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eAIP

AMDT
03/2024
Effective date
16 MAY 2024
Publication date
16 MAY 2024

wp-AMDT-2024-03

1. Significant information and changes

1.1 Singapore FIR

a. Incorporated AIRAC AIP Supplement 066/2024 – Implementation of RNP 10 navigation specification on ATS route M768 within Singapore FIR.

b. Incorporated Rate of Climb and Descent procedures in Singapore FIR under ENR 1.1, sub-paragraph 3 – General Flight Procedures.

c. Updated the bearing between VASTI to VIRET from 164º to 163º within the relevant WSSS SID charts.

d. Incorporated holding parameters for EXOMO and AKOMA within the relevant WSSS IAC charts.

e. Updated HOSBA (Low & High), NYLON (High) and SAMKO (High) Holding within AREA CHART - ICAO published in ENR 3.6-3 and ENR 3.6-5 to be reflective of the information contained in the Enroute Holding table.

1.2 Singapore Changi Airport

a. Updated SINJON (SJ) DVOR/DME antenna height to 190ft (58M) within the relevant AIP sections and charts.

b. Updated WSSS – AD-2-WSSS-ADC-2, AD-2-WSSS-ADC-2.1 AND AD-2-WSSS-ADC-3.

1.3 Seletar Airport

a. Updated WSSL – AD-2-WSSL-ADC-1 and AD-2-WSSL-ADC-1.1.

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 This amendment incorporates information contained in the listed AIRAC AIP Supplement and NOTAM which are hereby superseded:

AIRAC AIP Supplement
066/2024 dated 18/04/2024

NOTAM
NIL

Amended Pages

GEN 0.2-3:	*: replace.*
GEN 0.3-1/2:	*: replace.*
GEN 0.3-3/4:	*: replace.*
GEN 0.3-5/6:	*: replace.*
GEN 0.4-1/2:	*: replace.*
GEN 0.4-3:	*: replace.*
GEN 0.6-1/2:	*: replace.*
GEN 1.1-1/2:	*: replace.*
GEN 1.3-1/2:	*: replace.*
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GEN 1.3-5/6:	*: replace.*
GEN 1.4-1/2:	*: replace.*
GEN 3.1-1/2:	*: replace.*
GEN 3.2-3/4:	*: replace.*
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GEN 3.6-1/2:	*: replace.*
ENR 0.6-1/2:	*: replace.*
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ENR 0.6-5/6:	*: replace.*
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ENR 1.1-7/8:	*: replace.*
ENR 1.1-9/10:	*: replace.*
ENR 1.1-11/12:	*: replace.*
ENR 1.1-13:	*: replace.*
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ENR 1.8-1/2:	*: replace.*
ENR 1.8-3/4:	*: replace.*
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ENR 1.8-11/12:	*: replace.*
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ENR 1.8-17/18:	*: replace.*
ENR 1.8-19/20:	*: replace.*
ENR 1.8-21/22:	*: replace.*
ENR 1.8-23/24:	*: replace.*
ENR 2.1-7/8:	*: remove.*
ENR 3.1-11/12:	*: replace.*
ENR 3.2-1/2:	*: replace.*
ENR 3.2-3/4:	*: replace.*
ENR 3.2-5/6:	*: replace.*
ENR 3.2-7/8:	*: replace.*
ENR 3.2-9/10:	*: replace.*
ENR 3.2-11/12:	*: replace.*
ENR 3.2-13/14:	*: replace.*
ENR 3.2-15/16:	*: replace.*
ENR 3.2-17/18:	*: replace.*
ENR 3.2-19/20:	*: replace.*

ENR 3.2-21/22: *: replace.*
ENR 3.2-23/24: *: replace.*
ENR 3.2-25/26: *: replace.*
ENR 3.2-27/28: *: replace.*
ENR 3.2-29/30: *: replace.*
ENR 3.2-31/32: *: replace.*
ENR 3.2-33/34: *: replace.*
ENR 3.2-35/36: *: replace.*
ENR 3.2-37/38: *: replace.*
ENR 3.2-39/40: *: replace.*
ENR 3.2-41/42: *: replace.*
ENR 3.2-43/44: *: replace.*
ENR 3.2-45/46: *: replace.*
ENR 3.2-47: *: replace.*
ENR 3.4-3: *: replace.*
ENR-3.6-3 to 3.1: *: replace.*
ENR-3.6-5 to 5.1: *: replace.*
ENR 4.1-1: *: replace.*
ENR 4.4-1/2: *: replace.*
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ENR 4.4-7: *: replace.*
ERC-6-1 En-Route Chart: *: replace.*
AD 2.WSSS-23/24: *: replace.*
AD 2.WSSS-25/26: *: replace.*
AD 2.WSSS-41/42: *: replace.*
AD 2.WSSS-43/44: *: replace.*
AD 2.WSSS-45/46: *: replace.*
AD-2-WSSS-ADC-2 to 2.1: *: replace.*
AD-2-WSSS-ADC-3: *: replace.*
AD-2-WSSS-SID-4 to 4.1: *: replace.*
AD-2-WSSS-SID-20 to 20.1: *: replace.*
AD-2-WSSS-SID-22 to 22.1: *: replace.*
AD-2-WSSS-SID-24 to 24.1: *: replace.*
AD-2-WSSS-SID-28 to 28.1: *: replace.*
AD-2-WSSS-STAR-9 to 9.1: *: replace.*
AD-2-WSSS-STAR-10 to 10.1: *: replace.*
AD-2-WSSS-IAC-1: *: replace.*
AD-2-WSSS-IAC-2: *: replace.*
AD-2-WSSS-IAC-3: *: replace.*
AD-2-WSSS-IAC-5: *: replace.*
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AD-2-WSSS-IAC-9 to 9.1: *: replace.*
AD-2-WSSS-IAC-12 to 12.1: *: replace.*
AD-2-WSSL-ADC-1 to 1.1: *: replace.*
AD 2.WSAP-7/8: *: replace.*
AD-2-WSAP-IAC-2: *: replace.*
AD-2-WSAP-IAC-3: *: replace.*
AD-2-WSAP-IAC-4: *: replace.*
AD-2-WSAP-IAC-6: *: replace.*
AD 2.WSAT-5/6: *: replace.*

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AIP AMENDMENT

NR/Year	*Publication date*	*Date inserted*	*Inserted by*
02/2023	20 APR 2023	20 APR 2023	
03/2023	15 JUN 2023	15 JUN 2023	
04/2023	10 AUG 2023	10 AUG 2023	
05/2023	05 OCT 2023	05 OCT 2023	
06/2023	30 NOV 2023	30 NOV 2023	
01/2024	25 JAN 2024	25 JAN 2024	
02/2024	21 MAR 2024	21 MAR 2024	
03/2024	16 MAY 2024	16 MAY 2024	

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GEN 0.3 RECORD OF CURRENT AIP SUPPLEMENTS

NR/Year	*Subject*	*AIP section(s) affected*	*Period of validity (from/to)*	*Cancellation record*
021/2020	Singapore Changi Airport - Long term closure of aircraft stand E5 at Terminal 2, Singapore Changi Airport	AD	*30 MAR 2020 / 30 DEC 2024*	
059/2020	Singapore Changi Airport - Long term closure of aircraft stand E20 at Terminal 2, Singapore Changi Airport	AD	*25 AUG 2020 / 30 DEC 2026*	
161/2021	Singapore Changi Airport - Steel Frame	AD	*17 JAN 2022 / 17 DEC 2024*	
065/2023	Paya Lebar Airport - Luffing Tower Crane	AD	*11 MAY 2023 / 31 DEC 2024*	
068/2023	Paya Lebar Airport - Cranes	AD	*11 MAY 2023 / 31 DEC 2024*	
073/2023	Paya Lebar Airport - Luffing Cranes	AD	*08 JUN 2023 / 31 MAY 2024*	
074/2023	Paya Lebar Airport - Cranes	AD	*08 JUN 2023 / 26 MAY 2024*	
075/2023	Paya Lebar Airport - Topless Crane	AD	*08 JUN 2023 / 30 DEC 2024*	
076/2023	Paya Lebar Airport - Luffing Cranes	AD	*08 JUN 2023 / 30 DEC 2024*	
077/2023	Paya Lebar Airport - Topless Tower Cranes	AD	*08 JUN 2023 / 31 MAY 2024*	
079/2023	Paya Lebar Airport - Mobile Crane	AD	*08 JUN 2023 / 31 DEC 2024*	
080/2023	Paya Lebar Airport - Mobile Cranes	AD	*08 JUN 2023 / 31 DEC 2024*	
083/2023	Paya Lebar Airport - Luffing Crane	AD	*08 JUN 2023 / 31 DEC 2024*	
084/2023	Paya Lebar Airport - Luffing Tower Crane	AD	*08 JUN 2023 / 31 MAY 2024*	
092/2023	Paya Lebar Airport - Luffer Tower Crane	AD	*13 JUL 2023 / 31 DEC 2024*	
093/2023	Paya Lebar Airport - Luffer Tower Crane	AD	*13 JUL 2023 / 27 JUN 2024*	
094/2023	Paya Lebar Airport - Cranes	AD	*13 JUL 2023 / 30 JUN 2024*	
097/2023	Paya Lebar Airport - Topless Tower Cranes	AD	*13 JUL 2023 / 14 JUN 2024*	
098/2023	Paya Lebar Airport - Mobile Cranes	AD	*13 JUL 2023 / 12 JUN 2024*	
107/2023	Paya Lebar Airport - Mobile Crane	AD	*10 AUG 2023 / 31 JUL 2024*	
109/2023	Paya Lebar Airport - Mobile Crane	AD	*10 AUG 2023 / 31 AUG 2024*	
113/2023	Paya Lebar Airport - Flat-Top Cranes	AD	*10 AUG 2023 / 30 JUN 2024*	
114/2023	Paya Lebar Airport - Cranes	AD	*10 AUG 2023 / 31 DEC 2024*	
115/2023	Paya Lebar Airport - Mobile Crane	AD	*10 AUG 2023 / 31 JUL 2024*	
116/2023	Paya Lebar Airport - Cranes	AD	*10 AUG 2023 / 09 JUL 2024*	
117/2023	Paya Lebar Airport - Mobile Crane	AD	*07 SEP 2023 / 10 SEP 2024*	
121/2023	Paya Lebar Airport - Crawler Cranes	AD	*07 SEP 2023 / 31 DEC 2024*	

NR/Year	*Subject*	*AIP section(s) affected*	*Period of validity (from/to)*	*Cancellation record*
123/2023	Paya Lebar Airport - Tower Crane	AD	*07 SEP 2023 / 10 JUL 2024*	
127/2023	Singapore Changi Airport - Closure of aircraft stand 604 at East Cargo Apron	AD	*02 NOV 2023 / 30 MAY 2025*	
129/2023	Seletar Airport - Closure of Helicopter Landing Area	AD	*28 SEP 2023 / 30 SEP 2024*	
130/2023	Paya Lebar Airport - Mobile Crane	AD	*12 OCT 2023 / 06 OCT 2024*	
131/2023	Paya Lebar Airport - Flat-Top Cranes	AD	*12 OCT 2023 / 31 OCT 2024*	
132/2023	Paya Lebar Airport - Topless Cranes	AD	*12 OCT 2023 / 30 SEP 2024*	
133/2023	Paya Lebar Airport - Mobile Cranes	AD	*12 OCT 2023 / 12 SEP 2024*	
134/2023	Paya Lebar Airport - Mobile Crane	AD	*12 OCT 2023 / 30 OCT 2024*	
135/2023	Paya Lebar Airport - Cranes	AD	*12 OCT 2023 / 10 SEP 2024*	
136/2023	Paya Lebar Airport - Cranes	AD	*12 OCT 2023 / 01 SEP 2024*	
139/2023	Singapore Changi Airport - Steel and Frangible Frames and Frangible Posts	AD	*30 NOV 2023 / 28 FEB 2025*	
140/2023	Singapore Changi Airport - Downgrade of Taxilane N4 behind aircraft stand 604 to max wingspan 36m (Code C) and downgrade of aircraft stand 603 to Code C	AD	*30 NOV 2023 / 30 MAY 2025*	
141/2023	Singapore Changi Airport - Apply minimum thrust at East Cargo Apron	AD	*23 OCT 2023 / 30 MAY 2025*	
142/2023	Singapore Changi Airport - Temporary fixed objects in the runway strip of Runway 02C/20C	AD	*30 NOV 2023 / 30 JUN 2024*	
143/2023	Paya Lebar Airport - Luffing Cranes	AD	*09 NOV 2023 / 31 DEC 2024*	
144/2023	Paya Lebar Airport - Mobile Cranes	AD	*09 NOV 2023 / 20 OCT 2024*	
145/2023	Paya Lebar Airport - Mobile Crane	AD	*09 NOV 2023 / 21 OCT 2024*	
146/2023	Paya Lebar Airport - Tower Luffer Cranes	AD	*09 NOV 2023 / 31 DEC 2024*	
147/2023	Paya Lebar Airport - Tower Cranes	AD	*09 NOV 2023 / 31 DEC 2024*	
148/2023	Paya Lebar Airport - Mobile Cranes	AD	*09 NOV 2023 / 05 JUN 2024*	
149/2023	Paya Lebar Airport - Topless Cranes	AD	*09 NOV 2023 / 31 OCT 2024*	
151/2023	Paya Lebar Airport - Cranes	AD	*09 NOV 2023 / 08 OCT 2024*	
153/2023	Paya Lebar Airport - Tower Cranes	AD	*09 DEC 2023 / 08 DEC 2024*	
154/2023	Paya Lebar Airport - Topless Cranes	AD	*07 DEC 2023 / 01 DEC 2024*	
155/2023	Paya Lebar Airport - Luffing Cranes	AD	*07 DEC 2023 / 01 DEC 2024*	
156/2023	Paya Lebar Airport - Cranes	AD	*07 DEC 2023 / 31 JUL 2024*	
158/2023	Paya Lebar Airport - Mobile Crane	AD	*07 DEC 2023 / 26 MAY 2024*	
159/2023	Paya Lebar Airport - Cranes	AD	*07 DEC 2023 / 30 NOV 2024*	

NR/Year	Subject	AIP section(s) affected	Period of validity (from/to)	Cancellation record
160/2023	Paya Lebar Airport - Tower Cranes	AD	*08 DEC 2023 / 08 DEC 2024*	
161/2023	Paya Lebar Airport - Cranes	AD	*07 DEC 2023 / 30 NOV 2024*	
162/2023	Paya Lebar Airport - Luffing Tower Crane	AD	*07 DEC 2023 / 30 NOV 2024*	
001/2024	Paya Lebar Airport - Tower Cranes	AD	*11 JAN 2024 / 31 DEC 2024*	
002/2024	Paya Lebar Airport - Tower Cranes	AD	*11 JAN 2024 / 31 DEC 2024*	
003/2024	Paya Lebar Airport - Luffing Cranes	AD	*11 JAN 2024 / 31 DEC 2024*	
004/2024	Paya Lebar Airport - Crawler Cranes	AD	*11 JAN 2024 / 31 DEC 2024*	
005/2024	Paya Lebar Airport - Flat-Top Cranes	AD	*11 JAN 2024 / 31 DEC 2024*	
006/2024	Paya Lebar Airport - Cranes	AD	*11 JAN 2024 / 31 DEC 2025*	
007/2024	Paya Lebar Airport - Luffing Cranes	AD	*11 JAN 2024 / 31 DEC 2025*	
008/2024	Paya Lebar Airport - Mobile Crane	AD	*11 JAN 2024 / 30 JUN 2024*	
009/2024	Paya Lebar Airport - Luffing Crane	AD	*11 JAN 2024 / 31 DEC 2024*	
010/2024	Paya Lebar Airport - Mobile Crane	AD	*11 JAN 2024 / 31 AUG 2024*	
011/2024	Paya Lebar Airport - Tower Cranes	AD	*11 JAN 2024 / 31 DEC 2024*	
012/2024	Paya Lebar Airport - Mobile Crane	AD	*11 JAN 2024 / 31 DEC 2024*	
013/2024	Paya Lebar Airport - Flat-Top Cranes	AD	*11 JAN 2024 / 31 DEC 2024*	
014/2024	Paya Lebar Airport - Luffing Crane	AD	*11 JAN 2024 / 31 DEC 2024*	
015/2024	Paya Lebar Airport - Cranes	AD	*11 JAN 2024 / 30 DEC 2024*	
016/2024	Paya Lebar Airport - Luffer Crane	AD	*11 JAN 2024 / 31 DEC 2024*	
017/2024	Singapore Changi Airport - Closure of aircraft stand 504 at West Cargo Apron	AD	*22 FEB 2024 / 31 OCT 2025*	
020/2024	Paya Lebar Airport - Saddle Cranes	AD	*08 FEB 2024 / 31 DEC 2025*	
022/2024	Paya Lebar Airport - Topless Cranes	AD	*08 FEB 2024 / 30 NOV 2024*	
023/2024	Paya Lebar Airport - Luffing Tower Crane	AD	*08 FEB 2024 / 30 JUN 2025*	
024/2024	Paya Lebar Airport - Luffing Crane	AD	*08 FEB 2024 / 29 JAN 2025*	
025/2024	Paya Lebar Airport - Crawler Cranes	AD	*08 FEB 2024 / 31 JUL 2024*	
026/2024	Paya Lebar Airport - Mobile Crane	AD	*08 FEB 2024 / 31 MAY 2024*	
027/2024	Paya Lebar Airport - Topless Tower Cranes	AD	*08 FEB 2024 / 25 JAN 2025*	
028/2024	Paya Lebar Airport - Crawler Crane	AD	*08 FEB 2024 / 27 NOV 2024*	
029/2024	Paya Lebar Airport - Cranes	AD	*08 FEB 2024 / 20 JUL 2024*	
030/2024	Paya Lebar Airport - Cranes	AD	*08 FEB 2024 / 20 JUN 2024*	

NR/Year	*Subject*	*AIP section(s) affected*	*Period of validity (from/to)*	*Cancellation record*
031/2024	Paya Lebar Airport - Tower Cranes	AD	*08 FEB 2024 / 19 DEC 2024*	
032/2024	Paya Lebar Airport - Topless Cranes	AD	*08 FEB 2024 / 31 DEC 2024*	
033/2024	Paya Lebar Airport - Mobile Cranes	AD	*08 FEB 2024 / 21 JUL 2024*	
034/2024	Paya Lebar Airport - Mobile Crane	AD	*08 FEB 2024 / 21 MAY 2024*	
035/2024	Paya Lebar Airport - Cranes	AD	*08 FEB 2024 / 31 DEC 2024*	
036/2024	Paya Lebar Airport - Cranes	AD	*08 FEB 2024 / 17 JUN 2025*	
037/2024	Paya Lebar Airport - Tower Crane	AD	*08 FEB 2024 / 31 DEC 2024*	
038/2024	Paya Lebar Airport - Luffer Cranes	AD	*08 FEB 2024 / 17 JUN 2025*	
039/2024	Paya Lebar Airport - Cranes	AD	*08 FEB 2024 / 31 DEC 2024*	
040/2024	Paya Lebar Airport - Luffing Cranes	AD	*08 FEB 2024 / 16 JAN 2025*	
041/2024	Paya Lebar Airport - Cranes	AD	*08 FEB 2024 / 31 DEC 2024*	
042/2024	Paya Lebar Airport - Topless Cranes	AD	*08 FEB 2024 / 16 JAN 2025*	
043/2024	Paya Lebar Airport - Crawler Tower Cranes	AD	*08 FEB 2024 / 16 FEB 2025*	
044/2024	Paya Lebar Airport - Luffer Cranes	AD	*08 FEB 2024 / 31 AUG 2025*	
045/2024	Paya Lebar Airport - Mobile Crane	AD	*08 FEB 2024 / 16 JAN 2025*	
046/2024	Paya Lebar Airport - Tower Cranes	AD	*08 FEB 2024 / 16 FEB 2025*	
047/2024	Paya Lebar Airport - Luffing Cranes	AD	*08 FEB 2024 / 30 DEC 2025*	
048/2024	Paya Lebar Airport - Cranes	AD	*08 FEB 2024 / 31 DEC 2025*	
049/2024	Paya Lebar Airport - Luffer Tower Crane	AD	*08 FEB 2024 / 10 JAN 2025*	
050/2024	Paya Lebar Airport - Topless Cranes	AD	*08 FEB 2024 / 10 JAN 2025*	
051/2024	Paya Lebar Airport - Luffing Tower Crane	AD	*08 FEB 2024 / 10 JAN 2025*	
052/2024	Paya Lebar Airport - Luffing Cranes	AD	*08 FEB 2024 / 10 JAN 2025*	
053/2024	Paya Lebar Airport - Topless Cranes	AD	*08 FEB 2024 / 16 FEB 2025*	
054/2024	Paya Lebar Airport - Mobile Crane	AD	*08 FEB 2024 / 30 MAY 2024*	
056/2024	Singapore Changi Airport - Updated closure schedules for Runway 02L/20R and Runway 02C/20C	AD	*31 MAR 2024 / 30 SEP 2025*	
057/2024	Paya Lebar Airport - Luffing Tower Cranes	AD	*07 MAR 2024 / 30 JUN 2024*	
058/2024	Paya Lebar Airport - Mobile Cranes	AD	*07 MAR 2024 / 29 SEP 2024*	
059/2024	Paya Lebar Airport - Mobile Crane	AD	*07 MAR 2024 / 29 SEP 2024*	
060/2024	Paya Lebar Airport - Mobile Cranes	AD	*07 MAR 2024 / 31 DEC 2024*	

NR/Year	Subject	AIP section(s) affected	Period of validity (from/to)	Cancellation record
061/2024	Paya Lebar Airport - Mobile Cranes	AD	*07 MAR 2024 / 30 SEP 2024*	
062/2024	Paya Lebar Airport - Mobile Crane	AD	*07 MAR 2024 / 31 JUL 2024*	
063/2024	Paya Lebar Airport - Cranes	AD	*07 MAR 2024 / 31 OCT 2024*	
064/2024	Paya Lebar Airport - Obstacles	AD	*07 MAR 2024 / 04 FEB 2025*	
065/2024	Paya Lebar Airport - Obstacles	AD	*07 MAR 2024 / 31 DEC 2024*	
068/2024	Airspace closure in support of Republic of Singapore Air Force (RSAF) operational requirements from 28 May to 11 August 2024	AD/ENR	*28 MAY 2024 / 11 AUG 2024*	
069/2024	Area of collection, formula of Route Air Navigation Services (RANS) charges, and other changes	GEN	*21 MAR 2024* PERM	
070/2024	Paya Lebar Airport - Crawler Tower Cranes	AD	*21 MAR 2024 / 31 MAR 2025*	
072/2024	Singapore Changi Airport - Closure of Runway 02R/20L, Taxiway closures and restrictions	AD	*16 MAY 2024 / 31 OCT 2024*	
073/2024	Paya Lebar Airport - Topless Cranes	AD	*11 APR 2024 / 31 JUL 2024*	
074/2024	Paya Lebar Airport - Cranes	AD	*11 APR 2024 / 25 APR 2025*	
075/2024	Paya Lebar Airport - Mobile Cranes	AD	*11 APR 2024 / 01 APR 2025*	
076/2024	Paya Lebar Airport - Mobile Crane	AD	*11 APR 2024 / 06 AUG 2024*	
077/2024	Paya Lebar Airport - Cranes	AD	*11 APR 2024 / 31 DEC 2024*	
078/2024	Paya Lebar Airport - Mobile Crane	AD	*11 APR 2024 / 23 AUG 2024*	
079/2024	Paya Lebar Airport - Mobile Crane	AD	*11 APR 2024 / 20 SEP 2024*	
080/2024	Paya Lebar Airport - Mobile Crane	AD	*11 APR 2024 / 31 JUL 2024*	
081/2024	Singapore Changi Airport - Reinstatement of the Runway 20C Approach lighting to 900 metres	AD	*17 MAY 2024* PERM	
082/2024	Singapore Changi Airport - New Taxiways between Taxiway B and Taxiway D	AD	*13 JUN 2024* PERM	
083/2024	Singapore Changi Airport - Decommissioning of aircraft stands E1 and F30 and temporary closure of taxilanes R1, R2, R3 and aircraft stands E2, E3, E4, F31, F32, F33 and F34 due to construction work activities at Terminal 2	AD	*09 MAY 2024 / 03 JAN 2028*	
084/2024	Paya Lebar Airport - Cranes	AD	*09 MAY 2024 / 31 DEC 2024*	
085/2024	Paya Lebar Airport - Mobile Crane	AD	*09 MAY 2024 / 30 OCT 2024*	
086/2024	Paya Lebar Airport - Cranes	AD	*09 MAY 2024 / 01 MAY 2025*	
087/2024	Paya Lebar Airport - Cranes	AD	*09 MAY 2024 / 25 APR 2025*	
088/2024	Paya Lebar Airport - Mobile Crane	AD	*09 MAY 2024 / 31 DEC 2024*	
089/2024	Paya Lebar Airport - Mobile Cranes	AD	*09 MAY 2024 / 15 APR 2025*	

NR/Year	*Subject*	*AIP section(s) affected*	*Period of validity (from/to)*	*Cancellation record*
090/2024	Paya Lebar Airport - Mobile Crane	AD	*09 MAY 2024 / 31 DEC 2024*	
091/2024	Paya Lebar Airport - Topless Cranes	AD	*09 MAY 2024 / 15 APR 2025*	
092/2024	Paya Lebar Airport - Mobile Crane	AD	*09 MAY 2024 / 30 AUG 2024*	
093/2024	Paya Lebar Airport - Flat-Top Crane	AD	*09 MAY 2024 / 10 APR 2025*	
094/2024	Paya Lebar Airport - Crawler Crane	AD	*09 MAY 2024 / 30 SEP 2025*	

GEN 0.4 CHECKLIST OF AIP PAGES

Part 1 – General (GEN)

GEN 0

GEN 0.1-1	26 MAR 2020
GEN 0.1-2	05 OCT 2023
GEN-0.1-3	19 MAY 2022
GEN 0.2-1	13 SEP 2018
GEN 0.2-2	23 FEB 2023
GEN 0.2-3	16 MAY 2024
GEN 0.3-1	16 MAY 2024
GEN 0.3-2	16 MAY 2024
GEN 0.3-3	16 MAY 2024
GEN 0.3-4	16 MAY 2024
GEN 0.3-5	16 MAY 2024
GEN 0.3-6	16 MAY 2024
GEN 0.4-1	16 MAY 2024
GEN 0.4-2	16 MAY 2024
GEN 0.4-3	16 MAY 2024
GEN 0.5-1	30 JAN 2020
GEN 0.6-1	16 MAY 2024
GEN 0.6-2	21 MAR 2024
GEN 0.6-3	21 MAR 2024

GEN 1

GEN 1.1-1	16 MAY 2024
GEN 1.1-2	16 MAY 2024
GEN 1.2-1	21 MAR 2024
GEN 1.2-2	30 NOV 2023
GEN 1.2-3	25 JAN 2024
GEN 1.2-4	25 JAN 2024
GEN 1.2-5	25 JAN 2024
GEN 1.2-6	21 MAR 2024
GEN 1.2-7	21 MAR 2024
GEN 1.3-1	16 MAY 2024
GEN 1.3-2	16 MAY 2024
GEN 1.3-3	16 MAY 2024
GEN 1.3-4	16 MAY 2024
GEN 1.3-5	16 MAY 2024
GEN 1.3-6	16 MAY 2024
GEN-1.3/ARR PAX FLOW	25 APR 2019
GEN-1.3/DEP PAX FLOW 1	25 APR 2019
GEN-1.3/DEP PAX FLOW 2	25 APR 2019
GEN 1.4-1	16 MAY 2024
GEN 1.4-2	16 MAY 2024
GEN 1.5-1	21 MAR 2024
GEN 1.6-1	21 MAR 2024
GEN 1.6-2	21 MAR 2024
GEN 1.6-3	21 MAR 2024
GEN 1.6-4	05 NOV 2020
GEN 1.7-1	08 SEP 2022
GEN 1.7-2	23 FEB 2023
GEN 1.7-3	23 FEB 2023
GEN 1.7-4	25 JAN 2024

GEN 2

GEN 2.1-1	24 MAR 2022
GEN 2.1-2	05 OCT 2023
GEN 2.2-1	02 MAR 2017
GEN 2.2-2	02 MAR 2017
GEN 2.2-3	21 MAR 2024
GEN 2.2-4	21 MAR 2024
GEN 2.2-5	21 MAR 2024
GEN 2.3-1	12 NOV 2015
GEN 2.3-2	12 NOV 2015
GEN 2.3-3	12 NOV 2015
GEN 2.4-1	21 MAR 2024
GEN 2.5-1	21 MAR 2024
GEN-2.5-3	21 MAR 2024
GEN 2.6-1	12 NOV 2015
GEN 2.6-2	12 NOV 2015
GEN 2.7-1	05 DEC 2019

GEN 3

GEN 3.1-1	16 MAY 2024
GEN 3.1-2	21 MAR 2024
GEN 3.1-3	02 DEC 2021
GEN 3.1-4	19 MAY 2022
GEN 3.2-1	19 MAY 2022
GEN 3.2-2	31 MAR 2016
GEN 3.2-3	31 MAR 2016
GEN 3.2-4	16 MAY 2024
GEN 3.2-5	21 MAR 2024
GEN 3.2-6	19 MAY 2022
GEN 3.3-1	19 MAY 2022
GEN 3.3-2	19 MAY 2022
GEN 3.4-1	16 MAY 2024
GEN 3.4-2	16 MAY 2024
GEN 3.4-3	10 SEP 2020
GEN 3.4-4	19 MAY 2022
GEN 3.4-5	21 MAR 2024
GEN-3.4-7	10 SEP 2020
GEN-3.4-9	21 MAR 2024
GEN 3.5-1	21 MAR 2024
GEN 3.5-2	21 MAR 2024
GEN 3.5-3	21 MAR 2024
GEN 3.5-4	21 MAR 2024
GEN 3.5-5	21 MAR 2024
GEN 3.5-6	21 MAR 2024
GEN 3.5-7	21 MAR 2024
GEN 3.5-8	21 MAR 2024
GEN 3.5-9	21 MAR 2024
GEN 3.6-1	16 MAY 2024
GEN 3.6-2	21 MAR 2024
GEN 3.6-3	07 OCT 2021
GEN 3.6-4	21 MAR 2024
GEN-3.6-5	21 MAR 2024

GEN 4

GEN 4.1-1	14 JUL 2022
GEN 4.2-1	24 MAY 2018
GEN 4.2-2	12 NOV 2015
GEN 4.2-3	12 NOV 2015
GEN 4.2-4	12 NOV 2015
GEN 4.2-5	12 NOV 2015
GEN 4.2-6	12 NOV 2015

Part 2 – EN-ROUTE (ENR)

ENR 0

ENR 0.6-1	16 MAY 2024
ENR 0.6-2	16 MAY 2024
ENR 0.6-3	16 MAY 2024
ENR 0.6-4	16 MAY 2024
ENR 0.6-5	16 MAY 2024
ENR 0.6-6	21 MAR 2024

ENR 1

ENR 1.1-1	16 MAY 2024
ENR 1.1-2	16 MAY 2024
ENR 1.1-3	16 MAY 2024
ENR 1.1-4	16 MAY 2024
ENR 1.1-5	16 MAY 2024
ENR 1.1-6	16 MAY 2024
ENR 1.1-7	16 MAY 2024
ENR 1.1-8	16 MAY 2024
ENR 1.1-9	16 MAY 2024
ENR 1.1-10	16 MAY 2024
ENR 1.1-11	16 MAY 2024
ENR 1.1-12	16 MAY 2024
ENR 1.1-13	16 MAY 2024
ENR 1.2-1	21 MAR 2024
ENR 1.3-1	21 MAR 2024
ENR 1.4-1	21 MAR 2024
ENR 1.5-1	21 MAR 2024
ENR 1.5-2	21 MAR 2024
ENR 1.5-3	16 MAY 2024
ENR 1.5-4	16 MAY 2024
ENR 1.6-1	25 JAN 2024
ENR 1.6-2	25 JAN 2024
ENR 1.6-3	25 JAN 2024
ENR 1.6-4	25 JAN 2024
ENR 1.6-5	25 JAN 2024
ENR 1.6-6	25 JAN 2024
ENR 1.6-7	25 JAN 2024
ENR 1.6-8	21 MAR 2024
ENR 1.6-9	25 JAN 2024
ENR 1.6-10	21 MAR 2024
ENR 1.7-1	21 MAR 2024
ENR 1.7-2	16 MAY 2024
ENR 1.7-3	16 MAY 2024
ENR 1.7-4	16 MAY 2024
ENR 1.7-5	16 MAY 2024
ENR 1.7-6	16 MAY 2024
ENR 1.7-7	16 MAY 2024
ENR 1.8-1	16 MAY 2024
ENR 1.8-2	16 MAY 2024
ENR 1.8-3	16 MAY 2024
ENR 1.8-4	16 MAY 2024
ENR 1.8-5	16 MAY 2024
ENR 1.8-6	16 MAY 2024
ENR 1.8-7	16 MAY 2024
ENR 1.8-8	16 MAY 2024
ENR 1.8-9	16 MAY 2024
ENR 1.8-10	16 MAY 2024
ENR 1.8-11	16 MAY 2024
ENR 1.8-12	16 MAY 2024
ENR 1.8-13	16 MAY 2024
ENR 1.8-14	16 MAY 2024
ENR 1.8-15	16 MAY 2024
ENR 1.8-16	16 MAY 2024
ENR 1.8-17	16 MAY 2024
ENR 1.8-18	16 MAY 2024
ENR 1.8-19	16 MAY 2024
ENR 1.8-20	16 MAY 2024
ENR 1.8-21	16 MAY 2024
ENR 1.8-22	16 MAY 2024
ENR 1.8-23	16 MAY 2024
ENR 1.8-24	16 MAY 2024
ENR 1.8-25	16 MAY 2024
ENR 1.8-26	16 MAY 2024
ENR 1.8-27	16 MAY 2024
ENR 1.8-28	16 MAY 2024
ENR 1.9-1	16 MAY 2024
ENR 1.9-2	16 MAY 2024
ENR 1.9-3	16 MAY 2024
ENR 1.9-4	16 MAY 2024
ENR 1.9-5	16 MAY 2024
ENR 1.10-1	16 MAY 2024
ENR 1.10-2	16 MAY 2024
ENR 1.10-3	21 MAR 2024
ENR 1.11-1	21 MAR 2024
ENR 1.12-1	12 NOV 2015
ENR 1.12-2	12 NOV 2015
ENR 1.12-3	12 NOV 2015
ENR 1.12-4	12 NOV 2015
ENR 1.13-1	12 NOV 2015
ENR 1.14-1	16 MAY 2024
ENR 1.14-2	16 MAY 2024
ENR-1.14-3 to ENR-1.14-4	15 SEP 2016
ENR-1.14-5 to ENR-1.14-6	15 SEP 2016
ENR-1.14-7 to ENR-1.14-8	15 AUG 2019

ENR 2

ENR 2.1-1	16 MAY 2024
ENR 2.1-2	16 MAY 2024
ENR 2.1-3	16 MAY 2024
ENR 2.1-4	16 MAY 2024
ENR 2.1-5	16 MAY 2024
ENR-2.1-7	21 MAR 2024
ENR-2.1-9	21 MAR 2024
ENR-2.1-11A	21 JUL 2016
ENR-2.1-11B	08 SEP 2022
ENR-2.1-13	21 JUL 2016
ENR-2.1-14	21 MAR 2024

ENR 3

ENR 3.1-1	21 MAR 2024
ENR 3.1-2	21 MAR 2024
ENR 3.1-3	21 MAR 2024
ENR 3.1-4	21 MAR 2024

AD-2-WSSS-SID-45 to 45.1	21 MAR 2024
AD-2-WSSS-SID-46 to 46.1	21 MAR 2024
AD-2-WSSS-SID-47 to 47.1	21 MAR 2024
AD-2-WSSS-SID-48 to 48.1	21 MAR 2024
AD-2-WSSS-SID-49 to 49.1	21 MAR 2024
AD-2-WSSS-SID-50 to 50.1	21 MAR 2024
AD-2-WSSS-SID-51 to 51.1	21 MAR 2024
AD-2-WSSS-SID-52 to 52.1	21 MAR 2024
AD-2-WSSS-SID-53 to 53.1	21 MAR 2024
AD-2-WSSS-SID-54 to 54.1	21 MAR 2024
AD-2-WSSS-SID-55 to 55.1	21 MAR 2024
AD-2-WSSS-SID-56 to 56.1	21 MAR 2024
AD-2-WSSS-SID-57 to 57.1	21 MAR 2024
AD-2-WSSS-SID-58 to 58.1	21 MAR 2024
AD-2-WSSS-SID-59 to 59.1	21 MAR 2024
AD-2-WSSS-SID-60 to 60.1	21 MAR 2024
AD-2-WSSS-SID-61 to 61.1	21 MAR 2024
AD-2-WSSS-SID-62 to 62.1	21 MAR 2024
AD-2-WSSS-SID-63 to 63.1	21 MAR 2024
AD-2-WSSS-SID-64 to 64.1	21 MAR 2024
AD-2-WSSS-STAR-1 to 1.1	21 MAR 2024
AD-2-WSSS-STAR-2 to 2.1	21 MAR 2024
AD-2-WSSS-STAR-3 to 3.1	21 MAR 2024
AD-2-WSSS-STAR-4 to 4.1	21 MAR 2024
AD-2-WSSS-STAR-5 to 5.1	21 MAR 2024
AD-2-WSSS-STAR-6 to 6.1	21 MAR 2024
AD-2-WSSS-STAR-7 to 7.1	21 MAR 2024
AD-2-WSSS-STAR-8 to 8.1	21 MAR 2024
AD-2-WSSS-STAR-9 to 9.1	16 MAY 2024
AD-2-WSSS-STAR-10 to 10.1	16 MAY 2024
AD-2-WSSS-STAR-11 to 11.1	21 MAR 2024
AD-2-WSSS-STAR-12 to 12.1	21 MAR 2024
AD-2-WSSS-STAR-13 to 13.1	21 MAR 2024
AD-2-WSSS-STAR-14 to 14.1	21 MAR 2024
AD-2-WSSS-STAR-15 to 15.1	21 MAR 2024
AD-2-WSSS-STAR-16 to 16.1	21 MAR 2024
AD-2-WSSS-STAR-17 to 17.1	21 MAR 2024
AD-2-WSSS-STAR-18 to 18.1	21 MAR 2024
AD-2-WSSS-STAR-19 to 19.1	21 MAR 2024
AD-2-WSSS-IAC-1	16 MAY 2024
AD-2-WSSS-IAC-2	16 MAY 2024
AD-2-WSSS-IAC-3	16 MAY 2024
AD-2-WSSS-IAC-5	16 MAY 2024
AD-2-WSSS-IAC-6	16 MAY 2024
AD-2-WSSS-IAC-7	16 MAY 2024
AD-2-WSSS-IAC-9 to 9.1	16 MAY 2024
AD-2-WSSS-IAC-10 to 10.1	21 MAR 2024
AD-2-WSSS-IAC-11 to 11.1	21 MAR 2024
AD-2-WSSS-IAC-12 to 12.1	16 MAY 2024
AD-2-WSSS-IAC-13 to 13.1	21 MAR 2024
AD-2-WSSS-IAC-14 to 14.1	21 MAR 2024
AD-2-WSSS-VAC-1 to 1.1	21 MAR 2024
AD 2.WSSL-1	10 SEP 2020
AD 2.WSSL-2	30 NOV 2023
AD 2.WSSL-3	30 NOV 2023
AD 2.WSSL-4	05 DEC 2019
AD 2.WSSL-5	30 NOV 2023
AD 2.WSSL-6	25 JAN 2024
AD 2.WSSL-7	21 MAR 2024
AD 2.WSSL-8	08 SEP 2022
AD 2.WSSL-9	25 JAN 2024
AD 2.WSSL-10	21 MAR 2024
AD 2.WSSL-11	21 MAR 2024
AD 2.WSSL-12	21 MAR 2024
AD 2.WSSL-13	21 MAR 2024
AD 2.WSSL-14	21 MAR 2024
AD 2.WSSL-15	21 MAR 2024
AD 2.WSSL-16	21 MAR 2024
AD 2.WSSL-17	21 MAR 2024
AD 2.WSSL-18	21 MAR 2024
AD 2.WSSL-19	21 MAR 2024
AD 2.WSSL-20	21 MAR 2024
AD-2-WSSL-ADC-1 to 1.1	16 MAY 2024
AD-2-WSSL-ADC-2	21 MAR 2024
AD-2-WSSL-ADC-3	03 NOV 2022
AD-2-WSSL-AOC-1	16 JUL 2020
AD-2-WSSL-AOC-2	16 JUL 2020
AD-2-WSSL-VAC-1	08 SEP 2022
AD-2-WSSL-VAC-2	08 SEP 2022
AD-2-WSSL-VAC-3	08 SEP 2022
AD-2-WSSL-VAC-4	08 SEP 2022
AD-2-WSSL-VDC-1 to 1.1	08 SEP 2022
AD-2-WSSL-VDC-2 to 2.1	08 SEP 2022
AD-2-WSSL-VFR-1	21 MAR 2024
AD-2-WSSL-IFR-1	21 MAR 2024
AD-2-WSSL-IFR-2	21 MAR 2024
AD 2.WSAP-1	16 JUL 2020
AD 2.WSAP-2	19 JUL 2018
AD 2.WSAP-3	10 OCT 2019
AD 2.WSAP-4	19 JUL 2018
AD 2.WSAP-5	10 OCT 2019
AD 2.WSAP-6	12 OCT 2017
AD 2.WSAP-7	19 JUL 2018
AD 2.WSAP-8	16 MAY 2024
AD 2.WSAP-9	21 MAR 2024
AD 2.WSAP-10	21 MAR 2024
AD 2.WSAP-11	21 MAR 2024
AD-2-WSAP-ADC-1	16 JUL 2020
AD-2-WSAP-ADC-2	16 JUL 2020
AD-2-WSAP-AOC-1	24 MAR 2022
AD-2-WSAP-IAC-1	25 JAN 2024
AD-2-WSAP-IAC-2	16 MAY 2024
AD-2-WSAP-IAC-3	16 MAY 2024
AD-2-WSAP-IAC-4	16 MAY 2024
AD-2-WSAP-IAC-5	21 MAR 2024
AD-2-WSAP-IAC-6	16 MAY 2024
AD 2.WSAT-1	16 JUL 2020
AD 2.WSAT-2	26 MAR 2020
AD 2.WSAT-3	25 FEB 2021
AD 2.WSAT-4	25 FEB 2021
AD 2.WSAT-5	16 MAY 2024
AD 2.WSAT-6	21 MAR 2024
AD 2.WSAT-7	21 MAR 2024
AD-2-WSAT-ADC-1	17 JUN 2021
AD 2.WSAG-1	25 JAN 2024
AD 2.WSAG-2	25 JAN 2024
AD 2.WSAG-3	21 MAR 2024
AD 2.WMKJ-1	12 NOV 2015
AD 2.WIDD-1	21 MAR 2024
AD 2.WIDN-1	21 MAR 2024
AD 2.WIDN-2	21 MAR 2024
AD 2.WIDT-1	21 MAR 2024

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GEN 0.6 TABLE OF CONTENTS TO PART 1

GEN 1 NATIONAL REGULATIONS AND REQUIREMENTS

GEN 1.1 DESIGNATED AUTHORITIES

The authority responsible for civil aviation in Singapore is the Civil Aviation Authority of Singapore under the Ministry of Transport. The addresses of the designated authorities concerned with facilitation of international air navigation are as follows:

1 CIVIL AVIATION

Post:
CIVIL AVATION AUTHORITY OF SINGAPORE
SINGAPORE CHANGI AIRPORT, P.O. BOX 1
SINGAPORE 918141
Tel: (65) 65421122
Fax: (65) 65421231
AFS: WSSSYAYX
URL: www.caas.gov.sg

2 METEOROLOGY

Post:
DIRECTOR-GENERAL METEOROLOGICAL SERVICE SINGAPORE
Singapore Changi Airport, P.O. Box 8
SINGAPORE 918141
Tel: (65) 65457190
Fax: (65) 65457192
AFS: WSSSYMYX
URL: www.weather.gov.sg

3 CUSTOMS

Post:
SINGAPORE CUSTOMS
55 Newton Road #07-01, Revenue House
SINGAPORE 307987
Tel: (65) 63552000
Fax: (65) 62508663
URL: www.customs.gov.sg

4 IMMIGRATION

Post:
IMMIGRATION & CHECKPOINTS AUTHORITY
10 Kallang Road, #08-00 ICA Building
SINGAPORE 208718
Tel: (65) 63916100
URL: www.ica.gov.sg ←

5 HEALTH

Post:
MINISTRY OF HEALTH
16 College Road, College of Medicine Building
SINGAPORE 169854
Tel: (65) 63259220
URL: www.moh.gov.sg

6 ENROUTE AND AERODROME CHARGES

Post:
CIVIL AVIATION AUTHORITY OF SINGAPORE
Singapore Changi Airport P.O. Box 1
SINGAPORE 918141
Tel: (65) 65421122
Fax: (65) 65421231
AFS: WSSSYAYX

Post:
CHANGI AIRPORT GROUP (S) PTE LTD
SELETAR AIRPORT
21 Seletar Aerospace Road 1 #02-01
SINGAPORE 797405
Tel: (65)64815077 Airside Operations
Fax: (65)64831754

7 AGRICULTURE QUARANTINE

Post:
Head Office: ANIMAL & VETERINARY SERVICE
JEM Office Tower Level 9, 52 Jurong Gateway Road
SINGAPORE 608550
Email: animals_feedbac@nparks.gov.sg
URL: www.nparks.gov.sg/avs

Post:
CHANGI ANIMAL AND PLANT QUARANTINE STATION
Gate C7, Airport Cargo Road Changi Airfreight Centre
SINGAPORE 918104
Tel: (65) 65457523

8 TRANSPORT SAFETY INVESTIGATION BUREAU

Post:
Director (TSIB)
MINISTRY OF TRANSPORT
c/o Changi Airport Post Office P.O. Box 1005
SINGAPORE 918155
Tel: (65) 65412798
Fax: (65) 65422394
URL: www.mot.gov.sg

GEN 1.3 ENTRY, TRANSIT AND DEPARTURE OF PASSENGERS AND CREW

1 CUSTOMS REQUIREMENTS

1.1 The Red and Green Channel system is operated at the Airport to expedite customs clearance of arriving air passengers. All arriving passengers and crew members shall present themselves personally with their baggage and make oral declarations at the Red Channel if they have any prohibited or controlled goods or goods exceeding their duty-free concession and Goods and Services Tax (GST) import relief. If they do not have any of such goods, they may leave the Arrival Hall through the Green Channel. However, as part of our multi-layered security checks, some travellers going through the Green Channel may be subjected to further checks. Departing passengers are not subject to Customs formalities unless required to do so. Baggage may be examined in such manner as deemed necessary and it shall be the duty of the person in charge of the baggage to produce, open, unpack and repack such baggage.

1.2 **Dutiable Goods**. All dutiable goods brought into Singapore are subject to customs duty and/or excise duty and GST. There are 4 categories of dutiable goods: Intoxicating liquors; tobacco products; motor vehicles; and motor fuel. Please refer to the Singapore Customs' website for the latest list of dutiable goods and their respective duty rates. There is no customs duty on goods exported from Singapore.

1.3 **Duty-Free Allowance**. Please note that each arriving traveller is allowed to bring in a maximum of 10 litres of liquor products, subject to the payment of duty and GST. A traveller arriving with more than 10 litres of liquor products must present a valid Customs import permit for clearance at our checkpoints. Travellers are entitled to duty-free concession for liquors if they meet all the following conditions:

- Is 18 years of age and above;
- Have spent 48 hours or more outside Singapore immediately before arrival;
- Not arriving from Malaysia;
- The liquor is for personal consumption; and
- The liquor is not prohibited from import into Singapore.

Travellers will be given duty-free concession for liquors on one of the following options:

Option	Spirits	Wine	Beer
A	1 Litre	1 Litre	-
B	1 Litre	-	1 Litre
C	-	1 Litre	1 Litre
D	-	2 Litres	-
E	-	-	2 Litres

Bona-fide crew members are granted duty-free concession on 0.25 litre of spirits and 1 litre of wine or 1 litre of beer.

1.4 **GST Taxable Goods**. All goods brought into Singapore are subject to GST, at the prevailing rate of 9 percent of the goods' Cost, Insurance and Freight (CIF) value and applicable duty (for dutiable goods only). This is inclusive of all other charges, costs and expenses incidental to the sale and delivery of the goods into Singapore.

1.5 **GST Import Relief**. Travellers (excluding crew members and holders of a work permit, employment pass, student pass, dependent pass or long-term pass issued by the Singapore Government), are granted GST import relief on new articles, souvenirs, gifts and food preparations brought into Singapore. These goods must be intended for traveller's personal use or consumption and not for sale. The GST import relief amount is based on the number of hours the traveller has spent outside Singapore, as specified in the table below:

Time spent outside Singapore	Value of goods granted GST relief
48 hours and above	Up to S$500
Less than 48 hours	Up to S$100

There is no GST import relief and duty-free concession on intoxicating liquor and tobacco products, as well as goods imported for commercial purposes.

For more information on duty-free concession and GST import relief, please visit Singapore Customs' website.

1.6 **Declaration and Payment of Duty and/or GST**. Arriving travellers are required to declare and pay the duty and GST to bring in dutiable and taxable goods exceeding their duty-free concession and GST import relief. For convenience, you are encouraged to make an advance declaration and payment of duties and GST prior to your arrival through our Customs@SG web portal. Once tax payment is successful, the Customs@SG web portal will create an e-receipt in your mobile device and you may exit the Arrival Hall via the Green Channel. If you are stopped for checks, you can show the e-receipt stored in your mobile device as proof of payment to the officers. Please visit Singapore Customs' website for more information on the Customs@SG mobile app and web portal. Alternatively, you may proceed directly to the Customs Tax Payment Office or the Red Channel upon arrival to declare your goods. Please present supporting documents such as invoices or receipts indicating the value of your goods to facilitate declaration and payment (if necessary).

1.7 **Goods Requiring a Customs Import Permit**. A valid Customs import permit is required for clearance if travellers are carrying (but not limited to):

- More than 0.4 kilogrammes of cigarettes or other tobacco products;
- More than 10 litres of liquor products;
- More than 0.5 kilogrammes of investment precious metals for personal use;
- More than 10 litres of motor fuel;
- Goods for trade, commercial or business purposes in which the GST on which exceeds S$300; or
- Goods clearly marked as trade samples (excluding liquors and tobacco products) the value of which exceeds S$400

1.8 **Prohibited Goods**. The following items are NOT allowed to be imported into Singapore. Some examples of prohibited goods include (but not limited to):

- Chewing gum (except approved oral dental and medicated gum by Singapore's Health Sciences Authority)
- Chewing tobacco and imitation tobacco products (e.g. electronic cigarettes, etc)
- Nasal snuff
- Oral snuff (including snus and dipping tobacco)
- Gutkha, Khaini and Zarda
- Shisha
- Smokeless cigars, smokeless cigarillos or smokeless cigarettes
- Dissolvable tobacco or nicotine. Any product containing nicotine or tobacco that may be used topically for application, by implant or injected into any parts of the body
- Any solution or substance, of which tobacco or nicotine is a constituent, that is intended to be used with an electronic nicotine delivery system or vaporizers
- Concealed weapon, cigarette lighters of pistol or revolver shape
- Cross Bow
- Firecrackers, including tube sparklers and “pop-pop”
- Flick knife, Gravity Knife, Wasp Knife, Throwing knife
- Knuckleduster, Ninja Star, Catapult / Slingshot
- Controlled drugs and psychotropic substances
- Endangered species of wildlife and their by-products
- Firecrackers
- Obscene articles, publications, video tapes/discs and software
- Reproduction of copyright publications, video tapes, video compact discs, laser discs, records or cassettes
- Seditious and treasonable materials

It is an offence to attempt to bring prohibited goods into Singapore.

1.9 **Controlled Goods**. You are required to obtain an import permit or authorisation form from the relevant Competent Authorities before you can bring controlled goods into Singapore. Please produce the goods and the import permit or authorisation form to the checking officer at the Red Channel on your arrival. Some examples of controlled goods include (but not limited to):

- Animals and animal products (including veterinary biologics, pet food and fertilizers containing animal products), birds, ornamental fish, plants, CITES-listed animals and their products
- Endangered species of wildlife
- Ornamental fish
- Plants and propagatable plant parts including cuttings, seeds and bulbs with or without potting medium, organic fertilisers of plant origin, live insects and microorganisms
- Fish and seafood products
- Fruit and vegetables
- Meat and meat products
- CDs-roms and video games
- Films, videotapes, videodiscs, and laser discs
- Newspapers, books and magazines
- Pre-recorded cartridges and casettes
- Telecommunication and radio communication equipment

- Toy walkie-talkies
- Arms and explosives
- Bulletproof clothing
- Toy guns, pistols, and revolvers
- Weapons, kris, spears and swords
- Medicines and pharmaceutical products
- Poisons
- Dangerous Cargo
- Ionising Radiation (IR) irradiating apparatus & Radioactive material (e.g. x-ray equipment)
- Non-ionising Radiation (IR) irradiating apparatus (e.g. ultraviolet sunlamps)
- Telecommunication and radio communication equipment

Please visit the Immigration & Checkpoints Authority (ICA) website for more information on controlled and prohibited goods .

2 IMMIGRATION REQUIREMENTS

2.1 All passengers are required to present themselves with their travel documents, and endorsements (if necessary).

All travellers, including Singapore Citizens, Permanent Residents, Long-Term Pass holders and foreign visitors, are required to electronically submit their pre-trip health and travel history declarations to the Immigration & Checkpoints Authority (ICA) via the SG Arrival Card (SGAC) e-Service, before arriving in Singapore. This does not apply to those transiting/transferring through Singapore without seeking immigration clearance.

All travellers seeking entry into Singapore are required to comply with Singapore's border control requirements, which can be found at ICA | Entering, Transiting and Departing.

2.2 Any person entering Singapore from a place outside Singapore, or is leaving Singapore for a place outside Singapore (including aircrew entering or leaving Singapore on functional check flights) shall present to an immigration officer at an authorised airport, a valid passport or a valid travel document recognised by the Government of Singapore (in the case of an alien, a visa for Singapore where such a visa is required) with the exception of the following persons:

a. A member of the Singapore Armed Forces travelling on duty;
b. A member of such Visiting Forces as the Minister may determine;
c. Any child or person who is included in the passport or other travel document of a parent of the child, or of a spouse or other relative of the person and is accompanying that parent, spouse or relative (as the case may be) when travelling to and leaving from Singapore.

2.3 Nationals of the following countries require visas for the purpose of social visits in Singapore (with exception of an aircrew who is an airline crew member that, in the course of a journey on duty from a place outside Singapore to Singapore, or from a place outside Singapore to a place outside Singapore, calls at an authorised airport):

- Afghanistan
- Algeria
- Bangladesh*
- Commonwealth of Independent States*+
- Democratic People's Republic of Korea (North Korea)
- Egypt
- Georgia*
- India*
- Iran
- Iraq
- Jordan*
- Kosovo
- Lebanon
- Libya
- Mali
- Morocco*
- Nigeria*
- People's Republic of China*
- Pakistan
- Somalia
- South Sudan^
- Sudan
- Syria

- Tunisia*
- Turkmenistan*
- Ukraine*
- Yemen
- Holders of Alien's passport

Visitors holding Hong Kong Document of Identity, Macao Special Administrative Region (MSAR) Travel Permit, Palestinian Authority Passport, Refugee Travel Document** and Temporary Passport issued by United Arab Emirates will also require a visa to enter Singapore.

^ South Sudan has been recognised as a sovereign state, with AL2 visa to be imposed. Only the ordinary and official South Sudan TDs has been assessed to be recognised for entry.

* Commonwealth of Independent States (CIS): Armenia, Azerbaijan, Belarus, Kazakhstan, Krygyzstan, Moldova, Russia, Taijikistan, and Uzbekistan.

** Refugee Travel Documents are subjected to assessment of recognition for entry into Singapore.

Nationals of Commonwealth of Independent States (Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, and Uzbekistan), Georgia, Turkmenistan, and Ukraine may qualify for the 96-hour visa free transit facility (VFTF) provided that:

a. the person is in transit to a third country;
b. the person holds a valid passport, confirmed onward air-ticket, entry facilities (including visa) to the third country and have sufficient funds for the period of stay in Singapore;
c. the person continues his journey to the third country within 96 hours visa free period granted; and
d. the person satisfies Singapore's entry requirements.

Nationals of India and the PRC may qualify for the 96-hour VFTF provided that:

a. the person is in transit to or from a third country via Singapore by any mode of transport and will depart via air or sea;

b. the person holds a valid passport and confirmed onward air/ferry/cruise ticket for departure from Singapore within 96 hours;

c. the person has a valid visa*/long-term pass (with a validity of at least 1 month from the date of entry into Singapore under the VFTF) issued by any of the following countries:

    - Australia
    - Canada
    - Germany
    - Japan
    - New Zealand
    - Switzerland
    - United Kingdom
    - United States of America

* A visa is considered valid so long as it is issued by/ good for entry into one of the eight countries listed above. Travellers with Single Journey Visas (SJV) may still be granted VFTF on the return leg of their journey (i.e. after the SJV is used and no longer valid), but:

- the person must travel directly from the country that issued the SJV, en route through Singapore, back to their home country
- the person must not have returned to their home country since they last used the SJV.

← 2.4 Visitors must satisfy the following basic entry requirements before they are allowed to enter Singapore:

a. They are in possession of entry approval letters issued by the Singapore Government and passports with at least 6 months' validity with assurance of their re-entry into their countries of residence or origin;
b. They have sufficient funds to last for the intended period of stay in Singapore;
c. They hold confirmed onward/return tickets and entry facilities (including visas) to their onward destinations;
d. Short-term travellers holding a passport of travel document from a visa-required country/ region must apply for a Visa; and
e. They must fulfil all prevailing public health requirements.

The granting of social visit passes to all visitors is determined by the Immigration & Checkpoints Authority (ICA) officers at the point of entry.

3 PUBLIC HEALTH REQUIREMENTS

3.1 Strict compliance with the provisions of the International Health Regulations, 2005, of the World Health Organisation, and Singapore's Infectious Diseases Act is required.

3.2 The pilot-in-command of an aircraft landing at Airports in Singapore shall furnish the Airport Health Officer with one copy of the General Declaration form (see ICAO Annex 9 Appendix 1) and one copy of the Passenger Manifest (see ICAO Annex 9 Appendix 2) signed by the pilot-in-command.

3.3 Vaccination Certificate Requirements for entry into Singapore are as follows:

A valid International Certificate of Vaccination for yellow fever is required from all travellers, including Singapore Residents, with travel history to countries with risk of yellow fever transmission (regardless of area, city or region) in the six days prior to arrival in Singapore. The certificate is valid for life, beginning from 10 days after the date of vaccination (this applies to existing and new certificates). Travellers without a valid International Certificate of Vaccination for yellow fever (e.g. unvaccinated individuals, including those who are ineligible to receive the vaccination, and travellers whose certificate has yet to become valid), are liable to be quarantined under Section 31 of the Infectious Disease Act. For more details on public health requirements related to yellow fever, please refer to Singapore's Ministry of Health website (https://www.moh.gov.sg/diseases-updates/yellow-fever) and Immigration & Checkpoints Authority website (https://www.ica.gov.sg/enter-transit-depart/entering-singapore/yellow-fever-vaccination-certificate).

3.4 For more details on public health requirements related to COVID-19, please refer to https://www.caas.gov.sg/legislation-regulations/covid-19-publications/.

4 FLYING LICENCES AND RATINGS

4.1 VISITING PILOTS - HOLDERS OF NON-SINGAPORE PILOT LICENCES

4.1.1 When a holder of a non-Singapore pilot's licence wishes to fly on a Singapore registered aircraft in a private capacity in Singapore, he will be required to apply for a Certificate of Validation for his foreign licence. The Certificate of Validation, if approved, will be issued for this purpose only and for a limited period. The applicant would also be required to fulfil certain conditions. Pilots who wish to apply for a Certificate of Validation should contact the Personnel Licensing Section of the Civil Aviation Authority of Singapore (see address in paragraph 4.2.2 below)

4.2 CONVERSION OF FOREIGN LICENCE TO SINGAPORE LICENCE

4.2.1 Pilots holding valid licences, including an instrument rating and/or flying instructor's rating issued by ICAO Contracting States, may be considered for the conversion of their licences under the following conditions:

a. The pilot must demonstrate formal prospective employment by a Singapore air operator, approved training organisation or flying club to operate on Singapore registered aircraft.
(This requirement will not be applicable for the conversion of a foreign licence to a Singapore PPL.)

b. The pilot's foreign licence and its associated ratings must be valid from the time of application to the time of issue of a Singapore licence and its associated ratings.

c. The pilot must fulfil all conversion terms as specified by CAAS within a period of 6 months preceding the issue of a Singapore licence and its associated ratings.

4.2.2 Further details on the conversion of a foreign licence can be obtained from:

Safety Policy and Planning Division
Personnel Licensing Section
Civil Aviation Authority of Singapore
Singapore Changi Airport Terminal 2
South Finger Pier Level 3
Unit No. 038-039
Singapore 819643

TEL: (65) 65412482
FAX: (65) 65434941

4.3 PILOTS WHO HAVE ATTAINED THE AGE OF 65

4.3.1 Any pilot who has attained his 65th birthday shall not be permitted to act as pilot-in-command or co-pilot of an aircraft engaged in scheduled or non-scheduled international commercial air transport operations within Singapore airspace.

GEN 1.4 ENTRY, TRANSIT AND DEPARTURE OF CARGO

1 CUSTOMS REQUIREMENTS CONCERNING CARGO AND OTHER ARTICLES

1.1 The following supporting documents: Airway Bill, Invoice, Packing List together with Customs Permits [for all goods including controlled goods, dutiable goods and goods subject to Goods and Services Tax (GST)] are to be produced if they are required for checks by Immigration and Checkpoints Authority officers at the checkpoint.

1.2 The following are applicable to the Free Trade Zone (FTZ):

a. Transhipment within the same FTZ (In Through Airway Bill cases), no Customs documentation is required if the items are not controlled by the Competent Authorities (CAs);
b. Transhipment of controlled goods within the same FTZ (In Through Airway Bill cases), a transshipment (Through transshipment within the same FTZ) permit is required; and
c. Import for re-export within the same FTZ (In Non-Through Airway Bill cases) without storage, an import for re-export permit is required for the importation and exportation of the goods.
d. For the temporary storage of imported goods (excluding liquors and tobacco) in the Free Trade Zones, pending re-export to another destination or pending local release, an import permit is required. Subsequently for exportation, an export permit is required to be taken up.

1.3 Under the Strategic Goods (Control) Act (SGCA), goods in transhipment or transit are subject to controls under the full control list. No clearance documents are required for strategic goods in transhipment or transit which are taken into a FTZ immediately after they have been brought into Singapore and stay in the FTZ for not more than 45-days (for sea) / 21-days (for air) except for certain categories of goods. For transhipment and transit of certain sensitive strategic goods (listed under the Fourth and Fifth Schedule of the SGCR) and goods that are intended or likely to be used for nuclear, chemical or biological weapon purposes, or missiles capable of delivering such weapons (i.e. catch-all for WMD purposes), a strategic good permit is still required. Depending on the conditions stated in the permits, these goods may be required to be presented for Customs clearance at the checkpoint

1.4 For the exportation of dutiable goods from a Licensed Warehouse, or non-dutiable goods from a Zero-GST Warehouse, Customs outward permits and goods are to be presented for checkpoint inspection and clearance.

1.5 For the importation and exportation of controlled goods, depending on the Competent Authorities'(CA) requirements, these goods may be required to be presented for Customs clearance at the checkpoint. For more information on the list of Controlled and Prohibited Goods for the importation and exportation of goods, please visit the respective pages on the Singapore Customs website. You may also refer to the Strategic Goods and the United Nations Security Council Sanctions webpages for more information on the relevant topics.

2 REQUIREMENTS FOR ANIMALS, BIRDS, PLANTS, VETERINARY BIOLOGICS, ORNAMENTAL FISH, CITES AND THEIR PRODUCTS

2.1 Prior permission of the Singapore Food Agency (SFA) is required for import, export or transshipment of:

a. Animals, birds for the purpose of rearing and slaughter for human consumption, animal feed for food producing animals, eggs and egg products, meat and meat products (including canned or processed meat).
b. Fish and aquatic animals (for rearing as food and for human consumption, fisheries products (in all forms).
c. Fruits and vegetables.
d. Processed food products and food contact articles.

2.2 Prior permission of the Animal & Veterinary Service (AVS) is required for import, export or transshipment of:

a. Animals and animal products (including veterinary biologics, pet food and fertilizers containing animal products), birds, plants, ornamental fish.

2.3 Prior permission of the National Parks Board (NParks) is required for the import of:

a. Plants and propagatable plant parts including cuttings, seeds and bulbs with or without potting medium, organic fertilisers of plant origin, live insects and microorganisms.

2.4 In the case of live animals, prior permission is also required for animals in transit. No prior permission required for transshipment of plants and plant products.

← 2.5 Prior permission of the National Parks Board (NParks) is required for the import, export and re-export of all species of animals and plants, including their parts or derivatives protected under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

3 REQUIREMENTS RELATING TO ARMS AND EXPLOSIVES

3.1 Arms, explosives and explosives precursors are items regulated under the Arms & Explosives Act, Chapter 13. Under the said Act, any import or export of any of these items will require a licence from the Police Licensing & Regulatory Department (PLRD). For avoidance of any doubt, any transhipment (i.e. import of goods into Singapore on one conveyance and moved to another conveyance for the sole purpose of export to any place outside of Singapore) would similarly require an import and export licence respectively.

3.2 Application for the necessary licences can be submitted via Singapore Custom's TradeNet website (for traders) or GoBusiness website (https://www.gobusiness.gov.sg). More information can be obtained from PLRD's website at https://www.police.gov.sg/licence or email: spf_licensing_feedback@spf.gov.sg.

4 REQUIREMENTS FOR THE CARRIAGE OF DANGEROUS GOODS IN AIRCRAFT

4.1 DANGEROUS GOODS

4.1.1 Regulation 5(1) of Air Navigation (92-Carriage of Dangerous Goods) Regulations 2022 states that an operator of an aircraft must not load or carry any dangerous goods as cargo on its aircraft unless the operator of the aircraft has been granted a dangerous permit by CAAS and in accordance with any conditions which CAAS may impose. This requirement applies to all aircraft operated for the purpose of commercial air transport flying to or from the Republic of Singapore, and without an authorisation granted under regulation 14 of Air Navigation (121-Commercial Air Transport by Large Aeroplanes) Regulations 2018 or regulation 14 of Air Navigation (135-Commercial Air Transport by Helicopters and Small Aeroplanes) Regulations 2018.

4.1.2 Where an operator of an aircraft has diplomatic clearance from the Government of Singapore to land the aircraft in Singapore, the operator is not required, for the period of time that the diplomatic clearance is valid, to obtain a dangerous goods permit.

4.1.3 A dangerous goods permit, if granted, is subject to compliance with Annex 18 to the Convention on International Civil Aviation and the latest edition of the ICAO Technical Instructions relating to the Safe Transport of Dangerous Goods by Air.

4.1.4 Operators of aircraft that wish to carry dangerous goods as cargo should submit their online application for a dangerous goods permit via the Enterprise Safety Oversight Management System (eSOMS) at https://esoms.caas.gov.sg/esoms/landingpage.html. Applications should be submitted at least 7 working days prior to the intended date of carriage of the dangerous goods cargo. New applicants may write to Dangerous Goods Section, Flight Standards Division, CAAS (email: CAAS_dangerousgoods@caas.gov.sg), to request for an eSOMS account.

5 REPORTING OF DANGEROUS GOODS ACCIDENT/INCIDENT

5.1 Regulation 24(1) of Air Navigation (92-Carriage of Dangerous Goods) Regulations 2022 requires the operator of an aircraft to report to the Director-General of Civil Aviation:

a. any dangerous goods accident or incident involving any aircraft that lands in or departs from Singapore; or
b. the finding of undeclared or misdeclared dangerous goods in cargo, mail or passenger's baggage that originate from or destined for Singapore, or are in transit in Singapore.

Operators are required to submit this report to CAAS in the quickest available means within 24 hours of the occurrence coming to the knowledge of the person making the report.

5.2 All dangerous goods occurrence reports will be administered through the CAAS' reporting system known as the Singapore Aviation Accident / Incident Reporting System (SAIRS). Such reports are to be made using CAAS AW139 form, also known as the SAIRS Form. For the reporting of dangerous goods occurrences, only Part 4 of CAAS AW139 form needs to be completed. The form is available on the CAAS website and can be downloaded at the following link:
https://www.caas.gov.sg/operations-safety/safety-reporting/singapore-aviation-accident-incident-reporting-system

5.3 All written reports using Part 4 of CAAS AW139 form should be made by the air operator or it's agent and submitted via email to caas_dfirs@caas.gov.sg.

5.4 For more information on the reporting of dangerous goods occurrences, air operators may refer to the CAAS Advisory Circular, ***AC 92-3-2 – Reporting of Dangerous Goods Occurrences***, in the following link:
https://www.caas.gov.sg/docs/default-source/docs---srg/ac-92-3-2-(rev-0)---reporting-of-dangerous-goods-occurrences.pdf

GEN 3 SERVICES

GEN 3.1 AERONAUTICAL INFORMATION SERVICES

3.1.1 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:
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

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

Post:
Singapore Air Traffic Control Centre (SATCC)
60 Biggin Hill Road
Singapore 509950

Tel: (65) 65956056 (Duty Supervisor)
Tel: (65) 65956053 (NOF)
AFS: WSSSYNYX (NOF)
Tel: (65) 65956052 (Changi FPL Officer)
Fax: (65) 65431826 (Changi AIS)
AFS: WSSSZPZX (Changi AIS)
Tel: (65) 64812909 (Seletar FPL Officer)
Fax: (65) 64833044 (Seletar AIS)
AFS: WSSLZPZX (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).

3.1.2 AREA OF RESPONSIBILITY

3.1.2.1 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.

← 3.1.2.2 For the following airspace within Jakarta FIR, AIS is jointly provided by Indonesia and Singapore:

The area bounded by 031727N 1052959E 012450N 1061648E 001030N 1045656E 000000N 1050340E 000000N 1044330E thence around the arc of a circle radius 90 NM centred on 011324N 1035124E to 013430N 1022353E 011300N 1033000E 011408N 1033142E 011200N 1033900E 011046N 1034015E 010800N 1034500E 011500N 1040000E 011800N 1043000E 012921N 1043441E 011947N 1044606E 021838N 1052205E 023641N 1051311E 024348N 1050854E 025010N 1051210E 031453N 1052619E 031727N 1052959E excluding the Tanjungpinang Terminal Control Area (TMA) and Control Zone (CTR)

Vertical limit: SFC to FL370

3.1.3 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
Aeronautical Charts

NOTAM and related monthly checklists 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 and the airspace within Jakarta FIR where AIS is jointly provided by Indonesia and Singapore 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

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.

3.2.5 LIST OF AERONAUTICAL CHARTS AVAILABLE

GEN 3.2.5 LIST OF AERONAUTICAL CHARTS AVAILABLE					
Title of Chart Series	*Scale*	*Name and/or number*		*Price ($)*	*Date*
World Aeronautical Chart ICAO (WAC)	1:1 000 000		WAC 2860	In AIP	21 MAR 24
← **Enroute Chart** ICAO (ENRC)			ERC 6-1	In AIP	16 MAY 24
Instrument Approach Chart ICAO (IAC)		***Singapore Changi***			
←	1:400 000	RWY 02L - ICW ILS/DME	AD-2-WSSS-IAC-1	In AIP	16 MAY 24
←	1:400 000	RWY 02C - ICE ILS/DME	AD-2-WSSS-IAC-2	In AIP	16 MAY 24
←	1:400 000	RWY 02R - ICX ILS/DME	AD-2-WSSS-IAC-3	In AIP	16 MAY 24
←	1:400 000	RWY 20R - ICH ILS/DME	AD-2-WSSS-IAC-5	In AIP	16 MAY 24
←	1:400 000	RWY 20C - ICC ILS/DME	AD-2-WSSS-IAC-6	In AIP	16 MAY 24
←	1:400 000	RWY 20C - VTK DVOR/DME	AD-2-WSSS-IAC-7	In AIP	16 MAY 24
←	1:400 000	RWY 02L - RNP	AD-2-WSSS-IAC-9	In AIP	16 MAY 24
	1:400 000	RWY 02C - RNP	AD-2-WSSS-IAC-10	In AIP	21 MAR 24
	1:400 000	RWY 20R - RNP	AD-2-WSSS-IAC-11	In AIP	21 MAR 24
←	1:400 000	RWY 20C - RNP	AD-2-WSSS-IAC-12	In AIP	16 MAY 24
	1:400 000	RWY 02R - RNP	AD-2-WSSS-IAC-13	In AIP	21 MAR 24
	1:400 000	RWY 20L - RNP	AD-2-WSSS-IAC-14	In AIP	21 MAR 24
		Paya Lebar			
	1:400 000	RWY 20 - PU DVOR/DME	AD-2-WSAP-IAC-1	In AIP	25 JAN 24
←	1:400 000	RWY 02 - PU DVOR/DME	AD-2-WSAP-IAC-2	In AIP	16 MAY 24
←	1:400 000	RWY 20 - IPS ILS/DME	AD-2-WSAP-IAC-3	In AIP	16 MAY 24
←	1:400 000	RWY 02 - IPN ILS/DME	AD-2-WSAP-IAC-4	In AIP	16 MAY 24
	1:400 000	RWY 02 - RNP	AD-2-WSAP-IAC-5	In AIP	21 MAR 24
←	1:400 000	RWY 20 - RNP	AD-2-WSAP-IAC-6	In AIP	16 MAY 24
Visual Approach Chart ICAO (VAC)	1:400 000	***Singapore Changi***	AD-2-WSSS-VAC-1	In AIP	21 MAR 24
		Seletar			
	1:100 000	RWY 03	AD-2-WSSL-VAC-1	In AIP	08 SEP 22
	1:100 000	RWY 21	AD-2-WSSL-VAC-2	In AIP	08 SEP 22
	1:100 000	RWY 03	AD-2-WSSL-VAC-3	In AIP	08 SEP 22
	1:100 000	RWY 21	AD-2-WSSL-VAC-4	In AIP	08 SEP 22
Visual Departure Chart		***Seletar***			
	1:100 000	RWY 03	AD-2-WSSL-VDC-1	In AIP	08 SEP 22
	1:100 000	RWY 21	AD-2-WSSL-VDC-2	In AIP	08 SEP 22
← **Aerodrome Chart**		***Singapore Changi***	AD-2-WSSS-ADC-2	In AIP	16 MAY 24
← ICAO (AC)		***Seletar***	AD-2-WSSL-ADC-1	In AIP	16 MAY 24
		Paya Lebar	AD-2-WSAP-ADC-1	In AIP	16 JUL 20
Aerodrome Obstacle Chart ICAO TYPE A (AOC)		***Singapore Changi***			
	1:10 000	RWY 20R/02L	AD-2-WSSS-AOC-1	In AIP	08 SEP 22
	1:10 000	RWY 20C/02C	AD-2-WSSS-AOC-2	In AIP	21 MAR 24
	1:10 000	RWY 02R/20L	AD-2-WSSS-AOC-4	In AIP	08 SEP 22
		Seletar			
	1:10 000	RWY 03/21	AD-2-WSSL-AOC-1	In AIP	16 JUL 20
		Paya Lebar			
	1:20 000	RWY 20/02	AD-2-WSAP-AOC-1	In AIP	24 MAR 22
Aerodrome Obstacle Chart ICAO TYPE B (AOC)		***Singapore Changi***			
	1:20 000	RWY 02L/20R, 02C/20C and RWY 02R/20L	AD-2-WSSS-AOC-3	In AIP	21 MAR 24
		Seletar			
	1:20 000	RWY 03/21	AD-2-WSSL-AOC-2	In AIP	16 JUL 20

GEN 3.4 COMMUNICATION SERVICES

3.4.1 RESPONSIBLE SERVICE

1.1 The Civil Aviation Authority of Singapore (CAAS) is responsible for the provision of telecommunication and navigation facility services in Singapore.

1.2 Enquiries, suggestions or complaints regarding any telecommunication and navigation facility services should be referred to the Director-General of Civil Aviation.

Post:
Director-General of Civil Aviation
Civil Aviation Authority of Singapore
Singapore Changi Airport
P. O. Box 1
Singapore 918141

Tel: (65) 65421122
Fax: (65) 65421231
AFS: WSSSYAYX

1.3 The service is provided in accordance with the provisions contained in the following ICAO documents:

Annex 10 – *Aeronautical Telecommunications*
Doc 8400 – *Procedures for Air Navigation Services - ICAO Abbreviations and Codes (PANS-ABC)*
Doc 8585 – *Designators for Aircraft Operating Agencies, Aeronautical Authorities and Services*
Doc 7030 – *Regional Supplementary Procedures*
Doc 7910 – *Location Indicators*
Doc 9880 - Manual on Detailed Technical Specifications for the Aeronautical Telecommunications Network (ATN) using ISO / OSI standards and protocols

1.4 Differences to these provisions are detailed in subsection GEN 1.7.

3.4.2 AREA OF RESPONSIBILITY

2.1 Communication services are provided for the entire SINGAPORE FIR.

← 2.2 For the following airspace within Jakarta FIR, aeronautical telecommunication services (CNS) will be jointly provided by Indonesia and Singapore:

The area bounded by 031727N 1052959E 012450N 1061648E 001030N 1045656E 000000N 1050340E 000000N 1044330E thence around the arc of a circle radius 90 NM centred on 011324N 1035124E to 013430N 1022353E 011300N 1033000E 011408N 1033142E 011200N 1033900E 011046N 1034015E 010800N 1034500E 011500N 1040000E 011800N 1043000E 012921N 1043441E 011947N 1044606E 021838N 1052205E 023641N 1051311E 024348N 1050854E 025010N 1051210E 031453N 1052619E 031727N 1052959E excluding the Tanjungpinang Terminal Control Area (TMA) and Control Zone (CTR)

Vertical limit: SFC to FL370

3.4.3 TYPES OF SERVICE

3.1 Radio navigation services

3.1.1 The following types of radio aids to navigation are available:

LF/MF non-directional beacon (NDB)
Instrument landing system (ILS)
Doppler VHF omni-directional radio range (DVOR)
Distance measuring equipment (DME)
Long range primary and secondary surveillance radar
Primary and secondary approach radar
Airport surface detection equipment (ASDE)

3.2 Voice/data link services

3.2.1 *Voice service*

The aeronautical stations maintain a continuous watch on their stated frequencies during the published hours of service unless otherwise notified.

An aircraft should normally communicate with the air-ground control radio station that exercises control in the area in which the aircraft is flying. Aircraft should maintain a continuous watch on the appropriate frequency of the control station and should not abandon watch, except in an emergency, without informing the control radio station.

3.2.2 *Enroute Communications Organisation*

a. The radio frequencies for enroute communications are listed in subsection ENR 2.1

b. The Singapore HF network provides an umbrella communication coverage for the FIR and may be contacted if communication cannot be maintained on the primary channel.

c. Aircraft approaching or departing from an airport is required to communicate with that airport on the appropriate surface movement, tower or approach control frequency.

← d. ADS-C and / or CPDLC services are available to suitably equipped aircraft operating outside radar cover and not in ADS-B exclusive airspace within the Singapore FIR. The hours when ADS-C and CPDLC services are available and the logon requirements are listed in ENR 2.1. Full details of the services are published in ENR 1.1 paragraphs 9.1 to 9.6.

3.2.3 Data link Service

The messages to be transmitted over the Aeronautical Fixed Service (AFS) are accepted only if:

a. the messages satisfy the requirements of ICAO Annex 10, Volume II, Chapter 3, paragraph 3.3;

b. the messages are prepared in the form specified in ICAO Annex 10;

c. the text of an individual message does not exceed 1800 characters.

3.2.4 General Aircraft Operating Agency Messages

General aircraft operating agency messages (with priority indicator “KK”) are only accepted for transmission to countries which have agreed to accept Class B2 traffic. Details of telecommunication charges for Class B2 traffic to countries with which Singapore has agreement for handling of such traffic are given below:

List of States/Regions to which Class B2 traffic will be accepted (rate of charge will be S$0.30 per word):

Australia, Brunei, Hong Kong, Indonesia (AFS stations), Kampuchea Democratic, Malaysia (Peninsular Malaysia, Sabah and Sarawak), Myanmar, Netherlands, New Zealand, Philippines (Manila), Singapore, Taiwan, Thailand and Vietnam.

3.3 Broadcasting service

3.3.1 The following broadcasts are available for the use of aircraft in flight:

a. HF RTF Volmet Broadcasts (page GEN 3.5-7 refers)

b. VHF ATIS Broadcasts (page GEN 3.4-3 refers)

GEN 3.6 SEARCH AND RESCUE

3.6.1 RESPONSIBLE SERVICE(S)

1.1 The search and rescue service in Singapore is provided by the Civil Aviation Authority of Singapore, in collaboration with the Ministry of Defence, Meteorological Service and Maritime and Port Authority of Singapore, which have the responsibility for making the necessary facilities available. The postal and telegraphic addresses of the Civil Aviation Authority of Singapore are given on page GEN 1.1-1.

Post:
RESCUE COORDINATION CENTRE (RCC),
60 Biggin Hill Road,
Singapore 509950.
Tel: (65) 65425024 - Singapore RCC
(65) 65412668 or (65) 65412672 - Singapore ACC
Fax: (65) 65422548
AFS: WSJCZQZX

1.2 The service is provided in accordance with the provisions contained in the following ICAO documents and local procedures:

Annex 12 – Search and Rescue
Annex 13 – Aircraft Accident and Incident Investigation
Doc 7030 – Regional Supplementary Procedures for Alerting and SAR services applicable in the SEA Region.
Doc 9731 – International Aeronautical and Maritime Search and Rescue Manuals Volume 1, 2 and 3 Singapore local procedures

3.6.2 AREA OF RESPONSIBILITY

2.1 The search and rescue service in Singapore is responsible for SAR operations within Singapore SRR.

← 2.2 For the following airspace within Jakarta FIR, search and rescue services (SAR) will be jointly provided by Indonesia and Singapore:

The area bounded by 031727N 1052959E 012450N 1061648E 001030N 1045656E 000000N 1050340E 000000N 1044330E thence around the arc of a circle radius 90 NM centred on 011324N 1035124E to 013430N 1022353E 011300N 1033000E 011408N 1033142E 011200N 1033900E 011046N 1034015E 010800N 1034500E 011500N 1040000E 011800N 1043000E 012921N 1043441E 011947N 1044606E 021838N 1052205E 023641N 1051311E 024348N 1050854E 025010N 1051210E 031453N 1052619E 031727N 1052959E excluding the Tanjungpinang Terminal Control Area (TMA) and Control Zone (CTR)

Vertical limit: SFC to FL370

3.6.3 TYPES OF SERVICES

3.1 Details of the rescue coordination centre and related supporting rescue units are given in the table on page GEN 3.6-3 titled - Search and Rescue Units. In addition, various elements of the Singapore Police Force, Maritime and Port Authority of Singapore and the Merchant Marine are available for search and rescue missions, when required. The aeronautical, maritime and public telecommunication services are available to the search and rescue organisation.

3.2 All search aircraft are land planes and carry survival equipment, capable of being dropped, consisting of inflatable rubber dinghies equipped with general purpose first aid supplies, emergency rations and survival radio equipment. Aircraft are equipped to communicate on 121.5MHz, 123.1MHz, 243.0MHz, 282.8MHz, 2182KHz, 3023KHz and 5680KHz and are also equipped with VHF/UHF direction finder. Marine craft are equipped to communicate on 123.1MHz, 282.8MHz, 2182KHz, 3023KHz and 5680KHz and are equipped with radar.

3.3 The Singapore RCC provides distress alert detection of Emergency Locator Transmitters (ELTs), Emergency Position Indicator Radio Beacons (EPIRBs) and Personal Locator Beacons (PLBs) using the Cospas-Sarsat Satellite Aided Tracking System. This system is able to detect 406.0MHz beacons globally and the information is shared with the other users of the system. A database of the Singapore registered aviation beacons is kept at the RCC and the Maritime beacons are in the Maritime and Port Authority database.

3.4 Users of 406.0MHz beacons that are coupled with the 121.5MHz frequency will be able to use the 121.5MHz for homing purposes only by search units.

3.6.4 SAR AGREEMENTS

4.1 SAR agreements have been concluded between Civil Aviation Authority of Singapore and the SAR authorities or agencies of Indonesia, Malaysia, Philippines, Thailand and Vietnam. These agreements provide for mutual assistance in the conduct of SAR operations within each others' SAR Regions (SRR) and approval for entry of SAR aircraft, vessels and personnel of one State into the SRR of another State, with prior permission, for the purpose of conducting SAR operations or rendering SAR assistance and for direct communications between the SAR authorities or agencies on all common SAR matters.

4.2 Requests for the entry of aircraft, equipment and personnel from other States to engage in search for aircraft in distress or to rescue survivors of aircraft accidents should be transmitted to the Rescue Coordination Centre. Instructions as to the control which will be exercised on entry of such aircraft and/ or personnel will be given by the Rescue Coordination Centre in accordance with the standing plan for the conduct of search and rescue in the area.

4.3 Civil Aviation Authority of Singapore has also concluded an SAR agreement with the SAR Coordinator Pacific RCC, United States Air Force (USAF). The agreement provides for all possible assistance to assist RCC Singapore in its response to United States (US) military SAR incidents within the Singapore SRR. It will also provide US assistance to RCC Singapore in its prosecution of civil SAR incidents when requested.

3.6.5 CONDITIONS OF AVAILABILITY

5.1 The SAR service and facilities in Singapore are available without charge to neighbouring states on opportunity basis and upon request to the Rescue Coordination Centre Singapore or the Singapore Air Traffic Control Centre. All facilities are specialised in SAR techniques and functions.

3.6.6 PROCEDURES AND SIGNALS USED

6.1 Procedures and signals used by aircraft

6.1.1 Procedures for pilots-in-command observing an accident or intercepting a distress call and/or message are outlined in ICAO Annex 12, Chapter 5.

6.2 Communications

6.2.1 Transmission and reception of distress messages within the Singapore Search and Rescue Region are handled in accordance with ICAO Annex 10, Volume II, Chapter 5, para 5.3.

6.2.2 For communications during search and rescue operations, the codes and abbreviations published in *ICAO Abbreviations and Codes (Doc 8400)* are used.

6.2.3 Information concerning positions, callsigns, frequencies and hours of operation of Singapore aeronautical stations is published in sections AD 2 and ENR 2.

6.2.4 The frequency 121.5MHz is guarded continuously by the Control Tower, Singapore Changi Airport, the Singapore Air Traffic Control Centre and Control Tower, Seletar Aerodrome. The Coast Radio Station in Singapore guards the international distress frequencies.

6.2.5 Search and Rescue aircraft conducting Search and Rescue Operations will use the following callsigns:

a. Fixed Wing 'Rescue (plus number 61 to 85)'
b. Rotary Wing 'Rescue (plus number 10 to 19)'

6.2.6 Rescue vessels / boats conducting Search and Rescue Operations will use the following callsigns:

a. 'Rescue Vessel (plus number 21 to 31)'
b. 'Rescue Boat (plus number or callsign)'

6.3 Search and Rescue Signals

6.3.1 The search and rescue signals to be used are those prescribed in ICAO Annex 12, Chapter 5, paragraph 5.8.

6.3.2 Ground/Air Visual Signal Codes for use by Survivors

ENR 0.6 TABLES OF CONTENTS TO PART 2

Note: The following sections in this chapter are intentionally left blank:
ENR 0.1, ENR 0.2, ENR 0.3, ENR 0.4, ENR 0.5.

ENR 1 GENERAL RULES AND PROCEDURES

ENR 1.1 GENERAL RULES

1 INTRODUCTION

1.1 The air traffic rules and procedures applicable to air traffic within the Singapore FIR conform to Annexes 2 and 11 to the Convention on International Civil Aviation and to those portions on the Procedures for Air Navigation Services – Air Traffic Management applicable to aircraft and of the regional Supplementary Procedures applicable to the Asia Pacific Region except for the differences listed in GEN 1.7.

1.2 Additionally, aircraft in flight shall comply with the instrument flight rules (IFR) or the visual flight rules (VFR). An aircraft operating between the hours of sunset and sunrise, irrespective of weather conditions shall comply with IFR requirements or, if in a control zone during these hours, shall require special authorisation from ATC.

1.3 Aircraft operating in controlled airspace shall comply with any instruction, clearance or request issued by ATC, or shall immediately advise ATC if unable to comply. Aircraft operating on ATS routes are to maintain track centreline.

2 FLIGHTS ON AIRWAYS

2.1 SEPARATION

2.1.1 Areas of responsibility for the control of flights on airways and the units providing this service are shown in subsection ENR 2.1.

2.1.2 Separation is based on:

a. Estimated and actual times over position reporting points;
b. Reports of visual sighting; and
c. Radar identification.

Note: As position reports are most commonly used it is important for estimates to be revised and notified to the ACC if more than 2 minutes in error.

2.1.3 To preserve standard vertical separation from aircraft operating above and below controlled airspace in the Singapore/Johor Airspace Complex, aircraft shall not be flown within 500ft of the upper and lower limits. Similarly, an encroachment on the horizontal limits of these airspaces should be avoided because of the proximity of restricted and danger areas.

2.2 COMMUNICATIONS AND RADIO NAVIGATION REQUIREMENTS

2.2.1 All aircraft operating under IFR or VFR within controlled airspaces shall be equipped with appropriate communications and navigation equipment enabling them:

a. To maintain two-way communication with the appropriate ATC unit. The minimum requirement is VHF RTF equipment suitable for communicating on ATC frequencies and HF RTF beyond the range of VHF.
b. To maintain track within the lateral limits of the airway and to navigate in accordance with ATC instructions. The minimum requirement is one radio compass.

2.2.2 The pilot-in-command shall maintain a continuous listening watch on the appropriate air/ground frequency.

2.3 AIR TRAFFIC CONTROL CLEARANCE

2.3.1 An air traffic control clearance is an authorisation by ATC for an aircraft to proceed under specified traffic conditions within controlled airspaces. If for any reason an air traffic control clearance is not acceptable to the pilot-in-command, he may request an alternative clearance.

2.3.2 The pilot-in-command shall obtain an air traffic control clearance prior to operating in a controlled airspace.

2.3.3 An air traffic control clearance will contain the following items:

a. Aircraft identification;
b. Clearance limit and route instruction;
c. Level assignment;
d. Departure instruction when necessary;
e. Approach instruction when necessary;
f. Clearance expiry time when necessary; and
g. Any special instructions and information.

2.3.4 **Request for Amended Clearance**. If the amended clearance is requested at a time a position report is made, the information contained in that report shall be given on the assumption that the aircraft is proceeding in accordance with the current clearance, and not with that which is being requested.

2.3.5 The contents of an air traffic control clearance or any revisions thereto shall apply only to those portions of the flight conducted within controlled airspaces.

2.3.6 An air traffic control clearance may be issued direct to an aircraft by an ACC or through an aerodrome control unit or an air/ground HF RTF communications unit.

2.3.7 Phrases used in air traffic clearances will have the following meanings:

a. “Clearance expires at ..... (time)”.
If the aircraft is not airborne by the time stated, a fresh clearance shall be obtained.

b. “Depart not before ..... (time)”.
An aircraft will not be cleared for departure until the time specified.

c. “Unable to approve ..... (flight planned level)’.
When ATC is unable to approve the flight planned level, an alternative level will be offered whenever possible, to avoid or reduce delay.

2.3.8 A pilot-in-command operating under VFR in controlled airspaces shall not enter instrument meteorological conditions without first obtaining an ATC clearance in accordance with the procedure laid down for flights joining airways. Until such clearance is received, the aircraft must remain in VMC.

2.3.9 Where a flight plan specifies IFR for the first portion of a flight and VFR for the latter portion, the aircraft will normally be cleared to the point where IFR terminates. (Clearance is not necessary beyond that point unless within the Singapore-Johor Airspace Complex and CTR).

2.3.10 If an ATC clearance stipulates VFR climb or descent and it becomes evident to the pilot-in-command that VMC cannot be maintained, he shall hold in VMC and request an alternative clearance.

2.3.11 The pilot-in-command having acknowledged an air traffic control clearance shall not deviate from the provisions of the clearance unless an amended clearance has been obtained.

2.3.12 Subsection ENR 1.6 provides guidance to pilot-in-command compelled to deviate from the provisions of an air traffic control clearance because of communications failure.

2.3.13 A flight shall normally be cleared to the aerodrome of first intended landing and the point of leaving controlled airspace or, in the case of a flight where prior co-ordination with an adjacent unit cannot be established, the FIR boundary. This is known as the clearance limit.

2.3.14 An aircraft which has been cleared to an intermediate point en-route to await further ATC clearance will whenever possible, be issued the required ATC clearance at least 5 minutes before the aircraft arrives at the clearance limit, unless the pilot is instructed to hold over the intermediate holding point until a specified time.

2.3.15 In the event of an aircraft arriving at the clearance limit without having received a further clearance, the pilot-in-command shall immediately request a further clearance and hold in accordance with the specified holding pattern where one is established or otherwise the standard holding pattern, maintaining the last assigned cruising level until further clearance is received. Where no direct ATC coordination facilities between Regional Area Control Centres exist, pilots on such routes must endeavour, when airborne, to contact the Area Control Centre of the next FIR which the aircraft is entering and obtain clearance to enter its Control Area before reaching the transfer point of the two ACCs.

2.3.16 When a flight operates successively in a Control Area and subsequently along the advisory route or area, the clearance issued for the flight or any revisions thereto will only apply to those portions of the flight conducted within controlled airspaces.

2.4 ROUTE AND LEVEL ASSIGNMENT

2.4.1 The pilot-in-command shall fly in strict accordance to the route specified by ATC. Deviation from the specified route may be permitted by ATC if traffic conditions permit.

2.4.2 Traffic permitting ATC will assign the flight planned level if in accordance with the table of Semi-Circular System of Cruising Levels. Cruising levels below the minimum specified in subsection ENR 3.1 will not be assigned.

2.5 ESSENTIAL TRAFFIC INFORMATION

2.5.1 Essential traffic is that controlled traffic to which the provision of separation by ATC is applicable but, which in relation to a particular controlled traffic, does not have the required minimum separation.

2.5.2 Essential traffic information will be issued to controlled flights concerned whenever they constitute essential traffic to each other.

Note: This information will inevitably relate to controlled flights which are cleared subject to maintaining own separation and remaining in visual meteorological conditions.

2.5.3 Essential traffic information will include:

a. Direction of flight of aircraft concerned;
b. Type of aircraft concerned;
c. Level(s) of aircraft concerned and estimated time of passing or if this is not available, the estimated time of arrival for the reporting point nearest to where the level will be crossed.

2.6 INSTRUCTIONS TO DEPARTING AIRCRAFT

2.6.1 ATC may specify any or all of the following items when issuing clearance to departing aircraft:

a. Turn after take-off;

b. Track to make good before turning on desired route;

c. Initial level to maintain;

d. Time, point and/or rate at which level change shall be made.

2.6.2 ATC may instruct a departing aircraft to leave a reporting point at a specified time or to be at a specified level at a specified point or time. The pilot-in-command shall notify ATC if these instructions cannot be complied with.

2.7 ARRIVAL/APPROACH INSTRUCTIONS

2.7.1 ATC clearance or control instructions for approach to an aerodrome or holding point will be issued to an arriving aircraft on initial contact with the appropriate ATC unit.

2.7.2 The clearance will specify the clearance limit, route and level to be flown. An Expected Approach Time will be included if it is anticipated that the arriving aircraft will be required to hold.

2.7.3 Pilots are reminded to use the phraseology minimum fuel and MAYDAY MAYDAY MAYDAY fuel to notify ATC of their low fuel state or fuel emergency. For details, refer to CAAS Information Circular IC 5/ 2013 available at URL https://www.caas.gov.sg - Regulations - Safety - Documents and Notices - Information Circulars.

2.8 WEATHER INFORMATION

2.8.1 Weather information will be passed to inbound aircraft on request. However, pilots should tune on to ATIS frequency 128.6 MHz for the weather.

2.8.2 The term CAVOK will be used in place of visibility, weather and cloud when the following conditions apply simultaneously:

a. Visibility 10km or more;
b. No precipitations or thunderstorms;
c. No cloud below 1 500m.

2.8.3 Deterioration and improvement weather reports and significant weather information, e.g. severe turbulence, thunderstorms, icing conditions etc. will be passed to all aircraft concerned.

2.9 AIRCRAFT JOINING OR CROSSING AIRWAYS

2.9.1 Pilots-in-command of aircraft joining or crossing an airway will:

a. When flying under VFR outside the Singapore/Johor Airspace Complex and CTRs notify the appropriate authority; or

b. When flying under IFR, or when joining or crossing the Singapore/Johor Airspace Complex and CTRs request clearance from the appropriate authority not later than 10 minutes on VHF RTF or 20 minutes on HF RTF before joining or crossing.

2.9.2 An in-flight request or notification or intention to join an Airway shall include the following information, as appropriate:

a. Aircraft identification;
b. Aircraft type;
c. Position;
d. Level and flight conditions;
e. Estimated time at point of joining;
f. Desired level;
g. Route and point of first intended landing;
h. True airspeed;
i. The words “Request joining clearance”.

2.9.3 An in-flight request or notification of intention to cross an Airway shall include the following information:

a. Aircraft identification;
b. Aircraft type;
c. True track;
d. Place and estimated time of crossing;
e. Desired crossing level;
f. Ground Speed;
g. The words “Request crossing clearance”

2.9.4 The selected crossing or joining point should, where possible, be associated with a radio facility to assist accurate navigation.

2.10 VFR Flights Crossing Airways

2.10.1 VFR flights intending to cross Airways outside the Singapore/Johor Airspace Complex shall only cross them at various levels plus 500ft at an angle of 90° to the direction of the Airway, or as close as possible to this angle. Condition for operation of VFR flights are given in page ENR 1.2 para 2.

2.10.2 In an emergency, where neither a radar nor a procedural crossing can be obtained, an Airway may be crossed at various levels plus 500ft. The various levels referred to are flight levels of whole thousands in feet.

2.11 TEMPORARY DANGER AREAS ON AIRWAYS

2.11.1 Military operations, both air and ground, frequently take place within the Singapore FIR and airspace within the Jakarta FIR where ATS is provided by Singapore (see ENR 2.1). Danger Areas will be promulgated by NOTAM, giving the reference point, vertical extent, radius and duration of the operation.

2.11.2 Where danger areas infringe controlled airspace, the areas will not be available for use by civil aircraft at the levels affected.

2.12 SINGAPORE/JOHOR AIRSPACE COMPLEX - SPECIAL REQUIREMENTS

2.12.1 All flights, IFR and VFR, conducted within the Singapore/Johor Airspace Complex are subject to an Air Traffic Control Clearance and are regulated in accordance with IFR separation standards.

2.12.2 Singapore ACC performs both Area and Approach Control functions for all aircraft landing at Singapore Changi and Seletar Airports. Procedural traffic bound for RSAF Paya Lebar, Tengah or Sembawang are likewise controlled by Singapore ACC but such traffic will normally be released to the respective military aerodrome/approach unit according to traffic circumstances and at the most convenient point within the Singapore/Johor Airspace Complex. Due to the close proximity of these aerodromes, all FIR procedural traffic are processed in order of priority irrespective of destination and slight delays may be expected. The pilot-in-command will call the appropriate Tower at the time, level or place specified by Singapore ACC.

2.12.3 Control instructions for arriving and departing aircraft will be issued in accordance with paras 2.6 and 2.7.

2.13 IFR FLIGHTS OUTSIDE SINGAPORE/JOHOR AIRSPACE COMPLEX IN VMC

2.13.1 The pilot-in-command of an aircraft operating under IFR within 183km (100NM) from Singapore Changi Airport below FL150 may request a VFR clearance for any portion of the flight. In the absence of such a request, ATC will issue a full IFR clearance regardless of weather conditions.

2.13.2 Outside the Singapore/Johor Airspace Complex within 100NM from Singapore Changi Airport, when necessary to expedite traffic, ATC may request a pilot-in-command under IFR below FL150 to conduct portion of the flight under VFR. An alternative clearance will be issued if the pilot-in-command has any doubt as to his ability to maintain VFR.

3 GENERAL FLIGHT PROCEDURES

3.1 RATE OF CLIMB AND DESCENT

3.1.1 Upon receipt of climb or descent instructions from ATC, the Pilot-in-Command shall carry out the climb or descent manoeuvre promptly on acknowledgement of clearance.

3.1.2 The Pilot-in-Command of an aircraft commencing a climb or descent shall inform ATC if the anticipated ROC or ROD of aircraft will be lesser than 500ft per minute, or if it is necessary to level off at an intermediate Flight Level or altitude.

Note: This is not a restriction on ROC or ROD that is lesser than 500ft per minute for flight operations. ATC will require the information to better predict flight trajectory for separation purposes.

3.1.3 When ACAS produces a resolution advisory (RA), pilots shall take immediate actions to ensure separation from conflicting aircraft. This may involve following instructions to climb, descend, or as directed by the ACAS, even if the action conflicts with an instruction from the appropriate air traffic control unit.

3.1.4 Pilot-in-Command shall use appropriate procedures to ensure that the ROC or ROD of not exceeding 1500ft per minute is achieved throughout last 1000ft of climb or descent to assigned altitude or Flight Level unless the appropriate ATC unit instructs otherwise.

4 AIR TRAFFIC ADVISORY SERVICE

Not Provided

5 FLIGHT INFORMATION SERVICE

5.1 INTRODUCTION

5.1.1 Flight Information Service is provided to all flights.

5.1.2 Units providing FIS and the areas they serve are shown in section ENR 2.

5.2 PROVISION OF FLIGHT INFORMATION SERVICE

5.2.1 Under this service the following information is provided to pilots by the FIC or at the request of the pilot:

a. SIGMET Information concerning tropical revolving storm, active thunderstorm areas, severe line squall, heavy hail, severe turbulence, severe icing and marked mountain waves, is provided;
b. Special Air-Reports are provided as available;
c. Landing Forecast (Trend Type) for Singapore is provided to turbine operations when approximately one hour from landing;
d. Aerodrome Forecasts are readily available on request for Singapore, Kuala Lumpur and Soekarno-Hatta; *Note: Aerodrome Forecasts for other aerodromes are also provided on request but are not readily available.*
e. Amended Aerodrome Forecasts for local as well as foreign aerodromes are provided as available;
f. Special Met Reports (aviation selected special weather reports) are provided for Singapore and Kuala Lumpur;
g. Met Reports (aviation routine weather reports) (half-hourly) are readily available on request for Singapore, Kuala Lumpur and Soekarno Hatta; *Note: Met Reports for other aerodromes are also provided on request but are not readily available.*
h. Upper-Air Information - Forecast of en-route upper winds and temperatures are available on request.

5.2.2 In addition, the FIC may arrange diversions of aircraft in consultation with the appropriate operating company representative.

Note: As traffic information may be based on data of doubtful accuracy and completeness and as it may be subject to communication delay, the FIC cannot assume any responsibility by issuing information or professing advice to aircraft in an endeavour to resolve an apparent hazardous traffic situation.

5.2.3 All aircraft on VFR flights and aircraft on IFR flights outside controlled airspace shall maintain watch on the frequency used by the unit providing flight information service and file with the station information as to their position.

Note: No information on position of surface vessels is provided by the Singapore ATC Centre.

6 AERODROME/APPROACH CONTROL SERVICE

6.1 INTRODUCTION

6.1.1 Aerodrome/Approach Control issue air traffic control clearances, instructions and information to aircraft to ensure the safe, orderly and expeditious flow of air traffic.

6.1.2 In VMC all aircraft flying in a control zone (CTR) or aerodrome traffic zone (ATZ) come under Aerodrome Control. This does not, however, relieve the pilot-in-command from responsibility for avoiding collision.

6.1.3 In VMC control of traffic on the runway in use and in the air is shared between Aerodrome Control and Approach Control. Normally, departing aircraft is the responsibility of Approach Control when airborne, whilst arriving aircraft is handed over to Aerodrome Control after it has been properly sequenced for an approach to land. The actual point of transfer depends on traffic conditions and is coordinated between the two units. Control of traffic on other parts of the manoeuvring area, with the exception of the marshalling area, is the responsibility of Aerodrome Control.

6.1.4 CTR dimensions and controlling authorities are specified in section ENR 3.

6.2 PROCEDURE

6.2.1 Holding, instrument approach, arrival and departure procedures are specified in subsections ENR 1.5 and ENR 3.6.

6.2.2 Radio communication shall be established with the appropriate Aerodrome/Approach Control Unit:

a. Prior to taxiing for departure; or
b. When intending to operate in a CTR, CTA or ATZ.

6.2.3 For IFR or VFR operation in a CTR, aircraft shall be equipped with appropriate two-way VHF radio apparatus, plus a radio compass. Exemptions may be granted by the appropriate Controlling Authority.

6.2.4 A pilot-in-command under IFR or VFR intending to enter, cross or operate within a CTR or ATZ shall request a clearance from the Aerodrome/Approach Control on the appropriate radio frequency. He shall:

a. Pass the aircraft's position, level, track and estimated time of crossing the zone boundary;
b. Maintain a continuous listening watch on that frequency while the aircraft is within the zone;
c. Navigate in accordance with the flight plan and ATC clearance;
d. Carry out any instructions received from Aerodrome/Approach Control.

6.2.5 All flights within a CTR, at night or in IMC, shall be conducted in accordance with IFR or special authorisation by ATC. However, in order to expedite traffic, ATC may clear an aircraft for a visual approach if weather conditions permit.

6.2.6 Special VFR Flight

6.2.6.1 A Special VFR flight is a VFR flight cleared by air traffic control to operate within a control zone in meteorological conditions below VMC.

6.2.6.2 Special VFR flights may be authorised to enter a control zone for the purpose of landing or to take-off and depart directly from a control zone when the ground visibility is not less than 1.5km (1 mile). The pilot of an aircraft on a Special VFR flight:

a. Must comply with ATC instructions;
b. Is responsible for ensuring that his flight conditions enable him to remain clear of cloud, determine his flight path with reference to the surface and keep clear of obstructions;
c. Is responsible for ensuring that he flies within the limitations of his licence. Controllers are not responsible for checking pilot's qualifications.

6.2.6.3 A Special VFR clearance shall be issued only when specifically requested by a pilot.

6.2.6.4 Before clearing a Special VFR flight a controller must consider the prevailing traffic conditions, the extent of the proposed flight and the availability of air/ground communications. IFR flights take precedence over Special VFR flights. Standard separation shall be provided:

a. Between IFR flights and Special VFR flights;
b. Between flights operating on Special VFR clearance except where a reduction is specifically authorised by CAAS.

6.2.6.5 Aircraft on Special VFR clearance are not normally given a specific height to fly but for the purpose of ensuring vertical separation from other aircraft flying above, the Special VFR flight may be required to fly not above a specified level.

← *6.3 SEPARATION MINIMA*

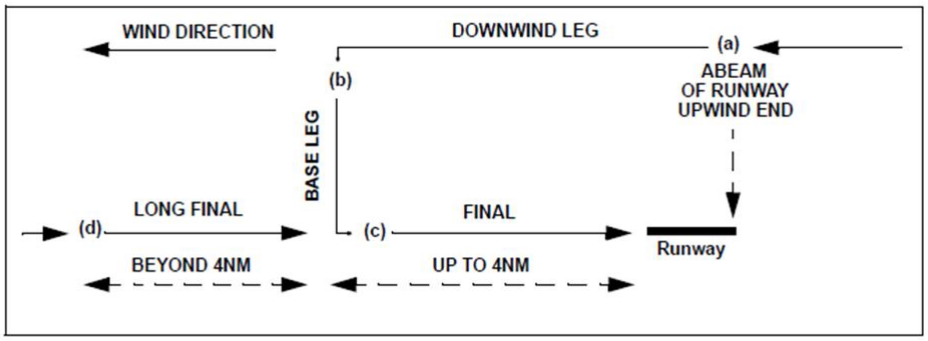
6.3.1 All VFR or IFR flights within CTRs will be regulated in accordance with IFR separation standards unless the conditions stated in ENR 1.7 para 4.10.2 prevail. ATC Services are also provided to aircraft within ATZs.

6.4 WAKE TURBULENCE SEPARATION MINIMA

6.4.1 For arrival aircraft operating into Singapore Changi Airport, distance-based wake turbulence separation minima based on the seven wake turbulence groups will be applied.

6.5 VISUAL CIRCUIT REPORTING PROCEDURE

6.5.1 The pilot-in-command shall report position in accordance with the following diagram:



a. Downwind
Aircraft shall report “Downwind” abeam the upwind end of the runway.

b. Base Leg
Aircraft shall report “Base Leg” on completion of the turn on to base leg.

c. Final
Aircraft shall report “Final” after completion of the turn on to final approach, not more than 4NM from the approach end of the runway.

d. Long Final
Aircraft flying a straight-in approach shall report “Long Final” 8NM from the approach end of the runway, and “Final” when at 4NM.

Note: At grass aerodrome, the area to be used for landing is regarded as the runway for the purposes of reporting position in the circuit.

6.6 USE OF RUNWAY

6.6.1 The Aerodrome Controller will nominate the runway direction according to prevailing conditions.

6.6.2 Notwithstanding the runway direction nominated by ATC, the pilot-in-command shall ensure that there is sufficient length of run and that the crosswind or downwind component is within the operational limits of each particular operation. If the nominated runway direction is not suitable for these reasons or for any other safety reason, he may request for an alternative runway direction. ATC will grant the use of an alternative runway direction but the flight may be subject to some delay because of other traffic.

6.6.3 The decision to undertake a take-off or landing rests solely with the pilot-in-command.

6.6.4 Unless prior permission has been obtained from ATC, the pilot-in-command shall not hold on the runway in use.

6.6.5 Only one aircraft will be cleared to land on the runway in use at any one time.

6.6.6 In VMC, an aircraft may be cleared to continue approach to a runway occupied by a preceding aircraft but clearance to land will not be given until the runway is vacated.

6.7 CLOSURE OF AERODROMES

6.7.1 Aircraft will not be refused permission to land or take off from airfields in the Singapore FIR solely because of adverse weather conditions. The pilot-in-command of a public transport aircraft shall be responsible for operation in accordance with applicable company weather minima.

6.7.2 Aerodrome will be closed:

a. When the surface of the landing area is unfit (e.g. soft surface or dangerous obstruction on the manoeuvring area); or
b. At such other times and in conditions specified by NOTAM.

6.7.3 In an emergency, an aircraft will be permitted to land regardless of the conditions of the aerodrome and aerodrome facilities, but the pilot will be advised of these conditions.

6.8 REGULATING OF AIR TRAFFIC MOVEMENTS AFTER CLOSURE OF SINGAPORE CHANGI AIRPORT'S RUNWAY/CONTROL ZONE

6.8.1 In order to prevent unnecessary air traffic congestion which normally occurs following the resumption of air traffic operations after the closure of the Singapore Changi Airport's Runways/Control Zone, due to VIP Movement or Major Air Exercise, slot-times will be introduced to regulate the flow of aircraft which are scheduled to depart for a period of at least one hour after the commencement of operations. Thus, depending on the prevailing traffic conditions all such departures will be spaced at intervals of 5 minutes or more to minimise unnecessary delays on the ground, which may be caused by arriving aircraft.

6.8.2 During the one hour period, pilots will be required to give ATC 5 minutes notice prior to starting engines.

6.8.3 Slot time is defined as the time during which take-off clearance may be expected.

6.9 AIR TRAFFIC CONTROL CLEARANCES

6.9.1 All flights within a CTR, or ATZ, irrespective of weather conditions, require an air traffic control clearance.

6.9.2 The pilot-in-command of an aircraft departing from a CTR or an ATZ shall obtain an air traffic control clearance prior to departure.

6.9.3 A clearance to enter or cross a CTR or ATZ will include the following information:

a. A clearance limit and holding instructions, if necessary;
b. The route to be flown; and
c. The altitude or flight level.

6.10 NOISE ABATEMENT PROCEDURE

6.10.1 To alleviate the problem of noise, all aircraft on AWY G579 between SINJON and GUMPU shall operate at/above 5,000ft.

6.11 SPEED CONTROL PROCEDURES FOR ARRIVALS INTO AIRPORTS IN SINGAPORE

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

6.11.2 All arriving turboprop and turbo-jet aircraft are to fly not faster than indicated air speed 250 knots when within 40NM from airports in Singapore or when at or below 10,000ft. Aircraft cleared on RNAV STARS must comply with the published speed restrictions and transitions unless otherwise instructed by ATC.

6.11.3 All arrivals into Singapore Changi Airport instructed to intercept the final approach course, are to maintain 180 knots by 8NM from touchdown, and thereafter 150 knots till 4NM from touchdown.

6.11.4 Pilots who are unable to comply with the speed limits specified above for reasons of flight safety and/or weather must provide timely notifications to ATC and state the acceptable speed(s) which is appropriate.

6.12 AUTHORIZATION

6.12.1 Either an IFR clearance or a Special VFR authorisation shall be issued by Air Traffic Control prior to every movement within a control zone in the following weather conditions:

When the ceiling is less than 1,500ft and/or a visibility less than 5km.

6.12.2 The deciding factors determining whether conditions are such that compliance with IFR or Special VFR authorisation is required will be the official meteorological observations.

6.12.3 When a pilot so requests and traffic conditions permit, Special VFR flight may be authorised within control zones, clear of cloud and in sight of land or water.

6.12.4 When a Special VFR flight has been authorised, ATC will provide it with standard separation from other similar flights and any IFR flight.

6.12.5 Special VFR flights will not normally be given a special level to fly; they will be merely instructed to remain clear of cloud and in sight of land or water. If, however, it is necessary to provide vertical separation from aircraft above, the Special VFR flight will be instructed not to fly above a certain level.

6.12.6 A Special VFR flight may be required to make good a prescribed track. When no track is prescribed, the pilot must fly directly towards his destination or towards the first turning point shown in the flight plan.

6.12.7 Special VFR absolves the pilot from complying with Instrument Flight Rules. Special VFR flight does not, however, absolve the pilot-in-command from the responsibility of maintaining minimum safe levels as prescribed in Part 2, para 5 of the eleventh Schedule of the Air Navigation Order. He must comply with ATC instructions and it will be entirely his responsibility to ensure that his flight conditions i.e. forward visibility and distance from cloud, will enable him to determine his flight path and remain clear of all obstructions.

6.12.8 Authorisation for Special VFR flight will depend not only upon zonal traffic conditions but also whether or not air/ground communications can be maintained and the extent of the flight proposed.

6.13 APPLICATION OF GENERAL FLIGHT RULES

6.13.1 Aircraft flying under Special VFR authorisation are subject to the general flight rules. Compliance with these rules is the responsibility of the pilot.

7 REQUIREMENTS FOR AERIAL PHOTOGRAPHY

7.1 Section 7 of the Air Navigation Act provides that no aerial photography of protected places in Singapore may be undertaken without the written permission of the Director-General of Civil Aviation. Applications for Aerial Photography Permits must be submitted in duplicate, one copy to the Director-General of Civil Aviation and the other copy to the Head, Field Security Branch, MINDEF, at least ten (10) days prior to the date of the photography flight.

8 LIGHT SIGNALS

Appendix A

Light	**From Aerodrome Control To:**	
Directed towards aircraft concerned	Aircraft in Flight	Aircraft on the Ground
STEADY GREEN	Cleared to land	Cleared for take-off
STEADY RED	Give way to other aircraft and continue circling	Stop
SERIES OF GREEN FLASHES	Return for landing *	Cleared to taxi
SERIES OF RED FLASHES	Aerodrome unsafe, do not land	Taxi clear of landing area in use
SERIES OF WHITE FLASHES	Land at this aerodrome and proceed to apron *	Return to starting point on the aerodrome

* Clearance to land and to taxi will be thereafter given as a steady green light and a series of green flashes respectively.

9 DATA LINK SERVICES IN SINGAPORE FIR

9.1 BACKGROUND

9.1.1 Controller Pilot Data Link Communications (CPDLC) and Automatic Dependent Surveillance (ADS) data link applications will be used to provide services to FANS 1/A equipped aircraft, in particular within the Singapore FIR beyond the range of existing radar / ADS-B and VHF voice communications. Area Navigation (RNAV) routes suitable for ADS-C and / or CPDLC logon are described in ENR 3.2.

9.1.2 Messages will be transferred by VHF and satellite data link.

9.1.3 CPDLC supports the following services:

a. Emergency alerting;

b. Pilot to Controller downlink of position reports and clearance requests;

c. Controller to Pilot uplink of ATC clearances and instructions; and

d. Free text as a supplement to pre-formatted message elements.

9.1.4 Pre-Departure Clearance (PDC) via CPDLC is available on selected ATS routes/destinations as described in WSSS AD 2.22 paragraph 8.4.

9.1.5 Automatic Dependent Surveillance (ADS) supports automatic reporting by the aircraft Flight Management System (FMS) of aircraft position and intent information. The FMS reports the required information in accordance with parameters selected by the ground system.

9.2 LOGON PROCEDURES

9.2.1 The AFN LOGON address for the Singapore FIR is WSJC.

9.2.2 To avoid automatic rejection of the LOGON, the flight identification number used by the pilot in the LOGON process must be identical to the flight identification number filed in the flight plan.

9.2.3 A LOGON must be received from the aircraft before any data link connections can be initiated by the ground system. This is achieved via the ATS facility notification (AFN) LOGON process to be initiated by the pilot in accordance with company procedures.

9.2.4 Aircraft requesting data link services inbound to Singapore FIR are required to manually LOGON onto WSJC at least 10 minutes prior to the estimated time for entering Singapore FIR. Data link equipped aircraft departing from aerodromes within the Singapore FIR and requesting data link may LOGON to WSJC prior to departure. Pilots who are unable to establish a data link connection are to inform ATC on VHF or HF RTF.

9.2.5 Pilots are reminded to provide the flight level on first contact with HF, including when established on data link.

9.3 APPLICATION OF CPDLC

9.3.1 Aircraft operating outside radar coverage and not in the ADS-B exclusive airspace within the Singapore FIR shall establish contact with ATC using CPDLC as a primary means of communication except for the following:

a. prior instruction to contact ATC on VHF;
b. receive notice that CPDLC service is not available; and
c. during data link outage.

9.3.2 To ensure the correct synchronisation of messages, controller/pilot dialogues opened by CPDLC must be closed by CPDLC. Controller/pilot dialogues opened by voice must be closed by voice.

9.3.3 Due to inherent integrity checks and a coded reference to any preceding related message contained within CPDLC messages, a clearance issued by CPDLC requires only the appropriate CPDLC response, not a read-back as would be required if the clearance had been issued by voice.

9.3.4 The down link response “WILCO” indicates that the pilot accepts the full terms of the whole uplink message.

9.3.5 A down link response “AFFIRM” is not an acceptable acknowledgement or reply to a CLEARANCE issued by CPDLC.

9.3.6 To avoid ambiguity in message handling and response, a CPDLC downlink message should not contain more than one clearance request.

9.3.7 If multiple clearance requests are contained in a single downlink message and the controller cannot approve all requests, the uplink message element “UNABLE” will be sent as a response to the entire message. A separate message containing a response to those requests that can be complied with will be sent by the controller.

9.3.8 If any ambiguity exists as to the intent of a particular message, clarification must be sought by voice.

9.3.9 Standard pre-formatted message elements must be used whenever possible. Free text messages should be used only when an appropriate pre-formatted message element does not exist or to supplement the pre-formatted message element. The use of free text should be kept to a minimum.

9.3.10 When CPDLC connection is established, aircraft will be instructed to transfer from voice to CPDLC.
The phraseology used is:
TRANSFER TO SINGAPORE CONTROL ON DATA LINK [position];
MONITOR [HF frequency primary/secondary]

9.3.11 Pilots should down link a CPDLC position report upon position over first compulsory reporting point when aircraft enters Singapore FIR.

9.3.12 CPDLC connections will be terminated at the FIR boundary position or when entering radar coverage. The CONTACT [unit name][frequency] message and the END SERVICE message will be sent as separate messages. The END SERVICE message will be sent as soon as possible after receipt of the WILCO response to the CONTACT message.

9.4 APPLICATION OF ADS

9.4.1 ADS Periodic contracts will be established automatically on receipt of a LOGON.

9.4.2 The Periodic reporting rate is 10 minutes for aircraft operating outside radar coverage and 20 minutes for aircraft operating within radar coverage.

9.4.3 For ADS logged-on aircraft, CPDLC position reports are required only when aircraft enters Singapore FIR upon the first compulsory reporting point.

9.4.4 ADS contracts will be terminated automatically at a system parameter time after the aircraft has left the Singapore FIR.

9.5 DATA LINK FAILURE

9.5.1 Pilots recognising a failure of a CPDLC connection must immediately establish communications on the appropriate voice frequency. When voice communications have been established, voice must continue to be used as the primary medium until a CPDLC connection has been re-established and the controller has authorised the return to data link.

9.5.2 In the event of an expected CPDLC shutdown, the controller will immediately advise all data link connected aircraft of the failure by voice. Instructions will continue to be issued by voice until the return of the data link system. The return of the system to an operational state will require a new AFN LOGON from the affected aircraft.

9.6 FLIGHT PLAN NOTIFICATION

9.6.1 Aircraft planning to utilise data link communications must annotate their ICAO flight plan as follows:

a. Data link communication serviceability and capability must be notified by inserting one or more of the following letters in Item 10a (radio communication, navigation and approach aid equipment and capabilities):

J1	CPDLC ATN VDL Mode 2
J2	CPDLC FANS 1/A HFDL
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

b. Aircraft registration must be inserted in Item 18 as the ground system uses the information during the AFN LOGON.

c. Serviceable ADS equipment carried must be annotated on the flight plan by adding one or more of the following descriptors to describe the serviceable surveillance equipment and/or capabilities on board:

B1	ADS-B with dedicated 1090MHz ADS-B “out” capability
B2	ADS-B with dedicated 1090MHz ADS-B “out” and “in” capability
U1	ADS-B “out” capability using UAT
U2	ADS-B “out” and “in” capability using UAT
V1	ADS-B “out” capability using VDL Mode 4
V2	ADS-B “out” and “in” capability using VDL Mode 4
D1	ADS-C with FANS 1/A capabilities
G1	ADS-C with ATN capabilities

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

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3.4 RUNWAY 02R

a. When there are no reports of vessel movement along the northern shipping channel or where the reported vessel height is 95m AMSL and below, all aircraft departures on Runway 02R, regardless of on SID or vectors, shall be on a minimum climb gradient of 5% until reaching or passing 2,500ft. Thereafter, the minimum climb gradient shall be 3.3%.

b. Where the reported vessel height is above 95m AMSL, ATC shall advise departing pilots of the vessel height. Pilots on receipt of this information shall apply the minimum climb gradient in accordance with Para 3.6. After the aircraft has reached or passed the minimum crossing altitude over vessel, the minimum climb gradient shall be 3.3%.

c. The minimum climb gradient restriction stated above for Runway 02R is for the purpose of air traffic management. If the climb gradient restriction cannot be complied with, the pilot-in-command of an aircraft departure shall inform ATC during the time when the aircraft commences taxiing to the holding point for departure. Delays can be expected as coordination is required.

3.5 RUNWAYS 20L, 20C AND 20R

3.5.1 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%.

3.5.2 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%.

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

3.5.4 The minimum climb gradient restrictions stated above for Runway 20C/20R/20L are for the purpose of air traffic management. If the climb gradient restriction cannot be complied with, the pilot-in-command of an aircraft departure shall inform ATC during the time when the aircraft commences taxiing to the holding point for departure. Delays can be expected as coordination is required.

(Please also refer to charts AD-2-WSSS-SID-1 to AD-2-WSSS-SID-64: Standard Instrument Departures for Runway 20L, Runway 20C and Runway 20R).

3.6 DETERMINATION OF CLIMB GRADIENT BY OPERATORS

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

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.

Note: The calculated climb gradient shall not be lower than the procedure climb gradient for departures.

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

DEP RWY	02L	02C	02R
Distance d	1 100m	2 590m	2 130m

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

1.5.4 OTHER RELEVANT INFORMATION AND PROCEDURES

4.1 HOLDING PROCEDURES

Initial approach tracks and holding patterns associated with Singapore Airports are detailed in ENR 3.6 Area Charts. Holding patterns for other airfields are indicated on the applicable approach charts.

4.1.1 LOW LEVEL HOLDING AREAS

4.1.1.1 The holding areas for procedural traffic landing at Singapore Changi Airport or Seletar Airport depend on the runway in use at Singapore Changi Airport and are as follows:

a. RWY 02L/02C/02R - SAMKO Holding Area (SHA).

b. RWY 20R/20C/20L - NYLON Holding Area (NHA).

c. Details of these holding areas and those mentioned in paragraphs 4.1.1.2 and 4.1.1.3 are given in ENR 3.6. They are also shown in ENR 3.6 Area Charts.

4.1.1.2 An intermediate holding area - HOSBA Holding Area (HHA) - is also established.

4.1.1.3 A bad weather holding area - SINJON Holding Area - is established for Seletar bound commercial traffic.

4.1.2 HIGH LEVEL HOLDING AREAS

4.1.2.1 High Level Holding Areas are also established at NHA, SHA and HHA. Details of these areas are given in ENR 3.6.

4.1.3 HOLDING SPEEDS

4.1.3.1 The maximum holding speeds for all holding areas are detailed in ENR 3.6.

4.1.3.2 During conditions of turbulence, pilots could request ATC clearance to hold at speeds up to 280kt for both high and low level holding areas.

ENR 1.7 ALTIMETER SETTING PROCEDURES

1 INTRODUCTION

1.1 A common transition altitude of 11,000ft (3,350 metres) has been established in the Singapore Flight Information Region and airspace where ATS is provided by Singapore (see ENR 2.1). This will ensure uniformity in the transition altitudes for aerodromes within the territories of Brunei, Malaysia and Singapore, except for an area of radius 10 nautical miles centred on Mount Kinabalu where the lowest safe altitude will be 15,000ft (4,570 metres) and the lowest usable flight level will be FL170.

1.2 The maximum variation in QNH values in the Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1) does not exceed 10hPa either side of the standard setting 1013.2hPa, representing a change of about 300ft on the altimeter from QNH to 1013.2hPa. To simplify ATC procedures, therefore, a transition level of FL130 has been established, thus providing a transition layer of 2,000ft and ensuring at all times the 1,000ft vertical separation between aircraft.

1.3 No aircraft should therefore flight plan to cruise at flight levels 115, 120 and 125 when operating in the Singapore Flight Information Region and airspace where ATS is provided by Singapore (see ENR 2.1).

1.4 AREA QNH

1.4.1 AREA QNH is the forecast value of the LOWEST mean sea level pressure within Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1), valid for a period of 6 hours. e.g. AREA QNH valid 0600-1200.

1.4.2 AREA QNH as defined above, is one of the types of MET data required for the determination of the lowest flight level which will ensure adequate terrain clearance at any location within Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1) during the period of validity.

1.4.3 Amendments are issued by MET when the mean sea level pressure at any location in Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1) is expected to fall below the current AREA QNH by more than 2hPa, and units responsible for airspace in which aircraft could be operating on AREA QNH shall broadcast the amended value on all air/ground frequencies in use.

1.4.4 Change from LOCAL QNH (set for departure) to AREA QNH will be made on leaving the Aerodrome Traffic Zone after take-off.

1.4.5 Cruising within the transition layer is not permitted unless specifically cleared by the ATC.

2 BASIC ALTIMETER SETTING PROCEDURES

2.1 ALTIMETER SETTING PROCEDURES

2.1.1 For flight at or below the transition altitude, the altimeter reference will be the AREA QNH. Flight will therefore be conducted in altitudes.

2.1.2 Change from LOCAL QNH (set for departure) to AREA QNH will be made on leaving the Singapore/Johor Airspace Complex or Aerodrome Traffic Zone after take-off.

2.1.3 Change from AREA QNH to LOCAL QNH will be made on entering Terminal Control Area or Aerodrome Traffic Zone or on commencement of final approach to land.

2.1.4 For flight at and above the transition level, the standard altimeter setting of 1013.2hPa will be used.

2.1.5 Change from AREA QNH to 1013.2hPa will be made on climb through the transition altitude.

2.1.6 Change from 1013.2hPa to AREA QNH will be made on descent through the transition level.

2.1.7 Cruising within the transition layer is not permitted unless specifically cleared by ATC.

2.1.8 Vertical displacement of aircraft when at or below the transition is expressed in terms of altitude whereas such displacement at or above the transition level is expressed in terms of flight level. While passing through the transition layer, vertical displacement is expressed in terms of altitude when descending and in terms of flight level when ascending.

2.1.9 Flight Level zero is located at the atmospheric pressure level of 1013.2hPa. Consecutive flight levels are separated by a pressure level corresponding to 500ft in the Standard Atmosphere.

Note:
Example of the relationship between flight levels and altimeter indications are given in the following table, the metric equivalents being approximate:

FLIGHT LEVEL	ALTIMETER INDICATION	
Number	**Feet**	**Metres**
10	1 000	300
15	1 500	450
20	2 000	600
50	5 000	1 000
100	10 000	3 050
130	13 000	3 950
150	15 000	4 550
200	20 000	6 100
250	25 000	7 600
300	30 000	9 150
350	35 000	10 650
400	40 000	12 200
450	45 000	13 700
500	50 000	15 250

2.2 TAKE-OFF AND CLIMB

2.2.1 A QNH altimeter setting shall be made available to aircraft by Approach/Aerodrome Control in the routine take-off and climb instructions.

2.2.2 Vertical displacement of aircraft during climb shall be effected by reference to altitude until reaching the transition altitude above which vertical displacement shall be effected by reference to flight level.

2.2.3 A QFE altimeter setting will be made available on request but reports to ATC are to be made in altitudes.

2.3 VERTICAL SEPARATION - ENROUTE

2.3.1 Aircraft en-route in the Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1), regardless whether IFR or VFR, shall be flown at flight levels or altitudes where appropriate.

2.3.2 It is the pilots' responsibility to select a flight level which will give adequate terrain clearance using forecast pressure information.

2.3.3 For the purpose of en-route vertical separation IFR and VFR flights within controlled airspace and flights in uncontrolled airspace of the Singapore FIR and airspace within the Jakarta FIR where ATS is provided by Singapore (see ENR 2.1), reference should be made to the following:

a. Semi-circular system of cruising levels within all controlled airspace (IFR flights) (section ENR 1.7 para 4.2);
b. VFR flights cruising levels up to FL150 within controlled airspace (section ENR 1.7 para 4.3);
c. Quadrantal cruising levels in uncontrolled airspace of the Singapore FIR and airspace within the Jakarta FIR where ATS is provided by Singapore (see ENR 2.1) (section ENR 1.7 para 4.4).

2.4 APPROACH AND LANDING

2.4.1 A QNH altimeter setting shall be made available in the routine approach and landing instructions.

2.4.2 A QFE altimeter setting will be made available on request but reports to ATC are to be made in altitude.

2.4.3 Vertical displacement of aircraft during approach is effected by reference to flight level until reaching the transition level below which vertical displacement is controlled by reference to altitude.

2.5 MISSED APPROACH

2.5.1 The relevant portions of paragraphs 2.1, 2.2, 2.3 and 2.4 shall be applied in case of a missed approach.

3 PROCEDURES APPLICABLE TO OPERATORS AND PILOTS

3.1 FLIGHT PLANNING

3.1.1 The level(s) at which a flight is to be conducted shall be specified in a flight plan;

a. In terms of flight level(s) if the flight is to be conducted at or above the transition level, and

b. In terms of altitude(s) if the flight is to be conducted in the vicinity of an aerodrome and at or below the transition altitude.

Note: 1:
Short flights in the vicinity of an aerodrome may often be conducted only at altitude below the transition altitude.

Note: 2:
Flight levels are specified in a plan by number, and not in terms of feet as is the case with altitudes.

4 TABLES OF CRUISING LEVELS

4.1 SEMI-CIRCULAR SYSTEM OF CRUISING LEVELS WITHIN THE SINGAPORE FIR AND AIRSPACE WHERE ATS IS PROVIDED BY SINGAPORE (SEE ENR 2.1)

4.1.1 The pilot-in-command of an IFR flight at or above 3,000ft within controlled airspace and above FL250 in uncontrolled airspace shall select a level corresponding to the appropriate magnetic track as indicated in para 4.2. The Quadrantal Height Rule as contained in para 4.4 will continue to be used for all flights below FL200 in uncontrolled airspace of the Singapore FIR and airspace within the Jakarta FIR where ATS is provided by Singapore (see ENR 2.1).

4.1.2 FL250 in uncontrolled airspace will be held vacant to serve as a buffer.

4.2 IFR FLIGHTS - CRUISING LEVELS WITHIN THE SINGAPORE FIR AND AIRSPACE WHERE ATS IS PROVIDED BY SINGAPORE (SEE ENR 2.1)

T R A C K			
000° to 179°		**180° to 359°**	
Flight Level	Altitude (feet)	Flight Level	Altitude (feet)
30	3 000	40	4 000
50	5 000	60	6 000
70	7 000	80	8 000
90	9 000	100	10 000
110	11 000	140	14 000
130	13 000	160	16 000
150	15 000	180	18 000
170	17 000	200	20 000
190	19 000	220	22 000
210	21 000	240	24 000
230	23 000	260	26 000
250	25 000	280	28 000
270	27 000	310	31 000
290	29 000	350	35 000
330	33 000	390	39 000
370	37 000	430	43 000
410	41 000	470	47 000
450	45 000	510	51 000
490	49 000	etc.	etc.
etc.	etc.		

4.3 VFR FLIGHTS - CRUISING LEVELS WITHIN THE SINGAPORE FIR AND AIRSPACE WHERE ATS IS PROVIDED BY SINGAPORE (SEE ENR 2.1) IN CONTROLLED AIRSPACE

T R A C K			
000° to 179°		**180° to 359°**	
Flight Level	Altitude (feet)	Flight Level	Altitude (feet)
15	1 500	25	2 500
35	3 500	45	4 500
55	5 500	65	6 500
75	7 500	85	8 500
95	9 500	105	10 500
135	13 500	145	14 500

4.4 QUADRANTAL CRUISING LEVELS FOR FLIGHTS BELOW FL200 OPERATING IN UNCONTROLLED AIRSPACE PART OF AIRSPACE WITHIN THE JAKARTA FIR WHERE ATS IS PROVIDED BY SINGAPORE (SEE ENR 2.1) BETWEEN PANGKALPINANG TMA AND PEKANBARU TMA

4.4.1 The pilot-in-command of a VFR or IFR flight operating at or above 3,000ft and below FL200 between Pangkalpinang TMA and Pekanbaru TMA shall select a level corresponding to the appropriate magnetic track as indicated in the following Quadrantal Cruising Levels:

QUADRANTAL CRUISING LEVELS			
000°to 089°	**090° to 179°**	**180° to 269°**	**270° to 359°**
30	35	40	45
50	55	60	65
70	75	80	85
90	95	100	105
110	-	-	-
130	135	140	145
150	155	160	165
170	175	180	185
190	-	-	-

4.4.2 If compliance with VFR cannot be maintained at a quadrantal cruising level, the aircraft shall be flown at another quadrantal level where it is possible to comply with VFR.

4.4.3 The pilot-in-command shall ensure that the cruising level selected for an IFR flight is not below the lowest safe flight level applicable for the route to be flown.
Note: The provision of terrain clearance is not part of ATC service.

4.4.4 Except when taking-off or landing, or with the approval of the appropriate authority, aircraft shall be flown at least 1,000ft above the highest obstacle within 10km of the estimated position of the aircraft in flight.

4.5 TRANSIT PROCEDURES

4.5.1 The procedures to be followed by aircraft when transitting between areas where the Quadrantal System of cruising levels is in use and those where the Semi-Circular System is applicable, are indicated below.

4.5.2 Transition from the Quadrantal System to the Semi-Circular System

TRACK FLOWN	**VFR FLIGHT**	**IFR FLIGHT**
000-089	Climb to next ODD + 500ft level	Maintain ODD level
090-179	Maintain ODD + 500ft level	Descend to next ODD level
180-269	Climb to next EVEN + 500ft level	Maintain EVEN level
270-359	Maintain EVEN + 500ft level	Descend to next EVEN level

4.5.3 Transition from the Semi-Circular System to the Quadrantal System

TRACK FLOWN	VFR FLIGHT	IFR FLIGHT
000-089	Descend to next ODD level	Maintain ODD level
090-179	Maintain ODD + 500ft level	Climb to next ODD + 500ft level
180-269	Descend to next EVEN level	Maintain EVEN level
270-359	Maintain EVEN + 500ft level	Climb to next EVEN + 500ft level

Note: The terms “ODD + 500ft” level and “EVEN + 500ft” level have been used to designate those series of levels where, below FL290, flight levels ending with 75, 95, 115, etc. and 65, 85, 105 etc respectively are prescribed.

4.6 CHANGING LEVELS

4.6.1 ATC may clear aircraft to change level at a specific time, place or rate. The pilot-in-command must acknowledge receipt of ATC instruction to a change of level and shall effect a change of level immediately unless a later time or place for the commencement is specified or is approved, as a result of a request by a pilot. The rate of change of level shall be the specific rate, or if no rate has been specified, a rate suitable for the type of aircraft.

Note: A pilot may request ATC approval for a different rate of change of level or a different time or place for commencing change of level.

4.6.2 When required, the pilot-in-command may be instructed to reach an assigned level by a specified time or position. The pilot-in-command shall advise ATC immediately if he is doubtful whether the assigned level can be reached as instructed.

4.6.3 A pilot-in-command shall report:

a. At the time of leaving a level for a newly assigned level;
b. When leaving or passing through such other levels as may be specified by ATC;
c. On reaching an assigned level.

4.6.4 A pilot-in-command shall read back level clearances.

4.7 UNIDIRECTIONAL ATS ROUTES LEVEL ASSIGNMENTS - SINGAPORE/JAKARTA SECTOR

4.7.1 The following Level Assignments for aircraft operating in the Singapore/Jakarta sector on the unidirectional ATS Routes B470 and G579 will be adopted by Singapore and Jakarta ACCs.

4.7.2 Level Assignments

4.7.2.1 Jakarta ACC shall assign:

a. All even flight levels plus 500ft above the minimum enroute level up to and including FL185.
b. Above FL185, starting at FL220 all even flight levels up to and including FL280.
c. Above FL280, all flight levels at 1,000ft intervals starting at FL290 and up to FL410 (inclusive), except for flights beyond Singapore where only even flight levels shall be assigned.

4.7.2.2 Singapore ACC shall assign:

a. All odd flight levels plus 500ft above the minimum enroute level up to and including FL195.
b. Above FL195, starting at FL210 all odd flight levels up to and including FL290.
c. Above FL290, all flight levels at 1,000ft intervals starting at FL290 and up to FL410 (inclusive), except for flights beyond Jakarta where only odd flight levels shall be assigned.

4.8 POSITION REPORTS

4.8.1 In so far as range permits, the pilot-in-command shall report position to the responsible ATC unit on the appropriate VHF RTF frequency. When outside VHF RTF range, the pilot-in-command shall report position on HF RTF.

4.8.2 The pilot-in-command shall report position as soon as possible after the aircraft has passed each designated reporting point or “on request” reporting point (when so required by ATC).

4.8.3 Where no designated or “on request” position report is required, the pilot-in-command shall report position hourly in latitude and longitude and shall report “operations normal” every 30 minutes in between.

Note: Operating companies may request approval to make fixed rather than hourly reports.

4.8.4 When reporting their positions, pilots shall transmit the word “POSITION” either immediately before or after the callsign of their aircraft.

4.8.5 A position report shall comprise Section 1 or Sections 2 and 3, or the AIREP form of report:

Section 1 (Position Information)

1. aircraft identification
2. position
3. time
4. flight level or altitude
5. next position and time over
6. ensuing significant point

Section 2 (Operational Information)

7. estimated time of arrival
8. endurance

← **Section 3** (Meteorological Information)

9. air temperature
10. wind direction
11. wind speed
12. turbulence
13. aircraft icing
14. humidity (if available)

4.8.6 Section 2 - Operational Information of an AIREP is not required for turbine powered aircraft operations.

4.8.7 Designated and on request reporting points for the various established routes are listed in section ENR 3.

4.9 HOLDING

4.9.1 An aircraft required to hold en-route or over the destination holding point shall do so in accordance with the holding pattern specified for the radio aid in subsection ENR 3.6.

4.9.2 Where no specified holding pattern is established and en-route holding is required by ATC, the pilot-in- command shall hold in accordance with the standard holding pattern as follows:

a. Follow the specified track inbound to the holding point;
b. On passing the holding point, make a 180° rate one turn to the right;
c. Maintain a parallel track outbound from the holding point for 1 min if at or below FL140 and 1½ min if above FL140;
d. Make a 180° rate one turn to the right; and
e. follow the specified track inbound.

Note:

1) NOTWITHSTANDING PARA 4.9 ABOVE, ATC may instruct an aircraft to execute a left hand turn and specify the direction in which the aircraft is to be held in relation to the reporting or holding point en-route.

2) The pilot-in-command should adjust his holding pattern within the limits of the established holding area in order to leave the holding point as far as possible at the exact time specified.

4.10 FLIGHT IN CONTROLLED AIRSPACES

4.10.1 Within controlled airspaces ATC separate IFR flights:

a. Vertically: by assigning them different levels or altitude;
b. Longitudinally: by instructing two aircrafts to maintain a minimum time interval between them; and
c. Laterally: by providing different flight paths;
d. By use of radar to ensure a minimum horizontal separation.

4.10.2 Standard separation in accordance with PANS-ATM DOC 4444 shall be provided to all flights operating in controlled airspace, except when:

a. Positive identification by radar of an aircraft's position is available to the appropriate ATC unit;

b. Within the Singapore/Johor Airspace Complex and Airways at/below FL150 during daylight hours, reports received from opposite direction aircraft indicate they have definitely passed each other;

c. In the vicinity of an aerodrome:

i. two or more aircraft are continuously visible to an aerodrome controller who can take positive action to ensure separation; or

ii. all aircraft are continuously visible to one another and the pilots concerned indicate that they can maintain their own separation.

←

4.10.3 Within the Singapore/Johor Airspace Complex, standard separation is provided between all flights irrespective of whether they are operating on a VFR or IFR Flight Plan. All operations are required to obtain an Air Traffic Control Clearance.

Note: See ENR 3.6 Area Charts

4.10.4 All aircraft operating under IFR or VFR in controlled airspaces shall be equipped with appropriate two- way radio communication, suitable instruments and radio navigation apparatus appropriate to the route to be flown and the pilot shall hold an instrument rating.

4.11 TRANSFER OF COMMUNICATIONS

4.11.1 The transfer of air/ground communications contact to an adjoining Area Control Centre is normally made at the agreed transfer point.

4.12 ALERTING SERVICE

4.12.1 Alerting service is available for all notified aircraft movements in Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1).

4.12.2 The pilot-in-command of an aircraft landing at an unattended landing ground shall notify arrival to ATC by the most expeditious means available.

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ENR 1.8 REGIONAL SUPPLEMENTARY PROCEDURES

1 RVSM PROCEDURES IN THE SINGAPORE FIR AND AIRSPACE WHERE ATS IS PROVIDED BY SINGAPORE (SEE ENR 2.1)

← *1.1 IMPLEMENTATION OF 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 (L625, L642, M767, M771, N884 and N892) that involve the 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 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.

1.1.3 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:

https://www.caas.gov.sg/legislation-regulations/guidelines-advisory/air-operations

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 (https://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:

https://www.aerothai.co.th/maar/

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 Appendix A 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.

1.5 SPECIAL PROCEDURES FOR IN-FLIGHT CONTINGENCIES IN OCEANIC AIRSPACE

Introduction

1.5.1 Although all possible contingencies cannot be covered, the procedures in 1.5.4, 1.5.5 and 1.5.6 provide for the more frequent cases such as:

a. the inability to comply with assigned clearance due to meteorological conditions (1.5.6 refers);
b. en-route diversion across the prevailing traffic flow (for example, due to medical emergencies (1.5.4 and 1.5.5 refer)); and
c. the loss of, or significant reduction in, the required navigation capability when operating in an airspace where the navigation performance accuracy is a prerequisite to the safe conduct of flight operations, or pressurization failure (1.5.4 and 1.5.5 refer).

1.5.2 The pilot shall take action as necessary to ensure the safety of the aircraft, and the pilot's judgement shall determine the sequence of actions to be taken, having regard to the prevailing circumstances. Air traffic control shall render all possible assistance.

General Procedures

Note.- Figure 1.5-1 provides an aid for understanding and applying the contingency procedures contained in Section 1.5

1.5.3 If an aircraft is unable to continue the flight in accordance with its ATC clearance, a revised clearance shall be obtained, whenever possible, prior to initiating any action.

← 1.5.4 If prior clearance cannot be obtained, the following contingency procedures should be employed until a revised clearance is received. In general terms, the aircraft should be flown at an offset level and on an offset track where other aircraft are less likely to be encountered. Specifically, the pilot shall:

a. leave the cleared track or ATS route by initially turning at least 30 degrees to the right or to the left, in order to establish and maintain a parallel, same direction track or ATS route offset 5.0 NM. The direction of the turn should be based on one or more of the following factors:

    1. aircraft position relative to any organized track or ATS route system;
    2. the direction of flights and flight levels allocated on adjacent tracks;
    3. the direction to an alternate airport;
    4. any strategic lateral offset being flown; and
    5. terrain clearance.

b. maintain a watch for conflicting traffic both visually and by reference to ACAS (if equipped), leaving ACAS in RA mode at all times, unless aircraft operating limitations dictate otherwise;
c. turn on all aircraft exterior lights (commensurate with appropriate operating limitations);
d. keep the SSR transponder on at all times and, when able, squawk 7700, as appropriate and, if equipped with ADS-B or ADS-C, select the appropriate emergency functionality;
e. as soon as practicable, advise air traffic control of any deviation from their assigned clearance;
f. use means as appropriate (i.e. voice and/or CPDLC) to communicate during a contingency or emergency;
g. if voice communications are used, the radiotelephony distress signal (MAYDAY) or urgency signal (PAN PAN) preferably spoken three times, shall be used, as appropriate;

h. when emergency situations are communicated via CPDLC, the controller may respond via CPDLC. However, the controller may also attempt to make voice contact with the aircraft;

Note.- Guidance on emergency procedures for controllers, radio operators, and flight crew in data link operations can be found in the Global Operational Data Link (GOLD) Manual (Doc 10037).

i. establish communications with and alert nearby aircraft by broadcasting on the frequencies in use and at suitable intervals on 121.5 MHz (or, as a backup, on the inter-pilot air-to-air frequency 123.45 MHz): aircraft identification, the nature of the distress condition, intention of the pilot, position (including the ATS route designator or the track code, as appropriate) and flight level.

Actions to be taken once offset from track

Note.- The pilot's judgement of the situation and the need to ensure the safety of the aircraft will determine the actions outlined to be taken. Factors for the pilot to consider when deviating from the cleared track or ATS route or level without an ATC clearance include, but are not limited to:

a. *operation within a parallel track system;*
b. *the potential for user preferred routes (UPRs) parallel to the aircraft's track or ATS route;*
c. *the nature of the contingency (e.g. aircraft system malfunction); and*
d. *weather factors (e.g. convective weather at lower flight levels).*

1.5.5 If possible, maintain the assigned flight level until established on the 5.0 NM parallel, same direction track or ATS route offset. If unable, initially minimize the rate of descent to the extent that is operationally feasible.

1.5.6 Once established on a parallel, same direction track or ATS route offset by 5.0 NM, either:

a. descend below FL 290, and establish a 500 ft vertical offset from those flight levels normally used, and proceed as required by the operational situation or if an ATC clearance has been obtained, in accordance with the clearance; or
b. establish a 500 ft vertical offset (or 1000 ft vertical offset if above FL 410) from those flight levels normally used, and proceed as required by the operational situation, or if an ATC clearance has been obtained, in accordance with the clearance.

Note.- Altimetry system errors (ASE) may result in less than 500 ft vertical spacing (less than 1000 ft above FL 410) when the above contingency procedure is applied.

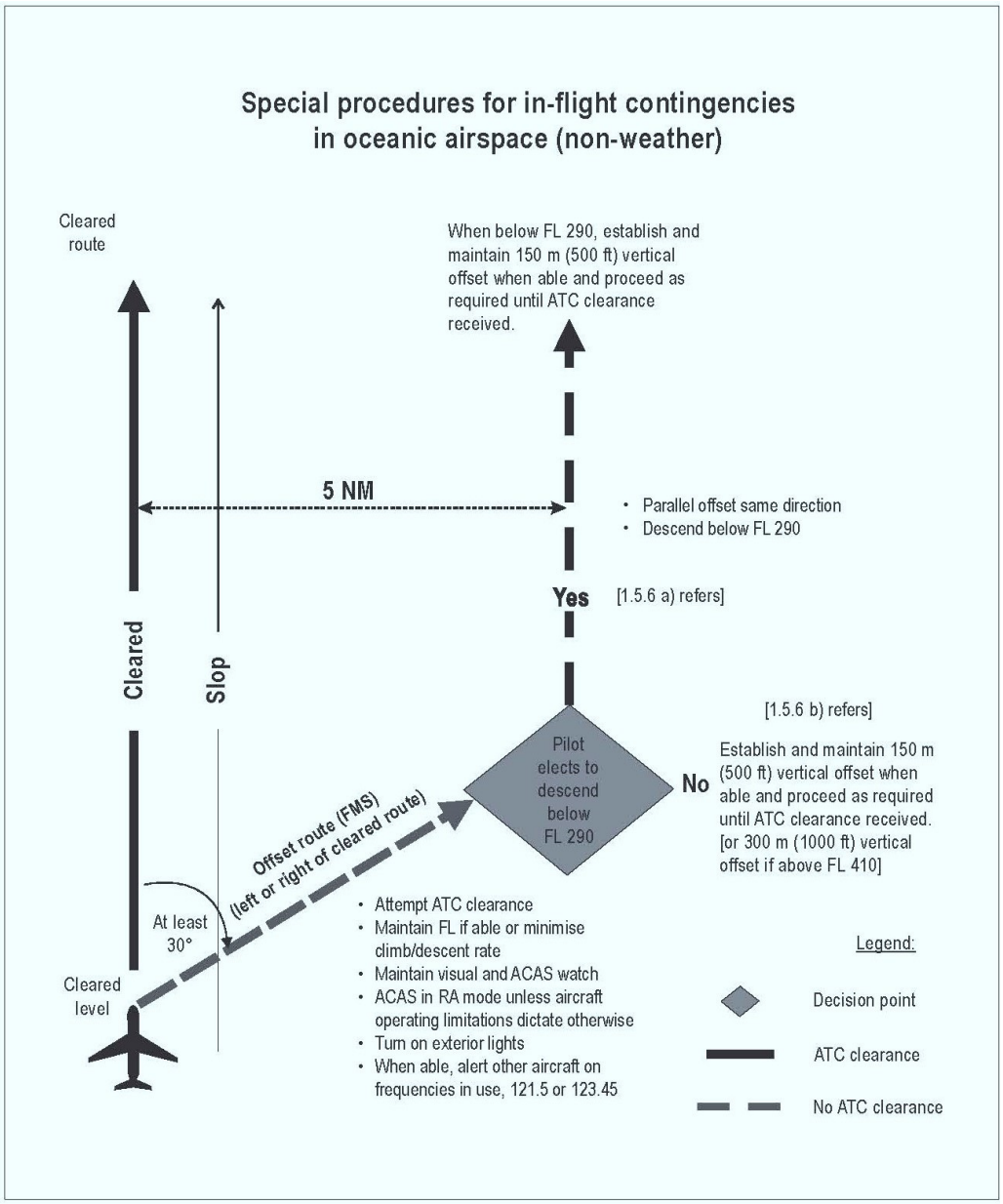

Figure 1.5-1. Visual aid for contingency procedures guidance

1.6 PROCEDURES TO MITIGATE WAKE TURBULENCE ENCOUNTERS AND DISTRACTING AIRCRAFT SYSTEM ALERTS IN THE OCEANIC AIRSPACE OF SINGAPORE FIR

1.6.1 The following special procedures are applicable to mitigate wake turbulence or distracting aircraft system alerts [e.g. ACAS, Ground Proximity Warning System (GPWS)] in Asia and Pacific airspace where RVSM is applied:

Note.- In the contingency circumstances below, ATC will not issue clearances for lateral offsets and will not normally respond to actions taken by the pilots.

1.6.2 An aircraft that encounters wake vortex turbulence or experiences distracting aircraft system alerts shall notify ATC and request a flight level, track or speed change to avoid the condition. However, in situations where such a change is not possible or practicable, the pilot may initiate the following temporary lateral offset procedure with the intention of returning to centreline as soon as practicable:

a. the pilot should establish contact with other aircraft, if possible, on the appropriate VHF inter-pilot air-to-air frequency 123.45MHz; and
b. one (or both) aircraft may initiate lateral offset(s) not to exceed 2NM from the assigned track, provided that:

   i. as soon as practicable to do so, the offsetting aircraft notify ATC that temporary lateral offset action has been taken and specify the reason for doing so (ATC will not normally respond); and
   ii. the offsetting aircraft notify ATC when re-established on assigned route(s) or track(s) (ATC will not normally respond).

1.7 FLIGHT PLANNING REQUIREMENTS

1.7.1 Unless special arrangement is made as detailed below, RVSM approval is required for aircraft to operate within designated RVSM airspace. The operator must determine that the appropriate State authority has approved the aircraft and will meet the RVSM requirements for the filed route of flight and any planned alternate routes. The letter "W" shall be inserted in item 10 (Equipment) of the ICAO standard flight plan to indicate that the aircraft is RVSM approved aircraft.

1.8 PROCEDURES FOR OPERATION OF NON-RVSM COMPLIANT AIRCRAFT IN RVSM AIRSPACE

1.8.1 It should be noted that RVSM approved aircraft will be given priority for level allocation over non-RVSM approved aircraft.

1.8.2 The vertical separation minimum between non-RVSM aircraft operating in the RVSM stratum and all other aircraft is 2,000ft.

1.8.3 Non-RVSM compliant aircraft operating in RVSM airspace should use the phraseology as contained in Appendix A.

1.8.4 Non-RVSM compliant aircraft may be cleared to climb to and operate above FL290 or descend to and operate below FL410 provided that they:

a. do not climb or descend at less than the normal rate for the aircraft, and
b. do not level off at an intermediate level while passing through the RVSM stratum.

1.8.5 Non-RVSM compliant aircraft may not flight plan between FL290 and FL410 inclusive within RVSM airspace. After special coordination as detailed in paragraph 1.8.6 below, the following non-RVSM aircraft may flight plan at RVSM flight levels in the RVSM stratum:

a. is being initially delivered to the State of Registry or Operator (see paragraph 1.10 for additional details and information); or
b. was formally RVSM approved but has experienced an equipment failure and is being flown to a maintenance facility for repair in order to meet RVSM requirements and/or obtain approval; or
c. is transporting a spare engine mounted under the wing; or
d. is being utilized for mercy or humanitarian purposes; or
e. State aircraft (those aircraft used in military, custom and police services shall be deemed State aircraft).

1.8.6 The assignment of cruising level to non-RVSM compliant aircraft listed in paragraph 1.10.5 (a) to (e) shall be subject to an ATC clearance. Aircraft operators shall include "STS/CATEGORY (FERRY/ HUMANITARIAN/ MILITARY/ CUSTOMS/POLICE)/NON-RVSM COMPLIANT" in field 18 of the ICAO flight plan.

1.8.7 Contact details for approval request are as follows:

Watch Manager, Singapore Air Traffic Control Centre:
TEL: (65) 65412668
AFS: WSJCZRZX
FAX: (65) 65457526

1.8.8 This approval process is intended exclusively for the purposes indicated above and not as a means to circumvent the normal RVSM approval process.

← *1.9 DELIVERY FLIGHTS FOR AIRCRAFT THAT ARE RVSM COMPLIANT ON DELIVERY*

1.9.1 An aircraft that is RVSM compliant on delivery may operate in RVSM airspace provided that the crew is trained on RVSM policies and procedures applicable in the airspace and the responsible State issues the operator a letter of authorisation approving the operation. State notification to the APARMO should be in the form of a letter, e-mail or facsimile documenting the one-time flight. The planned date of the flight, flight identification, registration number and aircraft type/series should be included.

1.10 PROCEDURES FOR SUSPENSION OF RVSM

1.10.1 Air traffic services will consider suspending RVSM procedures within affected areas of the Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1) when there are pilot reports of greater than moderate turbulence. Within areas where RVSM procedures are suspended, the vertical separation minimum between all aircraft will be 2,000ft.

1.11 GUIDANCE FOR PILOTS AND CONTROLLERS FOR ACTIONS IN THE EVENT OF AIRCRAFT SYSTEM MALFUNCTION OR TURBULENCE GREATER THAN MODERATE

1.11.1 See Appendix A for guidance in these circumstances.

1.12 PROCEDURES FOR AIR-GROUND COMMUNICATION FAILURE

1.12.1 The air-ground communication failure procedures specified in ENR 1.6 in conjunction with ICAO PANS-ATM DOC 4444 should be applied.

APPENDIX A

CONTINGENCY SCENARIOS

The following paragraphs summarize pilot actions to mitigate the potential for conflict with other aircraft in certain contingency situations. They should be reviewed in conjunction with the expanded contingency scenarios detailed below which contain additional technical and operational details.

* **Scenario 1** : The pilot is

a. unsure of the vertical position of the aircraft due to the loss or degradation of all primary altimetry systems, or

b. unsure of the capability to maintain cleared flight level (CFL) due to turbulence or loss of all automatic altitude control systems.

The pilot should:	ATC can be expected to:
Maintain CFL while evaluating the situation;	
Watch for conflicting traffic both visually and by reference to ACAS, if equipped;	
If considered necessary, alert nearby aircraft by a) Making maximum use of exterior lights; b) Broadcasting position, FL, and intentions on 121.5MHz (as a back-up, the VHF inter-pilot air-to-air frequency 123.45MHz may be used).	
Notify ATC of the situation and intented course of action. Possible courses of action include: a) Maintaining the CFL and route provided that ATC can provide lateral, longitudinal or conventional vertical separation. b) Requesting ATC clearance to climb above or descend below RVSM airspace if the aircraft cannot maintain CFL and ATC cannot establish adequate separation from other aircraft. c) Executing the contingency manoeuvre shown in paragraphs 1.5 and 1.6 to offset from the assigned track and FL, if ATC clearance cannot be obtained and the aircraft cannot maintain CFL.	Obtain the pilot's intentions and pass essential traffic information. If the pilot intends to continue in RVSM airspace, assess traffic situation to determine if the aircraft can be accommodated through the provision of lateral, longitudinal, or conventional vertical separation, and if so, apply the appropriate minimum. If the pilot requests clearance to exit RVSM airspace, accommodate expeditiously, if possible. If adequate separation cannot be established and it is not possible to comply with the pilot's request for clearance to exit RVSM airspace, advise the pilot of essential traffic information, notify other aircraft in the vicinity and continue to monitor the situation. Notify adjoining ATC facilities/sectors of the situation.

Scenario 2: There is a failure or loss of accuracy of one primary altimetry system (e.g. greater than 200ft difference between primary altimeters).

The pilot should:
Cross check standby altimeter, confirm the accuracy of a primary altimeter system and notify ATC of the loss of redundancy. If unable to confirm primary altimeter system accuracy, follow pilot actions listed in the preceding scenario.

EXPANDED EQUIPMENT FAILURE AND TURBULENCE ENCOUNTER SCENARIOS

Operators may consider this material for use in training programs.

* **Scenario 1**: All automatic altitude control systems failed (e.g. Automatic Altitude Hold).

The pilot should:	ATC can be expected to:
Initially, Maintain CFL Evaluate the aircraft's capability to maintain altitude through manual control Subsequently, Watch for conflicting traffic both visually and by reference to ACAS, if equipped.	
If considered necessary, alert nearby aircraft by: a) Making maximum use of exterior lights; b) Broadcasting position, FL, and intentions on 121.5MHz (as a back-up, the VHF inter-pilot air-to-air frequency 123.45MHz may be used).	
Notify ATC of the failure and intended course of action. Possible courses of action include: a) Maintaining the CFL and route, provided that the aircraft can maintain level. b) Requesting ATC clearance to climb above or descend below RVSM airspace if the aircraft cannot maintain CFL and ATC cannot establish lateral, longitudinal or conventional vertical separation. c) Executing the contingency manoeuvre shown in paragraphs 1.5 and 1.6 to offset from the assigned track and FL, if ATC clearance cannot be obtained and the aircraft cannot maintain CFL.	If the pilot intends to continue in RVSM airspace, assess traffic situation to determine if the aircraft can be accommodated through the provision of lateral, longitudinal, or conventional vertical separation, and if so, apply the appropriate minimum. If the pilot requests clearance to exit RVSM airspace, accommodate expeditiously, if possible. If adequate separation cannot be established and it is not possible to comply with the pilot's request for clearance to exit RVSM airspace, advise the pilot of essential traffic information, notify other aircraft in the vicinity and continue to monitor the situation. Notify adjoining ATC facilities/sectors of the situation

* **Scenario 2:** Loss of redundancy in primary altimetry systems

The pilot should:	ATC can be expected to:
If the remaining altimetry system is functioning normally, couple that system to the automatic altitude control system, notify ATC of the loss of redundancy and maintain vigilance of altitude keeping.	Acknowledge the situation and continue to monitor progress.

Scenario 3: All primary altimetry systems are considered unreliable or failed.

The pilot should:	ATC can be expected to:
Maintain CFL by reference to the standby altimeter (if the aircraft is so equipped).	
Alert nearby aircraft by: a) Making maximum use of exterior lights; b) Broadcasting position, FL, and intentions on 121.5MHz (as a back-up, the VHF inter-pilot air-to-air frequency 123.45MHz may be used).	
Consider declaring an emergency. Notify ATC of the failure and intended course of action.	Obtain pilot's intentions and pass essential traffic information.
Possible courses of action include:	
a) Maintaining CFL and route provided that ATC can provide lateral, longitudinal or conventional vertical separation.	If the pilot intends to continue in RVSM airspace, assess traffic situation to determine if the aircraft can be accommodated through the provision of lateral, longitudinal, or conventional vertical separation, and if so, apply the appropriate minimum.
b) Requesting ATC clearance to climb above or descend below RVSM airspace if ATC cannot establish adequate separation from other aircraft.	If the pilot requests clearance to exit RVSM airspace, accommodate expeditiously, if possible.
c) Executing the contingency manoeuvre shown in paragraphs 1.5 and 1.6 to offset from the assigned track and FL, if ATC clearance cannot be obtained.	If adequate separation cannot be established and it is not possible to comply with the pilot's request for clearance to exit RVSM airspace, advise the pilot of essential traffic information, notify other aircraft in the vicinity and continue to monitor the situation. Notify adjoining ATC facilities/sectors of the situation.

Scenario 4: The primary altimeters diverge by more than 200ft (60m).

The pilot should:
Attempt to determine the defective system through established trouble-shooting procedures and/or comparing the primary altimeter displace to the standby altimeter (as corrected by the correction cards, if required).
If the defective system can be determined, couple the functioning altimeter system to the altitude-keeping device.
If the defective system cannot be determined, follow the guidance in Scenario 3 for failure or unreliable altimeter indications of all primary altimeters.

Scenario 5: Turbulence (greater than moderate) which the pilot believes will impact the aircraft's capability to maintain flight level.

The pilot should:	ATC can be expected to:
Watch for conflicting traffic both visually and by reference to ACAS, if equipped.	
If considered necessary, alert nearby aircraft by: a) Making maximum use of exterior lights; b) Broadcasting position, FL, and intentions on 121.5MHz (as a back-up, the VHF inter-pilot air-to-air frequency 123.45MHz may be used).	
Notify ATC of intended course of action as soon as possible. Possible courses of action include: a) Maintaining CFL and route, provided ATC can provide lateral, longitudinal or conventional vertical separation. b) Requesting flight level change, if necessary c) Executing the contingency manoeuvre shown in paragraphs 1.5 and 1.6 to offset from the assigned track and FL, if ATC clearance cannot be obtained and the aircraft cannot maintain CFL.	Assess traffic situation to determine if the aircraft can be accommodated through the provision of lateral, longitudinal, or conventional vertical separation, and if so, apply the appropriate minimum. If unable to provide adequate separation, advise the pilot of essential traffic information and request pilot's intentions. Notify other aircraft in the vicinity and monitor the situation. Notify adjoining ATC facilities/sectors of the situation.

CONTROLLER / PILOT PHRASEOLOGY

Phrases	Purpose
(callsign) CONFIRM RVSM APPROVED	Used by the controller to ascertain the RVSM approval status of an aircraft.
NEGATIVE RVSM*	Used by the pilot to report non-RVSM approval status: a) On the initial call on any frequency within the RVSM airspace (controllers shall provide a readback with this same phrase); and b) In all requests for flight level changes pertaining to flight levels within the RVSM airspace; and c) In all readback of flight level clearances pertaining to flight levels within the RVSM airspace. Additionally, except for State aircraft, pilots shall include this RTF phrase to read back flight level clearances involving the vertical transit through FL290 or FL410.
AFFIRM RVSM*	Used by the pilot to report RVSM approval status.
NEGATIVE RVSM STATE AIRCRAFT*	Used by the pilot of a non-RVSM approved State aircraft to report non-RVSM approval status in response to the RTF phrase (callsign) CONFIRM RVSM APPROVED.
(callsign) UNABLE CLEARANCE INTO RVSM AIRSPACE, MAINTAIN [or DESCEND TO, or CLIMB TO] FLIGHT LEVEL *(number)*	Used to deny ATC clearance into the RVSM airspace.
UNABLE RVSM DUE TURBULENCE*	Used by the pilot to report when severe turbulence affects the aircraft's capability to maintain the height- keeping requirements for RVSM.
UNABLE RVSM DUE EQUIPMENT*	Used by the pilot to report that the aircraft's equipment has degraded below the MASPS (Minimum Aircraft Systems Performance Specification) required for flight within the RVSM airspace.
READY TO RESUME RVSM*	Used by the pilot to report the ability to resume operations within the RVSM airspace after an equipment or weather-related contingency.
REPORT ABLE TO RESUME RVSM	Used by the controller to confirm that an aircraft has regained its RVSM approval status or to confirm that the pilot is ready to resume RVSM operations.

** indicates a pilot transmission*

2 MACH NUMBER TECHNIQUE (MNT) AND AREA NAVIGATION (RNAV)

2.1 INTRODUCTION

2.1.1 RNAV is a method which permits aircraft navigation along any desired flight path within the coverage of the associated navigation aids, or within the limits of the capability of self-contained aids, or a combination of these methods. RNAV equipment is considered to be that equipment which operates by automatically determining aircraft position from one, or a combination of the following sensors with the means to establish and follow a desired path: VOR/DME, DME/DME, INS, LORAN C, GNSS.

2.1.2 Only aircraft equipped with RNAV systems would be able to operate on the RNAV routes in Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1). Aircraft that are not RNAV compliant will only be cleared to operate on non-RNAV routes.

2.1.3 The requirements for conduct of RNAV operations are stated in ICAO Doc 9613 (Manual on Required Navigation Performance) and at https://www.caas.gov.sg/legislation-regulations/guidelines-advisory/air-operations.

2.1.4 Minimum longitudinal separation of 10 minutes between RNAV equipped aircraft based on Mach Number Technique is applied on ATS routes A464, A576, B338, B469, B470, G334, G579, G580, L625, L642, L644, L649, L762, M630, M635, M646, M751, M753, M758, M761, M767, M768, M771, M772, M774, N502, N875, N884, N891, N892, P501, R469, T21, T22, T23, T24, T25, W22, W24 and W26 in accordance with DOC 7030/4. MNPS criteria is not required. If item 10 of the flight plan does not include any of the following equipment designators “G”, “I” or “R”, operators shall insert “NAV/NON-RNAV” in item 18 of the flight plan.

2.1.5 Operators of aircraft to which the Mach Number Technique and RNAV procedures will be applied must ensure that the equipment carried on their aircraft have been calibrated in accordance with the applicable airworthiness practices.

2.1.6 An 80NM RNAV distance-based longitudinal separation minima, with Mach Number Technique being applied, is permanently implemented on ATS routes within the oceanic portion of the Singapore FIR.

2.2 MACH NUMBER IN A FLIGHT PLAN

2.2.1 Aircraft are required to include their true Mach Number in item 15 of the ICAO flight plan as follows:

a. True airspeed and level preceding the entry point.
b. True Mach Number and level at entry point.

Example: Item 15 of a flight plan for a flight from Kuala Lumpur to Kota Kinabalu:
0460F330 M758 VPK/M072F330 M758

2.2.2 Westbound departure flights from Singapore Changi Airport proceeding beyond Indonesia, Malaysia and Thailand shall include Mach Number in item 18 of the flight plan.

2.3 ATC CLEARANCE

2.3.1 The ATC clearance shall include the filed Mach Number which is to be maintained, whether climbing, descending or on level flight.

Example: An ATC clearance for a flight from Kuala Lumpur to Kuching, issued by Lumpur ATC to aircraft:

MAS 518 CLEARED TO KUCHING VIA AIRWAY MIKE 761, MAINTAIN FL290, AT VPK MAINTAIN SPEED OF MACH POINT SEVEN TWO TILL AGOBA. SSR CODE A2215.

2.4 MAINTENANCE/CHANGE OF MACH NUMBER

2.4.1 Aircraft will be cleared to maintain their Mach numbers from the point of entry to the exit point. Pilots shall adhere strictly to the last assigned Mach number and notify ATC of any variation to the cleared (filed) Mach number. Application of longitudinal separation between aircraft when the Mach Number Technique is used is based on the assumption that the assigned Mach number will be maintained at all times. In the event that for operational reasons it is not feasible to do so, the pilot must inform ATC at the time initial clearance or when subsequent clearances are issued or requested.

2.4.2 The current true Mach number shall be included in routine position reports.

2.4.3 When reporting a change in Mach number, pilots should use the following phraseology:

Example
SINGAPORE RADAR, THIS IS MAS 524, SPEED NOW REDUCED (INCREASED) TO MACH POINT SEVEN ZERO

2.5 LONGITUDINAL SEPARATION ON ATS ROUTES M758 AND M761

2.5.1 Longitudinal Separation Minimum

The minimum longitudinal separation between RNAV equipped aircraft on ATS routes M758 and M761 is 10 minutes based on MNT.

2.5.2 Separation of aircraft when the following aircraft is faster

When the following aircraft is faster, for each 600NM in distance between the entry and exit points of the area where the Mach Number Technique is used, 1 minute is added for each 0.01 difference in Mach number between the two aircraft concerned to compensate for the fact that the second aircraft is overtaking the first aircraft according to the table in Appendix B.

2.5.3 Separation of aircraft when the preceding aircraft is faster

When the preceding aircraft is maintaining a greater Mach number than the following aircraft, the following separation shall be applied:

a. 9 minutes if the preceding aircraft is Mach 0.02 faster than the following aircraft;
b. 8 minutes if the preceding aircraft is Mach 0.03 faster than the following aircraft;
c. 7 minutes if the preceding aircraft is Mach 0.04 faster than the following aircraft;
d. 6 minutes if the preceding aircraft is Mach 0.05 faster than the following aircraft; and
e. 5 minutes if the preceding aircraft is Mach 0.06 faster than the following aircraft.

2.6 LONGITUDINAL SEPARATION ON ATS ROUTES A464, A576, B338, B469, B470, G579, G580, L625, L642, L644, L649, L762, M630, M635, M646, M751, M753, M758, M761, M767, M768, M771, M772, M774, N502, N875, N884, N891, N892, P501, R469, T21, T22, T23, T24, T25, W22, W24 AND W26

2.6.1 Requirements

The Mach Number Technique is applied on approved ATS routes between RNAV equipped aircraft.

2.6.2 Separation of aircraft with the same Mach number

10 minutes longitudinal separation shall be applied between aircraft with the same Mach number.

2.6.3 Separation of aircraft when the following aircraft is faster

The same buffer as stated in paragraph 2.5.2 shall be applied.

2.6.4 Separation of aircraft when the preceding aircraft is faster

The separation minima specified in paragraph 2.5.3 shall apply.

2.6.5 15 minutes longitudinal separation minimum

15 minutes longitudinal separation minimum shall be applied on these ATS routes between aircraft which cannot comply with RNAV procedures mentioned in paragraph 2.6.1.

APPENDIX B

Table

APPLICATION OF MACH NUMBER TECHNIQUE WHEN THE FOLLOWING AIRCRAFT IS THE FASTER
(BASED ON 10 MINUTES LONGITUDINAL SEPARATION)

DIFFERENCE IN MACH	DISTANCE TO FLY AND SEPARATION (IN MINUTES) REQUIRED AT ENTRY POINT				
	001-600 (NM)	601-1200 (NM)	1201-1800 (NM)	1801-2400 (NM)	2401-3000 (NM)
0.01	11	12	13	14	15
0.02	12	14	16	18	20
0.03	13	16	19	22	25
0.04	14	18	22	26	30
0.05	15	20	25	30	35
0.06	16	22	28	34	40
0.07	17	24	31	38	45
0.08	18	26	34	42	50
0.09	19	28	37	46	55
0.10	20	30	40	50	60

3 PERFORMANCE-BASED NAVIGATION ON RNAV ROUTES WITHIN SINGAPORE FIR AND AIRSPACE WHERE ATS IS PROVIDED BY SINGAPORE (SEE ENR 2.1)

3.1 INTRODUCTION

3.1.1 ATC separation minima based on RNP 10 navigation specification will be applied accordingly for aircraft which are approved for RNP 10 operations on the following segments of RNAV routes which fall within the airspace where ATS is provided by Singapore (see ENR 2.1):

L625 - BTN TOMAN and UXEDA and BTN GUTUP and AKMON
L642 - BTN ESPOB and MERSING
L649 - BTN DAKIX and LAXOR
M635 - BTN VTK and SURGA
M767 - BTN TEGID and UKLIS and BTN NIXEB and TOMAN
M768 - BTN AKMON and ASISU
M771 - BTN MERSING and DUDIS
M774 - BTN OBDOS and JUNHA
N884 - BTN MERSING and OLMUT and BTN RILRI and LAXOR
N892 - BTN MELAS and MERSING
L644 - BTN DUDIS and LIGVU
M772 - BTN ASISU and LAXOR

3.1.2 Additionally, to facilitate reduction of separation between suitably equipped aircraft, ATC separation minima based on RNP 4 navigation specification will be applied accordingly for aircraft which are approved for RNP 4 operations on the following segments of RNAV routes which fall within the Singapore FIR:

M767 – BTN TEGID and UKLIS
N884 – BTN RILRI and LAXOR

Note: Conformance monitoring shall be ensured by establishing an ADS-C event contract specifying a lateral deviation change event with a maximum of 5NM threshold and a waypoint change event.

3.1.3 RCP240 and RSP180 performance specifications shall be required for the application of the Performance-Based Longitudinal Separation Minima and in accordance with ICAO Doc 4444 PANS-ATM paragraph 5.4.2.9.2.

3.1.4 Pilots shall inform ATC of any deterioration or failure of the navigation systems below the navigation requirements for RNP 10. ATC shall then provide alternative separation and / or alternative routing.

3.2 OPERATIONS BY AIRCRAFT NOT MEETING RNP 10

3.2.1 An aircraft that is unable to meet the minimum navigational requirements for RNP 10 must file flight plan at below FL280. Operations at or above FL290 for these aircraft will be subjected to ATC approval, in accordance with the provisions of paragraph 3.2.2.

3.2.2 ATC units receiving a request for a non-RNP 10 approved aircraft to operate on ATS routes specified in paragraph 3.1, at or above FL290, will co-ordinate with adjacent ATC units affected by the flight. In deciding whether or not to approve the flight, each ATC unit will take into consideration:

a. traffic density;
b. communications, including the non-availability of normal communication facilities;
c. weather conditions en-route; and
d. any other factors pertinent at the time.

3.3 SAFETY ASSESSMENT CRITERIA

3.3.1 The safety criteria associated with the introduction of the reduced lateral separation minima of 60NM will be in accordance with the requirements for RNP 10 navigation performance, i.e. aircraft navigation performance shall be such that the standard deviation of lateral track errors shall be less than 8.7km (4.7NM).

3.4 MONITORING OF AIRCRAFT NAVIGATION PERFORMANCE

3.4.1 Monitoring of aircraft navigation performance is a joint responsibility between operators, States of Registry or States of Operators (as applicable), regulatory authorities and the ATS providers. The detection and reporting of non-conformance with the navigation requirements against the following parameters will rely primarily on radar monitoring by ATC units:

Lateral Deviations

i. a deviation of 15NM or more from track centreline based on radar observations;

Longitudinal Deviations

i. where time separation is applied by ATC - when the reported separation based on ATC verified pilot estimates varies by 3 minutes or more from the expected separation at the reporting point; or
ii. where a distance based standard is applied by ATC based on ADS, radar observation or RNAV distance reports - when the distance varies by 10NM or more from the expected distance.

3.4.2 ATC will advise the pilot-in-command when such deviations are observed and implement the required investigation procedures.

3.4.3 The ATC authority will investigate the causes of such deviations in conjunction with the aircraft operator and the State of Registry, or the State of the Operator, as applicable.

3.5 SEPARATION MINIMA

3.5.1 Lateral Separation Minima

a. 60NM lateral separation minima will be applied between aircraft which are approved for RNP 10, operating at or above FL290, on RNAV routes L644 and M772.

b. 50NM lateral separation minima will be applied between aircraft which are approved for RNP 10 operations on RNAV routes L625, L642, L649, M635, M767, M768, M771, M774, N884 and N892.

c. 23NM lateral separation minima will be applied between aircraft which are approved for RNP 4 operations on RNAV routes M767 and N884.

d. When an aircraft not meeting the RNP 10 navigation requirements is approved to operate at or above FL290, on the ATS routes shown in paragraph 3.1, vertical separation shall be applied with aircraft operating on adjacent routes.

3.5.2 Longitudinal Separation

a. 80NM RNAV or 10 minutes (or less) Mach Number Technique (MNT) separation minima may be applied between aircraft in situations where DCPC could not be maintained or when RCP240 / RSP180 performance requirement could not be complied.

Note: The maximum ADS-C periodic reporting interval of 12 minutes shall be used for RNP 4 approved aircraft.

b. 50NM longitudinal separation may be applied between RNP10 approved aircraft on RNAV routes L642, L762, M635, M767, M768, M771, M774 and N884 which either LOGON to CPDLC or are within VHF radio range.

c. 30NM longitudinal separation may be applied between RNP 4 approved aircraft on RNAV routes M767 and N884 which are LOGON to CPDLC.

3.6 OPERATORS' PROCEDURES

3.6.1 The operator shall ensure in-flight procedures, crew manuals and training programmes are established in accordance with RNP 10 or RNP 4 navigation requirements.

3.7 CONTINGENCY PROCEDURES (including WEATHER DEVIATION)

3.7.1 Contingency procedures, including weather deviation, shall be in accordance with the provisions contained in ENR 1.8 paragraphs 1 and 6.

4 NO-PRE-DEPARTURE CO-ORDINATION (NO PDC) PROCEDURES

4.1 INTRODUCTION

4.1.1 No Pre-Departure Co-ordination (No PDC) procedures apply to flights departing from airports within Bangkok, Hanoi, Ho Chi Minh, Hong Kong, Jakarta, Kota Kinabalu, Kuala Lumpur, Manila, Phnom Penh, Sanya, Singapore, Taipei, Ujung Pandang and Vientiane FIRs operating on RNAV and ATS routes over the South China Sea.

4.1.2 No Pre-Departure Co-ordination (No PDC) levels and FPL route shall be omitted in content of ATC clearance for departures from Singapore Changi Airport on ATS routes A457, B466 and B469/M751 to destinations in Peninsular Malaysia and Thailand, as well as to Medan Polonia.

4.2 NO PDC FLIGHT LEVEL ALLOCATION

4.2.1 Flight Level Allocation Scheme (FLAS) for Western Pacific / South China Sea Area:

ATS Route	No-PDC Flight Levels (Other levels available with prior approval)	Remarks
G334	Eastbound - FL250, FL270 Westbound - FL260, FL280	
G580	Eastbound - FL270, FL290, FL330 Westbound - FL280, FL300, FL340	
L517	FL280, FL300, FL340	
L625	FL310, FL320, FL350, FL360, FL390, FL400	
L642	FL310, FL320, FL350, FL360, FL390, FL400	
L644	Southbound - FL330, FL410	
B469 / **M751**	FL280, FL300, FL320, FL340, FL360, FL380, FL400	For flights to/from airports within Bangkok FIR
M753	Northbound - FL260, FL300, FL380 Southbound - FL270, FL330	
M754	Northbound - FL300, FL340, FL380 Southbound - FL290, FL330, FL370, FL410	
M758	Eastbound - FL270, FL290, FL330 Westbound - FL280, FL300, FL340	
M761	Eastbound - FL270, FL290, FL330 Westbound - FL280, FL300, FL340	
M767	FL310, FL320, FL350, FL360, FL390, FL400	
M768	Eastbound - FL270, FL330, FL410 Westbound - FL300, FL380	
M771	FL310, FL320, FL350, FL360, FL390, FL400	
M772	Northbound - FL300, FL380	
N875	Eastbound - FL290, FL330, FL370 Westbound - FL300, FL340, FL380	
N884	FL310, FL320, FL350, FL360, FL390, FL400	
N891	Northbound - FL260, FL300, FL380 Southbound - FL330	
N892	FL310, FL320, FL350, FL360, FL390, FL400	

4.2.2 FLAS for Large Scale Weather Deviations (LSWD) in Western Pacific / South China Sea Area as applicable by Singapore ACC:

Flight Level Allocation (LSWD)	ATS Route and Direction of Flight					
	L642	**M771**	**N892**	**L625**	**N884**	**M767**
	SW	NE	SW	NE	NE	SW
410						
400	400		400			400
390		390		390	390	
380						
370						
360	360		360			360
350		350		350	350	
340						
330						
320	320		320			320
310		310		310	310	
300						
290						

4.2.3 Aircraft requesting FL280, FL300 and FL320 on ATS route L759, L515/M770, N571, N571/N877, P628 and P574 will be cleared to FL280. Succeeding aircraft on the same route will be cleared to FL280 with 10 minutes longitudinal separation provided there is no closing speed with the preceding aircraft. Additional longitudinal separation as appropriate shall be provided by ATC for the faster aircraft following a slower aircraft on the same route.

4.2.4 For aircraft on N571 or N571/ N877, the first aircraft from Singapore or Kuala Lumpur to be over GUNIP can expect its requested flight level.

4.2.5 For aircraft on M770, the first aircraft from Singapore or Kuala Lumpur to be over the Kuala Lumpur / Bangkok FIR boundary can expect its requested flight level.

4.2.6 For aircraft on L759, the first aircraft from Singapore or Kuala Lumpur to be over the Kuala Lumpur / Bangkok FIR boundary can expect its requested flight level.

4.2.7 For aircraft on P628, the first aircraft from Singapore or Kuala Lumpur to be over VPL can expect its requested flight level.

4.2.8 For aircraft going beyond Medan on ATS route L762, FL280 and FL300 may be assigned. Succeeding aircraft on the same route will be cleared to FL280 or FL300 with 10 minutes longitudinal separation provided there is no closing speed with the preceding aircraft. Additional longitudinal separation as appropriate shall be provided by ATC for the faster aircraft following a slower aircraft on the same route.

5 STRATEGIC LATERAL OFFSET PROCEDURES

5.1 INTRODUCTION

5.1.1 Studies and safety analyses conducted by the ICAO Separation and Airspace Safety Panel (SASP) have shown that the application of a strategic lateral offset by aircraft from route centre line would result in an overall increase in safety of operations in remote and oceanic airspace.

5.2 STRATEGIC LATERAL OFFSETS IN EN-ROUTE AIRSPACE

5.2.1 Offsets may only be applied outside surveillance cover in en-route airspace within the Singapore FIR.

5.2.2 Offsets may only be applied by aircraft with automatic offset tracking capability.

5.2.3 The following requirements may apply to the use of the offset:

a. The decision to apply a strategic lateral offset is the responsibility of the flight crew;

b. The offset shall be established at a distance of one or two nautical miles to the right of the centre line relative to the direction of flight. Offsets are not to exceed two nautical miles right of centre line;

c. The strategic lateral offset procedure has been designed to include offsets to mitigate the effects of wake turbulence of preceding aircraft. If wake turbulence needs to be avoided, offsets to the right of the centreline relative to the direction of flight in tenths of a nautical mile up to a maximum of 3.7km (2nm) shall be used.

Pilots may contact other aircraft on the air to air frequency, 123.45MHz, as necessary, to coordinate the best wake turbulence offset option. As noted below, it is not necessary to notify air traffic control of approved offsets;

d. In airspace where the use of lateral offsets has been authorized, ATC clearance is not required for this procedure and pilots are not required to inform ATC that an offset is being applied;

e. Position reports are based on the current ATC clearance and not the exact coordinates of the offset position.

An example of a position report made by a pilot when passing reporting point TODAM while being offset from track is:

"Singapore Radio, Singapore 871, position TODAM 0930 Flight Level 380, estimate.....etc".

6 WEATHER DEVIATION PROCEDURES IN THE SINGAPORE FIR AND AIRSPACE WHERE ATS IS PROVIDED BY SINGAPORE (SEE ENR 2.1)

6.1 GENERAL

Note.- The following procedures are intended for deviations around adverse meteorological conditions.

6.1.1 Modern ATC radar equipment are normally designed to suppress weather clutter and ATC may not always be aware of its presence.

6.1.2 ATC may pass observed weather information that appears likely to affect the pilot's flight and advise if a detour will result in the aircraft leaving controlled airspace. The pilot will be responsible for deciding whether to accept a detour into uncontrolled airspace.

6.1.3 If the pilot intends to detour a storm centre observed on his radar display, the pilot shall, obtain clearance from ATC for his proposed action. This is to ensure that separation which ATC may be providing to other aircraft is not prejudiced.

6.1.4 The following procedures are intended to enhance ICAO Regional Supplementary Procedures (DOC 7030). However, it must be recognised that all possible circumstances cannot be covered. The pilot's judgement shall ultimately determine the sequence of actions taken and ATC shall render all possible assistance.

6.2 OBTAINING ATC PRIORITY WHEN WEATHER DEVIATION IS REQUIRED

6.2.1 When weather deviation is required, the pilot should initiate communications with ATC via voice or CPDLC. A rapid response may be obtained by either:

a. stating "WEATHER DEVIATION REQUIRED" to indicate that priority is desired on the frequency and for ATC response; or
b. requesting a weather deviation using a CPDLC lateral downlink message.

6.2.2 When necessary, the pilot should initiate the communications using the urgency call "PAN PAN" (preferably spoken three times) or by using a CPDLC urgency downlink message to alert all listening parties of a special handling condition which requires ATC priority for issuance of a clearance or assistance.

6.3 ACTIONS TO BE TAKEN WHEN CONTROLLER-PILOT COMMUNICATIONS ARE ESTABLISHED

6.3.1 When two-way pilot-controller communications are in effect, the pilot should notify ATC and request clearance to deviate from track or ATS route, advising, when possible, the extent of the deviation requested. The flight crew will use whatever means are appropriate (i.e. voice and/or CPDLC) to communicate during a weather deviation.

Note.- Pilots are advised to contact ATC as soon as possible with requests for clearance in order to provide adequate time for the request to be assessed and acted upon.

6.3.2 After communicating with ATC, ATC will take one of the following actions:

a. if there is no conflicting traffic in the lateral dimension, ATC shall issue clearance to deviate from track;
b. if there is conflicting traffic in the lateral dimension, ATC shall separate aircraft by establishing vertical separation and issue a clearance to deviate from track;
c. if there is conflicting traffic in the lateral dimension, and ATC is unable to establish vertical separation, ATC shall advise the pilot and provide information on all other aircraft with which the aircraft could potentially conflict.

6.3.3 The pilot shall either:

a. comply with the ATC clearance issued; or
b. if ATC is unable to issue a revised clearance, the pilot shall evaluate the circumstances of the situation and advise ATC of intentions before executing the procedures detailed in paragraph 6.4. ATC will issue essential traffic information to all affected aircraft.

6.4 ACTIONS TO BE TAKEN IF A REVISED ATC CLEARANCE CANNOT BE OBTAINED

6.4.1 If the aircraft is required to deviate from track or ATS route to avoid adverse meteorological conditions and a revised ATC clearance cannot be obtained, the pilot shall take the following actions:

a. if possible, deviate away from an organized track or ATS route system;
b. establish communications with and alert nearby aircraft by broadcasting on 121.5MHz, at suitable intervals:. (or, on 123.45MHz as a backup inter-pilot air-to-air frequency);

   i. aircraft identification;
   ii. flight level;
   iii. position (including ATS route designator or the track code); and
   iv. intentions.

c. watch for conflicting traffic both visually and by reference to ACAS (such as TCAS, if equipped);
d. turn on all aircraft exterior lights (commensurate with appropriate operating limitations);
e. for deviations of less than 5.0 NM from the originally cleared track or ATS route, remain at a level assigned by ATC;
f. for deviations greater than, or equal to 5.0 NM from the originally cleared track or ATS route, when the aircraft is approximately 5.0 NM from track, initiate a level change in accordance with the following table:

Originally cleared track or ATS route centreline	Deviations greater than 5NM	Level change
EAST (000-179 magnetic)	LEFT RIGHT	DESCEND 300ft CLIMB 300ft
WEST (180-359 magnetic)	LEFT RIGHT	CLIMB 300ft DESCEND 300ft

g. if the pilot receives clearance to deviate from cleared track or ATS route for a specified distance and, subsequently, requests, but cannot obtain a clearance to deviate beyond that distance, the pilot should apply an altitude offset in accordance with the table above before deviating beyond the cleared distance; and
h. when returning to track or ATS route, be at its assigned flight level when the aircraft is within approximately 5.0 NM of the centreline.

Note.- If, as a result of actions taken under the provisions of 6.4.1, the pilot determines that there is another aircraft at or near the same flight level with which a conflict may occur, then the pilot is expected to adjust the path of the aircraft, as necessary, to avoid conflict.

6.4.2 If contact was not established prior to deviating, continue to attempt to contact ATC to obtain a clearance. If contact was established, continue to keep ATC advised of intentions and obtain essential traffic information.

6.4.3 The pilot shall inform ATC when weather deviation is no longer required, or when a weather deviation has been completed and the aircraft has returned to its cleared route.

7 AIR TRAFFIC MANAGEMENT CONTINGENCY PLAN

7.1 INTRODUCTION

7.1.1 The Air Traffic Management (ATM) Contingency Plan for Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1) has been developed to fulfil the requirements of the ICAO Standards and Recommended Practices contained in Annex 11 and the Regional Supplementary Procedures (Doc 7030). In the event of partial or total disruption to the provision of Air Traffic Services (ATS) and / or the related support services in Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1), the ATM Contingency Plan referred to in this section shall be activated to ensure the continued safety of air navigation of aircraft operating through the affected airspace.

7.1.2 However, this contingency plan does not address arrangements for aircraft arriving and departing at Singapore airports. Aircraft departing or landing at Changi operating within 60NM from Singapore will be subjected to contingency procedures stated in ENR 1.8 paragraphs 1.5, 1.6, 1.7 and 1.8.

7.1.3 This ATM Contingency Plan provides:

a. the contingency routes structure using existing published airways to enable transit through the Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1) and

b. the associated Air Traffic Control (ATC) procedures to support the contingency plan.

7.1.4 As and where dictated by circumstances, aircraft planning to operate through Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1) that have not yet departed may be temporarily suspended until a full assessment of the prevailing conditions has been determined and sufficient air traffic services restored.

7.1.5 Long-haul international aircraft and special operations (e.g. Search and Rescue (SAR), State aircraft, humanitarian flights, etc.) shall be afforded priority for levels at FL290 and above. Aircraft operators that operate domestic and regional flights should plan on the basis that FL290 and above may not be available.

7.1.6 Aircraft operators may elect to avoid the Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1) by using ATS routes outside of Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1).

7.2 REDUCED ATS AND PROVISION OF FLIGHT INFORMATION SERVICES (FIS)

7.2.1 During the period where the contingency arrangements are in place, ATS including ATC services may not be available, a NOTAM will be issued providing the relevant information. The contingency plan provides for limited flight information and alerting services to be provided by Singapore ACC.

7.2.2 FIS and flight monitoring will be provided by the designated ATS authorities for the adjacent FIRs on the contingency routes that enter their respective FIRs.

7.2.3 During the early stages of a contingency event, ATC may be overloaded and tactical action may be taken to re-clear aircraft on alternative routes not included in this Plan.

7.2.4 In the event that ATS cannot be provided in the Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1) a NOTAM shall be issued indicating the following:

a. time and date on the commencement of the contingency measures;
b. airspace available for aircraft operations and airspace to be avoided;
c. details of the facilities and services available or not available and any limits on ATS provision, including an expected date of restoration of services if available;
d. information on the provisions made for alternative services;
e. applicable ATS routes, AIP-published contingency routes, or tactically defined contingency routes;
f. any special procedures to be complied by neighbouring ATS units not covered by this Plan;
g. any special procedures to be complied by pilots; and
h. any other details that aircraft operators may find useful with respect to the disruption and actions taken.

7.2.5 In the event that the Singapore International NOTAM Office is unable to issue the NOTAM, the alternate International NOTAM Office will take action to issue the contingency NOTAM upon notification by CAAS.

7.3 AIRCRAFT SEPARATION AND SPACING

7.3.1 Aircraft separation criteria, where applicable, will be in accordance with the ICAO Procedures for Air Navigation Services - Air Traffic Management (PANS-ATM, Doc 4444) and the Regional Supplementary Procedures (Doc 7030).

7.3.2 The longitudinal separation / spacing will be 15 minutes. However, this may be reduced to 10 minutes in conjunction with application of the Mach number technique where authorized by CAAS and the agreed ATS coordination with the adjacent ATS authority.

7.3.3 The contingency route structure provides for lateral separation / spacing of 100NM. In cases where the lateral spacing of contingency routes is less than 100NM, a minimum vertical separation of 1000 feet will be applicable.

7.4 PRIORITY FOR FLIGHT LEVELS

7.4.1 Where possible, aircraft on long-haul international flights shall be afforded priority for cruising levels assigned in accordance with the flight level allocation scheme as specified in paragraph 7.10.

7.5 AIRSPACE CLASSIFICATIONS

7.5.1 Depending on the degree of disruption, airspace classifications may be changed to reflect the reduced level of services. Changes to airspace classification will be notified via NOTAM.

7.6 AIRCRAFT POSITION REPORTING

7.6.1 Beyond VHF coverage, Automatic Dependent Surveillance - Contract (ADS-C) shall replace any requirement for voice position reporting to ATC for suitably equipped aircraft and in this case Controller-Pilot Data Link Communications (CPDLC) or HF will be the secondary means of communication. When CPDLC has been authorised for use by the relevant ATC authority, this will become the primary means of communication while HF will act as the secondary means of communication. If means of communication (i.e. ADS-C, CPDLC, HF, VHF) are not available, aircraft operators shall comply with the communications procedures as stated in paragraph 7.9.

7.6.2 In the event that communication with the appropriate ATS authority could not be established, aircraft operators may apply Traffic Information Broadcast by Aircraft (TIBA) procedures in the Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1) as outline in paragraph 7.11 on 121.5MHz.

7.7 EXCLUSIONS

7.7.1 VFR flights shall not operate in the Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1) during contingency operations, except for State aircraft, Medevac flights, and any other aircraft as authorised by CAAS.

7.8 PILOT AND OPERATOR PROCEDURES

7.8.1 **Filing of flight plans**

7.8.1.1 Flight planning requirements detailed in AIP Singapore continue to apply during contingency operations, except where modified by the contingency ATS routes and flight level allocation scheme specified by ATC and / or in NOTAM.

7.8.1.2 Airspace users are expected to familiarize themselves with the Contingency Plan of the Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1) and the activation times. For aircraft intending to operate in areas during periods when the Contingency Plan is activated, the operators shall plan the flight to conform to the requirements of Contingency Plan.

7.8.1.3 The flight planning requirements during contingency periods will be in accordance to ICAO Annex 2 Chapter 3 and DOC 4444 Chapter 4 and Appendix 2. Additional information, will, however, be required, to indicate that the aircraft will operate in airspace where the Contingency Plan is active.

7.8.2 **Overflight approval**

7.8.2.1 Airspace users must obtain overflight approval from CAAS prior to operating aircraft through the Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1). During the period of activation of this Contingency Plan, the adjacent ATS authority will provide normal ATC clearances for aircraft to enter Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1). The adjacent ATS authority is not responsible for coordination or provision of overflight clearances for Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1). The airspace users must ensure any required overflight approval has been obtained.

7.8.3 **Pilot operating procedures**

7.8.3.1 Pilots will continue to make or broadcast routine position reports in line with normal ATC procedures.

7.8.3.2 Pilots of aircraft operating in the Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1) during contingency operations shall comply with the following procedures:

a. all aircraft proceeding along the ATS routes established in this Contingency Plan will comply with the instrument flight rules (IFR) and will be assigned a flight level in accordance with the flight level allocation scheme applicable to the route(s) being flown as specified in paragraph 7.10;
b. aircraft are to flight plan using the Contingency Routes specified in paragraph 7.10, according to their airport of origin and destination;
c. aircraft are to operate as close as possible to the centre line of the assigned contingency route;
d. a continuous communications watch shall be maintained on the specified contingency frequency as specified in paragraph 7.10;
e. aircraft position reports and other information as necessary shall be broadcast in accordance with TIBA procedures defined in paragraph 7.11;
f. aircraft navigation and anti-collision lights shall be displayed;
g. except in cases of emergency or for reasons of flight safety, pilots are to maintain the last assigned flight level, MACH number and SSR transponder code during their entire flight within Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1). If no transponder code has been assigned, aircraft shall squawk Code 2000.

h. aircraft are to reach the flight level last assigned by the responsible ACC at least 10 minutes before entering the Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1) or as otherwise instructed by the ATC unit acting in accordance with the Operational Contingency Arrangement;
i. pilots are to contact the next adjacent ACC as soon as possible, and in any event not less than ten (10) minutes before the estimated time of arrival over the relevant exit point from the Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1);
j. pilots are to strictly adhere to the ICAO Traffic Information Broadcasts by Aircraft (TIBA) procedures, reproduced in paragraph 7.11, on the specified VHF and HF frequencies listed in paragraph 7.10. When necessitated by emergency conditions or flight safety requirements, pilots are to transmit blind on these frequencies, their current circumstances and the commencement and completion of any climb and descent or deviation from the cleared contingency route;
k. whenever emergencies and / or flight safety reasons make it impossible to maintain the flight level assigned for transit of Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1), pilots are to comply with the special procedures for in-flight contingencies set out in ENR 1.8 paragraph 1.5. If the deviation brings the aircraft out of Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1), pilots are to immediately inform the ACC unit responsible for that airspace. Pilots are to broadcast details of any level change including aircraft identification, aircraft position and route, vacated flight level, intended flight level; flight level passed and cruising flight level on 121.5MHz;
l. pilots are to maintain own longitudinal separation of 15 minutes from preceding aircraft at the same cruising level. However, this may be reduced to 10 minutes in conjunction with application of the Mach number technique where authorized by CAAS and the agreed ATS coordination with the adjacent ATS authority; and
m. not all operational circumstances can be addressed by this Contingency Plan and pilots are to maintain a high level of alertness when operating in the contingency airspace and take appropriate action to ensure safety of aircraft.

7.8.4 **Interception of civil aircraft**

7.8.4.1 Aircraft operators must be familiar with international intercept procedures contained in ICAO Annex 2 - Rules of the Air, paragraph 3.8 and Appendix 2, Sections 2 and 3.

7.8.4.2 Pilots are to comply with instructions given by the pilot of the intercepting aircraft. In such circumstances, the pilot of the aircraft being intercepted shall broadcast information on the situation.

7.8.4.3 If circumstances leading to the closure of the Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1) where no contingency routes are available, aircraft will be required to keep clear of Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1). As much warning as possible will be provided by the appropriate ATS authorities in the event of the complete closure of airspace.

7.8.4.4 Pilots shall continuously guard the VHF emergency frequency 121.5MHz and shall operate their transponder at all times during flight, regardless of whether the aircraft is within or outside airspace where secondary surveillance radar (SSR) is used for ATS purposes. Transponder should be set on the last discrete code assigned by ATC or select Code 2000 if no code was assigned.

7.9 COMMUNICATION PROCEDURES

7.9.1 **Degradation of Communication - Pilot Radio Procedures**

7.9.1.1 When operating within the contingency airspace, pilots should use normal radio communication procedures where ATS services are available. Where limited or no ATS is available, communications shall be conducted in accordance with the procedures in this Plan or as otherwise notified by NOTAM.

7.9.1.2 If communications are lost unexpectedly on the normal ATS frequencies, pilots shall try the next applicable frequency, e.g. if en-route contact is lost, pilots shall try the next appropriate frequency (the next normal handover frequency). Pilots should also consider attempting to contact ATC on the last frequency where two-way communication had been established. In the absence of communication with ATC, the pilot shall continue to make routine position reports on the assigned frequency, and also broadcast positions in accordance with the TIBA procedures in paragraph 7.11.

7.9.2 **Communication frequencies**

7.9.2.1 A list of frequencies to be used for the contingency routes and the ATS units providing FIS and air-ground communication monitoring for the Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1) is detailed in paragraph 7.10.

7.10 CONTINGENCY ROUTES

7.10.1 Between Singapore and Manila FIR

7.10.1.1 The following table shows the Contingency Routes (CR) Structure, Flight Level Allocation Scheme (FLAS) and Transfer of Control and Communication (TOC) between Singapore and Manila FIR.

CR	ATS Route	Direction	FLAS	ACC	Transfer of Communication (TOC)	Remarks
CRS-3	N884 (075400N 1122000E - LAXOR)	East	FL310 FL350	Manila ACC	At 075400N 1122000E, contact Manila ACC: - ADS/CPDLC: Logon RPHI - HF: 5655 / 8942 - VHF : 118.9 (LAXOR)	Aircraft operators may choose to avoid the Singapore FIR by using alternate ATS routes in other FIRs.
CRM-3	N884 (LAXOR - CAB)	East	FL310 FL350 FL390	Kobe ACC	At CAB, contact Tokyo Radio: - HF: 8903 / 4666 - VHF: 123.9 (LEBIX)	Aircraft operators may choose to avoid the Manila FIR by using alternate ATS routes in other FIRs.
CRM-4	M767 (JOM - TEGID)	West	FL320 FL360 FL400	Singapore ACC	At JOM, contact Singapore ATC: - ADS/CPDLC: Logon WSJC - HF: 5655 / 8942	Aircraft operators may choose to avoid the Manila FIR by using alternate ATS routes in other FIRs.
N/A	M772	N/A	N/A	N/A	Not applicable. M772 will be suspended. No flight planning is allowed.	N/A

7.10.2 Between Singapore and Ho Chi Minh FIR

7.10.2.1 The following table shows the Contingency Routes (CR) Structure, Flight Level Allocation Scheme (FLAS) and Transfer of Control and Communication (TOC) between Singapore and Ho Chi Minh FIR.

CR	ATS Route	Direction	FLAS	ACC	Transfer of Communication (TOC)	Remarks
CRS-1	L642 (ESPOB – 060000N 1045600E)	West	FL360 FL400	Ho Chi Minh ACC	At 060000N 1045600E, contact Kuala Lumpur ATC: - VHF: 132.6 - HF: 5655 / 8942	International operators may choose to avoid the Singapore FIR by using alternate ATS routes in other FIRs.
CRS-2	M771 (060000N 1060900E – DUDIS)	East	FL350 FL390	Ho Chi Minh ACC	At 060000N 1060900E, contact Ho Chi Minh ATC: - ADS / CPDLC: Logon VVHM - VHF: 133.05 / 120.9 - HF: 5655 / 8942	International operators may choose to avoid the Singapore FIR by using alternate ATS routes in other FIRs.
CRS-3	N884 (060000N 1095600E – 075400N 1122000E)	East	FL310 FL350	Ho Chi Minh ACC	At 060000N 1095600E, contact Ho Chi Minh ATC: - ADS / CPDLC: Logon VVHM - VHF: 133.05 / 120.7 - HF: 5655 / 8942 At 075400N 1122000E, contact Manila ATC: - ADS / CPDLC: Logon RPHI - VHF: 118.9 (LAXOR) - HF: 5655 / 8942	International operators may choose to avoid the Singapore FIR by using alternate ATS routes in other FIRs.

CR	ATS Route	Direction	FLAS	ACC	Transfer of Communication (TOC)	Remarks
CRS-4	M768 (064600N 1121500E - AKMON)	East	FL330	Ho Chi Minh ACC	At 064600N 1121500E, contact Kota Kinabalu ATC: - ADS / CPDLC: Logon WBFC - VHF: 126.1	International operators may choose to avoid the Singapore FIR by using alternate ATS routes in other FIRs.
		West	FL380	Ho Chi Minh ACC	At 064600N 1121500E, contact Ho Chi Minh ATC: - ADS / CPDLC: Logon VVHM - VHF: 133.05 / 120.7	
CRH-1	N891 (XONAN - IGARI)	North	FL300	Hanoi ACC	At IGARI, contact Hanoi ACC: - VHF: 120.9	International operators may choose to avoid the Ho Chi Minh FIR by using alternate ATS routes in other FIRs.
		South	FL330	Hanoi ACC	At IGARI, contact Singapore ATC: - ADS / CPDLC: Logon WSJC - VHF: 134.35 - HF: 5655 / 8942	
CRH-2	M753 (OSOTA – IPRIX)	North	FL270	Hanoi ACC	At IPRIX, contact Hanoi ACC: - VHF: 120.9	International operators may choose to avoid the Ho Chi Minh FIR by using alternate ATS routes in other FIRs.
		South	FL260	Hanoi ACC	At IPRIX, contact Singapore ATC: - ADS / CPDLC: Logon WSJC - VHF: 134.35 - HF: 5655 / 8942	
CRH-3	R468 / M768 (SAPEN – TSH – AKMON)	East	FL270	Hanoi ACC	At AKMON, contact Singapore ATC: - ADS / CPDLC: Logon WSJC - HF: 5655 / 8942	International operators may choose to avoid the Ho Chi Minh FIR by using alternate ATS routes in other FIRs.
		West	FL380	Hanoi ACC	At AKMON, contact Hanoi ACC: - VHF: 133.05 - HF: 5655 / 8942	
CRH-4	L642 (EXOTO – ESPOB)	West	FL310 FL320 FL390 FL400	Hanoi ACC	At ESPOB, contact Singapore ATC: - ADS / CPDLC: Logon WSJC - VHF: 134.35 - HF: 5655 / 8942	International operators may choose to avoid the Ho Chi Minh FIR by using alternate ATS routes in other FIRs.
CRH-5	M771 (DUDIS - DONDA)	East	FL310 FL320 FL390 FL400	Hanoi ACC	At DUDIS, contact Hanoi ACC: - VHF: 133.05 / 120.7 - HF: 5655 / 8942	International operators may choose to avoid the Ho Chi Minh FIR by using alternate ATS routes in other FIRs.
CRH-6	N892 (MIGUG – MELAS)	West	FL310 FL320 FL390 FL400	Hanoi ACC	At MELAS, contact Singapore ATC: - ADS / CPDLC: Logon WSJC - VHF: 134.35 - HF: 5655 / 8942	International operators may choose to avoid the Ho Chi Minh FIR by using alternate ATS routes in other FIRs.
CRH-7	L625 (AKMON – ARESI)	East	FL310 FL320 FL390 FL400	Hanoi ACC	At AKMON, contact Hanoi ACC: - VHF: 133.05 / 120.7 - HF: 5655 / 8942	International operators may choose to avoid the Ho Chi Minh FIR by using alternate ATS routes in other FIRs.

7.10.3 **Between Singapore and Kota Kinabalu FIR**

7.10.3.1 To be developed

7.10.4 **Between Singapore and Kuala Lumpur FIR**

7.10.4.1 To be developed

7.11 TRAFFIC INFORMATION BROADCASTS BY AIRCRAFT (TIBA)

7.11.1 **Introduction and applicability of broadcasts**

7.11.1.1 Traffic information broadcasts by aircraft are intended to permit reports and relevant supplementary information of an advisory nature to be transmitted by pilots on a designated VHF radiotelephone (RTF) frequency for the information of pilots of other aircraft in the vicinity.

7.11.1.2 TIBAs shall be introduced only when necessary and as a temporary measure.

7.11.1.3 The broadcast procedures shall be applied in designated airspace where:

a. there is a need to supplement collision hazard information provided by air traffic services outside controlled airspace; or

b. there is a temporary disruption of normal air traffic services.

7.11.1.4 Such airspaces shall be identified by the States responsible for provision of air traffic services within these airspaces, if necessary with the assistance of the appropriate ICAO Regional Office(s), and duly promulgated in aeronautical information publications or NOTAM, together with the VHF RTF frequency, the message formats and the procedures to be used. Where, in the case of paragraph 7.11.1.3 a., more than one State is involved, the airspace should be designated on the basis of regional air navigation agreements and promulgated in Doc 7030.

7.11.1.5 When establishing a designated airspace, dates for the review of its applicability at intervals not exceeding 12 months should be agreed by the appropriate ATS authority(ies).

7.11.2 **Details of broadcasts**

VHF RTF frequency to be used

7.11.2.1 The VHF RTF frequency to be used shall be determined and promulgated on a regional basis. However, in the case of temporary disruption occurring in controlled airspace, the States responsible may promulgate, as the VHF RTF frequency to be used within the limits of that airspace, a frequency used normally for the provision of air traffic control service within that airspace.

7.11.2.2 Where VHF is used for air-ground communications with ATS and an aircraft has only two serviceable VHF sets, one should be tuned to the appropriate ATS frequency and the other to the TIBA frequency.

Listening watch

7.11.2.3 A listening watch shall be maintained on the TIBA frequency 10 minutes before entering the designated airspace until leaving this airspace. For an aircraft taking off from an aerodrome located within the lateral limits of the designated airspace, listening watch should start as soon as appropriate after take-off and be maintained until leaving the airspace.

Time of broadcasts

7.11.2.4 A broadcast shall be made:

a. 10 minutes before entering the designated airspace or, for a pilot taking off from an aerodrome located within the lateral limits of the designated airspace, as soon as appropriate after take-off;

b. 10 minutes prior to crossing a reporting point;

c. 10 minutes prior to crossing or joining an ATS route;

d. at 20-minute intervals between distant reporting points;

e. 2 to 5 minutes, where possible, before a change in flight level;

f. at the time of a change in flight level; and

g. at any other time considered necessary by the pilot.

Forms of broadcast

7.11.2.5 The broadcasts other than those indicating changes in flight level, i.e. the broadcasts referred to in paragraph 7.11.2.4 a., b., c., d. and g., should be in the following form:

ALL STATIONS (necessary to identify a traffic information broadcast)

(call sign)

FLIGHT LEVEL (number) (or CLIMBING* TO FLIGHT LEVEL (number))

(direction)

(ATS route) (or DIRECT FROM (position) TO (position))

POSITION (position**) AT (time)

ESTIMATING (next reporting point, or the point of crossing or joining a designated ATS route) AT (time)

(call sign)

FLIGHT LEVEL (number) (direction)

Fictitious example:

"ALL STATIONS WINDAR 671 FLIGHT LEVEL 350 NORTHWEST BOUND DIRECT FROM PUNTA SAGA TO PAMPA POSITION 5040 SOUTH 2010 EAST AT 2358 ESTIMATING CROSSING ROUTE LIMA THREE ONE AT 4930 SOUTH 1920 EAST AT 0012 WINDAR 671 FLIGHT LEVEL 350 NORTHWEST BOUND OUT"

7.11.2.6 Before a change in flight level, the broadcast (referred to in paragraph 7.11.2.4 e.) should be in the following form:

ALL STATIONS

(call sign)

(direction)

(ATS route) (or DIRECT FROM (position) TO (position))

LEAVING FLIGHT LEVEL (number) FOR FLIGHT LEVEL (number) AT (position and time)

7.11.2.7 Except as provided in paragraph 7.11.2.8, the broadcast at the time of a change in flight level (referred to in paragraph 7.11.2.4 f.) should be in the following form:

ALL STATIONS

(call sign)

(direction)

(ATS route) (or DIRECT FROM (position) TO (position))

LEAVING FLIGHT LEVEL (number) NOW FOR FLIGHT LEVEL (number)
followed by:

ALL STATIONS

(call sign)

MAINTAINING FLIGHT LEVEL (number)

7.11.2.8 Broadcasts reporting a temporary flight level change to avoid an imminent collision risk should be in the following form:

ALL STATIONS

(call sign)

LEAVING FLIGHT LEVEL (number) NOW FOR FLIGHT LEVEL (number)
followed as soon as practicable by:

ALL STATIONS

(call sign)

RETURNING TO FLIGHT LEVEL (number) NOW

ENR 1.9 AIR TRAFFIC FLOW MANAGEMENT (ATFM)

1 AIR TRAFFIC FLOW MANAGEMENT (ATFM)

1.1 ATFM is a service to complement the safe, orderly and efficient delivery of Air Traffic Services (ATS) by regulating air traffic flow to match the prevailing capacity at a given airport or airspace. Through ATFM, airspace users (AUs) and ATS units (ATSUs) can be made aware of predicted delays so that timely adjustment to operations and flight schedules could be made accordingly. ATFM measure such as Ground Delay Programme (GDP), Minimum Departure Interval (MDI) and Miles- in-Trail (MIT) are some of the methods to achieve the objectives of ATFM as defined in ICAO's Manual on Collaborative ATFM (Doc 9971).

1.2 For Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1), ATFM services are provided by Civil Aviation Authority of Singapore (CAAS) from the Singapore ATFM Unit (ATFMU) operating on a 24-hour basis. The services comprise the planning and implementation of ATFM measures to balance demand and capacity. The review of the effectiveness of ATFM measures are carried out through the conduct of post operation analysis. The implementation of ATFM measures will be coordinated with AUs and ATSUs through Collaborative Decision Making (CDM) processes and agreed operating procedures.

2 ATFM OPERATIONS FOR FLIGHTS ARRIVING AT SINGAPORE CHANGI AIRPORT

2.1 Where necessary, ATFM measures will be applied for flights scheduled to arrive at Singapore Changi Airport (WSSS).

2.2 Flights departing from the following airports may be subjected to ATFM measures:

States/Administrations	Airport
Cambodia	VDPP, VDSA, VDSV
China	ZGGG, ZGSZ, ZJHK, ZJSY
Hong Kong	VHHH, VMMC
Indonesia	WIII, WADD, WARR
Malaysia	WBGG, WBGR, WBKK, WMKC, WMKI, WMKJ, WMKK, WMKP, WMSA, WMKL
Myanmar	VYMD, VYNT, VYYY
Philippines	RPLL, RPLC, RPVM, RPSP
Republic of Korea	RKSI, RKSS, RKPK, RKPC, RKTN, RKNW
Thailand	VTBS, VTSP, VTBD, VTBU, VTCC, VTCT, VTSB, VTSG, VTSM, VTSS, VTUD
Vietnam	VVTS, VVNB, VVDN, VVCI, VVCR, VVPQ, VVVD, VVVH, VVPB, VVCT, VVDL

2.3 When ATFM measures are applied, the Singapore ATFMU will assign Calculated Take-Off Times (CTOTs) to flights departing from the airports listed in paragraph 2.2 planning to arrive into Singapore Changi Airport.

2.4 AUs and ATSUs are advised to refer to the Air Traffic Flow Management (ATFM) Portal to access CTOTs and/or other pertinent ATFM information via the Civil Aviation Authority Singapore (CAAS) Webpage, link provided: http://www.caas.gov.sg/e-services/air-traffic-flow-management

2.5 Compliance to CTOT during the ATFM operation is important, it contributes to the realisation of the ATFM plan. It would assist in the reduction of the need for tactical airborne delay, promoting a safer and more efficient operating environment for AOs and AUs.

2.6 All AUs planning to arrive into WSSS shall:

i. file and submit FPLs at least 3 hours before the Estimated Off Block Time (EOBT);
ii. transmit the appropriate ATS messages (CHG / DLA) when the EOBT changes by more than 15 minutes; and
iii. transmit CNL message if the flight is cancelled after the submission of FPL.

2.7 FPLs and ATS messages shall be addressed to WSJCZQZX.

3 ATFM OPERATIONS FOR FLIGHTS PLANNING TO OPERATE WITHIN THE SINGAPORE FIR AND AIRSPACE WHERE ATS IS PROVIDED BY SINGAPORE (SEE ENR 2.1)

3.1 The Singapore ATFMU may implement ATFM measures to facilitate ATC of flow restrictions originated by downstream ATSUs, with the aim to provide a higher level of predictability for AUs and affected upstream ATSUs when operating in the Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1). For example, flow restriction on a given ATS route in a form of Minutes-in- trail MINIT at downstream segments would be converted into CTOT, and/or Calculated Time Over (CTO) at a given waypoint within the Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1).

3.2 Procedures for flight plan submission for such ATFM facilitation would be coordinated tactically by the Singapore ATFMU with AUs and affected upstream ATSUs. The transmit of the appropriate ATS messages would take reference from para 2.6 in the above.

Note: In general, Singapore ATFMU would request for FPL to be filed and submitted within 1 hour from the notification of the activation of ATFM measure.

3.3 FPLs and ATS messages should be addressed to WSJCZQZX.

4 SINGAPORE ATFMU CONTACT INFORMATION AND WEB CONFERENCE

4.1 When ATFM measure are implemented, Singapore ATFMU will open a CDM channel for AUs and affected ATSUs through an active web conferencing facilities and ATFM helpdesk thereafter to facilitate operational queries from AUs relating to the ATFM measure.

4.2 The contact details of the Singapore ATFMU are as follows:
Email: CAAS_ATFMU@caas.gov.sg
Phone: (+65) 62414143, (+65) 62414142
Fax: (+65) 62414034

5 BAY OF BENGAL COOPERATIVE ATFM (BOBCAT)

5.1 INTRODUCTION

5.1.1 The States of the ICAO Asia/Pacific Region within the Bay of Bengal, South Asia and Pakistan airspace have implemented an automated Air Traffic Flow Management (ATFM) service under the auspices of the ICAO Bay of Bengal ATS Coordination Group - ATFM Task Force.

5.2 PROVISION OF ATFM SERVICES

5.2.1 ATFM services are provided by Aeronautical Radio of Thailand LTD (AEROTHAI) from the Bangkok Air Traffic Flow Management Unit (ATFMU) at Bangkok ACC. ATFM services will be limited to calculation, promulgation and management of mandatory Calculated Take-Off Time (CTOT) and Kabul FIR flight level, ATS route and Calculated Time-Over (CTO) entry waypoint for each affected flight.

5.2.2 Singapore ATC retains responsibility for the tactical management of flights that are subject to ATFM. In discharging tactical responsibilities, Singapore ATC will manage non-ATFM compliant flights using delayed pushback and start clearances, non-preferred routes and/or flight levels.

5.2.3 The ATFMU utilises the automated web based Bay of Bengal Cooperative ATFM System (BOBCAT) system in meeting its ATFM responsibilities. These responsibilities will be managed in coordination with aircraft operators and Singapore ATC in the Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1).

5.2.4 The Bangkok ATFMU operates on a 24-hour basis and is responsible for westbound flights entering the Kabul FIR at specified times, flight levels and ATS routes in accordance with paragraph 5.3. The objectives of these ATFM services are to:

a. reduce ground and en-route delays;
b. maximise capacity and optimize the flow of air traffic through Kabul FIR;
c. provide an informed choice of routing and flight level selection;
d. alleviate unplanned in-flight re-routing and technical stops; and
e. assist regional Air Navigation Service Providers (ANSPs) in planning for and managing future workload in the light of forecast increased traffic flows through Kabul FIR.

5.3 ATFM AFFECTED ATS ROUTES, FLIGHT LEVELS AND APPLICABLE HOURS

5.3.1 All westbound flights intending to enter Kabul FIR between 2000UTC and 2359UTC daily on ATS routes and flight levels specified in the Table below shall comply with the BOBCAT ATFM procedure. This includes a mandatory requirement to obtain ATFM slot allocation - CTOT, CTO at Kabul FIR entry waypoint, allocated flight level and allocated ATS route from Bangkok ATFMU for entry into Kabul FIR.

Routing through the Kabul FIR	Metering Waypoint	Flight Level
L509 - M875	LAJAK	FL280, FL300, FL320, FL340, FL360, FL380, FL400
M875	SITAX	FL280, FL300, FL320, FL340, FL360, FL380, FL400
N644	DOBAT	FL280, FL300, FL320, FL340, FL360, FL380, FL400
L750	BIROS	FL280, FL300, FL320, FL340, FL360, FL380, FL400
P628	ASLUM	FL300, FL320, FL340, FL360, FL380, FL400
N636 - P628	SERKA	FL280, FL300, FL320, FL340, FL360, FL380, FL400

5.3.2 Flights that plan to enter Kabul FIR without an ATFM slot allocation will be accommodated only after flights with slots have been processed. Such flights should expect delayed pushback and start clearances, non- preferred routes and/or flight levels, enroute holding and/or diversion around Kabul FIR.

5.3.3 The following flights are exempted from the ATFM procedures:

a. Flights experiencing an emergency, including aircraft subjected to unlawful interference;
b. Flights on search and rescue or firefighting missions;
c. Urgent medical evacuation flights or humanitarian flights specifically declared by State medical authorities that flight delays would put the life of patients aboard at risk; and
d. Flights with “Head of State” status.

Note: After medical flights have completed their mission, they should be subjected to ATFM measures. Scheduled passenger transfer flights are, by their nature, non-urgent and should not be given priority under normal operational situation.

5.3.4 Flights exempted from ATFM procedures shall indicate the exemption in their flight plan as follows:
(Field 18 - STS-BOB ATFM EXMP).

5.4 MANDATORY CTOT AND KABUL FIR SLOT ALLOCATION

5.4.1 Affected flights shall obtain the mandatory Kabul FIR slot allocation - CTOT, CTO at Kabul FIR entry waypoint, allocated flight level and allocated ATS route from the BOBCAT system. The CTOT and Kabul slot allocation will enable ANSPs to tactically control westbound flights transiting the Kabul FIR at specified times by assigning minimum spacing requirements at established gateway fix points in the vicinity of the eastern boundary of the Kabul FIR.

5.4.2 The application, calculation and distribution of CTOT and Kabul FIR entry waypoint slot allocations will be managed via internet access to the BOBCAT system in accordance with the ATFM operating procedures in paragraph 5.5.

5.5 BOBCAT OPERATING PROCEDURES

5.5.1 All affected flights are required to submit their slot requests to the BOBCAT system by logging onto https://www.bobcat.aero between 0100UTC and 1159UTC on the day of flight and completing the electronic templates provided.

5.5.2 Stakeholders are able to view the slot allocation results at https://www.bobcat.aero which will be published no later than 1230 UTC. Alternative arrangements for notification of slot distribution (e.g. e-mail, fax, telephone) should be coordinated with the Bangkok ATFMU.

5.5.3 After the slot allocation has been published at https://www.bobcat.aero, aircraft operators can:

a. use the slot allocation result for ATS flight planning purposes;
b. cancel the allocated slot; and / or
c. change slot allocation to another available slot in the published list of unallocated slots.

5.5.4 Affected aircraft operators who do not have dedicated BOBCAT username / password access should complete the application form provided and fax it to the Bangkok ATFMU as soon as possible.

5.6 SUBMISSION OF ATS FLIGHT PLAN

5.6.1 Once aircraft operators are in receipt of the slot allocation, they shall submit the ATS flight plan using the time, ATS route and flight level parameters of the BOBCAT allocated slot.

5.6.2 In addition to the normal addressees, Singapore AIS will also address the flight plan (FPL) and related ATS messages (e.g. DLA, CNL, CHG) to the Bangkok ATFMU via AFTN address VTBBZDZX for all flights that have submitted a slot request.

5.7 AIRCRAFT OPERATOR / PILOT-IN-COMMAND AND ANSP RESPONSIBILITIES

Aircraft Operator / Pilot-in-Command

5.7.1 In accordance with ICAO PANS-ATM provisions, it is the responsibility of the Pilot-in-Command (PIC) and the aircraft operator to ensure that the aircraft is ready to taxi in time to meet any required departure time. PIC shall be kept informed by their aircraft operators of the CTOT, CTO at Kabul FIR entry waypoint and flight parameters (route / level) allocated by BOBCAT.

5.7.2 The PIC, in collaboration with ATC, shall arrange take-off as close as possible to the CTOT in order to meet the allocated CTO at Kabul FIR entry waypoint.

ANSPs

5.7.3 In accordance with ICAO PANS-ATM provisions, flights with an ATFM slot allocation should be given priority for take-off to facilitate compliance with the CTOT.

5.7.4 CTOT shall be included as part of the initial ATC clearance. In collaboration with PIC, Singapore ATC shall ensure that every opportunity and assistance is granted to a flight to meet the allocated CTOT and CTO at Kabul FIR entry waypoint.

5.8 COORDINATION BETWEEN AIRCRAFT OPERATOR / PILOT-IN-COMMAND, ANSPs AND BANGKOK ATFMU

5.8.1 The PIC shall include the CTOT in the initial ATC clearance request.

5.8.2 PIC shall adjust cruise flight to comply with slot parameters at the Kabul FIR entry waypoint, requesting appropriate ATC clearances including speed variations in accordance with the published AIP requirements.

5.8.3 Prior to departure, in circumstances where it becomes obvious that the allocated Kabul FIR entry waypoint slot parameters will not be met, a new slot allocation should be obtained as soon as possible and via the most expeditious means (e.g. via coordination between flight dispatcher, PIC, Singapore ATC and Bangkok ATFMU). Early advice that the Kabul FIR slot parameters will be missed also enables the slots so vacated to be efficiently reassigned to other flights.

5.8.4 Prior to departure and after the aircraft has left the gate, in the event that the aircraft is unable to meet the Kabul FIR entry waypoint slot parameters, when requested by the PIC, Singapore ATC shall assist the PIC to coordinate with the Bangkok ATFMU for a revised slot allocation.

5.8.5 The Bangkok ATFMU (VTBBZDZX) shall be included in the list of AFTN addressees for NOTAMs regarding any planned activities that may affect slot availability (e.g. reservation of airspace / closure of airspace, non-availability of routes, etc.).

5.8.6 The Bangkok ATFMU (VTBBZDZX) shall be included in the list of AFTN addressees for ATS messages (e.g. FPL, DEP, DLA, CHG, CNL) relating to flights subject to ATFM procedures.

5.8.7 A missed slot results in dramatically increased coordination workload for ATC and PIC and should be avoided. To minimise coordination workload in obtaining a revised slot allocation, the following procedures are recommended:

a. If the flight is still at the gate, coordination should take place via aircraft operators / flight dispatchers to Bangkok ATFMU;

b. If the flight has left the gate, coordination to Bangkok ATFMU may also take place via the ATS unit presently communicating with the flight.

5.9 BASIC COMPUTER REQUIREMENT

5.9.1 Aircraft operators and Singapore ATC are required to have computer equipment capable of connecting to the BOBCAT website https://www.bobcat.aero via the internet and satisfying the following minimum technical requirements:

a. A personal computer of any operating system with the following characteristics:

i. Processor: minimum CPU clock speed of 150MHz;

ii. Operating System: any that operates one of the following web browsers (i.e. Windows 2000 / XP, Linux, Unix, or Mac OS);

iii. Web Browser: Internet Explorer 5.5 or newer, Mozilla 1.0 or newer, Mozilla Firefox 1.0 or newer, Netscape 7 or newer;

iv. RAM: 64MB or larger (depending on operating system);

v. Hard Disk Space: minimum of 500MB or larger (depending on operating system);

vi. Monitor Display Resolution: minimum of 800 x 600 pixels; and

vii. Internet Connection: 56Kbps modem or faster.

5.10 ATFM USERS HANDBOOK

5.10.1 Supporting documentation, including detailed information in respect of the ATFM operations described above and other pertinent information has been included in the Bay of Bengal and South Asia ATFM Handbook (the "ATFM Users Handbook"), available at https://www.bobcat.aero

5.10.2 ANSPs and aircraft operators shall ensure that they are conversant with and able to apply the relevant procedures described in the ATFM Users Handbook.

5.11 CONTINGENCY PROCEDURES

5.11.1 In the event that an aircraft operator or Singapore ATC is unable to access the Bangkok ATFMU website, the Bangkok ATFMU shall be contacted via the alternative means (telephone, fax, AFTN) described in paragraph 5.13.

5.11.2 Contingency procedures for submission of slot request, including activation of Contingency Slot Request Templates (CSRT), are included in the ATFM Users Handbook.

5.11.3 In the event of system failure of BOBCAT, Bangkok ATFMU shall notify all parties concerned and advise that ATFM slot allocation procedures are suspended. In this event, all parties concerned will revert to the existing ATM procedures as applicable outside the daily period of ATFM metering.

5.12 ATFM SYSTEM FAULT REPORTING

5.12.1 An ATFM system fault is defined as a significant occurrence affecting an ATS unit, an aircraft operator or Bangkok ATFMU resulting from the application of ATFM procedures.

5.12.2 Aircraft operators and Singapore ATC experiencing an ATFM system fault should complete an ATFM System Fault Report Form from the ATFM Users Handbook and forward it to the Bangkok ATFMU at the address indicated on the form. The Bangkok ATFMU will analyse all reports, make recommendations / suggestions as appropriate and provide feedback to the parties concerned to enable remedial action.

5.13 ADDRESS OF AIR TRAFFIC FLOW MANAGEMENT UNIT (ATFMU)

5.13.1 The Bangkok ATFMU may be contacted as follows:

Unit Name	:	Bangkok ATFMU
Telephone	:	+66-2-287-8024, +66-2-287-8025
Fax	:	+66-2-287-8027
Tel/Fax	:	+66-2-287-8026
E-mail	:	atfmu@bobcat.aero
AFTN	:	VTBBZDZX
Website	:	https://www.bobcat.aero

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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 functional check/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 Functional Check/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.

1.2 REQUIREMENT FOR SUBMISSION OF A FLIGHT PLAN FOR FUNCTIONAL CHECK FLIGHTS

← 1.2.1 Functional check flights shall be conducted on ATS route G580 between OBGET and NIMIX to minimise disruption to civil scheduled flight movements and to facilitate the functional check flight operations.

1.2.2 A flight plan shall be submitted for a functional check 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 of the functional check flight shall adhere to ATC instructions at all times. Functional check flight manoeuvres are subject to ATC clearance, real-time coordination and traffic.

1.2.4 Procedures for application to conduct functional check flights are provided on GEN 1.2 section 6.

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 ENR 1.1 section 9) 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 HFDL
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 (see ENR 1.1 section 9) 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 (see ENR 3.2) must be RNAV equipped and should annotate their flight plan as follows:

	Item 10	**Item 15**	**Item 18**
RNAV equipment is carried	**G** (GNSS) **I** (Inertial Navigation) **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).	True Mach NR and FL at entry and exit points	The types of external GNSS augmentation, if any, are specified following the indicator NAV/ and separated by a space. The performance based navigation levels that can be met shall be specified following the indicator PBN/.

ENR 1.14 AIR TRAFFIC INCIDENTS

1 DEFINITION OF AIR TRAFFIC INCIDENTS

1.1 An incident is an occurrence other than an accident associated with the operation of an aircraft which affect or could affect the safety of operation.

1.2 An incident may be caused by any of the following:

a. Ground Organisation:

i. abnormal function or operation of radio communication or navigational aids, faulty organisation or procedure;
ii. personal negligence, incompetence, error or misapplication of procedures or instructions.

b. Aircrew - negligence, incompetence, error of judgement, misapplication of procedures or failure to comply with procedures or instructions.
c. Aircraft - defects in the aircraft or its equipment.
d. Severe meteorological conditions.

2 USE OF AIR TRAFFIC INCIDENT REPORTING FORMS

2.1 Pilots shall file all incident reports on the “Air Traffic Incident Report Form” (see pages ENR 1.14-3 to ENR 1.14-6) in order to speed up the process of investigation of the various categories of incidents.

3 AIR TRAFFIC INCIDENT REPORTING PROCEDURES

3.1 A pilot should proceed as follows regarding an incident in which he is or has been involved:

a. during flight, use the appropriate air/ground frequency for reporting an incident of major significance, particularly if it involves other aircraft, so as to permit the facts to be ascertained immediately;

b. as promptly as possible after landing submit a completed “Air Traffic Incident Report Form”:

i. for confirming a report of an incident made initially as in 3.1 a) above, or for making the initial report on such an incident if it had not been possible to report it by radio;

ii. for reporting an incident which did not require immediate notification at the time of occurrence.

3.2 An initial report made by radio should contain the following information:

A - Type of incident, e.g. near collision.
F - Radio call sign of aircraft making report.
J - Position, heading or route, true airspeed.
K - FL, altitude or height, and aircraft altitude.
L - IMC or VMC.
M - Time of incident, in UTC.
N - Description of other aircraft, if relevant.
O - Brief details of incident, including when appropriate, sighting distance and miss distance.

3.3 The confirmatory report on an incident of major significance initially reported by radio or the initial report on any other incident should be submitted to the Aeronautical Information Services located at Passenger Terminal 1, East, 4th Storey, Room 041-52 on the “Air Traffic Incident Report Form.” A copy of the incident report form should also be forwarded to the Co-ordination/Investigation Authority as shown in page ENR 1.14-2 para 5 and the operating company or agency concerned.

4 INVESTIGATION

4.1 All Incident Reports filed will be thoroughly investigated and the complainant will be notified of the results of the investigation as soon as possible.

5 CO-ORDINATION/INVESTIGATION AUTHORITY

5.1 Co-ordination/Investigation Authority responsible for the Co-ordination/Investigation of Near Collision/ Infringements, ATC Complaints, Fault Reporting and Post-Flight Information Service:

Co-ordination/Investigation Authority	Area Of Responsibility
Director-General of Civil Aviation Civil Aviation Authority of Singapore Singapore Changi Airport P O Box 1 Singapore 918141	Within Singapore FIR and airspace where ATS is provided by Singapore. (Refer to pages ENR 2.1-1 to ENR 2.1-5)

6 OTHER REPORTS UNDER ICAO INITIATIVE FOR DATA COLLECTION AND ANALYSIS PURPOSES

6.1 Wake Vortex

6.1.1 Pilots experiencing any wake vortex encounters within the Singapore FIR and airspace where ATS is provided by Singapore (see ENR 2.1) should report such encounters by filling out the Wake Vortex Encounter Reporting Form and submitting the form to CAAS. The contact address, facsimile and e- mail address can be found on the form.

6.1.2 Alternatively, pilots can submit the report online direct to ICAO at:

http://www.icao.int/fsix/wakevortexformpilot.html

7 INDEX OF REPORTING FORMS APPENDED TO THIS SECTION

ENR 2 AIR TRAFFIC SERVICES AIRSPACE

ENR 2.1 FIR, UIR, TMA

Name *Lateral limits* *Upper limit/Lower limit* *Class of airspace*	*Unit providing service*	*Call sign* *Languages* *Area and conditions of use* *Hr of ser*	*Frequency /Purpose*	*Remarks*
1	2	3	4	5
SINGAPORE FIR 082500N 1163000E 025050N 1091629E 045700N 1081619E 050012N 1080132E 045904N 1075525E 045203N 1074625E 043820N 1073315E 041312N 1071743E 033045N 1055130E 031727N 1052959E 031453N 1052619E 025010N 1051210E 024348N 1050854E 023641N 1051311E 021838N 1052205E 011947N 1044606E 012921N 1043441E 011800N 1043000E 011500N 1040000E 010800N 1034500E 011046N 1034015E 011200N 1033900E 011408N 1033142E 011700N 1033600E thence east along the national boundary of Singapore/Malaysia, thence along 012000N to 012000N 1042000E 023600N 1044500E 034000N 1034000E 045000N 1034400E 064500N 1024000E 070000N 1030000E 070000N 1080000E 103000N 1140000E 082500N 1163000E **UNL** **SFC**	SINGAPORE ACC	SINGAPORE RADAR English H24	255.4MHz Primary 123.7 MHz 133.25MHz 134.4MHz 133.8MHz 134.2MHz 134.35 MHz 134.7 MHz Secondary 127.3 MHz 135.8MHz 128.1MHz 133.35MHz 134.9 MHz 134.15 MHz SEA 1 6556kHz 11297kHz SEA 2 5655kHz 8942kHz 11396kHz SEA 3 6556kHz	The responsibility for providing air traffic services to flights within the following portions of the Singapore FIR is vested in the Kuala Lumpur ACC: The airspace between a line from 023600N 1044500E to 022715N 1051750E 023641N 1051311E 024348N 1050854E 025010N 1051210E 031453N 1052619E 031727N 1052959E 033045N 1055130E 041312N 1071743E 043820N 1073315E 045203N 1074625E 045904N 1075525E 050012N 1080132E 045700N 1081619E 025050N 1091629E, in the south, and a line along 060000N in the north, and from surface level to FL150 west of longitude 105E and from surface level to FL200 east of longitude 105E. SEA 1, SEA 2, SEA 3: SSB Suppressed Carriers.

Name *Lateral limits* *Upper limit/Lower limit* *Class of airspace*	*Unit providing service*	*Call sign* *Languages* *Area and conditions of use* *Hr of ser*	*Frequency /Purpose*	*Remarks*
1	2	3	4	5
		SINGAPORE CONTROL SOUTH CHINA SEA English H24	AFN LOGON WSJC	Suitably equipped aircraft operating outside radar cover and not in ADS-B exclusive airspace within the Singapore FIR should log on to Singapore's AFN LOGON address at least 10 minutes prior to entering the above-mentioned airspace in Singapore FIR. Area Navigation (RNAV) routes suitable for ADS-C and / or CPDLC logon are described in ENR 3.2.
AREAS WITHIN JAKARTA FIR WHERE PROVISION OF ATS IS DELEGATED TO SINGAPORE The area bounded by 031727N 1052959E 012450N 1061648E 001030N 1045656E 000000N 1050340E 000000N 1044330E thence around the arc of a circle radius 90 NM centred on 011324N 1035124E to 013430N 1022353E 011300N 1033000E 011408N 1033142E 011200N 1033900E 011046N 1034015E 010800N 1034500E 011500N 1040000E 011800N 1043000E 012921N 1043441E 011947N 1044606E 021838N 1052205E 023641N 1051311E 024348N 1050854E 025010N 1051210E 031453N 1052619E 031727N 1052959E Excluding the Tanjungpinang Terminal Control Area and Control Zone **FL370** **SFC**	SINGAPORE ACC	SINGAPORE RADAR English H24	255.4MHz Primary 133.25MHz 134.4MHz 134.2MHz Secondary 135.8MHz 128.1MHz 134.9 MHz	

Name *Lateral limits* *Upper limit/Lower limit* *Class of airspace*	*Unit providing service*	*Call sign* *Languages* *Area and conditions of use* *Hr of ser*	*Frequency /Purpose*	*Remarks*
1	2	3	4	5
AREAS WITHIN THE KUALA LUMPUR FIR FOR WHICH SINGAPORE ACC IS RESPONSIBLE FOR PROVIDING ATS				
SECTOR 1: That airspace contained within coordinates 011300N 1033000E 012203N 1030209E thence along an arc radius 50 DME SJ to 014529N 1031305E 014225N 1031728E, thence along the Johor TMA western boundary to 013022N 1033437E 012600N 1034055E, thence along the Peninsular Malaysia and Singapore international boundary to 011700N 1033600E 011300N 1033000E. The airspace herein is designated as follows: a. **AREA B**(SJ DVOR/DME - 35 DME SJ) - 3 000ft to FL245 b. **AREA D** (35 DME SJ - 45 DME SJ) - 5 500ft to FL245 c. **AREA F** (45 DME SJ - 50 DME SJ) - 9 500ft to FL245	SINGAPORE ACC	SINGAPORE RADAR English H24	Primary 133.25MHz Secondary 135.8MHz	Controlling Authority: Johor APP for airspaces below Sectors 1 and 2, Airway W401 and south of VMR DVOR. *Note:* *In the event an aircraft in the areas is forced to make an emergency descent which will penetrate Malaysian airspace, the pilot shall advise Singapore ATC immediately.*
SECTOR 2: That airspace contained within coordinates 013206N 1035031E 022205N 1034724E 025234N 1033340E 025432N 1034341E 033822N 1034139E 023600N 1044500E 012000N 1042000E 012000N 1040528E thence along the Peninsular Malaysia and Singapore international boundary to 012600N 1034055E to 013022N 1033437E 013130N 1034236E to 013206N 1035031E. The airspace herein is designated as follows: a. **AREA A** (PU DVOR/DME - 30 DME PU excluding the northern portion of Changi CTR) - 2 000FT to FL245 b. **AREA C** (30 DME PU - 61 DME PU) - 5 500FT to FL300 c. **AREA E** (61 DME PU - 90 DME PU) - FL120 to FL360 d. **AREA H** (from 025432N 1034341E thence along the 90 DME PU arc to the FIR boundary (024712N 1043337E) thence to 033822N 1034139E, 025432N 1034341E) - FL145 to FL360	SINGAPORE ACC	SINGAPORE RADAR English H24	Primary 123.7 MHz 133.8 MHz Secondary 127.3 MHz	
ATS ROUTES W401 and G579 a. W401 [Airspace between OMKOM and PU radial 324 from 2,000ft to FL245 and PU radial 324 to PIMOK (excluding WMP228) from 3,000ft to FL245]. b. G579 from 2000ft to FL460.	SINGAPORE ACC	SINGAPORE RADAR English H24		

Name Lateral limits Upper limit/Lower limit Class of airspace	*Unit providing service*	*Call sign Languages Area and conditions of use Hr of ser*	*Frequency /Purpose*	*Remarks*
1	2	3	4	5
SINGAPORE /JOHOR AIRSPACE COMPLEX All controlled airspace within 022600N 1025605E 022600N 1043400E 004300N 1043400E 004300N 1025605E. *FL250 2 000ft ALT	SINGAPORE ACC	SINGAPORE RADAR English H24	Primary 123.7 MHz 133.8 MHz Secondary 127.3 MHz	*Upper limit FL450 from HOSBA [34 DME SJ R-079 (24 DME VTK R-103)] Lower limit varies from 2 000ft to 3 500ft ALT.
ALL AIRWAYS WITHIN THE SINGAPORE FIR, KUALA LUMPUR FIR AND ITS TRANSFER AREAS AND KOTA KINABALU FIR (see subsection ENR 3.1)	SINGAPORE ACC	SINGAPORE RADAR English H24	Primary 133.25MHz 123.7 MHz 133.8 MHz Secondary 135.8MHz 127.3 MHz	Airspaces within the Kuala Lumpur FIR under the control of Singapore ACC are depicted in diagrams in AIP pages: ENR 2.1-11 for AWY A464 ENR 2.1-13 for AWY B469

Name *Lateral limits* *Upper limit/Lower limit* *Class of airspace*	*Unit providing service*	*Call sign* *Languages* *Area and conditions of use* *Hr of ser*	*Frequency /Purpose*	*Remarks*
1	2	3	4	5
TANJUNGPINANG TMA 002448N 1043700E follow the circle radius 30NM from 005511N 1043134E anti-clockwise until 010342N 1050018E 005612N 1053200E thence along the circle with radius 60NM from 005511N 1043134E clockwise until 000224N 1050206E 002448N 1043700E 10 000ft 3000 FT **TANJUNGPINANG NORTH CONTROL ZONE (CTR)** 011533N 1040852E 011638N 1041620E 011305N 1042029E 010942N 1043500E thence along the circle radius 27 NM from BTM VOR/DME clockwise until 004236N 1041654E 005315N 1040335E 010018N 1035530E 011553N 1040852E 3 000ft GND/MSL **TANJUNGPINANG SOUTH CONTROL ZONE (CTR)** 004236N 1041654E follow the circle radius 27 NM from BTM VOR/DME anti-clockwise until 010942N 1043500E 010342N 1050018E thence along the circle radius 30 NM from 0055.0N 10432.0E clockwise until 002448N 1043700E 004236N 1041654E 6 000ft GND/MSL	TANJUNGPINANG APPROACH CONTROL OFFICE (APP)	TANJUNGPINANG RADAR English H24	Primary 130.2MHz Secondary 119.35MHz	

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Route Designator {RNP Type} / Significant Point Name	[Route Usage Notes]								
	Significant Point Coordinates								Remarks
{RNP Type}	Track MAG ↓ / ↑	Dist NM	(COP)	Upper limit / Lower limit	MNM FLT ALT	Lateral limits NM	Direction of cruising levels ↓	Direction of cruising levels ↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7	8	9	10
G579	*Route availability:* (1) H24								
▲ JOHOR BAHRU DVOR/DME (VJB)	013950N 1033939E								
	162° / 342°	10.3NM		FL 460 / 6500 FT ALT	7000 FT	3	Odd(1)	Even(1)	[Class A – ABV FL150] [Class B – BLW FL150] (4)
▲ GUMPU	013000N 1034243E								
	152° / 332°	4.1NM		FL 460 / 2000 FT ALT	7000 FT	3	Odd(1)	Even(1)	[Class A – ABV FL150] [Class B – BLW FL150] (2) (4)
LAPOL	012622N 1034435E								
	153° / 333°	6.1NM		FL 460 / 2000 FT ALT	11000 FT	3	Odd(1)	Even(1)	[Class A – ABV FL150] [Class B – BLW FL150] (4)
LEGOL	012053N 1034723E								
	152° / 332°	8.4NM		FL 460 / 2000 FT ALT	3000 FT	3	Odd(1)	Even(1)	[Class A – ABV FL150] [Class B – BLW FL150] (4)
▲ SINJON DVOR/DME (SJ)	011321N 1035115E								
	- / 346°	2.2NM		FL 460 / 2000 FT ALT	4000 FT	10		Even(1)	[Class A – ABV FL150] [Class B – BLW FL150] (4) (5)
▲ OLNUB (WSJC/WIIF FIR BDRY) (Delegated airspace BDRY)	011110N 1035147E								
	- / 348°	12.2NM		FL 600 / 2000 FT ALT	4000 FT	10		Even(1)	[Class A – ABV FL150] [Class B – BLW FL150] (5)
▲ EMSIB	005911N 1035419E								
	- / 348°	15.8NM		FL 600 / 2000 FT ALT	5000 FT	10		Even(1)	[Class A – ABV FL150] [Class B – BLW FL150] (5)
▲ REMES	004342N 1035735E								
	- / 349°	10.0NM		FL 600 / 2000 FT ALT	5000 FT	10		Even(1)	[Class A – ABV FL150] [Class B – BLW FL150] (5)
▲ UXATI	003348N 1035933E								
	- / 349°	17.7NM		FL 600 / 2000 FT ALT	5000 FT	10		Even(1)	[Class A – ABV FL150] [Class B – BLW FL150] (5)
▲ REPOV	001623N 1040300E								
	- / 348°	51.1NM		FL 600 / 2000 FT ALT	5000 FT	10		Even(1)	[Class A – ABV FL150] [Class B – BLW FL150] (5)
▲ PARDI	003400S 1041300E								

Route Remarks:
Unidirectional route (Northbound) for flights from Jakarta FIR to Singapore FIR and beyond. FL310, FL330, FL350, FL370, FL390, FL410 can be assigned as flight levels for inbounds to Singapore.

Singapore ACC FREQ:
P134.4MHz S128.1MHz

Point/Segment Remarks:
(2) Kuala Lumpur/Singapore FIR boundary is approximately 2NM south of GUMPU.
(3) Flights above FL370 from PARDI to OLNUB, see AIP Indonesia ENR 2.1.
(4) Bidirectional route between SJ and VJB.
(5) Unidirectional route from PARDI to SJ.

Route Designator {RNP Type}	[Route Usage Notes]								
Significant Point Name	Significant Point Coordinates								Remarks
{RNP Type}	Track MAG ↓ ↑	Dist NM	(COP)	Upper limit / Lower limit	MNM FLT ALT	Lateral limits NM	Direction of cruising levels ↓	Direction of cruising levels ↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7	8	9	10
G580	*Route availability:* (1) H24								
▲ SINJON DVOR/DME (SJ)	011321N 1035115E								
	079° 259°	33.7NM		FL 460 2000 FT ALT	3000 FT	10	Odd(1)	Even(1)	[Class A – ABV FL150] [Class B – BLW FL150]
▲ HOSBA	011948N 1042418E								
	088° 268°	6.5NM		FL 460 6500 FT ALT	7000 FT	10	Odd(1)	Even(1)	[Class A – ABV FL150] [Class B – BLW FL150]
▲ DOWON (WSJC/WIIF FIR BDRY)	011957N 1043048E								
	088° 268°	76.6NM		FL 600 6500 FT ALT	7000 FT	10	Odd(1)	Even(1)	[Class A – ABV FL150] [Class B – BLW FL150]
▲ TOMAN	012147N 1054717E								
	088° 268°	26.8NM		FL 600 6500 FT ALT	7000 FT	10	Odd(1)	Even(1)	[Class A – ABV FL150] [Class B – BLW FL150]
▲ DODSO (Delegated airspace BDRY)	012225N 1061402E								

Route Remarks:
Singapore ACC FREQ:
P134.2MHz S133.35MHz

Point/Segment Remarks:
Flights above FL370 between DOWON and DODSO, see AIP Indonesia ENR 2.1.

ENR 3.2 AREA NAVIGATION ROUTES

←

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	2	3	4	5	6	7
L517	*Route availability:* (1) H24					
▲ TERIX	041521N 1093456E					*(2)*
		92.0NM	FL 460 / FL 240		Even*(1)*	[Class A]
▲ GULIB (WSJC/WBFC FIR BDRY)	041714N 1110633E					*(3)*

Route Remarks:
Lateral Limits:
25NM either side of line joining GULIB to TERIX.

ADS-C and CPDLC services are available to suitably equipped aircraft operating outside radar cover within the Singapore FIR.

Point/Segment Remarks:
(2) NIL
(3) VMI 269°
173NM

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	2	3	4	5	6	7
L625	*Route availability:* (1) H24					
▲ AKMON	081254N 1101306E					
(10)	- / 035°	236.1NM	FL 460 / FL 135			[Class A] *(2)*
▲ GUTUP (WSJC/WIIF FIR BDRY)	045911N 1075603E					
(10)	- / 035°	104.4NM	FL 600 / FL 135			[Class A] [Class B] *(2) (3)*
▲ LUSMO	033341N 1065534E					
(10)	- / 027°	48.2NM	FL 600 / FL 135			[Class A] [Class B] *(3)*
▲ UPLAM	025043N 1063319E					
(10)	- / 027°	6.8NM	FL 600 / FL 135			[Class A] [Class B] *(3)*
▲ ISDEB	024440N 1063011E					
(10)	- / 027°	12.5NM	FL 600 / FL 135			[Class A] [Class B] *(3)*
▲ VERIN	023332N 1062425E					
(10)	- / 027°	43.4NM	FL 600 / FL 245			[Class A] *(3)*
▲ UXEDA (Delegated airspace BDRY)	015449N 1060423E					
(10)	- / 027°	37.1NM	FL 600 / FL 245			[Class A] *(4)*
▲ TOMAN	012147N 1054717E					

Route Remarks:
Uni-directional for north-east bound flights from TOMAN to AKMON. No PDC Flight Levels FL310, FL320, FL350, FL360, FL390, FL400 applicable. Other levels available with prior approval.

Point/Segment Remarks:
(2) ADS-C and CPDLC services are available to suitably equipped aircraft operating outside radar cover between GUTUP and AKMON within the Singapore FIR.
(3) Segment from UXEDA to GUTUP to contact Jakarta ACC.
(4) Segment from TOMAN to UXEDA use:
P134.2 MHz
S133.35 MHz
(5) Flights above FL370 from TOMAN to UXEDA, see AIP Indonesia ENR 2.1.

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	2	3	4	5	6	7
L629	*Route availability:* (1) H24					
▲ DOLOX	044841N 1052247E					
		43.1NM	FL 460 / FL 240		Odd(1)	[Class A] (2)
▲ NOPAT	042313N 1044756E					
		52.2NM	FL 460 / FL 240		Odd(1)	[Class A] (2)
▲ VEPLI	035223N 1040542E					
		27.2NM	FL 460 / FL 240		Odd(1)	[Class A] (2)
▲ BUVAL (WSJC/WMFC FIR BDRY)	033622N 1034341E					
		22.6NM	FL 460 / FL 240		Odd(1)	[Class A] (2)
▲ PEKAN DVOR/DME (VPK)	032259N 1032524E					

Route Remarks:
Lateral Limits:
10NM either side of line joining VPK DVOR/DME to BUVAL and 25NM either side of line joining BUVAL to DOLOX.

Singapore ACC FREQ:
P123.7 MHz
S127.3 MHz

Point/Segment Remarks:
(2) NIL

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	2	3	4	5	6	7
L635	*Route availability:* (1) H24					
▲ MABLI	041717N 1061247E					
		59.9NM	FL 460 / FL 240	Even(1)		[Class A] (2)
▲ SUSAR	035848N 1051547E					
		31.6NM	FL 460 / FL 240	Even(1)		[Class A] (2)
▲ DUBSA	034901N 1044540E					
		39.7NM	FL 460 / FL 240	Even(1)		[Class A] (2)
▲ UGPEK	033647N 1040752E					
		19.4NM	FL 460 / FL 240	Even(1)		[Class A] (2)
▲ DOVOL (WSJC/WMFC FIR BDRY)	033047N 1034923E					
		25.2NM	FL 460 / FL 240	Even(1)		[Class A] (2)
▲ PEKAN DVOR/DME (VPK)	032259N 1032524E					

Route Remarks:
Lateral Limits:
10NM either side of line joining VPK DVOR/DME to DOVOL and 25NM either side of the line joining DOVOL to MABLI

Singapore ACC FREQ:
P123.7 MHz
S127.3 MHz

Point/Segment Remarks:
(2) NIL

Route Designator {RNP Type}	[Route Usage Notes]					
Significant Point Name	Significant Point Coordinates					Remarks
{RNP Type}	Track MAG ↓ ↑	Dist NM	Upper limit / Lower limit	Direction of cruising levels ↓	Direction of cruising levels ↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
L642	*Route availability:* (1) H24					
▲ ESPOB (VVHM/WSJC FIR BDRY)	070000N 1053318E					*(7)*
(10)		149.2NM	FL 460 / FL 135			[Class A] *(2) (3) (4)*
▲ ENREP	045224N 1041442E					*(8)*
(10)		60.4NM	FL 460 / FL 135	Odd*(1)*	Even*(1)*	[Class A] *(5)*
▲ VEPLI	035223N 1040542E					*(9)*
(10)		33.0NM	FL 460 / FL 135	Odd*(1)*	Even*(1)*	[Class A] *(5)*
▲ EGOLO (WSJC/WMFC FIR BDRY)	031934N 1040047E					*(10)*
(10)		25.1NM	FL 460 / FL 135	Odd*(1)*	Even*(1)*	[Class A] *(6)*
▲ ROBMO	025440N 1035700E					*(11)*
(10)		31.6NM	FL 460 / FL 135	Odd*(1)*	Even*(1)*	[Class A] *(6)*
▲ MERSING DVOR/DME (VMR)	022318N 1035218E					

Route Remarks:
Lateral Limits:
10NM either side of line joining VMR DVOR/DME to EGOLO and 25NM either side of line joining EGOLO to ESPOB.

Bi-directional between VMR and ENREP.

Flight planning for Direct Routing Operations (DRO):
Arriving aircraft to Singapore Changi Airport operating at FL290 to FL460 (inclusive) and entering Singapore FIR via ESPOB should flight plan using the direct route ESPOB DCT ELALO.

All other aircraft operating at FL290 to FL460 (inclusive) and entering Singapore FIR via ESPOB should flight plan using the direct route ESPOB DCT EGOLO.

Point/Segment Remarks:
(2) ADS-C service is available to suitably equipped aircraft operating outside radar cover (between ESPOB and ENREP) and not in the exclusive ADS-B airspace within Singapore FIR.
(3) Uni-directional for southbound flights from ESPOB to ENREP. No PDC Flight Levels FL310, FL320, FL350, FL360, FL390, FL400 applicable. Other levels available with prior approval.
(4) Segment from ESPOB to ENREP use:
P134.35MHz
S134.9MHz
(5) Segment from ENREP to EGOLO use:
P123.7 MHz
S127.3 MHz
(6) Segment from EGOLO to VMR use:
P133.8 MHz
S127.3 MHz
(7) NIL
(8) VMR 008°
150.0NM
(9) VMR 008°
89.7NM
(10) VMR 008°
56.6NM
(11) VMR 008°
31.6NM

Route Designator {RNP Type}	[Route Usage Notes]					
Significant Point Name	Significant Point Coordinates					Remarks
{RNP Type}	Track MAG ↓ / ↑	Dist NM	Upper limit / Lower limit	Direction of cruising levels ↓	Direction of cruising levels ↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
L644	*Route availability:* (1) H24					
▲ DUDIS (WSJC/VVHM FIR BDRY)	070000N 1064836E					
(10)	192° / -	165.8NM	FL 460 / FL 240	Odd(1)		[Class A] (2) (3)
▲ MABLI	041717N 1061247E					
(10)	169° / -	33.4NM	FL 460 / FL 240	Odd(1)		[Class A] (4)
▲ LIGVU (WSJC/WIIF FIR BDRY)	034417N 1061859E					

Route Remarks:

Flight Planning Instructions for Direct Routing Operations (DRO):

All aircraft operating at FL290 to FL460 (inclusive) and entering Singapore FIR via DUDIS should flight plan using the direct route DUDIS DCT LIGVU.

Point/Segment Remarks:

(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 LIGVU use:
P134.7 MHz
S134.15 MHz

Route Designator {RNP Type}	[Route Usage Notes]					
Significant Point Name	Significant Point Coordinates					Remarks
{RNP Type}	Track MAG ↓ ↑	Dist NM	Upper limit / Lower limit	Direction of cruising levels ↓	↑	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)

Route Remarks:
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.

Point/Segment Remarks:
(2) NIL
(3) BRU 359°
136NM

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ / ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	**2**	**3**	**4**	**5**	**6**	**7**
L762	*Route availability:* (1) H24					
▲ ASUNA	005948N 1030954E					
← (10)	291° / 111°	66.2NM	FL 600 / 9500 FT ALT	Even(1)	Odd(1)	[Class A – ABV FL150] [Class B – BLW FL150]
▲ MIBEL	012351N 1020816E					

Route Remarks:
Singapore ACC FREQ:
P133.25MHz S135.8MHz

Flight Planning Instructions:
Westbound - Aircraft originating only from airports within Singapore, Batam, Tanjungpinang and Johor to Medan and destinations beyond Jakarta FIR.

Eastbound - Aircraft to destinations within Singapore, Batam, Tanjungpinang and Johor only.

Point/Segment Remarks:
Flights above FL370 between ASUNA and MIBEL, see AIP Indonesia ENR 2.1.

Route Designator {RNP Type}		*[Route Usage Notes]*					
	Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}		*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1		2	3	4	5	6	7
M522		*Route availability:* (1) H24					
▲	VINIK (WSJC/RPHI FIR BDRY)	083830N 1161348E					*(2)*
			27.5NM	FL 460 FL 135	Even*(1)*	Odd*(1)*	[Class A - ABV FL150 Class B - BLW FL150]
▲	NODIN (WSJC/WBFC FIR BDRY)	081100N 1161142E					*(2)*

Route Remarks:
Portion of M522 within the Singapore FIR has been delegated to Kota Kinabalu ACC for provision of ATS

Kinabalu ACC FREQ:
126.1 MHz

Point/Segment Remarks:
(2) NIL

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	2	3	4	5	6	7
M630	*Route availability:* (1) H24					
▲ SUKRI (WMFC/WIIF FIR BDRY) (Delegated airspace BDRY)	012306N 1025904E					
(5)	123° / -	37.1NM	FL 600 / 5500 FT ALT	Odd(1)		[Class A – ABV FL150] [Class B – BLW FL150]
▲ BOBAG	010230N 1032954E					
(5)	098° / -	24.7NM	FL 600 / 5500 FT ALT	Odd(1)		[Class A – ABV FL150] [Class B – BLW FL150]
▲ EMSIB	005911N 1035419E					
(5)	098° / -	2.9NM	FL 600 / 5500 FT ALT	Odd(1)		[Class A – ABV FL150] [Class B – BLW FL150]
▲ OMDUD	005847N 1035714E					
(5)	098° / -	4.3NM	FL 600 / 5500 FT ALT	Odd(1)		[Class A – ABV FL150] [Class B – BLW FL150]
▲ IRPUG	005813N 1040127E					
(5)	098° / -	13.9NM	FL 600 / 5500 FT ALT	Odd(1)		[Class A – ABV FL150] [Class B – BLW FL150]
▲ AKVOM	005620N 1041514E					
(5)	097° / -	15.8NM	FL 600 / 5500 FT ALT	Odd(1)		[Class A – ABV FL150] [Class B – BLW FL150]
▲ JUNHA	005413N 1043052E					

Route Remarks:
Flight departing from aerodromes in Peninsular Malaysia with planned cruising level of FL270 or above are required to cross SUKRI at FL270 or above.

Singapore ACC FREQ:
P133.25 MHz S135.8 MHz

Point/Segment Remarks:
Flights above FL370 from SUKRI to JUNHA, see AIP Indonesia ENR 2.1.

Route Designator {RNP Type}	[Route Usage Notes]					
Significant Point Name	Significant Point Coordinates					Remarks
{RNP Type}	Track MAG ↓ ↑	Dist NM	Upper limit / Lower limit	Direction of cruising levels ↓	Direction of cruising levels ↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
M635	*Route availability:* (1) H24					
▲ TEKONG DVOR/DME (VTK)	012455N 1040120E					
(10)	136° / 316°	12.4NM	FL 460 / 5500 FT ALT	Odd(1)	Even(1)	[Class A] [Class B] (2)
▲ UNSID (WSJC/WIIF FIR BDRY) (Delegated airspace BDRY)	011600N 1040955E					
(10)	136° / 316°	30.2NM	FL 600 / 5500 FT ALT	Odd(1)	Even(1)	[Class A] [Class B]
▲ JUNHA	005413N 1043052E					
(10)	120° / 300°	51.8NM	FL 600 / 5500 FT ALT	Odd(1)	Even(1)	[Class A] [Class B]
▲ INVUB (Delegated airspace BDRY)	002749N 1051530E					
(10)	120° / 300°	6.7NM	FL 600 / 5500 FT ALT	Odd(1)	Even(1)	[Class A] [Class B]
▲ ATPOM	002425N 1052114E					
(10)	131° / 311°	93.0NM	FL 600 / 5500 FT ALT	Odd(1)	Even(1)	[Class A] [Class B]
▲ SURGA	003657S 1063119E					

Route Remarks:
Singapore ACC FREQ:
P134.4 MHz S128.1 MHz

Flight Planning Instructions:
Flights overflying Singapore to destinations north of Kuala Lumpur and Subang are to flight plan via M635 JUNHA IRTAD A464 SJ G579 VJB Y342 AROSO Y513.

Flights overflying Singapore to land at Kuala Lumpur and Subang are to flight plan via M635 JUNHA IRTAD A464 SJ G579 VJB A457.

All departures from Singapore aerodromes joining ATS route M635 to flight plan via JUNHA T24.

Point/Segment Remarks:
(2) Kuala Lumpur / Singapore FIR boundary approximately 1.2NM north of VTK.
(3) Flights above FL370 between UNSID and SURGA, see AIP Indonesia ENR 2.1.

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ / ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	**2**	**3**	**4**	**5**	**6**	**7**
M646	*Route availability:* (1) H24					
▲ VENUN (Delegated airspace BDRY)	013206N 1061351E					
(10)	249° / 069°	28.5NM	FL 600 / FL 245	Even(1)	Odd(1)	[Class A]
▲ TOMAN	012147N 1054717E					

Route Remarks:
Singapore ACC FREQ:
P134.2 MHz S133.35 MHz

Point/Segment Remarks:
Flights above FL370 between VENUN and TOMAN, see AIP Indonesia ENR 2.1.

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	2	3	4	5	6	7
M753	*Route availability:* (1) H24					
▲ IPRIX (VVHM/WSJC FIR BDRY)	070000N 1040754E					
		127.2NM	FL 460 / FL 155	Odd(1)	Even(1)	[Class A] (2)
▲ ENREP	045224N 1041442E					

Route Remarks:
Singapore ACC FREQ:
P134.35 MHz
S134.9 MHz

ADS-C service is available to suitably equipped aircraft operating outside radar cover and not in the exclusive ADS-B airspace within the Singapore FIR.

Flight planning for Direct Routing Operations (DRO):
Departing aircraft from Singapore operating at FL290 to FL460 (inclusive) and exiting Singapore FIR via IPRIX should flight plan using the direct route EGOLO DCT IPRIX.

All other aircraft operating at FL290 to FL460 (inclusive) and entering or exiting Singapore FIR via L642 ENREP M753 IPRIX should flight plan using the direct route EGOLO DCT IPRIX or its reciprocal track.

Lateral Limits:
25NM either side of line joining ENREP to IPRIX.

Point/Segment Remarks:
(2) NIL

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	**2**	**3**	**4**	**5**	**6**	**7**
M754	*Route availability:* (1) H24					
▲ VINIK (WSJC/RPHI FIR BDRY)	083830N 1161348E					
		37.9NM	FL 460 / FL 135	Even(1)	Odd(1)	[Class A–ABV FL150 Class B-BLW FL150] (2)
▲ SUMLA (WSJC/WMFC FIR BDRY)	080242N 1160054E					

Route Remarks:
Lateral Limits:
10NM either side of line joining SUMLA to VINIK.

Portion of M754 within the Singapore FIR has been delegated to Kinabalu ACC for provision of ATS.

Kinabalu ACC FREQ:
126.1 MHz

Point/Segment Remarks:
(2) BRU 019°
238.9NM

Route Designator {RNP Type} / Significant Point Name	[Route Usage Notes] Significant Point Coordinates					Remarks
{RNP Type}	Track MAG ↓ ↑	Dist NM	Upper limit / Lower limit	Direction of cruising levels ↓	Direction of cruising levels ↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
M758	*Route availability:* (1) H24					
▲ PEKAN DVOR/DME (VPK)	032259N 1032524E					
	087° / 267°	30.4NM	FL 460 / FL 240	Odd(1)	Even(1)	[Class A] (3)
▲ IDSEL (WMFC/WSJC FIR BDRY)	032432N 1035544E					
	087° / 267°	11.1NM	FL 460 / FL 240	Odd(1)	Even(1)	[Class A] (4)
▲ URIGO	032505N 1040647E					
	087° / 267°	24.8NM	FL 460 / FL 240	Odd(1)	Even(1)	[Class A] (4)
▲ VISAT	032620N 1043134E					
	087° / 267°	41.1NM	FL 460 / FL 240	Odd(1)	Even(1)	[Class A] (4)
▲ MABAL	032826N 1051236E					
	087° / 267°	35.7NM	FL 460 / FL 240	Odd(1)	Even(1)	[Class A] (4)
▲ ELGOR	033014N 1054818E					
	087° / 267°	2.6NM	FL 460 / FL 240	Odd(1)	Even(1)	[Class A] (4)
∆ UPVUN (WSJC/WIIF FIR BDRY)	033022N 1055053E					
	087° / 267°	30.5NM	FL 600 / FL 245	Odd(1)	Even(1)	[Class A] (4) (5)
▲ OPULA	033155N 1062118E					
	087° / 267°	34.3NM	FL 600 / FL 245	Odd(1)	Even(1)	[Class A] (5)
▲ LUSMO	033341N 1065534E					
	075° / 255°	110.7NM	FL 600 / FL 245	Odd(1)	Even(1)	[Class A] (5)
▲ GULGU (WSJC/WIIF FIR BDRY)	040141N 1084242E					
	075° / 255°	53.9NM	FL 460 / FL 240	Odd(1)	Even(1)	[Class A] (2)
▲ TERIX	041521N 1093456E					
	075° / 255°	140.5NM	FL 460 / FL 240	Odd(1)	Even(1)	[Class A] (2)
▲ OLKIT (WSJC/WBFC FIR BDRY)	045010N 1115118E					

Point/Segment Remarks:

(2) ADS-C and CPDLC services are available to suitably equipped aircraft operating outside radar cover between GULGU and OLKIT within the Singapore FIR.

(3) Segment from VPK to IDSEL use:
P123.7 MHz
S127.3 MHz

(4) Segment from IDSEL to UPVUN use:
P134.7 MHz
S134.15 MHz

(5) Segment from UPVUN to GULGU to contact Jakarta ACC.

Route Designator {RNP Type}	[Route Usage Notes]					
Significant Point Name	Significant Point Coordinates					Remarks
{RNP Type}	Track MAG ↓ / ↑	Dist NM	Upper limit / Lower limit	Direction of cruising levels ↓	Direction of cruising levels ↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
M761	*Route availability:* (1) H24					
▲ PEKAN DVOR/DME (VPK)	032259N 1032524E					
	105° / 285°	46.0NM	FL 460 / FL 240	Odd(1)	Even(1)	[Class A] (2)
▲ KETOD (WMFC/WSJC FIR BDRY)	031042N 1040942E					
	105° / 285°	10.8NM	FL 460 / FL 240	Odd(1)	Even(1)	[Class A] (3)
▲ OTLON	030752N 1042006E					
	105° / 285°	21.0NM	FL 460 / FL 240	Odd(1)	Even(1)	[Class A] (3)
▲ KILOT	030217N 1044023E					
	105° / 285°	32.3NM	FL 460 / FL 240	Odd(1)	Even(1)	[Class A] (3)
▲ LIPRO	025342N 1051128E					
	105° / 285°	2.4NM	FL 460 / FL 240	Odd(1)	Even(1)	[Class A] (3)
▲ BOPVA (WSJC/WIIF FIR BDRY) (Delegated airspace BDRY)	025303N 1051349E					
	105° / 285°	30.9NM	FL 600 / FL 245	Odd(1)	Even(1)	[Class A] (3)
▲ OSERU (Delegated airspace BDRY)	024450N 1054334E					

Point/Segment Remarks:

(2) Segment from VPK to KETOD use:
P123.7 MHz
S127.3 MHz

(3) Segment from KETOD to OSERU use:
P134.7 MHz
S134.15 MHz

(4) Flights above FL370 between BOPVA and OSERU, see AIP Indonesia ENR 2.1.

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	↑	*Controlling unit Frequency {Airspace class} Remarks*
1	2	3	4	5	6	7
M763	*Route availability:* (1) H24					
▲ ENREP	045224N 1041442E					*(2)*
		70.3NM	FL 460 / FL 240	Even*(1)*	Odd*(1)*	[Class A]
▲ TAXUL (WMFC/WSJC FIR BDRY)	035035N 1034037E					*(2)*
		31.4NM	FL 460 / FL 240	Even*(1)*	Odd*(1)*	[Class A]
▲ PEKAN DVOR/DME (VPK)	032259N 1032524E					

Route Remarks:
Lateral Limits:
10NM either side of line joining VPK DVOR/DME to TAXUL and 25NM either side of line joining TAXUL to ENREP.

Singapore ACC FREQ:
P123.7 MHz
S127.3 MHz

Point/Segment Remarks:
(2) NIL

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	2	3	4	5	6	7
M765	*Route availability:* (1) H24					
▲ IGARI	065612N 1033506E					
		53.3NM	FL 460 / FL 135	Even(1)	Odd(1)	[Class B] (2)
▲ VENLI (WMFC/WSJC FIR BDRY)	062848N 1024900E					

Route Remarks:
Lateral Limits:
10NM either side of line joining VKB DVOR/DME to IGARI.

Portion of M765 within the Singapore FIR has been delegated to Lumpur ACC for provision of ATS.

Lumpur ACC FREQ:
132.6MHz

Point/Segment Remarks:
(2) VKB 058°
88.8NM

Route Designator {RNP Type}	[Route Usage Notes]					
Significant Point Name	Significant Point Coordinates					Remarks
{RNP Type}	Track MAG ↓ / ↑	Dist NM	Upper limit / Lower limit	Direction of cruising levels ↓	Direction of cruising levels ↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
M767	*Route availability:* (1) H24					
▲ TEGID (RPHI/WSJC FIR BDRY)	085656N 1155143E					
(10)	233° / -	242.5NM	FL 460 / FL 205			[Class A] *(2) (3)*
▲ TODAM	063138N 1123536E					
(10)	233° / -	225.5NM	FL 460 / FL 205			[Class A] *(2) (3)*
← ▲ TERIX	041521N 1093456E					
(10)	233° / -	54.0NM	FL 460 / FL 205			[Class A] *(2) (3)*
▲ UKLIS (WSJC/WIIF FIR BDRY)	034234N 1085149E					
(10)	233° / -	132.8NM	FL 600 / FL 205	Even *(1)*		[Class A] [Class B] *(2) (3) (4)*
▲ BOBOB	022206N 1070558E					
(10)	233° / -	69.6NM	FL 600 / FL 205	Even *(1)*		[Class A] [Class B] *(4)*
▲ NIXEB (Delegated airspace BDRY)	013943N 1061040E					
(10)	232° / -	29.4NM	FL 600 / FL 205			[Class A – ABV FL150] *(4)*
▲ TOMAN	012147N 1054717E					

Route Remarks:
Uni-directional for south-west bound flights from TEGID to TOMAN. No PDC Flight Levels FL310, FL320, FL350, FL360, FL390, FL400 applicable. Other levels available with prior approval.

Point/Segment Remarks:
(2) ADS-C and CPDLC services are available to suitably equipped aircraft operating outside radar cover (between TEGID and UKLIS) within the Singapore FIR.
(3) Segment from UKLIS to NIXEB to contact Jakarta ACC.
(4) Segment from NIXEB to TOMAN use:
P134.2 MHz
S133.35 MHz
(5) Flights above FL370 from NIXEB to TOMAN, see AIP Indonesia ENR 2.1.

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	2	3	4	5	6	7
M768	*Route availability:* (1) H24					
▲ AKMON	081254N 1101306E					*(2)*
(10)		96.9NM	FL 460 / FL 135	Odd*(1)*	Even*(1)*	[Class A]
← ▲ LAGOT	071632N 1113243E					*(2)*
(10)		76.9NM	FL 460 / FL 135	Odd*(1)*	Even*(1)*	[Class A]
▲ TODAM	063138N 1123536E					*(2)*
(10)		55.4NM	FL 460 / FL 135	Odd*(1)*	Even*(1)*	[Class A]
▲ ASISU (WSJC/WBFC FIR BDRY)	055906N 1132046E					*(3)*

Route Remarks:
Lateral Limits:
25NM either side of line joining ASISU to AKMON.

ADS-C and CPDLC services are available to suitably equipped aircraft operating outside radar cover within the Singapore FIR.

Point/Segment Remarks:
(2) NIL
(3) BRU 305°
113.3NM

Route Designator {RNP Type} / Significant Point Name	[Route Usage Notes] Significant Point Coordinates					Remarks
{RNP Type}	Track MAG ↓ ↑	Dist NM	Upper limit / Lower limit	Direction of cruising levels ↓	Direction of cruising levels ↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
M771	*Route availability:* (1) H24					
▲ DUDIS (WSJC/VVHM FIR BDRY)	070000N 1064836E					*(7)*
(10)		156.2NM	FL 460 / FL 135			[Class A] *(2) (3)*
▲ DOLOX	044841N 1052247E					*(8)*
(10)		42.5NM	FL 460 / FL 135			[Class A] *(4)*
▲ DAMOG	041225N 1050014E					*(9)*
(10)		27.5NM	FL 460 / FL 135			[Class A] *(4)*
▲ DUBSA	034901N 1044540E					*(10)*
(10)		26.6NM	FL 460 / FL 135			[Class A] *(5)*
▲ VISAT	032620N 1043134E					*(11)*
(10)		21.7NM	FL 460 / FL 135			[Class A] *(5)*
▲ OTLON	030752N 1042006E					*(12)*
(10)		5.4NM	FL 460 / FL 135			[Class A] *(5)*
▲ RAXIM (WMFC/WSJC FIR BDRY)	030318N 1041713E					*(13)*
(10)		47.0NM	FL 460 / FL 135			[Class A] *(6)*
▲ MERSING DVOR/DME (VMR)	022318N 1035218E					

Route Remarks:

Lateral Limits:

10NM either side of line joining VMR DVOR/DME to RAXIM and 25NM either side of line joining RAXIM to DUDIS.

Uni-directional for north-east bound flights from VMR to DUDIS. No PDC Flight Levels FL310, FL320, FL350, FL360, FL390, FL400 applicable. Other levels available with prior approval.

Point/Segment Remarks:

(2) ADS-C service is available to suitably equipped aircraft operating outside radar cover (between DOLOX and DUDIS) and not in exclusive ADS-B airspace within the Singapore FIR.

(3) Segment from DUDIS to DOLOX use:
P134.35 MHz
S134.9 MHz

(4) Segment from DOLOX to DUBSA use:
P123.7 MHz
S127.3 MHz

(5) Segment from DUBSA to RAXIM use:
P134.7 MHz
S134.15 MHz

(6) Segment from RAXIM to VMR use:
P133.8 MHz
S127.3 MHz

(7) NIL

(8) VMR 031°
170.6NM

(9) VMR 031°
128.1NM

(10) VMR 032°
100.6NM

(11) VMR 032°
74.0NM

(12) VMR 032°
52.4NM

(13) VMR 032°
47.0NM

Route Designator {RNP Type}	[Route Usage Notes]					
Significant Point Name	Significant Point Coordinates					Remarks
{RNP Type}	Track MAG ↓ / ↑	Dist NM	Upper limit / Lower limit	Direction of cruising levels ↓	Direction of cruising levels ↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
M772	*Route availability:* (1) H24					
▲ LAXOR (WSJC/RPHI FIR BDRY)	094937N 1144829E					*(2)*
(10)	020° / -	147.5NM	FL 460 / FL 240		Even*(1)*	[Class A]
▲ BIDAG	073101N 1135544E					*(2)*
(10)	020° / -	97.9NM	FL 460 / FL 240		Even*(1)*	[Class A]
▲ ASISU (WBFC/WSJC FIR BDRY)	055906N 1132046E					*(3)*

Route Remarks:
Lateral Limits:
25NM either side of line joining ASISU to LAXOR.

Available only for flights departing from :
- WIII and WIHH to VHHH and airports in People's Republic of China.
- WBGB, WBSB, WBGG, WBKL, WBGR and WBGS to VHHH only.

ADS-C and CPDLC services are available to suitably equipped aircraft operating outside radar cover within the Singapore FIR.

Point/Segment Remarks:
(2) NIL
(3) BRU 305°
113.3NM

Route Designator {RNP Type}	[Route Usage Notes]					
Significant Point Name	Significant Point Coordinates					Remarks
{RNP Type}	Track MAG ↓ / ↑	Dist NM	Upper limit / Lower limit	Direction of cruising levels ↓	Direction of cruising levels ↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
M774	*Route availability:* (1) H24					
▲ JUNHA	005413N 1043052E					
(10)	101° / 281°	61.3NM	FL 600 / 5500 FT ALT	Odd(1)	Even(1)	[Class A – ABV FL150] [Class B – BLW FL150]
▲ OTLAL (Delegated airspace BDRY)	004209N 1053052E					
(10)	101° / 281°	86.8NM	FL 600 / 5500 FT ALT	Odd(1)	Even(1)	[Class A] [Class B]
▲ OBDOS	002503N 1065551E					

Route Remarks:
Singapore ACC FREQ:
P134.4 MHz S128.1 MHz

Flight Planning:
Flights overflying Singapore to destinations north of Kuala Lumpur and Subang to flight plan via M774 JUNHA IRTAD A464 SJ G579 VJB Y342 AROSO Y513.

Flights overflying Singapore to land at Kuala Lumpur and Subang to flight plan via M774 JUNHA IRTAD A464 SJ G579 VJB A457.

All departures from Singapore aerodromes joining ATS route M774 to flight plan via HOSBA G580 DODSO T21.

Point/Segment Remarks:
Flights above FL370 between JUNHA and OBDOS, see AIP Indonesia ENR 2.1.

Route Designator {RNP Type}	***[Route Usage Notes]***					
Significant Point Name	***Significant Point Coordinates***					***Remarks***
{RNP Type}	***Track MAG*** ↓ ↑	***Dist NM***	***Upper limit / Lower limit***	***Direction of cruising levels*** ↓	↑	***Controlling unit Frequency {Airspace class} Remarks***
1	**2**	**3**	**4**	**5**	**6**	**7**
M904	*Route availability:* (1) H24					
▲ TIDAR (WSJC/VTBB FIR BDRY)	065230N 1025000E					
(10)	144° 324°	19.8NM	FL 460 6500 FT ALT	Odd*(1)*	Even*(1)*	[Class A (FL290 and ABV)] *(2)*
▲ ODONO	063614N 1030129E					
(10)	144° 324°	33.1NM	FL 460 FL 145	Odd*(1)*	Even*(1)*	[Class A (FL290 and ABV)] *(2)*
▲ UPRON	060903N 1032040E					
(10)	144° 324°	93.4NM	FL 460 FL 245	Odd*(1)*	Even*(1)*	[Class A (FL290 and ABV)] *(2)*
▲ ENREP	045224N 1041442E					

Route Remarks:
Singapore ACC FREQ:
P134.35 MHz
S134.9 MHz

ADS-C service is available to suitably equipped aircraft operating outside radar cover and not in the exclusive ADS-B airspace within the Singapore FIR.

Point/Segment Remarks:
(2) NIL

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	2	3	4	5	6	7
N502	*Route availability:* (1) H24					
▲ BOBAG	010230N 1032954E					
(5)	336° / -	105.3NM	FL 600 / FL 275		Even(1)	[Class A]
▲ PARDI	003400S 1041300E					

Route Remarks:
Singapore ACC FREQ:
P134.4 MHz S128.1 MHz

Point/Segment Remarks:
Flights above FL370 from PARDI to BOBAG, see AIP Indonesia ENR 2.1.

Route Designator {RNP Type}	[Route Usage Notes]					
Significant Point Name	Significant Point Coordinates					Remarks
{RNP Type}	Track MAG ↓ / ↑	Dist NM	Upper limit / Lower limit	Direction of cruising levels ↓	Direction of cruising levels ↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
N875	*Route availability:* (1) H24					
▲ ENREP	045224N 1041442E					
	131° / 311°	44.1NM	FL 460 / FL 245	Odd(1)	Even(1)	[Class A] (2)
▲ NOPAT	042313N 1044756E					
	131° / 311°	16.3NM	FL 460 / FL 245	Odd(1)	Even(1)	[Class A] (2)
▲ DAMOG	041225N 1050014E					
	131° / 311°	20.6NM	FL 460 / FL 245	Odd(1)	Even(1)	[Class A] (2)
▲ SUSAR	035848N 1051547E					
	131° / 311°	21.8NM	FL 460 / FL 245	Odd(1)	Even(1)	[Class A] (3)
▲ MUMSO	034420N 1053213E					
	131° / 311°	21.3NM	FL 460 / FL 245	Odd(1)	Even(1)	[Class A] (3)
▲ ELGOR	033014N 1054818E					
	131° / 311°	1.3NM	FL 460 / FL 245	Odd(1)	Even(1)	[Class A] (3)
∆ AKDAT (WSJC/WIIF FIR BDRY)	032923N 1054917E					

Point/Segment Remarks:

(2) Segment from ENREP to SUSAR use:
P123.7 MHz
S127.3 MHz

(3) Segment from SUSAR to AKDAT use:
P134.7 MHz
S134.15 MHz

Route Designator {RNP Type} / Significant Point Name	[Route Usage Notes] Significant Point Coordinates					Remarks
{RNP Type}	Track MAG ↓ ↑	Dist NM	Upper limit / Lower limit	Direction of cruising levels ↓	Direction of cruising levels ↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
N884	*Route availability:* (1) H24					
▲ LAXOR (WSJC/RPHI FIR BDRY)	094937N 1144829E					
(10)	051° / -	246.6NM	FL 460 / 6500 FT ALT			[Class A] *(2)*
▲ LAGOT	071632N 1113243E					
(10)	051° / -	242.9NM	FL 460 / 6500 FT ALT			[Class A] *(2)*
▲ RILRI (WSJC/WIIF FIR BDRY)	044343N 1082239E					
(10)	051° / -	111.5NM	FL 600 / 6500 FT ALT		Odd*(1)*	[Class A] [Class B] [Class C] *(5)*
▲ LUSMO	033341N 1065534E					
(10)	069° / -	53.0NM	FL 600 / 6500 FT ALT		Odd*(1)*	[Class A] [Class B] *(5)*
▲ LEBIN	031438N 1060604E					
(10)	069° / -	32.2NM	FL 600 / 6500 FT ALT		Odd*(1)*	[Class A] [Class B] *(5)*
▲ OLMUT (Delegated airspace BDRY)	030306N 1053558E					
(10)	069° / -	22.5NM	FL 600 / 6500 FT ALT			[Class A – ABV FL150] [Class B – BLW FL150] *(3)*
▲ VEGLO (WSJC/WIIF FIR BDRY)	025502N 1051457E					
(10)	069° / -	3.7NM	FL 460 / 6500 FT ALT			[Class A] *(3)*
▲ LIPRO	025342N 1051128E					
(10)	069° / -	34.2NM	FL 460 / 6500 FT ALT			[Class A] *(3)*
▲ LENDA (WSJC/WMFC FIR BDRY)	024124N 1043932E					
(10)	069° / -	50.6NM	FL 460 / 6500 FT ALT			[Class A] *(4)*
▲ MERSING DVOR/DME (VMR)	022318N 1035218E					

Route Remarks:
Uni-directional for east bound flights from VMR to LAXOR. No PDC Flight Levels FL310, FL320, FL350, FL360, FL390, FL400 applicable. Other levels available with prior approval.

Flight planning:
Not available for flight planning between VMR and OLMUT. Flight Plan via TOMAN L625.

Point/Segment Remarks:
(2) ADS-C and CPDLC services are available to suitably equipped aircraft operating outside radar cover (between RILRI and LAXOR) within the Singapore FIR.
(3) Segment from OLMUT to LENDA use:
P134.7 MHz
S134.15 MHz
(4) Segment from LENDA to VMR use:
P133.8 MHz
S127.3 MHz
(5) Segment from OLMUT to RILRI to contact Jakarta ACC.
(6) Flights above FL370 from VEGLO to OLMUT, see AIP Indonesia ENR 2.1.

Route Designator {RNP Type}	[Route Usage Notes]					
Significant Point Name	Significant Point Coordinates					Remarks
{RNP Type}	Track MAG ↓ / ↑	Dist NM	Upper limit / Lower limit	Direction of cruising levels ↓	Direction of cruising levels ↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
N891	*Route availability:* (1) H24					
▲ IGARI (WSJC/VVHM FIR BDRY)	065612N 1033506E					*(6)*
(10)	162° / 342°	65.4NM	FL 460 / FL 155	Odd*(1)*	Even*(1)*	[Class A] *(2)*
▲ IKUMI	055338N 1035509E					*(6)*
(10)	162° / 342°	64.0NM	FL 460 / FL 155	Odd*(1)*	Even*(1)*	[Class A] *(2)*
▲ ENREP	045224N 1041442E					
(10)	185° / 005°	75.5NM	FL 460 / FL 155	Odd*(1)*	Even*(1)*	[Class A] *(3)*
▲ UGPEK	033647N 1040752E					
(10)	185° / 005°	11.7NM	FL 460 / FL 155	Even*(1)*	Odd*(1)*	[Class A] *(3)*
▲ URIGO	032505N 1040647E					
(10)	184° / 004°	10.6NM	FL 460 / FL 155	Even*(1)*	Odd*(1)*	[Class A] *(3)*
▲ MANIM (WMFC/WSJC FIR BDRY)	031430N 1040554E					
(10)	185° / 005°	2.6NM	FL 460 / FL 155	Even*(1)*	Odd*(1)*	[Class A] *(4)*
▲ OBDAB	031153N 1040538E					
(10)	185° / 005°	106.4NM	FL 460 / FL 155	Even*(1)*	Odd*(1)*	[Class A] *(4)*
▲ PAPA UNIFORM DVOR/DME (PU)	012524N 1035600E					*(5)*

Route Remarks:
ADS-C service is available to suitably equipped aircraft operating outside radar cover and not in the exclusive ADS-B airspace within the Singapore FIR

Point/Segment Remarks:
(2) Segment from IGARI to ENREP use:
P134.35 MHz
S134.9 MHz
(3) Segment from ENREP to MANIM use:
P123.7 MHz
S127.3 MHz
(4) Segment from MANIM to PU use:
P133.8 MHz
S127.3 MHz
(5) WSJC/WMFC FIR boundary approximately 0.4NM North of PU.
(6) NIL

Route Designator {RNP Type} / Significant Point Name	[Route Usage Notes] Significant Point Coordinates					Remarks
{RNP Type}	Track MAG ↓ ↑	Dist NM	Upper limit / Lower limit	Direction of cruising levels ↓	Direction of cruising levels ↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
N892	*Route availability:* (1) H24					
▲ MELAS (VVHM/WSJC FIR BDRY)	070518N 1080912E					
(10)		203.6NM	FL 460 / FL 135			[Class A] *(2) (3)*
▲ MABLI	041717N 1061247E					*(6)*
(10)		52.1NM	FL 460 / FL 135			[Class A] *(4)*
▲ MUMSO	034420N 1053213E					*(7)*
(10)		25.2NM	FL 460 / FL 135			[Class A] *(4)*
▲ MABAL	032826N 1051236E					*(8)*
(10)		41.4NM	FL 460 / FL 135			[Class A] *(4)*
▲ KILOT	030217N 1044023E					*(9)*
(10)		15.7NM	FL 460 / FL 135			[Class A] *(4)*
▲ KIBOL WSJC/WMFC FIR BDRY	025224N 1042818E					*(10)*
(10)		28.1NM	FL 460 / FL 135			[Class A] *(5)*
▲ PEKLA	023437N 1040618E					*(11)*
(10)		18.0NM	FL 460 / FL 135			[Class A] *(5)*
▲ MERSING DVOR/DME (VMR)	022318N 1035218E					

Route Remarks:

Lateral Limits:

10NM either side of line joining VMR DVOR/DME to KIBOL and 25NM either side of line joining KIBOL to MELAS.

Uni-directional for south-west bound flights from MELAS to VMR. No PDC Flight Levels FL310, FL320, FL350, FL360, FL390, FL400 applicable. Other levels available with prior approval.

Flight planning for Direct Routing Operations (DRO):

Arriving aircraft into Singapore Changi Airport operating at FL290 to FL460 (inclusive) and entering Singapore FIR via MELAS should flight plan using the direct route MELAS DCT MABAL.

All other aircraft operating at FL290 to FL460 (inclusive) and entering Singapore FIR via MELAS should flight plan using the direct route MELAS DCT MABAL.

Point/Segment Remarks:

(2) ADS-C service is available to suitably equipped aircraft operating outside radar cover (between MELAS and MABLI) and not in the exclusive ADS-B airspace within the Singapore FIR.
(3) Segment from MELAS to MABLI use:
P134.35 MHz
S134.9 MHz
(4) Segment from MABLI to KIBOL use:
P134.7 MHz
S134.15 MHz
(5) Segment from KIBOL to VMR use:
P133.8 MHz
S127.3 MHz
(6) VMR 051°
180.6NM
(7) VMR 051°
128.4NM
(8) VMR 051°
103.2NM
(9) VMR 051°
61.8NM
(10) VMR 050°
46.1NM
(11) VMR 051°
18.0NM

Route Designator {RNP Type}	[Route Usage Notes]					
Significant Point Name	Significant Point Coordinates					Remarks
{RNP Type}	Track MAG ↓ / ↑	Dist NM	Upper limit / Lower limit	Direction of cruising levels ↓	Direction of cruising levels ↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
P501	*Route availability:* (1) H24					
▲ ARAMA (Delegated airspace BDRY)	013654N 1030712E					
(10)	146° / -	25.0NM	FL 460 / 9500 FT ALT	Odd(1)		[Class A – ABV FL150] [Class B – BLW FL150] (2)
▲ ANBUS (WMFC/WIIF FIR BDRY) (Delegated airspace BDRY)	011554N 1032100E					
(10)	146° / -	16.0NM	FL 600 / 9500 FT ALT	Odd(1)		[Class A – ABV FL150] [Class B – BLW FL150] (2)
▲ BOBAG	010230N 1032954E					
(10)	134° / -	41.2NM	FL 600 / FL 275	Odd(1)		[Class A] (3)
▲ UXATI	003348N 1035933E					
(10)	134° / -	19.2NM	FL 600 / FL 275	Odd(1)		[Class A] (3)
▲ POSOG	002024N 1041323E					
(10)	134° / -	53.7NM	FL 600 / FL 275	Odd(1)		[Class A] (3)
▲ ANITO	001700S 1045200E					

Point/Segment Remarks:

(2) Segment from ARAMA to BOBAG use:
P133.25 MHz
S135.8 MHz

(3) Segment from BOBAG to ANITO use:
P134.4 MHz
S128.1 MHz

(4) Flights above FL370 from ANBUS to ANITO, see AIP Indonesia ENR 2.1.

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	2	3	4	5	6	7
Q801	*Route availability:* (1) H24					
▲ ESPOB (VVHM/WSJC FIR BDRY)	070000N 1053318E					
		143.0NM	FL 460 / FL 200			[Class A]
▲ ESBUM	045210N 1042830E					

Route Remarks:

Lateral Limits:

15NM either side of line joining ESPOB TO ESBUM.

Flight planning for Direct Routing Operations (DRO):

Arriving aircraft into Singapore Changi Airport operating at FL290 to FL460 (inclusive) and entering Singapore FIR via ESPOB should flight plan using the direct route ESPOB DCT ELALO.

Uni-directional for southbound flights from ESPOB to ESBUM. No PDC Flight Levels FL310, F320, F350, FL360, FL390, FL400 applicable. Other levels available with prior approval.

Singapore ACC FREQ:
P134.35 MHz
S134.9 MHz

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	**2**	**3**	**4**	**5**	**6**	**7**
Q802	*Route availability:* (1) H24					
▲ IPRIX (VVHM/WSJC FIR BDRY)	070000N 1040754E					
		130.0NM	FL 460 / FL 200	Odd(1)		[Class A]
▲ ESBUM	045210N 1042830E					
		39.0NM	FL 460 / FL 200	Odd(1)		[Class A]
▲ ELALO	041240N 1043329E					

Route Remarks:
Lateral Limits:
15NM either side of line joining IPRIX to ELALO

Singapore ACC FREQ:
P134.35 MHz
S134.9 MHz

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	↑	*Controlling unit Frequency {Airspace class} Remarks*
1	2	3	4	5	6	7
Q803	*Route availability:* (1) H24					
▲ UPRON	060903N 1032040E					
		87.0NM	FL 460 / FL 240	Odd(1)		[Class A]
▲ IPDOL	045111N 1035920E					
		15.0NM	FL 460 / FL 200	Odd(1)		[Class A]
▲ KEXOL	043930N 1040942E					
		36.0NM	FL 460 / FL 200	Odd(1)		[Class A]
▲ ELALO	041240N 1043329E					

Route Remarks:
Lateral Limits:
15NM either side of line joining UPRON to ELALO

Singapore ACC FREQ:
P134.35 MHz
S134.9 MHz

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	2	3	4	5	6	7
T21	*Route availability:* (1) H24					
▲ JUNHA	005413N 1043052E					
(2)	041° / -	34.6NM	FL 600 / 3000 FT ALT	Odd(1)		[Class A – ABV FL150] [Class B – BLW FL150]
▲ VEBMA	012030N 1045332E					
(2)	088° / -	53.8NM	FL 600 / 3000 FT ALT	Odd(1)		[Class A – ABV FL150] [Class B – BLW FL150]
▲ TOMAN	012147N 1054717E					
(2)	088° / -	26.8NM	FL 600 / 5500 FT ALT	Odd(1)		[Class A – ABV FL150] [Class B – BLW FL150]
▲ DODSO (Delegated airspace BDRY)	012225N 1061402E					

Route Remarks:
Singapore ACC FREQ:
P134.2 MHz S133.35 MHz

Flight Planning Instructions:
All departures from Singapore aerodromes, Batam and Tanjungpinang joining ATS route L504 or M774 to flight plan via DODSO T21.

Point/Segment Remarks:
Flights above FL370 from JUNHA to DODSO, see AIP Indonesia ENR 2.1.

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ / ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	2	3	4	5	6	7
T22	*Route availability:* (1) H24					
▲ OBDOS	002503N 1065551E					
(2)	278° / -	92.4NM	FL 600 / 3000 FT ALT	Even*(1)*		[Class A] [Class B]
▲ UGEBO	003813N 1052432E					

Route Remarks:
Singapore ACC FREQ:
P134.2 MHz S133.35 MHz

Flight Planning Instructions:
Arrivals into Changi, Batam and Tanjungpinang on L504 or M774 to flight plan via OBDOS – UGEBO. After UGEBO, to join the UGEBO STAR.
Arrivals into WSSL and WSAP on L504 or M774 to flight plan via OBDOS – T22 – UGEBO – T23 – JUNHA. After JUNHA to route either to OMKOM or SJ.

Point/Segment Remarks:
Flights above FL370 from OBDOS to UGEBO, see AIP Indonesia ENR 2.1.

Route Designator {RNP Type}	***[Route Usage Notes]***					
Significant Point Name	***Significant Point Coordinates***					***Remarks***
{RNP Type}	***Track MAG*** ↓ ↑	***Dist NM***	***Upper limit*** / ***Lower limit***	***Direction of cruising levels*** ↓	***Direction of cruising levels*** ↑	***Controlling unit Frequency {Airspace class} Remarks***
1	**2**	**3**	**4**	**5**	**6**	**7**
T23	*Route availability:* (1) H24					
▲ SURGA	003657S 1063119E					
(2)	318° / -	100.4NM	FL 600 / 3000 FT ALT	Even(1)		[Class A] [Class B]
▲ UGEBO	003813N 1052432E					
(2)	286° / -	56.1NM	FL 600 / 5500 FT ALT	Even(1)		[Class A – ABV FL150] [Class B – BLW FL150]
▲ JUNHA	005413N 1043052E					

Route Remarks:
Singapore ACC FREQ:
P134.2 MHz S133.35 MHz

Flight Planning Instructions:
Arrivals into Changi, Batam and Tanjungpinang on M635 to flight plan via SURGA – UGEBO. After UGEBO, to join the UGEBO STAR.
Arrivals into WSSL and WSAP on M635 to flight plan via SURGA – T23 – JUNHA. After JUNHA to route either to OMKOM or SJ.

Point/Segment Remarks:
Flights above FL370 from SURGA to JUNHA, see AIP Indonesia ENR 2.1.

Route Designator {RNP Type} / Significant Point Name	[Route Usage Notes]					
	Significant Point Coordinates					Remarks
{RNP Type}	Track MAG ↓ / ↑	Dist NM	Upper limit / Lower limit	Direction of cruising levels ↓	Direction of cruising levels ↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
T24	*Route availability:* (1) H24					
▲ JUNHA	005413N 1043052E					
(2)	163° / -	27.0NM	FL 600 / 3000 FT ALT	Odd(1)		[Class A – ABV FL150] [Class B – BLW FL150]
▲ GURES	002814N 1043835E					
(2)	120° / -	26.7NM	FL 600 / 3000 FT ALT	Odd(1)		[Class A – ABV FL150] [Class B – BLW FL150]
▲ IDBUD (Delegated airspace BDRY)	001454N 1050139E					
(2)	120° / -	103.6NM	FL 600 / 5500 FT ALT	Odd(1)		[Class A] [Class B]
▲ SURGA	003657S 1063119E					

Route Remarks:
Singapore ACC FREQ:
P134.4 MHz S128.1 MHz

Flight Planning Instructions:
All departures from Singapore aerodromes, Batam and Tanjungpinang joining ATS route M635 to flight plan via IDBUD T24.

Point/Segment Remarks:
Flights above FL370 from JUNHA to SURGA, see AIP Indonesia ENR 2.1.

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	**2**	**3**	**4**	**5**	**6**	**7**
T25	*Route availability:* (1) H24					
▲ AVLUB	003112S 1042501E					
(2)	341° -	18.6NM	FL 600 FL 290	Even(1)		[Class A] [Class B] [Class C]
▲ IGUTU	001331S 1041857E					
Route Remarks: See Indonesia AIP ENR 2.1.						

Route Designator {RNP Type}		*[Route Usage Notes]*					
	Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}		*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1		2	3	4	5	6	7
T611		*Route availability:* (1) H24					
▲	IPRIX (VVHM/WSJC FIR BDRY)	070000N 1040754E					
			128.0NM	FL 460 / FL 200		Even(1)	[Class A]
▲	IPDOL	045111N 1035920E					
			86.0NM	FL 460 / FL 200		Even(1)	[Class A]
▲	IDSEL (WMFC/WSJC FIR BDRY)	032432N 1035544E					

Route Remarks:
Lateral Limits:
15NM either side of line joining IDSEL to IPRIX.

Singapore ACC FREQ:
P123.7 MHz
S127.3 MHz

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	**2**	**3**	**4**	**5**	**6**	**7**
T612	*Route availability:* (1) H24					
▲ DOLOX	044841N 1052247E					
		121.0NM	FL 460 / FL 200			[Class A]
▲ IDSEL (WMFC/WSJC FIR BDRY)	032432N 1035544E					

Route Remarks:
Lateral Limits:
15NM either side of line joining IDSEL to DOLOX.

Uni-directional for north-east bound flights from IDSEL to DOLOX. No PDC Flight Levels FL310, FL320, FL350, FL360, FL390, FL400 applicable. Other levels available with prior approval.

Singapore ACC FREQ:
P123.7 MHz
S127.30 MHz

Route Designator {RNP Type}		*[Route Usage Notes]*					
	Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}		*Track MAG* ↓ / ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1		2	3	4	5	6	7
Y332		*Route availability:* (1) H24					
▲	TAXUL (WSJC/WMFC FIR BDRY)	035035N 1034037E					*(2)*
		192° / -	42.1NM	FL 460 / FL 245	Even*(1)*		
▲	PADLI	030918N 1033133E					*(2)*

Route Remarks:
Lateral Limits:
10NM either side of line joining TAXUL to PADLI.

Singapore ACC FREQ:
P123.7 MHz
S127.3 MHz

Point/Segment Remarks:
(2) NIL

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	**2**	**3**	**4**	**5**	**6**	**7**
Y334	*Route availability:* (1) H24					
▲ DOVOL (WSJC/WMFC FIR BDRY)	033047N 1034923E					*(2)*
	219° -	27.8NM	FL 460 FL 245	Even*(1)*		
▲ PADLI	030918N 1033133E					*(2)*

Route Remarks:
Lateral Limits:
10NM either side of line joining DOVOL to PADLI.

Singapore ACC FREQ:
P123.7 MHz
S127.3 MHz

Point/Segment Remarks:
(2) NIL

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	2	3	4	5	6	7
Y335	*Route availability:* (1) H24					
▲ IDSEL (WMFC/WSJC FIR BDRY)	032432N 1035544E					
(2)	057° / 237°	28.5NM	FL 460 / FL 245	Even(1)	Odd(1)	(2)
▲ PADLI	030918N 1033133E					

Route Remarks:
Lateral Limits:
10NM on either side of line joining IDSEL to PADLI.

Singapore ACC FREQ:
P123.7 MHz
S127.3 MHz

Point/Segment Remarks:
(2) NIL

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ / ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	**2**	**3**	**4**	**5**	**6**	**7**
Y336	*Route availability:* (1) H24					
▲ KETOD (WMFC/WSJC FIR BDRY)	031042N 1040942E					
(2)	087° / 267°	38.2NM	FL 460 / FL 245	Even(1)	Odd(1)	
▲ PADLI	030918N 1033133E					

Route Remarks:
Lateral Limits:
10NM on either side of line joining KETOD to PADLI.

Singapore ACC FREQ:
P123.7 MHz
S127.3 MHz

Route Designator {RNP Type}		*[Route Usage Notes]*					
	Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}		*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1		2	3	4	5	6	7
Y339		*Route availability:* (1) H24					
Δ	AKOMA (20 DME PU)	014522N 1035443E					
(2)			38.3NM	FL 460 / 5500 FT ALT	Even(1)		[Class A-ABV FL150 Class B-BLW FL150]
Δ	AROSO	020846N 1032421E					

Route Remarks:
Lateral Limits:
11.5NM either side of line joining AKOMA to AROSO.

Flight Planning
Flights departing from or overflying Singapore FIR to destinations north of WMKK and WMSA are to flight plan via Y339.

Flights landing at WMKK and WMSAs, or flights operating at FL220 and below, refer to A457.

Singapore ACC FREQ:
P133.25 MHz
S135.8 MHz

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	**2**	**3**	**4**	**5**	**6**	**7**
Y342	*Route availability:* (1) H24					
▲ JOHOR BAHRU DVOR/DME (VJB)	013950N 1033939E					
(5)		32.6NM	FL 460 / 4500 FT	Even(1)		[Class A-ABV FL150 Class B-BLW FL150]
∆ AROSO	020846N 1032421E					

Route Remarks:
Lateral Limits:
10NM either side of line joining VJB to AROSO.

Flight Planning
Flights overflying Singapore FIR to destinations north of WMKK and WMSA are to flight plan via Y342.

Flights landing at WMKK and WMSA, refer to A457.

Route Designator {RNP Type}	*[Route Usage Notes]*					
Significant Point Name	*Significant Point Coordinates*					*Remarks*
{RNP Type}	*Track MAG* ↓ ↑	*Dist NM*	*Upper limit* / *Lower limit*	*Direction of cruising levels* ↓	*Direction of cruising levels* ↑	*Controlling unit Frequency {Airspace class} Remarks*
1	2	3	4	5	6	7
Y514	*Route availability:* (1) H24					
∆ VIRID	031728.05N 1031318.04E					
(2)		34.57	FL 460 / 11000 FT ALT	Odd(1)		[Class A] (2)
▲ NUFFA	025341.40N 1033829.80E					

Route Remarks:
Singapore ACC FREQ:
P123.7MHz
S127.3MHz

Flight Planning
Arrivals into Changi to flight plan via Y514 - NUFFA - PIBAP - PASPU. After PASPU, expect radar vectors.
All other flights to flight plan via Y514 - NUFFA - BIKTA -B469

Point/Segment Remarks:
(2) NIL

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1.7.2 While this requirement is not applicable for helicopter training flights operating within a designated aircraft training area (Light Aircraft Training Areas A, B or C), flight planning requirements per paragraphs 1.1.2 and 1.1.3 in page ENR 1.10-1 remain applicable.

1.7.3 An application for permission can be submitted to caas_ats_ansp@caas.gov.sg. CAAS may ask for a flight inspection of the proposed route and / or areas of operation. The applicant shall provide the means and bear the cost of the flight inspection. Each case would be considered on its own merits and unless CAAS is satisfied that there are very good justifications, approval would normally not be given.

1.8 FLIGHT PLAN REQUIREMENTS

1.8.1 For Flight Plan requirements, refer to ENR 1.10 FLIGHT PLANNING.

2 PROCEDURES FOR THE CONTROL OF HELICOPTER OPERATIONS AT SINGAPORE CHANGI AIRPORT

2.1 APPROACH AND DEPARTURE PROCEDURES

2.1.1 Before entering the Changi Control Zone, a helicopter pilot is to advise Singapore Tower of his direction of approach, distance from the airport, altitude and type of helicopter. Singapore Tower will pass to the pilot the runway in use, QNH (QFE on request), surface wind and direction and if necessary the position of the helicopter alighting area:

Example: RWY 20R QNH 1008, Wind 020/7kt, light on the runway, Clear to make an approach or hold clear of the Control Zone until advised.

2.1.2 All alightings and take-offs are to be made in a north/south direction as determined by the prevailing wind. The approach from and the turn after take-off shall be made clear of all airport buildings, aprons and obstructions. Requests for approach into and take-offs from Singapore Changi Airport shall be made to Singapore Tower.

2.1.3 Helicopters intending to cross the Changi Control Zone must cross the runway immediately on receipt of clearance and cross at right angles to the runway. Helicopters would be cleared to cross the runway up to the time when a fixed wing aircraft has reached 4NM final approach and Singapore Tower has the landing aircraft in sight. If the weather condition is such that it is not expected that Singapore Tower can see the landing aircraft at 4NM final approach, crossing will only be cleared up to the time the landing aircraft reports leaving the SAMKO Holding Area or NYLON Holding Area inbound.

2.1.4 After take-off, the helicopter is to make a turn-off right or left as appropriate as soon as possible and proceed until well clear of the Changi Control Zone. On reaching the boundary of the zone, the pilot will report ‘clearing your zone’ and normal clearance will be given.

2.2 GROUND OR AIR TAXIING

2.2.1 After landing, the helicopter is required either to ground or air taxi via the taxiways into its allocated aircraft stand.

2.2.2 For take-offs, the helicopter will either ground or air taxi away from its aircraft stand and move out of the parking area via taxiways to the runway or helicopter area for take-off.

2.3 ALLOCATION OF AIRCRAFT STANDS

2.3.1 The allocation of aircraft stands for helicopters rests with the Apron Control Unit. In allocating aircraft stands the Duty Officer at the Apron Control Unit shall take into consideration the type of helicopter, stand occupancy time and the nature of the flight i.e. passenger carrying, training or for maintenance purposes.

2.3.2 Helicopter ferrying passengers will normally be allocated remote aircraft stands, i.e. stands without aerobridges.

2.4 RADIO FAILURE PROCEDURE

2.4.1 In the event of radio failure, the helicopter affected if on the ground shall not take-off

← 2.4.2 If radio failure occurs while in the air, alighting and taxiing clearances will be given by the Tower by the use of the appropriate light signals as described in page ENR 1.1-10, Appendix ‘A’.

2.5 NIGHT OPERATIONS BY HELICOPTERS

2.5.1 Helicopters that are required to operate into and out of Singapore Changi Airport at night shall land on the runway and ground taxi into its aircraft stand via the lighted taxiways.

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AREA CHART - ICAO

LEGEND

Terminal Control Area (TMA)
Name of TMA
Airspace Classification
Upper Limit
Lower Limit
Radio frequency(ies)
Example: TMA JOHOR, B, FL 145, C, 1 500ft, 124.7

Control Zone (CTR)
Name of CTR
Airspace Classification
Upper Limit
Radio frequency(ies)
Example: CTR CHANGI, C, 3 000ft, 118.6m

Aerodrome Traffic Zone (ATZ)
Name of ATZ
Airspace Classification
Upper Limit
Radio frequency(ies)
Example: ATZ TENGAH, D, 3 000ft, 122.0

ATS Routes
Route designator
Distance in nautical miles
Minimum flight altitude (ft)/flight level
Lower limit (ft)/flight level
Example: B469, 20, 4 000/FL 160, (4 000)/(FL 160)

Reporting Point
Compulsory ▲
On request △

DME distance from SJ Navaid D35/SJ

Radio Navigation Aid
Name
Identification and frequency
Geographical Coordinates
Elevation of DME site
Example: SINJON DVOR/DME 113.5, SJ ···· — ··, 01° 13' 21"N, 103° 51' 15"E, 58m

Collocated VOR and DME Radio Navigation Aids
Compass rose orientated on the chart to Magnetic North

Restricted Airspace
(P - Prohibited, R - Restricted, D - Danger)
Identification of area
Nationality letter
Vertical limits
Activation by NOTAM
Example: WSD13, FL 400, WATER, 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 terrains and obstacles in the quadrilateral. It is represented in thousands and hundreds of feet above mean sea level.

Example : 3 400 feet **3 4**

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	Surface to upper limit	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	DEP	128.6
		ARR	128.025
	APP	DEP	120.3
		ARR	119.3
		APP	124.05
	TWR		118.6
			118.25

Note :

FOR DEPARTURE AND ARRIVAL ROUTES REFER TO AD-2-WSSS-SID-1 TO AD-2-WSSS-SID-64 AND AD-2-WSSS-STAR-1 TO AD-2-WSSS-STAR-19

CHANGES :
1. Amended Tanjungpinang Airspace Classification
2. Amended minimum altitude for HOSBA
3. Amended SINJON (SJ) DVOR/DME antenna height
4. Removed JR NDB

PROHIBITED, RESTRICTED AND DANGER AREAS

	ACTIVITY	UPPER LIMIT / LOWER LIMIT	REMARKS
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
WSD34	Rifle Range	500ft ALT / GND	Permanently Active as in ENR 5
WSD35	Rifle Range	900ft ALT / GND	Permanently Active as in ENR 5
WSD36	Rifle Range	750ft 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 Fits 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 RESPECTIVLEY. 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

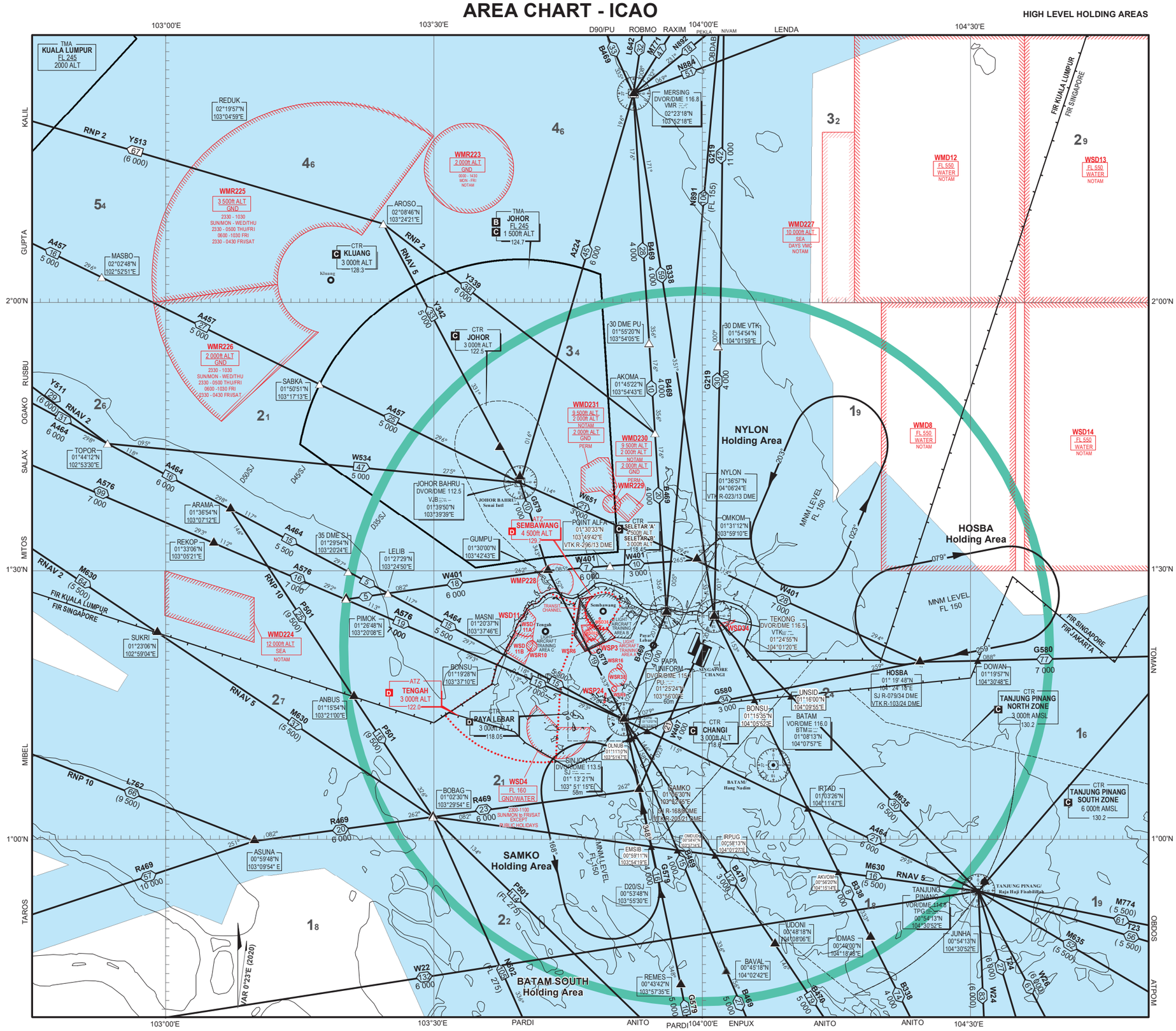
(A) GENERAL WARNING

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



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CHANGES : 1. Amended Tanjungpinang Airspace Classification.
2. Amended SINJON (SJ) DVOR/DME antenna height.
3. Amended minimum level for HOSBA, NYLON and SAMKO Holding.
4. Removed JR NDB.

Nautical Miles 10 0 10 20 30 40

Kilometers 10 0 10 20 30 40 50 60 70 80

AIP AMDT 03/2024

LEGEND

Terminal Control Area (TMA)
Name of TMA
Airspace Classification
Upper Limit
Lower Limit
Radio frequency(ies)
Example: TMA JOHOR, B FL 145, C 1 500ft, 124.7

Control Zone (CTR)
Name of CTR
Airspace Classification
Upper Limit
Radio frequency(ies)
Example: CTR CHANGI, C, 3 000ft, 118.6m

Aerodrome Traffic Zone (ATZ)
Name of ATZ
Airspace Classification
Upper Limit
Radio frequency(ies)
Example: ATZ TENGAH, D, 3 000ft, 122.0

ATS Routes
Route designator
Distance in nautical miles
Minimum flight altitude (ft)/flight level
Lower limit (ft)/flight level
Example: B469, 20, 4 000/FL 160, (4 000)/(FL 160)

Oceanic Control Area (OCA)

Reporting Point
Compulsory
On request

DME distance from SJ Navaid — *D35/SJ*

Radio Navigation Aid
Name
Identification and frequency
Geographical Coordinates
Elevation of DME site
Example: SINJON DVOR/DME 113.5, SJ ···· — ··, 01° 13' 21"N, 103° 51' 15"E, 58m

Collocated VOR and DME Radio Navigation Aids
Compass rose orientated on the chart to Magnetic North

Restricted Airspace
(P - Prohibited, R - Restricted, D - Danger)
Identification of area
Nationality letter
Vertical limits
Activation by NOTAM
Example: WSD13, FL 400, WATER, 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 terrains 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	Surface to upper limit	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	DEP	128.6
		ARR	128.025
	APP	DEP	120.3
		ARR	119.3
		APP	124.05
	TWR		118.6
			118.25

Note :

FOR DEPARTURE AND ARRIVAL ROUTES REFER TO AD-2-WSSS-SID-1 TO AD-2-WSSS-SID-64 AND AD-2-WSSS-STAR-1 TO AD-2-WSSS-STAR-19

PROHIBITED, RESTRICTED AND DANGER AREAS

	ACTIVITY	UPPER LIMIT LOWER LIMIT	REMARKS
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
WSD34	Rifle Range	500ft ALT GND	Permanently Active as in ENR 5
WSD35	Rifle Range	900ft ALT GND	Permanently Active as in ENR 5
WSD36	Rifle Range	750ft 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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*	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

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ENR 4 RADIO NAVIGATION AIDS/SYSTEMS

ENR 4.1 RADIO NAVIGATION AIDS - ENROUTE

Name of station (VOR/VAR)	*Id*	*Frequency (CH)*	*Hours of operation*	*Co-ordinates*	*ELEV DME antenna*	*Remarks*
1	2	3	4	5	6	7
JOHOR BAHRU DVOR/DME	VJB	112.5 MHz (CH 72X)	H24	013950N 1033939E	43.07 M	Operating Authority: Department of Civil Aviation Malaysia
JOHOR BAHRU NDB	JR	245 kHz	H24	014030N 1033936E	-	Operating Authority: Department of Civil Aviation Malaysia EM: A0/A2 (NDB)
MERSING DVOR/DME	VMR	116.8 MHz (CH 115X)	H24	022318N 1035218E	-	Operating Authority: Department of Civil Aviation Malaysia. 50w
PAPA UNIFORM DVOR/DME	PU	115.1 MHz (CH 98X)	H24	012524N 1035600E	Antenna HGT: 190 FT AMSL	BRG 020° DIST 9km from THR RWY 02 (WSAP). MAINT Period: Third WED of EV month BTN 0200-0600 Coverage 200NM. EM: F1
PAYA LEBAR TACAN	PLA	(CH 110X)	BTN 2300-1100 SUN/MON to THU/FRI; BTN 2300-0500 FRI/SAT; PPR from RSAF HQ via Paya Lebar OPS at other times.	012224N 1035451E	-	BRG 015° DIST 1.5km from WSAP ARP. MAINT Period: Second THU of EV month BTN 0001-1100
SEMBAWANG NDB	AG	325 kHz	H24	012526.4N 1034913.0E	-	BRG 198° DIST 0.54km from WSAG ARP. MAINT Period: Second FRI of EV month BTN 0200-0400. Coverage 30NM. EM: A3
← SINJON DVOR/DME	SJ	113.5 MHz (CH 82X)	H24	011321N 1035115E	Antenna HGT: 190 FT AMSL	BRG 201° DIST 14.5km from THR RWY 02 (WSAP). MAINT Period: Third THU of EV month BTN 0200-0600. Coverage 200NM. EM: F1
TANJUNGPINANG VOR/DME	TPG	114.8 MHz (CH 95X)	from 00:00 to 14:00	005413N 1043052E	-	Operating Authority: AirNav Indonesia, Indonesia. Coverage 40NM.
TEKONG DVOR/DME	VTK	116.5 MHz (CH 112X)	H24	012455N 1040120E	Antenna HGT: 150 FT AMSL	BRG 023° DIST 6.4km from THR RWY 20C (WSSS). MAINT Period: Third FRI of EV month BTN 0200-0600. Coverage 200NM. EM:F1
TENGAH TACAN	TNG	(CH 86X)	BTN 2300-1100 SUN/MON to THU/FRI; BTN 2300-0500 FRI/SAT; PPR from RSAF HQ via Tengah OPS at other times.	012336N 1034242E	-	BRG 043° DIST 0.55km from WSAT ARP. MAINT Period: Second SAT of EV month BTN 0001-0900.

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ENR 4.4 NAME-CODE DESIGNATIONS FOR SIGNIFICANT POINTS

Name-code designator	*Co-ordinates*	*ATS route or other route*	*Terminal Area*
1	2	3	4
ABVIP	010008N 1035032E		STAR-WSSS
ABVON	012028N 1035827E		IAC-WSSS
ADNIK	011651N 1035655E		IAC-WSSS
← ADPON	011203N 1040514E		SID-WSSS
AGROT	010108N 1035808E		STAR-WSSS
AGVAR	014719N 1034145E		SID-WSSS
AKDAT	032923N 1054917E	N875	
AKIPO	011356N 1035542E		IAC-WSSS
AKMET	015355N 1034339E		SID-WSSS
AKMON	081254N 1101306E	L625, M768	
AKOMA	014522N 1035443E	B469, Y339	SID-WSSS, IAC-WSSS
AKVOM	005620N 1041514E	B338, M630	
ANBUS	011554N 1032100E	P501	
ANITO	001700S 1045200E	B338, B470, P501	SID-WSSS
ANUMA	011053N 1035424E		IAC-WSSS
APIPA	010618N 1035228E		IAC-WSSS
ARAMA	013654N 1030712E	A464, P501	STAR-WSSS
AROSO	020846N 1032421E	Y339, Y342	SID-WSSS
ASISU	055906N 1132046E	M768, M772	
ASITI	004906N 1035042E		SID-WSSS
ASOMI	010142N 1040207E		SID-WSSS
ASUNA	005948N 1030954E	R469, L762	STAR-WSSS
ATLEX	010302N 1033331E		SID-WSSS
ATLIR	011120N 1035208E	B469	
ATPOM	002425N 1052114E	M635	
ATRUM	013256N 1040057E		SID-WSSS
AVLUB	003112S 1042501E	T25	
AVPIV	011207N 1035349E	A464	
BAVAL	004518N 1040242E	B469	
BETBA	013302N 1035331E		STAR-WSSS
← BIDAG	073101N 1135544E	M772	
BIDUS	013554N 1035755E		IAC-WSSS, STAR-WSSS
BIKTA	024337N 1034308E	B469	
BIMOS	011512N 1035815E		IAC-WSSS
BIPOP	013122N 1041018E		IAC-WSSS, STAR-WSSS

Name-code designator	Co-ordinates	ATS route or other route	Terminal Area
1	2	3	4
BISOV	004229N 1025214E		SID-WSSS
BISUT	011218N 1035701E		IAC-WSSS
BITAM	010813N 1040757E		STAR-WSSS
BOBAG	010230N 1032954E	R469, M630, N502, P501	HLDG ID, SID-WSSS, STAR-WSSS
BOBOB	022206N 1070558E	M767	
BOKIP	010421N 1034353E		SID-WSSS, STAR-WSSS
BONSU	011928N 1033710E	A576	
BOPVA	025303N 1051349E	M761	
BUNTO	024200N 1060000E		
BUVAL	033622N 1034341E	L629	
DAKIX	070854N 1145054E	L649	
DAMOG	041225N 1050014E	M771, N875	
DODSO	012225N 1061402E	G580, T21	SID-WSSS
DOLOX	044841N 1052247E	L629, M771, T612	
DOVAN	011938N 1041249E		STAR-WSSS
DOVOL	033047N 1034923E	L635, Y334	
DOWON	011957N 1043048E	G580	
DUBOT	010846N 1040103E		SID-WSSS
DUBSA	034901N 1044540E	L635, M771	
DUDIS	070000N 1064836E	L644, M771	
DUMUP	005430N 1035516E		STAR-WSSS
EGOLO	031934N 1040047E	L642	
EGORA	013621N 1040607E		IAC-WSSS
ELALO	041240N 1043329E	Q802, Q803	HLDG ID, STAR-WSSS
ELALU	013440N 1040524E		IAC-WSSS
ELBEB	012845N 1040254E		IAC-WSSS
ELBEX	013149N 1040314E		IAC-WSSS
ELGAP	012820N 1040146E		IAC-WSSS
ELGOR	033014N 1054818E	M758, N875	
ELMIN	012550N 1040141E		IAC-WSSS
EMRIX	012606N 1041040E		SID-WSSS
EMSIB	005911N 1035419E	G579, M630	
EMSUX	024647N 1051026E	G334	
EMTAP	011656N 1035657E		IAC-WSSS
ENLES	010932N 1035350E		IAC-WSSS
ENPUX	002859S 1043434E	B469, W24	
ENREP	045224N 1041442E	L642, M753, M763, M904, N875, N891	

Name-code designator	Co-ordinates	ATS route or other route	Terminal Area
1	2	3	4
LIGVU	034417N 1061859E	L644	
LIPRO	025342N 1051128E	M761, N884	
LUSMO	033341N 1065534E	L625, M758, N884	
LUXOL	011803N 1035823E		IAC-WSSS
MABAL	032826N 1051236E	M758, N892	HLDG ID, STAR-WSSS
MABLI	041717N 1061247E	L635, L644, N892	
MANIM	031430N 1040554E	N891	
MASBO	020248N 1025251E	A457	SID-WSSS
MASNI	012037N 1033746E	A464	
MELAS	070518N 1080912E	N892	
MIBEL	012351N 1020816E	L762	SID-WSSS
MOLVO	012955N 1040227E		SID-WSSS
MOXIB	012933N 1040315E		SID-WSSS
MUMDU	010521N 1042714E		SID-WSSS
MUMSO	034420N 1053213E	N875, N892	
NIVAM	023650N 1040228E	G219	
NIXEB	013943N 1061040E	M767	
NODIN	081100N 1161142E	M522	
NOPAT	042313N 1044756E	L629, N875	
NUFFA	025341.40N 1033829.80E	Y514	
NYLON	013657N 1040624E		HLDG ID, IAC-WSSS, SID-WSSS, STAR-WSSS
OBDAB	031153N 1040538E	N891	
← OBDOS	002503N 1065551E	M774, T22	
OBGET	012307N 1064531E		
ODONO	063614N 1030129E	M904	
OLKIT	045010N 1115118E	M758	
OLMUT	030306N 1053558E	N884	
OLNUB	011110N 1035147E	G579	
OMDUD	005847N 1035714E	B469, M630	
OMKOM	013112N 1035910E	W401, W651	
OMLIV	025512N 1062812E		
OPULA	033155N 1062118E	M758	
← OSERU	024450N 1054334E	M761	
OTLAL	004209N 1053052E	M774	
OTLON	030752N 1042006E	M761, M771	
PADLI	030918N 1033133E	B469, Y332, Y334, Y335, Y336	
PALGA	011059N 1034759E		STAR-WSSS

Name-code designator	Co-ordinates	ATS route or other route	Terminal Area
1	2	3	4
PAMSI	010459N 1034845E		STAR-WSSS
PARDI	003400S 1041300E	G579, N502	
PASPU	015915N 1040618E		STAR-WSSS,
PEKLA	023437N 1040618E	N892	
PIBAP	023023N 1040618E		STAR-WSSS
PIMOK	012648N 1032008E	A576, W401	,
POSOG	002024N 1041323E	B469, P501	
POSUB	012725N 1040748E		STAR-WSSS
POVEB	011344N 1040130E		SID-WSSS
RAXIM	030318N 1041713E	M771	
REKOP	013306N 1030521E	A576	
REMES	004342N 1035735E	G579	HLDG ID, STAR-WSSS
REPOV	001623N 1040300E	G579	HLDG ID, STAR-WSSS
RILRI	044343N 1082239E	N884	
ROBMO	025440N 1035700E	L642	
SABKA	015051N 1031713E	A457	SID-WSSS
SALRU	011701N 1040802E		SID-WSSS
SAMKO	010530N 1035255E	R469, W407	HLDG ID, STAR-WSSS, SID-WSSS
SANAT	010749N 1035930E		STAR-WSSS
SAPEX	011316N 1035617E	W407	
SEBVO	011258N 1043448E		SID-WSSS
SUKRI	012306N 1025904E	M630	
SUMLA	080242N 1160054E	M754	
SURGA	003657S 1063119E	M635, T23, T24	
SUSAR	035848N 1051547E	L635, N875	
TAROS	004200N 1021612E	R469	SID-WSSS
TAXUL	035035N 1034037E	M763, Y332	
TEBUN	011455N 1031557E		STAR-WSSS
TEGID	085656N 1155143E	M767	
TERIX	041521N 1093456E	L517, M758, M767	
TIDAR	065230N 1025000E	M904	
TODAM	063138N 1123536E	M767, M768	
TOMAN	012147N 1054717E	G580, L625, M646, M767, T21	SID-WSSS, STAR-WSSS
TOPOR	014412N 1025330E	W534	
TUSNU	003403N 1022109E	W22	
TUSPI	003301N 1040959E		HLDG ID
UDONI	004818N 1040806E	B470	

Name-code designator	Co-ordinates	ATS route or other route	Terminal Area
1	2	3	4
UGEBO	003813N 1052432E	T22, T23	HLDG ID, STAR-WSSS
UGPEK	033647N 1040752E	L635, N891	
UKIBO	011758N 1035924E		SID-WSSS
UKLIS	034234N 1085149E	M767	
UNSID	011600N 1040955E	M635	
UPLAM	025043N 1063319E	L625	
UPRON	060903N 1032040E	M904, Q803	
UPTEL	005925N 1040730E		SID-WSSS
UPVUN	033022N 1055053E	M758	
URIGO	032505N 1040647E	M758, N891	
UXATI	003348N 1035933E	G579, P501	
UXEDA	015449N 1060423E	L625	
VABRI	013115N 1040358E		IAC-WSSS
VAMPO	005833N 1032525E		HLDG ID, STAR-WSSS
VANBU	010643N 1042740E		SID-WSSS
VASTI	004320N 1043406E		SID-WSSS
VEBMA	012030N 1045332E	T21	SID-WSSS
VEGLO	025502N 1051457E	N884	
VENLI	062848N 1024900E	M765	
VENUN	013206N 1061351E	M646	
VEPGA	011131N 1035232E	B470	
VEPLI	035223N 1040542E	L629, L642	,
VERIN	023332N 1062425E	L625	
VEXEL	005904N 1034254E		STAR-WSSS
VIBOG	004310N 1034302E		SID-WSSS
VIGUD	011328N 1035730E		SID-WSSS
VILEV	012729N 1040222E		IAC-WSSS
VIMAL	010942N 1042353E		STAR-WSSS
VINIK	083830N 1161348E	M522, M754	
VIRET	003940N 1043511E		SID-WSSS
VIRID	031728.05N 1031318.04E	Y514	
VISAT	032620N 1043134E	M758, M771	
VOVOS	011123N 1032651E		SID-WSSS

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ENROUTE CHART - ICAO

LEGEND

Aerodrome

Flight Information Region (FIR)

Name of FIR — SINGAPORE; Upper Limit — UNL; Lower Limit — GND/WATER; Unit providing service — ACC SINGAPORE

Terminal Control Area (TMA)

Name of TMA — KUCHING; Airspace Classification — A B C; Upper Limit — FL 250; Lower Limit — 3 000ft; Radio Frequency (ies) — 134.5,120.2

Control Zone (CTR)

Name of CTR — KUCHING; Airspace Classification — C; Upper Limit — 3 000ft; Radio frequency (ies) — 120.2

ATS route

Route designator — L642; Magnetic track — 032°; Distance in nautical miles — 122; Minimum flight altitude (ft)/flight level — 7 000/FL 140; Lower limit (ft)/flight level — (7 000)/(FL 140); Required navigation performance — RNP 10

ATS route reporting point by-pass
(No report is required on this route)

Reporting Point (REP) — **Compulsory** / **On Request**

ATS/MET reporting point (MRP) — **Compulsory** / **On Request**

Restricted Airspace
(P-Prohibited, R-Restricted, D-Danger)

Identification of area — WSD8; Nationality letter; Vertical limits — FL 400 / WATER

Note : Restricted airspace outside Singapore FIR are not shown

Collocated VOR and DME navigation aids (VOR/DME)

Compass rose orientated on the chart to Magnetic North

Identification for radio navigation aids (NAVAID)

Name — SINJON; NAVAID, frequency, identification or call sign — DVOR/DME 113.5 SJ; Geographical coordinates in WGS-84 — 01°13'21"N 103°51'15"E; Elevation of DME site (to the nearest 30m) — 60m

COP at mid-point between VOR are not shown

Area Minimum Altitude (AMA)

Each 2° 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 terrains and obstacles in the quadrilateral. It is represented in thousands and hundreds of feet above mean sea level.

Example : 3 500 feet **3**5

A — Airway in which Mach Number Technique and RNAV are applied (Refer to pages ENR 1.8-13 to 1.8-18)

B — Inbound and Outbound flights exempted from reporting aircraft observations at these points.

WSJC/WMFC FIR BDRY REPORTING POINTS	
TAXUL 03 50 35N 103 40 37E	**MANIM** 03 14 30N 104 05 54E
BUVAL 03 36 22N 103 43 41E	**KETOD** 03 10 42N 104 09 42E
DOVOL 03 30 47N 103 49 23E	**RAXIM** 03 03 18N 104 17 13E
IDSEL 03 24 32N 103 55 44E	**KIBOL** 02 52 24N 104 28 18E
EGOLO 03 19 34N 104 00 47E	**LENDA** 02 41 24N 104 39 32E

**RVSM SEPARATION AVAILABLE
SINGAPORE FIR
BTN FL 290 AND FL 410 (Inclusive)**

AIRSPACE CLASSIFICATION IN THE SINGAPORE FIR

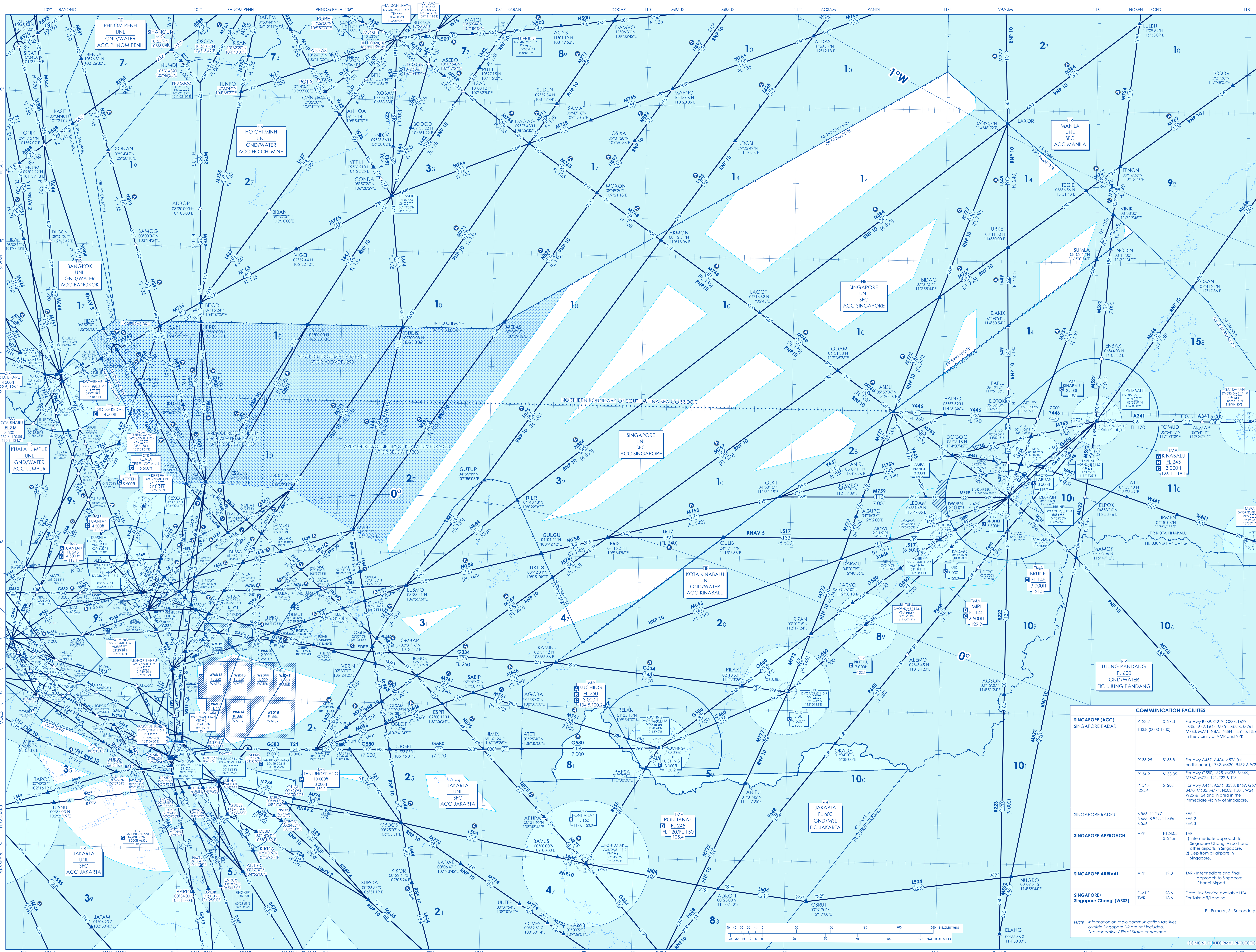
Airspace		Levels	Classification
Controlled airspace		FL 150 to FL 460	A
		Surface to FL 150	B
Controlled airspace more than 100 nm seaward from the shoreline		Lower limit to FL 460	A
Control Zones (CTRs)	Changi CTR	Surface to upper limit	C
	Paya Lebar CTR		D
	Seletar CTR		C
ATZs		Surface to upper limit	D
Uncontrolled airspace			G*

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

CAUTION

Consult respective NOTAMs and AIPs of States concerned for the latest information
and
the Civil Aviation Authority of Singapore does not accept responsibility for any errors or omissions in the information shown outside of Singapore FIR

MAGNETIC INFORMATION FOR THE YEAR 2020



COMMUNICATION FACILITIES

SINGAPORE (ACC) SINGAPORE RADAR	P123.7 S127.3 133.8 (0000-1430)	For Awy B469, G219, G334, L629, L635, L642, L644, M751, M758, M761, M763, M771, N875, N884, N891 & N892 in the vicinity of VMR and VPK.
	P133.25 S135.8	For Awy A457, A464, A576 (all northbound), L762, M630, R469 & W22
	P134.2 S133.35	For Awy G580, L625, M635, M646, M767, M774, T21, T22 & T23
	P134.4 S128.1 255.4	For Awy A464, A576, B338, B469, G579, B470, M635, M774, N502, P501, W24, W26 & T24 and in area in the immediate vicinity of Singapore.
SINGAPORE RADIO	6 556, 11 297 5 655, 8 942, 11 396 6 556	SEA 1 SEA 2 SEA 3
SINGAPORE APPROACH	APP P124.05 S124.6	TAR - 1) Intermediate approach to Singapore Changi Airport and other airports in Singapore. 2) Dep from all airports in Singapore.
SINGAPORE ARRIVAL	APP 119.3	TAR - Intermediate and final approach to Singapore Changi Airport.
SINGAPORE/ Singapore Changi (WSSS)	D-ATIS 128.6 TWR 118.6	Data Link Service available H24. For Take-off/Landing

P - Primary ; S - Secondary

NOTE : Information on radio communication facilities outside Singapore FIR are not included. See respective AIPs of States concerned.

CHANGES : 1. Amended Tanjungpinang Airspace Classification.
2. Included RNP10 annotation for segments of ATS Route M768.
3. Amended SINJON (SJ) DVOR/DME antenna height.

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WSSS AD 2.18 ATS COMMUNICATION FACILITIES

Service Designation	Call sign	*Frequency (P-Pri, S-Sec)*	Hours of operation	Remarks
APP	Singapore Departure	P120.3 MHz S132.15 MHz	H24	DEP from all airports in Singapore.
	Singapore Arrival	P119.3 MHz S119.4 MHz S119.55 MHz		TAR - Intermediate and final approach to Singapore Changi AP.
	Singapore Approach	P124.05 MHz S124.6 MHz S126.3 MHz	2100-1700	TAR - flow control service provided for ARR/DEP ACFT. Intermediate approach to Singapore Changi AP and other airports in Singapore.
TWR	Singapore Tower	118.6 MHz	H24	for TKOF/LDG. for ACFT operating on RWY 02L/20R for vehicular movements on RWY 02L/20R
		118.25 MHz		for ACFT operating on RWY 02C/20C for vehicular movements on RWY 02C/20C for ground movement of ACFT (including ACFT on tow) north and south of RWY 02C/20C
		131.4 MHz		for ACFT operating on RWY 02R/20L for vehicular movements on RWY 02R/20L
	Singapore Ground	124.3 MHz	0000-1800 2100-2400	for push-back / taxiing of all ACFT, including ACFT on tow, west of Terminal 3
		121.725 MHz	0000-1600 2100-2400	for push-back / taxiing of all ACFT, including ACFT on tow, east of Terminal 2
		121.85 MHz	0000-1600	for push-back / taxiing of all ACFT including ACFT on tow, north of Terminal 1
			1600-2400	for push-back/ taxiing of all ACFT
		121.00 MHz	H24	for ground emergency
		122.55 MHz		for push-back / taxiing of all ACFT for ground movement of ACFT (including ACFT on tow) east of Terminal 4
		125.65 MHz		for push-back / taxiing of all ACFT for ground movement of ACFT (including ACFT on tow) west of Terminal 4
		127.275 MHz		for taxiing of all ACFT for ground movement of ACFT (including ACFT on tow) west of RWY 02R/20L and east of TWY C
	Singapore Delivery	121.65 MHz	H24	for Pre-flight check/ATC clearance
		119.6 MHz	0030-0230 1200-1300	for issuance of ATC clearance

Service Designation	Call sign	*Frequency (P-Pri, S-Sec)*	Hours of operation	Remarks
TWR	Changi Tower / Changi Apron	121.9 MHz	H24	Requests for engine runs on aprons and taxiways, excluding runways, would be regulated by Changi Apron. All towing request to contact Changi Apron followed by instruction to contact respective Singapore Ground frequency for towing clearance. Request for vehicular movements on taxiways, excluding runways, would be regulated by Changi Tower. For ACFT on tow and vehicular movements on the runway when the runway is closed for maintenance. All personnel operating the radio station on board an ACFT that is on the ground in Changi Airport should possess the Aircraft Radio Operator Approval (AROA) or other equivalent certification.
	Changi East Tower	119.675 MHz	H24	Request for vehicular movements on taxiways, excluding runway, west of RWY 02R/20L and east of TWY C will be regulated by Changi East Tower. For ACFT on tow and vehicular movements on RWY 02R/20L when the runway is closed for maintenance. All personnel operating the radio station on board an ACFT that is on the ground in Changi Airport should possess the Aircraft Radio Operator Approval (AROA) or other equivalent certification.
	Changi East Ground	120.95 MHz	Not for use, unless with prior coordination	For start-up / taxiing of all aircraft
D-ATIS	Changi Airport Departure Information	128.6 MHz	H24	(broadcasting with half hourly updated MET INFO) Data Link Service available. AP IDENT WSSS Messages comply with ARINC 623 Standards. Updating of data: H+00 to H+10 and H+30 to H+40
	Changi Airport Arrival Information	128.025 MHz	H24	
ATIS	Changi East Information (02R/ 20L)	139.95 MHz	Not for use, unless with prior coordination	NIL

WSSS 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
SINJON DVOR/DME	SJ	113.5 MHz CH82X	H24	011321.34N 1035115.22E	201° MAG 14.5km from THR RWY 02 (Paya Lebar). Antenna HGT: 190ft AMSL. Coverage 200NM. EM: F1. Maintenance period: Third Thursday of every month between 0200-0600
TEKONG DVOR/DME	VTK	116.5 MHz CH112X	H24	012455.36N 1040120.17E	023° MAG 6.4km from THR RWY 20C (Singapore Changi). Antenna HGT: 150ft AMSL. Coverage 200NM. EM: F1 Maintenance Period: Third Friday of every month between 0200-0600
RWY 20C ILS LLZ	ICC	109.7MHz	H24	011932.40N 1035901.32E	Located 368m (1207ft) from THR RWY 02C, along RWY centreline. Course width 2.80°. EM: A0/A2.
RWY 20C ILS GP	-	333.2MHz	H24	012131.73N 1035955.71E	Located 338m (1109ft) from THR RWY 20C on left side of RWY, 120m (394ft) from RWY centreline. GP angle 3°. HGT of ILS Reference Datum: 16.2m (53ft). EM: A0/A2.
RWY 20C ILS DME	ICC	CH34X	H24	012131.73N 1035955.71E	DME co-located with GP. EM: P9.
RWY 20C ILS MM	-	75MHz	H24	012212.24N 1040008.87E	Located 964m (3162ft) from THR RWY 20C along extended centreline of RWY. No back beam.
RWY 02C ILS LLZ	ICE	108.3MHz	H24	012154.47N 1040001.18E	Located 368m (1207ft) from THR RWY 20C, along RWY centreline. Course width 2.80°. EM: A0/A2.
RWY 02C ILS GP	-	334.1MHz	H24	011952.18N 1035913.68E	Located 338m (1109ft) from THR RWY 02C on right side of RWY, 120m (394ft) from RWY centreline. GP angle 3°. HGT of ILS Reference Datum: 16.5m (54ft). EM: A0/A2.
RWY 02C ILS DME	ICE	CH20X	H24	011952.18N 1035913.68E	DME co-located with GP. EM: P9.
RWY 02C ILS MM	-	75MHz	H24	011914.72N 1035853.19E	Located 966m (3169ft) from THR RWY 02C along extended centreline of RWY. No back beam.
RWY 20R ILS LLZ	ICH	108.9MHz	H24	012045.23N 1035834.17E	Located 368m (1207ft) from THR RWY 02L, along centreline of the RWY. Course width 3.38°. EM: A0/A2.
RWY 20R ILS GP	-	329.3MHz	H24	012225.59N 1035912.29E	Located 330m (1083ft) from displaced THR RWY 20R on right side of the RWY, 120m (394ft) from RWY centreline. GP angle 3°. HGT of ILS Reference Datum: 17m (56ft). EM: A0/A2.
RWY 20R ILS DME	ICH	CH26X	H24	012225.59N 1035912.29E	DME co-located with GP. RWY 20R ILS DME not available beyond 15 degrees west of RWY 20R centreline below 2500ft. EM: P9.
RWY 20R ILS MM	-	75MHz	H24	012307.51N 1035934.24E	Located 1122m (3681ft) from displaced THR RWY 20R, along centreline of the RWY.

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
RWY 02L ILS LLZ	ICW	110.9MHz	H24	012307.03N 1035934.03E	Located 1105m (3625ft) from displaced THR RWY 20R, along centreline of RWY. Course width 2.81°. EM:A0/A2.
RWY 02L ILS GP	-	330.8MHz	H24	012108.35N 1035838.86E	Located 343m (1125ft) from THR RWY 02L on left side of RWY, 143m (469ft) from RWY centreline. GP angle 3°. HGT of ILS Reference Datum: 17m (56ft). EM:A0/A2.
RWY 02L ILS DME	ICW	CH46X	H24	012108.35N 1035838.86E	DME co-located with GP. EM:P9.
RWY 02L ILS MM	-	75MHz	H24	012027.54N 1035826.68E	Located 957m (3140ft) from THR RWY 02L along extended centreline of RWY. No back beam.
RWY 20L ILS LLZ	ICZ	108.55MHz	H24	011909.54N 1035954.79E	Located 367m (1204ft) from THR RWY 02R, along RWY centreline. Course width 2.80°. EM: A0/A2.
RWY 20L ILS GP	-	329.75MHz	H24	012108.89N 1040049.38E	Located 335m (1099ft) from THR RWY 20L on left side of the RWY, 120m (394ft) from RWY centreline. GP angle 3°. HGT of ILS REF datum: 16.8m (55ft). EM: A0/A2.
RWY 20L ILS DME	ICZ	CH22Y	H24	012108.89N 1040049.38E	DME co-located with GP. EM: P9.
RWY 20L ILS MM	-	75MHz	H24	012149.37N 1040102.55E	Located 968m (3176ft) from THR RWY 20L, along extended centreline of the RWY.
RWY 02R ILS LLZ	ICX	110.5MHz	H24	012131.46N 1040054.70E	Located 367m (1204ft) from THR RWY 20L, along RWY centreline. Course width 2.80°. EM: A0/A2.
RWY 02R ILS GP	-	329.6MHz	H24	011929.11N 1040007.26E	Located 335m (1099ft) from THR RWY 02R on right side of the RWY, 120m (394ft) from RWY centreline. GP angle 3°. HGT of ILS REF datum: 16.2m (53ft). EM: A0/A2.
RWY 02R ILS DME	ICX	CH42X	H24	011929.11N 1040007.26E	DME co-located with GP EM: P9
RWY 02R ILS MM	-	75MHz	H24	011851.60N 1035947.22E	Located 974m (3196ft) from THR RWY 02R, along extended centreline of the RWY.

ATS Route	RNAV-1 SID	Remarks and Flight Planning Requirements
N891	MERSING	VMR ENREP N891 Expect radar vectors or further ATC clearance on approaching VMR.
R469	TAROS	NIL
T21 / L504	DODSO	Departures joining ATS route L504 to flight plan via DODSO T21 OBDOS.
T21 / M774	DODSO	Departures joining ATS route M774 to flight plan via DODSO T21 OBDOS.
T24 / M635	IDBUD	Departures joining ATS route M635 to flight plan via IDBUD T24 SURGA M635.
W26	KIRDA	NIL
Y513	AROSO	Flight planning permitted for flights departing from or overflying Singapore to destinations north of Kuala Lumpur and Subang Airports. For flights operating at FL220 and below, to flight plan on A457.
[2]Refer to ENR 1.3 and ENR 3.2 for Direct Routing Operations (DRO) flight planning procedures.		

19.4 VERTICAL AND SPEED RESTRICTIONS

19.4.1 Pilots shall comply with an ATC assigned level. Pilots shall also adhere to the vertical and speed restrictions depicted on the SIDs and STARs. ATC clearance will take precedence when the ATC clearance does not allow the pilots to adhere to the vertical and speed restrictions depicted on the SIDs and STARs.

19.5 OPERATORS' PROCEDURES

19.5.1 The operator shall ensure that in-flight procedures, crew manuals and training programmes are established in accordance with RNAV-1 (GNSS) navigation requirements.

19.5.2 Pilots shall inform ATC when on-board equipment does not meet the RNAV-1 (GNSS) navigation requirements. Pilots can then expect radar vector from ATC.

20 COORDINATES OF SID/STAR WAYPOINTS (WGS84 DATUM)

Name	Latitude	Longitude	Radius/Distance from VTK	Radius/DIstance from SJ
ABVIP	010008N	1035032E	VTK R-203.5/ D27.0	SJ R-183.5 / D13.2
← ADPON	011203N	1040514E	VTK R-163.1/ D13.4	SJ R-095.3 / D14.1
AGROT	010108N	1035808E	VTK R-187.7 / D24.0	SJ R-150.8 / D14.0
AGVAR	014719N	1034145E	VTK R-318.8 / D29.8	SJ R-344.3 / D35.3
AKMET	015355N	1034339E	VTK R-328.6 / D34.0	SJ R-349.3 / D41.3
AKOMA	014522N	1035443E	VTK R-342.0 / D21.4	SJ R-006.2 / D32.0
ALFA	013033N	1034942E	VTK R-295.7 / D12.9	SJ R-354.8 / D17.2
ANITO	001700S	1045200E	VTK R-153.4 / D113.4	SJ R-146.0 / D108.6
ARAMA	013654N	1030712E	VTK R-282.4 / D55.5	SJ R-298.0 / D50.0
AROSO	020846N	1032421E	VTK R-319.9 / D57.4	SJ R-334.0/ D61.7
ASITI	004906N	1035042E	VTK R-196.6 / D37.2	SJ R-181.3 / D24.1
ASOMI	010142N	1040207E	VTK R-178.1 / D23.1	SJ R-136.9 / D15.9
ASUNA	005948N	1030954E	VTK R-244.1 / D57.3	SJ R-252.0 / D43.6
ATLEX	010302N	1033331E	VTK R-232.0 / D-35.4	SJ R-240.0 / D20.5
ATRUM	013256N	1040057E	VTK R-357.3 / D8.0	SJ R-026.1 / D21.8
BETBA	013302N	1035331E	VTK R-316.1/ D11.3	SJ R-006.3 / D19.8
← BIDUS	013554N	1035755E	VTK R-326.0 / D13.2	SJ R-006.9 / D22.6
BIPOP	013122N	1041018E	VTK R-054.5 / D11.0	SJ R-046.8 / D26.2
BISOV	004229N	1025214E	VTK R-238.6 / D81.1	SJ R-242.6 / D66.6
BITAM	010813N	1040757E	VTK R-158.3 / D17.9	SJ R-107.0 / D17.5
BOBAG	010230N	1032954E	VTK R-234.7 / D38.6	SJ R-243.2 / D24.0
← BOKIP	010421N	1034353E	VTK R-220.5 / D26.9	SJ R-219.5 / D11.6
DODSO	012225N	1061402E	VTK R-091.0 / D154.3	SJ R-086.4 / D143.3
DOVAN	011938N	1041249E	VTK R-114.6 / D12.7	SJ R-073.9 / D22.5
DUBOT	010846N	1040103E	VTK R-181.0 / D16.1	SJ R-115.0 / D10.8
DUMUP	005430N	1035516E	VTK R-191.4 / D30.9	SJ R-167.9 / D19.2

Name	Latitude	Longitude	Radius/Distance from VTK	Radius/DIstance from SJ
ELALO	041240N	1043329E	VTK R-010.6 / D169.9	SJ R-013.4 / D183.3
EMRIX	012606N	1041040E	VTK R-083.0 / D9.4	SJ R-057.0 / D23.2
ERVIV	010445N	1041013E	VTK R-156.1 / D22.0	SJ R-114.3 / D20.8
GIXEM	004920N	1042539E	VTK R-145.5 / D43.0	SJ R-124.8 / D41.9
GOTGA	012013N	1044200E	VTK R-096.6 / D41.0	SJ R-082.3 / D51.3
GUMPU	013000N	1034243E	VTK R-285.1 / D19.3	SJ R-332.6 / D18.6
GUNUD	011042N	1050618E	VTK R-102.3 / D66.6	SJ R-092.0 / D75.2
GURES	002814N	1043835E	VTK R-146.4 / D67.5	SJ R-133.3 / D65.2
HOSBA	011948N	1042418E	VTK R-102.5 / D23.6	SJ R-079.0 / D33.7
IBASU	005751N	1033410E	VTK R-225.3 / D38.3	SJ R-228.0 / D23.1
IBIVA	011351N	1035637E	VTK R-203.1/ D12.0	SJ R-084.3 / D5.3
IBIXU	011621N	1035740E	VTK R-203.2 / D9.3	SJ R-064.4 / D7.0
IDBUD	001454N	1050139E	VTK R-139.1 / D92.2	SJ R-129.5 / D91.4
IDKIV	005652N	1041333E	VTK R-156.3 / D30.5	SJ R-126.3 / D27.7
IGNON	010847N	1041257E	VTK R-144.1 / D19.8	SJ R-101.8 / D22.2
IGOSI	005645N	1040644E	VTK R-169.1 / D28.6	SJ R-136.8 / D22.7
IKIRO	000849N	1044420E	VTK R-150.4 / D87.1	SJ R-140.4 / D83.4
ISGIL	004246N	1031257E	VTK R-229.1 / D64.1	SJ R-231.6 / D49.0
ISNOM	010629N	1035826E	VTK R-189.0 / D18.6	SJ R-133.6 / D9.9
KANLA	034556N	1043606E	VTK R-013.8 / D144.5	SJ R-016.5 / D158.3
KARTO	011124N	1053343E	VTK R-098.3 / D93.5	SJ R-091.1 / D102.6
KEXAS	011019N	1044818E	VTK R-107.2 / D49.2	SJ R-093.0 / D57.2
KILOT	030217N	1044023E	VTK R-022.0 / D104.5	SJ R-024.4 / D119.0
KIRDA	000009N	1045934E	VTK R-145.4 / D102.7	SJ R-136.8 / D100.1
LAVAX	010950N	1042714E	VTK R-120.1 / D30.0	SJ R-095.5 / D36.2
LEDOX	011642N	1035651E	VTK R-208.6 / D9.4	SJ R-058.5 / D6.5
LELIB	012729N	1032450E	VTK R-274.0 / D36.6	SJ R-298.0 / D30.0
LETGO	011411N	1035548E	VTK R-207.3 / D12.1	SJ R-079.1 / D4.6
MABAL	032826N	1051236E	VTK R-030.1 / D142.1	SJ R-031.2 / D157.2
MASBO	020248N	1025251E	VTK R-299.0 / D78.3	SJ R-310.2 / D76.6
MIBEL	012351N	1020816E	VTK R-269.5 / D113.2	SJ R-275.8 / D103.7
MOLVO	012955N	1040227E	VTK R-012.8 / D5.1	SJ R-034.2 / D20.0
MOXIB	012933N	1040315E	VTK R-022.7 / D5.0	SJ R-036.7 / D20.1
MUMDU	010521N	1042714E	VTK R-126.9 / D32.4	SJ R-102.5 / D36.9
← NYLON	013657N	1040624E	VTK R-023.0 / D13.0	SJ R-032.9 / D28.0
PALGA	011059N	1034759E	VTK R-223.8 / D19.3	SJ R-235.1 / D4.1
PAMSI	010459N	1034845E	VTK R-212.3 / D23.6	SJ R-197.2 / D8.7
PASPU	015915N	1040618E	VTK R-008.3 / D34.5	SJ R-018.3 / D48.1
PIBAP	023023N	1040618E	VTK R-004.4 / D65.3	SJ R-011.1 / D78.1
POSUB	012725N	1040748E	VTK R-069.0 / D6.9	SJ R-049.8 / D21.7
POVEB	011344N	1040130E	VTK R-179.2 / D11.1	SJ R-087.9 / D10.3
PU	012524N	1035600E	VTK R-275.2 / D5.4	SJ R-021.1 / D13.0
REMES	004342N	1035735E	VTK R-185.2 / D41.2	SJ R-167.9 / D30.2
REPOV	001623N	1040300E	VTK R-178.6 / D68.2	SJ R-168.3 / D57.9
RWY 02R DER	012122N	1040051E	VTK R-187.8 / D3.6	SJ R-050.3 / D12.5
RWY 02C DER	012145N	1035957E	VTK R-203.3 / D3.4	SJ R-045.8 / D12.1
RWY 02L DER	012305N	1035933E	VTK R-224.1 / D2.5	SJ R-040.6 / D12.8
RWY 20C DER	011942N	1035905E	VTK R-203.0 / D5.7	SJ R-050.8 / D10.1
RWY 20R DER	012047N	1035835E	VTK R-213.7 / D4.9	SJ R-044.8 / D10.4
RWY 20L DER	011919N	1035959E	VTK R-193.7 / D5.7	SJ R-055.8 / D10.6
SABKA	015051N	1031713E	VTK R-300.4/ D51.2	SJ R-317.7 / D50.7
SALRU	011701N	1040802E	VTK R-139.5 / D10.3	SJ R-077.8 / D17.2
SAMKO	010530N	1035255E	VTK R-203.5 / D21.1	SJ R-168.0 / D8.0
SANAT	010749N	1035930E	VTK R-186.1 / D17.1	SJ R-123.7 / D9.9
← SEBVO	011258N	1043448E	VTK R-109.5 / D35.6	SJ R-090.5 / D43.6
SJ (SINJON)	011321N	1035115E	-	-

Name	Latitude	Longitude	Radius/Distance from VTK	Radius/DIstance from SJ
SURGA	003657S	1063119E	VTK R-129.1 / D193.3	SJ R-124.6 / D194.3
TAROS	004200N	1021612E	VTK R-247.9 / D139.4	SJ R-251.9 / D100.2
TEBUN	011455N	1031557E	VTK R-257.7 / D46.5	SJ R-272.5 / D35.4
TOMAN	012147N	1054717E	VTK R-091.7 / D106.2	SJ R-085.9 / D116.5
UGEBO	003813N	1052432E	VTK R-119.1 / D95.4	SJR-110.5 / D99.8
UKIBO	011758N	1035924E	VTK R-195.7 / D7.2	SJ R-060.6 / D9.4
UPTEL	005925N	1040730E	VTK R-166.3 / D26.1	SJ R-130.5 / D21.4
VAMPO	005833N	1032525E	VTK R-233.9 / D44.5	SJ R-240.4 / D29.8
VANBU	010643N	1042740E	VTK R-124.5 / D32.0	SJ R-100.3 / D37.1
VASTI	004320N	1043406E	VTK R-141.6 / D52.8	SJ R-124.8 / D52.3
VEBMA	012030N	1045332E	VTK R-094.8 / D52.5	SJ R-083.5 / D57.8
VEXEL	005904N	1034254E	VTK R-215.7 / D31.7	SJ R-210.5 / D16.5
VIBOG	004310N	1034302E	VTK R-203.8 / D45.4	SJ R-195.3 / D31.2
VIGUD	011328N	1035730E	VTK R-198.6 / D69.7	SJ R-089.0 / D6.2
VIMAL	010942N	1042353E	VTK R-123.8 / D27.2	SJ R-096.4 / D22.9
VIRET	003940N	1043511E	VTK R-143.0 / D56.4	SJ R-127.3 / D55.3
VMR	022318N	1035218E	VTK R-351.2 / D58.8	SJ R-000.9 / D69.6
VOVOS	011123N	1032651E	VTK R-248.7 / D37.1	SJ R-265.4 / D24.5
VTK (TEKONG)	012455N	1040120E	-	-

21 SID / STAR PHRASEOLOGIES

21.1 SID / STAR phraseologies allow ATC and pilot to communicate and understand detailed clearance information that would otherwise require long and potentially complex transmissions. To eliminate safety risk due to a mismatch between ATC and pilot expectations when SID / STAR phraseologies are used, and what certain terms may mean, ICAO has published Amendment 7-A to Doc 4444, PANS- ATM to harmonise the core phraseologies that positively reinforce the lateral, vertical and speed requirements embedded in a SID or STAR that will continue to apply, unless explicitly cancelled or amended by the controller.

21.2 The core phraseologies are:

i. CLIMB VIA SID TO (level)
ii. DESCEND VIA STAR TO (level)

21.3 These require the aircraft to:

i. Climb / descend to the cleared level in accordance with published level restrictions;
ii. Follow the lateral profile of the procedure; and
iii. Comply with published speed restrictions or ATC-issued speed control instructions as applicable.

21.4 Phraseologies for removal of speed or level restrictions are:

i. CLIMB VIA SID TO (level), CANCEL SPEED RESTRICTION(S)
ii. DESCEND VIA STAR TO (level), CANCEL LEVEL RESTRICTION(S) AT (point(s))

21.5 These phraseologies mean that:

i. The lateral profile of the procedure continue to apply and
ii. Speed or level restrictions which have not been referred to will continue to apply.

21.6 Phraseologies for variations to the lateral profile of the SID / STAR are:

i. PROCEED DIRECT (waypoint), or
ii. VECTORING

21.7 These phraseologies mean that speed and level restrictions associated with the bypassed waypoints are cancelled.

21.8 Phraseology to clear aircraft to return to SID / STAR is: REJOIN SID / STAR

21.9 This phraseology means that speed and level restrictions associated with the waypoint where the rejoin occurs, as well as those associated with all subsequent waypoints must be complied with.

21.10 The term 'VIA' will no longer be used when issuing lateral routing clearances.

22 LIGHT AIRCRAFT OPERATIONS

22.1 Light aircraft operations into and out of Singapore Changi Airport may be approved subject to the following conditions:

a. Prior permission has been granted;
b. Aircraft is suitably equipped;
c. Pilot is appropriately rated;
d. Subject to ATC.

22.2 Flight notification shall be given by filing a flight plan.

22.3 All such operations will be regulated in accordance with IFR procedures.

23 CHANGI FLOW MANAGEMENT PROCEDURES

23.1 INTRODUCTION

23.1.1 The objectives of the procedures are to improve the efficiency of Singapore's air traffic service by minimising radar vectoring as well as improving airspace capacity.

23.1.2 The procedures require the holding of Changi arrivals over established holding areas.

23.2 ENTRY AND EXIT GATES

23.2.1 'Entry gates' and 'Exit gates' are established to ensure segregation between arriving and departing aircraft operating at Singapore Changi Airport. These gates (waypoints) are incorporated in the RNAV SIDs/STARs which have been implemented to support the flow management procedures. The 'entry' and 'exit' gates are shown below:

Entry Gate	Coordinates
KEXAS	011019N 1044818E
PASPU	015915N 1040618E
REMES	004342N 1035735E
VAMPO	005833N 1032525E

23.3 ARRIVING AIRCRAFT TO SINGAPORE CHANGI AIRPORT

23.3.1 STANDARD INSTRUMENT ARRIVAL (STAR)
IFR flight should expect a Standard Instrument Arrival (STAR).

23.3.2 ENTRY GATE TIME
To regulate the flow of traffic into the Approach airspace, ATC will issue, when necessary, a time restriction at an entry gate associated with the inbound route of the flight into Singapore Changi Airport.

23.3.3 DESCENT PROFILE
Pilots shall plan their descent profile in accordance with the published STAR procedures.

23.3.4 SPEED CONTROL
Speed control restrictions are incorporated into the STARs to enhance predictability and planning of air traffic in the Approach airspace. Pilots shall adhere to the speed control restrictions published in the STAR procedures unless otherwise advised. ATC may issue further speed adjustment during the different phases of the flight if traffic situation warrants.

23.4 APPROACH AIRSPACE HOLDING PROCEDURES

23.4.1 ENTRY PROCEDURE
The entry into the holding patterns shall be in accordance with the three-sector entry procedure as prescribed in ICAO Doc 8168 - OPS/611 Edition 1993.

23.4.2 RATE OF TURN
All turns are to be made at a bank angle of 25° or at a rate of 3° per second, whichever requires the lesser bank.

23.4.3 DESCENT PROCEDURE
When instructed to join a holding pattern, pilots shall reach their assigned altitudes prior to arriving at the holding point. This will allow appropriate traffic sequencing and the reduction of step-descents in the holding pattern.

23.4.4 DETAILS OF APPROACH AIRSPACE HOLDING AREAS

Holding Fix / ID / Co-ordinates	Inbound Track °M	Direction of Turn	MAX HLDG Speed (IAS)	Time (MIN)	MNM-MAX HLDG Level	Controlling Unit and Frequency
1	2	3	4	5	6	7
NYLON 013657N 1040624E	203°	Left	220 knots	1	FL140 3,000ft	Singapore Approach 124.05MHz (PRI) 132.15MHz (SRY)
KEXAS 011019N 1044818E	268°	Left	220 knots	1	FL160 11,000ft	Singapore Approach 124.05MHz (PRI) 132.15MHz (SRY)
REMES 004342N 1035735E	348°	Left	220 knots	1	FL140 6,000ft	Singapore Approach 124.6MHz (PRI) 132.15MHz (SRY)
BOBAG 010230N 1032954E	082°	Right	220 knots	1	FL140 6,000ft	Singapore Approach 124.6MHz (PRI) 132.15MHz (SRY)
VAMPO 005833N 1032525E	149°	Right	220 knots	1	FL180 6,000ft	Singapore Approach 124.6MHz (PRI) 132.15MHz (SRY)

23.4.5 ALTERNATE HOLDING AREAS
In the event of inclement weather or capacity constraints rendering a specific holding area unusable, arrivals may be cleared to an alternate holding area for re-sequencing. To ensure smooth transition to alternate holding area, all arrivals bound for Singapore Changi Airport shall have their FMS programmed with all the four promulgated holding areas (paragraph 23.4.4).

23.5 EXPECTED TIME TO LEAVE HOLDING AREA

23.5.1 If arrival delay is processed by means of holding, pilots will be informed of the expected time to leave the respective holding area.

23.5.2 The expected time to leave is issued to serve as an early notification of the probable holding duration as well as for unforeseen circumstance such as radio failure (see ENR 1.6). Subsequently, a specified time to leave the holding area will be issued to pilots to resume the flight according to the assigned RNAV STARs.

23.6 DEPARTING AIRCRAFT FROM SINGAPORE CHANGI AIRPORT

23.6.1 DEPARTURE SPEED CONTROL
Departing aircraft shall not exceed IAS 230 knots below 4,000 feet AMSL or at the waypoints specified in the SID and not exceed IAS 250 knots below 10,000 feet AMSL. Pilots shall also comply with speed control restrictions according to published SIDs.

24 SIMULTANEOUS INDEPENDENT PARALLEL APPROACHES

24.1 INTRODUCTION

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

24.2 PROCEDURES FOR SIMULTANEOUS INDEPENDENT PARALLEL APPROACHES

24.2.1 To ensure safe operations between aircraft on parallel approaches, Normal Operating Zones (NOZs) are established for each extended runway centreline and a No Transgression Zone (NTZ) is established between the NOZs.

24.2.2 ATC will vector arriving flights into Singapore Changi Airport from the final waypoint of the respective STARs to the respective NOZs.

24.2.3 Within the NOZ, ATC shall provide a minimum vertical separation of 1,000ft or 3NM surveillance separation between pairs of aircraft until both aircraft are established on the ILS Localizer course.

24.2.4 ATC is not required to provide separation between aircraft on adjacent ILS Localizers and will monitor aircraft for deviation from the approach path.

24.2.5 Aircraft can expect to maintain altitude 2,500ft till Glide Path Interception for Runway 20R / 02L and 3,500ft till Glide Path Interception for Runway 20C / 02C. This is to ensure the necessary vertical separation prior to establishing on the respective ILS Localizer course.

24.2.6 Aircraft can expect the following radiotelephony phraseology to intercept the Localizer before clearing for ILS:

"TURN LEFT (RIGHT) HEADING (three digits) MAINTAIN (altitude) REPORT ESTABLISHED ON THE LOCALIZER RUNWAY (number) LEFT (CENTRE / RIGHT)"

followed by ...

"MAINTAIN (altitude), CLEARED FOR ILS APPROACH RUNWAY (number) LEFT (CENTRE/RIGHT)"

24.2.7 Aircraft can expect to maintain speed 180 knots at base turn or earlier till 8NM from touchdown.

24.3 BREAK-OUT MANOEUVRE

24.3.1 When an aircraft is observed to have not established on the appropriate Localizer course or deviated from its course towards the NTZ, ATC will instruct the aircraft to return immediately to the correct Localizer course with the following radiotelephony phraseology:

"YOU HAVE CROSSED THE LOCALIZER, TURN LEFT (or RIGHT) IMMEDIATELY AND RETURN TO THE LOCALIZER"

or

"TURN LEFT (or RIGHT) TO RETURN TO LOCALIZER COURSE"

24.3.2 When ATC observed aircraft to be penetrating or will penetrate the NTZ, ATC will instruct the aircraft on the adjacent Localizer course to alter course to avoid the deviating aircraft with the following radiotelephony phraseology:

"TRAFFIC ALERT, TURN LEFT (or RIGHT) IMMEDIATELY HEADING (degrees), CLIMB AND MAINTAIN (altitude)"

24.4 PILOT NOTIFICATION AND CONDITIONS FOR OPERATIONS

24.4.1 Simultaneous approaches to parallel runways operation will be broadcasted on ATIS during the active period.

24.4.2 Simultaneous approaches to the parallel runways will be suspended in the event of adverse weather or any other conditions that may affect the safe conduct of such approaches to the parallel runways.

WSSS 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 Singapore Changi Airport include the following:

- cattle egrets (weighing approximately 400g each)
- intermediate egrets (weighing approximately 500g each)
- brahminy kites (weighing approximately 600g each)
- grey herons (weighing approximately 1500g each)
- white-bellied sea eagle (weighing approximately 2900g each)

1.2 There could be an increase in bird activities during the migratory months of September to March. During this period, migratory birds may use the airport as their feeding ground.

1.3 Various active dispersal devices generating light, sound or cracking effects are used for bird dispersal to mitigate wildlife hazards where necessary within Singapore Changi Airport (such as handheld laser device, long range acoustic device, scarecrow, stock-whip, pyrotechnic, etc.).

AERODROME CHART - ICAO

01 21' 33"N
103 59' 22"E

AERODROME ELEVATION 6.66m

TWR	118.6 / 118.25 / 131.4
GND	124.3 / 121.85 / 121.725 / 127.275
DELIVERY	121.65 / 119.6

RAMP TWR	
GND	122.55 (GMC 4 EAST)
	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	02R	20L
2 White lights and 2 red lights	20.0m	20.0m	19.8m	19.8m	19.7m	19.7m
3 White lights and 1 red light	24.0m	22.6m	23.7m	23.7m	23.6m	23.6m
4 White lights	26.4m	25.0m	26.2m	26.2m	26.0m	26.0m

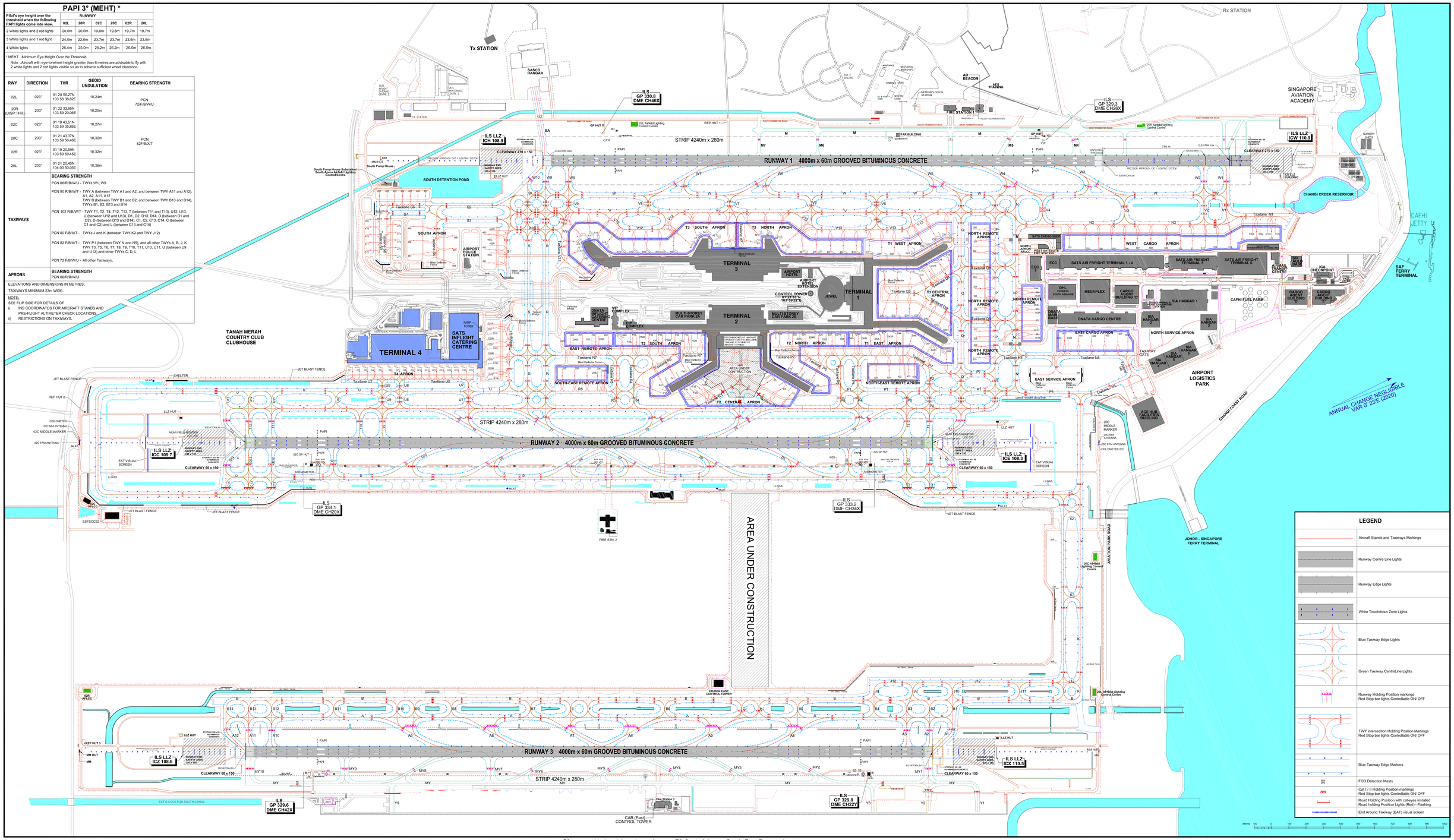
* MEHT ..Minimum Eye Height Over the Threshold.

Note :Aircraft with eye-to-wheel height greater than 8 metres are advisable 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	PCN 82/F/B/X/T
20C	203°	01 21 43.37N 103 59 56.46E	10.30m	
02R	023°	01 19 20.59N 103 59 59.45E	10.32m	
20L	203°	01 21 20.45N 104 00 50.05E	10.36m	

TAXIWAYS	BEARING STRENGTH PCN 86/R/B/W/U - TWYs W1, W9 PCN 90 R/B/W/T - TWY A (between TWY A1 and A2, and between TWY A11 and A12), A1, A2, A11, A12 TWY B (between TWY B1 and B2, and between TWY B13 and B14), TWYs B1, B2, B13 and B14 PCN 102 R/B/W/T - TWY T1, T2, T4, T12, T13, T (between T11 and T13), U12, U13, U (between U12 and U13), D1, D2, D13, D14, D (between D1 and D2), D (between D13 and D14), C1, C2, C13, C14, C (between C1 and C2) and L (between C13 and C14) PCN 80 F/B/X/T - TWYs J and K (between TWY K2 and TWY J12) PCN 82 F/B/X/T - TWY P1 (between TWY N and N5), and all other TWYs A, B, J, K TWY T3, T5, T6, T7, T8, T9, T10, T11, U10, U11, U (between U9 and U12) and other TWYs C, D, L PCN 72 F/B/W/U - All other Taxiways.
APRONS	BEARING STRENGTH PCN 86/R/B/W/U
ELEVATIONS AND DIMENSIONS IN METRES.	
TAXIWAYS MINIMUM 23m 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 CentreLine Lights
- Runway 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
- FOD Detection Masts
- Cat I / II Holding Position markings Red Stop bar lights Controllable ON/ OFF
- Road Holding Position with cat-eyes installed Road holding Position Lights (Red) - Flashing
- End Around Taxiway (EAT) visual screen

Changes : Updated Aerodrome layout - T2 Central Apron, South-East Remote Apron.

INS COORDINATES FOR AIRCRAFT STANDS AND PRE-FLIGHT ALTIMETER CHECK LOCATIONS

LOCATION	STAND NR	NORTH LAT	EAST LONG	ELEVATION
T3 SOUTH APRON	A1	01 21 21.52	103 59 06.25	4.75m (15.58ft)
	A2	01 21 21.75	103 59 04.00	4.65m (15.26ft)
	A3	01 21 19.86	103 59 02.79	4.66m (15.29ft)
	A4	01 21 17.61	103 59 02.54	4.79m (15.72ft)
	A5	01 21 15.50	103 59 03.62	4.86m (15.94ft)
	A9	01 21 12.56	103 59 03.65	5.02m (16.47ft)
	A10	01 21 10.34	103 59 02.40	5.04m (16.54ft)
	A11	01 21 07.93	103 59 01.41	5.25m (17.22ft)
	A12	01 21 05.76	103 59 00.49	5.38m (17.65ft)
	A13	01 21 03.59	103 58 59.58	5.48m (17.98ft)
	A14	01 21 01.66	103 58 57.59	5.57m (18.27ft)
	A15	01 21 00.77	103 58 55.41	5.46m (17.91ft)
	A16	01 20 59.27	103 58 54.20	5.51m (18.08ft)
	A17	01 20 57.25	103 58 54.06	5.23m (17.16ft)
	A18	01 20 55.97	103 58 55.25	5.37m (17.62ft)
	A19	01 20 55.26	103 58 57.13	5.40m (17.72ft)
	A20	01 20 56.09	103 58 58.83	5.45m (17.88ft)
	A21	01 20 57.10	103 59 00.80	5.49m (18.01ft)
T3 NORTH APRON	B1	01 21 26.86	103 59 08.37	4.82m (15.81ft)
	B2	01 21 28.18	103 59 06.82	4.68m (15.35ft)
	B3	01 21 30.33	103 59 07.30	4.65m (15.26ft)
	B4	01 21 32.03	103 59 08.60	4.75m (15.58ft)
	B5	01 21 32.98	103 59 10.89	4.80m (15.75ft)
	B6	01 21 35.15	103 59 13.16	4.96m (16.27ft)
	B7	01 21 37.65	103 59 13.93	4.97m (16.31ft)
	B8	01 21 39.94	103 59 15.20	5.13m (16.83ft)
	B9	01 21 42.19	103 59 16.16	5.13m (16.83ft)
	B10	01 21 44.47	103 59 17.12	5.15m (16.90ft)
T1 WEST APRON	C1	01 21 46.75	103 59 18.08	5.09m (16.70ft)
	C20	01 21 48.83	103 59 19.23	5.08m (16.67ft)
	C22	01 21 51.00	103 59 20.13	5.15m (16.90ft)
	C23	01 21 53.56	103 59 20.77	5.08m (16.67ft)
	C24	01 21 56.54	103 59 20.97	4.89m (16.04ft)
	C25	01 21 59.12	103 59 20.59	4.99m (16.37ft)
	C26	01 22 01.46	103 59 20.76	5.01m (16.44ft)
T1 CENTRAL APRON	C11	01 21 47.42	103 59 23.82	5.09m (16.70ft)
	C13	01 21 49.63	103 59 24.75	5.03m (16.50ft)
	C15	01 21 51.89	103 59 25.70	5.06m (16.60ft)
	C16	01 21 53.47	103 59 26.62	4.86m (15.94ft)
	C17	01 21 55.50	103 59 26.20	5.01m (16.44ft)
	C17L	01 21 54.75	103 59 26.22	4.96m (16.27ft)
	C17R	01 21 56.01	103 59 25.68	5.12m (16.80ft)
	C18	01 21 57.86	103 59 25.75	4.99m (16.37ft)
	C19	01 21 59.79	103 59 25.63	4.95m (16.24ft)
	D30	01 21 44.54	103 59 30.14	5.08m (16.67ft)
	D32	01 21 46.75	103 59 31.08	5.08m (16.67ft)
	D34	01 21 49.03	103 59 32.04	5.07m (16.63ft)
	D35	01 21 50.87	103 59 32.82	5.02m (16.47ft)
	D36	01 21 51.98	103 59 34.52	5.06m (16.60ft)
	D37	01 21 53.37	103 59 36.28	4.97m (16.31ft)
	D38	01 21 54.58	103 59 37.77	4.99m (16.37ft)
T1 EAST APRON	D40	01 21 38.13	103 59 32.89	5.11m (16.77ft)
	D40L	01 21 37.38	103 59 32.83	5.09m (16.70ft)
	D40R	01 21 38.77	103 59 32.84	5.13m (16.83ft)
	D41	01 21 40.30	103 59 33.81	5.07m (16.63ft)
	D42	01 21 42.77	103 59 34.58	5.15m (16.89ft)
	D42L	01 21 42.00	103 59 34.47	5.12m (16.79ft)
	D42R	01 21 43.45	103 59 34.44	5.21m (17.09ft)
	D44	01 21 44.97	103 59 35.44	5.14m (16.86ft)
	D46	01 21 47.40	103 59 36.72	5.08m (16.67ft)
	D47	01 21 49.19	103 59 38.89	4.93m (16.17ft)
	D48	01 21 50.60	103 59 40.77	4.97m (16.31ft)
	D49	01 21 52.23	103 59 42.35	4.98m (16.34ft)
T2 NORTH APRON	E8	01 21 27.99	103 59 38.45	4.68m (15.35ft)
	E10	01 21 24.15	103 59 32.67	4.71m (15.45ft)
	E11	01 21 25.57	103 59 34.37	4.78m (15.68ft)
	E12	01 21 27.20	103 59 36.42	4.75m (15.58ft)
	E20	01 21 24.36	103 59 27.08	5.04m (16.54ft)
	E22	01 21 26.64	103 59 28.04	5.07m (16.63ft)
	E24	01 21 29.01	103 59 29.06	5.09m (16.70ft)
	E24L	01 21 28.32	103 59 28.77	5.10m (16.73ft)
	E24R	01 21 29.53	103 59 29.28	5.08m (16.67ft)
	E26	01 21 31.19	103 59 29.96	5.08m (16.67ft)
	E27	01 21 33.56	103 59 30.96	5.07m (16.62ft)
	E27L	01 21 32.79	103 59 30.86	5.03m (16.48ft)
	E27R	01 21 34.20	103 59 30.91	5.12m (16.80ft)
	E28	01 21 35.74	103 59 31.89	5.08m (16.67ft)

INS COORDINATES FOR AIRCRAFT STANDS AND PRE-FLIGHT ALTIMETER CHECK LOCATIONS

LOCATION	STAND NR	NORTH LAT	EAST LONG	ELEVATION
T2 CENTRAL APRON	E2	01 21 19.28	103 59 27.30	4.90m (16.08ft)
	E3	01 21 18.44	103 59 29.27	4.82m (15.81ft)
	E4	01 21 18.10	103 59 31.70	4.80m (15.75ft)
	E5	01 21 19.56	103 59 33.72	4.90m (16.08ft)
	E6	01 21 21.22	103 59 35.93	4.84m (15.88ft)
	E7	01 21 22.48	103 59 37.46	4.73m (15.52ft)
	F31	01 21 13.87	103 59 25.30	4.91m(16.11ft)
	F32	01 21 13.03	103 59 27.26	4.85m (15.91ft)
	F33	01 21 11.30	103 59 28.54	4.91m (16.11ft)
	F34	01 21 08.98	103 59 28.96	4.92m (16.14ft)
	F35	01 21 06.60	103 59 29.55	4.91m (16.11ft)
	F35L	01 21 06.06	103 59 30.13	4.74m (15.55ft)
	F35R	01 21 06.96	103 59 29.05	5.04m (16.54ft)
	F36	01 21 04.34	103 59 29.67	4.82m (15.81ft)
T2 SOUTH APRON	F37	01 20 59.83	103 59 27.87	4.75m (15.58ft)
	F40	01 21 05.62	103 59 25.34	4.85m (15.91ft)
	F41	01 21 03.19	103 59 25.58	4.82m (15.81ft)
	F42	01 21 00.61	103 59 25.96	4.72m (15.49ft)
	F50	01 21 10.69	103 59 21.32	5.03m (16.50ft)
	F52	01 21 08.51	103 59 20.40	5.11m (16.77ft)
	F52L	01 21 07.82	103 59 20.11	5.16m (16.93ft)
	F52R	01 21 09.04	103 59 20.62	5.08m (16.67ft)
	F54	01 21 06.14	103 59 19.40	5.22m (17.13ft)
	F56	01 21 03.96	103 59 18.48	5.30m (17.39ft)
	F56L	01 21 03.27	103 59 18.18	5.42m (17.78ft)
	F56R	01 21 04.49	103 59 18.70	5.34m (17.52ft)
	F58	01 21 01.58	103 59 17.47	5.49m (18.01ft)
	F59	01 20 59.41	103 59 16.55	5.64m (18.50ft)
	F59L	01 20 58.72	103 59 16.26	5.67m (18.60ft)
	F59R	01 20 59.93	103 59 16.78	5.60m (18.37ft)
	F60	01 20 56.91	103 59 15.50	5.77m (18.93ft)
EAST REMOTE APRON	200	01 20 47.83	103 59 11.67	6.23m (20.44ft)
	200L	01 20 46.91	103 59 11.92	6.29m (20.64ft)
	200R	01 20 48.35	103 59 11.89	6.18m (20.28ft)
	201	01 20 49.99	103 59 12.62	5.96m (19.55ft)
	202	01 20 52.34	103 59 13.57	5.94m (19.49ft)
	202L	01 20 51.65	103 59 13.28	5.76m (18.90ft)
	202R	01 20 52.87	103 59 13.79	5.73m (18.80ft)
	203	01 20 54.52	103 59 14.47	5.92m (19.42ft)
SOUTH-EAST REMOTE APRON	205	01 20 43.91	103 59 17.06	4.77m (15.65ft)
	206	01 20 46.08	103 59 17.98	4.76m (15.62ft)
	207	01 20 48.21	103 59 19.01	4.74m (15.55ft)
	208	01 20 50.68	103 59 20.05	4.75m (15.58ft)
	208L	01 20 50.01	103 59 19.76	4.74m (15.55ft)
	208R	01 20 51.25	103 59 20.29	4.73m (15.42ft)
NORTH REMOTE APRON	300	01 22 06.95	103 59 22.67	4.53m (14.86ft)
	301	01 22 06.41	103 59 24.69	4.93m (16.17ft)
	302	01 22 05.21	103 59 26.75	4.97m (16.31ft)
	303	01 22 03.55	103 59 31.40	5.32m (17.45ft)
	304	01 22 02.84	103 59 33.06	5.35m (17.55ft)
	305	01 22 02.14	103 59 34.71	5.30m (17.39ft)
	306	01 22 01.41	103 59 36.42	5.16m (16.93ft)
	307	01 21 59.39	103 59 40.36	5.16m (16.93ft)
	308	01 21 58.96	103 59 41.35	5.10m (16.73ft)
	309	01 21 58.52	103 59 43.17	5.06m (16.60ft)
	310	01 21 57.42	103 59 44.96	4.74m (15.55ft)
	951	01 22 09.35	103 59 45.23	5.15m (16.90ft)
	951L	01 22 08.91	103 59 44.27	5.00m (16.40ft)
	951R	01 22 08.35	103 59 45.58	5.00m (16.40ft)
	952	01 22 09.94	103 59 42.65	4.89m (16.04ft)
	953	01 22 11.22	103 59 40.85	4.98m (16.34ft)
	953L	01 22 10.78	103 59 39.89	4.83m (15.85ft)
	953R	01 22 10.41	103 59 41.28	4.87m (15.98ft)
	954	01 22 12.46	103 59 37.95	4.84m (15.88ft)
	954L	01 22 12.02	103 59 36.99	4.70m (15.42ft)
	954R	01 22 11.65	103 59 38.38	4.74m (15.55ft)
NORTH-EAST REMOTE APRON	400	01 21 38.71	103 59 40.14	4.31m (14.14ft)
	401	01 21 40.98	103 59 41.10	4.31m (14.14ft)
	402	01 21 42.85	103 59 41.89	4.30m (14.11ft)
	403	01 21 44.37	103 59 42.53	4.29m (14.07ft)
	404	01 21 45.45	103 59 42.98	4.20m (13.78ft)

INS COORDINATES FOR AIRCRAFT STANDS AND PRE-FLIGHT ALTIMETER CHECK LOCATIONS

LOCATION	STAND NR	NORTH LAT	EAST LONG	ELEVATION
WEST CARGO APRON	502	01 22 22.23	103 59 31.62	4.35m (14.27ft)
	503	01 22 24.98	103 59 32.78	4.29m (14.07ft)
	504	01 22 27.26	103 59 33.74	4.29m (14.07ft)
	505	01 22 29.54	103 59 34.70	4.32m (14.17ft)
	506	01 22 31.81	103 59 35.66	4.38m (14.37ft)
	507	01 22 34.11	103 59 36.64	4.36m (14.30ft)
	508	01 22 36.41	103 59 37.61	4.29m (14.07ft)
	509	01 22 39.12	103 59 38.76	4.09m (13.42ft)
	510	01 22 41.37	103 59 40.18	4.19m (13.75ft)
	511	01 22 43.54	103 59 41.09	4.22m (13.85ft)
	512	01 22 45.71	103 59 42.01	4.24m (13.91ft)
	513	01 22 47.89	103 59 42.92	4.26m (13.98ft)
	514	01 22 50.19	103 59 43.54	4.36m (14.30ft)
	515	01 22 52.90	103 59 43.20	4.09m (13.43ft)
	516	01 22 55.39	103 59 43.97	4.04m (13.26ft)
	516L	01 22 56.24	103 59 43.80	3.96m (12.98ft)
	516R	01 22 54.93	103 59 43.25	3.95m (12.97ft)
	517	01 22 58.02	103 59 45.08	4.05m (13.27ft)
	517L	01 22 58.83	103 59 44.99	3.98m (13.05ft)
	517R	01 22 57.55	103 59 44.35	3.96m (12.98ft)
EAST CARGO APRON	600	01 22 14.12	103 59 48.10	4.25m (13.94ft)
	600L	01 22 13.28	103 59 48.27	4.22m (13.83ft)
	600R	01 22 14.58	103 59 48.81	4.15m (13.60ft)
	601	01 22 16.52	103 59 49.27	4.27m (14.01ft)
	602	01 22 18.80	103 59 50.23	4.30m (14.11ft)
	603	01 22 21.15	103 59 51.02	4.29m (14.07ft)
	604	01 22 23.46	103 59 51.99	4.31m (14.14ft)
	605	01 22 25.19	103 59 52.75	4.27m (14.01ft)
EAST SERVICE APRON	606	01 22 10.00	103 59 52.53	2.43m (7.97ft)
	609	01 22 12.95	103 59 55.04	2.91m (9.55ft)
ACEHUB	611	01 22 22.14	104 00 02.87	4.01m (13.16ft)
	612	01 22 24.50	104 00 02.87	3.91m (12.83ft)
SOUTH APRON	461	01 20 39.67	103 58 52.75	5.28m (17.32ft)
	462	01 20 40.69	103 58 50.37	5.75m (18.86ft)
	462L	01 20 40.41	103 58 51.02	5.48m (17.98ft)
	462R	01 20 40.97	103 58 49.71	5.71m (18.73ft)
	463	01 20 41.80	103 58 47.76	5.97m (19.59ft)
	463L	01 20 41.52	103 58 48.42	5.82m (19.10ft)
	463R	01 20 42.06	103 58 47.17	5.82m (19.10ft)
	464	01 20 32.33	103 58 49.39	4.98m (16.34ft)
	465	01 20 33.61	103 58 47.20	5.01m (16.44ft)
	466	01 20 34.53	103 58 45.05	5.01m (16.44ft)
	467	01 20 27.32	103 58 45.73	5.01m (16.44ft)
	468	01 20 28.34	103 58 43.34	5.00m (16.41ft)
	469	01 20 29.36	103 58 40.96	5.02m (16.47ft)
	471	01 20 23.76	103 58 44.49	5.16m (16.93ft)
	472	01 20 24.55	103 58 43.24	5.16m (16.93ft)
	473	01 20 25.12	103 58 41.90	5.16m (16.93ft)
	474	01 20 25.70	103 58 40.56	5.16m (16.93ft)
	475	01 20 26.27	103 58 39.22	5.16m (16.93ft)
	476	01 20 19.16	103 58 41.47	5.16m (16.93ft)
	477	01 20 19.74	103 58 40.13	5.16m (16.93ft)
	478	01 20 20.31	103 58 38.79	5.16m (16.93ft)
	479	01 20 20.88	103 58 37.45	5.16m (16.93ft)
	480	01 20 21.45	103 58 36.11	5.16m (16.93ft)
	481	01 20 25.27	103 58 32.56	5.22m (17.13ft)
	482	01 20 26.62	103 58 33.13	5.22m (17.13ft)
	483	01 20 27.96	103 58 33.70	5.22m (17.13ft)
	484	01 20 29.31	103 58 34.27	5.22m (17.13ft)
	485	01 20 30.66	103 58 34.84	5.22m (17.13ft)
	486	01 20 32.01	103 58 35.41	5.22m (17.13ft)
	487	01 20 33.36	103 58 35.98	5.22m (17.13ft)
T4 APRON	G1	01 20 07.58	103 59 00.97	3.95m (12.96ft)
	G2	01 20 08.88	103 59 01.52	3.95m (12.96ft)
	G3	01 20 10.18	103 59 02.07	3.95m (12.96ft)
	G4	01 20 11.48	103 59 02.07	3.94m (12.93ft)
	G5	01 20 12.77	103 59 03.17	3.94m (12.93ft)
	G6	01 20 14.49	103 59 03.89	3.93m (12.89ft)
	G7	01 20 15.70	103 59 04.57	3.89m (12.76ft)
	G8	01 20 17.01	103 59 05.12	3.85m (12.63ft)
	G9	01 20 18.31	103 59 05.67	3.85m (12.63ft)
	G10	01 20 19.60	103 59 06.22	3.86m (12.66ft)
	G11	01 20 20.90	103 59 06.77	3.84m (12.60ft)
	G12	01 20 22.20	103 59 07.31	3.83m (12.57ft)
	G13	01 20 23.50	103 59 07.86	3.82m (12.53ft)
	G14	01 20 24.79	103 59 08.41	3.83m (12.57ft)
	G15	01 20 26.09	103 59 08.96	3.88m (12.73ft)
	G16	01 20 27.39	103 59 09.50	4.05m (13.29ft)
	G17	01 20 28.69	103 59 10.05	4.00m (13.12ft)
	G18	01 20 31.53	103 59 11.86	4.36m (14.30ft)
	G18L	01 20 32.05	103 59 12.85	4.34m (14.24ft)
	G18R	01 20 31.65	103 59 11.26	4.43m (14.53ft)
	G19	01 20 32.64	103 59 09.25	4.56m (14.96ft)
	G19L	01 20 33.17	103 59 11.26	4.47m (14.67ft)
	G19R	01 20 32.77	103 59 08.66	4.56m (14.96ft)
	G20	01 20 33.75	103 59 06.65	4.52m (14.83ft)
	G20L	01 20 34.13	103 59 07.58	4.44m (14.57ft)
	G20R	01 20 33.99	103 59 06.10	4.52m (14.83ft)
	G21	01 20 34.87	103 59 04.04	4.51m (14.80ft)
	G21L	01 20 35.24	103 59 04.98	4.52m (14.83ft)
	G21R	01 20 35.10	103 59 03.49	4.55m (14.93ft)

RESTRICTIONS ON TAXIWAYS

1) Pilots are advised to apply minimum thrust when
   i) turning into TWY P2, P4, P5 and Taxilane P6 while taxiing either northwards or southwards on Taxilane P7, and
   ii) thereafter when taxiing along TWY P2 up to and including the TWY P1/P2 junction.
   This is in view of apron activities at aircraft stands D40, D41, D47, D48, D49, E22, E24, E27 and E28.

2) TWY SA can only be used by aircraft with maximum wingspan 65m. TWY SA is a one-way live TWY for aircraft taxiing into SASCO hangar via RWY 02L. Only tow-out operation is allowed from SASCO hangar into TWY SA and RWY 02L.

3) Taxiway Q (between TWY V and TWY P7) can only be used by aircraft with maximum wingspan 65m.

4) Taxiway centreline along TWY T between TWY R1 and R3 offset eastward by 2.5m away from aircraft stands E7 and F36

5) Pilots are advised to apply minimum thrust when turning into Taxiway V from Taxilane V7.

6) Taxilane V11 (behind aircraft stands A18 to A21) can only be used by aircraft with maximum wingspan 61m.

7) Taxilane Q1 (behind aircraft stands C16 to C19 and between TWY P and TWY Q),
   Taxilane Q2 and Taxilane Q3 (behind aircraft stands D35 to D38 and between TWY P and TWY Q)
   can only be used by aircraft with maximum wingspan 65m.

8) Taxilane P7 (behind aircraft stands E20 to E22) and Taxilane R7 (behind aircraft stands F50 to F54) can only be used by aircraft with maximum wingspan 65m (towing and pushback exempted).

9) Taxilane U2 can only be used by aircraft with maximum wingspan 36m.

10) Taxiway U7 (between Taxilane U2 and Taxiway U), Taxiway U8 (between Taxilane U2 and Taxiway U) and Taxiway U9 (between Taxilane U2 and Taxiway U) can only be used by aircraft with maximum wingspan 36m.

11) Pilots are advised to exercise caution when taxiing near Taxilane U2, Taxiway U, U7, U8 and U9.

12) Pilots are advised to apply speed limit of 20 knots when taxiing along TWY R and TWY S.

13) Pilots turning aircraft into aircraft stand A2 or aircraft stand B2 are advised to wait for any aircraft holding at Taxilane V7, at the inner cul-de-sac portion of the terminal building to vacate this portion before turning into aircraft stand A2 or aircraft stand B2.

14) TWY M, M4, M5, M6 and M7, located western side of RWY 02L/20R, are solely for use by Republic of Singapore Air Force (RSAF) aircraft.

15) TWY MY, MY1, MY2, MY3, MY4, MY5, MY6, MY7, MY8, MY9 and MY10, located eastern side of RWY 02R/20L, are solely for use by Republic of Singapore Air Force (RSAF) aircraft.

16) Taxiway S2, S3 and Taxilane S4 can only be used by aircraft with maximum wingspan 65m.

17) Taxilane S6, S8, S9 and Taxiway S7 can only be used by aircraft with maximum wingspan 36m.

18) Pilots are advised to apply minimum thrust when taxiing on Taxilane N4 turning into Taxilane N5 (and vice versa), due to potential jet blast issues affecting Bays 603, 604, 611 and 612. Aircraft shall not stop on TXL N5 between aircraft stands 604 and 611.

NOTE:
Pilots to follow stand lead-in line and taxi through white hatched apron markings of the following aircraft stands:
A5, A9, B5, B6, C17, D40, D42, E24, E27, F35, F52, F56, F59, G18, G19, G20, G21, 200, 202, 208, 462, 463, 600, 516, 517, 951, 953, 954.

RADIO ALTIMETER OPERATIONS AREA

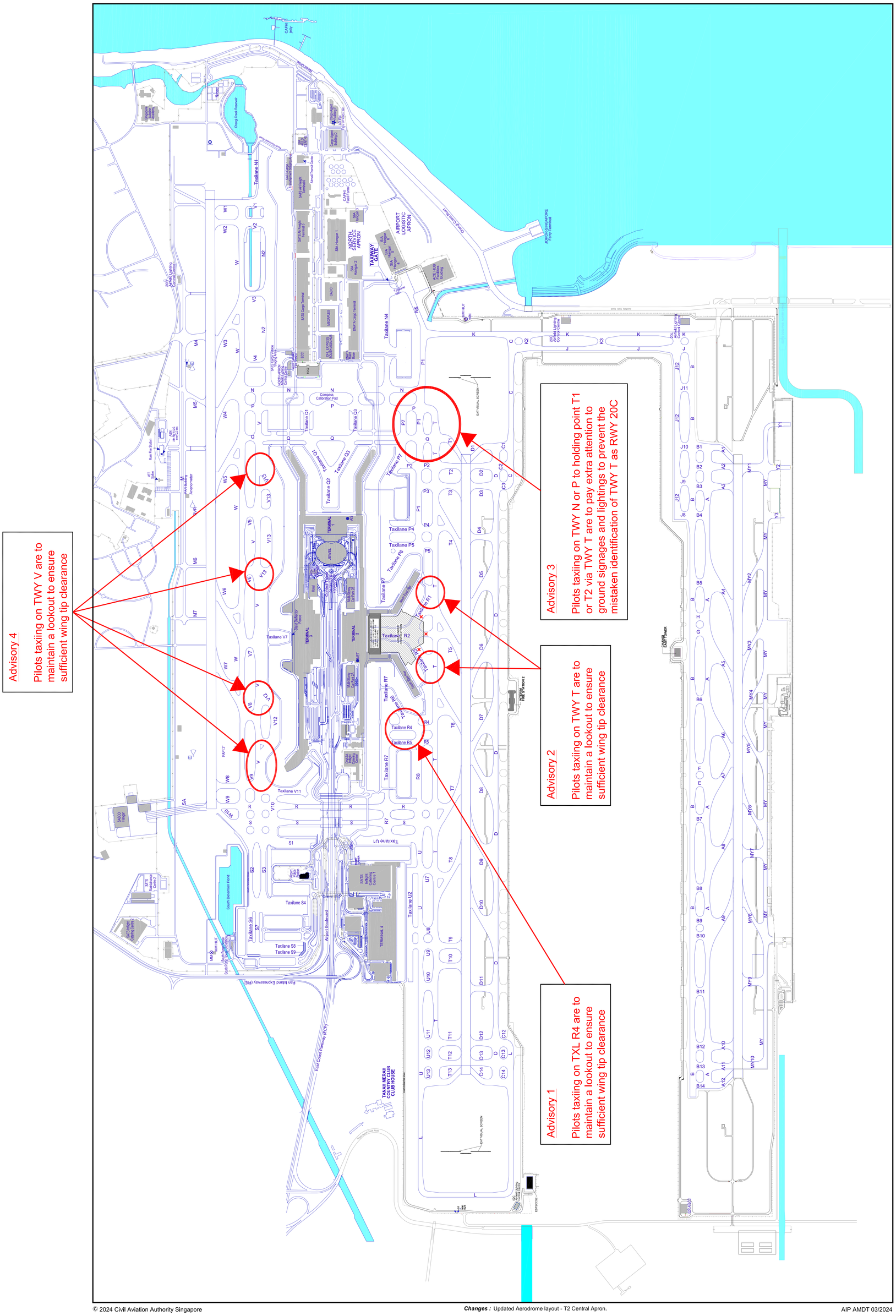
A radio altimeter operating area is established in the pre-threshold area of Runway 02L/20R, Runway 02C/20C and Runway 02R/20L.
The size of the radio altimeter operating area is 300m length and 120m width.

AIRCRAFT STANDS WITH SAFEGATE AIRCRAFT DOCKING GUIDANCE SYSTEM.

TOTAL AIRCRAFT PARKING POSITIONS : 241

Changes : Permanent decomissioned of aircraft stands E1 and F30.

AERODROME ADVISORY CHART



Changes : Updated Aerodrome layout - T2 Central Apron.

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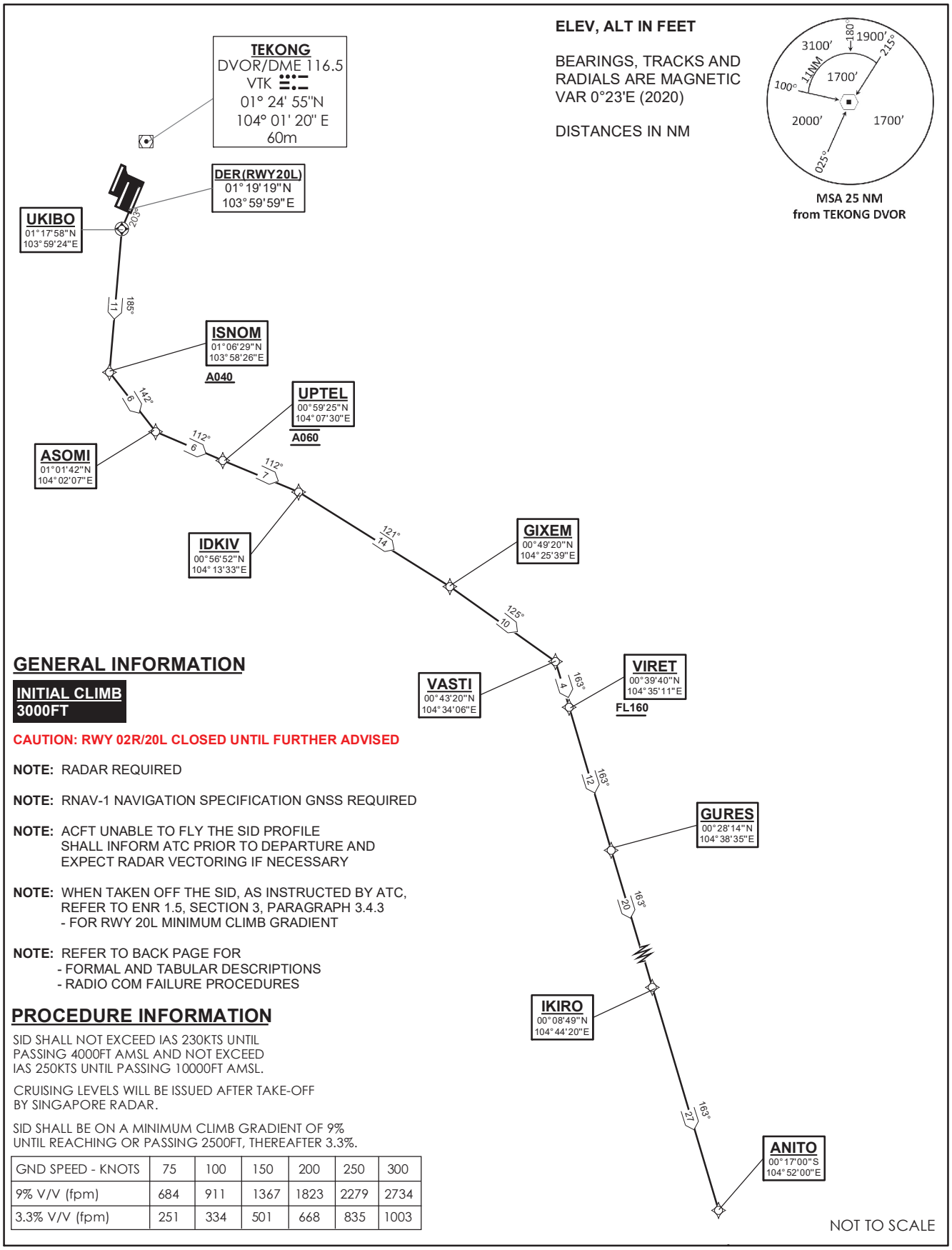
STANDARD DEPARTURE CHART RNAV (GNSS) - INSTRUMENT (SID)

TWR 118.6 / 118.25
APP 120.3
124.05
ACC 134.4

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

SINGAPORE/Singapore Changi
RWY 20L
ANITO DEPARTURES
ANITO 1D



GENERAL INFORMATION

INITIAL CLIMB 3000FT

CAUTION: RWY 02R/20L CLOSED UNTIL FURTHER ADVISED

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 EXPECT RADAR VECTORING IF NECESSARY

NOTE: WHEN TAKEN OFF THE SID, AS INSTRUCTED BY ATC, REFER TO ENR 1.5, SECTION 3, PARAGRAPH 3.4.3 - FOR RWY 20L MINIMUM CLIMB GRADIENT

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

PROCEDURE INFORMATION

SID 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 9% UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

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

CHANGES : 1. Amended bearing between VASTI to VIRET
2. Amended bearing between VASTI to VIRET on flip-page

ANITO 1D (SID) RNAV GNSS RWY 20L - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To UKIBO on course 203°, turn left.	UKIBO [M203; L] -	CF	N
To ISNOM at or above 4000ft, turn left.	ISNOM [A040+; L] -	TF	N
To ASOMI, turn left.	ASOMI [L] -	TF	N
To UPTEL at 6000ft.	UPTEL [@A060] -	TF	N
To IDKIV, turn right.	IDKIV [R] -	TF	N
To GIXEM, turn right.	GIXEM [R] -	TF	N
To VASTI, turn right.	VASTI [R] -	TF	N
To VIRET at or above FL160.	VIRET [FL160+] -	TF	N
To GURES.	GURES -	TF	N
To IKIRO.	IKIRO -	TF	N
To ANITO.	ANITO	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Distance (NM)	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	UKIBO	Y	203(203.4)	1.5	L	-	-	RNAV1
TF	ISNOM	-	185(185.4)	11.0	L	A040+	-	RNAV1
TF	ASOMI	-	142(142.4)	6.0	L	-	-	RNAV1
TF	UPTEL	-	112(112.4)	6.0	-	@A060	-	RNAV1
TF	IDKIV	-	112(112.4)	7.0	R	-	-	RNAV1
TF	GIXEM	-	121(121.4)	14.0	R	-	-	RNAV1
TF	VASTI	-	125(125.4)	10.0	R	-	-	RNAV1
TF	VIRET	-	163(163.4)	4.0	-	FL160+	-	RNAV1
TF	GURES	-	163(163.4)	12.0	-	-	-	RNAV1
TF	IKIRO	-	163(163.4)	20.0	-	-	-	RNAV1
TF	ANITO	-	163(163.4)	27.0	-	-	-	RNAV1

Radio Communications Failure Procedure

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

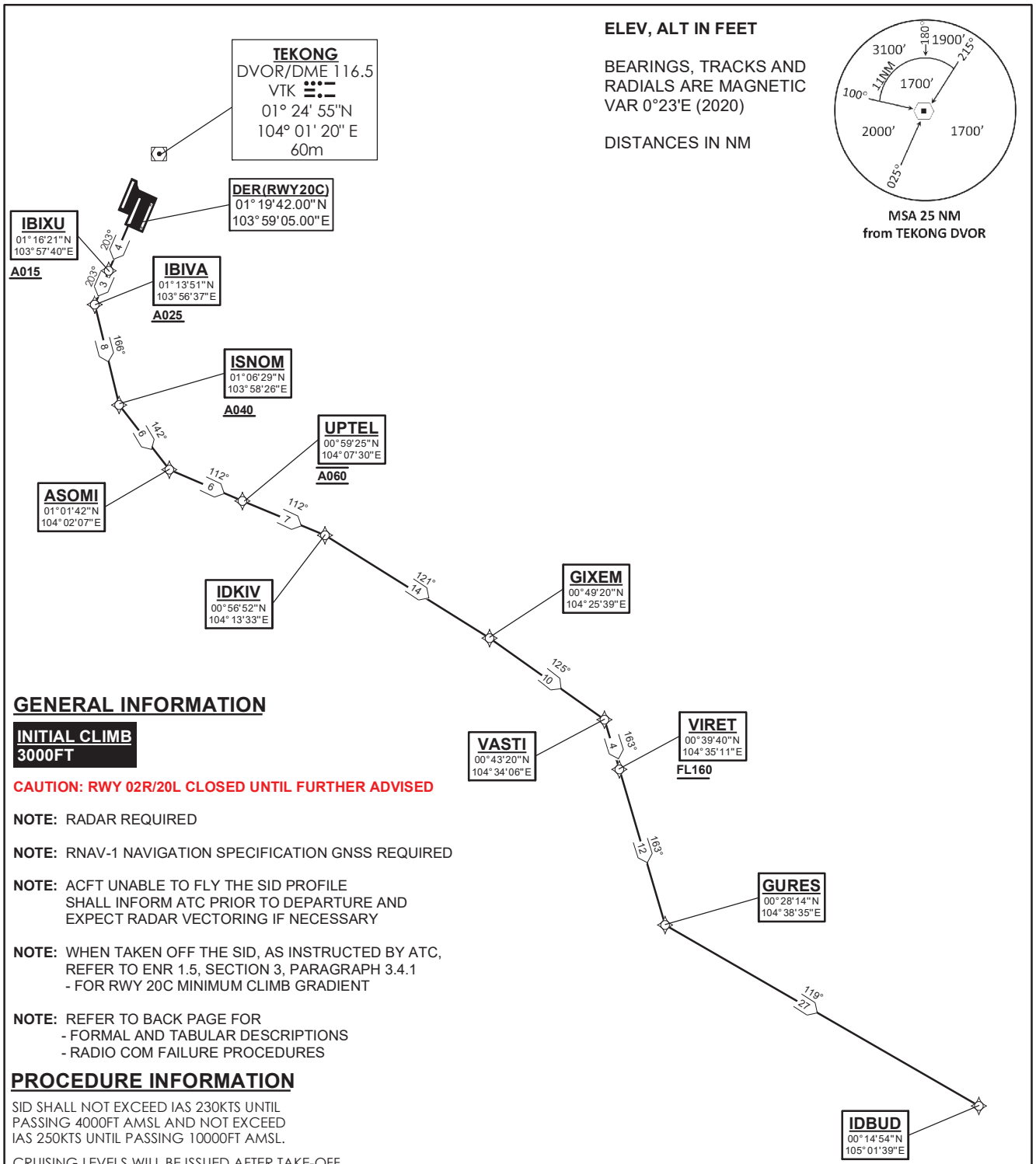
STANDARD DEPARTURE CHART RNAV (GNSS) - INSTRUMENT (SID)

TWR 118.6 / 118.25
APP 120.3
124.05
ACC 134.4

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

SINGAPORE/Singapore Changi
RWY 20C
IDBUD DEPARTURES
IDBUD 1B



ELEV, ALT IN FEET

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

DISTANCES IN NM

MSA 25 NM
from TEKONG DVOR

GENERAL INFORMATION

INITIAL CLIMB 3000FT

CAUTION: RWY 02R/20L CLOSED UNTIL FURTHER ADVISED

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 EXPECT RADAR VECTORING IF NECESSARY

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

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

PROCEDURE INFORMATION

SID 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	1063	1418	1772	2127
3.3% V/V (fpm)	251	334	501	668	835	1003

NOT TO SCALE

CHANGES : 1. Amended bearing between VASTI to VIRET
2. Amended bearing between VASTI to VIRET on flip-page

IDBUD 1B (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.	IBIXU [M203; A015+] -	CF	N
To IBIVA at or above 2500ft, turn left.	IBIVA [A025+; L] -	TF	N
To ISNOM at or above 4000ft, turn left.	ISNOM [A040+; L] -	TF	N
To ASOMI, turn left.	ASOMI [L] -	TF	N
To UPTEL at 6000ft.	UPTEL [@A060] -	TF	N
To IDKIV, turn right.	IDKIV [R] -	TF	N
To GIXEM, turn right.	GIXEM [R] -	TF	N
To VASTI, turn right.	VASTI [R] -	TF	N
To VIRET at or above FL160.	VIRET [FL160+] -	TF	N
To GURES, turn left.	GURES [L] -	TF	N
To IDBUD.	IDBUD	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Distance (NM)	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	IBIXU	-	203(203.4)	4.0	-	A015+	-	RNAV1
TF	IBIVA	-	203(203.4)	3.0	L	A025+	-	RNAV1
TF	ISNOM	-	166(166.4)	8.0	L	A040+	-	RNAV1
TF	ASOMI	-	142(142.4)	6.0	L	-	-	RNAV1
TF	UPTEL	-	112(112.4)	6.0	-	@A060	-	RNAV1
TF	IDKIV	-	112(112.4)	7.0	R	-	-	RNAV1
TF	GIXEM	-	121(121.4)	14.0	R	-	-	RNAV1
TF	VASTI	-	125(125.4)	10.0	R	-	-	RNAV1
TF	VIRET	-	163(163.4)	4.0	-	FL160+	-	RNAV1
TF	GURES	-	163(163.4)	12.0	L	-	-	RNAV1
TF	IDBUD	-	119(119.4)	27.0	-	-	-	RNAV1

Radio Communications Failure Procedure

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

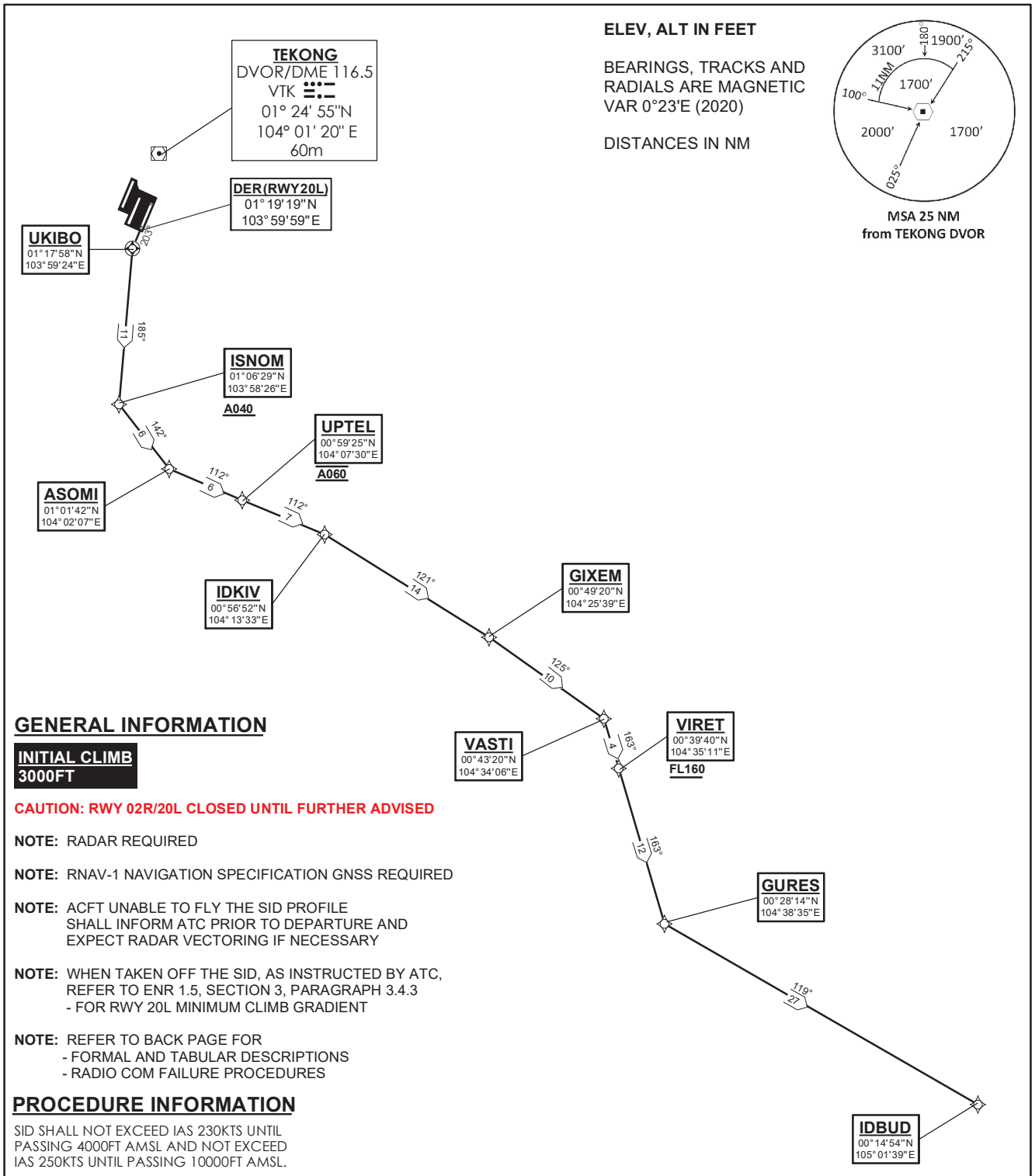
STANDARD DEPARTURE CHART RNAV (GNSS) - INSTRUMENT (SID)

TWR 118.6 / 118.25
APP 120.3
124.05
ACC 134.4

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

SINGAPORE/Singapore Changi
RWY 20L
IDBUD DEPARTURES
IDBUD 1D



GENERAL INFORMATION

INITIAL CLIMB 3000FT

CAUTION: RWY 02R/20L CLOSED UNTIL FURTHER ADVISED

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 EXPECT RADAR VECTORING IF NECESSARY

NOTE: WHEN TAKEN OFF THE SID, AS INSTRUCTED BY ATC, REFER TO ENR 1.5, SECTION 3, PARAGRAPH 3.4.3 - FOR RWY 20L MINIMUM CLIMB GRADIENT

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

PROCEDURE INFORMATION

SID 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 9% UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

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

NOT TO SCALE

CHANGES : 1. Amended bearing between VASTI to VIRET
2. Amended bearing between VASTI to VIRET on flip-page

IDBUD 1D (SID) RNAV GNSS RWY 20L - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To UKIBO on course 203°, turn left.	UKIBO [M203; L] -	CF	N
To ISNOM at or above 4000ft, turn left.	ISNOM [A040+; L] -	TF	N
To ASOMI, turn left.	ASOMI [L] -	TF	N
To UPTEL at 6000ft.	UPTEL [@A060] -	TF	N
To IDKIV, turn right.	IDKIV [R] -	TF	N
To GIXEM, turn right.	GIXEM [R] -	TF	N
To VASTI, turn right.	VASTI [R] -	TF	N
To VIRET at or above FL160.	VIRET [FL160+] -	TF	N
To GURES, turn left.	GURES [L] -	TF	N
To IDBUD.	IDBUD	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Distance (NM)	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	UKIBO	Y	203(203.4)	1.5	L	-	-	RNAV1
TF	ISNOM	-	185(185.4)	11.0	L	A040+	-	RNAV1
TF	ASOMI	-	142(142.4)	6.0	L	-	-	RNAV1
TF	UPTEL	-	112(112.4)	6.0	-	@A060	-	RNAV1
TF	IDKIV	-	112(112.4)	7.0	R	-	-	RNAV1
TF	GIXEM	-	121(121.4)	14.0	R	-	-	RNAV1
TF	VASTI	-	125(125.4)	10.0	R	-	-	RNAV1
TF	VIRET	-	163(163.4)	4.0	-	FL160+	-	RNAV1
TF	GURES	-	163(163.4)	12.0	L	-	-	RNAV1
TF	IDBUD	-	119(119.4)	27.0	-	-	-	RNAV1

Radio Communications Failure Procedure

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

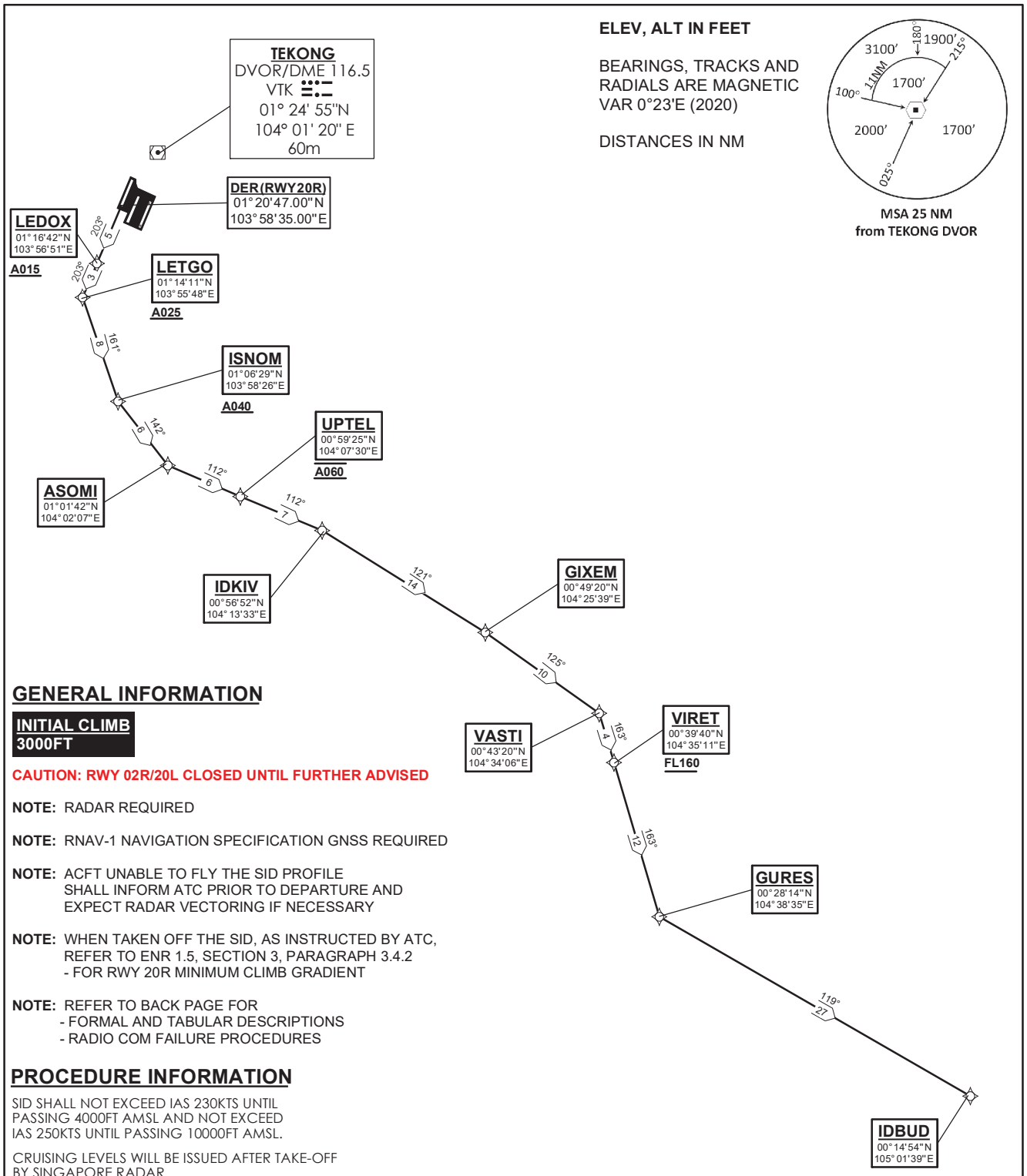
STANDARD DEPARTURE CHART RNAV (GNSS) - INSTRUMENT (SID)

TWR 118.6 / 118.25
APP 120.3
124.05
ACC 134.4

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

SINGAPORE/Singapore Changi
RWY 20R
IDBUD DEPARTURES
IDBUD 1F



ELEV, ALT IN FEET

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

DISTANCES IN NM

MSA 25 NM
from TEKONG DVOR

GENERAL INFORMATION

INITIAL CLIMB 3000FT

CAUTION: RWY 02R/20L CLOSED UNTIL FURTHER ADVISED

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 EXPECT RADAR VECTORING IF NECESSARY

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

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

PROCEDURE INFORMATION

SID 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

CHANGES : Amended bearing between VASTI to VIRET

on flip-page

IDBUD 1F (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.	LEDOX [M203; A015+] -	CF	N
To LETGO at or above 2500ft, turn left.	LETGO [A025+; L] -	TF	N
To ISNOM at or above 4000ft, turn left.	ISNOM [A040+; L] -	TF	N
To ASOMI, turn left.	ASOMI [L] -	TF	N
To UPTEL at 6000ft.	UPTEL [@A060] -	TF	N
To IDKIV, turn right.	IDKIV [R] -	TF	N
To GIXEM, turn right.	GIXEM [R] -	TF	N
To VASTI, turn right.	VASTI [R] -	TF	N
To VIRET at or above FL160.	VIRET [FL160+] -	TF	N
To GURES, turn left.	GURES [L] -	TF	N
To IDBUD.	IDBUD	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Distance (NM)	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	LEDOX	-	203(203.4)	5.0	-	A015+	-	RNAV1
TF	LETGO	-	203(203.4)	3.0	L	A025+	-	RNAV1
TF	ISNOM	-	161(161.4)	8.0	L	A040+	-	RNAV1
TF	ASOMI	-	142(142.4)	6.0	L	-	-	RNAV1
TF	UPTEL	-	112(112.4)	6.0	-	@A060	-	RNAV1
TF	IDKIV	-	112(112.4)	7.0	R	-	-	RNAV1
TF	GIXEM	-	121(121.4)	14.0	R	-	-	RNAV1
TF	VASTI	-	125(125.4)	10.0	R	-	-	RNAV1
TF	VIRET	-	163(163.4)	4.0	-	FL160+	-	RNAV1
TF	GURES	-	163(163.4)	12.0	L	-	-	RNAV1
TF	IDBUD	-	119(119.4)	27.0	-	-	-	RNAV1

Radio Communications Failure Procedure

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

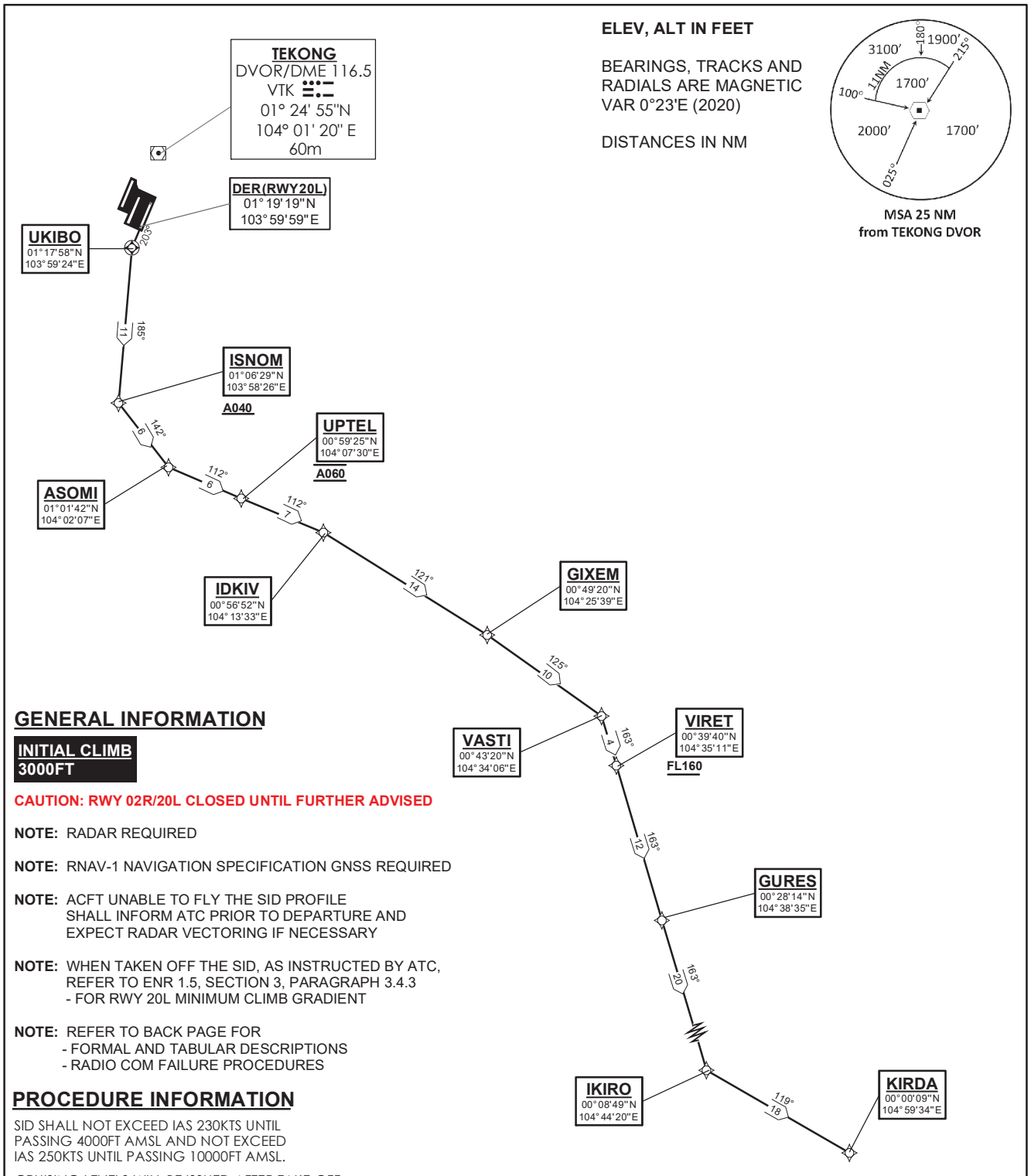
STANDARD DEPARTURE CHART RNAV (GNSS) - INSTRUMENT (SID)

TWR 118.6 / 118.25
APP 120.3
124.05
ACC 134.4

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

SINGAPORE/Singapore Changi
RWY 20L
KIRDA DEPARTURES
KIRDA 1D



ELEV, ALT IN FEET

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

DISTANCES IN NM

MSA 25 NM
from TEKONG DVOR

GENERAL INFORMATION

INITIAL CLIMB 3000FT

CAUTION: RWY 02R/20L CLOSED UNTIL FURTHER ADVISED

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 EXPECT RADAR VECTORING IF NECESSARY

NOTE: WHEN TAKEN OFF THE SID, AS INSTRUCTED BY ATC, REFER TO ENR 1.5, SECTION 3, PARAGRAPH 3.4.3 - FOR RWY 20L MINIMUM CLIMB GRADIENT

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

PROCEDURE INFORMATION

SID 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 9% UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.

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

NOT TO SCALE

CHANGES : 1. Amended bearing between VASTI to VIRET
2. Amended bearing between VASTI to VIRET on flip-page

KIRDA 1D (SID) RNAV GNSS RWY 20L - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To UKIBO on course 203°, turn left.	UKIBO [M203; L] -	CF	N
To ISNOM at or above 4000ft, turn left.	ISNOM [A040+; L] -	TF	N
To ASOMI, turn left.	ASOMI [L] -	TF	N
To UPTEL at 6000ft.	UPTEL [@A060] -	TF	N
To IDKIV, turn right.	IDKIV [R] -	TF	N
To GIXEM, turn right.	GIXEM [R] -	TF	N
To VASTI, turn right.	VASTI [R] -	TF	N
To VIRET at or above FL160.	VIRET [FL160+] -	TF	N
To GURES.	GURES -	TF	N
To IKIRO, turn left.	IKIRO [L] -	TF	N
To KIRDA.	KIRDA	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Distance (NM)	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	UKIBO	Y	203(203.4)	1.5	L	-	-	RNAV1
TF	ISNOM	-	185(185.4)	11.0	L	A040+	-	RNAV1
TF	ASOMI	-	142(142.4)	6.0	L	-	-	RNAV1
TF	UPTEL	-	112(112.4)	6.0	-	@A060	-	RNAV1
TF	IDKIV	-	112(112.4)	7.0	R	-	-	RNAV1
TF	GIXEM	-	121(121.4)	14.0	R	-	-	RNAV1
TF	VASTI	-	125(125.4)	10.0	R	-	-	RNAV1
TF	VIRET	-	163(163.4)	4.0	-	FL160+	-	RNAV1
TF	GURES	-	163(163.4)	12.0	-	-	-	RNAV1
TF	IKIRO	-	163(163.4)	20.0	L	-	-	RNAV1
TF	KIRDA	-	119(119.4)	18.0	-	-	-	RNAV1

Radio Communications Failure Procedure

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

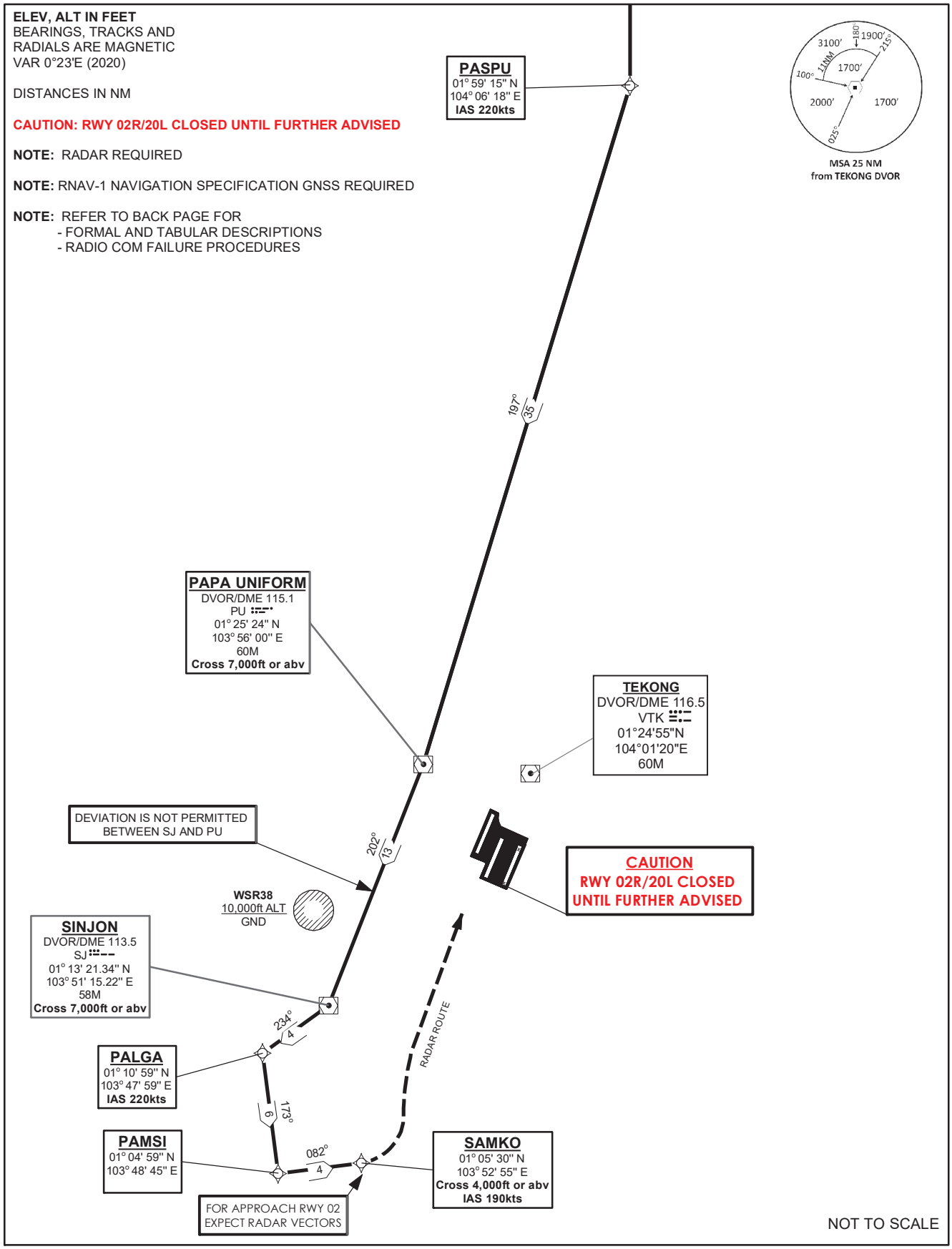
STANDARD ARRIVAL CHART RNAV (GNSS) - INSTRUMENT (STAR)

ACC 133.8
APP 124.05
119.3
TWR 118.6

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.025

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



CHANGES : Amended SINJON (SJ) DVOR/DME antenna height

LEBAR 2A (STAR) RNAV GNSS RWY 02L/02C/02R - DESCRIPTIONS

Formal & Abbreviated Descriptions

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

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Distance (NM)	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	PASPU	-	-	-	-	-	K220	RNAV1
TF	PU	-	197(197.4)	35.0	R	A070+	-	RNAV1
TF	SJ	-	202(202.4)	13.0	R	A070+	-	RNAV1
TF	PALGA	-	234(234.4)	4.0	L	-	K220	RNAV1
TF	PAMSI	-	173(173.4)	6.0	L	-	-	RNAV1
TF	SAMKO	-	082(082.4)	4.0	-	A040+	K190	RNAV1

Radio Communications Failure Procedure

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

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

ACC 134.4
APP 124.6
119.3
TWR 118.6 / 118.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.025

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

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

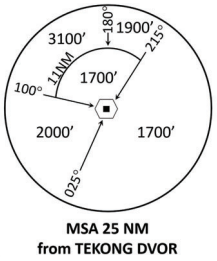
DISTANCES IN NM

CAUTION: RWY 02R/20L CLOSED UNTIL FURTHER ADVISED

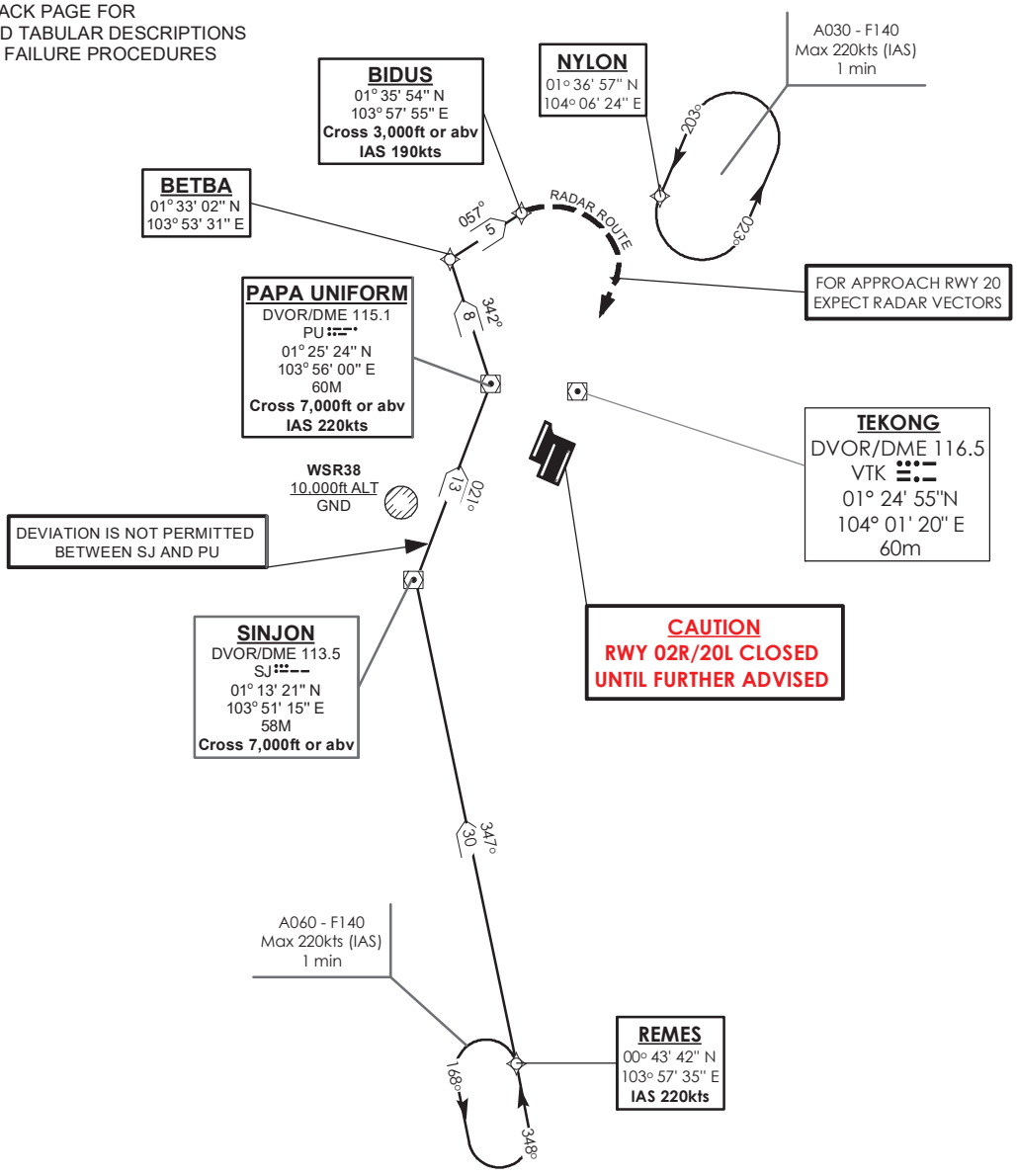
NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

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



MSA 25 NM from TEKONG DVOR



NOT TO SCALE

CHANGES : Amended SINJON (SJ) DVOR/DME antenna height

LEBAR 3B (STAR) RNAV GNSS RWY 20R/20C/20L - DESCRIPTIONS

Formal & Abbreviated Descriptions

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

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Distance (NM)	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	REMES	-	-	-	-	-	K220	RNAV1
TF	SJ	-	347(347.4)	30.0	R	A070+	-	RNAV1
TF	PU	-	021(021.4)	13.0	L	A070+	K220	RNAV1
TF	BETBA	-	342(342.4)	8.0	R	-	-	RNAV1
TF	BIDUS	-	057(057.4)	5.0	-	A030+	K190	RNAV1

Radio Communications Failure Procedure

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

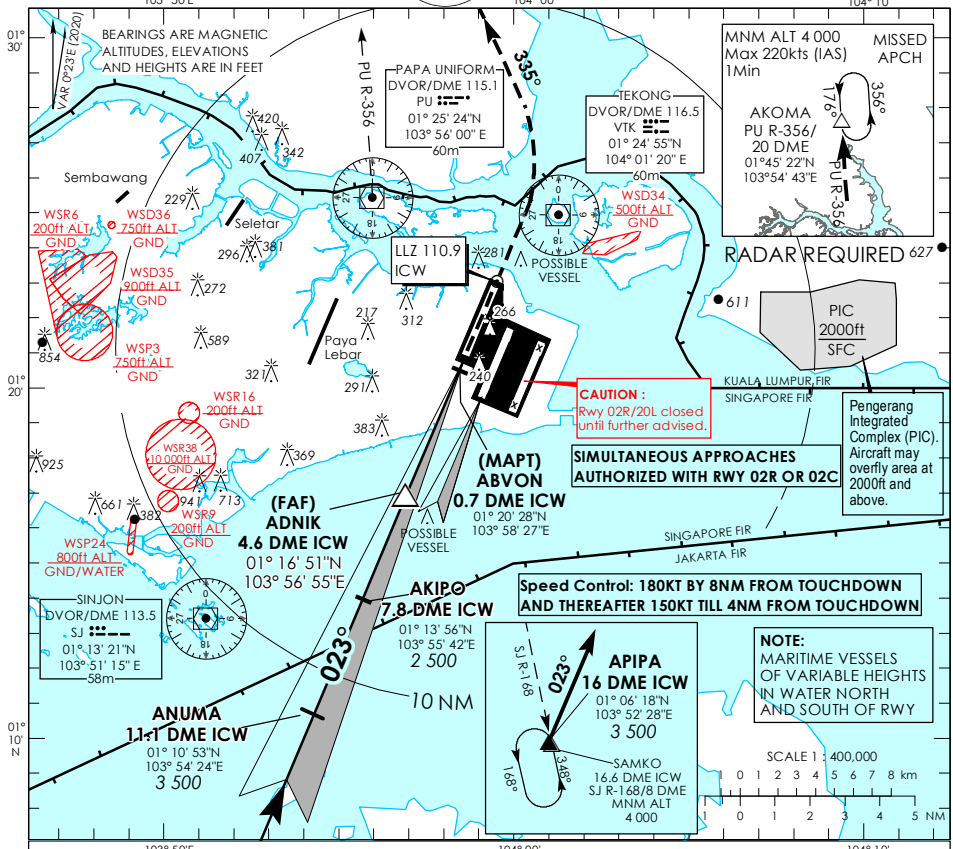
INSTRUMENT APPROACH CHART - ICAO

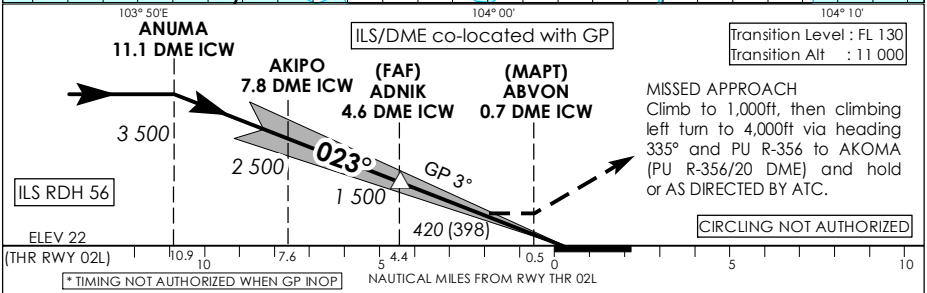
AERODROME ELEV 22ft
HEIGHT RELATED TO THR RWY 02L - ELEV 22ft

MSA 25 NM from TEKONG DVOR

D-ATIS	AP ID WSSS
	128.025
APP	124.05
	119.3
TWR	118.6
	118.25

SINGAPORE/ SINGAPORE CHANGI
ICW ILS/DME RWY 02L





* TIMING NOT AUTHORIZED WHEN GP INOP

		OCA (OCH)				
Category of Aircraft		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**

CHANGES : 1. Included holding parameters for AKOMA
2. Amended SINJON (SJ) DVOR/DME antenna height

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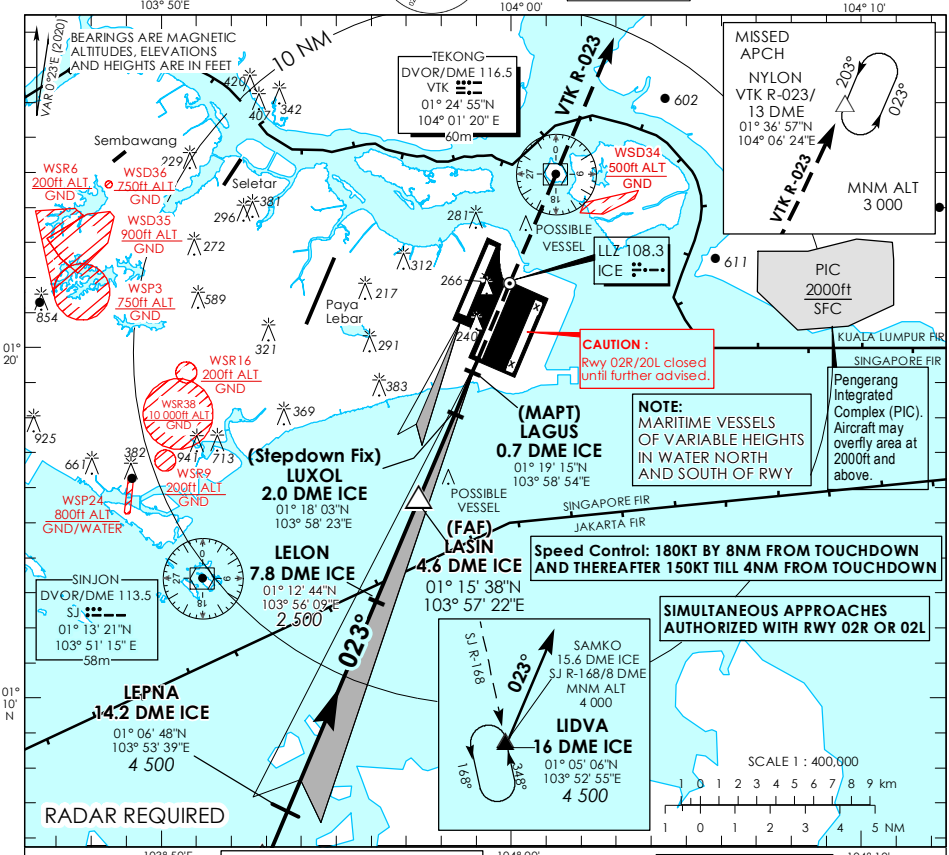
INSTRUMENT APPROACH CHART - ICAO

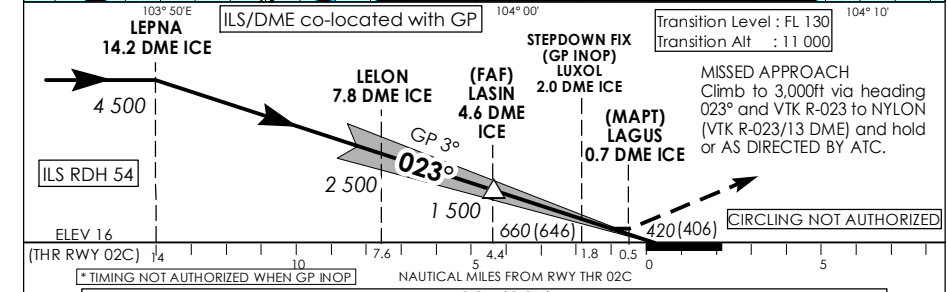
AERODROME ELEV 22ft
HEIGHT RELATED TO THR RWY 02C - ELEV 16ft

MSA 25 NM from TEKONG DVOR

D-ATIS	AP ID WSSS
	128.025
APP	124.05
	119.3
TWR	118.6
	118.25

SINGAPORE/ SINGAPORE CHANGI
ICE ILS/DME RWY 02C





* TIMING NOT AUTHORIZED WHEN GP INOP

OCA (OCH)						
Category of Aircraft		A	B	C	D	D_L
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	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**

CHANGES : Amended SINJON (SJ) DVOR/DME antenna height

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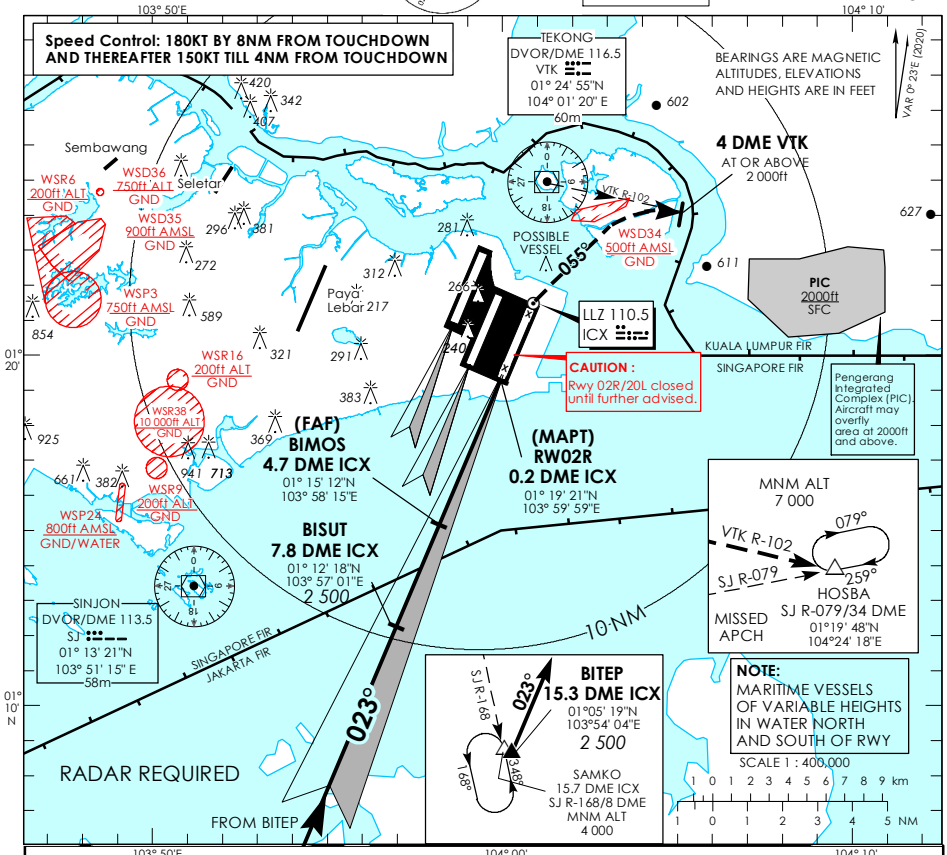
INSTRUMENT APPROACH CHART

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

MSA 25 NM from TEKONG DVOR

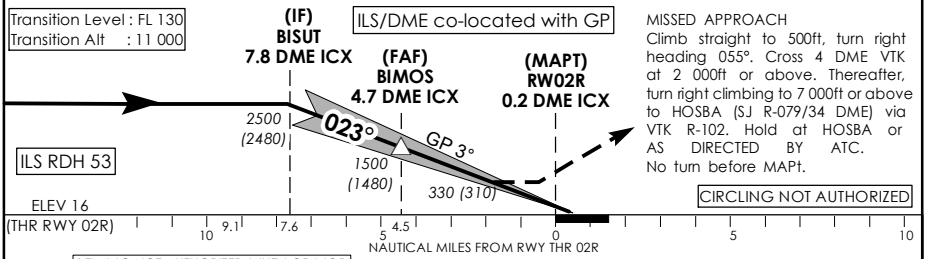
D-ATIS	AP ID WSSS
APP	128.025
	124.05
TWR	119.3
	131.4

SINGAPORE/ SINGAPORE CHANGI
ICX ILS/DME RWY 02R



1. This procedure requires a missed approach climb gradient of 5% (304 ft/NM) until passing 2.000ft. MAX IAS 185kts during turning missed approach.
2. For aircraft which can only achieve a 2.5% (152 ft/NM) climb gradient, the OCA (OCH) is 820ft (800ft) and aircraft shall climb straight to 1200ft before commencing right turn climbing to 7000ft or above to HOSBA.

Transition Level : FL 130
Transition Alt : 11 000



MISSED APPROACH
Climb straight to 500ft, turn right heading 055°. Cross 4 DME VTK at 2 000ft or above. Thereafter, turn right climbing to 7 000ft or above to HOSBA (SJ R-079/34 DME) via VTK R-102. Hold at HOSBA or AS DIRECTED BY ATC.
No turn before MAPT.

CIRCLING NOT AUTHORIZED

* TIMING NOT AUTHORIZED WHEN GP INOP

		OCA (OCH)			
Category of Aircraft		A	B	C	D
Straight-in	CAT I ILS	220 (200)			
	CAT II ILS	120 (100)			
	GP INOP	330 (310)			

Distance		4 DME		3 DME		2 DME	
Altitude (Height)		1300 (1280)		980 (960)		660 (640)	
Speed	knots	70	120	150	185		
FAF - MAPT 4.5nm	min : s *	3 : 52	2 : 15	1 : 48	1 : 28		
Rate of descent/GS	ft/min	630	1080	1350	1665		

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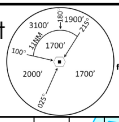
INSTRUMENT APPROACH CHART - ICAO

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



D-ATIS	AP ID WSSS
	128.025
APP	124.05
	119.3
TWR	118.6
	118.25

SINGAPORE/ SINGAPORE CHANGI
ICH ILS/DME RWY 20R

103° 50'E — 104° 00' — 104° 10'

01° 30' — 01° 20' N

Speed Control: 180KT BY 8NM FROM TOUCHDOWN AND THEREAFTER 150KT TILL 4NM FROM TOUCHDOWN

RWY 20R ILS DME NOT AVAILABLE BEYOND 15 DEG WEST OF RWY 20R CENTRELINE BELOW 2500FT

SIMULTANEOUS APPROACHES AUTHORIZED WITH RWY 20L OR 20C

BEARINGS ARE MAGNETIC
ALTITUDES, ELEVATIONS AND HEIGHTS ARE IN FEET

10 NM

IGULA
11.1 DME ICH
01° 32' 32"N
104° 03' 33"E
3 500

IDVAS
7.8 DME ICH
01° 29' 35"N
104° 02' 18"E
2 500

(FAF) IDURO
4.6 DME ICH
01° 26' 40"N
104° 01' 04"E

(MAPT) IDUNA
0.8 DME ICH
01° 23' 06"N
103° 59' 34"E

203°

IPNAK
16 DME ICH
01° 37' 12"N
104° 05' 31"E
3 500

NYLON
(16.2 DME ICH/ VTK R-023/ 13 DME)
MNM ALT 3 000

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

RADAR REQUIRED

Pengerang Integrated Complex (PIC). Aircraft may overfly area at 2000ft and above.

PIC 2000ft SFC

KUALA LUMPUR FIR
SINGAPORE FIR

Sembawang
Seletar
Paya Lebar

WSR6 200ft ALT GND
WSD36 750ft ALT GND
WSD35 900ft ALT GND
WSP3 750ft ALT GND
WSR16 200ft ALT GND
WSR38 10 000ft ALT GND
WSR9 200ft ALT GND
WSP24 800ft ALT GND/WATER
WSD34 500ft ALT GND

POSSIBLE VESSEL

CAUTION : Rwy 02R/20L closed until further advised.

LLZ 108.9
ICH

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

SINJON DVOR/DME 113.5
SJ
01° 13' 21"N
103° 31' 15" E
58m

SINGAPORE FIR
JAKARTA FIR

SCALE 1 : 400,000
1 0 1 2 3 4 5 6 7 8 9 km
1 0 1 2 3 4 5 NM

MISSED APCH
SJ R-168
SJ R-146
SAMKO
SJ R-168/8 DME
01° 05' 30"N
103° 52' 55"E

103° 50'E — 104° 00' — 104° 10'

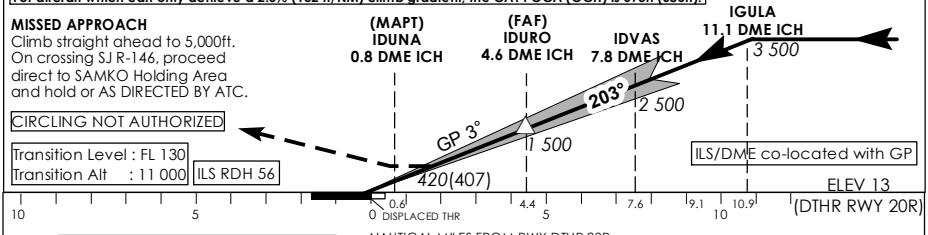
This procedure requires a missed approach climb gradient of 3.7% (225 ft/NM) until passing 2,500ft.
For aircraft which can only achieve a 2.5% (152 ft/NM) climb gradient, the CAT I OCA (OCH) is 693ft (680ft).

MISSED APPROACH
Climb straight ahead to 5,000ft.
On crossing SJ R-146, proceed direct to SAMKO Holding Area and hold or AS DIRECTED BY ATC.

CIRCLING NOT AUTHORIZED

Transition Level : FL 130
Transition Alt : 11 000

ILS RDH 56



* TIMING NOT AUTHORIZED WHEN GP INOP

Category of Aircraft		OCA (OCH) 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**	

CHANGES : Amended SINJON (SJ) DVOR/DME antenna height

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INSTRUMENT APPROACH CHART - ICAO

AERODROME ELEV 22ft
HEIGHT RELATED TO
THR RWY 20C - ELEV 16ft

MSA 25 NM from TEKONG DVOR

D-ATIS	AP ID WSSS
	128.025
APP	124.05
	119.3
TWR	118.6
	118.25

SINGAPORE/ SINGAPORE CHANGI
ICC ILS/DME RWY 20C

Speed Control: 180KT BY 8NM FROM TOUCHDOWN AND THEREAFTER 150KT TILL 4NM FROM TOUCHDOWN

RADAR REQUIRED

SIMULTANEOUS APPROACHES AUTHORIZED WITH RWY 20L OR 20R

VAR 0°23'E (2020)

BEARINGS ARE MAGNETIC
ALTITUDES, ELEVATIONS
AND HEIGHTS ARE IN FEET

10 NM

ELALU
14.2 DME ICC
01° 34' 40"N
104° 05' 24"E
4 500

EGORA
16 DME ICC
01° 36' 21"N
104° 06' 07"E
4 500

NYLON
16.7 DME ICC
VTK R-023/
13 DME
MNM ALT
3 000

ELBEB
7.8 DME ICC
01° 28' 45"N
104° 02' 54"E

(FAF)
ELMIN
4.6 DME ICC
01° 25' 50"N
104° 01' 41"E
2 500

203°

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

Pengerang Integrated Complex (PIC) Aircraft may overfly area at 2000ft and above.

PIC
2000ft
SFC

(MAPT)
ESBIT
0.7 DME ICC
01° 22' 12"N
104° 00' 09"E

POSSIBLE VESSEL

WSD34 500ft ALT GND

CAUTION :
Rwy 02R/20L closed until further advised.

KUALA LUMPUR FIR

SINGAPORE FIR

Sembawang
Selerar
Paya Lebar

WSR6 200ft ALT GND
WSD36 750ft ALT GND
WSD35 900ft ALT GND
WSP3 750ft ALT GND
WSR16 200ft ALT GND
WSR38 10 000ft ALT GND
WSR9 200ft ALT GND
WSP24 800ft ALT GND/WATER

LLZ 109.7
ICC

130°

POSSIBLE VESSEL

ESLUX
6.7 DME VTK
01° 18' 44"N
103° 58' 40"E

SINGAPORE FIR
JAKARTA FIR

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

EXOMO
VTK R-158/
22 DME
01° 04' 25"N
104° 09' 33"E

VTK R-158°
158°
336°

MISSED APCH
MNM ALT 4 000
Max 220kts (IAS)
1 Min

SINJON
DVOR/DME 113.5
SJ
01° 13' 21"N
103° 51' 15" E
58m

SCALE 1 : 400,000
1 0 1 2 3 4 5 6 7 8 9 km
1 0 1 2 3 4 5 NM

103° 50'E 104° 00' 104° 10'

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).

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

CIRCLING NOT AUTHORIZED

(MAPT) ESBIT 0.7 DME ICC
(FAF) ELMIN 4.6 DME ICC
ELBEB 7.8 DME ICC
ELALU 14.2 DME ICC
4 500
2 500
1 500
203°
GP 3°
420(405)

ILS/DME co-located with GP

ILS RDH 53

Transition Level : FL 130
Transition Alt : 11 000

ELEV 16
(THR RWY 20C)

0 0.5 4.4 5 7.6 10 14 15
NAUTICAL MILES FROM RWY THR 20C

* TIMING NOT AUTHORIZED WHEN GP INOP

		OCA (OCH)				
Category of Aircraft		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**	

CHANGES : 1.Included holding parameters for EXOMO
2. Amended SINJON (SJ) DVOR/DME antenna height

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INSTRUMENT APPROACH CHART - ICAO

AERODROME ELEV 22ft
HEIGHT RELATED TO AD ELEV

MSA 25 NM from TEKONG DVOR

D-ATIS	AP ID WSSS
	128.025
APP	124.05
	119.3
TWR	118.6
	118.25

SINGAPORE/ SINGAPORE CHANGI
VTK DVOR/DME
RWY 20C

103° 50'E 104° 00' 104° 10'

Speed Control: 180KT BY 8NM FROM TOUCHDOWN AND THEREAFTER 150KT TILL 4NM FROM TOUCHDOWN

BEARINGS ARE MAGNETIC
ALTITUDES, ELEVATIONS AND HEIGHTS ARE IN FEET

VAR 0° 23'E (2020)

01° 30'

10 NM

IF
9.1 DME VTK
2 000

203°

NYLON
(13 DME VTK-R-023 VTK)

203°

203°

MNM ALT 3 000

FAF
2.6 DME VTK
01° 27' 19"N
104° 02' 18"E

Pengerang Integrated Complex (PIC). Aircraft may overfly area at 2000ft and above.

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

Sembawang
Seletar
Paya Lebar

WSR6 200ft ALT GND
WSD36 750ft ALT GND
WSD35 900ft ALT GND
WSP3 750ft ALT GND
WSR16 200ft ALT GND
WSR38 10 000ft ALT GND
WSR9 200ft ALT GND
WSP24 800ft ALT GND/WATER
WSD34 500ft ALT GND

POSSIBLE VESSEL

MAPT
3 DME VTK

PIC
2000ft
SFC

KUALA LUMPUR FIR
SINGAPORE FIR

01° 20' N

CAUTION :
Rwy 02R/20L closed until further advised.

ESLUX
6.7 DME VTK
01° 18' 44"N
103° 58' 40"E

130°

POSSIBLE VESSEL

SINGAPORE FIR
JAKARTA FIR

EXOMO
VTK R-158/ 22 DME
01° 04' 25"N
104° 09' 33"E

VTK R-158°
158°
338°

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

MISSED APCH
MNM ALT 4 000
Max 220kts (IAS)
1 Min

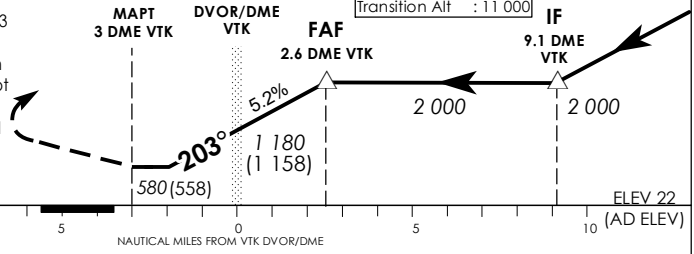
SINJON DVOR/DME 113.5
SJ
01° 13' 21"N
103° 51' 15" E
58m

SCALE 1 : 400,000
1 0 1 2 3 4 5 6 7 8 9 km
1 0 1 2 3 4 5 NM

103° 50'E 104° 00' 104° 10'

Transition Level : FL 130
Transition Alt : 11 000

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	185
FAF - MAPT 5.6nm	min : s	4 : 48	2 : 48	2 : 15	1 : 49
Rate of descent/GS	ft/min	370	635	795	980

CHANGES : 1.Included holding parameters for EXOMO
2. Amended SINJON (SJ) DVOR/DME antenna height

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INSTRUMENT APPROACH CHART - ICAO

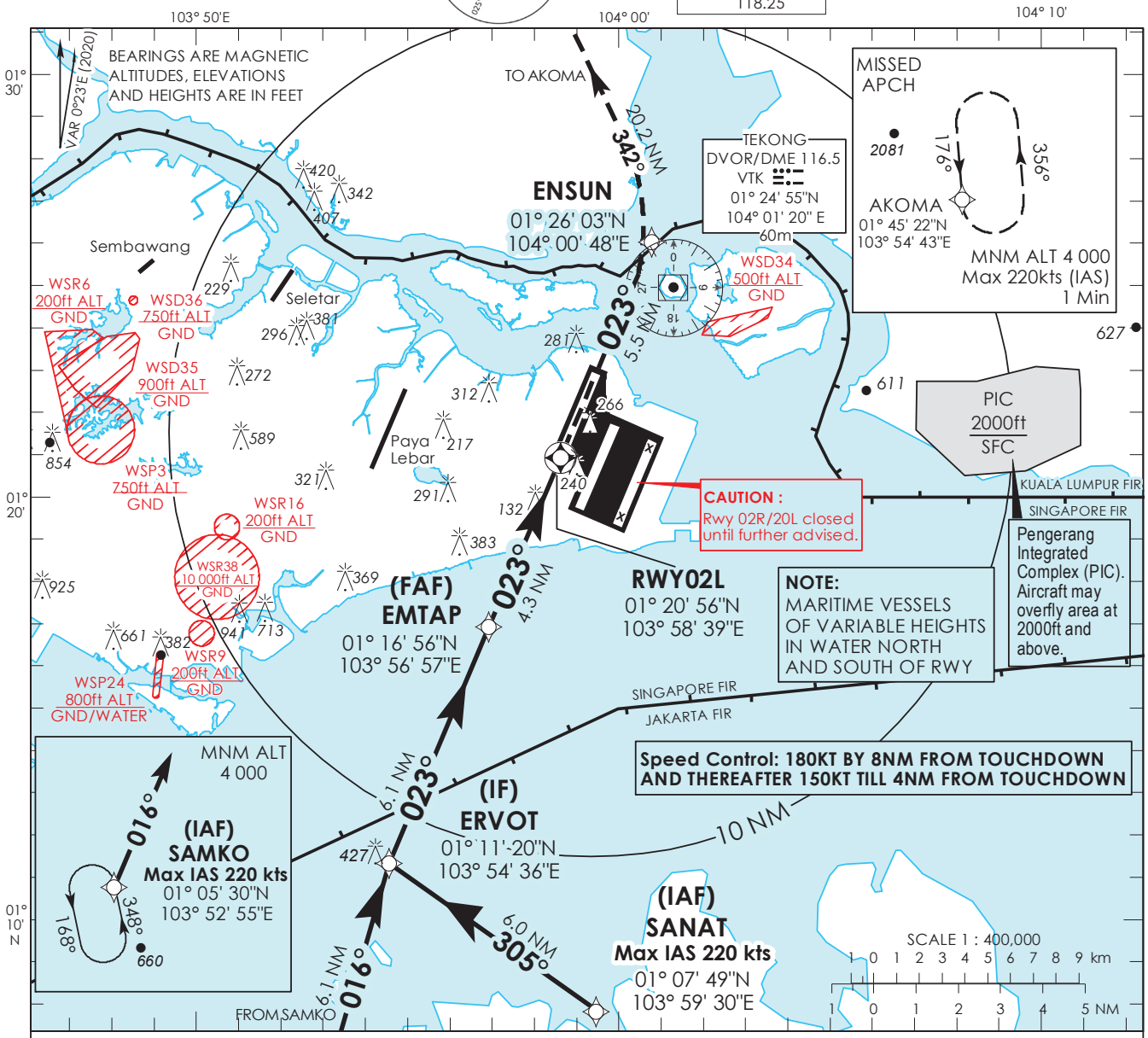
AERODROME ELEV 22ft
HEIGHT RELATED TO
THR RWY 02L - ELEV 22ft

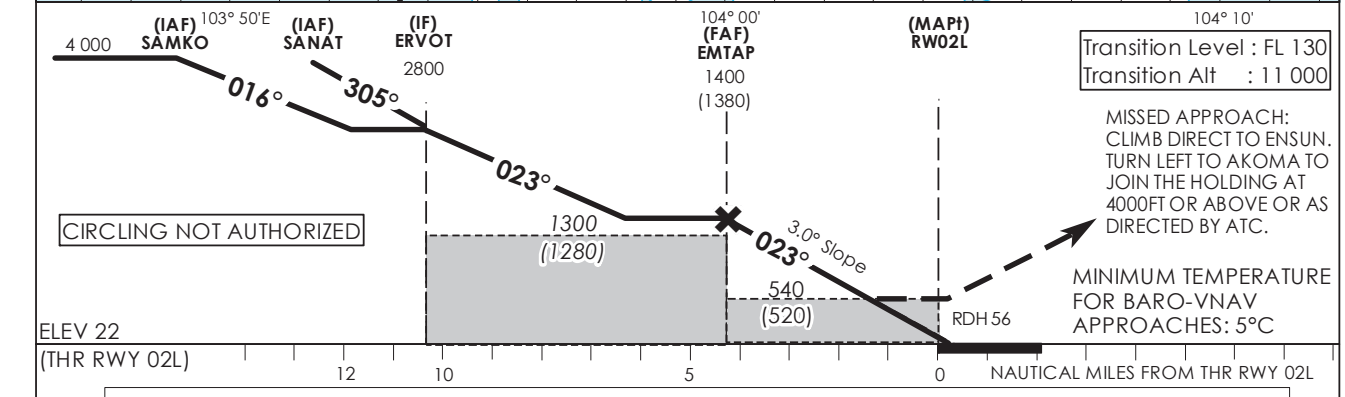
MSA 25 NM from TEKONG DVOR

D-ATIS	AP ID WSSS
	128.025
APP	124.05
	119.3
TWR	118.6
	118.25

SINGAPORE/ SINGAPORE CHANGI

RNP RWY 02L





		OCA (OCH)			
Category of Aircraft		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 - MAPt 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**

CHANGES : 1. Included holding parameters for AKOMA
2. Amended holding speed in flip-page

SINGAPORE CHANGI RNP-APCH RWY 02L – Approach from SAMKO

Path Terminator	Waypoint	Fly-Over	Course °M (°T)	Magnetic Variation	Distance (NM)	Turn Direction	Altitude (FT)	Speed Limit (KT)	VPA/ TCH(FT)	Navigation Specification
IF	SAMKO	-	-	-0.4	-	-	A040+	220	-	RNP APCH
TF	ERVOT	-	016 (016.4)	-0.4	6.1	R	A028+	-	-	RNP APCH
TF	EMTAP	-	023 (023.4)	-0.4	6.1	-	A014+	-	-	RNP APCH
TF	RW02L	Y	023 (023.4)	-0.4	4.3	-	-	-	-3.0° / 50	RNP APCH
DF	ENSUN	-	-	-0.4	-	L	-	-	-	RNP APCH
TF	AKOMA	-	342 (342.4)	-0.4	20.2	-	A040+	220	-	RNP APCH

SINGAPORE CHANGI RNP-APCH RWY 02L – Approach from SANAT

Path Terminator	Waypoint	Fly-Over	Course °M (°T)	Magnetic Variation	Distance (NM)	Turn Direction	Altitude (FT)	Speed Limit (KT)	VPA/ TCH(FT)	Navigation Specification
IF	SANAT	-	-	-0.4	-	-	A040+	220	-	RNP APCH
TF	ERVOT	-	305 (305.4)	-0.4	6.0	R	A028+	-	-	RNP APCH
TF	EMTAP	-	023 (023.4)	-0.4	6.1	-	A014+	-	-	RNP APCH
TF	RW02L	Y	023 (023.4)	-0.4	4.3	-	-	-	-3.0° / 50	RNP APCH
DF	ENSUN	-	-	-0.4	-	L	-	-	-	RNP APCH
TF	AKOMA	-	342 (342.4)	-0.4	20.2	-	A040+	220	-	RNP APCH

Waypoint Coordinates

Name	Latitude	Longitude
SAMKO (IAF)	01° 05’ 30” N	103° 52’ 55” E
SANAT (IAF)	01° 07’ 49” N	103° 59’ 30” E
ERVOT (IF)	01° 11’ 20” N	103° 54’ 36” E
EMTAP (FAF)	01° 16’ 56” N	103° 56’ 57” E
RW02L	01° 20’ 56” N	103° 58’ 39” E
ENSUN	01° 26’ 03” N	104° 00’ 48” E
AKOMA	01° 45’ 22” N	103° 54’ 43” E

INSTRUMENT APPROACH CHART - ICAO

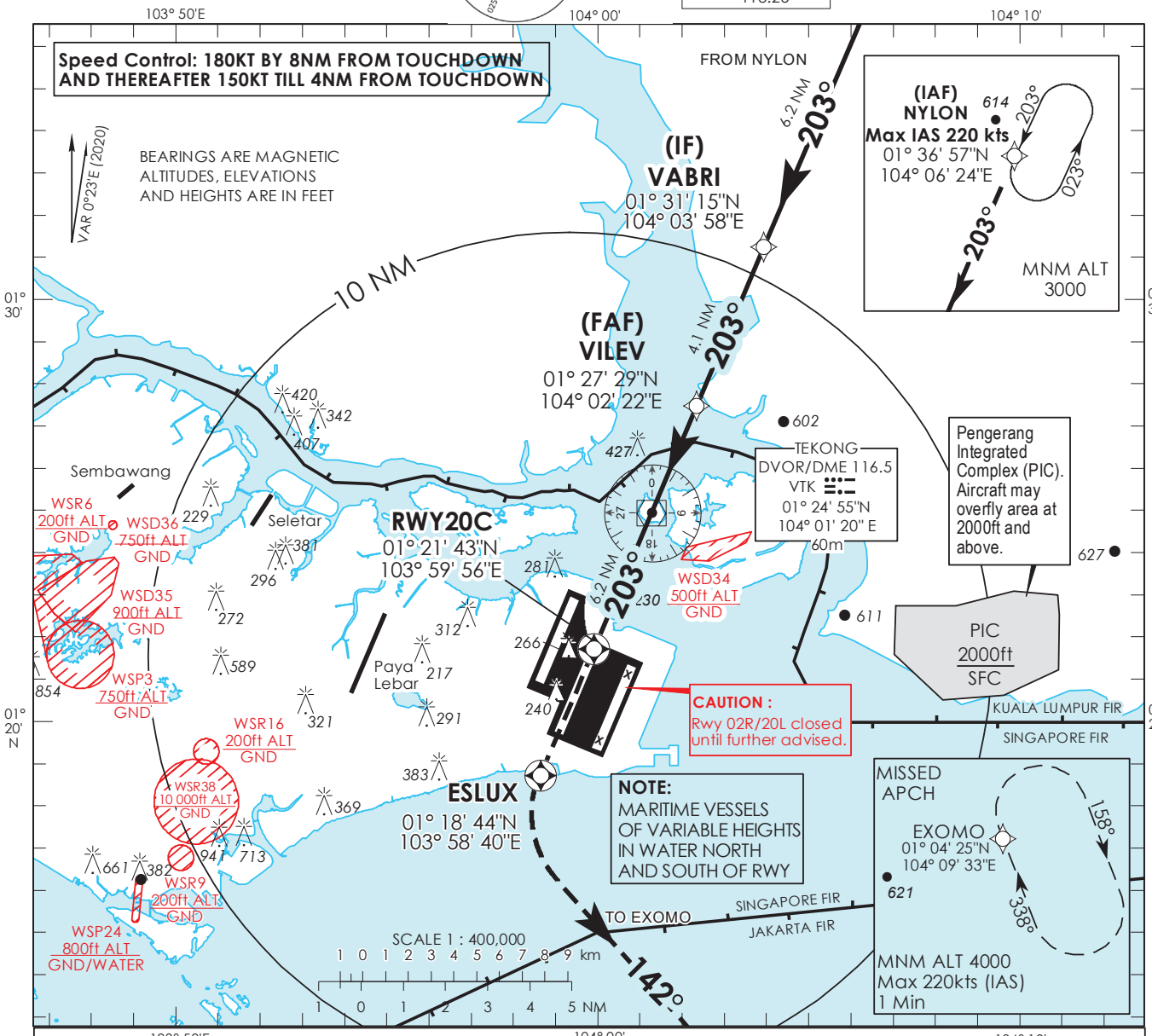
AERODROME ELEV 22ft
HEIGHT RELATED TO
THR RWY 20C - ELEV 16ft

MSA 25 NM from TEKONG DVOR

D-ATIS	AP ID	WSSS
		128.025
APP		124.05
		119.3
TWR		118.6
		118.25

SINGAPORE/ SINGAPORE CHANGI

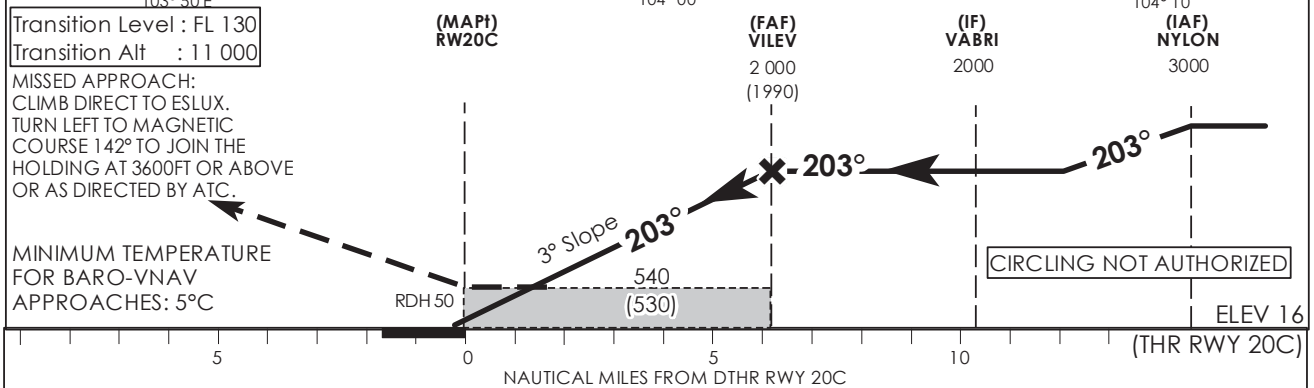
RNP RWY 20C



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



OCA (OCH)					
Category of Aircraft		A	B	C	D
LNAV/VNAV	2.5%	**490 (480)**			
LNAV	2.5%	**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 - MAPt 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**

CHANGES : 1. Included holding parameters for EXOMO
2. Amended holding altitude
3. Amended holding altitude and speed in flip-page

SINGAPORE CHANGI RNP-APCH RWY 20C – Approach from NYLON

Path Terminator	Waypoint	Fly-Over	Course °M (°T)	Magnetic Variation	Distance (NM)	Turn Direction	Altitude (FT)	Speed Limit (KT)	VPA/ TCH(FT)	Navigation Specification
IF	NYLON	-	-	-0.4	-	-	A030+	220	-	RNP APCH
TF	VABRI	-	203 (203.4)	-0.4	6.2	-	A020+	-	-	RNP APCH
TF	VILEV	-	203 (203.4)	-0.4	4.1	-	A020+	-	-	RNP APCH
TF	RW20C	Y	203 (203.4)	-0.4	6.2	-	-	-	-3.0° / 50	RNP APCH
DF	ESLUX	Y	-	-0.4	-	L	-	-	-	RNP APCH
TF	EXOMO	-	142 (142.4)	-0.4	-	-	A040+	220	-	RNP APCH

Waypoint Coordinates

Name	Latitude	Longitude
NYLON (IAF)	01° 36’ 57” N	104° 06’ 24” E
VABRI (IF)	01° 31’ 15” N	104° 03’ 58” E
VILEV (FAF)	01° 27’ 29” N	104° 02’ 22” E
RW20C	01° 21’ 43” N	103° 59’ 56” E
ESLUX	01° 18’ 44” N	103° 58’ 40” E
EXOMO	01° 04’ 25” N	104° 09’ 33” E

AERODROME CHART - ICAO

01° 25' 01.04"N
103° 52' 03.52"E

ELEV 14m

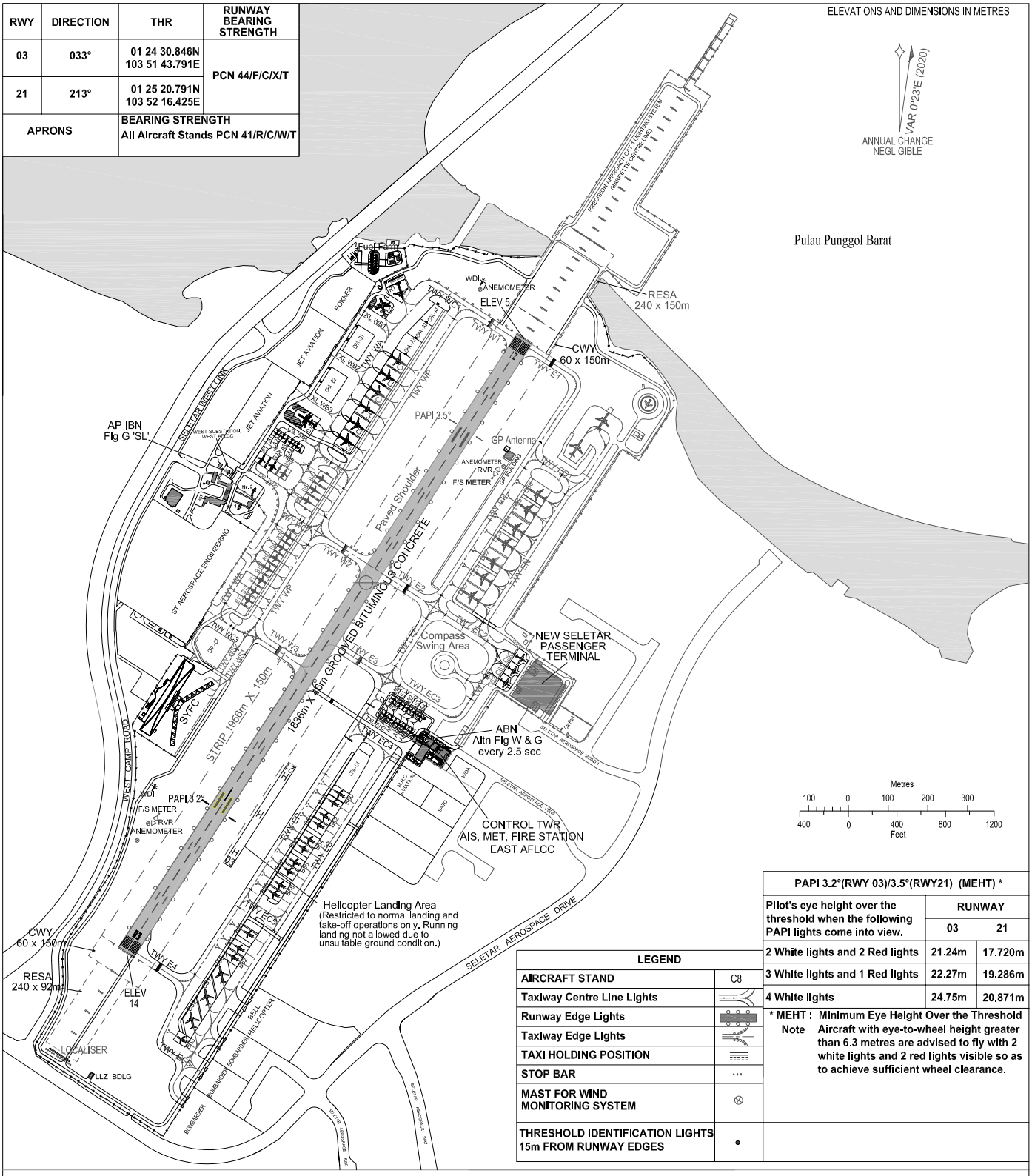
TWR	118.45
	121.6

SINGAPORE/SELETAR

RWY	DIRECTION	THR	RUNWAY BEARING STRENGTH
03	033°	01 24 30.846N 103 51 43.791E	PCN 44/F/C/X/T
21	213°	01 25 20.791N 103 52 16.425E	
APRONS		BEARING STRENGTH All Aircraft Stands PCN 41/R/C/W/T	

ELEVATIONS AND DIMENSIONS IN METRES

VAR 0°23'E (2020)
ANNUAL CHANGE NEGLIGIBLE

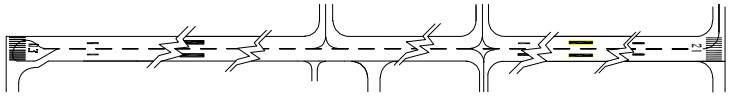


LEGEND	
AIRCRAFT STAND	C8
Taxiway Centre Line Lights	
Runway Edge Lights	
Taxiway Edge Lights	
TAXI HOLDING POSITION	
STOP BAR	
MAST FOR WIND MONITORING SYSTEM	⊗
THRESHOLD IDENTIFICATION LIGHTS 15m FROM RUNWAY EDGES	•

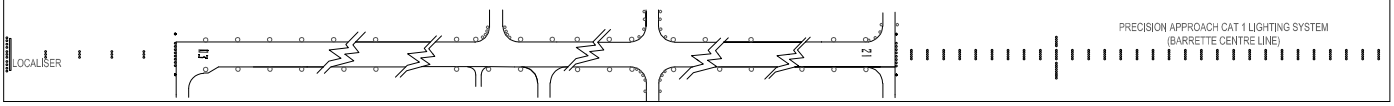
PAPI 3.2°(RWY 03)/3.5°(RWY21) (MEHT) *		
Pilot's eye height over the threshold when the following PAPI lights come into view.	RUNWAY	
	03	21
2 White lights and 2 Red lights	21.24m	17.720m
3 White lights and 1 Red lights	22.27m	19.286m
4 White lights	24.75m	20.871m

* 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 lights and 2 red lights visible so as to achieve sufficient wheel clearance.

MARKING AIDS RWY 03/21 AND EXIT TWY



LIGHTING AIDS RWY 03/21 AND EXIT TWY



CHANGES : Chart revision number updated.

INS COORDINATES FOR AIRCRAFT STANDS

STAND NR	NORTH LATITUDE	EAST LONGITUDE	ELEVATION
A1	01 25 13.102	103 51 56.167	6.181m (20.280ft)
A2	01 25 12.779	103 51 56.653	6.338m (20.795ft)
A3	01 25 12.350	103 51 57.301	6.586m (21.609ft)
A4	01 25 12.029	103 51 57.787	6.761m (22.183ft)
A50	01 24 51.431	103 52 05.765	7.807m (25.615ft)
A51	01 24 51.110	103 52 06.251	7.948m (26.077ft)
A52	01 24 50.681	103 52 06.900	8.105m (26.593ft)
A53	01 24 50.358	103 52 07.387	8.211m (26.940ft)
A54	01 24 50.036	103 52 07.874	8.337m (27.354ft)
A55	01 24 48.591	103 52 06.930	8.750m (28.709ft)
A56	01 24 48.913	103 52 06.443	8.587m (28.174ft)
A57	01 24 49.236	103 52 05.957	8.402m (27.567ft)
A58	01 24 49.665	103 52 05.309	8.179m (26.835ft)
A59	01 24 49.987	103 52 04.822	8.014m (26.294ft)
B1	01 25 11.401	103 51 55.231	6.301m (20.674ft)
B2	01 25 10.817	103 51 56.116	6.639m (21.783ft)
B3	01 25 10.221	103 51 57.014	6.967m (22.859ft)
B4	01 25 09.180	103 52 00.361	7.703m (25.274ft)
B5	01 25 08.258	103 51 59.758	7.933m (26.028ft)
B6	01 25 07.348	103 51 59.163	8.163m (26.783ft)
B7	01 25 04.505	103 51 57.519	8.442m (27.698ft)
B8	01 25 03.635	103 51 56.951	8.406m (27.580ft)
B9	01 25 02.765	103 51 56.382	8.396m (27.547ft)
B10	01 25 01.893	103 51 55.814	8.383m (27.505ft)
B11	01 25 01.006	103 51 55.237	8.330m (27.331ft)
B12	01 25 00.109	103 51 54.650	8.449m (27.721ft)
B13	01 24 59.374	103 51 54.170	8.571m (28.121ft)
B50	01 24 43.887	103 52 00.875	8.753m (28.719ft)
B51	01 24 43.153	103 52 00.394	8.847m (29.027ft)
B52	01 24 42.063	103 51 59.681	8.988m (29.490ft)
B53	01 24 41.328	103 51 59.202	9.183m (30.129ft)
B54	01 24 40.154	103 51 58.435	9.358m (30.704ft)
B55	01 24 39.420	103 51 57.954	9.434m (30.953ft)
B56	01 24 38.347	103 51 57.253	9.592m (31.471ft)
B57	01 24 37.614	103 51 56.774	9.679m (31.757ft)
B58	01 24 36.462	103 51 56.021	9.806m (32.172ft)
B59	01 24 35.728	103 51 55.541	9.930m (32.580ft)
B60	01 24 32.416	103 51 53.376	10.094m (33.117ft)
B61	01 24 31.265	103 51 52.624	10.177m (33.389ft)
B62	01 24 30.529	103 51 52.144	10.246m (33.617ft)
B63	01 24 23.858	103 51 47.937	10.639m (34.907ft)
C1	01 25 18.803	103 52 06.627	5.105m (16.750ft)
C2	01 25 17.498	103 52 05.773	5.423m (17.793ft)
C3	01 25 16.192	103 52 04.921	5.759m (18.895ft)
C4	01 25 14.887	103 52 04.067	6.256m (20.526ft)
C5	01 25 13.581	103 52 03.214	6.824m (22.390ft)
C6	01 25 12.275	103 52 02.360	7.304m (23.964ft)
C50	01 24 29.476	103 51 51.396	10.381m (34.060ft)
C51	01 24 27.626	103 51 50.188	10.589m (34.743ft)
C52	01 24 25.781	103 51 48.979	10.770m (35.335ft)
C60	01 24 54.470	103 52 16.296	6.280m (20.604ft)
C61	01 24 53.483	103 52 15.651	6.301m (20.673ft)
C62	01 24 52.496	103 52 15.006	6.312m (20.709ft)
D1	01 25 14.663	103 51 58.151	6.408m (21.025ft)
D2	01 25 24.033	103 52 04.804	3.471m (11.388ft)
D50	01 25 00.056	103 52 11.563	6.680m (21.916ft)
D51	01 25 01.585	103 52 12.561	6.440m (21.129ft)
D52	01 25 02.828	103 52 13.373	6.280m (20.604ft)
D53	01 25 04.357	103 52 14.372	6.040m (19.816ft)
D54	01 25 05.600	103 52 15.184	5.820m (19.094ft)
D55	01 25 07.129	103 52 16.184	5.550m (18.209ft)
D56	01 25 08.372	103 52 16.997	5.320m (17.454ft)

Changes: Identification number of Chart added.

WSAP AD 2.14 APPROACH AND RUNWAY LIGHTING

RWY Designator	**APCH LGT type LEN INTST**	**THR LGT colour WBAR**	**VASIS (MEHT) PAPI**	**TDZ LGT LEN**	**RWY Centre Line LGT LEN, spacing, colour, INTST**	**RWY edge LGT LEN, spacing colour, INTST**	**RWY END LGT colour WBAR**	**SWY LGT LEN colour**
1	2	3	4	5	6	7	8	9
02/20	Sequenced FLG LGT. Modified Calvert High INTST White LGT with brilliancy control.	Green	PAPI on 3° glide slope	-	NIL	White with Amber	Red	Red

WSAP AD 2.15 OTHER LIGHTING, SECONDARY POWER SUPPLY

WDI/Taxiway/Stopway	Lighted
IBN	012120.6N 1035410.0E; Flashing Red 'PL" ; Operating hours HN and IMC

WSAP AD 2.17 ATS AIRSPACE

1	*Designation and Lateral Limits*	**PAYA LEBAR CTR** 011100N 1035134E 013300N 1040149E 013200N 1035344E 012534N 1035454E thence along international BDRY to 012544N 1035320E 012227N 1035158E 012232N 1035016E 012100N 1034654E 012025N 1034539E 011835N 1034459E thence southwards on 180° to 011100N 1034459E and eastwards to join up with 011100N 1035134E.
2	*Vertical Limits*	GND to 3000 FT ALT
3	*Airspace Classification*	D
4	*ATS Unit Call Sign, Language(s)*	PAYA LEBAR TOWER (Singapore APP outside the opr hours of PAYA LEBAR TOWER), English
5	*Transition Altitude*	11000 FT (3,350m)
6	*Remarks*	Northern Transit Corridor: RSAF military aircraft (with the exception of trainer aircraft) using the northern transit corridor will enter the airspace over Johor at or above 5,000ft. RSAF trainer aircraft using the northern corridor will enter the airspace over Johor at or above 2,000ft.

WSAP AD 2.18 ATS COMMUNICATION FACILITIES

Service designation	Call sign	Frequency	Hours of operation	Remarks
APP	SELETAR APPROACH	126.025 MHz	0000-1500	TAR – Intermediate approach to Seletar Airport
	SINGAPORE APPROACH	124.05 MHz 124.6 MHz 126.3 MHz	H24	TAR – flow control service provided for ARR/DEP ACFT. Intermediate approach to Singapore Changi AP and other airports in Singapore. DEP from all airports in Singapore.
	PAYA LEBAR APPROACH	119.9 MHz 298.0 MHz *255.8 MHz #127.7 MHz	BTN 2300-1100 SUN-MON to THU-FRI On SAT-SUN, public holidays and outside the above times PPR from RSAF Headquarters via Paya Lebar Base Command Post.	* for monitoring aircraft operating in Light Aircraft Training Areas. # for monitoring aircraft operating in Light Aircraft Training Areas and Seletar outbound/inbound traffic.
TWR	PAYA LEBAR TOWER	118.05 MHz 263.1 MHz		NIL
GND	PAYA LEBAR GROUND	130.8 MHz 296.0 MHz		
PAR	PAYA LEBAR TALKDOWN	119.9 MHz †269.0 MHz ♦240.5 MHz		† for Talkdown 1,♦for Talkdown 2 Maint Period: BTN 0001-1100 First THU of EV month
SRE	PAYA LEBAR DIRECTOR	283.0 MHz		Maint Period: BTN 0001-1100 Second THU of EV month
Flight Information Service	SINGAPORE RADAR	119.1 MHz	H24	NIL

WSAP AD 2.19 RADIO NAVIGATION AND LANDING AIDS

Type of Aid and MAG Variation	IDENT	FREQ	OPR Hour	Position of transmitting Antenna Coordinates	DME transmitting Antenna Elevation / Remarks
TACAN	PLA	CH110X	H24	012224.00N 1035451.00E	030° MAG 2.375km from ARP. Maint Period: BTN 0001-0900 Second SAT of EV month For homing purposes only.
PAPA UNIFORM DVOR/DME	PU	115.1 MHz CH98X	H24	012524.00N 1035600.00E	020° MAG 9km from THR RWY 02 Antenna Hgt: 190ft AMSL. Coverage 200NM. Maint Period: BTN 0200-0600 Third WED of EV month
SINJON DVOR/DME	SJ	113.5 MHz CH82X	H24	011321.34N 1035115.22E	201° MAG 14.5km from THR RWY 02 (Paya Lebar). Antenna HGT: 190ft AMSL Coverage 200NM Maint Period: BTN 0200-0600 Third THU of EV month
ILS LLZ RWY 02	IPN	109.3MHz	H24	012246.41N 1035503.64E	LOC 401m from THR RWY 20 along centreline of RWY. Course width 3 DEG. Maint Period: BTN 0001-0900 First SUN of EV month
ILS GP RWY 02	-	332.00MHz	H24	012050.42N 1035410.11E	GP angle 3 DEG.
ILS DME RWY 02	IPN	CH30X	H24	012050.42N 1035410.11E	DME co-located with GP

INSTRUMENT APPROACH CHART - ICAO

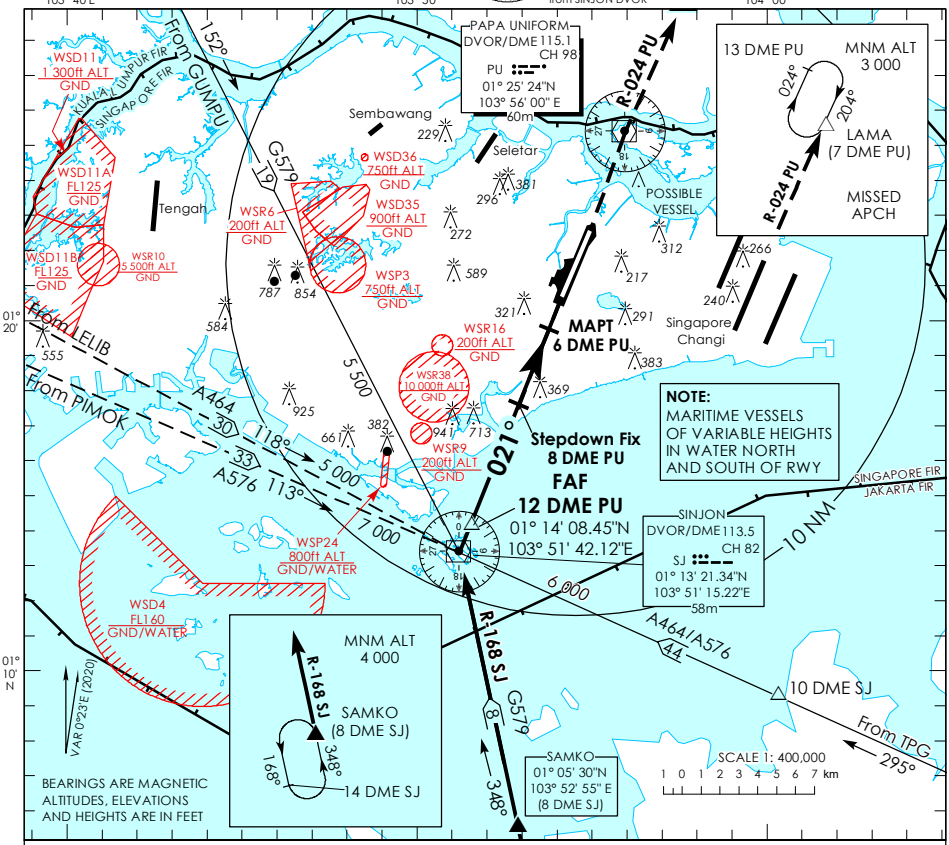
AERODROME ELEV 65ft
HEIGHT RELATED TO
THR RWY 02 - ELEV 43ft

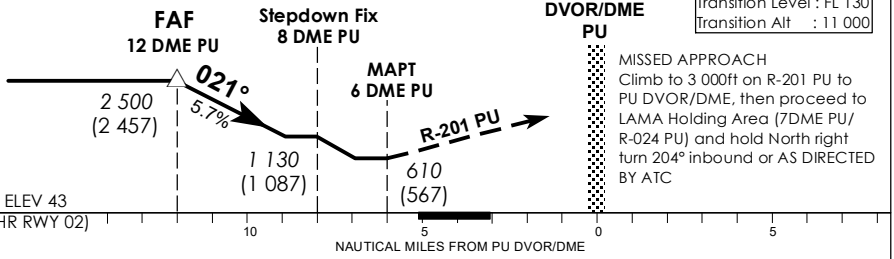
MSA 25 NM from SINJON DVOR
3400' 090° 2100' 2500' 360° 80°

APP	124.05
	119.9
	126.025
TWR	118.05

SINGAPORE/ PAYA LEBAR

PU DVOR/DME RWY 02





Transition Level : FL 130
Transition Alt : 11 000

MISSED APPROACH
Climb to 3 000ft on R-201 PU to PU DVOR/DME, then proceed to LAMA Holding Area (7DME PU/ R-024 PU) and hold North right turn 204° inbound or AS DIRECTED BY ATC

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**

CHANGES : 1. TI replaced with TPG annotation
2. Amended SINJON (SJ) DVOR/DME antenna height

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INSTRUMENT APPROACH CHART - ICAO

AERODROME ELEV 65ft
HEIGHT RELATED TO THR RWY 20 - 65ft

MSA 25 NM from PAPA UNIFORM DVOR
3400' 2900' 2100' 090° 180° 270°

ATIS Paya Lebar	148.9	
Singapore APP	124.05	
Paya Lebar APP	119.9	298.0
Seletar APP	126.025	
Paya Lebar TWR	118.05	263.1
Ground Control	130.8	296.0

RADAR REQUIRED

SINGAPORE/ PAYA LEBAR
IPS ILS/DME RWY 20

103°50'E 104°00' 104°10'

VAR 0°23'E (2020)

BEARINGS ARE MAGNETIC
ALTITUDES, ELEVATIONS AND HEIGHTS ARE IN FEET

10 NM

PAPA UNIFORM DVOR/DME 115.1 CH 98
PU
01° 25' 24"N
103° 56' 00" E
60m

203°

RADAR VECTORS
FAP
4.6 DME IPS
01° 26' 38.40"N
103° 56' 42.00"E

Pengerang Integrated Complex (PIC). Aircraft may overfly area at 2000ft and above.

PIC 2000ft SFC

Sembawang
Seletar
POSSIBLE VESSEL
Singapore Changi

WSD36 750ft ALT GND
WSD35 900ft ALT GND
WSD34 500ft ALT GND
WSR6 200ft ALT GND
WSP3 750ft ALT GND
WSR16 200ft ALT GND
WSR38 10 000ft ALT GND
WSR9 200ft ALT GND
WSP24 800ft ALT GND/WATER
WSD4 FL 160 GND/WATER

R-203 PU

LLZ 111.5 IPS

MISSED APCH
MNM ALT 2 500
8 DME SJ

SINJON DVOR/DME 113.5 CH 82
SJ
01° 13' 21.34"N
103° 51' 15.22" E
58m

KUALA LUMPUR FIR
SINGAPORE FIR
JAKARTA FIR

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

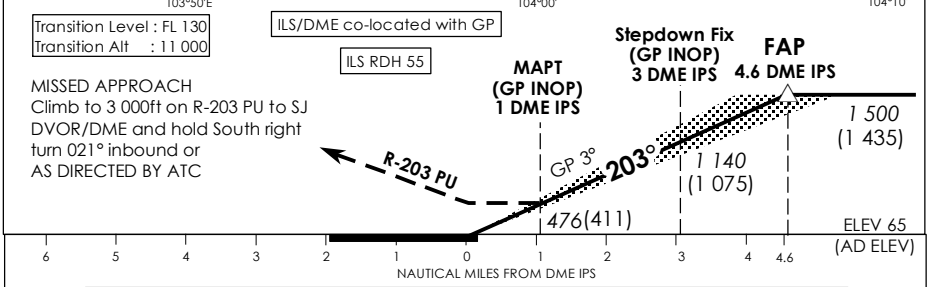
SCALE 1 : 400,000
1 0 1 2 3 4 5 6 7 8 9 km
1 0 1 2 3 4 5 NM

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)**	**224 (159)**
	GP INOP	**476 (411)**			

Distance		4 DME	3 DME	2 DME
Altitude (Height)		**1300 (1235)**	**1140 (1075)**	**820 (755)**
Speed	knots	70	120	150	185
FAF - MAPT 3.6nm	min : s	**3 : 06**	**1 : 48**	**1 : 27**	**1 : 11**
Rate of descent/GS	ft/min	**370**	**635**	**795**	**980**

CHANGES : Amended SINJON (SJ) DVOR/DME antenna height

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INSTRUMENT APPROACH CHART - ICAO

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

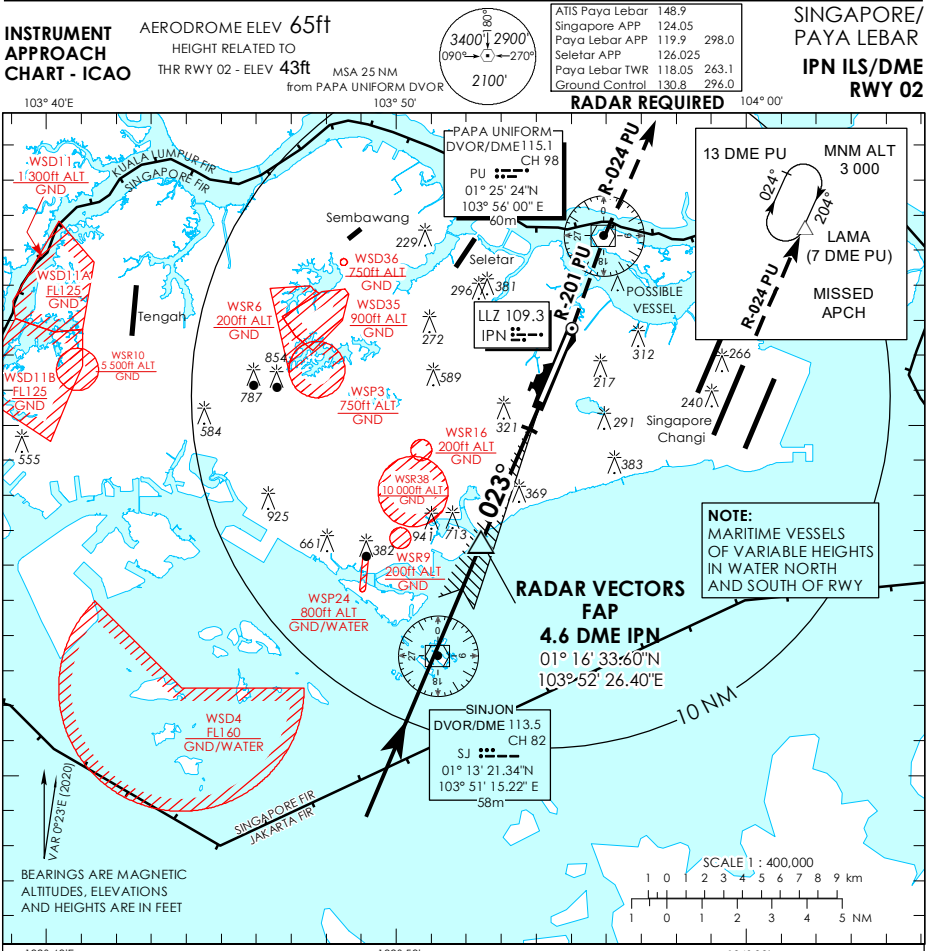
MSA 25 NM
from PAPA UNIFORM DVOR

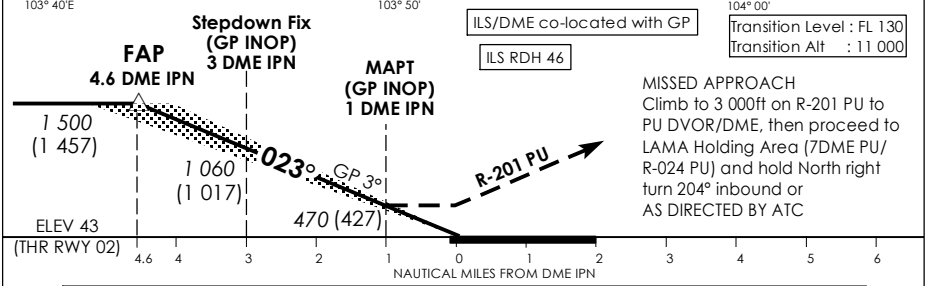
ATIS Paya Lebar	148.9
Singapore APP	124.05
Paya Lebar APP	119.9 298.0
Seletar APP	126.025
Paya Lebar TWR	118.05 263.1
Ground Control	130.8 296.0

SINGAPORE/ PAYA LEBAR

IPN ILS/DME RWY 02

RADAR REQUIRED





OCA (OCH)					
Category of Aircraft		A	B	C	D
Straight-in	CAT I ILS	**178 (135)**	**188 (145)**	**198 (155)**	**208 (165)**
	GP INOP	**470 (427)**			

Distance		4 DME	3 DME	2 DME
Altitude (Height)		**1300 (1257)**	**1060 (1017)**	**740 (697)**
Speed	knots	70	120	150	185
FAF - MAPT 3.6nm	min : s	**3 : 06**	**1 : 48**	**1 : 27**	**1 : 11**
Rate of descent/GS	ft/min	**370**	**635**	**795**	**980**

CHANGES : Amended SINJON (SJ) DVOR/DME antenna height

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INSTRUMENT APPROACH CHART - ICAO

AERODROME ELEV 65ft
HEIGHT RELATED TO THR RWY 20 - 65ft

SINGAPORE/ PAYA LEBAR

RNP RWY 20

ATIS Paya Lebar	148.9	
Singapore APP	124.05	
Paya Lebar APP	119.9	298.0
Seletar APP	126.025	
Paya Lebar TWR	118.05	263.1
Ground Control	130.8	296.0

MSA 25 NM from PAYA LEBAR ARP

RADAR REQUIRED

VAR 0°23'E (2020)

BEARINGS ARE MAGNETIC
ALTITUDES, ELEVATIONS AND HEIGHTS ARE IN FEET

RADAR VECTORS (IF) ROBGU
01°31'18.70"N
103°58'41.60"E

10 NM

(MAPt) RWY20
01°22'34.41"N
103°54'58.53"E

(FAP) REDEN
01°26'42.64"N
103°56'44.17"E

203° 5.0 NM
203° 4.5 NM
203° 6.3 NM
200° 3.6 NM

Sembawang
Seletar
WSD36 750ft ALT GND
WSD35 900ft ALT GND
WSR6 200ft ALT GND
WSP3 750ft ALT GND
WSR16 200ft ALT GND
WSR38 10 000ft ALT GND
WSR9 200ft ALT GND
WSP24 800ft ALT GND/WATER
WSD4 FL 160 GND/WATER
WSD34 500ft ALT GND
POSSIBLE VESSEL
Singapore Changi

Pengerang Integrated Complex (PIC). Aircraft may overfly area at 2000ft and above.

PIC 2000ft SFC

KUALA LUMPUR FIR
SINGAPORE FIR

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

(MATF) RUGVI
01°16'45.71"N
103°52'30.23"E

MISSED APCH
MNM ALT 4 500
200°
168°
348°
SJ
01°13' 21.34"N
103°51'15.22"E

SINGAPORE FIR
JAKARTA FIR

SINJON
DVOR/DME 113.5
CH 82
SJ
01° 13' 21.34"N
103° 51' 15.22" E
58m

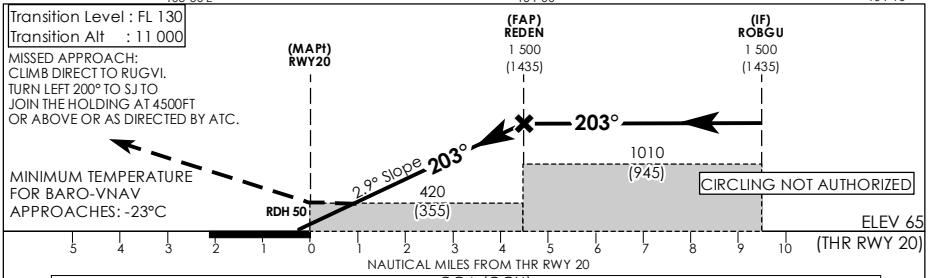
SCALE 1 : 400,000
1 0 1 2 3 4 5 6 7 8 9 km
1 0 1 2 3 4 5 NM

103°50'E 104°00' 104°10'

Transition Level : FL 130
Transition Alt : 11 000

MISSED APPROACH:
CLIMB DIRECT TO RUGVI.
TURN LEFT 200° TO SJ TO
JOIN THE HOLDING AT 4500FT
OR ABOVE OR AS DIRECTED BY ATC.

MINIMUM TEMPERATURE FOR BARO-VNAV APPROACHES: -23°C



OCA (OCH)					
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 - MAPt 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**

CHANGES : Amended SINJON (SJ) DVOR/DME antenna height

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WSAT AD 2.18 ATS COMMUNICATION FACILITIES

Service designation	*Call sign*	*Frequency P - Primary S - Secondary*	*Hours of operation*	*Remarks*
APP	TENGAH APPROACH	P130.0 MHz P263.4 MHz S122.0 MHz	BTN 2300-1100 SUN/MON to THU/FRI; and On SUN, Public holidays and outside the above times, PPR from RSAF HQ via Tengah Ops.	Nil
TWR	TENGAH TOWER	P122.0 MHz P282.5 MHz S263.4 MHz		
	TENGAH GROUND	122.0 MHz 337.8 MHz		
	TENGAH TALKDOWN	130.0 MHz 290.8 MHz 328.5 MHz		
Flight Information Service	SINGAPORE RADAR	119.1 MHz	H24	Nil
APP	SINGAPORE APPROACH	P124.05 MHz S124.6 MHz S126.3 MHz	H24	TAR – flow control service provided for ARR/DEP ACFT. Intermediate approach to Singapore Changi AP and other airports in Singapore. DEP from all airports in Singapore.

WSAT AD 2.19 RADIO NAVIGATION AND LANDING AIDS

RADIO NAVIGATION AND LANDING AIDS					
Type of Aid	*IDENT*	*FREQ*	*OPR Hour*	*Coordinates*	*Remarks*
TACAN	TNG	CH86X	2300-1100 from SUN/MON to THU/FRI; SUN, Public holidays and outside the above times prior permission required from RSAF HQ via Tengah Operations.	012336.00N 1034242.00E	043° MAG 0.55km from ARP Maint Period: 0001-0900 second SAT of EV month
SINJON DVOR/DME	SJ	113.5 MHz CH82X	H24	011321.34N 1035115.22E	201° MAG 14.5km from THR RWY 02 (Paya Lebar) Antenna HGT: 190ft AMSL. Coverage 200NM Maint Period: 0200-0600 third THU of EV month
ILS LLZ RWY 36	ITN	108.1 MHz	H24	012408.43N 1034234.34E	Located 260m from THR RWY 18 along centreline of RWY. Course width 3°
ILS GP RWY 36	-	334.7 MHz	H24	012240.84N 1034231.01E	GP antenna 3°
ILS DME RWY 36	ITN	CH18X	H24	012241.02N 1034226.67E	DME co-located with GP

WSAT AD 2.20 LOCAL TRAFFIC REGULATIONS - USE OF RSAF TENGAH AIR BASE AS AN EMERGENCY DIVERSION AERODROME FOR SINGAPORE CHANGI AIRPORT

1 INTRODUCTION

1.1 RSAF Tengah Air Base is nominated as the emergency diversionary aerodrome for Singapore Changi Airport. The arrangement outlined below is applicable for the handling of any civil aircraft movement that is diverted to RSAF Tengah Air Base.

1.2 It is emphasised that RSAF Tengah Air Base **is not an ICAO designated alternate aerodrome for Singapore Changi Airport** and therefore should not be flight planned as such. Its use by civil aircraft is permitted for emergency purposes only when Singapore Changi Airport runway is obstructed.

2 MANNING OF TENGAH AIR BASE

2.1 Tengah Air Base is open from 2300-1100 SUN/MON to THU/FRI. It is closed on SAT, SUN and public holidays. Outside the above stipulated operating hours, Tengah Air Base can be opened on 2 hours' prior notice. This arrangement, if necessary, will be undertaken by the Duty Tower Controller or SATCC Watch Manager of Singapore Changi Airport who will inform RSAF Headquarters via Tengah Ops.

2.2 Airline operators are requested to inform the Airport Manager and the Duty Tower Controller or SATCC Watch Manager at Singapore Changi Airport as soon as it is known that their service will require the use of Tengah Air Base. Revised ETAs/ETDs are to be notified as soon as known.

3 OPERATIONAL SERVICES

3.1 The layout of Tengah Airbase with the aircraft parking apron which is available for the use of civil aircraft (except B747 aircraft types) in the event of an emergency diversion from Singapore Changi Airport, is indicated in page WSAT AD 2-11. It is to be noted that only a limited number of civil aircraft can be accommodated at any one time.

3.2 Air-ground-air communication maintained by RSAF Tengah Tower/APP for AD Control Services is VHF 122.0MHz.

4 PASSENGER CLEARANCE

4.1 Once the aircraft has shutdown, only the Captain of the aircraft will be allowed out of the aircraft. All other passengers will remain in the aircraft due to space constraints and to avoid possible immigration problems.

4.2 Arrangements will be made to transport all the passengers back to Singapore Changi Airport for immigration processing.

4.3 The Airport Manager or his representative will be present at the Passenger Terminal to provide assistance when aircraft are required to land at Tengah Air Base.

4.4 No refreshment facilities are available.

5 SECURITY

5.1 All Airline personnel who are required to proceed to Tengah Air Base must wear their Singapore Changi Airport Passes at a prominent position and they will be escorted to the respective areas. All personnel not in possession of the laminated pass except Customs and Government Officers in uniform will be denied entry into Tengah Air Base by the RSAF Security Guard. Entry into the Air Base by both the airline personnel and service equipment is via the main gate. The Airline Engineering Coordinator shall be responsible for the proper positioning of the ground servicing equipment and vehicles in the Apron Area where arriving aircraft are to be parked.

5.2 No equipment, vehicles, stores, cargo or mail shall be left overnight at Tengah Air Base.

5.3 The security of civil aircraft parked in the Apron is the responsibility of the aircraft owner and any security service obtained shall first be cleared with the Tengah Air Base Security Authorities.

6 AIRCRAFT STAND ALLOCATION

6.1 Aircraft parking positions will be issued by the RSAF Tower Controller. A "follow-me" vehicle will be waiting at the accesses to guide the aircraft to the allocated parking stands.

7 COMMUNICATIONS

7.1 No VHF RTF surface movement frequency is available at Tengah Tower. Communication with the Tower will be by telephone, the nearest of which is in the Fire Station Building in front of the aircraft parking apron.