F/B/W/U Bituminous concrete	012041.08N 1035410.36E	12.9 M (43ft)
20	203° GEO 203° MAG	3780 x 61	72/F/B/W/U Bituminous concrete	012234.41N 1035458.53E	19.7 M (65ft)
Designations RWY NR	Slope of (RWY - SWY)	Dimensions of SWY (m)	Dimensions of CWY (m)	Dimensions of Strip	OFZ
1	7	8	9	10	11
02	-	300x61	300x150	-	-
20	-	300x61	300x150	-	-

12	Remarks
a.	Intensive fixed wing flying operation west of runway.
b.	Helizone adjacent west of runway up to 800ft QNH.
c.	Arrestor Barrier both ends of runway. Pilots are to land at least 500ft up the THR of RWY in use.
d.	Hookwire cable installed 335m inwards from RWY 20 THR and 360m inwards from RWY 02 THR.
e.	Intense bird activity after rain, and up to 2 hour after dusk and dawn.
f.	Pilots making approaches for RWY 20 are to take note of the high ground, 32m AMSL, 1NM north of RWY 20 THR and to exercise caution.
g.	Threshold markings consist of 16 stripes.

WSAP AD 2.13 DECLARED DISTANCES

RWY Designator	TORA (m)	TODA (m)	ASDA (m)	LDA (m)	Remarks
1	2	3	4	5	6
02	3780	4080	4080	3780	NIL
20	3780	4080	4080	3780	NIL

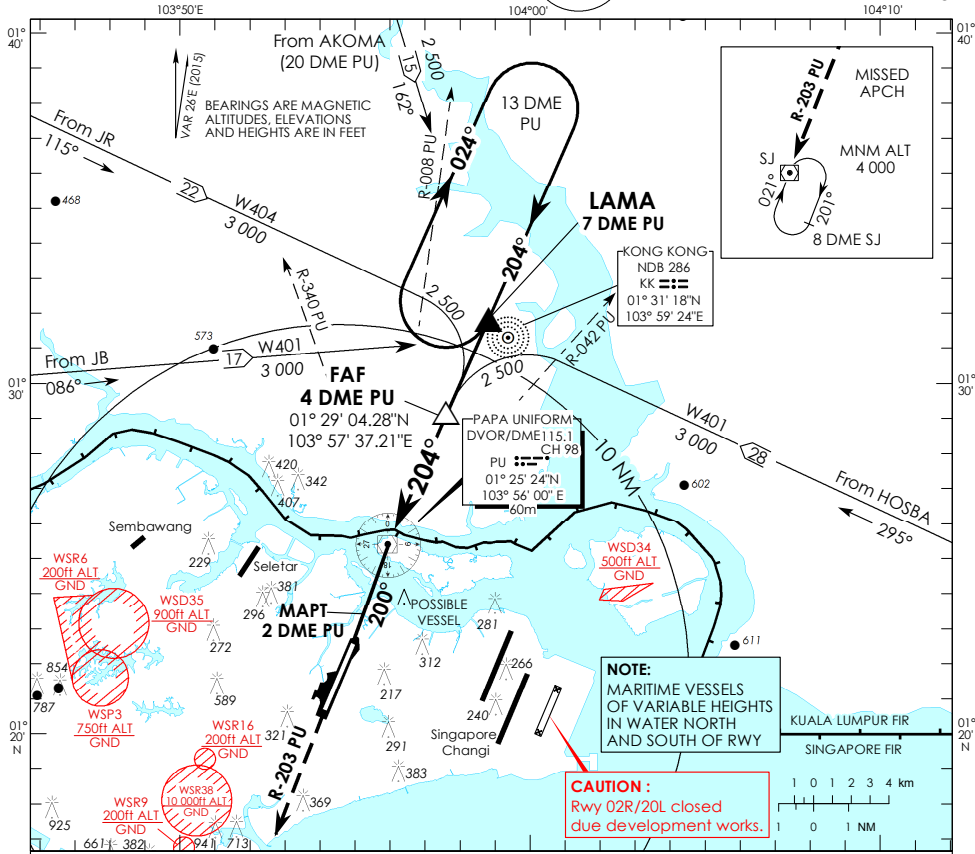
**INSTRUMENT
APPROACH
CHART - ICAO**

AERODROME ELEV **65ft**
HEIGHT RELATED TO
AD ELEV - 65ft



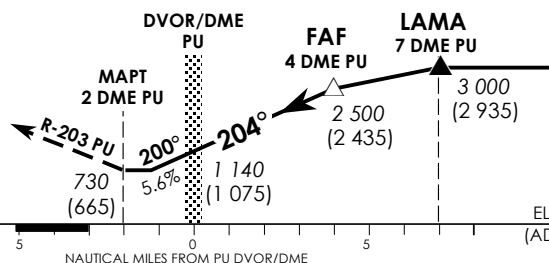
APP 120.3
119.9
126.025
TWR 118.05

**SINGAPORE/
PAYA LEBAR
PU DVOR/DME
RWY 20**



Transition Level : FL 130
Transition Alt : 11 000

MISSED APPROACH
Climb to 4 000ft on R-203 PU to SJ
DVOR/DME and hold South right
turn 021° inbound or
AS DIRECTED BY ATC



OCA (OCH)						
Category of Aircraft	A		B		C	D
Straight-in	730 (665)					
Distance	3 DME	2 DME	1 DME	PU DVOR/DME	1 DME	
Altitude (Height)	2160 (2095)	1820 (1755)	1480 (1415)	1140 (1075)	800 (735)	
Speed	knots	70	120	150	185	
FAF - MAPT 6nm	min : s	5 : 09	3 : 00	2 : 24	1 : 57	
Rate of descent/GS	ft/min	370	635	795	980	

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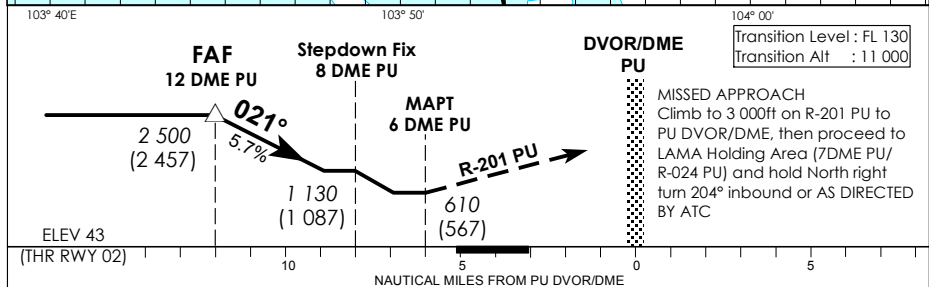
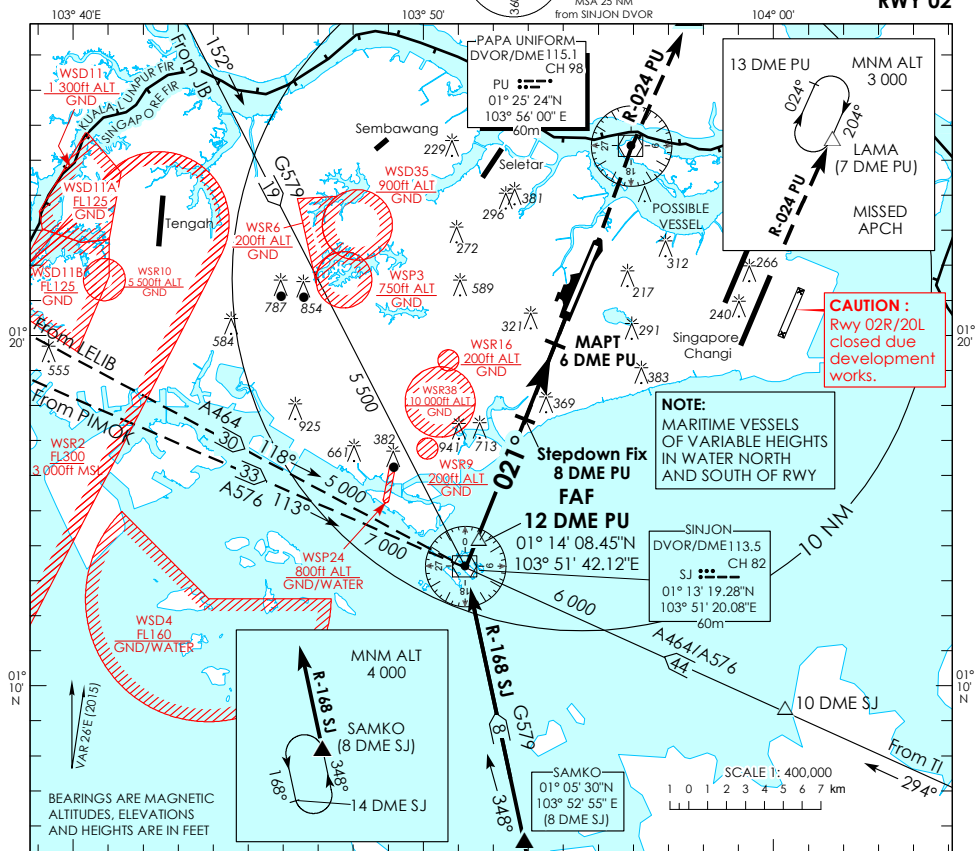
**INSTRUMENT
APPROACH
CHART - ICAO**

AERODROME ELEV **65ft**
HEIGHT RELATED TO
THR RWY 02 - ELEV **43ft**



APP 120.3
119.9
126.025
TWR 118.05

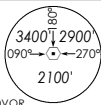
**SINGAPORE/
PAYA LEBAR
PU DVOR/DME
RWY 02**



OCA (OCH)					
Category of Aircraft	A	B	C	D	
Straight-in (with stepdown fix)	610 (567)				
Straight-in (without stepdown fix)	1 130 (1 087)				
Distance	11 DME	10 DME	9 DME	8 DME	7 DME
Altitude (Height)	2170 (2127)	1820 (1777)	1470 (1427)	1130 (1087)	780 (737)
Speed	knots	70	120	150	185
FAF - MAPT 6nm	min : s	5 : 09	3 : 00	2 : 24	1 : 57
Rate of descent/GS	ft/min	370	635	795	980

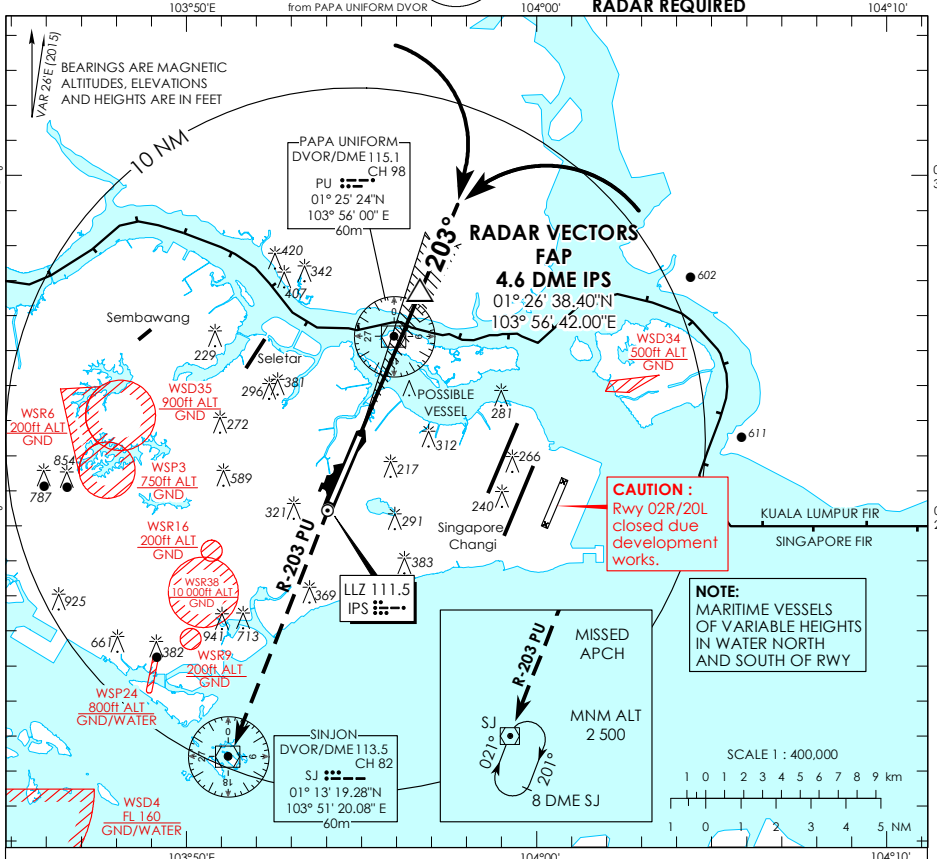
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INSTRUMENT APPROACH CHART - ICAO
AERODROME ELEV 65ft
 HEIGHT RELATED TO THR RWY 20 - 65ft



ATIS Paya Lebar	148.9
Singapore APP	120.3
Paya Lebar APP	119.9 298.0
Seletar APP	126.025
Paya Lebar TWR	118.05 263.1
Ground Control	130.8 296.0

SINGAPORE/PAYA LEBAR
IPS ILS/DME RWY 20

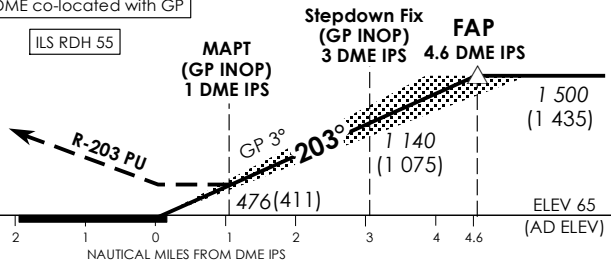


Transition Level : FL 130
 Transition Alt : 11 000

ILS/DME co-located with GP

ILS RDH 55

MISSED APPROACH
 Climb to 3 000ft on R-203 PU to SJ DVOR/DME and hold South right turn 021° inbound or AS DIRECTED BY ATC

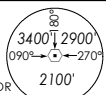


OCA (OCH)				
Category of Aircraft	A	B	C	D
Straight-in	CAT I ILS	194 (129)	204 (139)	214 (149)
	GP INOP	476 (411)		
Distance	4 DME	3 DME	2 DME	
Altitude (Height)	1300 (1235)	1140 (1075)	820 (755)	
Speed	knots	70	120	150
FAF - MAPT 3.6nm	min : s	3 : 06	1 : 48	1 : 27
Rate of descent/GS	ft/min	370	635	795

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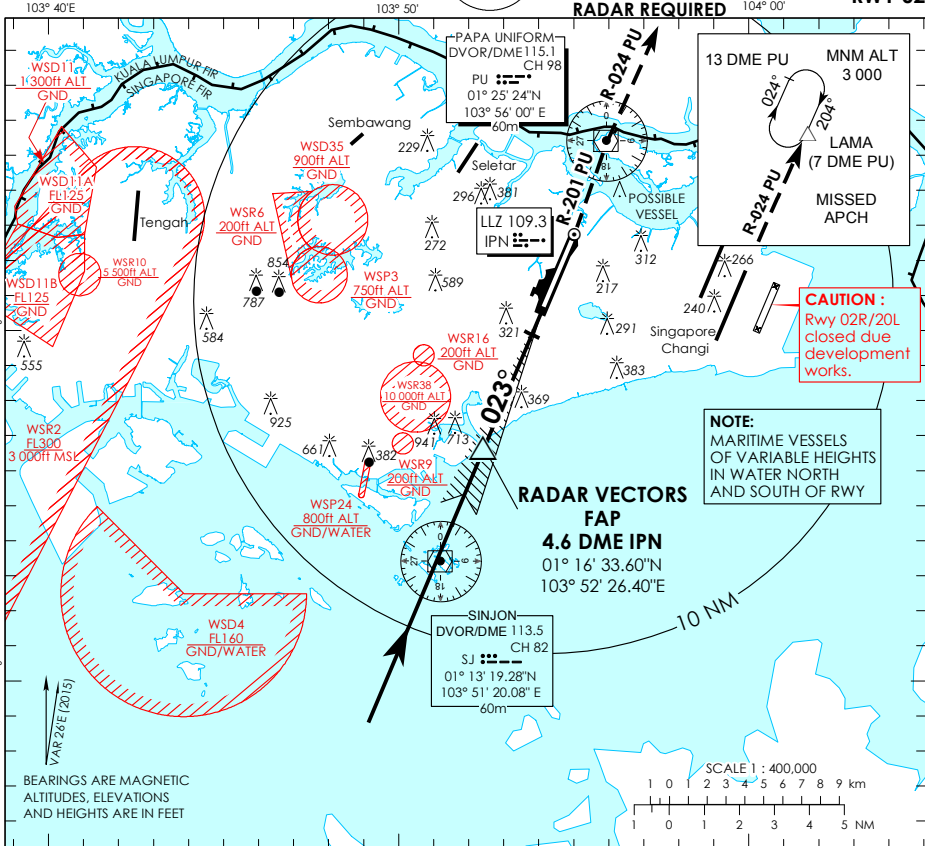
INSTRUMENT APPROACH CHART - ICAO

AERODROME ELEV 65ft
HEIGHT RELATED TO
THR RWY 02 - ELEV 43ft
MSA 25 NM
from PAPA UNIFORM DVOR

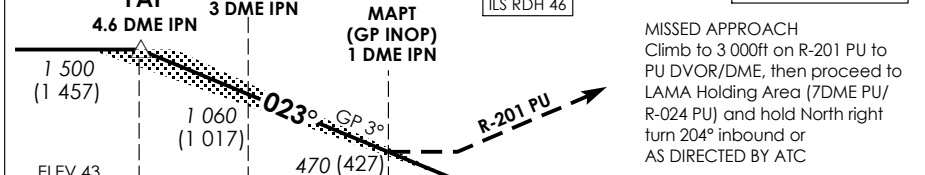


ATIS Paya Lebar	148.9
Singapore APP	120.3
Paya Lebar APP	119.9 298.0
Seletar APP	126.025
Paya Lebar TWR	118.05 263.1
Ground Control	130.8 296.0

SINGAPORE/PAYA LEBAR IPN ILS/DME RWY 02



BEARINGS ARE MAGNETIC ALTITUDES, ELEVATIONS AND HEIGHTS ARE IN FEET
SCALE 1 : 400,000
VAR 24E (2015)



OCA (OCH)				
Category of Aircraft	A	B	C	D
Straight-in	CAT I ILS	178 (135)	188 (145)	198 (155)
	GP INOP	470 (427)		
Distance	4 DME	3 DME	2 DME	
Altitude (Height)	1300 (1257)	1060 (1017)	740 (697)	
Speed	knots	70	120	150
FAF - MAPT 3.6nm	min : s	3 : 06	1 : 48	1 : 27
Rate of descent/GS	ft/min	370	635	795

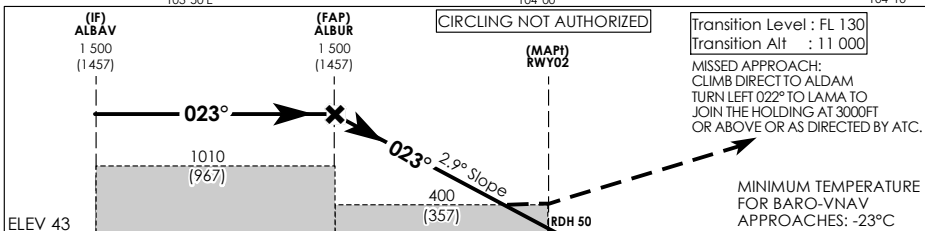
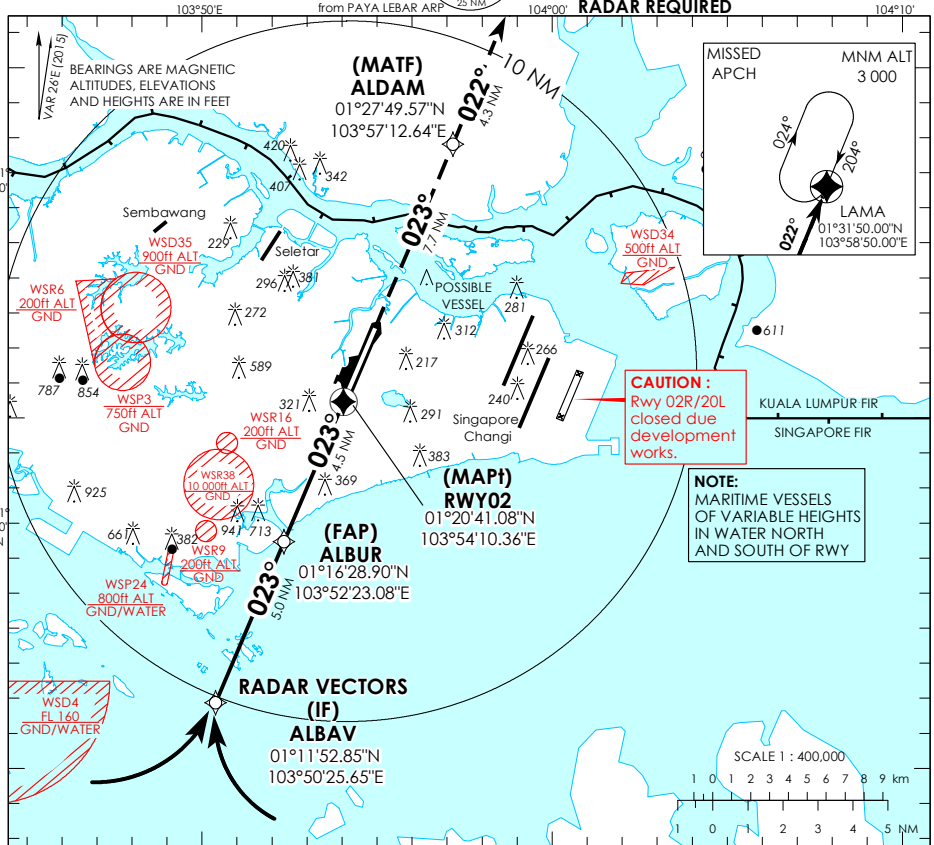
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**INSTRUMENT
APPROACH
CHART - ICAO**

AERODROME ELEV **65ft**
HEIGHT RELATED TO
THR RWY 02 - **43ft**

ATIS Paya Lebar	148.9
Singapore APP	120.3
Paya Lebar APP	119.9 298.0
Seletar APP	126.025
Paya Lebar TWR	118.05 263.1
Ground Control	130.8 296.0

**SINGAPORE/
PAYA LEBAR
RNAV (GNSS)
RWY 02**



OCA (OCH)					
Category of Aircraft	A	B	C	D	
LNAV/VNAV	2.5%			400 (357)	
LNAV	2.5%			400 (357)	
Fix	ALBAV	ALBUR	RWY02	ALDAM	LAMA
Altitude (Height)	1500 (1457)	1500 (1457)	400 (357)	1250 (1207)	1910 (1867)
Speed	knots	80	100	120	140
FAP - MAPt 4.5 nm	min : s	3 : 23	2 : 42	2 : 15	1 : 56
Rate of descent/GS	ft/min	410	513	615	718
				160	180
				1 : 41	1 : 30
				821	923

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INSTRUMENT APPROACH CHART - ICAO AERODROME ELEV 65ft
HEIGHT RELATED TO THR RWY 20 - 65ft

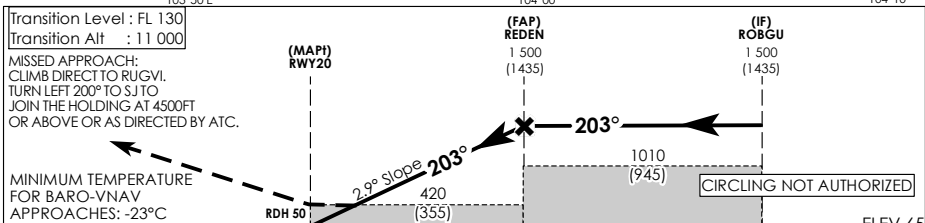
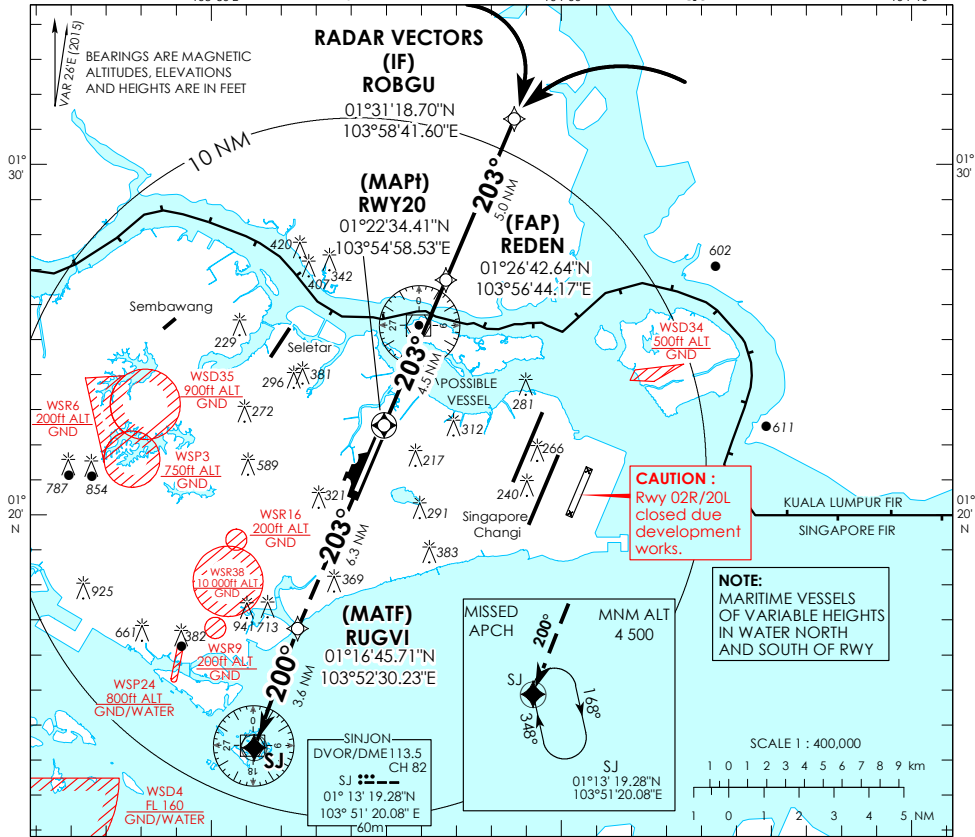
3500
+ ARP
25 NM

MSEA 25 NM from PAYA LEBAR ARP

RADAR REQUIRED

ATIS Paya Lebar	148.9
Singapore APP	120.3
Paya Lebar APP	119.9 298.0
Seletar APP	126.025
Paya Lebar TWR	118.05 263.1
Ground Control	130.8 296.0

SINGAPORE/ PAYA LEBAR RNAV (GNSS) RWY 20



Category of Aircraft	A	B	C	D			
LNAV/VNAV	2.5%	420 (355)					
LNAV	2.5%	420 (355)					
Fix	ROBGU	REDEN	RWY20	RUGVI	SINJON		
Altitude (Height)	1500 (1435)	1500 (1435)	420 (355)	1030 (965)	1580 (1515)		
Speed	knots	80	100	120	140	160	180
FAP - MAP1 4.5 nm	min : s	3 : 23	2 : 42	2 : 15	1 : 56	1 : 41	1 : 30
Rate of descent/GS	ft/min	410	513	615	718	821	923

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